

Appendix A

Wetlands Statement of Findings





**STATEMENT OF FINDINGS FOR EXECUTIVE ORDER 11990
(PROTECTION OF WETLANDS)**

**CAPE SABLE CANALS DAM RESTORATION PROJECT
EVERGLADES NATIONAL PARK**

June 2009

Recommended:

Dan Kimball, Superintendent, Everglades National Park

Date

Certified for Technical Accuracy and Servicewide Consistency:

Bill Jackson, Chief, NPS Water Resources Division

Date

Approved:

David Vela, Southeast Regional Director

Date

1.0 INTRODUCTION

The National Park Service (NPS) has prepared and made available for public review, an Environmental Assessment (EA) for the Cape Sable Canals Dam Restoration Project. 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. The EA and this Statement of Findings (SOF) would provide decision-makers with sufficient information to decide whether restoration/construction of the dams at the East Cape Extension and Homestead canals in the Cape Sable area of Everglades National Park is worth the financial cost and potential environmental effects associated with construction. The NPS is the lead agency for preparation of this SOF.

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 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 1.1 for the locations of the failed dam sites and Figures 1.2 and 1.3 for aerial views of the East Cape Extension and Homestead canals' dam site).

Due to the need to minimize or stop tidal flow to the interior marshes of the cape, the NPS retained URS Corporation to conduct a Preliminary Engineering Analysis in 2007 to identify and develop preliminary engineering design concepts for the restoration of the failed dams on the East Cape Extension and Homestead canals. Upon completion of the preliminary study, the no action (represents the current condition) and viable action (build) alternatives for each canal were carried forward in the EA and SOF to analyze the impacts that would potentially result from implementation of these alternatives, in accordance with all applicable laws and policies. The remoteness of both dam sites and the difficulty in accessing the dam areas on the East Cape Extension and Homestead canals would have significant impact on the repair alternatives that have been developed as well as the associated costs.

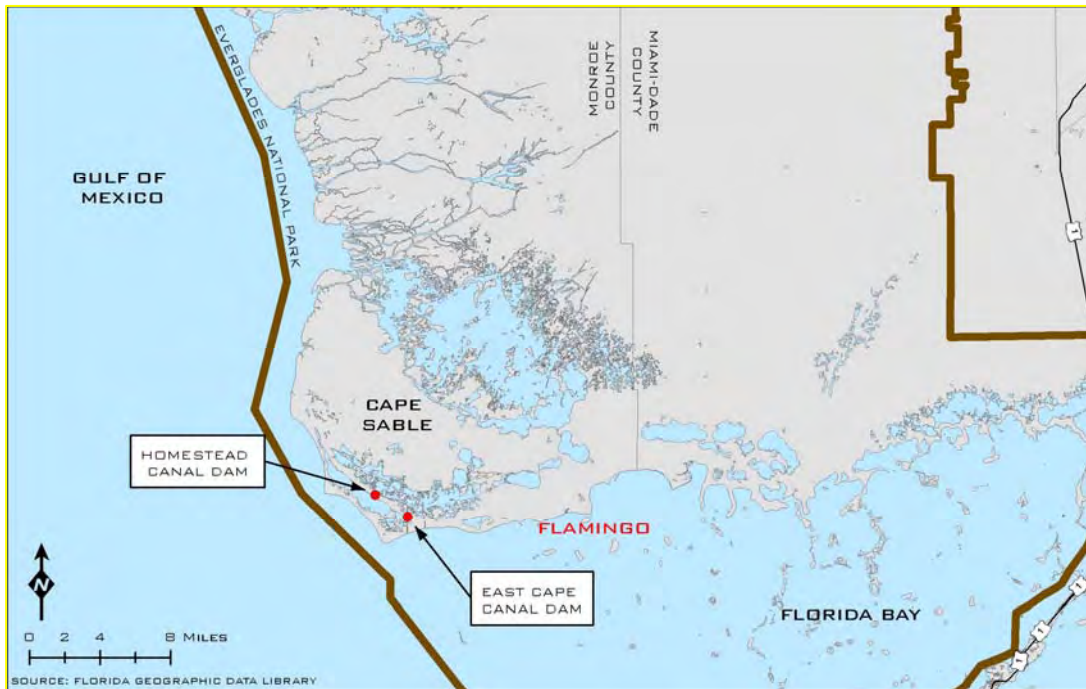


Figure 1.1 - Failed Dam Locations



Figure 1.2 – Aerial View of East Cape Extension Canal Failed Dam



Figure 1.3 – Aerial View of Homestead Canal Failed Dam

Executive Order 11990 (Protection of Wetlands) requires the NPS, and other federal agencies, to evaluate the likely impacts of actions in wetlands. The objectives of the Executive Order are to avoid, to the extent possible, the long-term and short-term adverse impacts associated with occupancy, modification, or destruction of wetlands, and to avoid indirect support of development and new construction in such areas, wherever there is a practicable alternative. The purpose of this SOF is to present the rationale for implementation of the proposed project in the wetlands of Everglades National Park and to document the anticipated effects on these wetland resources.

2.0 WETLANDS OF THE CAPE SABLE AREA

Cape Sable is located at the southwest corner of the Florida mainland. It is bordered by Florida Bay to the south, the Gulf of Mexico to the west and Whitewater Bay to the northeast. It is connected to the mainland by an easterly-trending marl ridge, at the southernmost end of the “river of grass” that makes up the Everglades ecosystem. It is located between the outlets of two major watersheds of the Everglades National Park: Shark River Slough and Taylor Slough. Shark River Slough flows from its origin in the northeast portion of the park and empties into the Gulf of Mexico to the west of Cape Sable, while Taylor Slough drains a smaller watershed along the eastern portion of the park and flows into northeastern Florida Bay (NPS 2003). The study area is at elevations near sea level and, given its location in relation to the sloughs, is subject to the overland flow that defines the park’s regional water system. Surface waters located within the Cape

Sable study area include several manmade canals, natural tidal creeks and Lake Ingraham.

The majority of the land in the Cape Sable area is classified as wetland habitat, an integral component of the Everglades National Park landscape. Wetlands of the greater Everglades ecosystem include a mosaic of vegetation types, including tree-islands, mangrove forests, cypress swamps, marl prairies, sawgrass marshes, and sloughs (USGS 2007). Figure 2.1 shows the approximate limits and wetland classifications of each distinct wetland type within the Cape Sable study area, based on available National Wetland Inventory (NWI) Geographic Information System (GIS) data layers (USFWS 2007). The “E2” wetlands are estuarine intertidal wetlands. The “SS3” wetlands are broad-leaved evergreen scrub-shrub wetlands, consisting mainly of mangrove vegetation that has had stunted growth due to the effect of hurricanes. The “EM” wetlands consist of emergent coastal prairie and salt marsh vegetation such as saltwort and other salt-tolerant plants and marsh grasses, primarily *Spartina* species. The adjacent Florida Bay, where access to Cape Sable would originate under any alternative, is classified as an estuarine subtidal habitat with aquatic beds of unknown substrate characteristics.

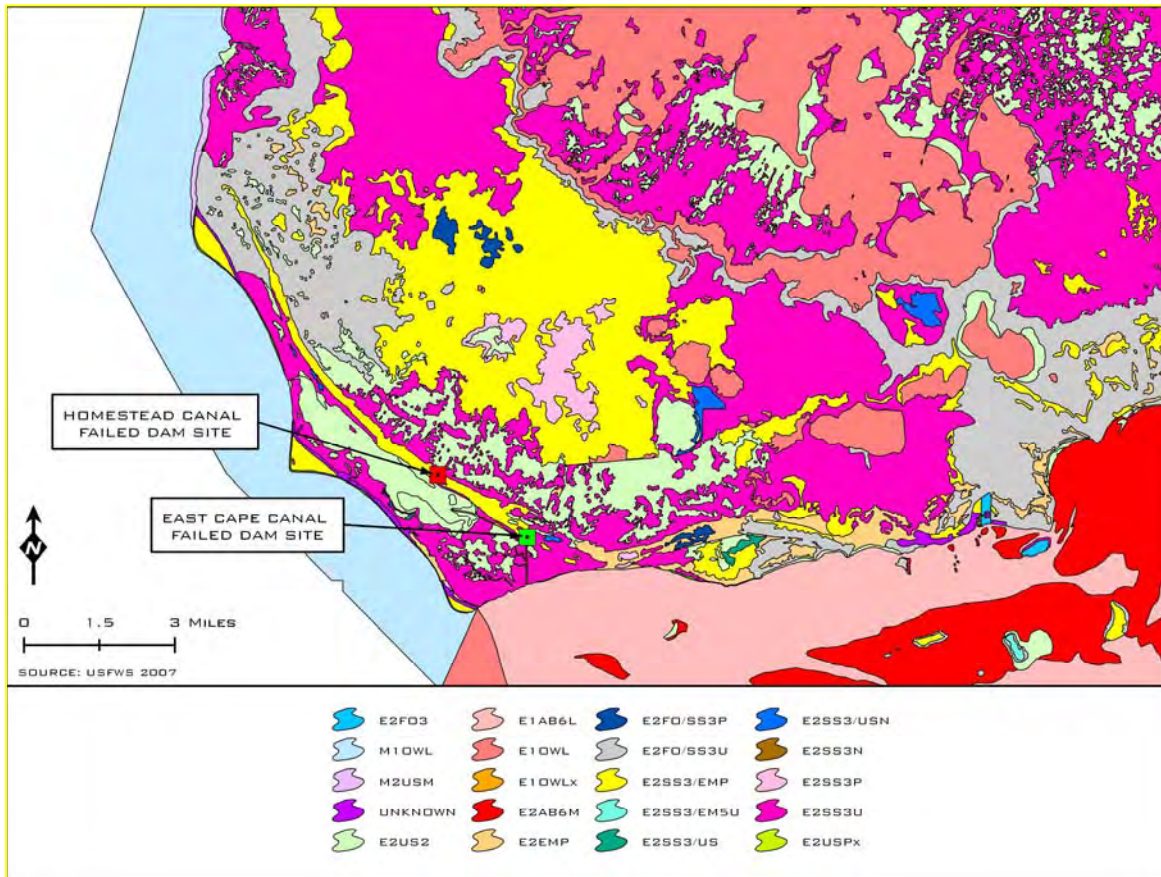


Figure 2.1 – NWI Classifications of Wetlands in Cape Sable Study Area

Prior to canal construction, the interior of Cape Sable consisted predominantly of freshwater marsh intermixed with brackish marsh. The marl ridge (shown in Figure 2.2, below) provided a continuous boundary between Florida Bay/Gulf of Mexico and the

interior areas of Cape Sable from Flamingo west to Clubhouse Beach where the marl ridge turned northwestward and continued north of Lake Ingraham and emerged at the coast north of North Cape and Little Sable Creek.



Figure 2.2 – Approximate Location of Marl Ridge

Along the Gulf of Mexico, the Cape Sable coast consists of a mangrove wetland with a series of penetrating tidal creeks running inland for approximately 1-2 miles. These penetrating tidal creeks extend along the north side of Cape Sable but fade as the shoreline turns southeastward along the shore of Whitewater Bay. The mangrove coastline typically yielded to inland brackish and freshwater marsh wetlands within 1,000 feet at most. It appears the freshwater from local rainfall and overland flow limited mangrove and other marine communities from further encroaching inland.

Canal construction appears to have had a dramatic effect on the southern portion of the interior of Cape Sable. By 1953, the higher marl areas became colonized by mangroves. According to Wanless and Vlaswinkel (2005), the collapse of the southern interior marsh was a direct result of the lowering of the marsh with construction of the East Cape, Homestead and Middle Cape canals through the marl ridge; large storm events/hurricanes (e.g., the 1935 Labor Day Hurricane was described as sending a six-foot storm surge across Cape Sable eliminating forested wetlands adjacent to Lake Ingraham, Hurricane Donna was described as lifting up whole areas of mangrove forest and moving those, creating instant new islands, Hurricane Andrew described as crumpling and rolling up large areas of marsh); and saline intrusion through the constructed canals. Since 1953, the

areas of open water have continued to gradually expand northward and the areas colonized by mangroves have progressed. In addition, the central and northern interior freshwater marsh communities of Cape Sable are interspersed with mangroves and other marine community vegetation. Peat soil is lost and fresh water marsh communities are being replaced by open water saline communities. This process has been accelerated on Cape Sable by saltwater moving through the Homestead and East Cape Extension canals where the dams have failed. The open canals and at least one “natural” tributary, East Side Creek, transport sediment and organic material from interior marshes to Lake Ingraham where much of this material has been deposited. Sediment, and probably nutrients, from the collapsed marsh also make their way to Florida Bay and the Gulf of Mexico.

Detailed characterizations of wetland/surface water areas located within and adjacent to the Cape Sable study area are as follows:

Lake Ingraham – Embayment opening directly into Gulf of Mexico / Tidal Flats (FLUCFCS – 541 / 651)

USFWS – E2USM/N (Estuarine, Intertidal, Unconsolidated Shore, Irregularly Exposed / Regularly Flooded)

Lake Ingraham is a shallow, intertidal embayment approximately 5 miles in length by 0.5 mile in width with the long axis trending northwest/southeast. This shallow embayment (3-5 feet in water depth) is separated from the marine waters of the Gulf of Mexico and Florida Bay by a narrow carbonate sand beach ridge and barrier beach, and from the interior Cape Sable complex of mangrove wetlands and numerous shallow subtidal open water areas by an emergent calcium carbonate marl ridge. Several manmade canals and natural tidal creeks provide access to the lake and function as tidal inlets enhancing tidal flow into and out of the lake. The expansion of the East Cape and Homestead canals has exacerbated sediment deposition in the interior marshes and is converting Lake Ingraham into a tidal mud flat. Today, the flood tidal delta in Lake Ingraham forms a sediment body over 2.5 miles over the entire width of the lake and is 2-3 feet thick resembling an emergent system at low tide (Wanless and Vlaswinkel 2005). The sedimentation allows for the growth of abundant surface algal and cyanobacterial mats on the substrate as well as providing suitable habitat for the colonization of red mangrove (*Rhizophora mangle*) seedlings.

Homestead Canal Dam – Mangrove Swamp / Saltwater Marsh (FLUCFCS – 612 / 642 / 512)

USFWS – E2SS3P (Estuarine, Intertidal, Scrub-Shrub, Broad-Leaved Evergreen, Irregularly Flooded), E2EMP (Estuarine, Intertidal, Emergent, Irregularly Flooded) and E1UBLx (Estuarine, Subtidal, Unconsolidated Bottom, Subtidal, Excavated)

The Homestead canal was constructed in the 1920's and cuts across the marl ridge in a low area entering Lake Ingraham on its northeast shore. The permanently flooded canal was originally excavated for development purposes and as a borrow area for fill material needed for the construction of the old Ingraham Highway. The substrate of the excavated canal is comprised of an approximate 13-foot layer of marl underlain by approximately one foot or less of peat followed by limestone bedrock. No submerged vegetation exists within the waterway itself possibly due to strong tidal currents. The canal banks are comprised primarily of regularly flooded mangrove wetlands dominated by red mangrove (*Rhizophora*

mangle), black mangrove (*Avicennia germinans*), and white mangrove (*Laguncularia racemosa*) with a sparse to dense groundcover dominated by saltwort (*Batis maritima*) and bushy seaside oxeye (*Borrchia frutescens*) adjacent to Lake Ingraham transitioning northward to a more elevated, irregularly flooded buttonwood (*Conocarpus erectus*) and saltwort (*Batis maritima*) dominated wetland in the vicinity of the Homestead Canal failed dam. The buttonwood-saltwort community dominating the marl ridge consists of a mosaic of dense to open canopy buttonwood and open areas with a sparse to dense groundcover of saltwort.

A slightly elevated relict spoil bank persisting from the construction of the canal extends eastward along the south bank of the canal from Lake Ingraham. The plant community inhabiting the spoil bank is comprised of a mosaic of estuarine wetland species, halophytic species, and plants that require less hydric conditions than those found in the surrounding mangrove and buttonwood-saltwort communities. In addition to buttonwood, saltwort, and bushy seaside oxeye, common species inhabiting the spoil bank include gray nicker (*Caesalpinia bonduc*), Portia tree (*Thespesia populnea*), white stopper (*Eugenia axillaris*), white indigoberry (*Randia aculeata*), common wireweed (*Sida ulmifolia*), moonflowers (*Ipomoea alba*), pricklypear (*Opuntia humifusa*), and triangle cactus (*Acanthocereus tetragonus*).

East Cape Extension Canal Dam – Mangrove Swamp / Saltwater Marsh (FLUCFCS – 612 / 642 / 512)

USFWS – E2SS3P (*Estuarine, Intertidal, Scrub-Shrub, Broad-Leaved Evergreen, Irregularly Flooded*), E2EMP (*Estuarine, Intertidal, Emergent, Irregularly Flooded*) and E1UBLx (*Estuarine, Subtidal, Unconsolidated Bottom, Subtidal, Excavated*)

The East Cape canal was constructed in the 1920's as a narrow canal crossing the marl ridge in a low area extending south to Florida Bay. The permanently flooded canal was originally excavated to assist with draining the southern Everglades region for agricultural purposes. The substrate of the excavated canal is comprised of an approximate 14-foot layer of marl underlain by approximately one foot or less of peat followed by limestone bedrock. No submerged vegetation exists within the waterway itself possibly due to strong tidal currents. The canal banks are comprised primarily of regularly flooded mangrove wetlands dominated by red mangrove, black mangrove, and white mangrove. This community has a groundcover dominated by saltwort and bushy seaside oxeye varying in density from sparse to dense. As the gradient increases northward toward the East Cape Extension canal failed dam site, the mangrove wetland transitions to an irregularly flooded community dominated by buttonwood and saltwort with a lesser component of white mangrove and black mangrove. This community is an open shrub canopy intermixed dense stands of saltwort.

Southern Interior – Embayment not opening directly into Gulf of Mexico / Mangrove Swamp (FLUCFCS – 542 / 612)

USFWS – E2SS3U (*Estuarine, Intertidal, Scrub-Shrub, Broad-Leaved Evergreen, Unknown Tidal*) and E2USM (*Estuarine, Intertidal, Unconsolidated Shore, Irregularly Exposed*)

The habitats on the mainland side of the marl ridge are comprised primarily of a mosaic of mangrove wetland and numerous shallow bottom subtidal areas of open water. The

southern interior of Cape Sable was a continuous marsh with isolated round lakes prior to the construction of the Homestead and East Cape Extension canals which increased saltwater intrusion to the interior (Wanless, 2005). These formerly freshwater southern interior marshes are separated from the intertidal habitats of Lake Ingraham by the marl ridge. In addition to periodic overtopping of the marl ridge, the interior marsh area receives saltwater input via the failed sheet piling dam in the Homestead and East Cape Extension Canals. Further north, the central and northern interior areas contain a mosaic of freshwater, brackish, marine, and hyper-saline flora although most of the interior is dominated by red mangrove interspersed with open water (Wanless, 2005). In addition to mangroves, common flora in the central and northern interior areas includes cordgrass (*Spartina* spp.) and sawgrass (*Cladium jamaicense*).

Florida Bay – Embayment opening directly into Gulf of Mexico (FLUCFCS – 541)

USFWS – E1UBL (Estuarine, Subtidal, Unconsolidated Bottom, Subtidal) and E1ABL (Estuarine, Subtidal, Aquatic Bed, Subtidal)

Florida Bay is located at the southernmost tip of the Florida Peninsula between the mainland and the Florida Keys, most of which lies within the boundaries of Everglades National Park. The bay is characterized by many shallow interconnected basins, with an average depth of only three feet. It is an area where freshwater from the everglades mixes with the salty waters from the Gulf of Mexico to form an estuary with interconnected basins, grassy mud banks, seagrass flats, and mangrove islands that serve as nesting, nursery, and/or feeding grounds for a host of marine animals.

3.0 PURPOSE OF AND NEED FOR ACTION AND PROJECT OBJECTIVES

As mentioned in Section 1.0, above, 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. While this landscape is naturally dynamic, slowing the rate of 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. Thus, the NPS has developed preliminary engineering design concepts for the restoration of the failed dams on the East Cape Extension and Homestead canals.

3.1 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.

3.2 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

3.3 Project Objectives

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.

3.3.1 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

3.3.2 Cultural Resources

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

3.3.3 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

3.3.4 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

4.0 ALTERNATIVES CONSIDERED

Based on the preliminary analysis, internal scoping with the NPS, and the public input related to the proposed project, the following alternatives were carried forward for analysis in the EA. Alternative drawings have been provided for review at the end of this document.

4.1 East Cape Extension Canal and Homestead Canal Alternatives

Prior to finalizing the location of each of the proposed alternatives, a Digital Terrain Model (DTM) based on aerial photography was recently created in March of 2009 for each of the failed dam sites. The purpose of the DTM was to determine the topographic features for each of the proposed restoration alternatives. The DTM was developed by contouring lands above the lowest possible tidal water line for the East Cape Extension and Homestead canal dam sites to determine the most suitable location along each canal that coincides with the highest elevation points of the adjacent low relief marl ridges. Each site was over-flown obtaining new high-resolution black and white aerial photography for photogrammetric compilation by stereo plotting methods. A survey crew using Real-Time Kinematic (RTK) – Geographic Positioning System (GPS) survey equipment surveyed (on the ground) the 3-dimensional locations of specific photo-identifiable (PID's) topographic features present in the aerial photography to 3-dimensional scale and rectified the photography.

Modeling technologies were used to develop the 3-dimensional spot elevations from the water line and above on any lands present within the prescribed area for both canal dam sites. The spot elevations peppered about the prescribed site were processed to create an AutoCAD 3-D triangular irregular network (TIN), a 3-D mesh of triangular lines connecting the 3-dimensional spot elevation points. From the TIN, contours were generated which graphically display relative elevation differences land formations above the water line. Please refer to Figures 4.1 and 4.2 below for details. Due to the remoteness of the sites, these elevation differences have not yet been correlated to NAVD 88 elevation datum. NAVD 88 datum and vertical control for the site will be completed in the near future in support of future design related activities.

The results of the DTM are represented in Figures 4.1 and 4.2 below. Figure 4.1 shows the approximate location of the preferred alternative for the East Cape Extension canal with respect to these DTM (highest) elevations. Comparative elevations in the vicinity of the existing and proposed dams are comparatively small and tend more to be sloping gently away from the canal. Such elevation changes are more indicative of the placement and spreading of excavated material away from the canal excavation during the original canal

construction. There appears to be minimal topographic relief which can be associated with a low lying Marl ridge paralleling the Lake Ingram shoreline in the vicinity of the existing dam.

Figure 4.2 shows the approximate location of the preferred alternative for the Homestead canal with respect to these (highest) elevations. The results of the DTM survey also identified a low lying area along the Homestead Canal just south of the existing failed sheetpile structure. This low lying area is approximately 40 feet by 150 feet and would require approximately one foot of fill to mitigate the potential for short-circuiting the proposed restoration alternatives. Additional filling of the canal bank area should be performed in this area to re-establish the elevated fill berm along the edge of the canal. Such filling is recommended so that flow around and south of the proposed plug area maintains a slow overland sheetflow course and does not short circuit such overland flow by discharge into the canal. These filling activities are addressed in each of the proposed alternatives presented below, except for Alternative C, since this low lying area is located in the immediate vicinity of the failed dam and the area will be filled as part of Alternative C.

The DTM survey is available for review from the National Park Service upon request.

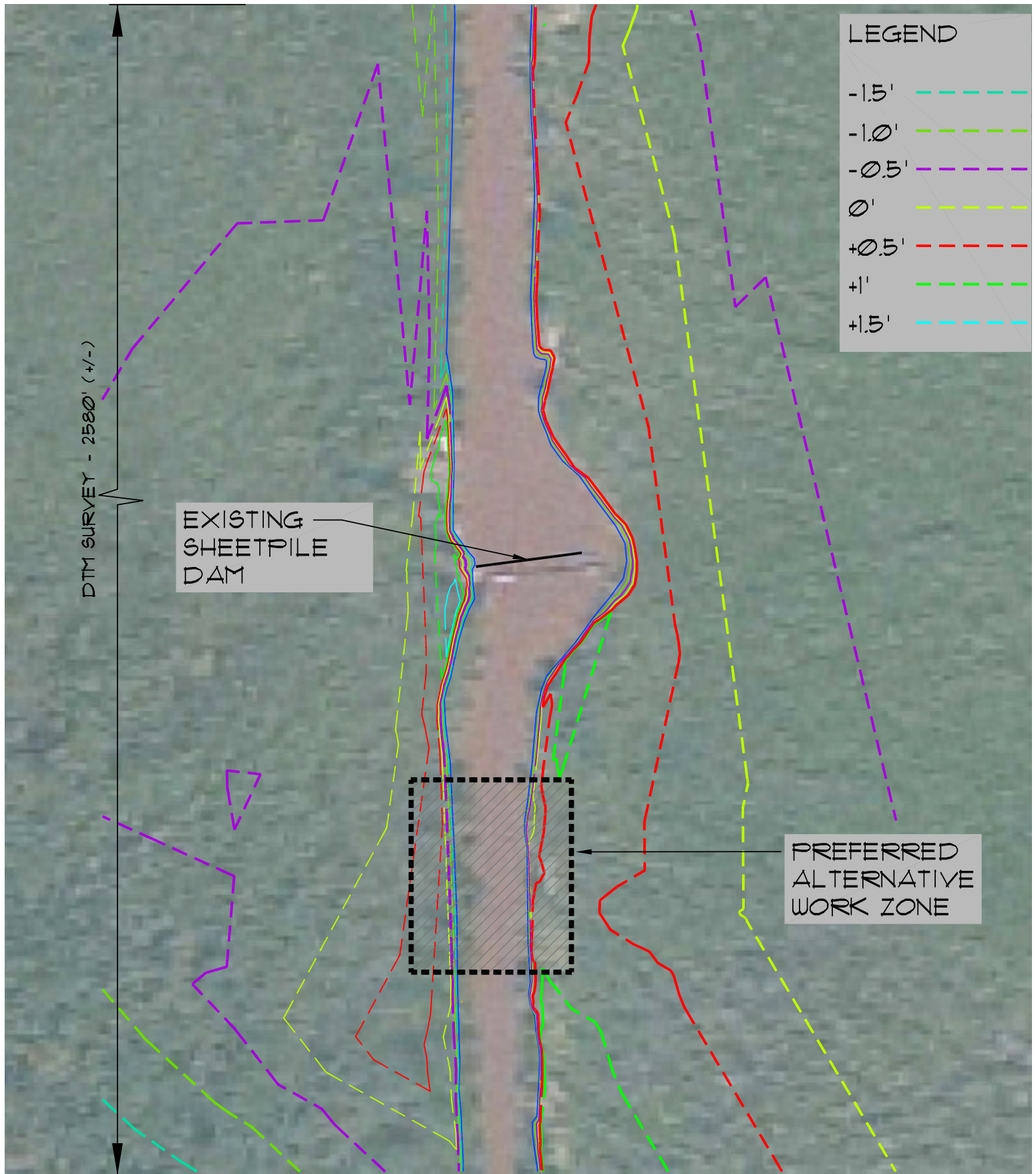
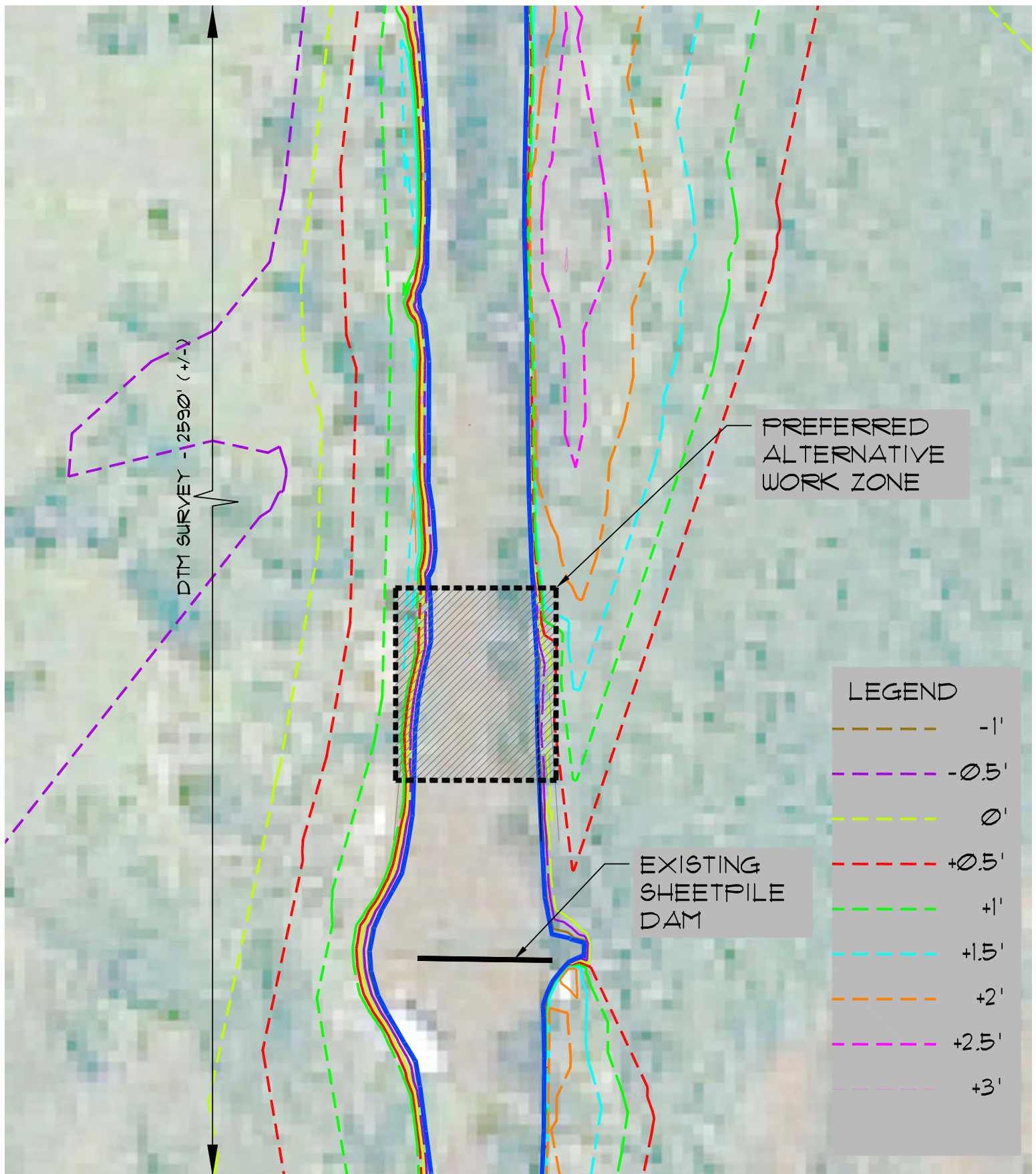


FIG. 4.1 - LOCATION OF PREFERRED ALTERNATIVE EAST CAPE EXTENSION CANAL



100 0 100 200



SCALE OF FEET

FIG. 4.2 - LOCATION OF PREFERRED ALTERNATIVE HOMESTEAD CANAL

4.1.1 Alternative A: No Action - Continue Current Management¹

The No-Action alternative involves leaving the existing sheetpile in the East Cape Extension and Homestead canals where it is today and allowing the channel to continue to widen through natural erosional processes. This alternative would fail to accomplish the goals of the NPS and the U.S. Fish and Wildlife Service (USFWS), 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 Cape Sable wilderness. In addition, no action will also require NPS personnel to continue their routine inspection and maintenance program of the failed dam structures in perpetuity to prevent access to unsafe and dangerous areas. Since the failed dam structures create strong white water currents during tide changes, NPS has been using floating buoys and cables to prevent unauthorized access. Unfortunately, due to the remote location of these failed structures and the desire for people to access the interior marshes for fishing, vandalism has become an on-going maintenance issue for NPS personnel to prevent unauthorized access.

4.1.2 Elements Common to all Action Alternatives

Several of the elements proposed as a part of this project would be common to all the alternatives considered, excluding the no action alternative. This is due to the purpose of and needs for the project, as well as the desire to incorporate sustainable design concepts in any new construction. These elements are described below.

- **Signage**

To ensure safety, warning signs would be posted at each of the proposed dam structures. Signs would be constructed of reflective material and posted a minimum of 5-ft above mean high water.

- **Floating Mooring Buoys**

Floating mooring buoys would also 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.

- **Florida Keys Staging Area**

All the necessary equipment and fill (earthen fill and riprap) would be mobilized to a suitable water transportation staging area in the Florida Keys (e.g., Sugarloaf Key or Marathon) by conventional dump trucks due to a lack of a suitable staging area in Everglades National Park and to further meet the criteria for avoidance and minimization of impacts to wetland resources. The exact location of the staging area in the Florida Keys

¹ Current Management includes, but is not limited to, public education about wilderness restrictions and safety hazards; maintenance of cables, floats and signs warning boaters of hazards; enforcement of regulations prohibiting motorized boats from entering wilderness area above the dams; monitoring of resource conditions and safety hazards.

would be determined by the awarded contractor; however, the area would be located entirely in previously disturbed uplands (i.e., parking lot, paved area, previously filled area, etc.). Construction materials would be transported to the East Cape canal via barges and tugs to the respective construction staging/work areas. The barges are anticipated to access the East Cape canal through existing navigational channels and/or deep water areas of the Gulf of Mexico and Florida Bay originating from the designated staging area in the Florida Keys. A potential barge route is depicted in Figure 4.3. The barge route was determined using available Geographic Information System (GIS) data layers obtained from the National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center documenting bathymetric contours for the state of Florida and surrounding areas (NOAA CSC, 2000). The exact route would be determined by the awarded contractor; however, the route would be restricted to existing navigational channels and/or deep water areas of the Gulf of Mexico and western Florida Bay to avoid potential adverse impacts to the submerged resources.

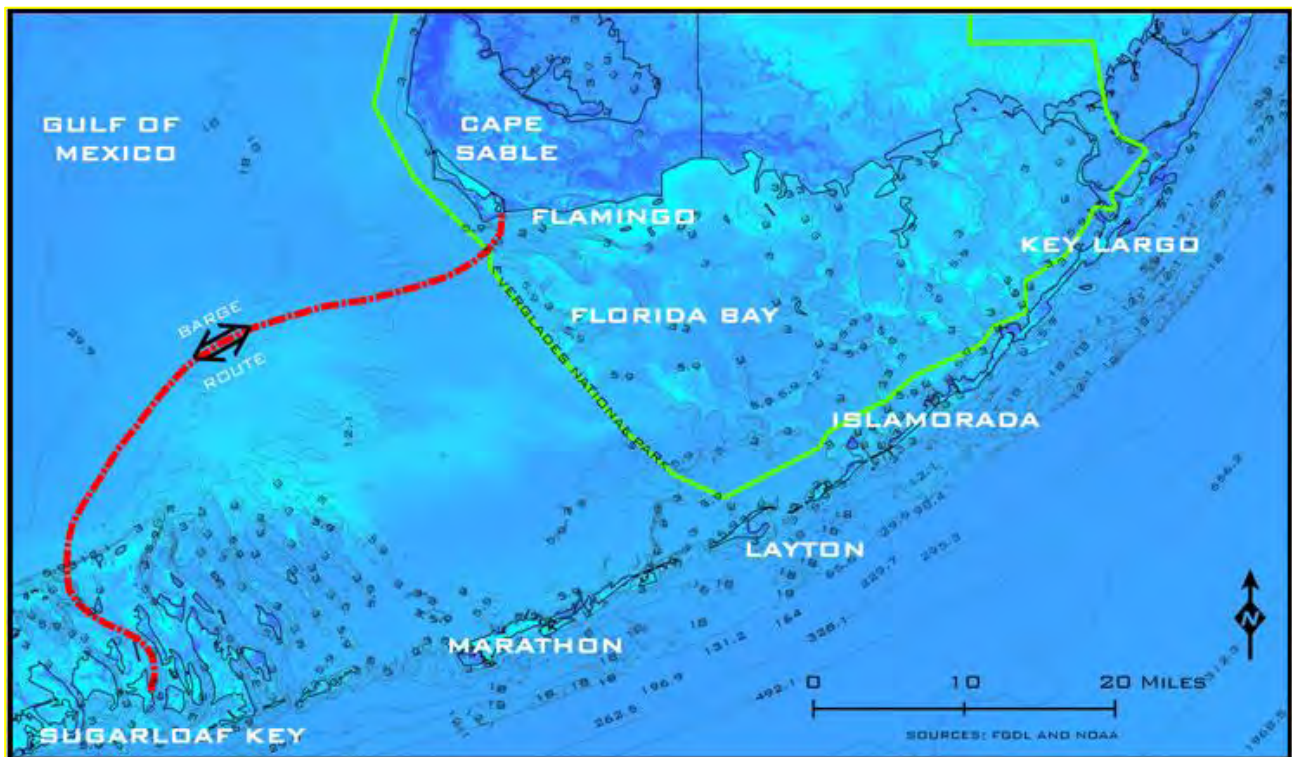


Figure 4.3 – Potential Barge Route

- **Woody Vegetation Clearing and Trimming**

Clearing of woody vegetation would be performed where necessary, along the banks of the canal for equipment access and construction within the limits of a designated safe work zone. Trimming of overhanging mangrove trees may also need to occur within the western portion of the Homestead canal and the southern portion of the East Cape Extension canal for barge access to the designated work zone (dam site). Trimming would be conducted per the requirements of the Florida Department of Environmental Protection's (FDEP) Mangrove Trimming Permit (to be acquired prior to commencement of construction).

- **Restoration of Disturbed Areas**

Areas located within the designated work area that are disturbed but not permanently filled as part of the construction would be restored. The exact type of restoration would depend on the size and location of the area, but would generally include removal of any construction materials and incidental fill material, followed by regrading to the historic contours. Any non-native vegetation observed within or directly adjacent to the work area would be removed concurrent with the regrading activities. Regrading would facilitate natural recruitment of native hydrophytic vegetation. To expedite the stabilization of the area, native vegetation will be planted in the area. A monitoring program would be initiated by the NPS in order to monitor the re-growth of native vegetation in the work zone areas for a period of up to five years.

- **Waste Management**

Waste is primarily expected to be generated from servicing and maintenance of equipment. This waste is expected to be maintained on the barge. Portable toilets would be arranged and placed at the dam site. The waste from the portable toilets would be pumped out, removed from park and disposed at an appropriate disposal facility.

- **Turbidity Control**

Construction procedures would include the use of turbidity curtains to contain disturbed sediments and reduce water quality impacts. A turbidity monitoring plan would be implemented during construction to ensure continued compliance with State water quality criteria.

- **Monitoring**

Anticipated monitoring during construction would include water quality/turbidity monitoring and monitoring for protected wildlife species. Standard USFWS and FFWCC guidelines for the protection of protected species that have the potential to occur within the project area (including but not limited to manatees, turtles, crocodiles, and smalltooth sawfish) would be implemented during construction activities to prevent injury. Anticipated long term monitoring/maintenance would include periodical riprap monitoring/maintenance. The structural aspects of the dam would also be monitored on a quarterly basis and after each major storm event. The construction phase of the project would be conducted outside of crocodile nesting season to avoid adverse impacts to this protected species.

- **Canoe/Kayak Portage**

Repair of the existing breached dam would prevent illegal motorized boat entry into the wilderness area. However, the potential exists for vandals to attempt to alter the banks of the canal beyond the outer edges of the dam, enabling access for illegal motorized boats.

Installation of the deflector wingwalls and/or riprap would mitigate this type of activity. Also, the repair of the existing dam would include an engineering component to provide safe passage over the restored dam for non-motorized boaters (canoeists/kayakers). To provide safe portage, a floating dock structure (approximately 10-ft by 10-ft) would be constructed in the center of each dam entrance. The dock would be constructed using a wood-plastic composite lumber composed of wood and recycled plastics. The dock structure would be constructed so that a portion of the structure would extend over the water. A ladder would be placed on each dock to allow for access. For Alternatives D/D1 and G/G1, 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 (see Alternative Drawings at the end of this SOF for portage details).

- **Bank Stabilization**

Banks would be stabilized within the limits of the work area to prevent internal piping and erosion of the marl into and through the riprap. This is accomplished by first placing a layer of fine sand fill over the existing sub-grade to establish a 2.5:1 side slope, which would act as both a graded filter and drainage exit for water seeping around the ends of the sheetpile and would prevent internal piping movement of the lime silts. The fine sands would be covered by a layer of non-woven geotextile fabric to prevent movement of the fine sands into the riprap. The fabric would be covered by a riprap system consisting of a coarse bedding sand/small gravel layer overlain by a coarse riprap surface cover.

4.1.3 Action Alternative C – Repair in Place

Repairing the existing steel sheetpile walls includes extending them further inland. 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.

Subsequent to sheetpile installation, fill material would be placed adjacent to the sheetpile walls (2.5:1 slope from the sheetpile to the ground) to substantially increase the lateral support for the dams. Additionally, graded riprap would be placed on top of the fill material and along the deflector wingwalls 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. Per NPS staff, the current water elevations at high tide in Lake Ingraham are up to two feet above existing substrate with portions becoming exposed at low tide due to accelerated sediment deposition. According to Wanless and Vlaswinkel (2005), portions of the lake have transitioned from an open water system to a mud flat system in recent years. The channel would be dredged to a depth of approximately six feet below the mean low water elevation. To minimize impacts caused by dredging, a mechanical (bucket) dredge would be used. While both hydraulic and mechanical dredging methods can successfully remove the accumulated sediments within the channel, mechanically dredged sediment can be placed

along the sides of the channel (less impact), versus hydraulic dredging which would require an off-site dewatering area and possible treatment equipment to allow dredge water effluent to be returned back to Lake Ingraham. For mechanical dredging operations within Lake Ingraham, accumulated sediments in the channel could be removed with a conventional barge-mounted long-reach excavator (40 to 60-ft reach). The width of the base of the dredged channel would not exceed 40 feet with anticipated 3:1 side slopes for a total top cross-sectional channel width of approximately 52 feet. The dredged material (approximately 40,000 cubic yards) would be temporarily stockpiled in areas adjacent to the dredged channel or other suitable area. Some of the dredged material would disperse through natural wave energy and erosional processes. However, construction procedures would include the use of turbidity curtains to contain disturbed sediments and reduce water quality impacts. A turbidity monitoring plan would be implemented during construction to ensure continued compliance with State water quality criteria. Upon completion of construction, the remaining material would be pulled back into the channel via a barge and heavy equipment (e.g., clam shell, backhoe, etc.). Over time, the dredged channel would be returned to pre-construction condition via natural processes.

4.1.4 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. It is anticipated that 80% of the extracted steel sheetpile could be reused. 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 and planted with wetland vegetation to reduce the potential for erosion. The fill material would originate from an off-site location. 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. Additionally, fill material would be placed adjacent to each sheetpile wall (2.5:1 slope from the sheetpile to the ground on the waterward side) to substantially increase the lateral support for the dams. Graded riprap would be placed on top of the fill material along the outside face of the sheetpile walls and along the deflector wingwalls and 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).

NPS developed a digital terrain model (DTM) by contouring lands above the lowest possible tidal water line for the East Cape Extension and Homestead Canal Dam sites in order to determine the most appropriate location along each canal that coincides with the highest elevation points of the marl ridge. Each site was over-flown obtaining new high-resolution black & white aerial photography for photogrammetric compilation by stereo plotting methods. Subsequently, a Real-Time Kinematic (RTK) Geographic Positioning System (GPS) survey field crew surveyed (on the ground) the 3-dimensional locations of specific photo-identifiable (PID's) topographic features present in the aerial photography to

3-dimensional scale and rectified the photography. The field work was conducted in March, 2009. Modeling technologies were used to develop the 3-dimensional spot elevations from the water line and above on any lands present within the prescribed area for both the East Cape Extension and Homestead canal dam sites. The spot elevations peppered about the prescribed site were processed to create an AutoCAD 3-D triangular irregular network (TIN), a 3-D mesh of triangular lines connecting the 3-dimensional spot elevation points. From the TIN, contours were generated which graphically display land formations above the water line.

To restore the low lying area identified in the DTM survey, additional fill will be added along the southern bank just east of the failed dam structure to raise the elevation along the bank approximately one foot. It is estimated that approximately 500 cubic yards of fill will be required. Since an access channel will be provided, a shallow draft barge will be used to transport the fill material to the site. Once positioned at the site, a long reach excavator will be used to transport the fill from the barge to the low lying area. A small front end loader will then be used to grade the fill placed in the low lying area to match the existing adjacent topographic elevation. Since the resulting elevation would match existing adjacent grades, regrowth of wetland vegetation is expected within two years and the area is expected to return to full functionality within five years. As a precaution, a monitoring program would be initiated by the NPS in order to monitor the re-growth of native vegetation in this area for a period of up to five years. If after two years, sufficient coverage of desirable species is not observed, supplemental plantings may be conducted to facilitate the process.

In addition to the above, 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 as described in Alternative C.

4.1.5 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 (New 100' Plug – Marl Ridge Location) and Action Alternative G (New 430' Plug – Marl Ridge Location) 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.

4.1.5.1 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 of Alternatives D and G. 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 these modified alternatives, fill material would be transported to the Homestead canal work area through a constructed floating pipeline. The 6 to 8 inch pipeline would be constructed using a shallow draft barge and would run from the work area to a larger barge located at a designated staging area at the western terminus of the Ingraham canal (eastern mouth of Lake Ingraham) for a distance of approximately 1.5 to 2 miles. The constructed floating pipeline would be anchored to the northern edge of the existing channel in Lake Ingraham and the eastern edge of the approach channel to the Homestead canal. 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 in order to avoid potential adverse impacts to the lake from dredging activities. 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 and G. The sheetpile would be removed for safety. Please reference Figure 4.4 for an aerial-view schematic of the proposed pump/pipeline system.

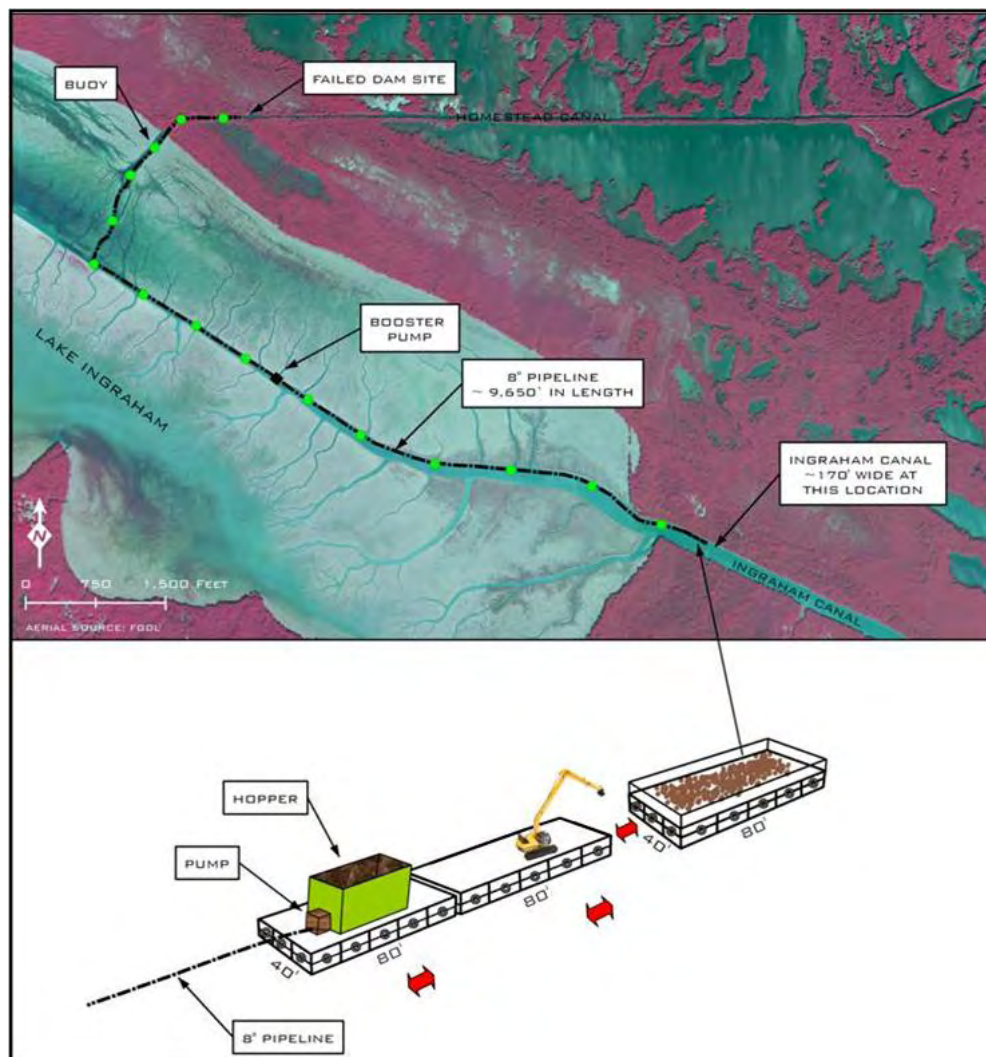


Figure 4.4 – Aerial View Schematic of Proposed Pump/Pipeline System

To restore the low lying area identified in the DTM survey, additional fill will be added along the southern bank just east of the failed dam structure to raise the elevation along the bank approximately one foot. It is estimated that approximately 500 cubic yards of fill will be required. Since an access channel will not be available to allow for a shallow draft barge to enter the work area, a helicopter will be used to transport fill material to the site and place the fill material in the low lying area. Due to the difficulty in transporting heavy equipment to the work site, manual labor will be used to grade the fill to match the existing topographic elevation. Since the resulting elevation would match existing adjacent grades, regrowth of wetland vegetation is expected within two years and the area is expected to return to full functionality within five years. As a precaution, a monitoring program would be initiated by the NPS in order to monitor the re-growth of native vegetation in this area for a period of up to five years.

4.2.1 Action Alternative B - Relocate the Existing Failed Sheetpile Dams to Narrower Location

This alternative would relocate the existing failed sheetpile dams to a narrower location upstream in the canals. The relocated dams would be strengthened by adding sheetpile wingwalls landward on both sides of the dams. The wingwalls would deflect surface flows away from the dams, help prevent illegal motorized boat entry into designated wilderness and reduce opportunities for vandals to alter the banks beyond the edge of the sheetpile walls. This alternative was considered but dismissed because it is similar to retained alternative C, it would require extracting and moving the existing sheetpile to currently undisturbed areas, and because a more sustainable solution, such as a plug configuration, would be preferable.

4.2.2 Action Alternative E - Plug from Mouths of Canals Downstream to the Existing Dams

This alternative proposes plugging the two canals from their mouths upstream to the site of the existing dams to reduce tidal inflow up to the repaired dams. A sheetpile or geotube dam would be installed at the mouths of the canals which would be filled up to the existing dams or a reasonable distance beyond the highest elevation point of the marl ridge (based on the digital terrain model described in Section 4.1.4 of this document). This alternative was considered but dismissed because it is similar to retained Alternatives G and G1 and would not be optimally cited along the high topographical point at the marl ridge. Furthermore, it was deemed economically infeasible due to the increased costs of filling longer reaches of the canals.

4.2.3 Action Alternative F - Backfill East Cape Canal from Florida Bay to the Existing Dam

This alternative proposes backfilling the East Cape Canal from Florida Bay to the existing failed dam or a reasonable distance across the marl ridge at the East Cape Canal Extension. It would also consist of plugging the Homestead Canal across the width of the marl ridge. This stretch of the East Cape Canal is approximately one mile long, 250 feet wide and ten feet deep. Due to the extensive size and volume of fill required for East Cape Canal, this alternative was deemed economically infeasible and could not be implemented in a timely manner. In addition, filling the East Cape Canal from Florida Bay to the existing failed dam at the East Cape Extension Canal would cut off boat access to Lake Ingraham

and the backcountry from the southern edge of Cape Sable, requiring park visitors to travel almost eight miles to the western entrance to Lake Ingraham. For these reasons, this alternative was dismissed from further consideration.

4.2.4 Action Alternative H - Backfill as Much of the Canals as is Feasible

This alternative proposes backfilling as much of the East Cape Extension and Homestead Canals as is feasible. This alternative would be very similar to two other retained alternatives, Alternatives G and G1 that include an amount of fill that was considered to be economically feasible. In addition, the East Cape Extension and Homestead Canals are both National Register-eligible historic resources and backfilling substantial portions of the canal could substantially affect the historic character of the resources. Filling the East Cape Extension and Homestead Canals would also cut off non-motorized boat access into the designated wilderness from Lake Ingraham and the East Cape Canal. This change would likely be controversial and potentially result in a moderate to major adverse effect on visitor use and experience. For these reasons, this alternative was dismissed from further consideration.

4.2.5 Action Alternative I - Plug Canals in Several Places with Geotubes or Fill

This alternative would plug the East Cape Extension and Homestead Canals in several places rather than the current configuration of only one dam at each canal. One of the objectives of the dam restoration project is 50-year sustainability of the replacement structure. This alternative would be less likely to fail than Alternatives B or C but probably would not be substantially more reliable than Alternatives D or G. Therefore, the alternative of multiple plugs in each canal was determined to be unnecessarily redundant since other alternatives put forward with only one dam location are being designed to meet the 50-year sustainability objective. Therefore, this alternative was dismissed from further consideration.

4.2.6 Action Alternative J - Completely Fill in the Canals

This alternative proposes backfilling the entire length of the East Cape Extension and Homestead Canals. The extensive size and volume of fill required for this alternative makes it economically infeasible and it could not be implemented in a timely manner. In addition, the East Cape Extension and Homestead Canals are both National Register-eligible historic resources and backfilling substantial portions of the canal could substantially affect the historic character of the resources. Filling the East Cape Extension and Homestead Canals would also cut off non-motorized boat access into the designated wilderness from Lake Ingraham and the East Cape Canal. This change would likely be controversial and potentially result in a moderate to major adverse effect on visitor use and experience. For these reasons, this alternative was dismissed from further consideration.

4.2.7 Action Alternative K - Repairing Middle Cape Canal at Gulf of Mexico and East Cape Canal at Florida Bay

This alternative proposes repairing the Middle Cape Canal at the Gulf of Mexico and the East Cape Canal at Florida Bay. Blocking these larger canals at the coast may substantially limit spring tide incursions into the interior marshes; however, due to the extensive size and volume of fill required for this alternative, it was found to be economically infeasible and could not be implemented in a timely manner. In addition, filling of the

Middle Cape Canal and East Cape Canal would entirely sever boat access to Lake Ingraham and the backcountry, prohibiting park visitors from traveling into these areas. This change would likely be controversial and potentially result in a moderate to major adverse effect on visitor use and experience. For these reasons, this alternative was dismissed from further consideration.

5.0 WETLANDS AND WETLAND FUNCTIONS

Most of Everglades National Park is prone to frequent and continual flooding due to low elevation, lack of extensive physical relief, and saline and freshwater hydrologic inputs (rainfall, overland sheet flow, tidal fluxes, and direct surface water discharges). The Cape Sable area is multifaceted, encompassing marine, estuarine and freshwater systems. Saltwater from Florida Bay and the Gulf of Mexico enters the Cape Sable region through a series of canals constructed in the early 20th century for agriculture and development purposes, as well as through natural watercourses such as Hidden and East Side creeks. Saltwater also enters the interior of Cape Sable through Whitewater Bay via Ponce De Leon Bay to the north. In addition, during moderate to high tides, the marl ridge is overtopped and substantial amounts of saltwater from the Gulf of Mexico enter the Cape Sable area.

For the East Cape Extension and Homestead canal dams, the areas to be affected by the physical footprint of the action alternatives (including the preferred alternatives) are a mixture of regularly flooded mangrove wetlands and irregularly flooded shrub-scrub buttonwood/saltwort/mangrove wetlands as well as the open water area of the canals. Figures 5.1 and 5.2 show the footprint of the preferred alternative overlain on a wetland map for the East Cape Extension canal dam site and the Homestead canal dam site, respectively. The wetlands are part of and contiguous with the estuarine wetland system of the greater Cape Sable area in the vicinity of the existing marl ridge. The primary functions of these wetlands include surface and subsurface water storage, support of the biogeochemical processes (nutrient cycling, peat accretion, etc.), support of characteristic plant community, and providing suitable habitat for native fish and wildlife. These functions appear to be retained, although degraded, following the excavation of the canals in the early 20th century.



Figure 5.1- East Cape Canal Preferred Alternative Footprint



Figure 5.2- Homestead Canal Preferred Alternative Footprint

5.1 Special Status Species

Eleven federally listed animal species have the potential to occur in the vicinity of the project area. These species, and their status, are listed in Table 5.1, below:

Table 5.1 – Federally Listed Endangered, Threatened and Candidate Animal Species with Potential to Occur in the Cape Sable Area

Common Name	Scientific Name	Federal Status
Florida panther	<i>Felis concolor coryi</i>	Endangered
West Indian manatee	<i>Trichechus manatus</i>	Endangered
Smalltooth sawfish	<i>Pristis pectinata</i>	Endangered
Atlantic hawksbill turtle	<i>Eretmochelys imbricata</i>	Endangered
Green turtle	<i>Chelonia mydas</i>	Endangered
Kemp's Ridley turtle	<i>Lepidochelys kempii</i>	Endangered
Atlantic leatherback turtle	<i>Dermochelys coriacea</i>	Endangered
Loggerhead turtle	<i>Caretta caretta</i>	Threatened
American crocodile	<i>Crocodylus acutus</i>	Threatened
Eastern indigo snake	<i>Drymarchon corais couperi</i>	Threatened
Wood stork	<i>Mycteria Americana</i>	Endangered

Sources: NPS, IRC 2009, Glassberg 2000.

The Florida panther lives in upper dry land habitats such as hardwood hammocks, pine flatwoods, and thicket swamps near wetlands. Although it does not like extremely wet places, it would wade across waterways if necessary to find food and drier land. The USFWS developed a Standard Local Operating Procedures for Endangered Species (SLOPES) for the Florida panther (April 18, 2000). According to that SLOPES, the USFWS designated a Panther Consultation Area in south Florida that extends from Monroe and Miami-Dade Counties north to Charlotte and Glades Counties, including portions of Collier, Broward, Palm Beach, Lee and Hendry Counties. Within the designated Panther Consultation Area (PCA) are Panther Preservation Areas (PPA) ranked as Priority 1 and 2. Also included are areas otherwise designated as Conservation Lands, such as national preserves (Big Cypress), national parks (Everglades National Park), state parks (Collier-Seminole), SFWMD Water Conservations Areas (WCA-1, -2, -3), etc. The East Cape Extension canal and the Homestead canal project areas are located outside of the Panther Preservation Areas and the Panther Conservation Area. In addition, wetlands are not particularly suitable panther habitat, but only serve as refuge from loss of suitable habitat. Therefore, since it has been determined that the proposed project is not located within the PCA, and no evidence was found of panthers inhabiting the wetlands of the Cape Sable area, the proposed project is anticipated to have no effect on the Florida panther.

The West Indian manatee is typically found in coastal or estuarine waters, bays, rivers, and lakes, but may be found in inland canals during winter months. Manatees are grazers and require sheltered coves for feeding, resting, and calving. The potential for manatees

exists within the East Cape Extension and Homestead canals, which are tidally connected to the waters of Florida Bay and the Gulf of Mexico. Although portions of these canals would be disturbed by all of the proposed action alternatives, the Florida Fish and Wildlife Conservation Commission's (FFWCC) standard protection measures would be utilized prior to and during all in-water construction activities to ensure that no adverse impacts to the West Indian manatee would result. As a result of these precaution measures, the proposed project may affect but is not likely to adversely affect the West Indian manatee.

The smalltooth sawfish can exist both in saltwater and freshwater, tending to prefer fairly shallow water with muddy or sandy bottoms such as rivers, streams, lakes, creeks, bays, lagoons, and estuaries. The potential exists for the smalltooth sawfish to occur within the project area and construction activities could affect the sawfish's behavior, causing them to avoid the affected area. However, these impacts would be minimal (affecting a relatively small area), temporary (lasting only for the duration of construction), and are not expected to jeopardize the continued existence of the smalltooth sawfish within the greater Cape Sable area. No measurable long-term effects are anticipated during operation of these facilities. Furthermore, care would be taken to ensure that no smalltooth sawfish are harmed during project construction activities. Also, smalltooth sawfish protection measures established by the FFWCC would be employed during all in-water construction activities to ensure that no adverse impacts to this species would occur. As a result of these precaution measures, the proposed project may affect but is not likely to adversely affect the smalltooth sawfish.

The Atlantic hawksbill turtle inhabits coastal reefs, bays, rocky areas, estuaries, and lagoons and are generally found at depths of 70 feet or less. Hatchlings may be found in the open sea floating on masses of marine plants. Juveniles, subadults, and adults typically forage on coral reefs, although hawksbills may also occupy other hard-bottom communities and occasionally mangrove-fringed bays. This species comes to land to nest and prefers undisturbed, deep sand beaches. No suitable nesting habitat exists within the project limits (NOAA Fisheries 2007a). Construction activities could affect the hawksbill sea turtles' behavior, causing them to avoid the affected area. However, such impacts would be minimal (affecting a relatively small area), temporary (lasting only for the duration of construction), and are not expected to jeopardize the continued existence of the hawksbill sea turtle within the greater Cape Sable area. No measurable long-term effects are anticipated during operation of these facilities. Also, sea turtle protection measures established by the FFWCC would be employed during all in-water construction activities to ensure that no adverse impacts to this species would occur. As a result of these precaution measures, the proposed project may affect but is not likely to adversely affect the Atlantic hawksbill turtle.

The green turtle is dependent upon three basic habitat types: high energy beaches for nesting; convergence zones in pelagic (open sea) habitats as juveniles, and benthic feeding grounds (namely seagrass meadows) as subadults and adults. Green sea turtle foraging areas in the southeastern United States include shallow coastal and estuarine waters with an abundance of macroalgae or seagrass. This species also occurs in non-vegetated areas near mainland coastlines, islands, reefs, or shelves, and has been observed in open-ocean surface waters, especially where wind and currents concentrate pelagic organisms (NMFS and USFWS 1991a) (NOAA Fisheries 2007a). Construction activities could affect the green sea turtles' behavior, causing them to avoid the affected

area. However, such impacts would be minimal (affecting a relatively small area), temporary (lasting only for the duration of construction), and are not expected to jeopardize the continued existence of the green sea turtle within the greater Cape Sable area. No measurable long-term effects are anticipated during operation of these facilities. Also, sea turtle protection measures established by the FFWCC would be employed during all in-water construction activities to ensure that no adverse impacts to this species would occur. As a result of these precaution measures, the proposed project may affect but is not likely to adversely affect the green turtle.

The Kemp's Ridley turtle inhabit shallow coastal and estuarine waters over sand or mud bottoms. Juveniles feed on sargassum, while adults are largely shallow-water benthic feeders whose food items include shrimp, snails, bivalves, jellyfish, and marine plants (NOAA Fisheries 2007a). Adults are restricted to the Gulf of Mexico; however, the pelagic juveniles also occur in the Atlantic Ocean (presumably dispersed by major oceanic currents). Kemp's Ridley sea turtles might temporarily forage in the open water areas in the vicinity of the proposed project; however, no suitable nesting habitat exists within the project limits. Construction activities could affect the Kemp's Ridley sea turtles' behavior, causing them to avoid the affected area. However, such impacts would be minimal (affecting a relatively small area), temporary (lasting only for the duration of construction), and are not expected to jeopardize the continued existence of the Kemp's Ridley sea turtle within the greater Cape Sable area. No measurable long-term effects are anticipated during operation of these facilities. Also, sea turtle protection measures established by the FFWCC would be employed during all in-water construction activities to ensure that no adverse impacts to this species would occur. As a result of these precaution measures, the proposed project may affect but is not likely to adversely affect the Kemp's Ridley turtle.

Atlantic leatherback sea turtles spend most of their time in the open sea, entering coastal waters only when nesting and/or in pursuit of jellyfish aggregations. Critical habitat for the leatherback includes a strip of land at, and the waters adjacent to, Sandy Point on the western end of St. Croix, U.S. Virgin Islands (NOAA Fisheries 2007a). Nesting occurs from February to July with sites located from Georgia to the U.S. Virgin Islands. During the summer, leatherbacks tend to be found along the east coast of the United States from the Gulf of Maine south to the central coast of Florida (NOAA Fisheries 2007a). Leatherbacks might temporarily forage in the open water areas in the vicinity of the proposed project; however, no suitable nesting habitat exists within the project limits. Construction activities could affect the leatherback sea turtles' behavior, causing them to avoid the affected area. However, such impacts would be minimal (affecting a relatively small area), temporary (lasting only for the duration of construction), and are not expected to jeopardize the continued existence of the leatherback sea turtle within the greater Cape Sable area. No measurable long-term effects are anticipated during operation of these facilities. Also, sea turtle protection measures established by the FFWCC would be employed during all in-water construction activities to ensure that no adverse impacts to this species would occur. As a result of these precaution measures, the proposed project may affect but is not likely to adversely affect the Atlantic leatherback turtle.

Loggerhead turtles typically occur over the continental shelf and in bays, estuaries, lagoons, creeks, and mouths of rivers, but have been found as far as 500 miles offshore (NMFS and USFWS 1991b). Nesting primarily occurs on barrier islands adjacent to continental landmasses in warm-temperate and sub-tropical waters (NMFS and USFWS

1991b). In the continental United States, loggerheads nest along the Atlantic coast and sporadically along the Gulf coast (NMFS and USFWS, 1991b). Nest sites are typically located on high-energy, open sandy beaches above the mean high tide and seaward of well-developed dunes; however, no suitable nesting habitat exists within the project limits. After hatching, juvenile loggerheads move directly to sea and often float in masses of sargassum (NMFS and USFWS, 1991b) (NOAA Fisheries 2007b). Construction activities could affect the loggerhead sea turtles' behavior, causing them to avoid the affected area. However, such impacts would be minimal (affecting a relatively small area), temporary (lasting only for the duration of construction), and are not expected to jeopardize the continued existence of the loggerhead sea turtle within the greater Cape Sable area. No measurable long-term effects are anticipated during operation of these facilities. Also, sea turtle protection measures established by the FFWCC would be employed during all in-water construction activities to ensure that no adverse impacts to this species would occur. As a result of these precaution measures, the proposed project may affect but is not likely to adversely affect the loggerhead turtle.

The American crocodile is distributed along a broad range of coastal and estuarine shores in parts of Mexico, Central and South America, the Caribbean, and the extreme tip of southern Florida (Gaby et al. 1985; Kushlan and Mazzotti 1989a; Kushlan and Mazzotti 1989b; Van Meter 1992; Hamilton 1999; Mazzotti 1999; Mazzotti and Cherkiss 2003). Historically in Florida, the American crocodile ranged from Lake Worth on the east coast, south through the upper keys and west through Florida Bay, and north to Charlotte Harbor (Kushlan and Mazzotti 1989a; Van Meter 1992). The recent distribution of the American crocodile in Florida is much more restricted, with documented populations across the southern tip of Florida from Cape Sable to southern Biscayne Bay, including Key Largo (Kushlan and Mazzotti 1989a; Hamilton 1999). American crocodile habitat in Florida Bay is defined as mangrove lined ponds, creeks, and shorelines, and man-made ponds and canals associated with them (Kushlan and Mazzotti 1989b; Van Meter 1992). American crocodile nesting habitat consists of mounds and holes built and dug in elevated substrate along the coast (Kushlan and Mazzotti 1989b; Van Meter 1992; Mazzotti and Cherkiss 2003). American crocodile nesting in Florida Bay occurs between the months of March and September (Kushlan and Mazzotti 1989b). Nesting and hatchling success has been linked to several factors, including salinity, fertility, predation, temperature extremes, moisture conditions, erosion of nest sites, and human disturbance (Mazzotti 1989). The American crocodile was designated as endangered on 25 September 1975 under the Federal Endangered Species Act (Federal Register 40:44149) (Van Meter 1992; Hamilton 1999; Mazzotti 1999; Mazzotti and Cherkiss 2003). Critical habitat for the American crocodile was designated in December of 1979 (Federal Register 45:10350-10355) (Hamilton 1999; Mazzotti and Cherkiss 2003). The federal status of the American crocodile was downlisted from Endangered to Threatened in May 2008 due to a recovery of the population, a large portion of which is located in the Cape Sable area. Seventy-five nests were located along the banks of the East Cape Extension and Homestead canals in 2007 and 2008 combined (M. Parry, NPS, personal communication, 2008). Construction activities for the proposed project would be limited to the months of October through February, during which no American crocodile nesting occurs. Therefore, due to the limiting timeframe of nesting activities and construction, the proposed project may affect but is not likely to adversely affect the American crocodile.

The Eastern indigo snake is found in a variety of habitats and would readily utilize disturbed areas and populated residential areas; however, their preferred habitat is dry pineland bordered by water. The project area consists of large expanses of wetland, which are not particularly attractive as habitat to this snake. Because the project location lacks the preferred snake habitat, there is a relatively low potential for this project to impact the Eastern indigo snake. In addition, project construction may be temporarily disruptive to individual snakes; therefore, it is predicted that any individual snake would migrate away from the construction work zone during construction activities. Also, Eastern indigo snake protection measures established by the USFWS would be employed during all construction activities. Therefore, based on the minimal potential for this snake to be present, and the implementation of these protection measures, it has been determined that this project may affect, but is not likely to adversely affect the Eastern indigo snake.

The wood stork is usually found nesting colonially in a variety of inundated forested wetlands, mixed hardwood swamps, sloughs, and mangroves. The wood stork forages mainly in shallow water in freshwater marshes, swamps, lagoons, ponds, tidal creeks, flooded pastures and ditches, where they are attracted to falling water levels that concentrate food sources (mainly fish). USFWS database records (USFWS 2009) indicate the existence of one active nesting colony located near the project area. This colony is located approximately 14.2 miles northeast of the project corridor. Therefore, the project is located in the CFA (within 18.6 miles) of this nesting colony. To minimize adverse effects to the wood stork due to any loss of wetlands, the USFWS recommends that any lost foraging habitat resulting from the project be replaced within the CFA of the affected nesting colony. However, based on the wetland functional benefits derived from the proposed project versus the minor impacts to wetlands and the fact that no suitable foraging habitat for the wood stork exists within the project limits, it has been determined that this project may affect, but is not likely to adversely affect the wood stork.

5.2 Wetland Impacts, Functional Assessment and Mitigation Analysis

Alternative A (No-Action)

1) Analysis. Under Alternative A, no construction would take place and current conditions/processes would continue. There would be no direct adverse effect from construction on existing wetland vegetation communities within the project area.

However, taking no action to address the issues associated with the failed sheetpile dams on the East Cape Extension and Homestead canals would sustain the anthropomorphic impacts on erosional processes within these canals and the greater Cape Sable area. As mentioned earlier, according to Wanless and Vlaswinkel (2005), the collapse of the southern interior marsh is a direct result of the lowering of the marsh with construction of the canals through the marl ridge, as well as large storm events/hurricanes and saline intrusion. The areas of open water have continued to gradually expand northward and the areas colonized by mangroves have progressed. Peat soil is lost and freshwater marsh communities are being replaced by open water saline communities. Thus, the characteristics and functions of large portions of the interior marsh wetlands are transitioning at increased rates from brackish ecosystems to marine ecosystems adversely impacting existing wildlife utilizing these areas (see the Wildlife and Wildlife Habitat section of this EA for further details). This process is accelerated with the substantial amount of

saltwater moving through the Homestead and East Cape Extension canals where the dams have failed. These processes would continue to act at current or potentially increasing rates. Related erosion and channel widening could also be expected to continue resulting in long-term degradation and permanent loss of portions of adjacent and downstream vegetated wetlands. Therefore, with Alternative A, long-term moderate to major adverse impacts to existing wetland resources could be expected.

Long-term, indirect, negligible to minor adverse impacts to the wetland areas directly adjacent to the existing dams are also anticipated to continue to occur as a result of canoe/kayak portage around the failed dam sites due to the dangerous conditions (i.e., strong currents, eddies, etc.) of trying to paddle through the waterway past the failed dam sites. This off-trail use by visitors has the potential to trample and possibly eliminate desirable wetland vegetation through continual usage of the trail. This impact, although minor, has the potential to introduce opportunities for the growth of nuisance, opportunistic and/or exotic vegetation within areas of higher elevation (i.e., areas with minimal/infrequent inundation allowing for the growth of exotic species). Furthermore, without the existence of a deterrent from entering the wilderness area or upstream marshes of Cape Sable, use of this area by motorized boats is likely to continue further degrading these interior marshes through disturbance and pollution from fuels, greases and oils.

While all the environmental impacts of climate change 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). Vegetation and wetlands would be impacted by the increasing amount and duration of saltwater in the interior freshwater and brackish marshes of Cape Sable.

2) Cumulative Impacts. No cumulative impacts to vegetation and wetlands would occur as a result of combining the cumulative projects with the actions contained in Alternative A because the effects of the cumulative projects would be negligible. Impacts to vegetation and wetlands would be limited only to those direct and indirect impacts resulting from Alternative A. For more information on the cumulative projects and the determinations of negligible impacts see Section 1.4.5 and Section 3.2.3 of the EA document, respectively.

3) Conclusion. No direct impacts to wetland/surface water areas would result with Alternative A. There would be moderate to major adverse effects to the wetland systems of the greater Cape Sable area. There would also be long-term, negligible to minor adverse impacts resulting from ongoing visitor use in and around the existing dam sites. No beneficial effects to wetlands are anticipated as a result of Alternative A. Alternative A would produce moderate to major adverse impacts on wetlands whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park’s master plan or other NPS planning documents. Consequently, there would be no impairment of wetlands as a result of Alternative A.

Action Alternative C (Repair in Place)

1) Analysis. Under Alternative C, the existing dam sites would be repaired along the East Cape Extension and Homestead canals. Wetland and surface water impacts would be largely restricted to the immediate banks of the canal. 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. Unavoidable direct impacts (permanent and temporary) were quantified for Alternative C based on the aerial extent of wetlands/surface waters within the proposed construction limits. The resulting quantities are depicted in Table 5.2, below:

Table 5.2 – Direct Impacts to Wetlands/Surface Waters for Alternative C

Wetland/Surface Water ID ²	Type of Impact/ Perm or Temp	Description	Direct Wetland Impacts (ft ²)	Direct Wetland Impacts (acres)
E1UBLx	Fill and Riprap - Permanent	East Cape Extension Canal	2,732.54	0.063
E1UBLx	New Sheetpile - Permanent	East Cape Extension Canal	67.77	0.001
E2SS3P/E2EMP	Riprap - Permanent	Banks of East Cape Extension Canal	3,522.52	0.081
E2SS3P/E2EMP	Mangrove Trimming - Temporary	Banks of East Cape Extension Canal	18,081.08	0.415
E2SS3P/E2EMP	New Sheetpile - Permanent	Banks of East Cape Extension Canal	499.82	0.011
E2SS3P/E2EMP	Temp. Work Zone Clearing - Temporary	Banks of East Cape Extension Canal	6,652.73	0.153
E1UBLx	Fill and Riprap - Permanent	Homestead Canal	2,848.15	0.065
E1UBLx	New Sheetpile - Permanent	Homestead Canal	122.05	0.003
E2SS3P/E2EMP	Riprap - Permanent	Banks of Homestead Canal	4,112.58	0.095
E2SS3P/E2EMP	New Sheetpile - Permanent	Banks of Homestead Canal	469.66	0.011
E2SS3P/E2EMP	Temp. Work Zone Clearing - Temporary	Banks of Homestead Canal	7,917.63	0.182
E2SS3P/E2EMP	Mangrove Trimming - Temporary	Banks of Homestead Canal	38,798.32	0.891
E2USM/N	Access Dredging - Temporary	Substrate of Lake Ingraham	1,431,040.00	32.852

Direct permanent impacts of 0.064 acres and 0.068 acres within surface waters of the East Cape Extension and Homestead canals, respectively, would occur as result of implementing Alternative C. These filling impacts are a direct result of the placement of the additional sheetpile needed to extend the existing dam to the banks of the canal as well as the placement of earthen fill and riprap for stabilization and armoring. Direct permanent impacts of 0.092 and 0.106 acres within wetlands along the banks of the East Cape

² Wetland/Surface Water identification codes define the type and characteristics of the wetland/surface water area. These codes are defined in detail in Section 2.0 of this document.

Extension and Homestead canals, respectively, would also occur. These filling impacts are associated with the placement of the additional sheetpile needed for the wingwalls as well as the placement of riprap for support and armoring. In addition to the above, approximately 0.002 acres (90 square feet) of permanent shading impacts to the East Cape Extension and Homestead canals would occur as a result of the proposed non-motorized boat (canoe/kayak) portage system. However, since no submerged resources are known to exist within these waterways, this new shading impact is negligible. Also, floating mooring buoys would be installed downstream (towards Lake Ingraham) of the dam structure 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. As a result, the moorings would minimize potential secondary impacts to the canal bottom from the use of standard boat anchors. As stated above, since no submerged resources are known to exist within these waterways, the impacts associated with installation of the moorings are negligible.

To minimize wetland resource impacts, BMPs would be implemented during construction. These practices would include employment of staked silt fence and turbidity barriers. Silt fence would be employed prior to commencement of construction around the outer perimeter of each work zone to minimize the potential for impacts to adjacent undisturbed wetlands. Turbidity barriers would be employed in the canals prior to commencement of construction at a sufficient distance (approximately 500 feet if conditions allow) from the work zone to create a temporary mixing zone upstream and downstream of the dam location in order to allow for settling of any turbidity generated during construction since the project is located in OFWs (see Water Resources section of EA for details on OFWs), which has restrictive requirements pertaining to water quality (i.e., restricted to zero NTUs above ambient). The barriers would remain in place and be regularly inspected throughout the construction phase of the project. To ensure compliance with water quality standards in OFWs, a turbidity monitoring plan would be employed during construction. If monitoring reveals that turbidity levels exceed the standards, construction activities shall cease immediately and shall not resume until corrective measures are employed (e.g., the use of additional barriers, timing construction activities with tidal cycles, modifications to equipment, etc.). After construction is completed, temporarily disturbed areas would be restored to pre-existing conditions (e.g., regraded, compacted, etc.) and possibly replanted with native coastal wetland vegetation if regrowth does not occur naturally. The turbidity barriers and silt fence would be removed at the work areas in the canals once turbidity has subsided following construction completion of the dams.

Due to the space limitations in the work area, designated work zones have been established along the canal banks in which equipment would be staged for use during construction. Additional staging is anticipated to occur on floating barge(s) along the East Cape canal at the approximate location where the Ingraham canal branches off to the west and along the Homestead canal just west of the work zone. The barge(s) are anticipated to access the East Cape Extension canal through existing navigational channels and/or deep water areas of Florida Bay, and Lake Ingraham and the Homestead canal through the Ingraham canal, Lower East Cape canal, and existing navigational channels and/or deep water areas of western Florida Bay. The barge(s) would originate from a designated staging area in the Florida Keys (e.g., Sugarloaf Key or Marathon) due to a lack of a suitable staging area in Everglades National Park and to further meet the criteria for

avoidance and minimization of impacts to wetland resources (see Figure 4.3 for the potential barge route). The exact location of the staging area in the Florida Keys would be determined by the awarded contractor; however, the area would be located entirely in previously disturbed uplands (i.e., parking lot, paved area, previously filled area, etc.). No adverse impacts to protected wetland resources are anticipated to occur as a result of utilizing the proposed accessways.

For the Homestead canal (only), barge(s) are anticipated to access the work zone with the dredging of a 52-foot wide by approximately 8,320 feet long temporary access channel through the shallow water depths within Lake Ingraham. Per NPS staff, the current water elevations at high tide in Lake Ingraham are up to 2 feet above existing substrate with portions becoming exposed at low tide due to accelerated sediment deposition. Portions of the lake have transitioned from an open water system to a mud flat system in recent years (Wanless and Vlaswinkel, 2005). The channel would be dredged to a depth of approximately six feet below the mean low water elevation. To minimize impacts caused by dredging, a mechanical (bucket) dredge would be used. While both hydraulic and mechanical dredging methods can successfully remove the accumulated sediments within the channel, mechanically dredged sediment can be placed along the sides of the channel (less impact), versus hydraulic dredging which would require an off-site dewatering area and possible treatment equipment to allow dredge water effluent to be returned back to Lake Ingraham, which has the potential to result in moderate to major adverse impacts to the water quality of Lake Ingraham. For mechanical dredging operations within Lake Ingraham, accumulated sediments in the channel could be removed with a conventional barge-mounted long-reach excavator (40 to 60-ft reach). The width of the base of the dredged channel would not exceed 40 feet with anticipated 3:1 side slopes for a total top cross sectional channel width of approximately 52 feet. The dredged material (approximately 40,000 cubic yards) would be temporarily stockpiled in areas adjacent to the dredged channel outward to a maximum distance of approximately 60 feet on both sides [for a total temporary impact footprint of approximately 172 feet wide by 8,320 feet long (32.852 acres)]. Turbidity resulting from the dredging operation would be contained within the construction footprint using staked and/or floating turbidity curtains or other suitable barriers to minimize the potential for turbidity beyond the limits of construction. The barriers would be employed prior to commencement of construction activities and remain in place and regularly inspected throughout the construction phase of the project. To ensure compliance with water quality standards in OFW (see Water Resources section of EA for details on OFWs), a turbidity monitoring plan would be employed during construction. If monitoring reveals that turbidity levels exceed the standards, construction activities shall cease immediately and shall not resume until corrective measures are employed (e.g., the use of additional barriers, timing construction activities with tidal cycles, modifications to equipment, etc.). Upon completion of construction at the Homestead canal dam site, the dredged material in Lake Ingraham would be pulled back into the channel via mechanical means and the turbidity barriers would be removed once turbidity has subsided. Some of the dredged material would disperse beyond the turbidity barriers via tidal currents and wave energy; however, due to the lack of submerged aquatic vegetation in Lake Ingraham, the effect would be considered minor to negligible. The channel would be returned to pre-construction condition upon completion of construction. Per discussions with the regulatory agencies, since no protected submerged aquatic vegetation exists in the area to be dredged, the backfilling of the channel would serve as

mitigation for dredging impacts to Lake Ingraham. Thus, no additional mitigation is anticipated for this temporary impact.

In addition to dredging, trimming of overhanging mangrove trees may need to occur within the canals for barge access. Trimming would be conducted per the requirements of the FDEP's Mangrove Trimming Permit (to be acquired prior to commencement of construction). Approximately 0.415 acres (18,081.08 s.f.) along the East Cape Extension canal and 0.891 acres (38,798.32 s.f.) along the Homestead canal may require trimming (areas based on aerial coverage of vegetation over each waterway between the mouth of each canal at Lake Ingraham and the existing dam site that would need to be trimmed to allow for barge access). Following construction completion, regrowth of the mangroves over the waterway would be left unrestricted and the area is expected to return to full functionality within five years.

The 0.153-acre temporary work zone along the East Cape Extension canal and the 0.182-acre temporary work zone along the Homestead canal would be temporarily cleared of woody vegetation above the existing substrate prior to construction. Following completion of construction activities, the work zone would be restored (e.g., regraded, compacted, etc.) to pre-existing conditions to facilitate natural recruitment of native hydrophytic vegetation. To expedite the stabilization of the area, native vegetation will be planted in the area. A monitoring program would be initiated by the NPS in order to monitor the re-growth of native vegetation in the work zone areas for a period of up to five years.

The areas to be affected by the physical footprint of the alternative are a mixture of regularly flooded mangrove wetlands and irregularly flooded shrub-scrub buttonwood/saltwort/mangrove wetlands as well as the open water area of the canal. The wetlands are part of and contiguous with the estuarine wetland system of the greater Cape Sable area in the vicinity of the existing marl ridge. The primary functions of these wetlands include surface and subsurface water storage, support of the biogeochemical processes (nutrient cycling, peat accretion, etc.), support of characteristic plant community, and providing suitable habitat for native fish and wildlife. These functions appear to be retained, although degraded, following excavation of the canals.

Per Chapter 62-345 Florida Administrative Code (F.A.C.), a functional analysis of the wetland areas to be impacted (permanent and temporary impacts) was conducted using the Florida Department of Environmental Protection's (FDEP) Uniform Wetland Mitigation Assessment Method (UMAM) (FDEP, 2004) which has been adopted by the South Florida Water Management District (SFWMD) on February 2, 2004 and, as of August 1, 2005, has also been adopted by the U.S. Army Corps of Engineers (USACE). The UMAM provides a standardized procedure for assessing the functions provided by wetlands and other surface waters; the amount that those functions are reduced by a proposed impact; and the amount of mitigation necessary to compensate for that loss in terms of current condition; hydrologic connection; uniqueness; location; fish and wildlife utilization; time lag; and mitigation risk. Impacts to surface water areas with no protected submerged aquatic vegetation typically do not require mitigation; thus, a UMAM analysis was not performed for impacts to the waterway itself. A summary of the results of the assessment on the area to be permanently and temporarily impacted is provided in Table 5.3 below. In Table 5.3, "Current" indicates the functional value of the assessment area based on existing conditions per the three categories of indicators of wetland function (location and landscape support, water environment and community structure) scored to the extent that

they affect the ecological value of the assessment area. Scores per each category range from ten to zero based on reasonable scientific judgment. A score of ten indicates an optimal level whereas a score of zero indicates a severely diminished or negligible level. The “Current” score is determined by summing the scores for each of the indicators and dividing that value by 30 to yield a number between zero and one. The “Current” assessment score is calculated twice, providing a functional assessment score without construction (existing conditions) and a functional assessment score with construction (proposed conditions). The “Delta” indicates the functional value difference between the existing conditions (without construction) and the proposed conditions (with construction). For example, a negative delta would indicate that a loss in functional value would occur with construction. “Functional Loss” indicates the total calculated loss based on the size of the wetland being impacted and the loss in functional value that would occur (impact area x “Delta”). For further details of the functional assessments, the UMAM assessment forms have been provided at the end of this Wetland SOF for review.

Table 5.3 – UMAM Functional Assessment – Impacted Areas - Alternative C

	Impact Area ID	Perm or Temp	Assess. Area Size	Current (Without)	Current (With)	Delta	Functional Loss
East Cape Extension Canal	Canal Banks – Filling	Perm	0.092 acres	0.667	0.500	-0.167	-0.015
	Canal Banks – Mangrove Trimming	Temp	0.415 acres	0.667	0.600	-0.067	-0.028
	Canal Banks – Work Zone Clearing	Temp	0.153 acres	0.700	0.533	-0.167	-0.026
Homestead Canal	Canal Banks – Filling	Perm	0.106 acres	0.667	0.500	-0.167	-0.018
	Canal Banks – Mangrove Trimming	Temp	0.891 acres	0.667	0.600	-0.067	-0.059
	Canal Banks – Work Zone Clearing	Temp	0.182 acres	0.700	0.533	-0.167	-0.030
	Lake Ingraham - Access Channel Dredging	Temp	32.852 acres	0.667	0.433	-0.233	-8.761

The UMAM analysis indicates that the banks of the East Cape Extension and Homestead canals have an existing functional assessment score ranging from 0.667 to 0.700, which falls within the moderate quality range, between 0.50 and 0.79. Wetlands assigned UMAM scores less than 0.50 are typically highly disturbed and have limited wetland functions. Wetlands assigned UMAM scores greater than 0.79 are typically high quality wetlands with pristine wetland functions.

As shown in Table 5.3, the functional loss for 0.092 acres and 0.106 acres of permanent filling impacts to wetlands along the East Cape Extension and Homestead canals was determined to be -0.015 and -0.018, respectively; the functional loss for 0.415 acres and 0.891 acres of temporary impacts to mangroves as a result of trimming activities along the East Cape Extension and Homestead canals was determined to be -0.028 and -0.059, respectively; the functional loss for 0.153 acres and 0.182 acres of temporary impacts to wetlands as a result of vegetation clearing activities along the East Cape Extension and Homestead canals was determined to be -0.026 and -0.030, respectively; and the functional loss for 32.852 acres of temporary impacts to Lake Ingraham as a result of dredging a temporary access channel was determined to be -8.761. Thus, the total functional loss for 0.092 acres of permanent impacts and 0.568 acres of temporary impacts to wetlands with implementing Alternative C for the East Cape Extension canal is -0.069. In addition, the total functional loss for 0.106 acres of permanent impacts and 33.925 acres of temporary impacts to wetlands with implementing Alternative C for the Homestead canal is -8.868.

All BMPs typically associated with NPS construction projects would be properly implemented and maintained throughout all construction activities minimizing short-term secondary impacts to adjacent and downstream wetland areas. Water quality impacts resulting from erosion and sedimentation during construction activities would be controlled through the use of BMPs, including temporary erosion control measures. Temporary erosion control measures would consist of staked silt fence and turbidity barriers. No substantial impacts due to sedimentation or water quality degradation are anticipated to occur during construction activities; however, the project would require a temporary mixing zone upstream and downstream of the dam location in order to allow for settling of any turbidity generated during construction since the project is located in OFWs, which has restrictive requirements pertaining to water quality (i.e., zero NTUs above ambient). If turbid conditions persist outside of the temporary mixing zone, the awarded contractor would be required to take all necessary measures to control turbidity. These measures may include timing construction activities with tidal cycles, modifications to equipment, or temporarily ceasing operations completely, if necessary. Permanent erosion control measures would consist of restoring disturbed areas (e.g., regrading, compacting, planting, etc.) and placement of riprap on disturbed banks for stability.

The potential for long-term secondary impacts resulting from the project were also analyzed due to the lack of a vegetative buffer between the proposed dam sites and the adjacent wetlands. However, since the area is located in the backcountry of Everglades National Park and no active roadways or trails lead to this area, continued long-term disturbance at the dam sites is not anticipated. In addition, the potential for long-term, indirect, negligible to minor adverse impacts to the wetland areas directly adjacent to the existing dams would be remedied through the construction of canoe/kayak portages over the new dams. Details of the portage are discussed in Section 4.0 of this document. Thus, this observed activity is not anticipated to continue following dam construction, which provides a net benefit in relation to indirect/secondary impacts.

Furthermore, no adverse impacts are anticipated to occur to the watershed as a result of the proposed project due to the derived benefits. Although a small area of existing wetland vegetation would be permanently impacted with construction of this alternative, the upstream and downstream benefits to existing wetland functions for Lake Ingraham

(approximately 1,863 acres) and the interior marshes of Cape Sable (approximately 55,894 acres based on aerial the footprint north of the marl ridge to the southern edge of Whitewater Bay) outweighs the wetland functional loss derived from the implementation of Alternative C (see above). This is evidenced through the use of the UMAM functional analysis, which was used to assess the potential benefits to the interior marsh and Lake Ingraham (see Figure 5.3 for locations of the proposed offsite mitigation areas) derived as a result of the proposed project. Since the Cape Sable area interior marsh wetlands are contiguous and retain similar wetland functions, it was appropriate to conduct one UMAM functional assessment for the entire area. In addition, the temporary impacts would be mitigated through onsite restoration activities as discussed above; however, a mitigation UMAM functional analysis was also performed for these temporary impacts to show that any resulting temporal functional losses would be mitigated with the upstream and downstream benefits to existing wetland functions within Lake Ingraham and the interior marshes of Cape Sable. The resulting UMAM assessment scores are provided in Table 5.4, below. Copies of the UMAM scores for the mitigation areas have been enclosed for review at the end of this SOF.

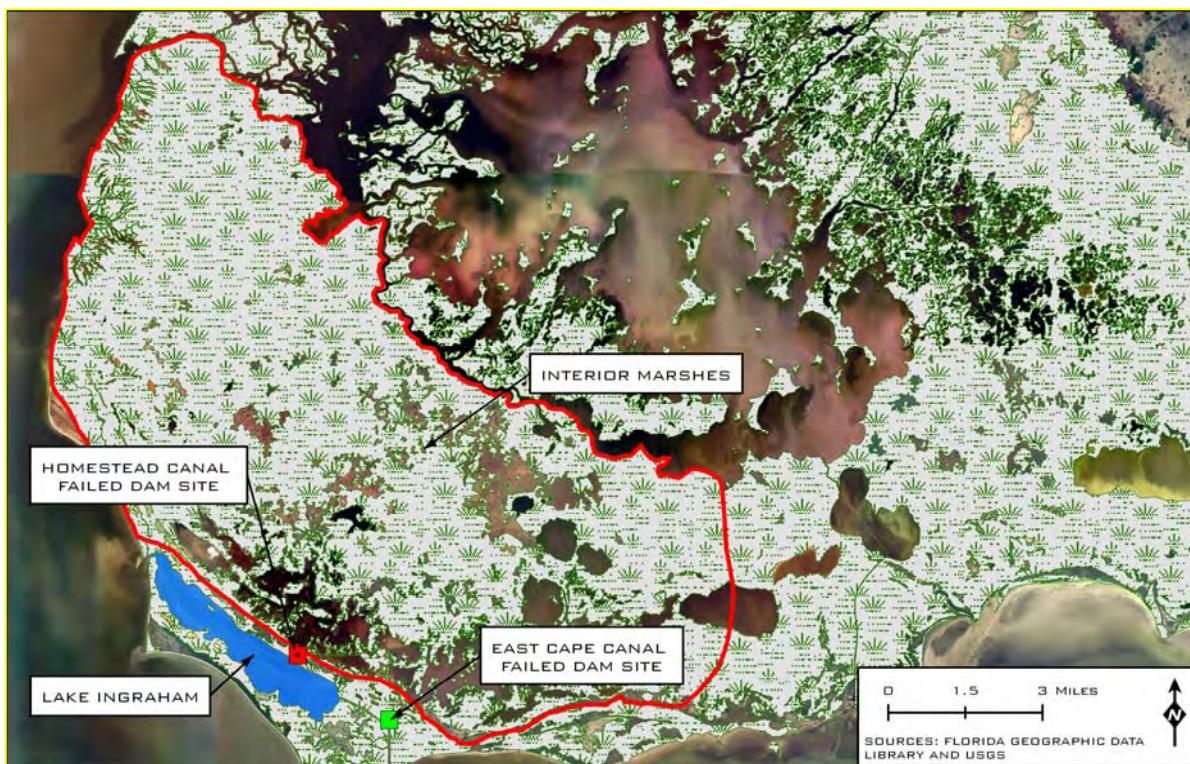


Figure 5.3 – Offsite Wetland Mitigation Areas

Table 5.4 – UMAM Functional Assessment for Mitigation Areas – Alternative C

Mitigation Area ID		Assess. Area Size	Current (Without)	Current (With)	Delta	Time Lag	Risk	Relative Functional Gain	Functional Gain (Mitigation Credits)
East Cape Extension Canal	Mangrove Trimming Onsite Restoration	0.415 acres	0.600	0.667	0.067	1.14	1.25	0.047	0.019
	Temporary Work Zone Onsite Restoration	0.153 acres	0.533	0.700	0.167	1.14	1.25	0.117	0.018
Lake Ingraham Offsite Enhancement		1,863 acres	0.700	0.767	0.100	1.0	1.25	0.080	149.040
Interior Marshes Offsite Enhancement		55,894 acres	0.667	0.767	0.067	1.0	1.25	0.053	2,962.382-
Homestead Canal	Mangrove Trimming Onsite Restoration	0.891 acres	0.600	0.667	0.067	1.14	1.25	.047	0.042
	Temporary Work Zone Onsite Restoration	0.182 acres	0.533	0.700	0.167	1.14	1.25	0.117	0.021
	Access Channel Dredging Onsite Restoration	32.852 acres	0.433	0.667	0.233	1.03	1.25	0.181	5.946

The time lag (the period of time between when the functions are lost at the impact site and when the functions are achieved at the mitigation site) and risk (the degree of uncertainty that the proposed conditions would be achieved resulting in a reduction in the ecological value of the mitigation sites) scores for the mitigation areas listed in Table 3.3, above, were determined as follows:

Mangrove Trimming Restoration (East Cape Extension and Homestead canals): The time lag was determined to be five years resulting in a T-factor score of 1.14 to allow for regrowth of trimmed mangroves and attain comparable pre-impact conditions. The risk was determined to have a score of 1.25 since vulnerability is low with a high probability of success (hydrological conditions, water quality, adjacent land uses not a factor; vulnerability to colonization of undesirable invasive exotics is low; vulnerability to undesirable plant communities is low).

Temporary Work Zone Restoration (East Cape Extension and Homestead canals): The time lag was determined to be five years resulting in a T-factor score of 1.14 to allow for regrowth of the mangrove/saltwort-dominated vegetation and attain comparable pre-impact conditions. The risk was determined to have a score of 1.25 since vulnerability is low with a high probability of success (hydrological conditions, water quality, adjacent land uses not a factor; vulnerability to colonization of undesirable invasive exotics is low; vulnerability to undesirable plant communities is low).

Access Channel Restoration (Lake Ingraham - Homestead canal): The time lag was determined to be two years resulting in a T-factor score of 1.03 to attain comparable pre-impact conditions as a regularly to periodically exposed mud flat with algal and cyanobacterial mats on the substrate. The risk was determined to have a score of 1.25 since vulnerability is low with high probability of success.

Lake Ingraham and the Interior Marshes: The time lag (the period of time between when the functions are lost at the impact site and when the functions are achieved at the mitigation sites) was determined to be immediate (less than one year) resulting in a T-factor score of 1.0 due to the following immediately derived benefits:

- Lake Ingraham
 - The dams would slow the rate of sediment deposition in Lake Ingraham as a result of marsh collapse and loss of sediment and nutrients from the interior freshwater and brackish marshes
 - The dams would improve habitat for wading birds, forage and game fish and other wildlife within Lake Ingraham due to the decrease in sediment deposition rates
- Interior Marshes
 - The dams would restrict the unnatural flow of saltwater into freshwater and brackish marshes north of the Cape Sable marl ridge through these canals
 - The dams would reduce freshwater loss from freshwater and brackish interior marshes through the East Cape Extension and Homestead canals
 - The dams would slow the rate of marsh collapse and loss of sediment and nutrients from the interior freshwater and brackish marshes
 - The dams would improve nesting and juvenile habitat for crocodiles, wading birds, forage and game fish and other wildlife within the freshwater and brackish marshes north of the marl ridge

The risk (the degree of uncertainty that the proposed conditions would be achieved resulting in a reduction in the ecological value of the mitigation sites) was determined to have a score of 1.25. The risk factor was determined based on the potential for scour during high tidal fluxes overtopping the marl ridge to erode new channels around the permanent riprap armor.

The mitigation functional gain was calculated as follows:

- A relative functional gain [$\text{mitigation Delta} / (\text{risk} \times \text{time lag})$] of 0.019 and 0.042 for mangrove trimming onsite restoration for the East Cape Extension and Homestead canals, respectively. The actual mitigation functional gain (gain in functions

provided by that mitigation assessment area = mitigation acres x relative functional gain) provided by this onsite restoration (allowing for unrestricted regrowth of mangroves over the waterway) is 0.008 and 0.037 for the East Cape Extension and Homestead canals, respectively.

- A relative functional gain of 0.018 and 0.021 for the restoration of the temporary work zones for the East Cape Extension and Homestead canals, respectively. The actual mitigation functional gain provided by this onsite restoration is 0.003 and 0.004 for the East Cape Extension and Homestead canals, respectively.
- A relative functional gain of 5.946 for the restoration of the temporary access channel in Lake Ingraham dredged to access the Homestead canal. The actual mitigation functional gain provided by this onsite restoration is 195.338.
- A relative functional gain of 0.053 for the interior marshes and 0.080 for Lake Ingraham. The actual mitigation functional gain provided by the mitigation sites was determined to be approximately 2,962.38 for the enhancement of approximately 55,894 acres of interior marsh and approximately 149.04 for the enhancement of approximately 1,863 acres of Lake Ingraham.

Thus, for the East Cape Extension canal, the total calculated functional gain for onsite restoration of 0.568 acres and offsite enhancement of 57,757 acres of wetlands is 3,111.459; whereas, the total calculated functional loss for 0.092 acres of permanent impacts and 0.568 acres of temporary impacts to wetlands with implementing Alternative C is -0.069 showing that the overall benefit to local and regional wetlands in the greater Cape Sable area as a result of the construction of this alternative far outweighs the total calculated functional loss to wetlands associated with construction. Thus, no additional mitigation is warranted for proposed permanent and temporary impacts to onsite wetlands as a result of implementing Alternative C for the East Cape Extension canal.

Similarly, for the Homestead canal, the total calculated functional gain for onsite restoration of 33.925 acres and offsite enhancement of 57,757 acres of wetlands is 3,117.431; whereas, the total calculated functional loss for 0.106 acres of permanent impacts and 33.925 acres of temporary impacts to wetlands with implementing Alternative C is -8.868 showing that the overall benefit to local and regional wetlands in the greater Cape Sable area as a result of the construction of this alternative far outweighs the total calculated functional loss to wetlands associated with construction. Thus, no additional mitigation is warranted for proposed permanent and temporary impacts to onsite wetlands as a result of implementing Alternative C for the Homestead canal.

While all the environmental impacts of climate change 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). Vegetation and wetlands 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 the proposed dam structure. 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 a dam structure would allow time for the interior marshes of Cape Sable 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.

2) Cumulative Impacts. No cumulative impacts to vegetation and wetlands would occur as a result of combining the cumulative projects with the actions contained in Alternative C because the effects of the cumulative projects would be negligible. Impacts to vegetation and wetlands would be limited only to those direct and indirect impacts resulting from implementation of Alternative C. For more information on the cumulative projects and the determinations of negligible impacts see Section 1.4.5 and Section 3.2.3 of the EA, respectively.

3) Conclusion. For Alternative C, construction activities would result in minor adverse, localized, direct effects on vegetation. However, this action alternative would provide an overall benefit to local and regional wetlands in the greater Cape Sable area, which far outweighs the minor direct impacts associated with construction. The conservation of the local and regional wetlands receiving the benefits derived from the project is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's master plan or other NPS planning documents. Alternative C would result in short-term, minor, adverse, and localized impacts as well as long-term beneficial effects. Thus, there would be no impairment of vegetation and wetlands as a result of the implementation of Alternative C.

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

1) Analysis. Under Alternative D, the existing dams would be removed and replaced with 100-foot plugs centered on the highest elevation point of the marl ridge along the East Cape Extension and Homestead canals (see Figures 4.1 and 4.2 in Section 4.1.4 of this document depicting the location of the preferred alternatives along the highest elevation points of the marl ridge for each of the canals). Under Alternative G, the existing dams would be removed and replaced with plugs the length of the approximate marl ridge along the East Cape Extension (370') and Homestead (430') canals. Wetland and surface water impacts are largely restricted to the immediate banks of the canals. 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. Unavoidable direct impacts (permanent and temporary) were quantified for Alternatives D and G based on the aerial extent of wetlands/surface waters within the proposed construction limits. The resulting quantities are depicted in Tables 5.5 and 5.6:

Table 5.5 – Direct Impacts to Wetlands/Surface Waters for Alternative D

	Wetland/Surface Water ID ³	Type of Impact/ Perm or Temp	Description	Direct Wetland Impacts (ft ²)	Direct Wetland Impacts (acres)
East Cape Extension Canal	<i>E1UBLx</i>	Fill and Riprap - Permanent	East Cape Extension Canal	1,664.18	0.038
	<i>E1UBLx</i>	New Sheetpile - Permanent	East Cape Extension Canal	607.78	0.014
	<i>E1UBLx</i>	Plug Fill - Permanent	East Cape Extension Canal	5,470.78	0.126
	<i>E2SS3P/E2EMP</i>	Riprap - Permanent	Banks of East Cape Extension Canal	3,970.57	0.091
	<i>E2SS3P/E2EMP</i>	New Sheetpile - Permanent	Banks of East Cape Extension Canal	499.90	0.011
	<i>E2SS3P/E2EMP</i>	Mangrove Trimming - Temporary	Banks of East Cape Extension Canal	18,081.08	0.415
	<i>E2SS3P/E2EMP</i>	Work Zone Clearing - Temporary	Banks of East Cape Extension Canal	8,551.11	0.196
Homestead Canal	<i>E1UBLx</i>	Fill and Riprap - Permanent	Homestead Canal	2,107.32	0.048
	<i>E1UBLx</i>	New Sheetpile - Permanent	Homestead Canal	445.64	0.010
	<i>E1UBLx</i>	Plug Fill - Permanent	Homestead Canal	4,105.33	0.094
	<i>E2SS3P/E2EMP</i>	Riprap - Permanent	Banks of Homestead Canal	3,127.24	0.072
	<i>E2SS3P/E2EMP</i>	New Sheetpile - Permanent	Banks of Homestead Canal	563.75	0.013
	<i>E2SS3P/E2EMP</i>	Temp. Work Zone Clearing - Temporary	Banks of Homestead Canal	8,337.40	0.191
	<i>E2SS3P/E2EMP</i>	Mangrove Trimming - Temporary	Banks of Homestead Canal	38,798.32	0.891
	<i>E2SS3P/E2EMP</i>	Earthen Fill - Temporary	Southern Bank of Homestead Canal	1,077.88	0.025
	<i>E2USM/N</i>	Access Dredging - Temporary	Substrate of Lake Ingraham	1,431,040.00	32.852

³ Wetland/Surface Water identification codes define the type and characteristics of the wetland/surface water area. These codes are defined in detail in Section 3.4.1.3 of this document.

Table 5.6 – Direct Impacts to Wetlands/Surface Waters for Alternative G

	Wetland/Surface Water ID ⁴	Type of Impact/ Perm or Temp	Description	Direct Wetland Impacts (ft ²)	Direct Wetland Impacts (acres)
East Cape Extension Canal	E1UBLx	Fill and Riprap - Permanent	East Cape Extension Canal	1,664.18	0.038
	E1UBLx	New Sheetpile - Permanent	East Cape Extension Canal	607.78	0.014
	E1UBLx	Plug Fill - Permanent	East Cape Extension Canal	5,470.78	0.126
	E2SS3P/E2EMP	Riprap - Permanent	Banks of East Cape Extension Canal	3,970.57	0.091
	E2SS3P/E2EMP	New Sheetpile - Permanent	Banks of East Cape Extension Canal	499.90	0.011
	E2SS3P/E2EMP	Mangrove Trimming - Temporary	Banks of East Cape Extension Canal	18,081.08	0.415
	E2SS3P/E2EMP	Work Zone Clearing - Temporary	Banks of East Cape Extension Canal	8,551.11	0.196
Homestead Canal	E1UBLx	Fill and Riprap - Permanent	Homestead Canal	2,107.32	0.048
	E1UBLx	New Sheetpile - Permanent	Homestead Canal	445.64	0.010
	E1UBLx	Plug Fill - Permanent	Homestead Canal	4,105.33	0.094
	E2SS3P/E2EMP	Riprap - Permanent	Banks of Homestead Canal	3,127.24	0.072
	E2SS3P/E2EMP	New Sheetpile - Permanent	Banks of Homestead Canal	563.75	0.013
	E2SS3P/E2EMP	Temp. Work Zone Clearing - Temporary	Banks of Homestead Canal	8,337.40	0.191
	E2SS3P/E2EMP	Mangrove Trimming - Temporary	Banks of Homestead Canal	38,798.32	0.891
	E2SS3P/E2EMP	Earthen Fill - Temporary	Southern Bank of Homestead Canal	1,077.88	0.025
	E2USM/N	Access Dredging - Temporary	Substrate of Lake Ingraham	1,431,040.00	32.852

Direct permanent impacts of 0.178 and 0.152 acres within surface waters of the East Cape Extension and Homestead canals, respectively, would occur as result of implementing Alternative D. Direct permanent impacts of 0.590 and 0.450 acres within surface waters of the East Cape Extension and Homestead canals, respectively, would occur as result of implementing Alternative G. These filling impacts are a direct result of the placement of the new sheetpile, earthen fill and riprap for the new plug, stabilization and armoring. Direct permanent impacts of 0.102 and 0.085 acres within wetlands along the banks of the East Cape Extension and Homestead canals, respectively, would also occur as a result of

⁴ Wetland/Surface Water identification codes define the type and characteristics of the wetland/surface water area. These codes are defined in detail in Section 3.4.1.3 of this document.

Alternative D. Direct permanent impacts of 0.084 and 0.085 acres within wetlands along the banks of the East Cape Extension and Homestead canals, respectively, would also occur as a result of Alternative G. These filling impacts are associated with the placement of the additional sheetpile needed for the deflector wingwalls as well as the placement of riprap for support and armoring. In addition to the above, approximately 0.002 acres (90 square feet) of permanent shading impacts to the East Cape Extension and Homestead canals would occur as a result of the proposed non-motorized boat (canoe/kayak) portage system with the implementation of either Alternative D or G. However, since no submerged resources are known to exist within these waterways, this new shading impact would be negligible. Also, floating mooring buoys would be installed downstream (towards Lake Ingraham) of the dam structure 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. As a result, the moorings would minimize potential secondary impacts to the canal bottom from the use of standard boat anchors. As stated above, since no submerged resources are known to exist within these waterways, the impacts associated with installation of the moorings are negligible.

To minimize wetland resource impacts, BMPs would be implemented during construction as discussed in the analysis for Alternative C, above. These practices would include employment of staked silt fence and turbidity barriers. The barriers would be employed in the canals prior to commencement of construction and maintained throughout the construction phase of the project. After construction is completed, temporarily disturbed areas would be restored to pre-existing conditions (e.g., regraded, compacted, etc.) and possibly replanted with native coastal wetland vegetation if regrowth does not occur naturally. The turbidity barriers and silt fence would be removed at the work areas in the canals once turbidity has subsided following construction completion of the dams.

Due to the space limitations in the work area, designated work zones have been established along the canal banks in which equipment would be staged for use during construction. Additional staging is anticipated to occur on floating barge(s) along the East Cape canal at the approximate location where the Ingraham canal branches off to the west and along the Homestead canal just west of the work zone. The barge(s) are anticipated to access the East Cape Extension canal through existing navigational channels and/or deep water areas of western Florida Bay, and Lake Ingraham and the Homestead canal through the Ingraham canal, Lower East Cape canal, and existing navigational channels and/or deep water areas of Florida Bay. The barge(s) would originate from a designated staging area in the Florida Keys (e.g., Sugarloaf Key or Marathon) due to a lack of a suitable staging area in Everglades National Park and to further meet the criteria for avoidance and minimization of impacts to wetland resources (see Figure 4.3 for the potential barge route). The exact location of the staging area in the Florida Keys would be determined by the awarded contractor; however, the area would be located entirely in previously disturbed uplands (i.e., parking lot, paved area, previously filled area, etc.). No adverse impacts to protected wetland resources are anticipated to occur as a result of utilizing the proposed accessways.

For the Homestead canal (only), barge(s) are anticipated to access the work zone with the dredging of a 52-foot wide by approximately 8,320 feet long temporary access channel through the shallow water depths within Lake Ingraham. Per NPS staff, the current water elevations at high tide in Lake Ingraham are up to two feet above existing substrate with

portions becoming exposed at low tide due to accelerated sediment deposition. Portions of the lake have transitioned from an open water system to a mud flat system in recent years (Wanless and Vlaswinkel, 2005). The channel would be dredged to a depth of approximately six feet below the mean low water elevation. To minimize impacts caused by dredging, a mechanical (bucket) dredge would be used. While both hydraulic and mechanical dredging methods can successfully remove the accumulated sediments within the channel, mechanically dredged sediment can be placed along the sides of the channel (less impact), versus hydraulic dredging which would require an off-site dewatering area and possible treatment equipment to allow dredge water effluent to be returned back to Lake Ingraham, which has the potential to result in moderate to major adverse impacts to the water quality of Lake Ingraham. For mechanical dredging operations within Lake Ingraham, accumulated sediments in the channel could be removed with a conventional barge-mounted long-reach excavator (40 to 60-ft reach). The width of the base of the dredged channel would not exceed 40 feet with anticipated 3:1 side slopes for a total top cross sectional channel width of approximately 52 feet. The dredged material (approximately 40,000 cubic yards) would be temporarily stockpiled in areas adjacent to the dredged channel outward to a maximum distance of approximately 60 feet on both sides [for a total temporary impact footprint of approximately 172 feet wide by 8,320 feet long (32.852 acres)]. Turbidity resulting from the dredging operation would be contained within the construction footprint using staked and/or floating turbidity curtains or other suitable barriers to minimize the potential for turbidity beyond the limits of construction. The barriers would be employed prior to commencement of construction activities and remain in place and regularly inspected throughout the construction phase of the project. To ensure compliance with water quality standards in OFWs (see Water Resources section of EA for details on OFWs), a turbidity monitoring plan would be employed during construction. If monitoring reveals that turbidity levels exceed the standards, construction activities shall cease immediately and shall not resume until corrective measures are employed (e.g., the use of additional barriers, timing construction activities with tidal cycles, modifications to equipment, etc.). Upon completion of construction at the Homestead canal dam site, the dredged material in Lake Ingraham would be pulled back into the channel via mechanical means and the turbidity barriers would be removed once turbidity has subsided. Some of the dredged material would disperse beyond the turbidity barriers via tidal currents and wave energy; however, due to the lack of submerged aquatic vegetation in Lake Ingraham, the effect would be considered minor to negligible. The channel would be returned to pre-construction condition upon completion of construction. Per discussions with the regulatory agencies, since no protected submerged aquatic vegetation exists in the area to be dredged, the backfilling of the channel may serve as mitigation for dredging impacts to Lake Ingraham.

In addition to dredging, trimming of overhanging mangrove trees may need to occur within the canals for barge access. Trimming would be conducted per the requirements of the FDEP's Mangrove Trimming Permit (to be acquired prior to commencement of construction). Approximately 0.415 acres (18,081.08 s.f.) along the East Cape Extension canal and 0.891 acres (38,798.32 s.f.) along the Homestead canal may require trimming (areas based on aerial coverage of vegetation over each waterway between the mouth of each canal at Lake Ingraham and the existing dam site that would need to be trimmed to allow for barge access). Following construction completion, regrowth of the mangroves

over the waterway would be left unrestricted and the area is expected to return to full functionality within five years.

The 0.196-acre work zone along the East Cape Extension canal and the 0.191-acre work zone along the Homestead canal for Alternative D and the 0.326-acre work zone along the East Cape Extension canal and the 0.343 work zone along the Homestead canal for Alternative G would be temporarily cleared of woody vegetation prior to construction. Following completion of construction, the work zone would be restored (e.g., regraded, compacted, etc.) to pre-existing conditions to facilitate natural recruitment of native hydrophytic vegetation. To expedite the stabilization of the area, native vegetation will be planted in the area. A monitoring program would be initiated by the NPS in order to monitor the re-growth of native vegetation in the work zone areas for a period of up to five years.

Per the results of the digital terrain model, one foot of earthen fill would need to be placed at the approximate location of the existing dam site along the southern bank of the Homestead canal (only). The fill is needed to bring an apparent low elevation area up to a higher grade to prevent a potential failure of the canal bank at this location (due to erosional processes) following construction of the new dam (see Section 4.1.4 of this document for further details). This activity would result in the temporary loss of wetland vegetation within an area of approximately 0.025 acres (1,077.88 s.f.). The area would also be planted with native wetland vegetation to reduce the potential for erosion. Since the resulting elevation would match existing adjacent grades, the area is expected to return to full functionality within five years. As a precaution, a monitoring/maintenance program would be initiated by the NPS in order to monitor and maintain the planted wetland vegetation in this area for a period of up to five years.

The areas to be affected by the physical footprint of the alternative are a mixture of regularly flooded mangrove wetlands and irregularly flooded shrub-scrub buttonwood/saltwort/mangrove wetlands as well as the open water area of the canal. The wetlands are part of and contiguous with the estuarine wetland system of the greater Cape Sable area in the vicinity of the existing marl ridge. The primary functions of these wetlands include surface and subsurface water storage, support of the biogeochemical processes (nutrient cycling, peat accretion, etc.), support of characteristic plant community, and providing suitable habitat for native fish and wildlife. These functions appear to be retained, although degraded, following excavation of the canal.

A functional analysis of the wetland areas to be impacted (permanent and temporary impacts) was conducted using UMAM (see above for description under Alternative C). Impacts to surface water areas with no protected submerged aquatic vegetation typically do not require mitigation, thus, a UMAM analysis was not performed for impacts to the waterways. A summary of the results of the assessment on the area to be permanently and temporarily impacted is provided in Tables 5.7 and 5.8, below. UMAM assessment forms for the impact areas have been provided at the end of this Wetland SOF for review.

Table 5.7 – UMAM Functional Assessment – Impacted Area - Alternative D

	Impact Area ID	Perm or Temp	Assess. Area Size	Current (Without)	Current (With)	Delta	Functional Loss
East Cape Extension Canal	Canal Banks – Filling	Perm	0.102 acres	0.667	0.500	-0.167	-0.017
	Canal Banks – Mangrove Trimming	Temp	0.415 acres	0.667	0.600	-0.067	-0.028
	Canal Banks – Work Zone Clearing	Temp	0.196 acres	0.700	0.533	-0.167	-0.033
Homestead Canal	Canal Banks – Filling	Perm	0.085 acres	0.667	0.500	-0.167	-0.014
	Canal Banks – Mangrove Trimming	Temp	0.891 acres	0.667	0.600	-0.067	-0.059
	Canal Banks – Work Zone Clearing	Temp	0.191 acres	0.700	0.533	-0.167	-0.032
	Southern Canal Bank – Filling	Temp	0.025 acres	0.667	0.500	-0.167	-0.004
	Lake Ingraham - Access Channel Dredging	Temp	32.852 acres	0.667	0.433	-0.233	-8.761

As shown in Table 5.7, the functional loss for 0.102 acres and 0.085 acres of permanent filling impacts to wetlands along the East Cape Extension and Homestead canals, respectively, was determined to be -0.017 and -0.014; and the functional loss for 0.196 acres and 0.191 acres of temporary impacts to wetlands as a result of vegetation clearing activities along the East Cape Extension and Homestead canals, respectively, was determined to be -0.033 and -0.032; and the functional loss for 0.025 acres of temporary impacts to wetlands as a result of raising the existing grade of an area along the southern bank of the Homestead canal was determined to be -0.004. The functional loss for temporary impacts to mangroves as a result of trimming activities and temporary impacts to Lake Ingraham as a result of dredging a temporary access channel are the same as what was calculated under Alternative C, above. Thus, for the East Cape Extension canal, the total functional loss as a result of Alternative D for 0.102 acres of permanent impacts and 0.611 acres of temporary impacts to wetlands is -0.078. In addition, for the Homestead canal, the total functional loss as a result of Alternative D for 0.085 acres of permanent impacts and 33.959 acres of temporary impacts to wetlands is -8.856.

Table 5.8 – UMAM Functional Assessment – Impacted Area - Alternative G

	Impact Area ID	Perm or Temp	Assess. Area Size	Current (Without)	Current (With)	Delta	Functional Loss
East Cape Extension Canal	Canal Banks – Filling	Perm	0.084 acres	0.667	0.500	-0.167	-0.014
	Canal Banks – Mangrove Trimming	Temp	0.415 acres	0.667	0.600	-0.067	-0.028
	Canal Banks – Work Zone Clearing	Temp	0.326 acres	0.700	0.533	-0.167	-0.054
Homestead Canal	Canal Banks – Filling	Perm	0.085 acres	0.667	0.500	-0.167	-0.014
	Canal Banks – Mangrove Trimming	Temp	0.891 acres	0.667	0.600	-0.067	-0.059
	Canal Banks – Work Zone Clearing	Temp	0.343 acres	0.700	0.533	-0.167	-0.057
	Southern Canal Bank - Filling	Temp	0.025 acres	0.667	0.500	-0.167	-0.004
	Lake Ingraham - Access Channel Dredging	Temp	32.852 acres	0.667	0.433	-0.233	-8.761

As shown in Table 5.8, the functional loss for 0.084 acres and 0.085 acres of permanent filling impacts to wetlands along the East Cape Extension and Homestead canals was determined to be -0.014 and -0.014; the functional loss for 0.326 acres and 0.343 acres of temporary impacts to wetlands as a result of vegetation clearing activities along the East Cape Extension and Homestead canals, respectively, was determined to be -0.054 and -0.057; and the functional loss for 0.025 acres of temporary impacts to wetlands as a result of raising the existing grade of an area along the southern bank of the Homestead canal was determined to be -0.004. The functional loss for temporary impacts to mangroves as a result of trimming activities and temporary impacts to Lake Ingraham as a result of dredging a temporary access channel are the same as what was calculated under Alternative C, above. Thus, for the East Cape Extension canal, the total functional loss as a result of Alternative G for 0.084 acres of permanent impacts and 0.741 acres of temporary impacts to wetlands is -0.096. In addition, for the Homestead canal, the total functional loss as a result of Alternative G for 0.085 acres of permanent impacts and 34.111 acres of temporary impacts to wetlands is -8.895.

All BMPs typically associated with NPS construction projects would be properly implemented and maintained throughout all construction activities minimizing short-term secondary impacts to adjacent and downstream wetland areas. Water quality impacts resulting from erosion and sedimentation during construction activities would be controlled through the use of BMPs, including temporary erosion control measures. Temporary erosion control measures would consist of staked silt fence and turbidity barriers. No substantial impacts due to sedimentation or water quality degradation are anticipated to occur during construction activities; however, the project would require a temporary mixing

zone upstream and downstream of the dam location in order to allow for settling of any turbidity generated during construction since the project is located in OFWs, which has restrictive requirements pertaining to water quality (i.e., zero NTUs above ambient). If turbid conditions persist outside of the temporary mixing zone, the awarded contractor would be required to take all necessary measures to control turbidity. These measures may include timing construction activities with tidal cycles, modifications to equipment, or temporarily ceasing operations completely, if necessary. Permanent erosion control measures would consist of restoring disturbed areas (e.g., regrading, compacting, planting, etc.) and placement of riprap on disturbed banks for stability.

The potential for long-term secondary impacts resulting from the project were also analyzed due to the lack of a vegetative buffer between the proposed dam sites and the adjacent wetlands. However, since the area is located in the backcountry of Everglades National Park and no active roadways or trails lead to this area, continued long-term disturbance at the dam sites is not anticipated. In addition, the potential for long-term, indirect, negligible to minor adverse impacts to the wetland areas directly adjacent to the existing dams would be remedied through the construction of canoe/kayak portages over the new dams. Details of the portage are discussed in Section 4.0 of this document. Thus, this observed activity is not anticipated to continue following dam construction, which provides a net benefit in relation to indirect/secondary impacts.

Furthermore, no adverse impacts are anticipated to occur to the watershed as a result of the proposed project due to the derived benefits. Although a small area of existing wetland vegetation would be permanently impacted with construction of this alternative, the upstream and downstream benefits to existing wetland functions for Lake Ingraham (approximately 1,863 acres) and the interior marshes of Cape Sable (approximately 55,894 acres based on aerial the footprint north of the marl ridge to the southern edge of Whitewater Bay) outweighs the wetland functional loss derived from the implementation of Alternative D or Alternative G (see above). This is evidenced through the use of the UMAM functional analysis as shown above in the analysis for Alternative C (the UMAM analysis for Lake Ingraham and the interior marshes is the same for all alternatives), which was used to assess the potential benefits to the interior marshes and Lake Ingraham (mitigation sites) derived as a result of the proposed project. In addition, the temporary impacts would be mitigated through onsite restoration activities as discussed above and a mitigation UMAM functional analysis was also performed for these temporary impacts to show that any resulting temporal functional losses would be mitigated with the upstream and downstream benefits to existing wetland functions within Lake Ingraham and the interior marshes of Cape Sable. The results of this UMAM assessment is similar to the analysis for Alternative C; however, differ slightly due to the size of the temporary work zone per each alternative. The results of the UMAM analysis for the onsite restoration areas are shown below in Tables 5.9 and 5.10. UMAM assessment forms for the onsite restoration areas have been provided at the end of this Wetland SOF for review.

Table 5.9 – UMAM Functional Assess. for Onsite Restoration Areas – Alternative D

Mitigation Area ID		Assess. Area Size	Current (Without)	Current (With)	Delta	Time Lag	Risk	Relative Functional Gain	Functional Gain (Mitigation Credits)
East Cape Extension Canal	Mangrove Trimming Onsite Restoration	0.415 acres	0.600	0.667	0.067	1.14	1.25	0.047	0.019
	Temporary Work Zone Onsite Restoration	0.196 acres	0.533	0.700	0.167	1.14	1.25	0.117	0.023
Homestead Canal	Mangrove Trimming Onsite Restoration	0.891 acres	0.600	0.667	0.067	1.14	1.25	.047	0.042
	Temporary Work Zone Onsite Restoration	0.191 acres	0.533	0.700	0.167	1.14	1.25	0.117	0.022
	Southern Canal Bank Filling Area Restoration	0.025 acres	0.533	0.700	0.167	1.14	1.25	0.117	0.003
	Access Channel Dredging Onsite Restoration	32.852 acres	0.433	0.667	0.233	1.03	1.25	0.181	5.946

The time lag (the period of time between when the functions are lost at the impact site and when the functions are achieved at the mitigation site) and risk (the degree of uncertainty that the proposed conditions would be achieved resulting in a reduction in the ecological value of the mitigation sites) scores for the southern canal bank filling restoration area for the Homestead canal (only) listed in Table 5.9, above, were determined as follows:

Southern Canal Bank Filling Restoration Area (Homestead canal only): The time lag was determined to be five years resulting in a T-factor score of 1.14 to allow for growth of the mangrove/saltwort-dominated vegetation and to attain comparable pre-impact conditions. The risk was determined to have a score of 1.25 since vulnerability is low with a high probability of success (hydrological conditions, water quality, adjacent land uses not a factor; vulnerability to colonization of undesirable invasive exotics is low; vulnerability to undesirable plant communities is low).

The mitigation functional gain for the southern canal bank filling restoration area for the Homestead canal (only) was calculated as follows:

A relative functional gain [mitigation Delta / (risk x time lag)] for the restoration of the southern canal bank filling area (Homestead canal only) is 0.117. The actual mitigation functional gain (relative functional gain x acres) provided by this onsite restoration is 0.003.

Thus, for the East Cape Extension canal, the total calculated functional gain for onsite restoration of 0.611 acres and offsite enhancement of 57,757 acres of wetlands is 3,117.464; whereas, the total calculated functional loss for 0.102 acres of permanent impacts and 0.611 acres of temporary impacts to wetlands as a result of implementing Alternative D is -0.078 showing that the overall benefit to local and regional wetlands in the greater Cape Sable area as a result of the construction of this alternative far outweighs the total calculated functional loss to wetlands associated with construction. Thus, no additional mitigation is warranted for proposed permanent and temporary impacts to onsite wetlands as a result of implementing Alternative D for the East Cape Extension canal.

Similarly, for the Homestead canal, the total calculated functional gain for onsite restoration of 33.934 acres and offsite enhancement of 57,757 acres of wetlands is 3,117.435; whereas, the total calculated functional loss for 0.085 acres of permanent impacts and 33.959 acres of temporary impacts to wetlands as a result of implementing Alternative D is -8.856 showing that the overall benefit to local and regional wetlands in the greater Cape Sable area as a result of the construction of this alternative far outweighs the total calculated functional loss to wetlands associated with construction. Thus, no additional mitigation is warranted for proposed permanent and temporary impacts to onsite wetlands as a result of implementing Alternative D for the Homestead canal.

Table 5.10 – UMAM Functional Assess. for Onsite Restoration Areas – Alternative G

Mitigation Area ID		Assess. Area Size	Current (Without)	Current (With)	Delta	Time Lag	Risk	Relative Functional Gain	Functional Gain (Mitigation Credits)
East Cape Extension Canal	Mangrove Trimming Onsite Restoration	0.415 acres	0.600	0.667	0.067	1.14	1.25	0.047	0.019
	Temporary Work Zone Onsite Restoration	0.326 acres	0.533	0.700	0.167	1.14	1.25	0.117	0.038
Homestead Canal	Mangrove Trimming Onsite Restoration	0.891 acres	0.600	0.667	0.067	1.14	1.25	.047	0.042
	Temporary Work Zone Onsite Restoration	0.343 acres	0.533	0.700	0.167	1.14	1.25	0.117	0.040

Mitigation Area ID		Assess. Area Size	Current (Without)	Current (With)	Delta	Time Lag	Risk	Relative Functional Gain	Functional Gain (Mitigation Credits)
	Southern Canal Bank Filling Area Restoration	0.025 acres	0.533	0.700	0.167	1.14	1.25	0.117	0.003
	Access Channel Dredging Onsite Restoration	32.852 acres	0.433	0.667	0.233	1.03	1.25	0.181	5.946

Thus, for the East Cape Extension canal, the total calculated functional gain for onsite restoration of 0.741 acres and offsite enhancement of 57,757 acres of wetlands is 3,111.479; whereas, the total calculated functional loss for 0.084 acres of permanent impacts and 0.741 acres of temporary impacts to wetlands as a result of implementing Alternative G is -0.096 showing that the overall benefit to local and regional wetlands in the greater Cape Sable area as a result of the construction of this alternative far outweighs the total calculated functional loss to wetlands associated with construction. Thus, no additional mitigation is warranted for proposed permanent and temporary impacts to onsite wetlands as a result of implementing Alternative G.

Similarly, for the Homestead canal, the total calculated functional gain for onsite restoration of 34.111 acres and offsite enhancement of 57,757 acres of wetlands is 3,117.453; whereas, the total calculated functional loss for 0.085 acres of permanent impacts and 34.111 acres of temporary impacts to wetlands as a result of implementing Alternative G is -8.895 showing that the overall benefit to local and regional wetlands in the greater Cape Sable area as a result of the construction of this alternative far outweighs the total calculated functional loss to wetlands associated with construction. Thus, no additional mitigation is warranted for proposed permanent and temporary impacts to onsite wetlands as a result of implementing Alternative G.

While all the environmental impacts of climate change 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). Vegetation and wetlands 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 the proposed dam structure. 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 a dam structure would allow time for the interior marshes of Cape Sable 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.

2) Cumulative Impacts. No cumulative impacts to vegetation and wetlands would occur as a result of combining the cumulative projects with the actions contained in Alternative D or G because the effects of the cumulative projects would be negligible. Impacts to vegetation and wetlands would be limited only to those direct and indirect impacts resulting from implementation of Alternative D or G. For more information on the cumulative projects and the determinations of negligible impacts see Section 1.4.5 and Section 3.2.3 of the EA, respectively.

3) Conclusion. For Alternative D or G, construction activities would result in minor adverse, localized, direct effects on vegetation. However, this action alternative would provide an overall benefit to local and regional wetlands in the greater Cape Sable area, which far outweighs the minor direct impacts associated with construction. The conservation of the local and regional wetlands receiving the benefits derived from the project is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's master plan or other NPS planning documents. Alternative D or G would result in short-term, minor, adverse, and localized impacts as well as long-term beneficial effects. Thus, there would be no impairment of vegetation and wetlands as a result of the implementation of Alternative D or G.

Action Alternatives D1 (New 100' Plug - Geotubes) and G1 (New 430' Plug - Geotubes)

These alternatives provide a construction option for the Homestead canal (only) that allows for further avoidance and minimization of impacts to wetland resources from Alternatives D and G through the avoidance of dredging a 52-foot wide by approximately 8,320 feet long navigational channel through Lake Ingraham. However, minor unavoidable wetland impacts would still occur since the project is wetland dependent and constructed entirely within wetlands/surface waters. Under Alternative D1, the existing dam would be removed and replaced with an approximate 100-foot plug centered on the highest elevation point of the marl ridge along the Homestead canal (see Figure 4.2 in Section 4.1.4 depicting the location of the preferred alternative along the highest elevation points of the marl ridge along the Homestead canal). Under Alternative G1, the existing dam would be removed and replaced with an approximate 430-foot plug filling the length of the approximate marl ridge along the Homestead canal. Wetland and surface water impacts are largely restricted to the immediate banks of the canal. 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 direct impacts (permanent and temporary) were quantified for Alternative D1 and Alternative G1 based on the aerial extent of wetlands/surface waters within the proposed construction limits. The resulting quantities are depicted in Table 5.11, below:

Table 5.11 – Direct Impacts to Wetlands/Surface Waters for Alternatives D1 and G1

	Wetland/Surface Water ID ⁵	Type of Impact/ Perm or Temp	Description	Direct Wetland Impacts (ft ²)	Direct Wetland Impacts (acres)
Alternative D1	E1UBLx	Fill and Riprap - Permanent	Homestead Canal	3,645.27	0.084
	E1UBLx	Geotubes - Permanent	Homestead Canal	2,262.73	0.052
	E1UBLx	Plug Fill - Permanent	Homestead Canal	4,505.56	0.103
	E2SS3P/E2EMP	Riprap - Permanent	Banks of Homestead Canal	1,394.25	0.032
	E2SS3P/E2EMP	Mangrove Trimming - Temporary	Banks of East Cape Extension Canal	18,081.08	0.415
	E2SS3P/E2EMP	Earthen Fill - Temporary	Southern Bank of Homestead Canal	1,077.88	0.025
	E2SS3P/E2EMP	Temp. Work Zone Clearing - Temporary	Banks of Homestead Canal	5,473.93	0.126
Alternative G1	E1UBLx	Fill and Riprap - Permanent	Homestead Canal	3,645.27	0.084
	E1UBLx	Geotubes - Permanent	Homestead Canal	2,262.73	0.052
	E1UBLx	Plug Fill - Permanent	Homestead Canal	17,705.56	0.406
	E2SS3P/E2EMP	Riprap - Permanent	Banks of Homestead Canal	1,394.25	0.032
	E2SS3P/E2EMP	Mangrove Trimming - Temporary	Banks of Homestead Canal	38,798.32	0.891
	E2SS3P/E2EMP	Earthen Fill - Temporary	Southern Bank of Homestead Canal	1,077.88	0.025
	E2SS3P/E2EMP	Temp. Work Zone Clearing - Temporary	Banks of Homestead Canal	23,600.81	0.542

Direct permanent impacts of 0.239 acres within surface waters of the canal would occur as result of implementing Alternative D1 and direct permanent impacts of 0.542 acres within surface waters of the canal would occur as result of implementing Alternative G1. These filling impacts are a direct result of the placement of the geotubes, earthen fill and riprap for the new plug, stabilization and armoring. Direct permanent impacts of 0.032 acres within wetlands along the banks of the canal would also occur as a result of implementing Alternative D1 and direct permanent impacts of 0.032 acres within wetlands along the

⁵ Wetland/Surface Water identification codes define the type and characteristics of the wetland/surface water area. These codes are defined in detail in Section 3.4.1.3 of this document.

banks of the canal would also occur as a result of implement Alternative G1. These filling impacts are associated with the placement of riprap for slope support and armoring of the geotubes. Also, floating mooring buoys would be installed downstream (towards Lake Ingraham) of the dam structure 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. As a result, the moorings would minimize potential secondary impacts to the canal bottom from the use of standard boat anchors. Since no submerged resources are known to exist within these waterways, the impacts associated with installation of the moorings are negligible.

To minimize wetland resource impacts, BMPs would be implemented during construction as discussed in the analysis for Alternative C, above. These practices would include employment of staked silt fence and turbidity barriers. The barriers would be employed in the Homestead canal prior to commencement of construction and maintained throughout the construction phase of the project. After construction is completed, temporarily disturbed areas would be restored to pre-existing conditions (e.g., regraded, compacted, etc.) and possibly replanted with native coastal wetland vegetation if regrowth does not occur naturally. The turbidity barriers and silt fence would be removed from the canal/work area once turbidity has subsided following construction completion of the dam.

Due to the space limitations in the work area, a designated work zone has been established along the canal banks in which small equipment and materials would be staged for use during construction. Additional staging is anticipated to occur on floating barge(s) at the western terminus of the Ingraham canal (eastern mouth of Lake Ingraham). This additional staging area is required due to access restrictions from this location to the work area along the Homestead canal (i.e., very shallow water depths within Lake Ingraham). Per NPS staff, the current water elevations at high tide in Lake Ingraham are up to two feet above existing substrate with portions becoming exposed at low tide due to accelerated sediment deposition. Portions of the lake have transitioned from an open water system to a mud flat system in recent years (Wanless and Vlaswinkel 2005). Therefore, in order to avoid dredging impacts to Lake Ingraham, fill material would be transported to the Homestead canal work area through a constructed floating pipeline. Since the pipeline would be floating on top of the lake waters, no adverse impacts to the lake are anticipated to occur from this activity. The 6-8 inch pipeline would be constructed using a shallow draft barge and would run from the work area to a larger barge located at the designated staging area at the western terminus of the Ingraham canal for a distance of approximately two miles. The use of the shallow draft barge is not anticipated to require dredging of the lake. 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 to fill the geotubes and plug. Riprap (armoring materials) would be transported to the work area using a helicopter (see Section 4.0 for further details regarding this alternative). The barge(s) are anticipated to access the Ingraham canal through the Lower east Cape canal and existing navigational channels and/or deep water areas of western Florida Bay originating from a designated staging area in the Florida Keys (e.g., Sugarloaf Key or Marathon) due to a lack of a suitable staging area in Everglades National Park and to further meet the criteria for avoidance and minimization of impacts to wetland resources (see Figure 4.3 for the potential barge route). The exact location of the staging area in the Florida Keys would be determined by the awarded contractor; however, the area would be located entirely in previously disturbed uplands

(i.e., parking lot, paved area, previously filled area, etc.). No adverse impacts to protected wetland resources are anticipated to occur as a result of utilizing the Ingraham canal as a staging area.

Trimming of overhanging mangrove trees may need to occur within the canals for barge access. Trimming would be conducted per the requirements of the FDEP's Mangrove Trimming Permit (to be acquired prior to commencement of construction). Approximately 0.415 acres (18,081.08 s.f.) along the East Cape Extension canal and 0.891 acres (38,798.32 s.f.) along the Homestead canal may require trimming (areas based on aerial coverage of vegetation over each waterway between the mouth of each canal at Lake Ingraham and the existing dam site that would need to be trimmed to allow for barge access). Following construction completion, regrowth of the mangroves over the waterway would be left unrestricted and the area is expected to return to full functionality within five years.

The 0.126-acre temporary work zone for Alternative D1 and the 0.542-acre temporary work zone for Alternative G1 along the Homestead canal would be temporarily cleared of woody vegetation prior to construction. Following completion of construction, the work zone would be restored (e.g., regraded, compacted, etc.) to pre-existing conditions to facilitate natural recruitment of native hydrophytic vegetation. To expedite the stabilization of the area, native vegetation will be planted in the area. A monitoring program would be initiated by the NPS in order to monitor the re-growth of native vegetation in the work zone areas for a period of up to five years.

Per the results of the digital terrain survey, one foot of earthen fill would need to be placed at the approximate location of the existing dam site along the southern bank of the Homestead canal (only). The fill is needed to bring an apparent low elevation area up to a higher grade to prevent a potential failure of the canal bank at this location (due to erosional processes) following construction of the new dam (see Section 4.1.4 of this document for further details). This activity would result in the temporary loss of wetland vegetation within an area of approximately 0.025 acres (1,077.88 s.f.). The area would also be planted with native wetland vegetation to reduce the potential for erosion. Since the resulting elevation would match existing adjacent grades, the area is expected to return to full functionality within five years. As a precaution, a monitoring/maintenance program would be initiated by the NPS in order to monitor and maintain the planted wetland vegetation in this area for a period of up to five years.

The area to be affected by the physical footprint of the alternative is a mixture of regularly flooded mangrove wetlands and irregularly flooded shrub-scrub buttonwood/saltwort/mangrove wetlands as well as the open water area of the canal. The wetlands are part of and contiguous with the estuarine wetland system of the greater Cape Sable area in the vicinity of the existing marl ridge. The primary functions of these wetlands include surface and subsurface water storage, support of the biogeochemical processes (nutrient cycling, peat accretion, etc.), support of characteristic plant community, and providing suitable habitat for native fish and wildlife. These functions appear to be retained, although degraded, following excavation of the canal.

A functional analysis of the wetland areas to be impacted (permanent and temporary impacts) was conducted using UMAM (see above for description under Alternative C). Impacts to surface water areas with no protected submerged aquatic vegetation typically

do not require mitigation, thus, a UMAM analysis was not performed for impacts to the waterway itself. A summary of the results of the assessment on the areas to be permanently and temporarily impacted is provided in Table 5.12, below. UMAM assessment forms for the impact areas have been provided at the end of this Wetland SOF for review.

Table 5.12 – UMAM Functional Assess. – Impacted Area - Alternatives D1 and G1

	Impact Area ID	Perm or Temp	Assess. Area Size	Current (Without)	Current (With)	Delta	Functional Loss
Alternative D1	Canal Banks – Filling	Perm	0.032 acres	0.667	0.500	-0.167	-0.005
	Canal Banks – Mangrove Trimming	Temp	0.415 acres	0.667	0.600	-0.067	-0.028
	Southern Canal Bank – Filling	Temp	0.025 acres	0.667	0.500	-0.167	-0.004
	Canal Banks – Work Zone Clearing	Temp	0.126 acres	0.700	0.533	-0.167	-0.021
Alternative G1	Canal Banks – Filling	Perm	0.032 acres	0.667	0.500	-0.167	-0.005
	Canal Banks – Mangrove Trimming	Temp	0.891 acres	0.667	0.600	-0.067	-0.059
	Southern Canal Bank – Filling	Temp	0.025 acres	0.667	0.500	-0.167	-0.004
	Canal Banks – Work Zone Clearing	Temp	0.542 acres	0.700	0.533	-0.167	-0.091

As shown in Table 5.12, the functional loss for 0.032 acres of permanent filling impacts to wetlands along the Homestead canal for both alternatives was determined to be -0.005; and the functional loss for 0.126 acres and 0.542 acres of temporary impacts to wetlands as a result of vegetation clearing activities along the Homestead canal for Alternative D1 (NPS Preferred Alternative for the Homestead canal) and Alternative G1, respectively, was determined to be -0.021 and -0.091. The functional loss for temporary impacts to mangroves as a result of trimming activities and for temporary impacts resulting from the need to raise the existing grade of an area along the southern bank of the Homestead canal for both alternatives are the same as what was calculated under the analysis for Alternatives D and G, above. Thus, the total functional loss as a result of Alternative D1 (NPS Preferred Alternative for the Homestead canal) for 0.032 acres of permanent impacts and 0.566 acres of temporary impacts to wetlands is -0.058. In addition, the total functional

loss as a result of Alternative G1 for 0.032 acres of permanent impacts and 1.458 acres of temporary impacts to wetlands is -0.159.

The UMAM analysis indicates that the wetland areas have a score of 0.667, which falls within the moderate quality range, between 0.50 and 0.79. Wetlands assigned UMAM scores less than 0.50 are typically highly disturbed and have limited wetland functions. Wetlands assigned UMAM scores greater than 0.79 are typically high quality wetlands with sustained wetland functions.

All BMPs typically associated with NPS construction projects would be properly implemented and maintained throughout all construction activities minimizing short-term secondary impacts to adjacent and downstream wetland areas. Water quality impacts resulting from erosion and sedimentation during construction activities would be controlled through the use of BMPs, including temporary erosion control measures. Temporary erosion control measures would consist of staked silt fence and turbidity barriers. No substantial impacts due to sedimentation or water quality degradation are anticipated to occur during construction activities; however, the project would require a temporary mixing zone upstream and downstream of the dam locations in order to allow for settling of any turbidity generated during construction since the project is located in OFWs, which has restrictive requirements pertaining to water quality (i.e., zero NTUs above ambient). If turbid conditions persist outside of the temporary mixing zone, the awarded contractor would be required to take all necessary measures to control turbidity. These measures may include timing construction activities with tidal cycles, modifications to equipment, or temporarily ceasing operations completely, if necessary. Permanent erosion control measures would consist of restoring disturbed areas (e.g., regrading, compacting, planting, etc.) and placement of riprap on disturbed banks for stability.

The potential for long-term secondary impacts resulting from the project were also analyzed due to the lack of a vegetative buffer between the proposed dam site and the adjacent wetlands. However, since the area is located in the backcountry of Everglades National Park and no active roadways or trails lead to this area, continued long-term disturbance at the dam sites is not anticipated. In addition, the potential for long-term, indirect, negligible to minor adverse impacts to the wetland areas directly adjacent to the existing dams would be remedied through the construction of canoe/kayak portages over the new dams. Details of the portage are discussed in Section 4.0 of this document. Thus, this observed activity is not anticipated to continue following dam construction, which provides a net benefit in relation to indirect/secondary impacts.

Furthermore, no adverse impacts are anticipated to occur to the watershed as a result of the proposed project due to the derived benefits. Although a small area of existing wetland vegetation would be impacted with construction of this alternative, the upstream and downstream benefits to existing wetland functions for Lake Ingraham (approximately 1,863 acres) and the interior marshes of Cape Sable (approximately 55,894 acres based on aerial the footprint north of the marl ridge to the southern edge of Whitewater Bay) outweighs the wetland functional loss derived from the implementation of Alternative D1 or Alternative G1 (see above). This is evidenced through the use of the UMAM functional analysis as shown above in the analysis for Alternatives D and G (the UMAM analysis for Lake Ingraham and the interior marshes is the same for all alternatives), which was used to assess the potential benefits to the interior marshes and Lake Ingraham (mitigation sites) derived as a result of the proposed project. In addition, the temporary impacts would

be mitigated through onsite restoration activities as discussed above and a mitigation UMAM functional analysis was also performed for these temporary impacts to show that any resulting temporal functional losses would be mitigated with the upstream and downstream benefits to existing wetland functions within Lake Ingraham and the interior marshes of Cape Sable. The results of this UMAM assessment is similar to the analysis for Alternatives D and G; however, differ slightly due to the size of the temporary work zone per each alternative. The results of the UMAM analysis for the onsite restoration areas are shown below in Table 5.13. UMAM assessment forms for the onsite restoration areas have been provided at the end of this Wetland SOF for review.

**Table 5.13 – UMAM Functional Assess. for Onsite Restoration Areas
– Alternatives D1 and G1**

Mitigation Area ID		Assess. Area Size	Current (Without)	Current (With)	Delta	Time Lag	Risk	Relative Functional Gain	Functional Gain (Mitigation Credits)
Alternative D1	Mangrove Trimming Onsite Restoration	0.415 acres	0.600	0.667	0.067	1.14	1.25	0.047	0.019
	Southern Canal Bank Filling Area Restoration	0.025 acres	0.533	0.700	0.167	1.14	1.25	0.117	0.003
	Temporary Work Zone Onsite Restoration	0.126 acres	0.533	0.700	0.167	1.14	1.25	0.117	0.015
Alternative G1	Mangrove Trimming Onsite Restoration	0.891 acres	0.600	0.667	0.067	1.14	1.25	.047	0.042
	Southern Canal Bank Filling Area Restoration	0.025 acres	0.533	0.700	0.167	1.14	1.25	0.117	0.003
	Temporary Work Zone Onsite Restoration	0.542 acres	0.533	0.700	0.167	1.14	1.25	0.117	0.063

Thus, for Alternative D1, the total calculated functional gain for onsite restoration of 0.566 acres and offsite enhancement of 57,757 acres of wetlands is 3,111.459; whereas, the total calculated functional loss for 0.032 acres of permanent impacts and 0.566 acres of temporary impacts to wetlands is -0.058 showing that the overall benefit to local and

regional wetlands in the greater Cape Sable area as a result of the construction of this alternative far outweighs the total calculated functional loss to wetlands associated with construction. Thus, no additional mitigation is warranted for proposed permanent and temporary impacts to onsite wetlands as a result of implementing Alternative D1.

Similarly, for Alternative G1, the total calculated functional gain for onsite restoration of 1.458 acres and offsite enhancement of 57,757 acres of wetlands is 3,117.530; whereas, the total calculated functional loss for 0.032 acres of permanent impacts and 1.458 acres of temporary impacts to wetlands is -0.159 showing that the overall benefit to local and regional wetlands in the greater Cape Sable area as a result of the construction of this alternative far outweighs the total calculated functional loss to wetlands associated with construction. Thus, no additional mitigation is warranted for proposed permanent and temporary impacts to onsite wetlands as a result of implementing Alternative G1.

While all the environmental impacts of climate change 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). Vegetation and wetlands 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 the proposed dam structure. 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 a dam structure would allow time for the interior marshes of Cape Sable 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.

2) Cumulative Impacts. No cumulative impacts to vegetation and wetlands would occur as a result of combining the cumulative projects with the actions contained in Alternative D1 or Alternative G1 because the effects of the cumulative projects would be negligible. Impacts to vegetation and wetlands would be limited only to those direct and indirect impacts resulting from implementation of Alternative D1 or Alternative G1. For more information on the cumulative projects and the determinations of negligible impacts see Section 1.4.5 and Section 3.2.3 of the EA, respectively.

3) Conclusion. For Alternative D1 or Alternative G1, construction activities would result in minor adverse, localized, direct effects on vegetation. However, these action alternatives would provide an overall benefit to local and regional wetlands in the greater Cape Sable area, which far outweighs the minor direct impacts associated with construction. The conservation of the local and regional wetlands receiving the benefits derived from the project is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park’s master plan or other NPS planning documents. Alternative D1 or Alternative G1 would result in short-term, minor, adverse, and localized impacts as well as long-term beneficial effects. Thus, there would be no impairment of vegetation and wetlands as a result of the implementation of Alternative D1 or Alternative G1.

5.3 Justification for Use of Wetlands

There are no practicable non-wetland alternatives for the construction component of the proposed action. The purpose of the project is 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. All areas within the study area are designated wetlands. No alternative non-wetland locations exist in the area of where the dams would function sufficiently.

6.0 COMPLIANCE

Clean Water Act Section 404

The proposed actions impact waters of the United States as defined by the Clean Water Act and are therefore subject to review by the U.S. Army Corps of Engineers. The Clean Water Act Section 404 regulates the discharge of dredged or fill material into waters of the United States. This review is conducted concurrent with the Section 10 Rivers and Harbors Act (see below) permitting process. Before moving forward with this project, NPS anticipates applying for a Section 404/Section 10 permit.

Before moving forward with this project, NPS anticipates applying for a Section 404 permit.

Rivers and Harbors Act Section 10

Section 10 of the Rivers and Harbors Act (33 U.S.C. 401 *et seq.*) requires authorization from the U.S. Army Corps of Engineers (USACE) for the construction of any structure in or over any navigable water of the United States, the excavation/dredging or deposition of material in these water or any obstruction or alteration in a "navigable water". The proposed actions include the construction of a structure within navigable waters of the United States as defined by the Rivers and Harbors Act and are therefore subject to review by the USACE. This review is conducted concurrent with the Section 404 Clean Water Act (see above) permitting process. Before moving forward with this project, NPS anticipates applying for a Section 404/Section 10 permit.

Coastal Zone Management Act

The proposed actions impact coastal resources as defined by the Coastal Zone Management Act (CZMA) (16 U.S.C. §§1451 *et. seq.*) and are therefore subject to review by the FDEP under the Florida Coastal Management Program (FCMP), the State of Florida's federally approved management program. 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. This review is conducted concurrent with the FDEP's Environmental Resource Permitting process. Before moving forward with this project, NPS anticipates applying for an Environmental Resources Permit from the State of Florida.

7.0 CONCLUSION

The NPS finds that there are no practicable alternatives to disturbing wetlands along the Cape Sable Extension and Homestead canals in the Cape Sable area. Wetlands have been avoided to the maximum practicable extent, and the wetland impacts that could not be avoided would be minimized. Unavoidable impacts to wetlands would be compensated for through the immediate and long-term wetland functional benefits associated with the proposed project. Table 7.1, below, summarizes the wetland impacts per each alternative. Alternative A (no action) is excluded from the summary table since this alternative would sustain the anthropomorphic impacts on erosional processes within these canals and the greater Cape Sable area and does not meet the objectives of the proposed project.

Table 7.1 – Summary of Wetland Impacts for Action Alternatives

Alternative ID		Permanent Impacts	Temporary Impacts	Total Impacts
East Cape Extension Canal	Alternative C	0.092 acres	0.568 acres	0.660 acres
	Alternative D	0.102 acres	0.611 acres	0.713 acres
	Alternative G	0.084 acres	0.741 acres	0.825 acres
Homestead Canal	Alternative C	0.106 acres	33.935 acres	34.041 acres
	Alternative D	0.085 acres	33.959 acres	34.044 acres
	Alternative G	0.085 acres	34.111 acres	34.196 acres
	Alternative D1	0.032 acres	0.566 acres	0.598 acres
	Alternative G1	0.032 acres	1.458 acres	1.490 acres

Based on the analysis of all of the proposed action alternatives, Alternative C was determined to have the least impact (permanent and temporary) on wetland resources for the Cape Sable Extension canal and Alternative D1 was determined to have the least impact on wetland resources for the Homestead canal.

The preferred alternative for the Homestead canal was determined to be Alternative D1, which coincides with the wetland analysis. However, the preferred alternative for the East Cape Extension canal was determined to be Alternative D, which was determined to result in 0.053 acres of additional wetland impact (compared to Alternative C). Alternative D was chosen over Alternative C due to the alternative's greater ability to meet the purpose,

needs and objectives of the proposed project, in particular, the ability to function for a 50-year life-cycle to prevent the loss of natural and cultural resources; provide greater visitor enjoyment; and improve the efficiency of other Park operations. Please reference the VA/CBA report in the appendices of the EA for further details.

It must be noted that the overall benefit to local and regional wetlands in the greater Cape Sable area (total wetland functional gain) as a result of the construction of any action alternative presented herein was determined to far outweighs the total calculated functional loss to wetlands associated with construction. Thus, no matter which alternative is constructed, the project would provide a net benefit to wetlands in the greater Cape Sable area of Everglades National Park.

8.0 REFERENCES

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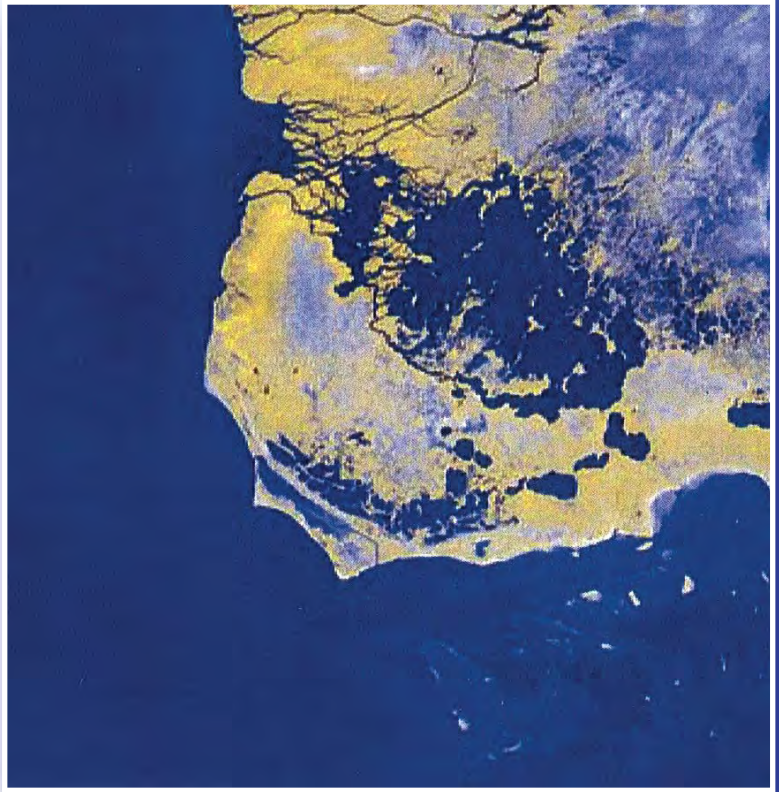
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UMAM Assessment Forms



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number East Cape Extension Canal Dam
Impact or Mitigation Impact	Assessment conducted by: Michael Breiner	Assessment date: February 16, 2009

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current 8	with 8	Habitats outside of the AA optimal for most wildlife expected to occur in the area. Very little invasive exotic vegetation occurs in the vicinity of the AA. Wildlife access to and from minimally limited by canal. Downstream functions negatively affected by failed dam in form of increase saltwater intrusion in interior wetland systems. Land uses outside AA minimally affect fish and wildlife.
		Dam construction will temporarily impact fish and wildlife; however the construction of the dam will benefit fish and wildlife habitat in the interior wetland system.
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current 6	with 7	Water flow around eroded sheet piling dam site inappropriate for system. Daily tidal fluctuations causing severe lateral erosion of the canal banks allowing increasing flow resulting with greater saltwater intrusion to the interior wetland systems. Erosion of the canal banks also contributing to loss of mangrove and buttonwood/saltwort marsh habitat.
		Construction of dam will halt bank erosion by stabilizing flow within remaining areas of canals. This will also enhance interior wetland water quality by stopping the tidal flow contributing to saltwater degradation of the interior wetlands.
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current 6	with 0	Majority of vegetation in all strata are appropriate for the habitats at the AA with few invasive exotic species present. Vegetation adjacent to canal increasing lost to the lateral erosion of the canal banks caused by excessive currents around failed dam. Vegetation and habitat will continue to deteriorate not only along canal banks but also within interior wetland systems due to the saltwater intrusion allowed by the failed dam.
		Restoration of the dam will result in the loss of mangrove/buttonwood/saltwort vegetation along canal banks from the permanent installation of riprap above the existing grade for stabilization and armoring.

Score=sum of above scores/30 (if uplands, divide by 20)	
w/o pres or current	with
0.6667	0.5000

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
-0.1667

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number		Assessment Area Name or Number East Cape Canal Dam Temporary Work Zones	
FLUCCs code 612 / 642		Further classification (optional) E2SS3P, E2EMP		Impact or Mitigation Site? Temporary Impact	
Assessment Area Size Varies					
Basin/Watershed Name/Number S-7 Watershed/Everglades		Affected Waterbody (Class) Class II		Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Man-made canal traversing an emergent carbonate marl ridge between Florida Bay and the interior mosaic of mangrove wetlands and numerous shallow subtidal open water areas that were formerly brackish to fresh marshes prior to the failure of the dam structure constructed to prevent tidal intrusion into the marsh habitat. The southern extension of the East Cape Canal functions as tidal inlet to Lake Ingraham and the interior wetlands from Florida Bay.					
Assessment area description Temporary work zones to be established on each side of the East Cape Canal in the vicinity of the failed dam site. The canal was constructed in the 1920s across an emergent marl ridge between Florida Bay and the interior Cape Sable wetlands. The canal banks are comprised primarily of regularly flooded mixed mangrove wetlands dominated by red mangrove (<i>Rhizophora mangle</i>), black mangrove (<i>Avicennia germinans</i>), and white mangrove (<i>Laguncularia racemosa</i>) with a sparse to dense groundcover dominated by saltwort (<i>Batis maritima</i>) and bushy seaside oxeye (<i>Borrchia frutescens</i>) near the junction with Ingraham Canal transitioning northward to a more elevated, irregularly flooded black mangrove, buttonwood (<i>Conocarpus erectus</i>), and saltwort dominated wetland in the vicinity of the East Cape Canal failed dam at the marl ridge. The black mangrove-buttonwood-saltwort community dominating the marl ridge consists of a mosaic of dense to open canopy black mangrove and buttonwood with mixed mangroves and open areas with a sparse to dense groundcover of saltwort.					
Significant nearby features Cape Sable, Florida Bay, Lake Ingraham, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands.			Uniqueness (considering the relative rarity in relation to the regional landscape.) Low for mangroves wetlands, medium for mosaic of buttonwood shrub and saltwort coastal prairie on marl ridge.		
Functions Wildlife and fisheries habitat, water quality			Mitigation for previous permit/other historic use N/A		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Raccoon (<i>Procyon lotor</i>), marsh rabbit (<i>Sylvilagus palustris</i>), red-shouldered hawk (<i>Buteo lineatus</i>), various wading birds (egrets, herons, ibis, etc.), belted kingfisher (<i>Ceryle alcyon</i>), diamondback terrapin (<i>Malaclemys terrapin</i>).			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) American crocodile (<i>Crocodylus acutus</i>) - T, eastern indigo snake (<i>Drymarchon corais couperi</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haleaetus</i>) - SSC, various wading birds - SSC.		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): Kingfishers, unidentified passerines.					
Additional relevant factors: Work zones will be established along the banks of the canal. Woody vegetation will be cut at ground level and debris cleared within the work zones to provide equipment access. No grubbing will take place. Soils within the work zones are likely to be disturbed and compacted which would likely increase the potential for runoff. To minimize the potential for runoff and increased turbidity within the canal, BMPs will be implemented during construction. These would include the use of stake silt fence around the outer perimeter of the work zone and the placement of turbidity barriers in the canals prior to construction.					
Assessment conducted by: Michael Breiner			Assessment date(s): May 7, 2009		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number East Cape Canal Dam Temporary Work Zones
Impact or Mitigation Temporary Impact	Assessment conducted by: Michael Breiner	Assessment date: May 7, 2009

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Optimal (10) Condition is optimal and fully supports wetland/surface water functions	Moderate(7) Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal (4) Minimal level of support of wetland/surface water functions	Not Present (0) Condition is insufficient to provide wetland/surface water functions
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.500(6)(a) Location and Landscape Support w/o pres or current with	Habitats outside of the AA optimal for most wildlife expected to occur in the area. Very little invasive exotic vegetation occurs in the vicinity of the AA. Wildlife access to and from AA minimally limited by canal. Downstream functions negatively affected by failed dam in form of increase saltwater intrusion in interior wetland systems. Land uses outside AA minimally affect fish and wildlife.	
	The clearing of woody vegetation and potential ground compaction within the temporary work zone increases the potential of runoff that may contribute to erosion, sediment deposition, and turbidity outside of the AA. Implementation of BMPs will minimize to habitats outside the AA.	
8	8	
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current with	Water flow around eroded sheet piling dam site inappropriate for system. Daily tidal fluctuations causing severe lateral erosion of the canal banks allowing increasing flow resulting with greater saltwater intrusion to the interior wetland systems. Erosion of the canal banks also contributing to loss of mangrove and buttonwood/saltwort marsh habitat	
	Creation of the temporary work zones has the potential to increase turbidity in nearby waters; however, implementation of BMPs will minimize runoff that could elevate turbidity levels.	
6	6	
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with	Majority of vegetation in all strata are appropriate for the habitats at the AA with few invasive exotic species present. Vegetation adjacent to canal is increasingly lost to the lateral erosion of the canal banks caused by excessive currents around failed dam. Vegetation and habitat will continue to deteriorate not only along canal banks but also within interior wetland systems due to the saltwater intrusion allowed by the failed dam.	
	All above-ground woody vegetation will be removed from the AA when the temporary work zones are created. No grubbing will take place therefore roots systems will remain intact allowing for regrowth upon cessation of construction activities.	
7	2	

Score=sum of above scores/30 (if uplands, divide by 20)	
w/o pres or current	with
0.7000	0.5333

Delta = [with-current]
-0.1667

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

If mitigation
Time lag (t-factor) =
Risk factor =

For impact assessment areas
FL = delta x acres =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number		Assessment Area Name or Number East Cape Canal Dam Temporary Work Zones	
FLUCCs code 612 / 642		Further classification (optional) E2SS3P, E2EMP		Impact or Mitigation Site? Mitigation	
Assessment Area Size Varies					
Basin/Watershed Name/Number S-7 Watershed/Everglades		Affected Waterbody (Class) Class II		Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Man-made canal traversing emergent carbonate marl ridge between Florida Bay and the interior mosaic of mangrove wetlands and numerous shallow subtidal open water areas that were formerly brackish to fresh marshes prior to the failure of the dam structure constructed to prevent tidal intrusion into the marsh habitat. The southern extension of the East Cape Canal functions as tidal inlet to Lake Ingraham and the interior wetlands from Florida Bay.					
Assessment area description Temporary work zones to be established on each side of the East Cape Canal in the vicinity of the failed dam site. The canal was constructed in the 1920's across an emergent marl ridge between Florida Bay and the interior Cape Sable wetlands. The canal banks are comprised primarily of regularly flooded mixed mangrove wetlands dominated by red mangrove (<i>Rhizophora mangle</i>), black mangrove (<i>Avicennia germinans</i>), and white mangrove (<i>Laguncularia racemosa</i>) with a sparse to dense groundcover dominated by saltwort (<i>Batis maritima</i>) and bushy seaside oxeye (<i>Borrchia frutescens</i>) near the junction with Ingraham Canal transitioning northward to a more elevated, irregularly flooded black mangrove, buttonwood (<i>Conocarpus erectus</i>), and saltwort dominated wetland in the vicinity of the East Cape Canal failed dam at the marl ridge. The black mangrove-buttonwood-saltwort community dominating the marl ridge consists of a mosaic of dense to open canopy black mangrove and buttonwood with mixed mangroves and open areas with a sparse to dense groundcover of saltwort.					
Significant nearby features Cape Sable, Florida Bay, Lake Ingraham, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands.			Uniqueness (considering the relative rarity in relation to the regional landscape.) Low for mangroves wetlands, medium for mosaic of buttonwood shrub and saltwort coastal prairie on marl ridge		
Functions Wildlife and fisheries habitat, water quality			Mitigation for previous permit/other historic use N/A		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Raccoon (<i>Procyon lotor</i>), marsh rabbit (<i>Sylvilagus palustris</i>), red-shouldered hawk (<i>buteo lineatus</i>), various wading birds (egrets, herons, ibis, etc.), belted kingfisher (<i>Ceryle alcyon</i>), diamondback terrapin (<i>Malaclemys terrapin</i>).			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) American crocodile (<i>Crocodylus acutus</i>) - T, eastern indigo snake (<i>Drymarchon corais couperi</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haleaetus</i>) - SSC, various wading birds - SSC.		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): Kingfishers, unidentified passerines.					
Additional relevant factors: Work zones will be established along the banks of the canal. Woody vegetation will be cut at ground level and debris cleared within the work zones to provide equipment access. No grubbing will take place. Soils within the work zones are likely to be disturbed and compacted which would likely increase the potential for runoff. In order to minimize the potential for runoff and increased turbidity within the canal, BMPs will be implemented during construction. These would include the use of stake silt fence around the outer perimeter of the work zone and the placement of turbidity barriers in the canals prior to construction. After construction is completed, areas where the soil is disturbed or compacted would be rehabilitated by aerating the soil. Regrowth is expected to occur naturally. Impacted areas of temporary work zones will be replanted if natural revegetation does not occur.					
Assessment conducted by: Michael Breiner			Assessment date(s): May 7, 2009		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number East Cape Canal Dam Temporary Work Zones
Impact or Mitigation Mitigation	Assessment conducted by: Michael Breiner	Assessment date: May 7, 2009

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current	with	<p>The clearing of woody vegetation and potential ground compaction within the temporary work zone increases the potential of runoff that may contribute to erosion, sediment deposition, and turbidity outside of the AA. Implementation of BMPs will minimize to habitats outside the AA.</p> <p>No change to habitats outside the AA upon completion of activities in work zones.</p>
8	8	
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current	with	<p>Creation of the temporary work zones has the potential to increase turbidity in nearby waters; however, implementation of BMPs will minimize runoff that could elevate turbidity levels.</p> <p>Minimal change to water environment upon completion of activities in work zones.</p>
6	6	
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current	with	<p>All above-ground woody vegetation will be removed from the AA when the temporary work zones are created. No grubbing will take place therefore root systems will remain intact allowing for regrowth upon cessation of construction activities.</p> <p>After construction is completed, areas where the soil is disturbed or compacted would be rehabilitated by aerating the soil. Regrowth is expected to occur naturally. Impacted areas of temporary work zones will be replanted if natural revegetation does not occur.</p>
2	7	

Score=sum of above scores/30 (if uplands, divide by 20)	
w/o pres or current	with
0.5333	0.7000

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.1667

If mitigation
1.14
Risk factor =
1.25

For mitigation assessment areas
RFG = delta/(t-factor x risk) =
0.1170

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number		Assessment Area Name or Number East Cape Canal Dam	
FLUCs code 612 / 642		Further classification (optional) E2SS3P, E2EMP		Impact or Mitigation Site? Impact	
Basin/Watershed Name/Number S-7 Watershed/Everglades		Affected Waterbody (Class) Class II		Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands <p>Man-made canal traversing an emergent carbonate marl ridge between Florida Bay and the interior mosaic of mangrove wetlands and numerous shallow subtidal open water areas that were formerly brackish to fresh marshes prior to the failure of the dam structure constructed to prevent tidal intrusion into the marsh habitat. The southern extension of the East Cape Canal functions as tidal inlet to Lake Ingraham and the interior wetlands from Florida Bay.</p>					
Assessment area description <p>The East Cape Canal was constructed in the 1920s across an emergent marl ridge between Florida Bay and the interior Cape Sable wetlands. The substrate of the excavated canal is comprised of an approximate 13-foot layer of marl underlain by approximately one foot or less of peat followed by limestone bedrock. No submerged vegetation exists within the waterway itself possibly due to strong tidal currents. The canal banks are comprised primarily of regularly flooded mixed mangrove wetlands dominated by red mangrove (<i>Rhizophora mangle</i>), black mangrove (<i>Avicennia germinans</i>), and white mangrove (<i>Laguncularia racemosa</i>) with a sparse to dense groundcover dominated by saltwort (<i>Batis maritima</i>) and bushy seaside oxeye (<i>Borrchia frutescens</i>) near Florida Bay transitioning northward to a more elevated, irregularly flooded black mangrove, buttonwood (<i>Conocarpus erectus</i>), and saltwort dominated wetland in the vicinity of the East Cape Canal failed dam at the marl ridge. The black mangrove-buttonwood-saltwort community dominating the marl ridge consists of a mosaic of dense to open canopy black mangrove and buttonwood with mixed mangroves and open areas with a sparse to dense groundcover of saltwort.</p>					
Significant nearby features <p>Cape Sable, Florida Bay, Lake Ingraham, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands.</p>			Uniqueness (considering the relative rarity in relation to the regional landscape.) <p>Low for mangroves wetlands, medium for mosaic of buttonwood shrub and saltwort coastal prairie on marl ridge.</p>		
Functions <p>Wildlife and fisheries habitat, water quality</p>			Mitigation for previous permit/other historic use <p>N/A</p>		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) <p>Raccoon (<i>Procyon lotor</i>), marsh rabbit (<i>Sylvilagus palustris</i>), red-shouldered hawk (<i>Buteo lineatus</i>), various wading birds (egrets, herons, ibis, etc.), double-crested cormorant (<i>Phalacrocorax auritus</i>), various gulls, belted kingfisher (<i>Ceryle alcyon</i>), diamondback terrapin (<i>Malaclemys terrapin</i>), mullet (<i>Mugil</i> spp.), pinfish (<i>Lagodon rhomboides</i>), blue crab (<i>Callinectes sapidus</i>), fiddler crab (<i>Uca</i> sp.)</p>			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) <p>Smalltooth sawfish (<i>Pristis pectinata</i>) - E, American crocodile (<i>Crocodylus acutus</i>) - T, eastern indigo snake (<i>Drymarchon corais couperi</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haleaetus</i>) - SSC, various wading birds - SSC, West Indian manatee (<i>Trichechus manatus</i>) - E</p>		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): <p>Kingfishers, unidentified passerines, mullet, small unidentified fish.</p>					
Additional relevant factors:					
Assessment conducted by: <p>Michael Breiner</p>			Assessment date(s): <p>February 16, 2009</p>		

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number	Assessment Area Name or Number East Cape Canal Mangrove Trimming	
FLUCCs code 612 / 642	Further classification (optional) E2SS3P, E2EMP		Impact or Mitigation Site? Impact	Assessment Area Size 0.415 acres
Basin/Watershed Name/Number S-7 Watershed/Everglades	Affected Waterbody (Class) Class II	Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Man-made canal traversing an emergent carbonate marl ridge between Florida Bay and the interior mosaic of mangrove wetlands and numerous shallow subtidal open water areas that were formerly brackish to fresh marshes prior to the failure of the dam structure constructed to prevent tidal intrusion into the marsh habitat. Lake Ingraham is connected to Florida Bay and Gulf of Mexico via canals now functioning as tidal inlets following dramatic lateral erosion after construction.				
Assessment area description The East Cape Canal was constructed in the 1920s across an emergent marl ridge between Florida Bay and interior Cape Sable wetlands. The substrate of the excavated canal is comprised of an approximate 13-foot layer of marl underlain by approximately one foot or less of peat followed by limestone bedrock. No submerged vegetation exists within the waterway itself possibly due to strong tidal currents. The canal banks are comprised primarily of regularly flooded mixed mangrove wetlands dominated by red mangrove (<i>Rhizophora mangle</i>), black mangrove (<i>Avicennia germinans</i>), and white mangrove (<i>Laguncularia racemosa</i>) with a sparse to dense groundcover dominated by saltwort (<i>Batis maritima</i>) and bushy seaside oxeye (<i>Borrchia frutescens</i>) at the junction with the Ingraham Canal transitioning northward to a more elevated, irregularly flooded black mangrove, buttonwood (<i>Conocarpus erectus</i>) and saltwort dominated wetland in the vicinity of the East Cape Canal failed dam at the marl ridge.				
Significant nearby features Cape Sable, Florida Bay, Lake Ingraham, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands.		Uniqueness (considering the relative rarity in relation to the regional landscape.) Low for mangroves wetlands, medium for mosaic of buttonwood shrub and saltwort coastal prairie on marl ridge		
Functions Wildlife and fisheries habitat, water quality		Mitigation for previous permit/other historic use N/A		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Raccoon (<i>Procyon lotor</i>), marsh rabbit (<i>Sylvilagus palustris</i>), red-shouldered hawk (<i>Buteo lineatus</i>), various wading birds (egrets, herons, ibis, etc.), double-crested cormorant (<i>Phalacrocorax auritus</i>), various gulls, belted kingfisher (<i>Ceryle alcyon</i>), diamondback terrapin (<i>Malaclemys terrapin</i>), mullet (<i>Mugil</i> spp.), pinfish (<i>Lagodon rhomboides</i>), blue crab (<i>Callinectes sapidus</i>), fiddler crab (<i>Uca</i> sp.)		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) American crocodile (<i>Crocodylus acutus</i>) - T, eastern indigo snake (<i>Drymarchon corais couperi</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haleaetus</i>) - SSC, various wading birds - SSC, West Indian manatee (<i>Trichechus manatus</i>) - E		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): Kingfishers, unidentified passerines, mullet, small unidentified fish.				
Additional relevant factors: In order to access for construction at the failed dam in the East Cape Canal, mangroves and other trees overhanging the canal from the banks will be trimmed and mangroves that have toppled into the canal will be removed to allow passage of an approximate 40' wide by 100' long barge. Upon cessation of construction activities, vegetation along the canal banks will be allowed to regrow naturally. All activities will take place outside the nesting season of the American crocodile to avoid disturbances to potential crocodile nesting.				
Assessment conducted by: Michael Breiner		Assessment date(s): May 16, 2009		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number East Cape Canal Mangrove Trimming
Impact or Mitigation Impact	Assessment conducted by: Michael Breiner	Assessment date: May 16, 2009

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current 8	with 8	Habitats outside of the AA optimal for most wildlife expected to occur in the area. Very little invasive exotic vegetation occurs in the vicinity of the AA. Wildlife access to and from minimally limited by canal. Downstream functions negatively affected by failed dam in form of increase saltwater intrusion in interior wetland systems. Land uses outside AA minimally affect fish and wildlife.
		Removal of mangroves that have toppled into the canal and trimming of overhanging mangroves and other trees along the banks from the junction of the East Cape Canal with the Ingraham Canal to the failed dam site will have minimal affect on habitat support outside of the AA.
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current 6	with 6	Water flowing around eroded sheet piling dam site is inappropriate for the system. Daily tidal fluctuations are causing severe lateral erosion of the canal banks that contributes to loss of adjacent mangrove and buttonwood/saltwort marsh habitat and downstream sediment deposition.
		A minimal number of toppled mangroves will be removed to allow passage of 40' wide barge to failed dam sight. Toppled trees will be cut and no soil disturbance will occur allowing for minimal impacts to water quality.
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current 6	with 4	Majority of vegetation in all strata are appropriate for the habitats at the AA with few invasive exotic species present. Vegetation adjacent to canal increasingly lost to the lateral erosion of the canal banks caused by excessive currents around failed dam. Vegetation and habitat will continue to deteriorate not only along canal banks but also within interior wetland systems due to the saltwater intrusion allowed by the failed dam.
		Limited mangrove trimming and removal of toppled mangroves and other trees will result in a temporary minor loss of aerial mangrove/buttonwood canopy cover along canal banks over the canal.

Score= sum of above scores/30 (if uplands, divide by 20) w/o pres or current 0.6667		with 0.6000
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Delta = [with-current]
-0.0667

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

If mitigation
Time lag (t-factor) =
Risk factor =

For impact assessment areas
FL = delta x acres = -0.0667 x -0.028 0.415

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

**PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)**

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number		Assessment Area Name or Number East Cape Canal Mangrove Trimming	
FLUCCs code 612 / 642		Further classification (optional) E2SS3P, E2EMP		Impact or Mitigation Site? Mitigation	
				Assessment Area Size 0.415 acres	
Basin/Watershed Name/Number S-7 Watershed/Everglades		Affected Waterbody (Class) Class II		Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Man-made canal traversing an emergent carbonate marl ridge between Lake Ingraham and the interior mosaic of mangrove wetlands and numerous shallow subtidal open water areas that were formerly brackish to fresh marshes prior to the failure of the dam structure constructed to prevent tidal intrusion into the marsh habitat. Lake Ingraham is connected to Florida Bay and Gulf of Mexico via canals now functioning as tidal inlets following dramatic lateral erosion after construction.					
Assessment area description The East Cape Canal was constructed in the 1920s across an emergent marl ridge between Florida Bay and interior Cape Sable wetlands. The substrate of the excavated canal is comprised of an approximate 13-foot layer of marl underlain by approximately one foot or less of peat followed by limestone bedrock. No submerged vegetation exists within the waterway itself possibly due to strong tidal currents. The canal banks are comprised primarily of regularly flooded mixed mangrove wetlands dominated by red mangrove (<i>Rhizophora mangle</i>), black mangrove (<i>Avicennia germinans</i>), and white mangrove (<i>Laguncularia racemosa</i>) with a sparse to dense groundcover dominated by saltwort (<i>Batis maritima</i>) and bushy seaside oxeye (<i>Borrchia frutescens</i>) adjacent to Lake Ingraham transitioning northward to a more elevated, irregularly flooded black mangrove, buttonwood (<i>Conocarpus erectus</i>) and saltwort dominated wetland in the vicinity of the East Cape Canal failed dam at the marl ridge.					
Significant nearby features Cape Sable, Florida Bay, Lake Ingraham, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands.			Uniqueness (considering the relative rarity in relation to the regional landscape.) Low for mangroves wetlands, medium for mosaic of buttonwood shrub and saltwort coastal prairie on marl ridge.		
Functions Wildlife and fisheries habitat, water quality			Mitigation for previous permit/other historic use N/A		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Raccoon (<i>Procyon lotor</i>), marsh rabbit (<i>Sylvilagus palustris</i>), red-shouldered hawk (<i>Buteo lineatus</i>), various wading birds (egrets, herons, ibis, etc.), double-crested cormorant (<i>Phalacrocorax auritus</i>), various gulls, belted kingfisher (<i>Ceryle alcyon</i>), diamondback terrapin (<i>Malaclemys terrapin</i>), mullet (<i>Mugil spp.</i>), pinfish (<i>Lagodon rhomboides</i>), blue crab (<i>Callinectes sapidus</i>), fiddler crab (<i>Uca sp.</i>)			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) American crocodile (<i>Crocodylus acutus</i>) - T, eastern indigo snake (<i>Drymarchon corais couperi</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haleaetus</i>) - SSC, various wading birds - SSC, West Indian manatee (<i>Trichechus manatus</i>) - E		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): Crocodile, kingfishers, unidentified passerines, mullet, small unidentified fish.					
Additional relevant factors: In order to access for construction at the failed dam in the East Cape Canal, mangroves and other trees overhanging the canal from the banks will be trimmed and mangroves that have toppled into the canal will be removed to allow passage of an approximate 40' wide by 100' long barge. Upon cessation of construction activities, vegetation along the canal banks will be allowed to regrow naturally. All activities will take place outside the nesting season of the American crocodile to avoid disturbances to potential crocodile nesting.					
Assessment conducted by: Michael Breiner			Assessment date(s): May 16, 2009		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number East Cape Canal Mangrove Trimming
Impact or Mitigation Mitigation	Assessment conducted by: Michael Breiner	Assessment date: May 16, 2009

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10) Condition is optimal and fully supports wetland/surface water functions	Moderate(7) Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal (4) Minimal level of support of wetland/surface water functions	Not Present (0) Condition is insufficient to provide wetland/surface water functions
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.500(6)(a) Location and Landscape Support w/o pres or current with 8 8	Removal of mangroves that have toppled into the canal and trimming of overhanging mangroves and other trees along the banks from the junction of the canal with the Ingraham Canal to the failed dam site will have minimal affect on habitat support outside of the AA. Mangroves will be allowed to regrow naturally along the canal banks.
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current with 6 6	A minimal number of toppled mangroves will be removed to allow passage of 40' wide barge to failed dam sight. Toppled trees will be cut and no soil disturbance will occur allowing for minimal impacts to water quality. Mangroves will be allowed to regrow naturally along the canal banks.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with 4 6	Limited mangrove trimming and removal of toppled mangroves and other trees will result in a temporary minor loss of aerial mangrove/buttonwood canopy cover along canal banks over the canal. Mangroves will be allowed to regrow naturally along the canal banks. The regrowth of mangroves along the canal banks will enhance vegetation structure within the AA.

Score=sum of above scores/30 (if uplands, divide by 20) w/o pres or current with 0.6000 0.6667

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current] 0.0667

If mitigation
Time lag (t-factor) = 5 year 1.14
Risk factor = 1.25

For mitigation assessment areas
RFG = delta/(t-factor x risk) = 0.0468

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number		Assessment Area Name or Number Homestead Canal Dam	
FLUCs code 612 / 642		Further classification (optional) E2SS3P, E2EMP		Impact or Mitigation Site? Impact	
				Assessment Area Size Varies	
Basin/Watershed Name/Number S-7 Watershed/Everglades		Affected Waterbody (Class) Class II		Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands <p>Man-made canal traversing emergent carbonate marl ridge between Lake Ingraham and the interior mosaic of mangrove wetlands and numerous shallow subtidal open water areas that were formerly brackish to fresh marshes prior to the failure of the dam structure constructed to prevent tidal intrusion into the marsh habitat. Lake Ingraham is connected to Florida Bay and Gulf of Mexico via canals now functioning as tidal inlets following dramatic lateral erosion after construction.</p>					
Assessment area description <p>The Homestead Canal was constructed in the 1920s across an emergent marl ridge between Lake Ingraham and the interior Cape Sable wetlands. The substrate of the excavated canal is comprised of an approximate 13-foot layer of marl underlain by approximately one foot or less of peat followed by limestone bedrock. No submerged vegetation exists within the waterway itself possibly due to strong tidal currents. The canal banks are comprised primarily of regularly flooded mixed mangrove wetlands dominated by red mangrove (<i>Rhizophora mangle</i>), black mangrove (<i>Avicennia germinans</i>), and white mangrove (<i>Laguncularia racemosa</i>) with a sparse to dense groundcover dominated by saltwort (<i>Batis maritima</i>) and bushy seaside oxeeye (<i>Borrchia frutescens</i>) adjacent to Lake Ingraham transitioning northeastward to a more elevated, irregularly flooded black mangrove, buttonwood (<i>Conocarpus erectus</i>) and saltwort dominated wetland in the vicinity of the Homestead Canal failed dam at the marl ridge. The black mangrove-buttonwood-saltwort community dominating the marl ridge consists of a mosaic of dense to open canopy black mangrove and buttonwood and open areas with a sparse to dense groundcover of saltwort.</p>					
Significant nearby features <p>Cape Sable, Lake Ingraham, Florida Bay, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands.</p>			Uniqueness (considering the relative rarity in relation to the regional landscape.) <p>Low for mangroves wetlands, medium for mosaic of buttonwood shrub and saltwort coastal prairie on marl ridge.</p>		
Functions <p>Wildlife and fisheries habitat, water quality</p>			Mitigation for previous permit/other historic use <p>N/A</p>		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) <p>Raccoon (<i>Procyon lotor</i>), marsh rabbit (<i>Sylvilagus palustris</i>), red-shouldered hawk (<i>Buteo lineatus</i>), various wading birds (egrets, herons, ibis, etc.), double-crested cormorant (<i>Phalacrocorax auritus</i>), various gulls, belted kingfisher (<i>Ceryle alcyon</i>), diamondback terrapin (<i>Malaclemys terrapin</i>), mullet (<i>Mugil</i> spp.), pinfish (<i>Lagodon rhomboides</i>), blue crab (<i>Callinectes sapidus</i>), fiddler crab (<i>Uca</i> sp.)</p>			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) <p>Smalltooth sawfish (<i>Pristis pectinata</i>) - E, American crocodile (<i>Crocodylus acutus</i>) - T, eastern indigo snake (<i>Drymarchon corais couperi</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haliaetus</i>) - SSC, various wading birds - SSC, West Indian manatee (<i>Trichechus manatus</i>) - E</p>		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): <p>Crocodile, kingfishers, unidentified passerines, mullet, small unidentified fish.</p>					
Additional relevant factors:					
Assessment conducted by: <p>Michael Breiner</p>			Assessment date(s): <p>February 16, 2009</p>		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number Homestead Canal Dam
Impact or Mitigation Impact	Assessment conducted by: Michael Breiner	Assessment date: February 16, 2009

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current 8	with 8	Habitats outside of the AA optimal for most wildlife expected to occur in the area. Very little invasive exotic vegetation occurs in the vicinity of the AA. Wildlife access to and from minimally limited by canal. Downstream functions negatively affected by failed dam in form of increase saltwater intrusion in interior wetland systems. Land uses outside AA minimally affect fish and wildlife
		Dam construction will temporarily impact fish and wildlife; however the construction of the dam will benefit fish and wildlife habitat in the interior wetland system.
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current 6	with 7	Water flow around eroded sheet piling dam site inappropriate for system. Daily tidal fluctuations causing severe lateral erosion of the canal banks allowing increasing flow resulting with greater saltwater intrusion to the interior wetland systems. Erosion of the canal banks also contributing to loss of mangrove and buttonwood/saltwort marsh habitat
		Construction of dam will halt bank erosion by stabilizing flow within remaining areas of canals. This will also enhance interior wetland water quality by stopping the tidal flow contributing to saltwater degradation of the interior wetlands.
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current 6	with 0	Majority of vegetation in all strata are appropriate for the habitats at the AA with few invasive exotic species present. Vegetation adjacent to canal increasing lost to the lateral erosion of the canal banks caused by excessive currents around failed dam. Vegetation and habitat will continue to deteriorate not only along canal banks but also within interior wetland systems due to the saltwater intrusion allowed by the failed dam.
		Restoration of the dam will result in the loss of mangrove/buttonwood/saltwort vegetation along canal banks from the permanent installation of riprap above the existing grade for stabilization and armoring.

Score=sum of above scores/30 (if uplands, divide by 20)	
w/o pres or current	with
0.6667	0.5000

Delta = [with-current]
-0.1667

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

If mitigation
Time lag (t-factor) =
Risk factor =

For impact assessment areas
FL = delta x acres =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number		Assessment Area Name or Number Homestead Canal Dam Temporary Work Zones	
FLUCCs code 612 / 642		Further classification (optional) E2SS3P, E2EMP		Impact or Mitigation Site? Temporary Impact	
Assessment Area Size Varies					
Basin/Watershed Name/Number S-7 Watershed/Everglades		Affected Waterbody (Class) Class II		Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park	
<p>Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands</p> <p>Man-made canal traversing an emergent carbonate marl ridge between Lake Ingraham and the interior mosaic of mangrove wetlands and numerous shallow subtidal open water areas that were formerly brackish to fresh marshes prior to the failure of the dam structure constructed to prevent tidal intrusion into the marsh habitat. Lake Ingraham is connected to Florida Bay and Gulf of Mexico via canals now functioning as tidal inlets following dramatic lateral erosion after construction.</p>					
<p>Assessment area description</p> <p>Temporary work zones to be established on each side of the Homestead Canal in the vicinity of the failed dam site. The canal was constructed in the 1920s across an emergent marl ridge between Lake Ingraham and the interior Cape Sable wetlands. The canal banks are comprised primarily of regularly flooded mixed mangrove wetlands dominated by red mangrove (<i>Rhizophora mangle</i>), black mangrove (<i>Avicennia germinans</i>), and white mangrove (<i>Laguncularia racemosa</i>) with a sparse to dense groundcover dominated by saltwort (<i>Batis maritima</i>) and bushy seaside oxeye (<i>Borrchia frutescens</i>) adjacent to Lake Ingraham transitioning northeastward to a more elevated, irregularly flooded black mangrove, buttonwood (<i>Conocarpus erectus</i>) and saltwort dominated wetland in the vicinity of the Homestead Canal failed dam site at the marl ridge. The black mangrove-buttonwood-saltwort community dominating the marl ridge consists of a mosaic of dense to open canopy black mangrove and buttonwood and open areas with a sparse to dense groundcover of saltwort.</p>					
<p>Significant nearby features</p> <p>Cape Sable, Lake Ingraham, Florida Bay, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands.</p>			<p>Uniqueness (considering the relative rarity in relation to the regional landscape.)</p> <p>Low for mangroves wetlands, medium for mosaic of buttonwood shrub and saltwort coastal prairie on marl ridge.</p>		
<p>Functions</p> <p>Wildlife and fisheries habitat, water quality</p>			<p>Mitigation for previous permit/other historic use</p> <p>N/A</p>		
<p>Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)</p> <p>Raccoon (<i>Procyon lotor</i>), marsh rabbit (<i>Sylvilagus palustris</i>), red-shouldered hawk (<i>Buteo lineatus</i>), various wading birds (egrets, herons, ibis, etc.), belted kingfisher (<i>Ceryle alcyon</i>), diamondback terrapin (<i>Malaclemys terrapin</i>).</p>			<p>Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)</p> <p>American crocodile (<i>Crocodylus acutus</i>) - T, eastern indigo snake (<i>Drymarchon corais couperi</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haleaetus</i>) - SSC, various wading birds - SSC.</p>		
<p>Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):</p> <p>Crocodile, kingfishers, unidentified passerines.</p>					
<p>Additional relevant factors:</p> <p>Work zones will be established along the banks of the canal. Woody vegetation will be cut at ground level and debris cleared within the work zones to provide equipment access. No grubbing will take place. Soils within the work zones are likely to be disturbed and compacted which would likely increase the potential for runoff. To minimize the potential for runoff and increased turbidity within the canal, BMPs will be implemented during construction. These would include the use of stake silt fence around the outer perimeter of the work zone and the placement of turbidity barriers in the canals prior to construction.</p>					
<p>Assessment conducted by:</p> <p>Michael Breiner</p>			<p>Assessment date(s):</p> <p>May 6, 2009</p>		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number Homestead Canal Dam Temporary Work Zones
Impact or Mitigation Temporary Impact	Assessment conducted by: Michael Breiner	Assessment date: May 6, 2009

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current with	8 8	Habitats outside of the AA optimal for most wildlife expected to occur in the area. Very little invasive exotic vegetation occurs in the vicinity of the AA. Wildlife access to and from minimally limited by canal. Downstream functions negatively affected by failed dam in form of increase saltwater intrusion in interior wetland systems. Land uses outside the AA minimally affect fish and wildlife.
		The clearing of woody vegetation and potential ground compaction within the temporary work zone increases the potential of runoff that may contribute to erosion, sediment deposition, and turbidity outside of the AA. Implementation of BMPs will minimize to habitats outside the AA.
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current with	6 6	Water flow around eroded sheet piling dam site inappropriate for system. Daily tidal fluctuations causing severe lateral erosion of the canal banks allowing increasing flow resulting with greater saltwater intrusion to the interior wetland systems. Erosion of the canal banks also contributing to loss of mangrove and buttonwood/saltwort marsh habitat
		Creation of the temporary work zones has the potential to increase turbidity in nearby waters; however, implementation of BMPs will minimize runoff that could elevate turbidity levels.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with	7 2	Majority of vegetation in all strata are appropriate for the habitats at the AA with few invasive exotic species present. Vegetation adjacent to canal is increasingly lost to the lateral erosion of the canal banks caused by excessive currents around failed dam. Vegetation and habitat will continue to deteriorate not only along canal banks but also within interior wetland systems due to the saltwater intrusion allowed by the failed dam.
		All above-ground woody vegetation will be removed from the AA when the temporary work zones are created. No grubbing will take place therefore roots systems will remain intact allowing for regrowth upon cessation of construction activities.

Score=sum of above scores/30 (if uplands, divide by 20)	
w/o pres or current	with
0.7000	0.5333

Delta = [with-current]
-0.1667

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

If mitigation
Time lag (t-factor) =
Risk factor =

For impact assessment areas
FL = delta x acres =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number	Assessment Area Name or Number Homestead Canal Dam Temporary Work Zones	
FLUCCs code 612 / 642	Further classification (optional) E2SS3P, E2EMP		Impact or Mitigation Site? Mitigation	Assessment Area Size Varies
Basin/Watershed Name/Number S-7 Watershed/Everglades	Affected Waterbody (Class) Class II	Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands <p>Man-made canal traversing an emergent carbonate marl ridge between Lake Ingraham and the interior mosaic of mangrove wetlands and numerous shallow subtidal open water areas that were formerly brackish to fresh marshes prior to the failure of the dam structure constructed to prevent tidal intrusion into the marsh habitat. Lake Ingraham is connected to Florida Bay and Gulf of Mexico via canals now functioning as tidal inlets following dramatic lateral erosion after construction.</p>				
Assessment area description <p>Temporary work zones to be established on each side of the Homestead Canal in the vicinity of the failed dam site. The canal was constructed in the 1920s across an emergent marl ridge between Lake Ingraham and the interior Cape Sable wetlands. The canal banks are comprised primarily of regularly flooded mixed mangrove wetlands dominated by red mangrove (<i>Rhizophora mangle</i>), black mangrove (<i>Avicennia germinans</i>), and white mangrove (<i>Laguncularia racemosa</i>) with a sparse to dense groundcover dominated by saltwort (<i>Batis maritima</i>) and bushy seaside oxeye (<i>Borrchia frutescens</i>) adjacent to Lake Ingraham transitioning northeastward to a more elevated, irregularly flooded black mangrove, buttonwood (<i>Conocarpus erectus</i>) and saltwort dominated wetland in the vicinity of the Homestead Canal failed dam site at the marl ridge. The black mangrove-buttonwood-saltwort community dominating the marl ridge consists of a mosaic of dense to open canopy black mangrove and buttonwood and open areas with a sparse to dense groundcover of saltwort.</p>				
Significant nearby features <p>Cape Sable, Lake Ingraham, Florida Bay, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands.</p>		Uniqueness (considering the relative rarity in relation to the regional landscape.) <p>Low for mangroves wetlands, medium for mosaic of buttonwood shrub and saltwort coastal prairie on marl ridge.</p>		
Functions <p>Wildlife and fisheries habitat, water quality</p>		Mitigation for previous permit/other historic use <p>N/A</p>		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) <p>Raccoon (<i>Procyon lotor</i>), marsh rabbit (<i>Sylvilagus palustris</i>), red-shouldered hawk (<i>Buteo lineatus</i>), various wading birds (egrets, herons, ibis, etc.), belted kingfisher (<i>Ceryle alcyon</i>), diamondback terrapin (<i>Malaclemys terrapin</i>).</p>		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) <p>American crocodile (<i>Crocodylus acutus</i>) - T, eastern indigo snake (<i>Drymarchon corais couperi</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haleaetus</i>) - SSC, various wading birds - SSC.</p>		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): <p>Crocodile, kingfishers, unidentified passerines.</p>				
Additional relevant factors: <p>Work zones will be established along the banks of the canal. Woody vegetation will be cut at ground level and debris cleared within the work zones to provide equipment access. No grubbing will take place. Soils within the work zones are likely to be disturbed and compacted which would likely increase the potential for runoff. In order to minimize the potential for runoff and increased turbidity within the canal, BMPs will be implemented during construction. These would include the use of stake silt fence around the outer perimeter of the work zone and the placement of turbidity barriers in the canals prior to construction. After construction is completed, areas where the soil is disturbed or compacted would be rehabilitated by aerating the soil. Regrowth is expected to occur naturally. Impacted areas of temporary work zones will be replanted if natural revegetation does not occur.</p>				
Assessment conducted by: <p>Michael Breiner</p>		Assessment date(s): <p>May 7, 2009</p>		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number Homestead Canal Dam Temporary Work Zones
Impact or Mitigation Mitigation	Assessment conducted by: Michael Breiner	Assessment date: May 7, 2009

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current with 8 8	The clearing of woody vegetation and potential ground compaction within the temporary work zone increases the potential of runoff that may contribute to erosion, sediment deposition, and turbidity outside of the AA. Implementation of BMPs will minimize to habitats outside the AA.		
	No change to habitats outside the AA upon completion of activities in work zones.		
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current with 6 6	Creation of the temporary work zones has the potential to increase turbidity in nearby waters; however, implementation of BMPs will minimize runoff that could elevate turbidity levels.		
	Minimal change to water environment upon completion of activities in work zones.		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with 2 7	All above-ground woody vegetation will be removed from the AA when the temporary work zones are created. No grubbing will take place therefore root systems will remain intact allowing for regrowth upon cessation of construction activities.		
	After construction is completed, areas where the soil is disturbed or compacted would be rehabilitated by aerating the soil. Regrowth is expected to occur naturally. Impacted areas of temporary work zones will be replanted if natural revegetation does not occur.		

Score=sum of above scores/30 (if uplands, divide by 20)	
w/o pres or current	with
0.5333	0.7000

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.1667

If mitigation
Time lag (t-factor) = 5 year 1.14
Risk factor = 1.25

For mitigation assessment areas
RFG = delta/(t-factor x risk) = 0.1170

**PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)**

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number		Assessment Area Name or Number Homestead Canal Mangrove Trimming	
FLUCCs code 612 / 642		Further classification (optional) E2SS3P, E2EMP		Impact or Mitigation Site? Impact	
				Assessment Area Size 0.891 acres	
Basin/Watershed Name/Number S-7 Watershed/Everglades		Affected Waterbody (Class) Class II		Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Man-made canal traversing an emergent carbonate marl ridge between Lake Ingraham and the interior mosaic of mangrove wetlands and numerous shallow subtidal open water areas that were formerly brackish to fresh marshes prior to the failure of the dam structure constructed to prevent tidal intrusion into the marsh habitat. Lake Ingraham is connected to Florida Bay and Gulf of Mexico via canals now functioning as tidal inlets following dramatic lateral erosion after construction.					
Assessment area description The Homestead Canal was constructed in the 1920s across an emergent marl ridge between Lake Ingraham and interior Cape Sable wetlands. The substrate of the excavated canal is comprised of an approximate 13-foot layer of marl underlain by approximately one foot or less of peat followed by limestone bedrock. No submerged vegetation exists within the waterway itself possibly due to strong tidal currents. The canal banks are comprised primarily of regularly flooded mixed mangrove wetlands dominated by red mangrove (<i>Rhizophora mangle</i>), black mangrove (<i>Avicennia germinans</i>), and white mangrove (<i>Laguncularia racemosa</i>) with a sparse to dense groundcover dominated by saltwort (<i>Batis maritima</i>) and bushy seaside oxeye (<i>Borrchia frutescens</i>) adjacent to Lake Ingraham transitioning northward to a more elevated, irregularly flooded black mangrove, buttonwood (<i>Conocarpus erectus</i>) and saltwort dominated wetland in the vicinity of the Homestead Canal failed dam at the marl ridge.					
Significant nearby features Cape Sable, Lake Ingraham, Florida Bay, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands.			Uniqueness (considering the relative rarity in relation to the regional landscape.) Low for mangroves wetlands, medium for mosaic of buttonwood shrub and saltwort coastal prairie on marl ridge		
Functions Wildlife and fisheries habitat, water quality			Mitigation for previous permit/other historic use N/A		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Raccoon (<i>Procyon lotor</i>), marsh rabbit (<i>Sylvilagus palustris</i>), red-shouldered hawk (<i>Buteo lineatus</i>), various wading birds (egrets, herons, ibis, etc.), double-crested cormorant (<i>Phalacrocorax auritus</i>), various gulls, belted kingfisher (<i>Ceryle alcyon</i>), diamondback terrapin (<i>Malaclemys terrapin</i>), mullet (<i>Mugil</i> spp.), pinfish (<i>Lagodon rhomboides</i>), blue crab (<i>Callinectes sapidus</i>), fiddler crab (<i>Uca</i> sp.)			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) American crocodile (<i>Crocodylus acutus</i>) - T, eastern indigo snake (<i>Drymarchon corais couperi</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haleaetus</i>) - SSC, various wading birds - SSC, West Indian manatee (<i>Trichechus manatus</i>) - E		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): Crocodile, kingfishers, unidentified passerines, mullet, small unidentified fish.					
Additional relevant factors: In order to access for construction at the failed dam in the Homestead Canal, mangroves and other trees overhanging the canal from the banks will be trimmed and mangroves that have toppled into the canal will be removed to allow passage of an approximate 40' wide by 100' long barge. Upon cessation of construction activities, vegetation along the canal banks will be allowed to regrow naturally. All activities will take place outside the nesting season of the American crocodile to avoid disturbances to potential crocodile nesting.					
Assessment conducted by: Michael Breiner			Assessment date(s): May 6, 2009		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number Homestead Canal Mangrove Trimming
Impact or Mitigation Impact	Assessment conducted by: Michael Breiner	Assessment date: May 6, 2009

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current 8	with 8	Habitats outside of the AA optimal for most wildlife expected to occur in the area. Very little invasive exotic vegetation occurs in the vicinity of the AA. Wildlife access to and from minimally limited by canal. Downstream functions negatively affected by failed dam in form of increase saltwater intrusion in interior wetland systems. Land uses outside AA minimally affect fish and wildlife.
		Removal of mangroves that have toppled into the canal and trimming of overhanging mangroves and other trees along the banks from the mouth of the canal to Lake Ingraham to the failed dam site will have minimal affect on habitat support outside of the AA.
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current 6	with 6	Water flowing around eroded sheet piling dam site is inappropriate for the system. Daily tidal fluctuations are causing severe lateral erosion of the canal banks that contributes to loss of adjacent mangrove and buttonwood/saltwort marsh habitat and downstream sediment deposition.
		A minimal number of toppled mangroves will be removed to allow passage of 40' wide barge to failed dam sight. Toppled trees will be cut and no soil disturbance will occur allowing for minimal impacts to water quality.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current 6	with 4	Majority of vegetation in all strata are appropriate for the habitats at the AA with few invasive exotic species present. Vegetation adjacent to canal increasingly lost to the lateral erosion of the canal banks caused by excessive currents around failed dam. Vegetation and habitat will continue to deteriorate not only along canal banks but also within interior wetland systems due to the saltwater intrusion allowed by the failed dam.
		Limited mangrove trimming and removal of toppled mangroves and other trees will result in a temporary minor loss of aerial mangrove/buttonwood canopy cover along canal banks over the canal.

Score=sum of above scores/30 (if uplands, divide by 20)	
w/o pres or current	with
0.6667	0.6000

Delta = [with-current]
-0.0667

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

If mitigation
Time lag (t-factor) =
Risk factor =

For impact assessment areas
FL = delta x acres = -0.0667 x 0.891 -0.059

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number		Assessment Area Name or Number Homestead Canal Mangrove Trimming	
FLUCCs code 612 / 642		Further classification (optional) E2SS3P, E2EMP		Impact or Mitigation Site? Mitigation	
				Assessment Area Size 0.891 acres	
Basin/Watershed Name/Number S-7 Watershed/Everglades		Affected Waterbody (Class) Class II		Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Man-made canal traversing an emergent carbonate marl ridge between Lake Ingraham and the interior mosaic of mangrove wetlands and numerous shallow subtidal open water areas that were formerly brackish to fresh marshes prior to the failure of the dam structure constructed to prevent tidal intrusion into the marsh habitat. Lake Ingraham is connected to Florida Bay and Gulf of Mexico via canals now functioning as tidal inlets following dramatic lateral erosion after construction.					
Assessment area description The Homestead Canal was constructed in the 1920s across an emergent marl ridge between Lake Ingraham and interior Cape Sable wetlands. The substrate of the excavated canal is comprised of an approximate 13-foot layer of marl underlain by approximately one foot or less of peat followed by limestone bedrock. No submerged vegetation exists within the waterway itself possibly due to strong tidal currents. The canal banks are comprised primarily of regularly flooded mixed mangrove wetlands dominated by red mangrove (<i>Rhizophora mangle</i>), black mangrove (<i>Avicennia germinans</i>), and white mangrove (<i>Laguncularia racemosa</i>) with a sparse to dense groundcover dominated by saltwort (<i>Batis maritima</i>) and bushy seaside oxeye (<i>Borrchia frutescens</i>) adjacent to Lake Ingraham transitioning northward to a more elevated, irregularly flooded black mangrove, buttonwood (<i>Conocarpus erectus</i>) and saltwort dominated wetland in the vicinity of the Homestead Canal failed dam at the marl ridge.					
Significant nearby features Cape Sable, Lake Ingraham, Florida Bay, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands.			Uniqueness (considering the relative rarity in relation to the regional landscape.) Low for mangroves wetlands, medium for mosaic of buttonwood shrub and saltwort coastal prairie on marl ridge.		
Functions Wildlife and fisheries habitat, water quality			Mitigation for previous permit/other historic use N/A		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Raccoon (<i>Procyon lotor</i>), marsh rabbit (<i>Sylvilagus palustris</i>), red-shouldered hawk (<i>Buteo lineatus</i>), various wading birds (egrets, herons, ibis, etc.), double-crested cormorant (<i>Phalacrocorax auritus</i>), various gulls, belted kingfisher (<i>Ceryle alcyon</i>), diamondback terrapin (<i>Malaclemys terrapin</i>), mullet (<i>Mugil</i> spp.), pinfish (<i>Lagodon rhomboides</i>), blue crab (<i>Callinectes sapidus</i>), fiddler crab (<i>Uca</i> sp.)			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) American crocodile (<i>Crocodylus acutus</i>) - T, eastern indigo snake (<i>Drymarchon corais couperi</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haleaetus</i>) - SSC, various wading birds - SSC, West Indian manatee (<i>Trichechus manatus</i>) - E		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): Crocodile, kingfishers, unidentified passerines, mullet, small unidentified fish.					
Additional relevant factors: In order to access for construction at the failed dam in the Homestead Canal, mangroves and other trees overhanging the canal from the banks will be trimmed and mangroves that have toppled into the canal will be removed to allow passage of an approximate 40' wide by 100' long barge. Upon cessation of construction activities, vegetation along the canal banks will be allowed to regrow naturally. All activities will take place outside the nesting season of the American crocodile to avoid disturbances to potential crocodile nesting.					
Assessment conducted by: Michael Breiner			Assessment date(s): May 6, 2009		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number Homestead Canal Mangrove Trimming
Impact or Mitigation Mitigation	Assessment conducted by: Michael Breiner	Assessment date: May 6, 2009

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10) Condition is optimal and fully supports wetland/surface water functions	Moderate(7) Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal (4) Minimal level of support of wetland/surface water functions	Not Present (0) Condition is insufficient to provide wetland/surface water functions
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.500(6)(a) Location and Landscape Support <div> <div>w/o pres or current</div> <div>with</div> </div> <div> <div>8</div> <div>8</div> </div>	Removal of mangroves that have toppled into the canal and trimming of overhanging mangroves and other trees along the banks from the mouth of the canal to Lake Ingraham to the failed dam site will have minimal affect on habitat support outside of the AA. Mangroves will be allowed to regrow naturally along the canal banks.
.500(6)(b) Water Environment (n/a for uplands) <div> <div>w/o pres or current</div> <div>with</div> </div> <div> <div>6</div> <div>6</div> </div>	A minimal number of toppled mangroves will be removed to allow passage of 40' wide barge to failed dam sight. Toppled trees will be cut and no soil disturbance will occur allowing for minimal impacts to water quality. Mangroves will be allowed to regrow naturally along the canal banks.
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community <div> <div>w/o pres or current</div> <div>with</div> </div> <div> <div>4</div> <div>6</div> </div>	Limited mangrove trimming and removal of toppled mangroves and other trees will result in a temporary minor loss of aerial mangrove/buttonwood canopy cover along canal banks over the canal. Mangroves will be allowed to regrow naturally along the canal banks. The regrowth of mangroves along the canal banks will enhance vegetation structure within the AA.

Score=sum of above scores/30 (if uplands, divide by 20)
<div> <div>w/o pres or current</div> <div>with</div> </div> <div> <div>0.6000</div> <div>0.6667</div> </div>

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.0667

If mitigation
Time lag (t-factor) = 5 year 1.14
Risk factor = 1.25

For mitigation assessment areas
RFG = delta/(t-factor x risk) = 0.0468

**PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)**

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number	Assessment Area Name or Number Dredged Access Channel	
FLUCCs code 541 / 651	Further classification (optional) E2USM, E2USN		Impact or Mitigation Site? Temporary Impact	Assessment Area Size 32,852 acres
Basin/Watershed Name/Number S-7 Watershed/Everglades	Affected Waterbody (Class) Class II	Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Temporary access channel through shallow water depths of Lake Ingraham, a shallow intertidal embayment separated from the marine waters of the Gulf of Mexico and Florida Bay by a narrow carbonate sand beach ridge and barrier beach and from the interior Cape Sable complex of mangrove wetlands and numerous shallow subtidal open water areas by an emergent calcium carbonate marl ridge. Two manmade canals that have eroded considerably since excavation function as tidal inlets and connect to the Gulf of Mexico and Florida Bay. Several natural tidal creeks also provide connection between Lake Ingraham and Florida Bay.				
Assessment area description The proposed temporary access channel to access the work zone at the Homestead Canal dam site traverses the shallow waters of Lake Ingraham between Ingraham Canal and Homestead Canal. The proposed action would result in dredging a 52-foot wide by approximate 8,320-foot temporary access channel. High tides in Lake Ingraham at the site of the proposed action are approximately two to four feet above the existing substrate with portions becoming exposed at low tide due to the ongoing transitioning from an open water system to a mud flat system in recent years.				
Significant nearby features Lake Ingraham tidal flats, Cape Sable, Florida Bay, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands,		Uniqueness (considering the relative rarity in relation to the regional landscape.) Relatively unique large intertidal embayment experiencing pronounced sedimentation resulting from the alteration of original hydrological regime by man-made canals. The lake is located within a mosaic of mangrove wetlands, tidal flats, and coastal prairie wetlands.		
Functions Wildlife and fisheries habitat, water quality		Mitigation for previous permit/other historic use N/A		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) West Indian manatee (<i>Trichechus manatus</i>), various wading birds (egrets, herons, ibis, etc.), double-crested cormorant (<i>Phalacrocorax auritus</i>), various gulls and terns, belted kingfisher (<i>Ceryle alcyon</i>), killdeer (<i>Charadrius vociferus</i>), various shorebirds, sea turtles, diamondback terrapin (<i>Malaclemys terrapin</i>), ladyfish (<i>Elops saurus</i>), pinfish (<i>Lagodon rhomboides</i>), various game and forage fish, nurse shark (<i>Ginglymostoma cirratum</i>), blue crab (<i>Callinectes sapidus</i>), shrimp (<i>Penaeus</i> spp.), burrowing mollusks		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) Smalltooth sawfish (<i>Pristis pectinata</i>) - E, Atlantic green turtle (<i>Chelonia mydas mydas</i>) - E, Atlantic loggerhead turtle (<i>Caretta caretta caretta</i>) - T, Atlantic hawksbill turtle (<i>Eretmochelys imbricata imbricata</i>) - E, Kemp's ridley (<i>Lepidochelys kempii</i>) - E, leatherback sea turtle (<i>Dermochelys coriacea</i>) - E, American crocodile (<i>Crocodylus acutus</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haleaetus</i>) - SSC, brown pelican (<i>Pelecanus occidentalis</i>) - SSC, various wading birds - SSC, West Indian manatee (<i>Trichechus manatus</i>) - E		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): Crocodile, ospreys, kingfishers, double-crested cormorants, unidentified gulls and terns, mullet, small unidentified fish,				
Additional relevant factors: The channel would be dredged to a depth approximately six feet below mean low water elevation. Sediment would be removed utilizing mechanical dredging methodology, i.e. a barge-mounted long reach excavator (40 to 60-foot reach). The dredged material (approx. 40,000 cubic yards) would be temporarily stockpiled in areas adjacent to the dredged channel outward to a maximum distance of approximately 60 feet on both sides (for a temporary impact footprint of approximately 172 feet wide by 8,320 feet long). Turbidity will be contained in the construction footprint utilizing staked and/or floating turbidity curtains or other suitable barriers.				
Assessment conducted by: Michael Breiner		Assessment date(s): May 5, 2009		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number Dredged Access Channel
Impact or Mitigation Temporary Impact	Assessment conducted by: Michael Breiner	Assessment date: May 5, 2009

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Optimal (10) Condition is optimal and fully supports wetland/surface water functions	Moderate(7) Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal (4) Minimal level of support of wetland/surface water functions	Not Present (0) Condition is insufficient to provide wetland/surface water functions
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.500(6)(a) Location and Landscape Support		Habitats outside of the AA optimal during a portion of the tidal cycle for certain wildlife such as saltwater fish, wading birds, shore birds, burrowing mollusks, etc., that are expected to occur in the area (however, extensive sedimentation that has occurred since the construction of the man-made canals has altered the original lake to a irregularly exposed tidal mud flat with dendritic drainage channels). Very little invasive exotic vegetation occurs in the vicinity of the AA.	
w/o pres or current	with	Sediment will be removed from a channel with a base not to exceed 40 feet wide with anticipated 3:1 side slopes. The total width at top is not to exceed 52 feet. The dredged material will be temporarily stockpiled in areas adjacent to the dredged channel outward to a maximum distance of approximately 60 feet on each side for a total temporary footprint of approximately 172 feet wide by 8,320 feet long. Turbidity will be contained within construction footprint utilizing turbidity curtains to minimize potential for turbidity beyond the limits of construction.	
7	7		
.500(6)(b) Water Environment (n/a for uplands)		Man-made canals that have experienced dramatic lateral erosion have dramatically altered the hydrological regime resulting in the conversion of a previously fresh to brackish lake to a tidally influenced system experiencing considerable sedimentation and siltation.	
w/o pres or current	with	The proposed dredging activity will result in short-term moderate to major adverse impacts to water quality within the impact footprint (within the limits of the turbidity barriers).	
7	4		
.500(6)(c) Community structure		Expansive intertidal and subtidal area composed primarily of loose mineral matter (e.g., marl, mud, etc.) and blue-green mat-forming algae.	
1. Vegetation and/or 2. Benthic Community		The dredging will result in the creation of a temporary channel up to 52 feet in width and to a depth approximately 6 feet below mean low water elevation within a periodically exposed mud flat system (no protected submerged aquatic vegetation is known within the AA. Approximately 40,000 cubic yards of dredged material will be temporarily stockpiled in areas adjacent to the dredged channel outward to a maximum distance of approximately 60 feet on both sides for a temporary footprint totaling 1,431,040 square feet (32.852 acres).	
w/o pres or current	with		
6	2		

Score= sum of above scores/30 (if uplands, divide by 20)	
w/o pres or current	with
0.6667	0.4333

Delta = [with-current]
-0.2333

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

If mitigation
Time lag (t-factor) =
Risk factor =

For impact assessment areas
FL = delta x acres = -0.2667 x 32.852 ac. -8.761

For mitigation assessment areas
RFG = delta/(t-factor x risk) = #DIV/0!

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number	Assessment Area Name or Number Dredged Access Channel
FLUCCs code 541 / 651	Further classification (optional) E2USM, E2USN	Impact or Mitigation Site? Mitigation	Assessment Area Size 32,852 acres
Basin/Watershed Name/Number S-7 Watershed/Everglades	Affected Waterbody (Class) Class II	Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Temporary access channel through shallow water depths of Lake Ingraham, a shallow intertidal embayment separated from the marine waters of the Gulf of Mexico and Florida Bay by a narrow carbonate sand beach ridge and barrier beach and from the interior Cape Sable complex of mangrove wetlands and numerous shallow subtidal open water areas by an emergent calcium carbonate marl ridge. Two manmade canals that have eroded considerably since excavation function as tidal inlets and connect to the Gulf of Mexico and Florida Bay. Several natural tidal creeks also provide connection between Lake Ingraham and Florida Bay.			
Assessment area description The proposed temporary access channel to access the work zone at the Homestead Canal dam site traverses the shallow waters of Lake Ingraham between Ingraham Canal and Homestead Canal. The proposed action would result in dredging a 52-foot wide by approximate 8,320-foot temporary access channel. High tides in Lake Ingraham at the site of the proposed action are approximately two to four feet above the existing substrate with portions becoming exposed at low tide due to the ongoing transitioning from an open water system to a mud flat system in recent years. The channel will be dredged to approximately six feet below mean low water.			
Significant nearby features Lake Ingraham tidal flats, Cape Sable, Florida Bay, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands,		Uniqueness (considering the relative rarity in relation to the regional landscape.) Relatively unique large intertidal embayment experiencing pronounced sedimentation resulting from the alteration of original hydrological regime by man-made canals. The lake is located within a mosaic of mangrove wetlands, tidal flats, and coastal prairie wetlands.	
Functions Wildlife and fisheries habitat, water quality		Mitigation for previous permit/other historic use N/A	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) West Indian manatee (<i>Trichechus manatus</i>), various wading birds (egrets, herons, ibis, etc.), double-crested cormorant (<i>Phalacrocorax auritus</i>), various gulls and terns, belted kingfisher (<i>Ceryle alcyon</i>), killdeer (<i>Charadrius vociferus</i>), various shorebirds, sea turtles, diamondback terrapin (<i>Malaclemys terrapin</i>), ladyfish (<i>Elops saurus</i>), pinfish (<i>Lagodon rhomboides</i>), various game and forage fish, nurse shark (<i>Ginglymostoma cirratum</i>), blue crab (<i>Callinectes sapidus</i>), shrimp (<i>Penaeus</i> spp.), burrowing mollusks		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) Smalltooth sawfish (<i>Pristis pectinata</i>) - E, Atlantic green turtle (<i>Chelonia mydas mydas</i>) - E, Atlantic loggerhead turtle (<i>Caretta caretta caretta</i>) - T, Atlantic hawksbill turtle (<i>Eretmochelys imbricata imbricata</i>) - E, Kemp's ridley (<i>Lepidochelys kempii</i>) - E, leatherback sea turtle (<i>Dermochelys coriacea</i>) - E, American crocodile (<i>Crocodylus acutus</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haleaetus</i>) - SSC, brown pelican (<i>Pelecanus occidentalis</i>) - SSC, various wading birds - SSC, West Indian manatee (<i>Trichechus manatus</i>) - E	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): Crocodile, ospreys, kingfishers, double-crested cormorants, unidentified gulls and terns, mullet, small unidentified fish.			
Additional relevant factors: Upon completion of construction at the Homestead Canal dam site, the dredged material temporarily stockpiled in areas up to 60 feet outward of both sides of the dredged channel will be pulled back into the channel via mechanical means and the turbidity barriers would be removed once turbidity has subsided. Over time, the channel is expected to fill back completely via natural processes.			
Assessment conducted by: Michael Breiner		Assessment date(s): May 5, 2009	

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number Dredged Access Channel
Impact or Mitigation Mitigation	Assessment conducted by: Michael Breiner	Assessment date: May 5, 2009

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current with 7 7	Turbidity will be contained within construction footprint utilizing turbidity curtains to minimize potential for turbidity beyond the limits of construction. Habitats outside of the AA utilized during portions of the tidal cycle by wildlife such as saltwater fish, wading birds, shore birds, burrowing mollusks, etc., that are expected to occur in the area will experience minimal impact.	
	The location and landscape support outside the AA will not be affected as turbidity curtains will not be removed until channel and stockpiled area are returned to grade following cessation of construction activities at Homestead Canal.	
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current with 4 7	The proposed dredging activity will result in short-term moderate to major adverse impacts to water quality within the impact footprint (within the limits of the turbidity barriers).	
	The AA area will return to pre-construction conditions after cessation of the construction activities and turbidity has subsided.	
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with 2 6	The dredging will result in the creation of a temporary channel up to 52 feet in width and to a depth approximately 6 feet below mean low water elevation within a periodically exposed mud flat system (no protected submerged aquatic vegetation is known within the AA. Approximately 40,000 cubic yards of dredged material will be temporarily stockpiled in areas adjacent to the dredged channel outward to a maximum distance of approximately 60 feet on both sides for a temporary footprint totaling 1,431,040 square feet (32.852 acres).	
	Upon completion of construction, the dredged material stockpiled within the AA would be pulled back into the dredged channel via mechanical means and returned to grade. Turbidity curtains would be removed once turbidity has subsided. Over time the channel is expected to completely fill back via natural processes.	

Score=sum of above scores/30 (if uplands, divide by 20)	
w/o pres or current	with
0.4333	0.6667

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.2333

If mitigation
Time lag (t-factor) = 1.03
Risk factor = 1.25

For mitigation assessment areas
RFG = delta/(t-factor x risk) = 0.1812

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number	Assessment Area Name or Number Homestead Canal Dam Southern Bank Fill at Existing Dam Site	
FLUCCs code 612 / 642	Further classification (optional) E2SS3P, E2EMP		Impact or Mitigation Site? Temporary Impact	Assessment Area Size 0.025 acres
Basin/Watershed Name/Number S-7 Watershed/Everglades	Affected Waterbody (Class) Class II	Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands <p>Man-made canal traversing an emergent carbonate marl ridge between Lake Ingraham and the interior mosaic of mangrove wetlands and numerous shallow subtidal open water areas that were formerly brackish to fresh marshes prior to the failure of the dam structure constructed to prevent tidal intrusion into the marsh habitat. Lake Ingraham is connected to Florida Bay and Gulf of Mexico via canals now functioning as tidal inlets following dramatic lateral erosion after construction.</p>				
Assessment area description <p>Southern bank of Homestead canal just south in the vicinity of the failed dam site. The canal was constructed in the 1920s across an emergent marl ridge between Lake Ingraham and the interior Cape Sable wetlands. The canal bank is comprised primarily of regularly flooded mixed mangrove wetlands dominated by red mangrove (<i>Rhizophora mangle</i>), black mangrove (<i>Avicennia germinans</i>), and white mangrove (<i>Laguncularia racemosa</i>) with a sparse to dense groundcover dominated by saltwort (<i>Batis maritima</i>) and bushy seaside oxeye (<i>Borrchia frutescens</i>) adjacent to Lake Ingraham transitioning northeastward to a more elevated, irregularly flooded black mangrove, buttonwood (<i>Conocarpus erectus</i>) and saltwort dominated wetland in the vicinity of the Homestead Canal failed dam site at the marl ridge. The black mangrove-buttonwood-saltwort community dominating the marl ridge consists of a mosaic of dense to open canopy black mangrove and buttonwood and open areas with a sparse to dense groundcover of saltwort.</p>				
Significant nearby features Cape Sable, Lake Ingraham, Florida Bay, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands.		Uniqueness (considering the relative rarity in relation to the regional landscape.) Low for mangroves wetlands, medium for mosaic of buttonwood shrub and saltwort coastal prairie on marl ridge.		
Functions Wildlife and fisheries habitat, water quality		Mitigation for previous permit/other historic use N/A		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Raccoon (<i>Procyon lotor</i>), marsh rabbit (<i>Sylvilagus palustris</i>), red-shouldered hawk (<i>Buteo lineatus</i>), various wading birds (egrets, herons, ibis, etc.), belted kingfisher (<i>Ceryle alcyon</i>), diamondback terrapin (<i>Malaclemys terrapin</i>).		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) American crocodile (<i>Crocodylus acutus</i>) - T, eastern indigo snake (<i>Drymarchon corais couperi</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haleaetus</i>) - SSC, various wading birds - SSC.		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): Crocodile, kingfishers, unidentified passerines.				
Additional relevant factors: Woody vegetation will be cut at ground level and debris cleared. No grubbing will take place. BMPs will be implemented during construction. These would include the use of stake silt fence around the outer perimeter of the work zone and the placement of turbidity barriers in the canal prior to construction.				
Assessment conducted by: Michael Breiner		Assessment date(s): May 20, 2009		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number Homestead Canal Dam Temporary Work Zones
Impact or Mitigation Temporary Impact	Assessment conducted by: Michael Breiner	Assessment date: May 20, 2009

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current 8	with 8	Habitats outside of the AA optimal for most wildlife expected to occur in the area. Very little invasive exotic vegetation occurs in the vicinity of the AA. Wildlife access to and from minimally limited by canal. Downstream functions negatively affected by failed dam in form of increase saltwater intrusion in interior wetland systems. Land uses outside the AA minimally affect fish and wildlife.
		The clearing of woody vegetation within the area increases the potential of runoff that may contribute to erosion, sediment deposition, and turbidity outside of the AA. Implementation of BMPs will minimize to habitats outside the AA.
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current 6	with 6	Water flow around eroded sheet piling dam site inappropriate for system. Daily tidal fluctuations causing severe lateral erosion of the canal banks allowing increasing flow resulting with greater saltwater intrusion to the interior wetland systems. Erosion of the canal banks also contributing to loss of mangrove and buttonwood/saltwort marsh habitat
		Construction has the potential to increase turbidity in nearby waters; however, implementation of BMPs will minimize runoff that could elevate turbidity levels.
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current 7	with 2	Majority of vegetation in all strata are appropriate for the habitats at the AA with few invasive exotic species present. Vegetation adjacent to canal is increasingly lost to the lateral erosion of the canal banks caused by excessive currents around failed dam. Vegetation and habitat will continue to deteriorate not only along canal banks but also within interior wetland systems due to the saltwater intrusion allowed by the failed dam.
		All above-ground woody vegetation will be removed from the AA. No grubbing will take place therefore roots systems will remain intact allowing for regrowth upon cessation of construction activities.

Score=sum of above scores/30 (if uplands, divide by 20)	
w/o pres or current	with
0.7000	0.5333

Delta = [with-current]
-0.1667

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

If mitigation
Time lag (t-factor) =
Risk factor =

For impact assessment areas
FL = delta x acres = -0.004

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number	Assessment Area Name or Number Homestead Canal Dam Southern Bank Fill at Existing Dam Site	
FLUCCs code 612 / 642	Further classification (optional) E2SS3P, E2EMP		Impact or Mitigation Site? Mitigation	Assessment Area Size 0.025 acres
Basin/Watershed Name/Number S-7 Watershed/Everglades	Affected Waterbody (Class) Class II	Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands <p>Man-made canal traversing an emergent carbonate marl ridge between Lake Ingraham and the interior mosaic of mangrove wetlands and numerous shallow subtidal open water areas that were formerly brackish to fresh marshes prior to the failure of the dam structure constructed to prevent tidal intrusion into the marsh habitat. Lake Ingraham is connected to Florida Bay and Gulf of Mexico via canals now functioning as tidal inlets following dramatic lateral erosion after construction.</p>				
Assessment area description <p>Southern bank of Homestead canal just south in the vicinity of the failed dam site. The canal was constructed in the 1920s across an emergent marl ridge between Lake Ingraham and the interior Cape Sable wetlands. The canal bank is comprised primarily of regularly flooded mixed mangrove wetlands dominated by red mangrove (<i>Rhizophora mangle</i>), black mangrove (<i>Avicennia germinans</i>), and white mangrove (<i>Laguncularia racemosa</i>) with a sparse to dense groundcover dominated by saltwort (<i>Batis maritima</i>) and bushy seaside oxeye (<i>Borrchia frutescens</i>) adjacent to Lake Ingraham transitioning northeastward to a more elevated, irregularly flooded black mangrove, buttonwood (<i>Conocarpus erectus</i>) and saltwort dominated wetland in the vicinity of the Homestead Canal failed dam site at the marl ridge. The black mangrove-buttonwood-saltwort community dominating the marl ridge consists of a mosaic of dense to open canopy black mangrove and buttonwood and open areas with a sparse to dense groundcover of saltwort.</p>				
Significant nearby features <p>Cape Sable, Lake Ingraham, Florida Bay, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands.</p>		Uniqueness (considering the relative rarity in relation to the regional landscape.) <p>Low for mangroves wetlands, medium for mosaic of buttonwood shrub and saltwort coastal prairie on marl ridge.</p>		
Functions <p>Wildlife and fisheries habitat, water quality</p>		Mitigation for previous permit/other historic use <p>N/A</p>		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) <p>Raccoon (<i>Procyon lotor</i>), marsh rabbit (<i>Sylvilagus palustris</i>), red-shouldered hawk (<i>Buteo lineatus</i>), various wading birds (egrets, herons, ibis, etc.), belted kingfisher (<i>Ceryle alcyon</i>), diamondback terrapin (<i>Malaclemys terrapin</i>).</p>		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) <p>American crocodile (<i>Crocodylus acutus</i>) - T, eastern indigo snake (<i>Drymarchon corais couperi</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haleaetus</i>) - SSC, various wading birds - SSC.</p>		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): <p>Crocodile, kingfishers, unidentified passerines.</p>				
Additional relevant factors: <p>Woody vegetation will be cut at ground level and debris cleared. No grubbing will take place. BMPs will be implemented during construction. These would include the use of stake silt fence around the outer perimeter of the work zone and the placement of turbidity barriers in the canal prior to construction. After construction is completed, regrowth is expected to occur naturally. Impacted areas of temporary work zones will be monitored and replanted if natural revegetation does not occur.</p>				
Assessment conducted by: <p>Michael Breiner</p>		Assessment date(s): <p>May 20, 2009</p>		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number Homestead Canal Dam Temporary Work Zones
Impact or Mitigation Mitigation	Assessment conducted by: Michael Breiner	Assessment date: May 20, 2009

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current <div>8</div>	with <div>8</div>	The clearing of woody vegetation within the area increases the potential of runoff that may contribute to erosion, sediment deposition, and turbidity outside of the AA. Implementation of BMPs will minimize to habitats outside the AA.
		No change to habitats outside the AA upon completion of activities in work zones.
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current <div>6</div>	with <div>6</div>	Construction activities have the potential to increase turbidity in nearby waters; however, implementation of BMPs will minimize runoff that could elevate turbidity levels.
		Minimal change to water environment upon completion of activities.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current <div>2</div>	with <div>7</div>	All above-ground woody vegetation will be removed from the AA. No grubbing will take place therefore root systems will remain intact allowing for regrowth upon cessation of construction activities.
		After construction is completed, the area will planted and additional regrowth of wetland vegetation is expected to occur naturally. Impacted area will be monitored and maintained exotic free for five years.

Score=sum of above scores/30 (if uplands, divide by 20)	
w/o pres or current	with
0.5333	0.7000

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.1667

If mitigation	
Time lag (t-factor) = 5 year	1.14
Risk factor =	1.25

For mitigation assessment areas	
RFG = delta/(t-factor x risk) =	0.1170

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number	Assessment Area Name or Number Lake Ingraham - post dams
FLUCCs code 541 / 651	Further classification (optional) E2USM, E2USN	Impact or Mitigation Site? Mitigation	Assessment Area Size 1,863 acres
Basin/Watershed Name/Number S-7 Watershed/Everglades	Affected Waterbody (Class) Class II	Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands <p>Shallow intertidal embayment separated from the marine waters of the Gulf of Mexico and Florida Bay by a narrow carbonate sand beach ridge and barrier beach and from the interior Cape Sable complex of mangrove wetlands and numerous shallow subtidal open water areas by an emergent calcium carbonate marl ridge. Two manmade canals that have eroded considerably since excavation function as tidal inlets and connect to the Gulf of Mexico and Florida Bay. Several natural tidal creeks also provide connection between Lake Ingraham and Florida Bay</p>			
Assessment area description <p>Lake Ingraham is a shallow, intertidal embayment approximately 5 miles by 0.5 mile with the long axis trending northwest/southeast. Two man-made canals that were established in the early 20th century, the Lower East Cape/Ingraham Canals near the southeast end of the lake and the Middle Cape Canal near the northwest end of the lake, have widened considerably and function as tidal inlets enhancing tidal flow into and out of the lake. This has exacerbated carbonate mud sediment deposition, resulting in a conversion to a tidal mud flat. The extensive sedimentation resembles an emergent system at low tide allowing for the growth of abundant algal and cyanobacterial mats on the substrate and providing habitat for colonization by red mangrove seedlings. Prior to canal construction, Lake Ingraham was an isolated fresh to brackish lake.</p>			
Significant nearby features <p>Cape Sable, Florida Bay, Gulf of Mexico, Marl Ridge, interior Cape Sable wetlands.</p>		Uniqueness (considering the relative rarity in relation to the regional landscape.) <p>Relatively unique large intertidal embayment experiencing pronounced sedimentation resulting from the alteration of original hydrological regime by man-made canals. The lake is located within a mosaic of mangrove wetlands, tidal flats, and coastal prairie wetlands.</p>	
Functions <p>Wildlife and fisheries habitat, water quality.</p>		Mitigation for previous permit/other historic use <p>N/A</p>	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) <p>West Indian manatee (<i>Trichechus manatus</i>), various wading birds (egrets, herons, ibis, etc.), double-crested cormorant (<i>Phalacrocorax auritus</i>), various gulls and terns, belted kingfisher (<i>Ceryle alcyon</i>), killdeer (<i>Charadrius vociferus</i>), various shorebirds, sea turtles, diamondback terrapin (<i>Malaclemys terrapin</i>), ladyfish (<i>Elops saurus</i>), pinfish (<i>Lagodon rhomboides</i>), various game and forage fish, nurse shark (<i>Ginglymostoma cirratum</i>), blue crab (<i>Callinectes sapidus</i>), shrimp (<i>Penaeus</i> spp.), burrowing mollusks</p>		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) <p>Smalltooth sawfish (<i>Pristis pectinata</i>) - E, Atlantic green turtle (<i>Chelonia mydas mydas</i>) - E, Atlantic loggerhead turtle (<i>Caretta caretta caretta</i>) - T, Atlantic hawksbill turtle (<i>Eretmochelys imbricata imbricata</i>) - E, Kemp's ridley (<i>Lepidochelys kempii</i>) - E, leatherback sea turtle (<i>Dermochelys coriacea</i>) - E, American crocodile (<i>Crocodylus acutus</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haliaetus</i>) - SSC, brown pelican (<i>Pelecanus occidentalis</i>) - SSC, various wading birds - SSC, West Indian manatee (<i>Trichechus manatus</i>) - E</p>	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): <p>Crocodile, ospreys, kingfishers, double-crested cormorants, unidentified gulls and terns, mullet, small unidentified fish.</p>			
Additional relevant factors:			
Assessment conducted by: <p>Michael Breiner</p>		Assessment date(s): <p>February 16, 2009</p>	

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number Lake Ingraham
Impact or Mitigation Mitigation	Assessment conducted by: Michael Breiner	Assessment date: February 16, 2009

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current with 7 8	Habitats outside of the AA optimal for most wildlife (e.g., saltwater fish, wading birds, shore birds, burrowing mollusks, etc.) expected to occur in the area (however, extensive sedimentation that has occurred since the construction of the man-made canals has altered the the original shallow open water fresh to brackish lake to a irregularly exposed tidal mud flat with dendritic drainage channels). Very little invasive exotic vegetation occurs in the vicinity of the AA.
	Restoration of the dams at the Homestead and East Cape Extension Canals will ameliorate impacts to wildlife in habitats outside the AA and increase the quality of habitat support outside the AA .
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current with 7 8	Man-made canals that have experienced dramatic lateral erosion that dramatically altered the hydrological regime resulting in the conversion of a previously fresh to brackish lake to a tidally influenced system experiencing considerable sedimentation and siltation.
	Restoration of the dams will slow the rate of sediment deposition in Lake Ingraham contributed by the result of marsh collapse in the interior wetlands through the canals: and improve habitat for estuarine fish, invertebrates, and water birds.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with 6 7	Expansive intertidal and subtidal area composed primarily of loose mineral matter (e.g., marl, mud, etc.) and blue-green mat-forming algae.
	The restoration of the dams will slow the rate of sediment deposition through the canals.

Score=sum of above scores/30 (if uplands, divide by 20)	
w/o pres or current	with
0.6667	0.7667

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.1000

If mitigation
Time lag (t-factor) = 1
Risk factor = 1.25

For mitigation assessment areas
RFG = delta/(t-factor x risk) = 0.0800

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment		Application Number		Assessment Area Name or Number Southern Interiors Wetlands - post restore	
FLUCCs code 542 / 612		Further classification (optional) E2SS3U / E2USM		Impact or Mitigation Site? Mitigation	
Assessment Area Size 55,894 acres					
Basin/Watershed Name/Number S-7 Watershed/Everglades		Affected Waterbody (Class) Class II		Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) OFW, Everglades National Park	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands <p>Mosaic of freshwater, brackish, marine, and hypersaline wetland communities and open water unconsolidated bottom systems between Whitewater Bay and Florida Bay/Gulf of Mexico. The southern interior wetlands are separated from Florida Bay and the Gulf of Mexico by an emergent calcium carbonate marl ridge system on the south and west. Several man-made canals and natural creeks connect the interior wetlands to tidal waters through the marl ridge.</p>					
Assessment area description <p>The habitats on the mainline side of the marl ridge are comprised primarily of a mosaic of mangrove wetland and numerous shallow bottom subtidal areas of open water. The southern interior of Cape Sable was a continuous marsh with isolated round lakes prior to the construction of the Homestead and East Cape Extension canals which increased saltwater intrusion to the interior resulting in the degradation of these systems. These formerly freshwater southern interior marshes are separated from the intertidal habitats of Lake Ingraham by the marl ridge. In addition to periodic overtopping of the marl ridge, the interior marsh area receives saltwater input via the failed sheet piling dams in the Homestead and East Cape Extension Canals. Further north, the central and northern interior areas contain a mosaic of freshwater, brackish, marine, and hyper-saline flora although much of the interior is dominated by red mangrove interspersed with open water. In addition to mangroves, common flora in the central and northern interior areas includes cordgrass (<i>Spartina</i> spp.) and sawgrass (<i>Cladium jamaicense</i>).</p>					
Significant nearby features <p>Marl Ridge, Cape Sable, Florida Bay, Gulf of Mexico, Marl Ridge, Whitewater Bay</p>			Uniqueness (considering the relative rarity in relation to the regional landscape.) <p>Relatively unique large intertidal embayment experiencing pronounced sedimentation resulting from the alteration of original hydrological regime by man-made canals. The lake is located within a mosaic of mangrove wetlands, tidal flats, and coastal prairie wetlands.</p>		
Functions <p>Wildlife and fisheries habitat, water quality</p>			Mitigation for previous permit/other historic use <p>N/A</p>		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) <p>Various wading birds (egrets, herons, ibis, etc.), belted kingfisher (<i>Ceryle alcyon</i>), various shorebirds, diamondback terrapin (<i>Malaclemys terrapin</i>), various game and forage fish, blue crab (<i>Callinectes sapidus</i>), shrimp (<i>Penaeus</i> spp.),</p>			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) <p>American crocodile (<i>Crocodylus acutus</i>) - T, wood stork (<i>Mycteria americana</i>) - E, osprey (<i>Pandion haleaetus</i>) - SSC, various wading birds - SSC,</p>		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Additional relevant factors:					
Assessment conducted by: <p>Michael Breiner</p>			Assessment date(s): <p>February 20, 2009</p>		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Everglades National Park (ENP) Cape Sable Canals Dam Restoration Project Environmental Assessment	Application Number	Assessment Area Name or Number Southern Interiors Wetlands - post restore
Impact or Mitigation Mitigation	Assessment conducted by: Michael Breiner	Assessment date: February 20, 2009

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current 8	with 8	Habitats outside of the AA (optimal for most wildlife (e.g., game and forage fish, wading birds, shore birds, etc.) expected to occur in the area . Very little invasive exotic vegetation occurs in the vicinity of the AA. Backcountry nature of the area presents very little in the way of man-made barriers to wildlife. Impacts to wildlife are exhibited primarily by the degradation of the former brackish to fresh marsh wetlands by saline intrusion via man-made canals. The quality of the the interior wetlands are adversely affected by the continued intrusion of tidal waters through the failed dams at the Homestead and East Cape Extension Canals.
		Restoration of the dams at the Homestead and East Cape Extension Canals will ameliorate impacts to wildlife in habitats outside the AA and increase the quality of habitat support outside the AA
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current 7	with 8	The man-made canals that have experienced lateral erosion and failed dams have altered the hydrological regime resulting in the conversion of a previously fresh to brackish wetlands to a tidally influenced system experiencing degradation of the wetland communities.
		Restoration of the dams will inhibit the rate of marsh collapse in the interior wetlands through the canals and improve habitat for fish and wildlife.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current 6	with 7	The habitats in the southern interior wetlands on the mainline side of the marl ridge are comprised primarily of a mosaic of mangrove wetland and numerous shallow bottom subtidal areas of open water that were formerly continuous marsh with isolated round lakes prior to the construction of the Homestead and East Cape Extension canals which increased saltwater intrusion to the interior resulting in marsh collapse. These habitats transition northward to a mosaic of freshwater, brackish, marine, and hyper-saline wetland systems in the central and northern interior areas.
		Restoration of the dams will inhibit the rate of marsh collapse in the interior wetlands.

Score=sum of above scores/30 (if uplands, divide by 20)	
w/o pres or current	with
0.7000	0.7667

If preservation as mitigation,	
Preservation adjustment factor =	
Adjusted mitigation delta =	

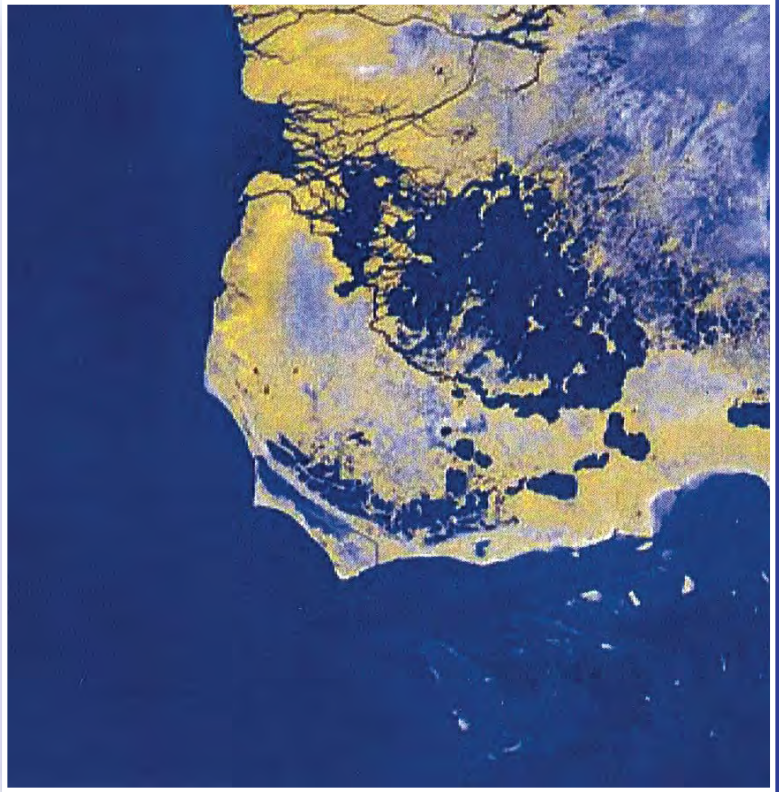
For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.0667

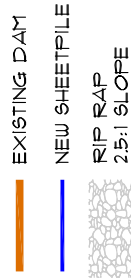
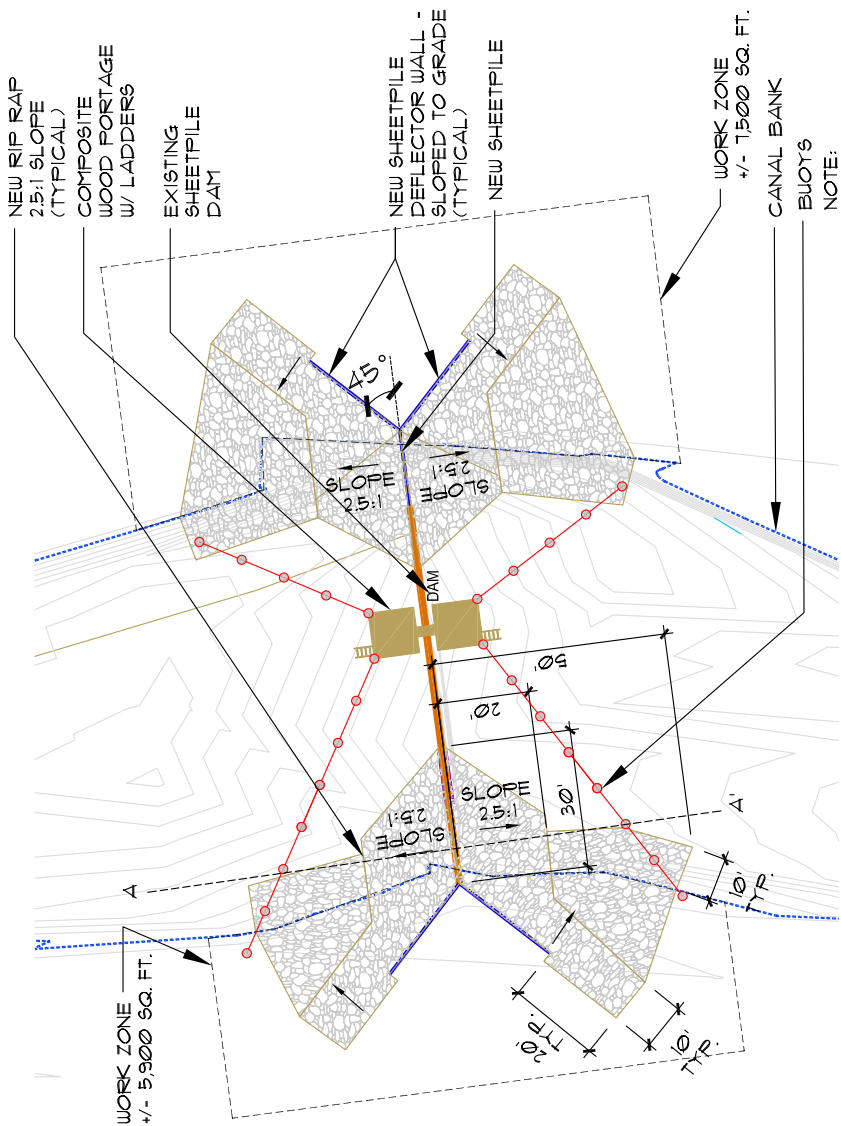
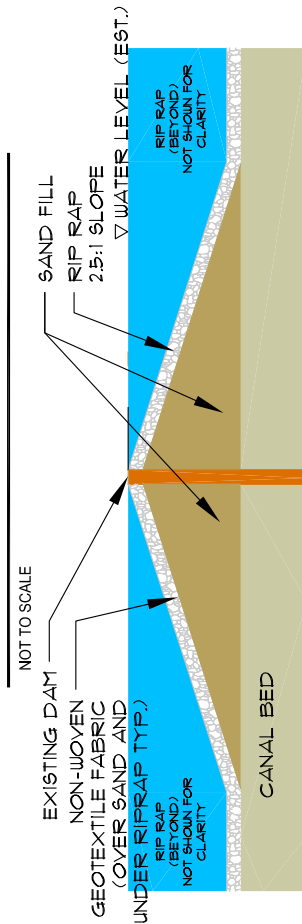
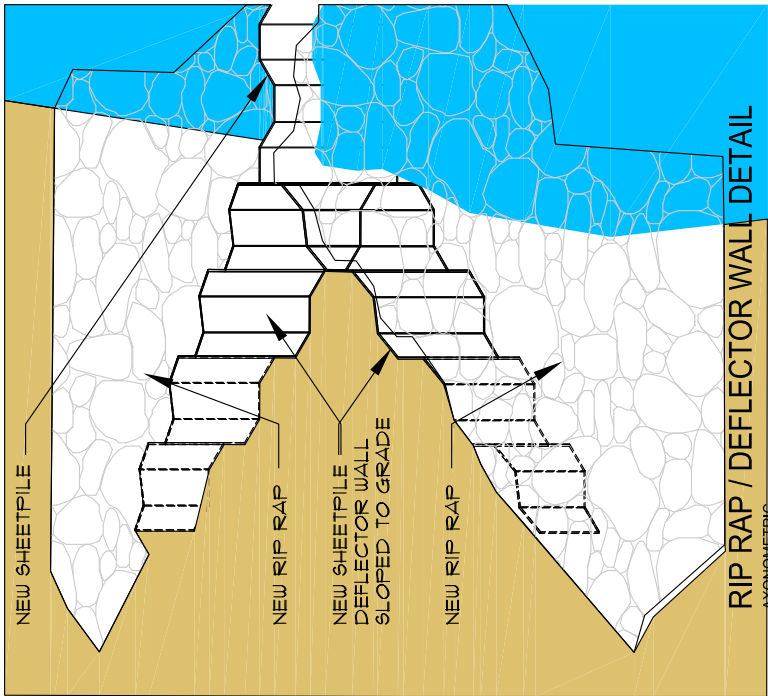
If mitigation	
Time lag (t-factor) =	1
Risk factor =	1.25

For mitigation assessment areas
RFG = delta/(t-factor x risk) = 0.0533333

Engineering Drawings



EAST CAPE EXTENSION CANAL DAM - ALTERNATIVE C DRAWING



URS

1650 Corporate Center Drive, Suite 401
 San Francisco, CA 94103
 Tel: 305-884-5900
 Fax: 305-884-2665
 DECEMBER 2008

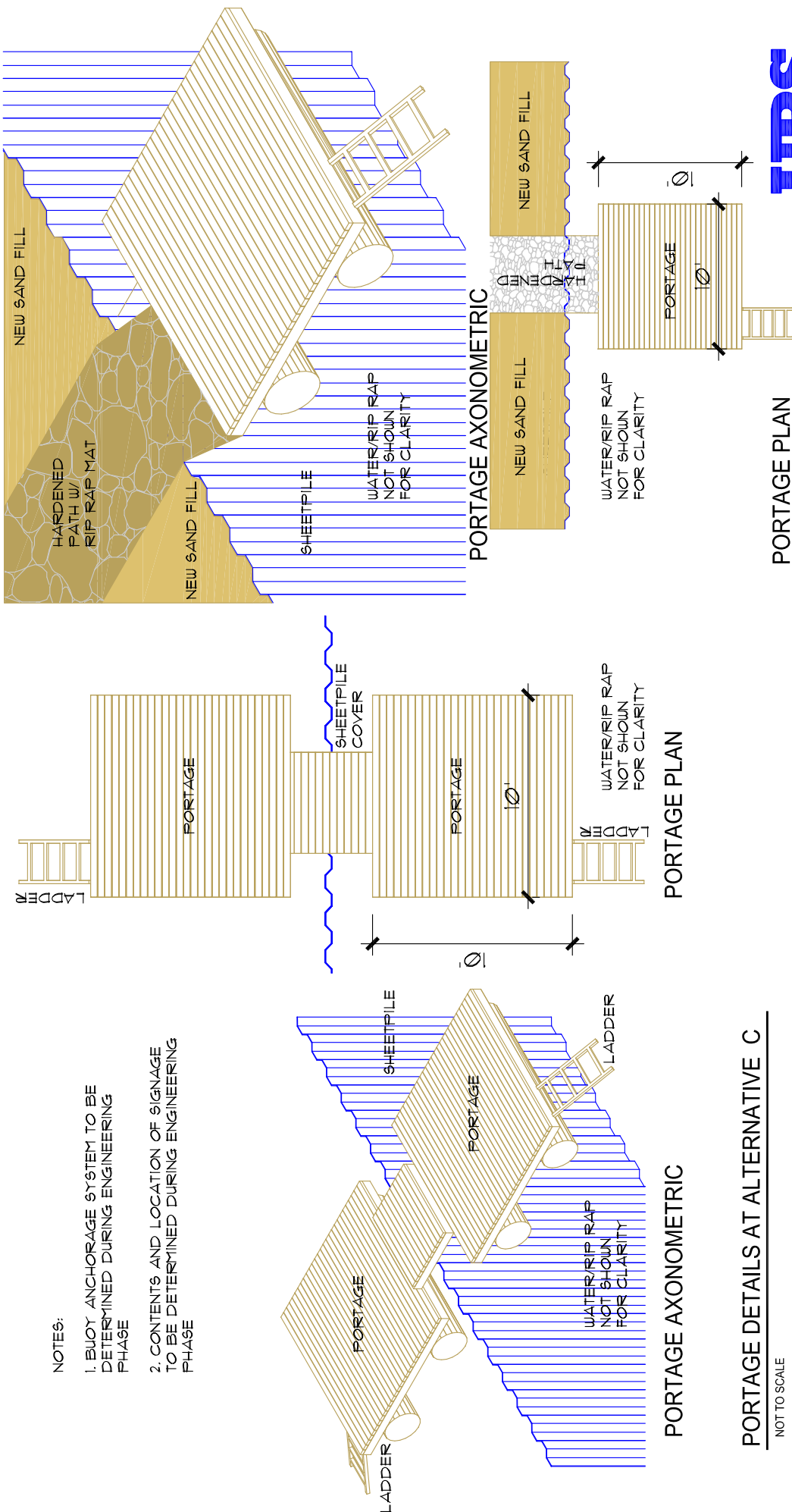
[illegible]

7650 Corporate Center Drive, Suite 401
Miami, FL 33126
Tel: 305-894-8900
Fax: 305-894-2665
DECEMBER 2008

EAST CAPE EXTENSION CANAL DAM - PORTAGE DETAILS DRAWING

NOTES:

- 1. BUOY ANCHORAGE SYSTEM TO BE DETERMINED DURING ENGINEERING PHASE
- 2. CONTENTS AND LOCATION OF SIGNAGE TO BE DETERMINED DURING ENGINEERING PHASE



PORTAGE AXONOMETRIC

PORTAGE DETAILS AT ALTERNATIVE C

NOT TO SCALE

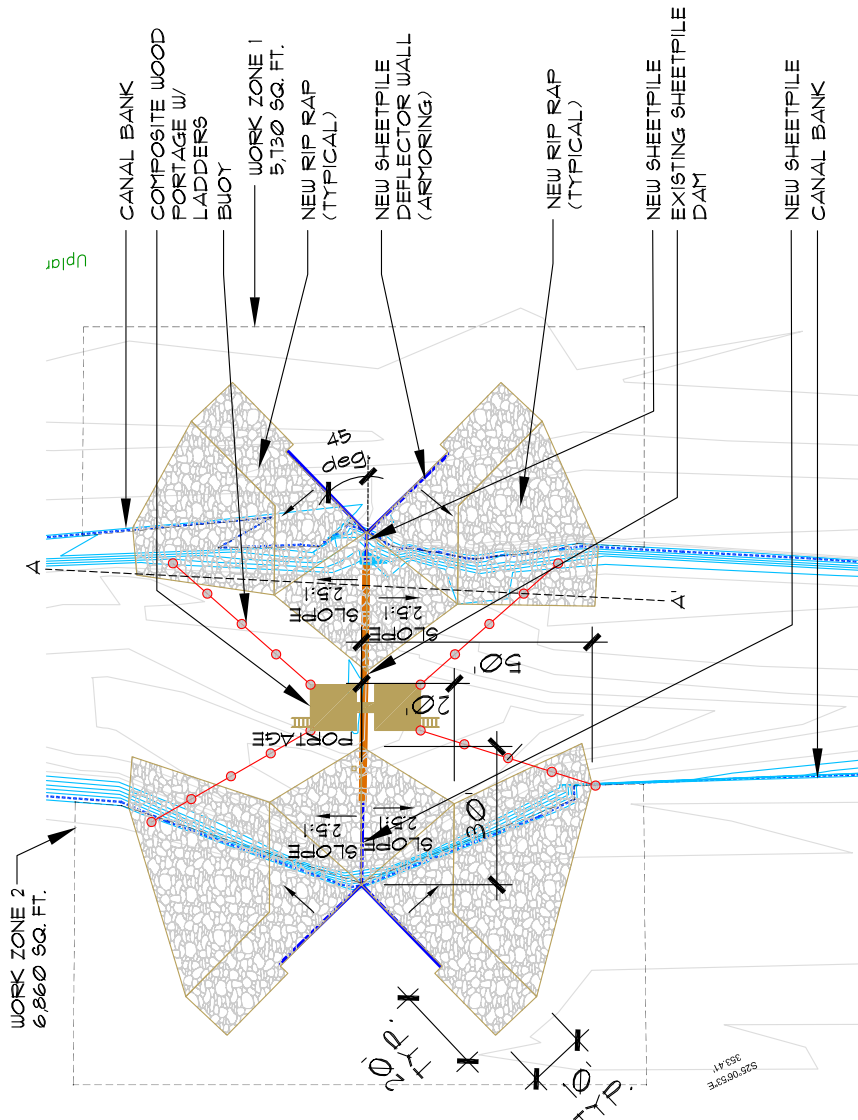
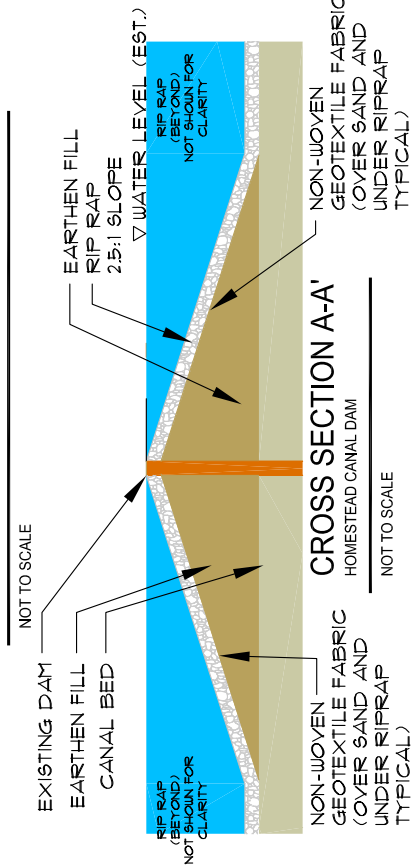
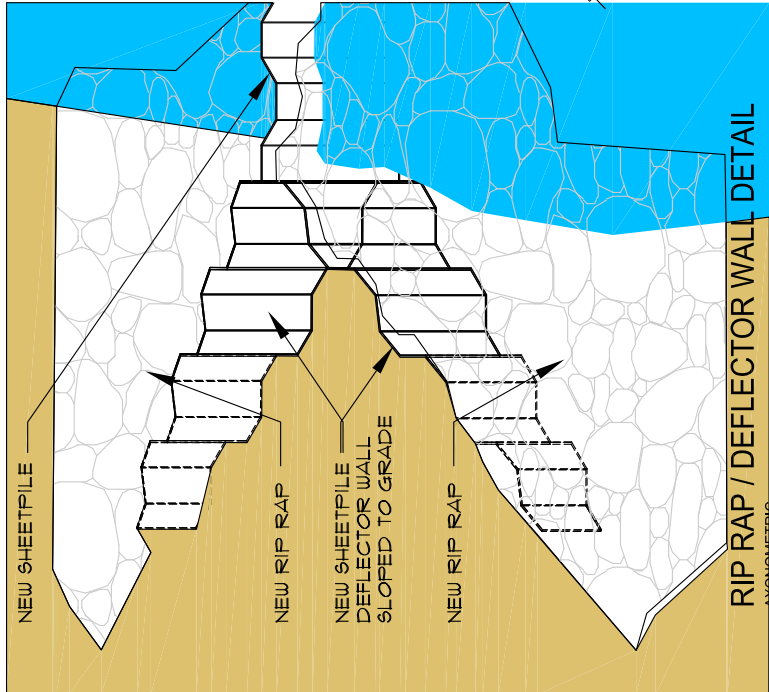
PORTAGE PLAN
PORTAGE DETAILS AT ALTERNATIVES D & G

NOT TO SCALE



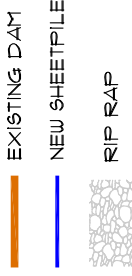
1650 Corporate Center Drive, Suite 401
Boulder, CO 80521
Tel: 303-440-2900
Fax: 303-440-2665
DECEMBER 2008

HOMESTEAD CANAL DAM - ALTERNATIVE C DRAWING



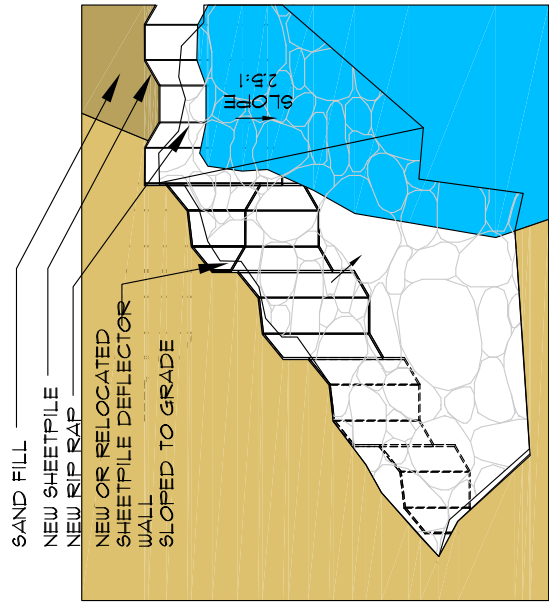
NOTES:

1. BUOY ANCHORAGE SYSTEM TO BE DETERMINED DURING ENGINEERING PHASE
2. CONTENTS AND LOCATION OF SIGNAGE TO BE DETERMINED DURING ENGINEERING PHASE



1650 Corporate Center Drive, Suite 401
 San Francisco, CA 94103
 Tel: 305-884-5900
 Fax: 305-884-2665
 DECEMBER 2008

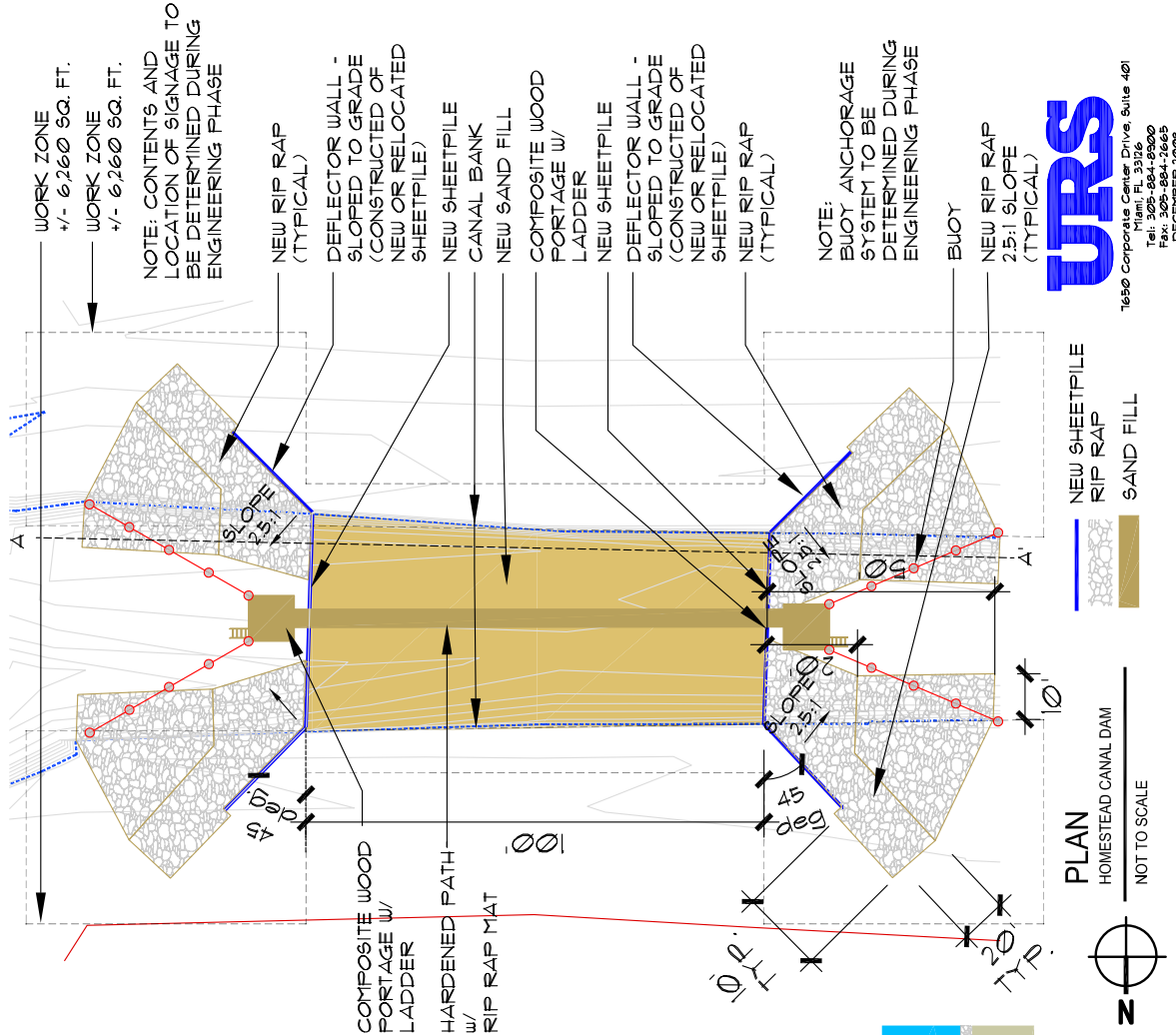
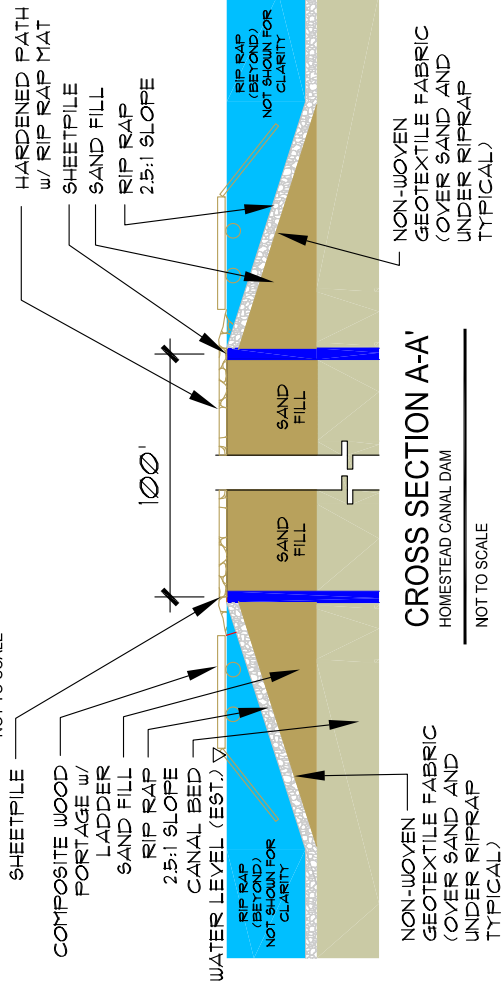
HOMESTEAD CANAL DAM - ALTERNATIVE D DRAWING



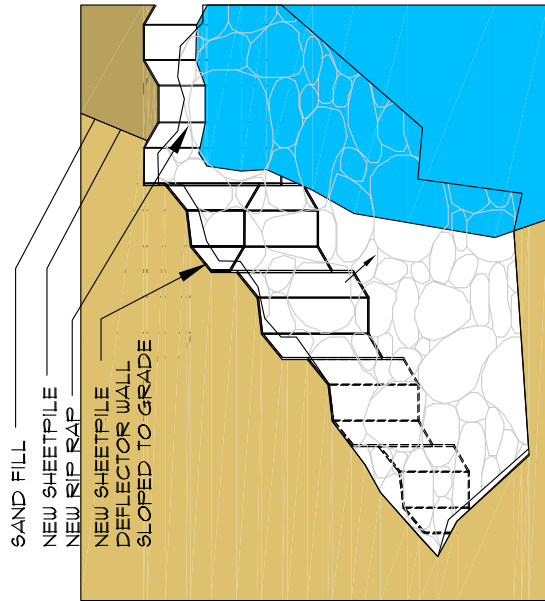
RIP RAP / DEFLECTOR WALL DETAIL

AXONOMETRIC

NOT TO SCALE



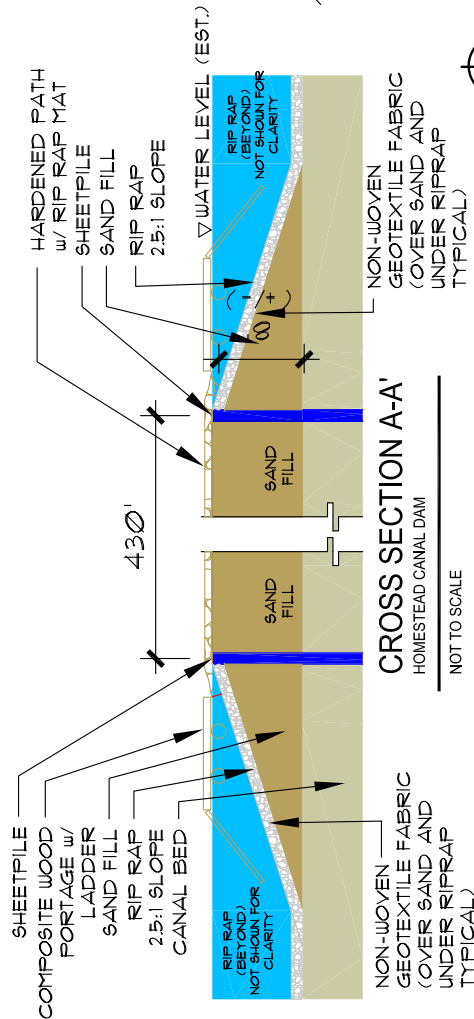
HOMESTEAD CANAL DAM - ALTERNATIVE G DRAWING



RIP RAP / DEFLECTOR WALL DETAIL

AXONOMETRIC

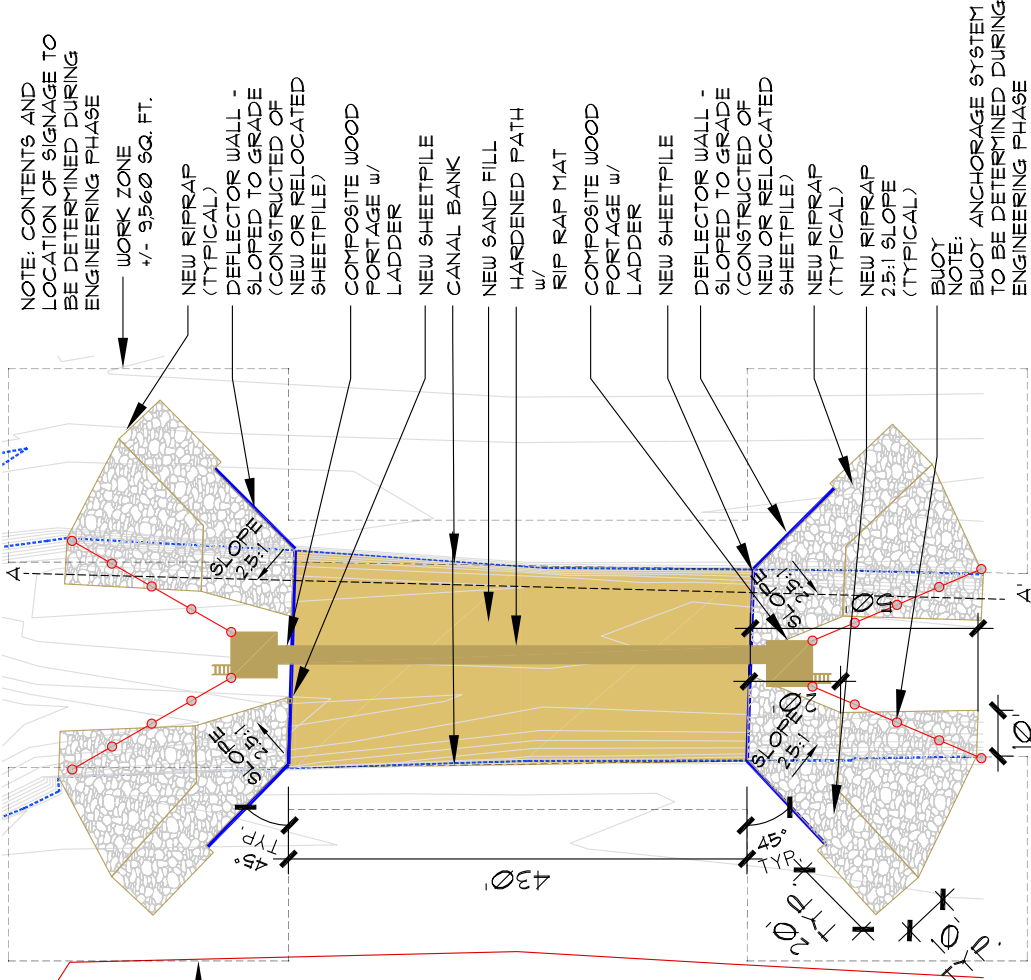
NOT TO SCALE



CROSS SECTION A-A'

HOMESTEAD CANAL DAM

NOT TO SCALE



PLAN

HOMESTEAD CANAL DAM

NOT TO SCALE



1650 Corporate Center Drive, Suite 401
 Houston, Texas 77002
 Tel: 305-884-5900
 Fax: 305-884-2665
 DECEMBER 2008

NOTE: CONTENTS AND LOCATION OF SIGNAGE TO BE DETERMINED DURING ENGINEERING PHASE



CROSS SECTION A-A'
HOMESTEAD CANAL DAM
NOT TO SCALE

URS
 7650 Corporate Center Drive, Suite
 Miami, FL 33126
 Tel: 305-884-0900
 Fax: 305-884-2665
 DECEMBER 2008

AXONOMETRIC
HOMESTEAD CANAL DAM
NOT TO SCALE

Labels for Axonometric view:
 - BOTTOM OF CANAL (SAND FILL NOT SHOWN FOR CLARITY IN THIS SECTION)
 - SAND FILL OVER GEOTUBES
 - RIPRAP 25:1 SLOPE
 - WATER LEVEL
 - CANAL BANK
 - GEOTUBES BELOW SAND FILL (NOT SHOWN FOR CLARITY)
 - RIPRAP ON TOP OF BANK
 - HARDENED PATH w/ RIP RAP MAT
 - COMPOSITE WOOD PORTAGE w/ LADDER
 - BOTTOM OF CANAL

CROSS SECTION B-B'
HOMESTEAD CANAL DAM
NOT TO SCALE

Labels for Cross Section B-B':
 - NON-WOVEN GEOTEXTILE FABRIC (OVER BANK AND UNDER RIPRAP)
 - TOP OF BANK
 - RIPRAP 25:1 SLOPE
 - WATER LEVEL (EST.)
 - BOTTOM OF CANAL
 - RIPRAP 25:1 SLOPE

Plan View
 - NOTE: BUOY ANCHORAGE SYSTEM TO BE DETERMINED DURING ENGINEERING PHASE
 - BUOY
 - COMPOSITE WOOD PORTAGE w/ LADDER
 - GEOTUBES (BELOW)
 - WORK ZONE +/- 6,942 SQ. FT.
 - CANAL BANK
 - NEW SAND FILL
 - HARDENED PATH w/ RIP RAP MAT
 - GEOTUBES (BELOW)
 - COMPOSITE WOOD PORTAGE w/ LADDER
 - BUOY
 - RIPRAP SLOPE 2.5:1
 - WORK ZONE +/- 6,942 SQ. FT.
 - A' B'

PLAN
HOMESTEAD CANAL DAM
NOT TO SCALE



CROSS SECTION A-A'
HOMESTEAD CANAL DAM
NOT TO SCALE

TABLE A-A'

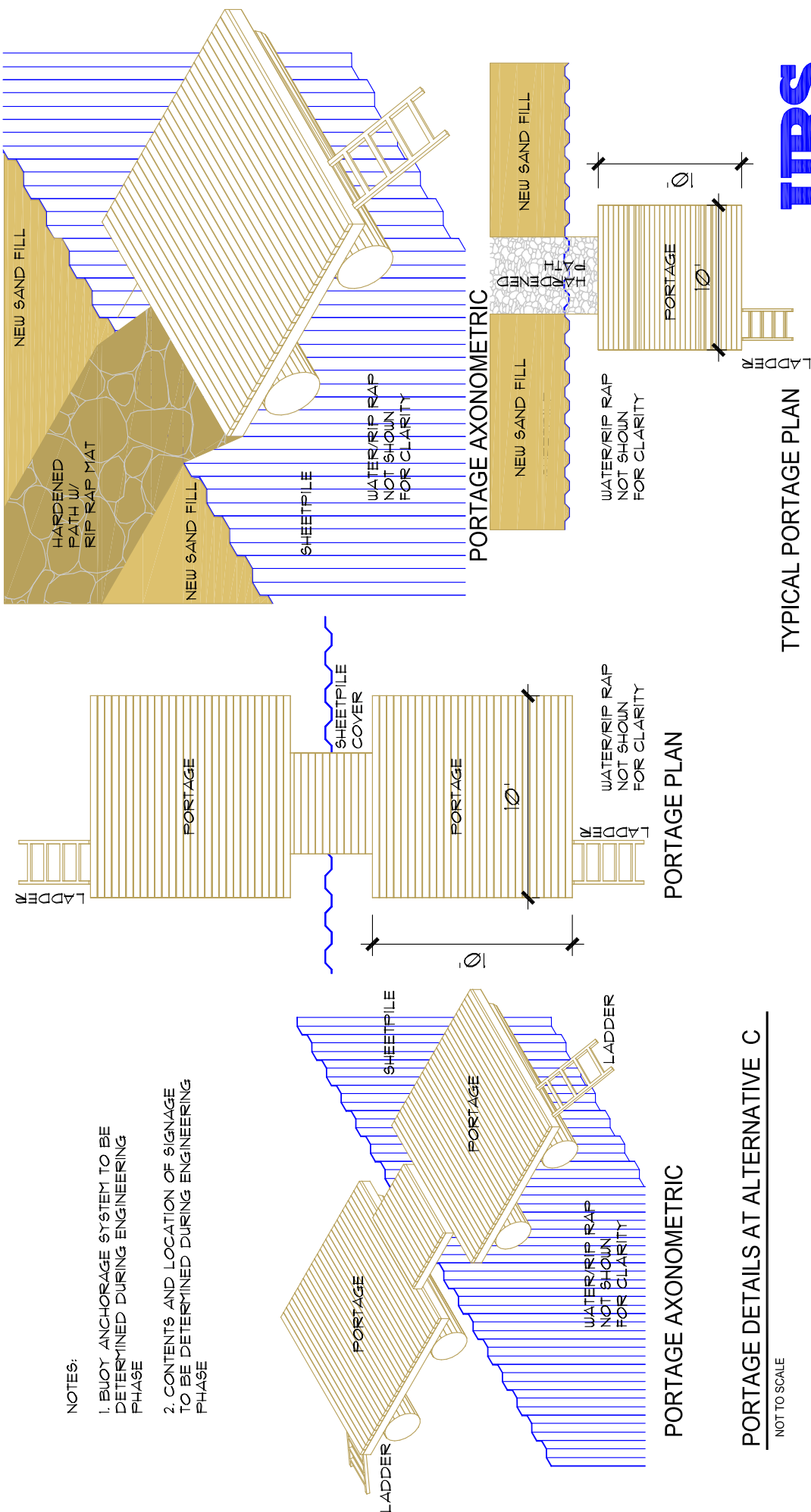
US

7650 Corporate Center Drive, Suite 401
Miami, FL 33126
Tel: 305-884-8900
Fax: 305-884-2665
DECEMBER 2008

HOMESTEAD CANAL DAM - PORTAGE DETAILS DRAWING

NOTES:

- 1. BUOY ANCHORAGE SYSTEM TO BE DETERMINED DURING ENGINEERING PHASE
- 2. CONTENTS AND LOCATION OF SIGNAGE TO BE DETERMINED DURING ENGINEERING PHASE



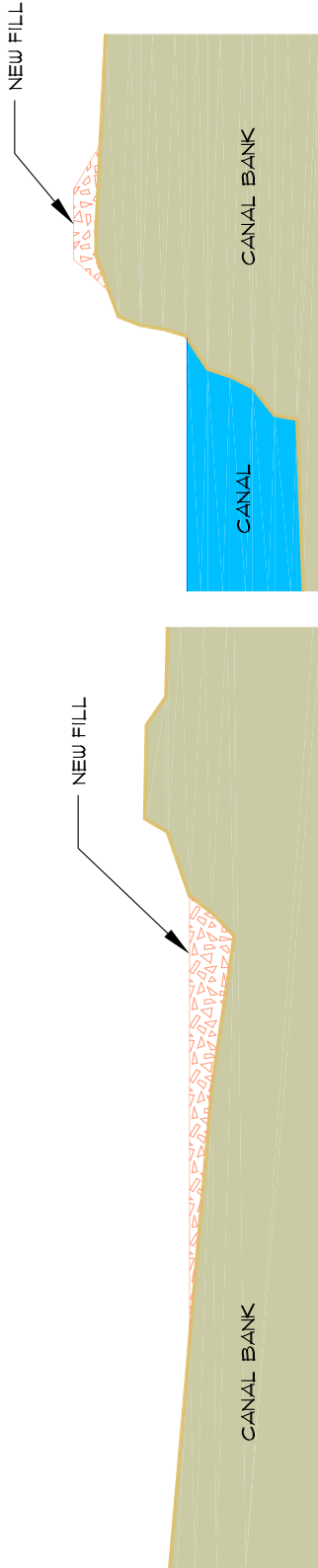
1650 Corporate Center Drive, Suite 401
Boulder, Colorado 80521
Tel: 303-440-2900
Fax: 303-440-2665
DECEMBER 2008

TYPICAL PORTAGE PLAN
PORTAGE DETAILS AT ALTERNATIVES D, D1, G & G1
NOT TO SCALE

PORTAGE DETAILS AT ALTERNATIVE C

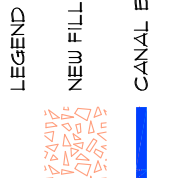
NOT TO SCALE

HOMESTEAD CANAL DAM - SOUTHERN BANK FILL AREA



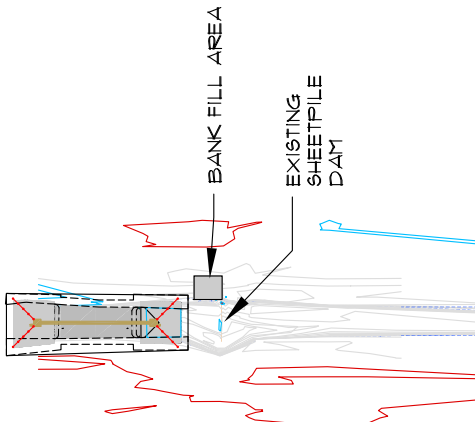
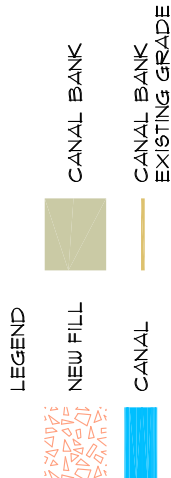
CROSS SECTION A-A'
HOMESTEAD CANAL DAM

NOT TO SCALE



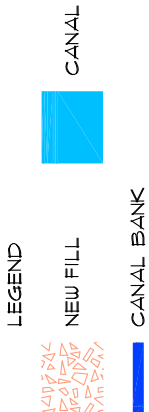
CROSS SECTION B-B'
HOMESTEAD CANAL DAM

NOT TO SCALE



FILL AREA
HOMESTEAD CANAL DAM

NOT TO SCALE



LOCATION MAP
HOMESTEAD CANAL DAM

NOT TO SCALE



16550 Corporate Center Drive, Suite 401
Houston, Texas 77058
Tel: 305-884-5900
Fax: 305-884-2665
DECEMBER 2008

Appendix B

Consultation/Coordination Documents





United States Department of the Interior
NATIONAL PARK SERVICE

Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034



In Reply Refer to:

L7615-FY07-050

SEP 16 2008

The Honorable Mel Martinez
United States Senate
356 Russell Senate Office Building
Washington, DC 20510

Dear Senator Martinez:

I am writing to inform you that the National Park Service (NPS) plans to prepare an Environmental Assessment of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of the project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. A detailed description of the site and the range of potential alternatives that could be selected for the project are provided in the enclosed newsletter. In accordance with the National Environmental Policy Act, the NPS will prepare an Environmental Assessment to analyze the potential environmental effects of the dam restoration alternatives.

The NPS will hold a public meeting on Wednesday, October 8, 2008. The purpose of this meeting is to provide information about the project and receive input from interested individuals and organizations on the scope of the environmental analysis. The meeting will be held at the following location:

South Dade Regional Library
10750 SW 211th St., Miami, Florida 33189
Date: Wednesday, October 8, 2008
Time: 5:00 - 8:00 p.m.

I would like to invite you to participate during the planning process, or designate a member from your staff. If you are unable to attend the scoping meeting, other ways in which you may provide input are outlined in the newsletter. Additionally, if you would like to receive a personal briefing regarding this project please contact my office at the Park (305-242-7710).

Sincerely,

Dan B. Kimball
Superintendent

Enclosure



**United States Department of the Interior
NATIONAL PARK SERVICE**

**Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034**



In Reply Refer to:

L7615-FY07-050

SEP 16 2008

The Honorable Bill Nelson
United States Senate
716 Hart Senate Office Building
Washington, DC 20510

Dear Senator Nelson:

I am writing to inform you that the National Park Service (NPS) plans to prepare an Environmental Assessment of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of the project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. A detailed description of the site and the range of potential alternatives that could be selected for the project are provided in the enclosed newsletter. In accordance with the National Environmental Policy Act, the NPS will prepare an Environmental Assessment to analyze the potential environmental effects of the dam restoration alternatives.

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Sincerely,

Dan B. Kimball
Superintendent

Enclosure



United States Department of the Interior
NATIONAL PARK SERVICE



Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034

In Reply Refer to:

L7615-FY07-050

SEP 16 2008

The Honorable Mario Diaz-Balart
United States House of Representatives
328 Cannon House Office Building
Washington, D.C. 20515

Dear: Representative Diaz-Balart:

I am writing to inform you that the National Park Service (NPS) plans to prepare an Environmental Assessment of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of the project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. A detailed description of the site and the range of potential alternatives that could be selected for the project are provided in the enclosed newsletter. In accordance with the National Environmental Policy Act, the NPS will prepare an Environmental Assessment to analyze the potential environmental effects of the dam restoration alternatives.

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Sincerely,

Dan B. Kimball
Superintendent

Enclosure



United States Department of the Interior
NATIONAL PARK SERVICE

Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034



In Reply Refer to:

L7615-FY07-050

SEP 16 2008

The Honorable Ileana Ros-Lehtinen
United States House of Representatives
2160 Rayburn House Office Building
Washington, D.C. 20515-0918

Dear Representative Ros-Lehtinen:

I am writing to inform you that the National Park Service (NPS) plans to prepare an Environmental Assessment of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of the project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. A detailed description of the site and the range of potential alternatives that could be selected for the project are provided in the enclosed newsletter. In accordance with the National Environmental Policy Act, the NPS will prepare an Environmental Assessment to analyze the potential environmental effects of the dam restoration alternatives.

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10750 SW 211th St., Miami, Florida 33189
Date: Wednesday, October 8, 2008
Time: 5:00 - 8:00 p.m.

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Sincerely,

Dan B. Kimball
Superintendent

Enclosure



**United States Department of the Interior
NATIONAL PARK SERVICE**

**Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034**



In Reply Refer to:

L7615-FY08-028

SEP 16 2008

**The Honorable Nan Rich
Florida Senate
777 Sawgrass Corporate Parkway
Sunrise, FL 33325-6256**

Dear Senator Rich:

I am writing to inform you that the National Park Service (NPS) plans to prepare an Environmental Assessment of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of the project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. A detailed description of the site and the range of potential alternatives that could be selected for the project are provided in the enclosed newsletter. In accordance with the National Environmental Policy Act, the NPS will prepare an Environmental Assessment to analyze the potential environmental effects of the dam restoration alternatives.

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**South Dade Regional Library
10750 SW 211th St., Miami, Florida 33189
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Time: 5:00 - 8:00 p.m.**

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Sincerely,

**Dan B. Kimball
Superintendent**

Enclosure



United States Department of the Interior
NATIONAL PARK SERVICE



Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034

In Reply Refer to:

L7615-FY07-050

SEP 16 2008

The Honorable Larcenia Bullard
Florida Senate
8603 S. Dixie Highway, Suite 304
Miami, FL 33143

Dear Senator Bullard:

I am writing to inform you that the National Park Service (NPS) plans to prepare an Environmental Assessment of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of the project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. A detailed description of the site and the range of potential alternatives that could be selected for the project are provided in the enclosed newsletter. In accordance with the National Environmental Policy Act, the NPS will prepare an Environmental Assessment to analyze the potential environmental effects of the dam restoration alternatives.

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Time: 5:00 - 8:00 p.m.

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Sincerely,

Dan B. Kimball
Superintendent

Enclosure



United States Department of the Interior
NATIONAL PARK SERVICE

Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034



In Reply Refer to:

L7615-FY07-050

SEP 16 2008

The Honorable Ron Saunders
Florida House of Representatives
PO Box 699 Suite A-90311, Overseas Hwy.
Tavernier, FL 33070

Dear Representative Saunders:

I am writing to inform you that the National Park Service (NPS) plans to prepare an Environmental Assessment of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of the project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. A detailed description of the site and the range of potential alternatives that could be selected for the project are provided in the enclosed newsletter. In accordance with the National Environmental Policy Act, the NPS will prepare an Environmental Assessment to analyze the potential environmental effects of the dam restoration alternatives.

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Sincerely,

Dan B. Kimball
Superintendent

Enclosure



United States Department of the Interior
NATIONAL PARK SERVICE



Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034

In Reply Refer to:

SEP 16 2008

L7615-FY07-050

Mr. Paul Souza
Field Supervisor, South Florida Field Office
U.S. Fish and Wildlife Service
1339-20th Street
Vero Beach, FL 32960

Dear Mr. Souza:

PAUL

In accordance with the National Environmental Policy Act, the National Park Service (NPS) plans to prepare an Environmental Assessment (EA) of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of the project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals.

Enclosed is a newsletter that describes the project. Also enclosed is a table of the federally listed threatened and endangered species known or potentially encountered in the project area. To ensure that the park's planning effort adequately evaluates the potential effect that the project would have on threatened and endangered species, we would appreciate your review of the enclosed list and identification of any issues or concerns that should be considered in the Environmental Assessment. In keeping with the requirements of Section 7 consultation and NPS policy, as soon as the draft EA is complete we will send you a copy with an official transmittal letter for your review and comment.

We look forward to working cooperatively with you on this project. Should you have any questions, please contact me or Brien Culhane, Chief, Planning and Compliance at (305) 242-7717 or at brien_culhane@nps.gov.

Sincerely,

Dan B. Kimball

Dan B. Kimball
Superintendent

Enclosures

Federally listed species with potential to occur in the Cape Sable area.

Common name	Species name	Federal status
Stock Island tree snail	<i>Orthalicus reses</i>	Threatened
American crocodile	<i>Crocodylus acutus</i>	Threatened
Eastern indigo snake	<i>Drymarchon corais couperi</i>	Threatened
Wood stork	<i>Mycteria americana</i>	Endangered
Cape Sable seaside sparrow	<i>Ammodramus maritimus mirabilis</i>	Endangered
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	Endangered
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Mangrove fox squirrel	<i>Sciurus niger</i>	Candidate
Florida panther	<i>Felis concolor coryi</i>	Endangered
West Indian manatee	<i>Trichechus manatus</i>	Endangered



**United States Department of the Interior
NATIONAL PARK SERVICE**



**Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034**

In Reply Refer to:

L7615-FY07-050

September 29, 2008

David Bernhart
Assistant Regional Administrator
National Marine Fisheries Service
Protected Resources Division
263 13th Avenue South
St. Petersburg, FL 33701

Subject: Essential Fish Habitat and ESA/Section 7 Consultation for proposed Cape Sable Canals Dam Restoration / Environmental Assessment.

Dear Mr. Bernhart:

In accordance with the National Environmental Policy Act, the National Park Service (NPS) plans to prepare an Environmental Assessment (EA) of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals at Cape Sable in Everglades National Park. The purpose of the project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals.

Enclosed is a newsletter that describes the project. On the back of this letter is a table of the federally listed threatened and endangered species under NMFS jurisdiction known or potentially encountered in the project area. To ensure that the park's planning effort adequately evaluates the potential effects that the project would have on listed species, we request your review of the enclosed list and identification of any additional listed species that should be considered in the EA.

We intend to use the EA to accomplish both Section 7 and Essential Fish Habitat (EFH) consultation with NMFS. Therefore, we would also appreciate your identifying any preliminary issues or concerns regarding EFH that you would like to see addressed in the EA. As soon as the draft EA is complete, we will send you a copy with an official transmittal letter for your review and comment.

We look forward to working cooperatively with you on this project. Should you have any questions, please contact me or Brien Culhane, Chief, Planning and Compliance at (305) 242-7717 or at brien_culhane@nps.gov.

Sincerely,

Dan B. Kimball
Superintendent
Enclosure

Federally listed species under NMFS jurisdiction with potential to occur in the Cape Sable area.

Common name	Species name	Federal status
Smalltooth sawfish	<i>Pristis pectinata</i>	Proposed
Atlantic hawksbill turtle	<i>Eretmochelys imbricate</i>	Endangered
Green turtle	<i>Chelonia mydas</i>	Endangered
Atlantic Ridley turtle	<i>Lepidochelys kemp</i>	Endangered
Atlantic leatherback turtle	<i>Dermochelys coriacea</i>	Endangered
Loggerhead turtle	<i>Caretta caretta</i>	Threatened



United States Department of the Interior
NATIONAL PARK SERVICE

Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034



In Reply Refer to:

L7615-FY07-50

SEP 16 2008

Ms. Kelly Yasaitis Fanizzo
Advisory Council on Historic Preservation
Old Post Office Building
1100 Pennsylvania Avenue, NW, Suite 809
Washington, DC 20004

Subject: Section 106 Compliance, Proposed Cape Sable Canals Dam Restoration Project
Everglades National Park

Dear Ms. Yasaitis Fanizzo:

In accordance with the National Environmental Policy Act, the National Park Service (NPS) plans to prepare an Environmental Assessment (EA) of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of the project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals.

In addition, the process and documentation for preparing the EA will be used to comply with §106 of the National Historic Preservation Act. In accordance with section 800.8(c) of the Advisory Council on Historic Preservation's regulations (36 CFR Part 800), I am notifying your office in advance of the park's intention to use the EA to meet its obligations under §106.

I have enclosed a scoping newsletter with additional information about the planning process. As required by 36 CFR 800, the Florida State Historic Preservation Office has been notified regarding inclusion of Section 106 compliance within the environmental assessment process.

If you have questions or need any additional information, please do not hesitate to contact Dewitt Smith, Project Manager, at 305-224-4218.

Sincerely,

Dan B. Kimball
Superintendent

Enclosure



United States Department of the Interior
NATIONAL PARK SERVICE

Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034



In Reply Refer to:

L7615-FY07-050

SEP 16 2008

Mr. Fred Gaske
State Historic Preservation Officer
Division of Historical Resources
R.A. Gray Building
500 S. Bronough Street
Tallahassee, Florida 32399-0250

Dear Mr. Gaske:

In accordance with the National Environmental Policy Act, the National Park Service (NPS) plans to prepare an Environmental Assessment (EA) of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of the project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals.

In addition, the process and documentation for preparing the EA will be used to comply with §106 of the National Historic Preservation Act. In accordance with section 800.8(c) of the Advisory Council on Historic Preservation's regulations (36 CFR Part 800), I am notifying your office in advance of the park's intention to use the EA to meet its obligations under §106.

I have enclosed a scoping newsletter with additional information about the planning process. As soon as the EA is completed, we will send it to you for your review and comment. As required by 36 CFR 800, the Advisory Council on Historic Preservation has been notified regarding inclusion of Section 106 compliance within the environmental assessment process.

If you have questions or need any additional information, please do not hesitate to contact Dewitt Smith, Project Manager, at 305-224-4218.

Sincerely,

Dan B. Kimball
Superintendent

Enclosure



**United States Department of the Interior
NATIONAL PARK SERVICE**



**Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034**

In Reply Refer to:

L7615-FY07-050

September 14, 2008

Ms. Lauren Milligan
Florida State Clearinghouse Coordinator
Florida Department of Environmental Protection
3900 Commonwealth Blvd., Mail Station 47
Tallahassee, FL 32399-3000

Dear Ms. Milligan:

**Subject: Proposed Cape Sable Canals Dam Restoration Project / Environmental Assessment
Everglades National Park, Monroe County**

In accordance with the National Environmental Policy Act, the National Park Service (NPS) plans to prepare an Environmental Assessment (EA) of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals at Cape Sable in Everglades National Park. The purpose of the project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals.

The enclosed newsletter is forwarded to your office for processing through appropriate State agencies. Although more specific comments will be solicited during the public review period for the draft EA, we request that permitting and permit reviewing agencies review the enclosed information and provide any general comments they consider pertinent at this time. In addition, please provide a consistency review for this project in accordance with the State's Coastal Zone Management Program and the approved Comprehensive Plan of the local government jurisdictions.

We look forward to receiving your comments. Should you need additional information, please contact Brien Culhane, Chief, Planning and Compliance at 305-242-7717, or by email at brien_culhane@nps.gov.

Everglades National Park
Attn: Brien Culhane, Cape Sable Canals Dam Restoration Project/EA
40001 State Road 9336
Homestead, Florida 33034

Sincerely,

Dan B. Kimball
Superintendent
Enclosure



United States Department of the Interior
NATIONAL PARK SERVICE



Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034

In Reply Refer to:

L7615-FY07-050

SEP 16 2008

Billy Cypress, Chairman
Miccosukee Tribe of Indians of Florida
P.O. Box 440021
Tamiami Station
Miami, Florida 33144

Dear Chairman Cypress:

In accordance with the National Environmental Policy Act, the National Park Service (NPS) plans to prepare an Environmental Assessment (EA) of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of this correspondence is to initiate government-to-government consultations and provide some background information about this project.

The purpose of the proposed project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. The NPS is seeking public, agency and Tribal input on the environmental issues and alternatives to be addressed in the planning process. During the coming months, the NPS will evaluate and analyze the potential environmental and cultural resource impacts of the alternatives in the environmental assessment.

If you have questions, need any additional information or would like to arrange a time to meet and discuss the project, please contact my office at 305-242-7710.

Sincerely,

Dan B. Kimball
Superintendent

Enclosure



United States Department of the Interior
NATIONAL PARK SERVICE

Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034



In Reply Refer to:

L7615-FY07-050

SEP 16 2008

Mr. Fred Dayhoff, NAGPRA
and Section 106 Representative
Miccosukee Tribe of Indians of Florida
HC61 SR 68
Ochopee, Florida 34141

Dear Mr. Dayhoff:

FRED

In accordance with the National Environmental Policy Act, the National Park Service (NPS) plans to prepare an Environmental Assessment (EA) of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of this correspondence is to initiate government-to-government consultations and provide some background information about this project.

The purpose of the proposed project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. The NPS is seeking public, agency and Tribal input on the environmental issues and alternatives to be addressed in the planning process. During the coming months, the NPS will evaluate and analyze the potential environmental and cultural resource impacts of the alternatives in the environmental assessment.

If you have questions, need any additional information or would like to arrange a time to meet and discuss the project, please contact my office at 305-242-7710.

Sincerely,

Dan B. Kimball

Dan B. Kimball
Superintendent

Enclosure



United States Department of the Interior
NATIONAL PARK SERVICE

Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034



In Reply Refer to:

L7615-FY07-50

SEP 16 2008

Mr. Steve Terry, NAGPRA
and Section 106 Representative
Miccosukee Tribe of Indians of Florida
Tamiami Station
P.O. Box 440021
Miami, Florida 33144

Dear Mr. Terry:

STEVE

In accordance with the National Environmental Policy Act, the National Park Service (NPS) plans to prepare an Environmental Assessment (EA) of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of this correspondence is to initiate government-to-government consultations and provide some background information about this project.

The purpose of the proposed project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. The NPS is seeking public, agency and Tribal input on the environmental issues and alternatives to be addressed in the planning process. During the coming months, the NPS will evaluate and analyze the potential environmental and cultural resource impacts of the alternatives in the environmental assessment.

If you have questions, need any additional information or would like to arrange a time to meet and discuss the project, please contact my office at 305-242-7710.

Sincerely,

Dan B. Kimball
Dan B. Kimball
Superintendent

Enclosure



**United States Department of the Interior
NATIONAL PARK SERVICE**

**Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034**



In Reply Refer to:

L7615-FY07-050

SEP 16 2008

Mitchell Cypress, President
Seminole Tribe of Florida
6300 Stirling Road
Hollywood, Florida 33024

Dear President Cypress:

In accordance with the National Environmental Policy Act, the National Park Service (NPS) plans to prepare an Environmental Assessment (EA) of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of this correspondence is to initiate government-to-government consultations and provide some background information about this project.

The purpose of the proposed project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. The NPS is seeking public, agency and Tribal input on the environmental issues and alternatives to be addressed in the planning process. During the coming months, the NPS will evaluate and analyze the potential environmental and cultural resource impacts of the alternatives in the environmental assessment.

If you have questions, need any additional information or would like to arrange a time to meet and discuss the project, please contact my office at 305-242-7710.

Sincerely,

Dan B. Kimball
Superintendent

Enclosure



**United States Department of the Interior
NATIONAL PARK SERVICE**

**Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034**



In Reply Refer to:

L7615-FY07-50

SEP 16 2008

Mr. Enoch Kelly Haney
Principal Chief
Seminole Nation of Oklahoma
P.O. Box 1498
Wewoka, Oklahoma 74884

Dear Mr. Haney:

In accordance with the National Environmental Policy Act, the National Park Service (NPS) plans to prepare an Environmental Assessment (EA) of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of this correspondence is to initiate government-to-government consultations and provide some background information about this project.

The purpose of the proposed project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. The NPS is seeking public, agency and Tribal input on the environmental issues and alternatives to be addressed in the planning process. During the coming months, the NPS will evaluate and analyze the potential environmental and cultural resource impacts of the alternatives in the environmental assessment.

If you have questions, need any additional information or would like to arrange a time to meet and discuss the project, please contact my office at 305-242-7710.

Sincerely,

Dan B. Kimball
Superintendent

Enclosure



**United States Department of the Interior
NATIONAL PARK SERVICE**

**Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034**



In Reply Refer to:

L7615-FY07-050

SEP 16 2008

Historic Preservation Officer
Seminole Nation of Oklahoma
P.O. Box 1498
Wewoka, Oklahoma 74884

Dear Historic Preservation Officer:

In accordance with the National Environmental Policy Act, the National Park Service (NPS) plans to prepare an Environmental Assessment (EA) of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of this correspondence is to initiate government-to-government consultations and provide some background information about this project.

The purpose of the proposed project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. The NPS is seeking public, agency and Tribal input on the environmental issues and alternatives to be addressed in the planning process. During the coming months, the NPS will evaluate and analyze the potential environmental and cultural resource impacts of the alternatives in the environmental assessment.

If you have questions, need any additional information or would like to arrange a time to meet and discuss the project, please contact my office at 305-242-7710.

Sincerely,

Dan B. Kimball
Superintendent

Enclosure



United States Department of the Interior
NATIONAL PARK SERVICE

Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, Florida 33034



In Reply Refer to:

L7615-FY07-050

SEP 16 2008

Willard S. Steele, THPO
Seminole Tribe of Florida
Ah-Tah-Thi-Ki Museum
HC-61, Box 21-A
Clewiston, Florida 33440

Dear Mr. Steele:

In accordance with the National Environmental Policy Act, the National Park Service (NPS) plans to prepare an Environmental Assessment (EA) of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals near Cape Sable in Everglades National Park. The purpose of this correspondence is to initiate government-to-government consultations and provide some background information about this project.

The purpose of the proposed project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. The NPS is seeking public, agency and Tribal input on the environmental issues and alternatives to be addressed in the planning process. During the coming months, the NPS will evaluate and analyze the potential environmental and cultural resource impacts of the alternatives in the environmental assessment.

If you have questions, need any additional information or would like to arrange a time to meet and discuss the project, please contact my office at 305-242-7710.

Sincerely,

Dan B. Kimball
Superintendent

Enclosure

TRIBAL HISTORIC
PRESERVATION OFFICE
SEMINOLE TRIBE OF FLORIDA
AH-TAH-THI-KI MUSEUM
HC-61, BOX 21A
CLEWISTON, FL 33440
(863) 983-6549



TRIBAL OFFICERS:
MITCHELL CYPRESS
CHAIRMAN
MOSES OSCEOLA
VICE CHAIRMAN
PRISCILLA D. SAYEN
SECRETARY
MICHAEL D. TIGER
TREASURER

SEMINOLE TRIBE OF FLORIDA
TRIBAL HISTORIC PRESERVATION OFFICE

RECEIVED
OCT 29 2008

Dan B. Kimball
Everglades and Dry Tortugas National Parks
40001 State Road 9336
Homestead, FL 33034

Thursday, October 16, 2008


Subject: East Cape and Homestead Canals, near Cape Sable, Everglades National Park

Dear Mr. Kimball,

The Seminole Tribe of Florida Tribal Historic Preservation Office (STOF-THPO) has reviewed the correspondence for the aforementioned project. The STOF-THPO appreciates the opportunity to consult on this project and will await further correspondence.

In any future correspondence regarding this issue, please reference **THPO-002603**. We look forward to working with you on this project.

Sincerely,


FOR

Willard Steele,
Tribal Historic Preservation Officer
Tribal Historic Preservation Office
Seminole Tribe of Florida
Ah-Tah-Thi-Ki Museum
HC 61, Box 21-A
Clewiston, FL 33440

Direct routine inquiries to:

Dawn Hutchins,
Compliance Review Supervisor
Tribal Historic Preservation Office
Seminole Tribe of Florida
Ah-Tah-Thi-Ki Museum
HC 61, Box 21-A
Clewiston, FL 33440



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
(727) 824-5317; FAX (727) 824-5300
<http://sero.nmfs.noaa.gov/>

May 4, 2009

F/SER4:JK/pw

(sent via electronic mail)

DeWitt Smith
Everglades National Park
South Florida Ecosystem Office
950 N. Krome Avenue, 3rd Floor # 31
Homestead, FL 33030-4443

Dear Mr. Smith:

NOAA's National Marine Fisheries Service (NMFS) reviewed the Environmental Assessment dated April 2009 for the Everglades National Park Cape Sable Canals Dam Restoration Project (EA). By letter dated September 29, 2008, Mr. Dan B. Kimball, Superintendent of Everglades National Park (ENP), notified us that the National Park Service (NPS) was preparing the EA and intended to use the EA as the essential fish habitat (EFH) assessment for the project; the EA was sent to us April 14, 2009. NPS proposes to repair or replace failed dams on the East Cape Extension and Homestead canals within the Cape Sable area of ENP. This project is intended to provide more sustainable solutions to issues associated with saltwater intrusion that is degrading 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 dams. As the nation's federal trustee for the conservation and management of marine, estuarine, and anadromous fishery resources, the following comments are provided pursuant to authorities of the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

Project History

In the early 20th 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, and this drainage triggered significant changes to 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. NPS has long recognized the importance of addressing impacts from Cape Sable canals. Impeding tidal flow into the Cape's interior marshes is the key to revitalizing the function of these freshwater marshes, and NPS used earthen dams to plug several of the canals at the marl ridge during the late 1950s and early 1960s. Over time, natural forces compromised two of these early structures and, by 1992, they failed. The earthen dams were replaced in 1997 with sheetpiling that failed after a few years.

Impacts to Essential Fish Habitat

Cape Sable contains seagrass, hardbottoms, mangroves, and other wetland habitats designated as EFH by the South Atlantic Fishery Management Council, Gulf of Mexico Fishery Management Council, and NMFS. The EA describes five action alternatives and one no-action alternative for the East Cape



Extension and Homestead Canals. Each of the five action alternatives would reduce saltwater intrusion and loss of freshwater through the breached dam. NPS concludes that implementation of any of the five alternatives would result in long-term minor to moderate beneficial effects to EFH. The EA states that impacts to EFH would be avoided and minimized to the maximum extent feasible and all unavoidable impacts would be mitigated. Best management practices would be used to control turbidity during and after construction. Specifically, construction procedures would include the use of turbidity curtains to contain disturbed sediments and reduce water quality impacts. In addition, a turbidity monitoring plan would be implemented to ensure compliance with State water quality criteria. While the EA does not include an EFH assessment prepared in accordance with the format prescribed at 50 CFR 600.10 to 600.920, the information provided in the EA is sufficient for NMFS to determine the level of effect on EFH.

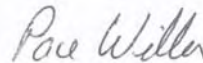
Conclusion

In most cases, NMFS supports restoration of historical hydrologic conditions. Improving the hydrology at Cape Sable should benefit the larger Everglades National Park, Florida Bay, and fishery resources that use these ecosystems. NMFS believes there will likely be a net benefit to EFH from this project and that long-term adverse impacts to EFH are unlikely.

Please note the project proposes actions in areas where smalltooth sawfish occur. Because smalltooth sawfish is protected under the provisions of the Endangered Species Act, NPS should contact the NMFS Southeast Region, Protected Resources Division, if NPS determines that their action would affect a listed species. The NMFS Southeast Region, Protected Resources Division can be contacted at the letterhead address.

We appreciate the efforts by the applicant and your staff to protect NOAA trust resources. Thank you for the opportunity to provide these comments. Related questions or comments should be directed to the attention of Ms. Jocelyn Karazsia at 400 North Congress Avenue, Suite 120, West Palm Beach, Florida, 33401. She may be reached by telephone at 561-616-8880 x207 or by e-mail at Jocelyn.Karazsia@noaa.gov.

Sincerely,



/ for

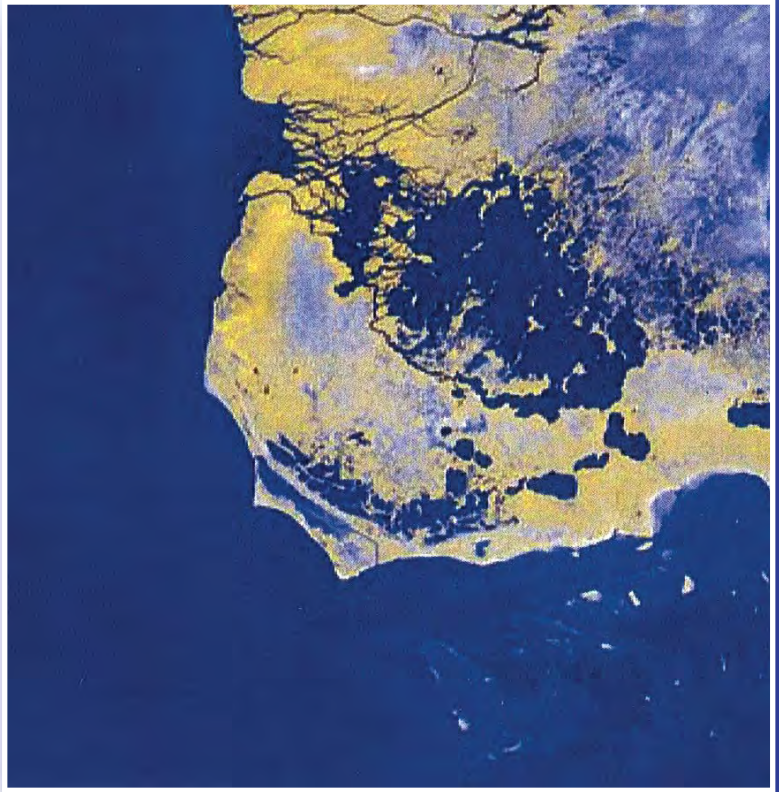
Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division

cc:

COE, Albert.Gonzalez@usace.army.mil
SFWMD, rpeeksto@sfwmd.gov
FWS, Vero Beach: Winston_Hobgood@fws.gov
NMFS, PRD: Shelley.Norton@noaa.gov
NPS, ENP: Patrick_Malone@nps.gov
NPS, ENP: Brien_Culhane@nps.gov
F/SER4, David.Dale@noaa.gov
F/SER47, Jocelyn.Karazsia@noaa.gov

Appendix C

Scoping Newsletter





CAPE SABLE CANALS DAM RESTORATION PROJECT

Dear Friends,

The National Park Service (NPS), in compliance with the National Environmental Policy Act of 1969 (NEPA), plans to prepare an environmental assessment (EA) of options for mitigating the impacts from failed dams on the East Cape and Homestead Canals in Cape Sable at Everglades National Park. The purpose of the project is to prevent saltwater intrusion into freshwater marshes that are habitat for the threatened American crocodile and various wading birds by restoring the failed dams on the two canals. A detailed description of the site and the range of potential alternatives that could be selected for the project are included in this newsletter.

The National Park Service is the lead agency for this environmental assessment, and other federal, state, and local agencies are invited to participate in the environmental documentation process. The National Park Service is requesting public input on the project and the environmental issues and alternatives to be included in the environmental assessment. During the coming months, the National Park Service will evaluate and analyze the potential environmental impact of the alternatives (including the proposed action) in the environmental assessment.

*The purpose of this newsletter is to provide you with information about the project and related issues and ask for your help. We invite you to attend an open house on **October 8, 2008** to learn about the proposed project, to ask questions, and share ideas, issues, and concerns. The open house will begin at 5:00 p.m., where attendees can review project material. This will be followed by a brief presentation at 6:00 p.m., and subsequently a public comment session. NPS staff will be available to discuss the project and record your ideas and input. Your opinions matter a great deal to us, and we want to hear from you. Please share your ideas, suggestions and concerns about this project with us by providing written comments and attending the open house.*

*Please provide your input on or before **October 23, 2008**. We look forward to hearing from you.*

Sincerely,

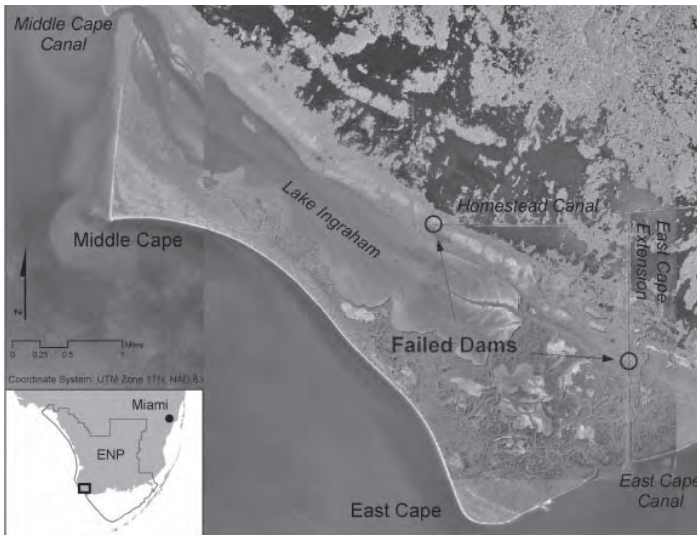
Dan B. Kimball
Superintendent, Everglades National Park

MEETING INFORMATION

You are invited to a public meeting to provide input on this project. The meeting will begin at 5:00 p.m. The first hour will be an open house and NPS staff will be available to discuss the project, answer questions and record your comments. At 6:00 p.m. there will be a brief presentation on the project, followed by a public comment session.

October 8, 2008
5:00 p.m. to 8:00 p.m.
South Dade Regional
Library
10750 SW 211th St.
Miami, Florida 33189

Figure 1. Location map.



PROJECT BACKGROUND

The East Cape and Homestead Canals on Cape Sable were constructed in the 1920's to allow draining of interior Everglades freshwater marshes and provide improved access to the backcountry. Because of the impact of these canals on the human and environmental history of the Everglades, they are considered eligible for the National Register of Historic Places. The construction of the canals in the 1920's allowed tidal saltwater to intrude into the freshwater marshes of Cape Sable. To control the intrusion of saltwater, dams were constructed on the East Cape and Homestead Canals in the late 1950's or early 1960s.

Over the years, the dams have been repaired and replaced with the goal of managing saltwater intrusion into the freshwater marshes of the Cape Sable backcountry. However at present, both dams have failed and once again require repair so that they function effectively to protect the freshwater marshes and surrounding areas which serve as habitat for the threatened American crocodile, various wading birds and other native species.

The National Park Service contracted with URS (an engineering firm) in 2007 to conduct an engineering analysis of various options for restoration of the failed dams. The report that URS completed included four options for the East Cape Canal and five for the Homestead Canal. The URS study provided the basis for the range of potential alternatives presented in this newsletter.

PURPOSE AND NEED OF PROJECT

The purpose of this project is to prepare an environmental assessment of options for the restoration of the failed dams on the East Cape and Homestead Canals in Cape Sable, Everglades National Park.

The project is needed because

- saltwater intrusion is causing collapse and erosion of freshwater marshes north of the marl ridge that once

kept saltwater out of the system, resulting in degradation of habitat for the threatened American crocodile and various wading birds

- tidal flushing has transported silt from the marshes resulting in siltation of Lake Ingraham and other water bodies
- currents around the failed dams present safety hazards to canoeists
- motorboats using the area are going around the failed dams into designated wilderness where they are prohibited.

The environmental assessment will evaluate the potential environmental effects of the National Park Service's proposed action (to be identified at a later date) and the alternatives.

POTENTIAL ALTERNATIVES

The potential alternatives for restoration of the failed dams on the East Cape and Homestead Canals are presented below. The no-action alternative would take no corrective action, which would result in the canal channels continuing to widen around the existing dams and allowing saltwater to continue to intrude into freshwater marshes. This would continue to result in the degradation of freshwater marsh habitat that is important to juvenile American crocodiles (a threatened species), wading birds, and other native species.

EAST CAPE CANAL DAM

- Install additional sheet pile at the existing location
- Install a new earthen dam at the existing location
- Install additional sheet pile and an earthen dam at the existing location
- Install a new dam downstream of the existing dam using sheet piling

HOMESTEAD CANAL DAM

- Install additional sheet pile at the existing location
- Install a new earthen dam at the existing location
- Install additional sheet pile and an earthen dam at the existing location
- Install a new dam using sheet piling in a new location
- Install a new dam by placing geotubes (high strength geotextiles) downstream of the existing sheet pile dam and filling the area with sand or other suitable materials (see figure below)



Figure 2. Dam construction using geotubes

ENVIRONMENTAL TOPICS

Potential environmental topics to be addressed in the environmental assessment include but are not limited to:

- water resources and hydrology
- biological resources (including threatened and endangered species)
- air quality and noise
- soils and geology
- land use planning
- cultural resources
- socioeconomics
- visual quality/aesthetics
- recreational quality
- park operations

POTENTIAL ISSUES

Some potential issues identified thus far regarding the dam restoration project include but are not limited to:

- The repair and construction of dams would alter existing wetland habitats within the park, and therefore environmental impact analysis is warranted.
- There are many federally listed threatened and endangered species within the park, and impacts to such species must be considered in the decision-making.
- The remoteness of both dam sites and the difficulty in accessing the dam area on the East Cape and Homestead Canals had significant impact on the repair alternatives that were developed as well as the associated costs.
- All repair alternatives need to provide a stable canoe/kayak portage as part of the construction project.

This list of issues is not complete. One of the primary objectives of the scoping process associated with the environmental assessment is to identify all issues and concerns that should be addressed in the environmental assessment.

CONSULTATION WITH OTHER AGENCIES

The National Park Service is the lead agency on the Cape Sable canals dam restoration project. Thus, the National Park Service will have decision authority over implementation. The U.S. Fish and Wildlife Service is a partner in this effort. The National Park Service will consult with a number of federal and state agencies, tribes, and other interested parties throughout the planning process. Agencies invited to participate in the planning process include but are not limited to the following:

- Florida Department of Environmental Protection
- Florida Fish and Wildlife Conservation Commission
- Florida State Historic Preservation Office
- National Oceanic and Atmospheric Administration - National Marine Fisheries Service
- Native American tribes
- South Florida Water Management District
- United States Army Corps of Engineers
- United States Fish and Wildlife Service

HOW YOU CAN PARTICIPATE

As part of the NEPA process, the proposed project will be evaluated in an environmental assessment, which will analyze the potential environmental effects of the proposed action (to be identified by the NPS at a later date) and the alternatives for restoration of the dams. At this time, the Superintendent of Everglades National Park is announcing a 30-day public scoping period to solicit public comments on this project. During this period, the public is invited to identify any issues or concerns they might have with the project so that the National Park Service can appropriately consider them in the environmental assessment. If the National Park Service determines that this project is likely to result in significant impacts to the human environment, the environmental assessment will be converted to an environmental impact statement.

There are a number of ways to participate in this process and make your voice heard. You may submit your comments electronically at the NPS Planning, Environment, and Public Comment website (<http://parkplanning.nps.gov>). Once on the website, select "Everglades NP" from the drop down box, then "Cape Sable Canals," and finally "Open For Public Comment." If you are unable to access this website, please submit written comments by October 23, 2008 to:

National Park Service
Attention: Patrick Malone
Denver Service Center, Planning Division
P.O. Box 25287
Denver, CO 80225-0287

Finally, we invite you to attend the public meeting on October 8, 2008 from 5:00 p.m. to 8:00 p.m. The meeting will be held at:

South Dade Regional Library
10750 SW 211th St
Miami, Florida 33189

Once the environmental assessment is completed, it will be made available for public review for 30 days.

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.

UNITED STATES DEPARTMENT OF THE INTERIOR
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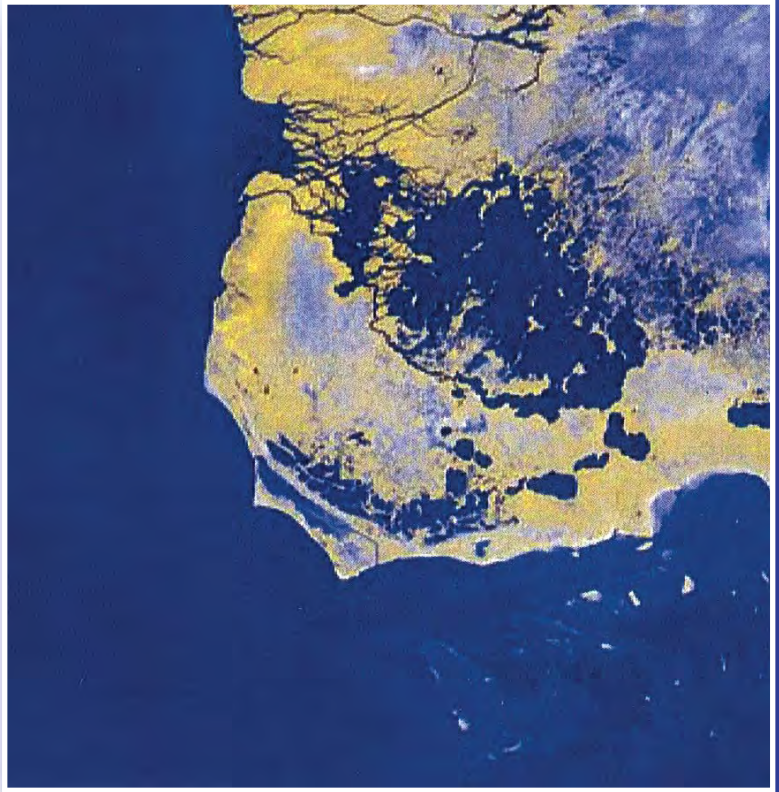
CAPE SABLE CANALS DAM RESTORATION PROJECT SCHEDULE

STEPS	PLANNING ACTIVITY	DATES	PUBLIC/AGENCY INVOLVEMENT OPPORTUNITIES
1	Scoping: Identify planning issues and opportunities (30-day public comment period)	September - October 2008	Attend public scoping meeting on October 8, 2008 Submit written comments by October 23, 2008
2	Prepare environmental assessment	October 2008 - February 2009	Agency and tribal consultations
3	Public comment on the environmental assessment (30-day public comment period)	March - April 2009	Review the environmental assessment and provide comments to the National Park Service Attend public meeting
4	Federal decision anticipated	May 2009	Review NPS decision

Thank you for your interest in Everglades National Park!

Appendix D

Value Analysis/Choosing by Advantages Report



VALUE ANALYSIS - Mini VA

Park: Everglades National Park

Project: Cape Sable Dams Restoration Project Environmental Assessment

Components Evaluated: 1.) East Cape Dam 2.) Homestead Dam

Phase I - Information:

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 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 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 in part to vandalism, which increased erosion of the canal banks.

The East Cape Extension and Homestead canals in Cape Sable were determined to be eligible for listing as significant structures in the development of South Florida under the National Register of Historic Places by the State Historic Preservation Officer (SHPO).

Restoration of the failed dams is needed to:

- Control the human-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 could function effectively
- Protect the freshwater and brackish interior marshes and surrounding areas, which serve as habitat for the American Crocodile, various wading birds and other species
- 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

Phase II - Functional Analysis:

Repair (or replace) the failed Homestead and East Cape dams

Phase III - Creativity (Alternatives):

Four alternatives were developed for the East Cape dam, and six alternatives were developed for the Homestead Dam.

Phase IV - Evaluation

The following evaluation factors and sub-factors were used for the evaluation, using the consensus-based definitions:

Evaluation Factors		Definition/Attribute
Factor 1: PROTECT CULTURAL AND NATURAL RESOURCES		
FACTOR 1a – Prevent Loss of Natural Resources and improve fish and wildlife habitat to enhance long-term sustainability		<ul style="list-style-type: none">• ability to restrict salt water inflow and fresh water outflow
FACTOR 1b - Prevent Loss of Cultural Resources		<ul style="list-style-type: none">• ability to prevent erosion of the canal banks
FACTOR 1c - Prevent illegal motor-boat access in designated wilderness area		<ul style="list-style-type: none">• ability to prevent illegal motor boat access in designated wilderness area
FACTOR 1d – Impacts during construction		<ul style="list-style-type: none">• size of the construction footprint – worksite & dredging
Factor 2: PROVIDE FOR VISITOR ENJOYMENT		
FACTOR 2a - Provide non-motorized boat access into the designated wilderness area for recreational opportunities		<ul style="list-style-type: none">• ability to provide safe access for non-motorized boats
FACTOR 2b - Protect Public Health, Safety and Welfare from safety hazards of proposed dams		<ul style="list-style-type: none">• ability of the dam to protect health, safety & welfare obstructions, currents
Factor 3: IMPROVE EFFICIENCY OF PARK OPERATIONS		
Factor 3a - Improve Operational Efficiency		<ul style="list-style-type: none">• ability to reduce enforcement efforts
Factor 3b – Provide for functional longevity of structure		<ul style="list-style-type: none">• ability of the alternative to function for the 50-year life-cycle
Factor 3c – Constructability -time		<ul style="list-style-type: none">• ability to construct within season
Factor 3 d – Complexity of the of the construction process		<ul style="list-style-type: none">• difficulty/complexity to construct
Factor 3e – Routine & cyclic maintenance of structure		<ul style="list-style-type: none">• frequency of monitoring/maintenance events
Factor 4 PROVIDE COST-EFFECTIVE, ENVIRONMENTALLY RESPONSIBLE, AND OTHERWISE BENEFICIAL DEVELOPMENT FOR THE NPS		

No unique sub-factors were identified by the study team that would distinguish the alternatives from one another. Therefore, Factor 4 was dropped from the evaluation.	<ul style="list-style-type: none"> N/A
--	---

The Choosing by Advantages evaluation matrices for both dams are in Attachments A and B.

Note: Advantages were determined by choosing the alternative with the Least-Preferred Attributes within each factor (underlined). Within each factor, the differences between each remaining alternative and that alternative with least-preferred set of attributes were determined. (These differences are the Advantages of the alternatives.) The advantages that are circled within each factor are the most important, as determined through consensus with the Study Team.

Phase V - Development:

The Choosing by Advantages (CBA) team began by focusing on the core purpose of the project, which is the ability of the dam alternatives to function for a 50-year life-cycle. There was consensus among the CBA team that the ability of the dams to function for 50-years is the primary goal, since it would have secondary beneficial affects such as: 1.) preventing the loss of natural and cultural resources, 2.) providing greater visitor enjoyment, and 3.) improving the efficiency of other Park operations. Under the No Action Alternative, the existing dam structure would not be able to function for a 50-year life-cycle since it is already failing. The secondary affects from the No Action Alternative would cause the natural and cultural resources to worsen, the visitor experience would be negative due to the existing safety concerns of the dam, and monitoring and enforcement of the failing dam structures would increase for Park staff.

Phase VI - Recommendation & (Recommendations, Preferred Alternative's Advantages, Benefit-Cost Issues Why should we do it?):

The recommended alternative for the East Cape Dam is Alternative D. Under this scenario, the dam structure will function for a 50-year life-cycle, the natural and cultural resources would be protected and the safety hazards from the existing dam structure would be removed resulting in a positive visitor experience. The advantages of Alternative D, compared to the other action alternatives, would be similar with the exception that the construction costs greatly vary between the alternatives due to different engineering techniques. The cost is lower for Alternative D and the advantages are higher; therefore, Alternative D would provide the most cost-effective solution for the Park for the East Cape Dam.

The recommended alternative for the Homestead Dam is Alternative D1. Under this scenario, the dam structure will function for a 50-year life-cycle, the natural and cultural resources would be protected and the safety hazards from the existing dam structure would be removed resulting in a positive visitor experience. The advantages of Alternative D1, compared to the other action alternatives, would be similar with the exception that the construction costs greatly vary between the alternatives due to different engineering techniques. The cost is lower for Alternative D1 and the advantages are higher; therefore, Alternative D1 would provide the most cost-effective solution for the Park for the Homestead Dam.

See Attachment A and B for the CBA matrices and charts showing the ratio between the importance of advantages and cost for each alternative.

Phase VII - Implementation (Considerations and Options for Implementation, Next steps, Who does what?)

After the required public review period for the Environmental Assessment, it is anticipated that the NPS would approve a Finding of No Significant Impact (FONSI) decision document. The NPS would then notify the public that the EA process has been completed and FONSI issued. Implementation steps (design, permitting, and construction) would then begin.

Study Team Members

Name	Organization
Keith Whisenant	NPS – Everglades NP
Mike Savage	NPS – Everglades NP
Brien Culhane	NPS – Everglades NP
Bob Showler	NPS – Everglades NP
Carol Mitchell	NPS – Everglades NP
Oron “Sonny” Bass	NPS – Everglades NP
Dewitt Smith	NPS – Everglades NP
Tony Terry	NPS – Everglades NP
Matt Kutch	NPS- Denver Services Center
Dan Levy	URS Corporation
Tom Mullin	URS Corporation
Keith Stannard	URS Corporation
Thom Rounds	URS Corporation
Amanda Rutherford	URS Corporation

Summary of Improvements, Cost Savings and Study Costs (All are reported to OMB)

The proposed project approach would provide higher advantages and could be implemented at a lower cost than any other action alternative. The no-action alternative could be achieved with minimal maintenance and enforcement costs; however, this alternative is unacceptable due to the existing failing dam structures and the dangers that the structures could cause to visitors, as well as the natural and cultural resources.

The cost of the No Action Alternative, for a 50-year period, would be \$797,699 since monitoring of the failed structure would be required by the Park staff.

Estimated study costs for the consultant’s salaries and travel were approximately \$23,900.

Attachment A

East Cape Dam Evaluation Matrix

Everglades National Park – Cape Sable Canals Dam Restoration Project, Environmental Assessment

Choosing by Advantages

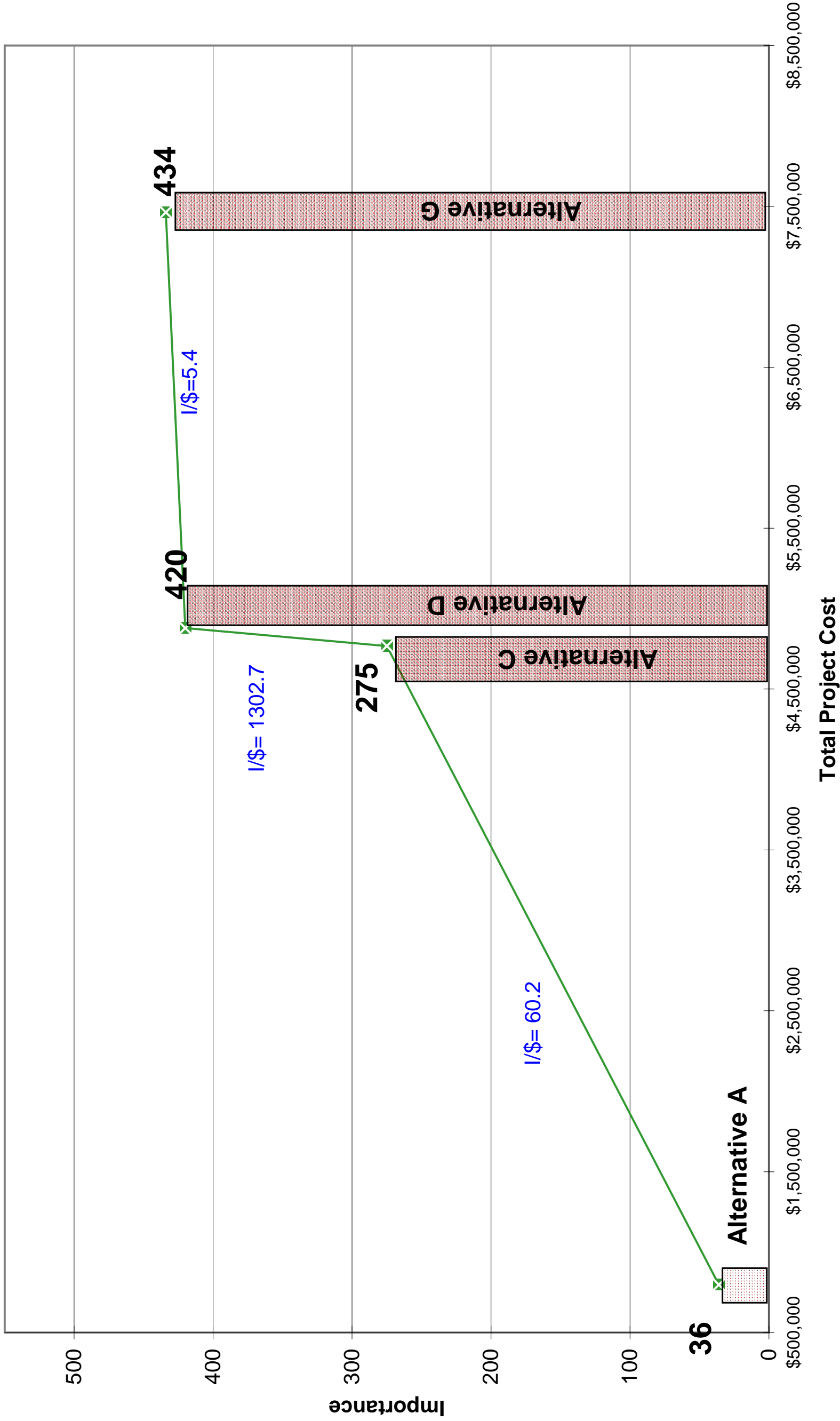
East Cape Dam

ALTERNATIVES				
COMPONENT;				
FACTOR	No Action •	Alternative C •	Alternative D •	Alternative G •
1. PROTECT CULTURAL AND NATURAL RESOURCES				
FACTOR 1a – Prevent Loss of Natural Resources and improve fish and wildlife habitat to enhance long-term sustainability				
Attributes: (ability to restrict salt water inflow and fresh water outflow)				
Advantages	<div>• No ability to restrict flows</div> No advantage in ability to restrict flows	<div>• minor ability to restrict flows</div> Moderate difference in ability to restrict flows	<div>• moderate ability to restrict flows</div> Large difference in ability to restrict flows	<div>• major ability to restrict flows</div> Very large difference in ability to restrict flows
FACTOR 1b - Prevent Loss of Cultural Resources				
Attributes: (ability to prevent erosion of the canal banks)	<div>• no ability to prevent erosion</div>	<div>• minor ability to prevent erosion</div>	<div>• moderate to major ability to prevent erosion</div>	<div>• major ability to prevent erosion (due to length of plug)</div>
Advantages	No advantage in ability to prevent loss of cultural resources	Small difference in ability to prevent loss of cultural resources	Moderate difference in ability to prevent loss of cultural resources	Large difference in ability to prevent loss of cultural resources
FACTOR 1c - Prevent illegal motor-boat access in designated wilderness area				
Attributes: (ability to prevent illegal	<div>• No ability to prevent illegal motor-boat access in designated wilderness area</div>	<div>• Minor ability to restrict</div>	<div>• Moderate ability to restrict</div>	<div>• Major ability to restrict</div>
Advantages	No advantage in ability to prevent illegal access to designated wilderness	Small difference in ability to prevent illegal access to designated wilderness	Moderate difference in ability to prevent illegal access to designated wilderness	Large difference in ability to prevent illegal access to designated wilderness
FACTOR 1d – Impacts during construction				
Attributes: (size of the construction footprint – worksite)	<div>• No worksite footprint</div>	<div>• Minor Worksite footprint</div>	<div>• Moderate Worksite footprint</div>	<div>• Major Worksite footprint</div>
Advantages	Large difference in impacts from construction	Moderate difference in impacts from construction	Small difference in impacts from construction	No advantage in impacts from construction
2. PROVIDE FOR VISITOR ENJOYMENT				

COMPONENT;		ALTERNATIVES			
FACTOR	No Action	Alternative C	Alternative D	Alternative G	
FACTOR 2a - Provide non-motorized boat access into the designated wilderness area for recreational opportunities					
Attributes: (provide safe access for non-motorized boats)	<ul style="list-style-type: none"> No safe access (currents, cables, and buoys) 	<ul style="list-style-type: none"> Provides safe access 	<ul style="list-style-type: none"> Provides safe access 	<ul style="list-style-type: none"> Provides safe access 	
Advantages	<div> <div>No advantage in ability to provide non-motorized boat access to designated wilderness</div> <div>0</div> </div>	<div> <div>Small difference in ability to provide non-motorized boat access to designated wilderness</div> <div>30</div> </div>	<div> <div>Large difference in ability to provide non-motorized boat access to designated wilderness</div> <div>50</div> </div>	<div> <div>Moderate difference in ability to provide non-motorized boat access to designated wilderness</div> <div>40</div> </div>	
FACTOR 2b - Protect Public Health, Safety and Welfare from safety hazards of proposed dams					
Attributes: ability of the dam to protect h, s & w obstructions, currents,	<ul style="list-style-type: none"> No ability – obstruction remains, currents remain 	<ul style="list-style-type: none"> Moderate ability to protect – possible to overtop sheet pile wall 	<ul style="list-style-type: none"> Major ability to protect 	<ul style="list-style-type: none"> Major ability to protect 	
Advantages	<div> <div>No advantage in ability to protect public health, safety, and welfare from hazards</div> <div>0</div> </div>	<div> <div>Moderate difference in ability to protect public health, safety, and welfare from hazards</div> <div>50</div> </div>	<div> <div>Very large difference in ability to protect public health, safety, and welfare from hazards</div> <div>80</div> </div>	<div> <div>Large difference in ability to protect public health, safety, and welfare from hazards</div> <div>76</div> </div>	
3. IMPROVE EFFICIENCY OF PARK OPERATIONS					
Factor 3a – Improve Operational Efficiency					
Attributes: (ability to reduce enforcement efforts)	<ul style="list-style-type: none"> No ability 	<ul style="list-style-type: none"> Minor ability to reduce efforts 	<ul style="list-style-type: none"> Major ability to reduce efforts 	<ul style="list-style-type: none"> Major ability to reduce efforts 	
Advantages	<div> <div>No advantage in reducing enforcement efforts</div> <div>0</div> </div>	<div> <div>Very small difference in reducing enforcement efforts</div> <div>3</div> </div>	<div> <div>Small difference in reducing enforcement efforts</div> <div>7</div> </div>	<div> <div>Moderate difference in reducing enforcement efforts</div> <div>10</div> </div>	
Factor 3b – Provide for functional longevity of structure					
Attributes: ability of the alternative to function for the 50-year life-cycle)	<ul style="list-style-type: none"> No ability 	<ul style="list-style-type: none"> Minor ability to function for life-cycle 	<ul style="list-style-type: none"> Moderate to major ability to function for life-cycle 	<ul style="list-style-type: none"> Major ability to function for life-cycle 	
Advantages	<div> <div>No advantage in ability to function for life-cycle</div> <div>0</div> </div>	<div> <div>Large difference in ability to function for life-cycle</div> <div>70</div> </div>	<div> <div>Very large difference in ability to function for life-cycle</div> <div>95</div> </div>	<div> <div>Extremely large difference in ability to function for life-cycle</div> <div>100</div> </div>	
Factor 3c – Complexity of the of the construction process					
Attributes: (difficulty/complexity to construct)	<ul style="list-style-type: none"> No difficulty or complexity to construct 	<ul style="list-style-type: none"> Moderate-major complexity to construct (no plug fill) 	<ul style="list-style-type: none"> Major complexity to construct (100’ plug fill) 	<ul style="list-style-type: none"> Major complexity to construct (430’ plug fill) 	
Advantages	<div> <div>Small difference in level of complexity to construct</div> <div>5</div> </div>	<div> <div>Very small difference in level of complexity to construct</div> <div>4</div> </div>	<div> <div>No advantage in level of complexity to construct</div> <div>3</div> </div>	<div> <div>No advantage in level of complexity to construct</div> <div>3</div> </div>	
Factor 3d – Routine & cyclic maintenance of structure					

COMPONENT;		ALTERNATIVES							
FACTOR		No Action		Alternative C		Alternative D		Alternative G	
Attributes: frequency of monitoring/maintenance events		• Twice/week monitoring		• <u>Twice/week monitoring</u>		• Monthly monitoring		• Monthly monitoring	
Advantages		Extremely small difference in reducing the frequency of monitoring/maintenance	1	No advantage in reducing the frequency of monitoring/maintenance	0	Moderate difference in reducing the frequency of monitoring/maintenance	12	Large difference in reducing the frequency of monitoring/maintenance	15
TOTAL IMPORTANCES OF ADVANTAGES			36		275		420		434
Initial Cost (Net)		\$0		\$2,509,225		\$4,006,617		\$6,570,367	
Re-design Cost									
Compliance		\$0		\$200,000		\$200,000		\$200,000	
Life Cycle Cost (Net)		\$797,699		\$2,058,412		\$672,327		\$692,627	
TOTAL		\$797,699		\$4,767,637		\$4,878,944		\$7,462,994	

EVERGLADES NATIONAL PARK
Cape Sable Dams Restoration Project - East Cape Dam



Attachment B

Homestead Dam Evaluation Matrix

Everglades National Park – Cape Sable Canals Dam Restoration Project, Environmental Assessment

Choosing by Advantages

Homestead Dam

COMPONENT;		ALTERNATIVES					
FACTOR	No Action		Alternative C	Alternative D	Alternative G	Alternative D1	Alternative G1
	•		•	•	•	•	•
4. PROTECT CULTURAL AND NATURAL RESOURCES							
FACTOR 1a – Prevent Loss of Natural Resources and improve fish and wildlife habitat to enhance long-term sustainability							
Attributes: (ability to restrict salt water inflow and fresh water outflow)	• No ability to restrict flows		• minor ability to restrict flows	• moderate to major ability to restrict flows – dam placed in marl ridge 100’ plug	• major ability to restrict flows – dam placed in marl ridge 430’ plug	• moderate ability to restrict flows – dam placed in marl ridge 100’ plug	• major ability to restrict flows – dam placed in marl ridge 430’ plug
Advantages	No advantage in ability to restrict flows	0	Moderate difference in ability to restrict flows	Very large difference in ability to restrict flows	Extremely large difference in ability to restrict flows	Large difference in ability to restrict flows	Very large difference in ability to restrict flows
FACTOR 1b - Prevent Loss of Cultural Resources							
Attributes: (ability to prevent erosion of the canal banks)	• no ability to prevent erosion		• minor ability to prevent erosion	• moderate to major ability to prevent erosion (due to wing walls)	• major ability to prevent erosion (due to wing walls & length of plug)	• Moderate ability to prevent erosion (no wing walls)	• Major ability to prevent erosion
Advantages	No advantage in ability to prevent loss of cultural resources	0	Small difference in ability to prevent loss of cultural resources	Large difference in ability to prevent loss of cultural resources	Very large difference in ability to prevent loss of cultural resources	Moderate difference in ability to prevent loss of cultural resources	Large difference in ability to prevent loss of cultural resources
FACTOR 1c - Prevent illegal motor-boat access in designated wilderness area							
Attributes: (ability to prevent illegal	• No ability to prevent illegal motor-boat access in designated wilderness area		• Minor ability to restrict	• Moderate ability to restrict- plug length & wing walls make it harder to circumvent	• Major ability to restrict – wing walls plus 430’ plug length is major deterrent to illegal access	• Moderate ability to restrict	• Major ability to restrict
Advantages	No advantage in ability to prevent illegal access to designated wilderness	0	Moderate difference in ability to prevent illegal access to designated wilderness	Very large difference in ability to prevent illegal access to designated wilderness	Extremely large difference in ability to prevent illegal access to designated wilderness	Large difference in ability to prevent illegal access to designated wilderness	Very large difference in ability to prevent illegal access to designated wilderness
FACTOR 1d – Impacts during construction							

Attributes: (size of the construction footprint – worksite & dredging)	<ul style="list-style-type: none">• No worksite footprint• No dredging footprint		<ul style="list-style-type: none">• Minor Worksite footprint• Major Dredging footprint	8	<ul style="list-style-type: none">• Moderate Worksite footprint• Major Dredging footprint	5	<ul style="list-style-type: none">• Major Worksite footprint• Major Dredging footprint		<ul style="list-style-type: none">• Moderate Worksite footprint• No Dredging footprint	20	<ul style="list-style-type: none">• Major Worksite footprint• No Dredging footprint	15
Advantages	Very large difference in impacts from construction	30	Small difference in impacts from construction	30	Very small difference in impacts from construction	5	No advantage in impacts from construction	0	Large difference in impacts from construction	20	Moderate difference in impacts from construction	15
5. PROVIDE FOR VISITOR ENJOYMENT												
FACTOR 2a - Provide non-motorized boat access into the designated wilderness area for recreational opportunities												
Attributes: (provide safe access for non-motorized boats)	<ul style="list-style-type: none">• No safe access (currents, cables, and buoys)		<ul style="list-style-type: none">• Provides safe access		<ul style="list-style-type: none">• Provides safe access – 100’ portage easier than 430’		<ul style="list-style-type: none">• Provides safe access		<ul style="list-style-type: none">• Provides safe access		<ul style="list-style-type: none">• Provides safe access	
Advantages	No advantage in ability to provide non-motorized boat access to designated wilderness	0	Moderate difference in ability to provide non-motorized boat access to designated wilderness	30	Very large difference in ability to provide non-motorized boat access to designated wilderness	50	Large difference in ability to provide non-motorized boat access to designated wilderness	40	Very large difference in ability to provide non-motorized boat access to designated wilderness	48	Large difference in ability to provide non-motorized boat access to designated wilderness	38
FACTOR 2b - Protect Public Health, Safety and Welfare from safety hazards of proposed dams												
Attributes: ability of the dam to protect h, s & w obstructions, currents, hazards	<ul style="list-style-type: none">• No ability – obstruction remains, currents remain		<ul style="list-style-type: none">• Moderate ability to protect – possible to overtop sheet pile wall		<ul style="list-style-type: none">• Major ability to protect		<ul style="list-style-type: none">• Major ability to protect		<ul style="list-style-type: none">• Major ability to protect Hazards removed & currents mitigated by geotube design		<ul style="list-style-type: none">• Major ability to protect	
Advantages	No advantage in ability to protect public health, safety, and welfare from hazards	0	Moderate difference in ability to protect public health, safety, and welfare from hazards	50	Very large difference in ability to protect public health, safety, and welfare from hazards	78	Large difference in ability to protect public health, safety, and welfare from hazards	76	Extremely large difference in ability to protect public health, safety, and welfare from hazards	80	Large difference in ability to protect public health, safety, and welfare from hazards	75
6. IMPROVE EFFICIENCY OF PARK OPERATIONS												
Factor 3a – Improve Operational Efficiency												
Attributes: (ability to reduce enforcement efforts)	<ul style="list-style-type: none">• No ability		<ul style="list-style-type: none">• Minor ability to reduce efforts		<ul style="list-style-type: none">• Major ability to reduce efforts		<ul style="list-style-type: none">• Major ability to reduce efforts		<ul style="list-style-type: none">• Major ability to reduce efforts		<ul style="list-style-type: none">• Major ability to reduce efforts	
Advantages	No advantage in reducing enforcement efforts	0	Extremely small difference in reducing enforcement efforts	3	Very small difference in reducing enforcement efforts	7	Moderate difference in reducing enforcement efforts	9	Small difference in reducing enforcement efforts	8	Large difference in reducing enforcement efforts	10
Factor 3b – Provide for functional longevity of structure												
Attributes: ability of the alternative to function for the 50-year life-cycle)	<ul style="list-style-type: none">• No ability		<ul style="list-style-type: none">• Minor ability to function for life-cycle		<ul style="list-style-type: none">• Moderate to major ability to function for life-cycle		<ul style="list-style-type: none">• Major ability to function for life-cycle		<ul style="list-style-type: none">• Moderate ability to function for life-cycle		<ul style="list-style-type: none">• Moderate to major ability to function for life-cycle	

Advantages	No advantage in ability to function for life-cycle	0	Large difference in ability to function for life-cycle	70	Very large difference in ability to function for life-cycle	95	Extremely large difference in ability to function for life-cycle	100	Very large difference in ability to function for life-cycle	93	Extremely large difference in ability to function for life-cycle	98
Factor 3c – Complexity of the of the construction process												
Attributes: (difficulty/complexity to construct)	<ul style="list-style-type: none"> No difficulty or complexity to construct 		<ul style="list-style-type: none"> Moderate-major complexity to construct (dredging with no plug fill) 		<ul style="list-style-type: none"> Major complexity to construct (dredging with 100’ plug fill) 		<ul style="list-style-type: none"> Major complexity to construct (dredging with 430’ plug fill) 		<ul style="list-style-type: none"> Major complexity to construct (geotube with 100’ plug fill) 		<ul style="list-style-type: none"> Major complexity to construct (geotube with 430’ plug fill) 	
Advantages	Moderate difference in the level of complexity to construct	5	Small difference in the level of complexity to construct	4	Very small difference in the level of complexity to construct	3	Very small difference in the level of complexity to construct	3	Extremely small difference in the level of complexity to construct	2	No advantage in the level of complexity to construct	0
Factor 3d – Routine & cyclic maintenance of structure												
Attributes: frequency of monitoring/maintenance events	<ul style="list-style-type: none"> Twice/week monitoring 		<ul style="list-style-type: none"> Twice/week monitoring 		<ul style="list-style-type: none"> Monthly monitoring 		<ul style="list-style-type: none"> Monthly monitoring 		<ul style="list-style-type: none"> Monthly monitoring 		<ul style="list-style-type: none"> Monthly monitoring 	
Advantages	Extremely small difference in reducing the frequency of monitoring/maintenance	1	No advantage in reducing the frequency of monitoring/maintenance	0	Moderate difference in reducing the frequency of monitoring/maintenance	12	Very large difference in reducing the frequency of monitoring/maintenance	15	Moderate difference in reducing the frequency of monitoring/maintenance	11	Large difference in reducing the frequency of monitoring/maintenance	14
TOTAL IMPORTANCES OF ADVANTAGES		36		279		424		433		429		431
Initial Cost (Net)	\$0		\$4,237,841		\$6,398,121		\$9,961,511		\$5,367,003		\$9,036,375	
Re-design Cost												
Compliance	\$0		\$250,000		\$250,000		\$250,000		\$200,000		\$200,000	
Life Cycle Cost (Net)	\$797,699		\$2,083,412		\$1,415,255		\$1,045,867		\$1,445,255		\$1,075,867	
TOTAL	\$797,699		\$6,571,253		\$8,063,376		\$11,257,378		\$7,012,258		\$10,312,242	

EVERGLADES NATIONAL PARK
Cape Sable Dams Restoration Project - Homestead Dam

