

PRELIMINARY FINDING OF NO SIGNIFICANT IMPACT
TEMPORARY DEVIATION FROM THE REGULATION SCHEDULES
FOR
WATER CONSERVATION AREAS 1 and 2A
CENTRAL AND SOUTHERN FLORIDA PROJECT

The proposed action analyzed in this Environmental Assessment is a recommendation of temporary deviations from the approved Regulation Schedules for Water Conservation Areas (WCAs) 1 and 2A that involves lowering the environmental floor of these schedules from 14 feet to 12.5 feet in WCA-1 and from 10.5 feet to 10 feet in WCA-2A. All elevations in this document are feet, NGVD, unless otherwise specified. I have reviewed the information analyzed in the Environmental Assessment for the proposed action, reflecting pertinent information obtained from other agencies having jurisdiction by law and/or special expertise. I conclude that there would be no significant adverse impacts caused by the proposed temporary deviations, taking into consideration the adverse effects of the severe drought itself. Summary reasons for this conclusion are that the proposed action:

- a. Is a short-term temporary deviation from the established Regulation Schedules for the named WCAs to aid in additional water supply during the ongoing regional drought.
- b. Will not adversely affect the balance of authorized purposes of the Central and Southern Florida Project for flood control, water supply, fish and wildlife conservation, and recreation.
- c. Will not permanently affect wildlife or fish or their habitats in the named WCAs.
- d. This action may adversely affect the endangered Everglade snail kite and the wood stork, a species listed under the Endangered Species Act (ESA), and formal consultation under Section 7 of the Endangered Species Act will be coordinated.

Based on the information summarized, and after consideration of public and agency comments received on the project, I find that the proposed action will not have a significant effect on the quality of human environment under the meaning of Section 102(2)(C) of the National Environmental Policy Act, and, therefore, does not require preparation of an Environmental Impact Statement.

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Date

March 2008

Environmental Assessment

WCA-1 and WCA-2A

Temporary Deviation to Regulation Schedule



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ENVIRONMENTAL ASSESSMENT

Temporary Deviations from the Regulation Schedules for Water Conservation Areas 1 and 2A Central and Southern Florida Project

1.0 Background

1.1 Introduction

As a result of the ongoing drought, the South Florida Water Management District (SFWMD) has requested, by letter dated 7 December, 2007, that the U.S. Army Corps of Engineers, Jacksonville District, (Corps) approve temporary deviations from the authorized regulation schedules for Water Conservation Area 1 (WCA-1) and WCA-2A through the 2008 dry season. This temporary deviation would allow the SFWMD greater flexibility in balancing the environmental and water supply purposes of the project. The deviation, if approved, would lower the WCA minimum floor elevations, which is the minimum level below which water releases are not permitted unless water is supplied from another source. There are three alternatives being considered as well as the no-action alternative, with Alternative 1 being the preferred alternative of the SFWMD. Alternative 1 would allow for the floor in WCA-1 to be lowered to 11.0 ft, NGVD (an additional 3 feet below approved regulation schedule) and the floor in WCA-2A to be lowered to 10 ft, NGVD (an additional 0.5 ft below approved regulation schedule). The water made available by lowering the floors would be used for water supply during the ongoing regional drought.

The SFWMD declared an extreme water shortage in Dec 2007 and has implemented water restrictions within its area of responsibility in accordance with the Water Shortage Plan. *Figure 1* is a map of the project area showing the WCA's and *Figure 2* shows the latest water restrictions.

1.2 Authority

Central and Southern Florida Project (C&SF Project), House Document 80-643, which Congress authorized as the C&SF in the 1948 Flood Control Act (Pub. L. No. 80-858), expressly provides for the impoundment of water in the water conservation areas. The purposes of the C&SF Project include flood control, water supply, recreation, and environmental restoration.

1.3 Purpose and Need

The purpose for the proposed deviation is to make available additional water below the current environmental floor of the WCAs for potential water supply withdrawals as necessary during the continuing drought. The current actions/restrictions imposed by the SFWMD under the provisions set forth by the Water Shortage Restriction Plan are extremely helpful in managing the water shortage but may not be sufficient should the regional drought conditions continue or worsen.

1.4 Decision to be Made

The Corps, SAJ, must decide upon no-action or recommend an alternative action (temporary deviation) and the Corps South Atlantic Division (SAD) must approve the preferred alternative for each WCA, approve another alternative, or decide to maintain existing Regulation Schedules. The Corps, SAJ, understands that it can recommend any complete alternative for all WCAs or recommend a combination of no-action and different intensity of actions for each WCA individually. Even if the proposed deviations are approved, the SFWMD is under no obligation to implement them if conditions improve and it is determined that they are not necessary, as was demonstrated last year.

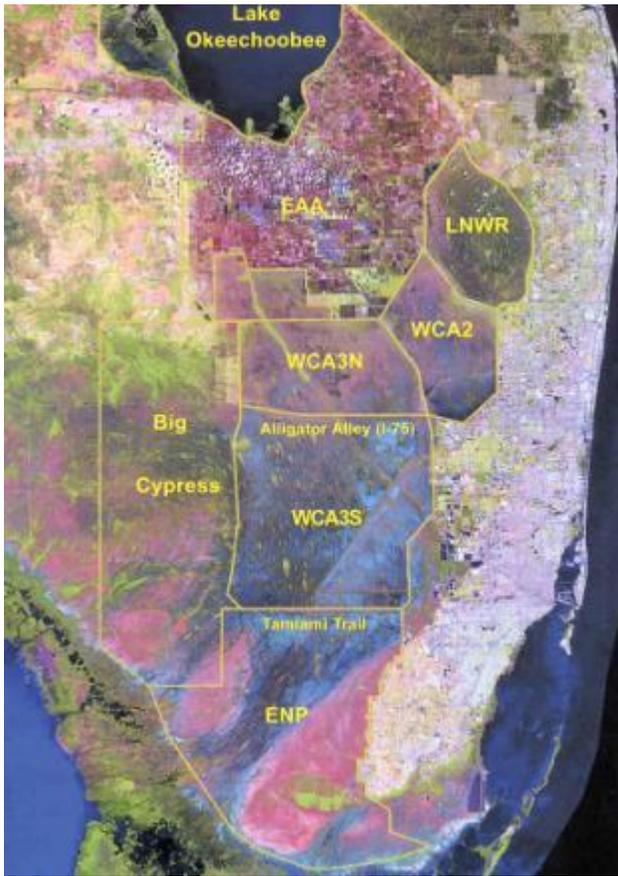


Figure 1 - Project Location Area Showing WCA's

New Water Restrictions Effective January 15, 2008

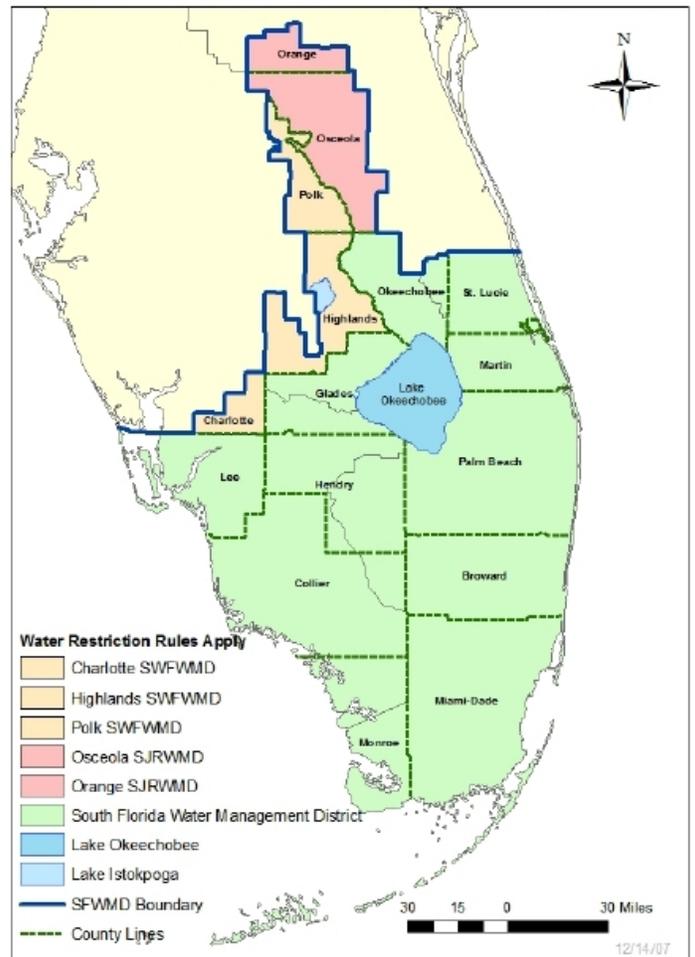


Figure 2 - Water Shortage Areas

2.0 Description of Proposed Action Alternatives

Four alternatives were submitted by SFWMD for consideration (Table 1), including a no action alternative (ALT-0). SFWMD's preferred alternative is Alternative 1. The Recommended Plan is Alternative 2 for WCA-1 and WCA-2A.

	ALT-0 Base	ALT-1	ALT-2	ALT-3
WCA-1	14.0	11.0	12.5	10.0
WCA-2A	10.5	10.0	10.0	10.0

Table 1 - Proposed Alternatives 1.

2.1 WCA-1

The proposed temporary deviation from the regulation schedule features a gradual

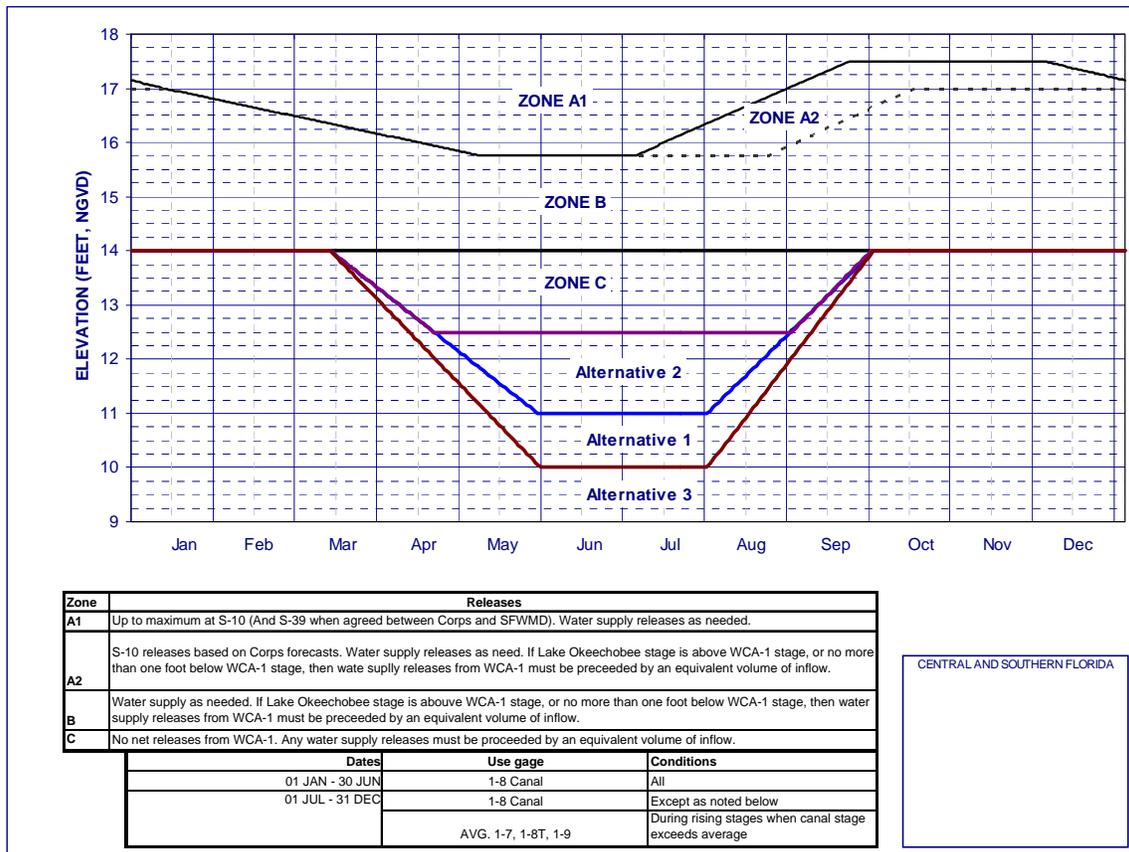


Figure 3 - Regulation Schedule WCA-1

decline in the environmental floor elevation from 14.0 to 11.0 (Alt 1), 12.5 (Alt 2), or 10.0 (Alt 3) feet NGVD as measured at the indicator gage at 1-8C (See Figure 3). The deviation, if needed, would begin March 15, 2008 for all three alternatives. Potential

discharges will be limited to the stage present at gage 1-8C on that day and would then gradually decline, over time, to the final stage shown in Table 1 at gage 1-8C, for each alternative. If stages fall below this line, and are less than the proposed floor of the preferred alternative plan, there would be no net releases from WCA-1; as per the current regulation schedule, “any water supply releases must be preceded by an equivalent volume of inflow.” Starting on either August 1 for Alts 1 and 3, or September 1 for Alt 2, the stages would gradually increase back to normal floor stage by October 1, 2008, environmental conditions permitting.

2.2 WCA-2A

The deviation would begin March 15, 2008, with a gradual decrease, over time, in WCA-2A regulated floor elevation (*See Figure 4*). This decrease would begin at the regulated floor of 10.5 feet NGVD at gage S-11B headwater on that day. The floor would then gradually decline, over time, to 10 ft, NGVD until May 31, 2008. The floor elevation would remain at 10 feet NGVD for all alternatives through the summer months and would then gradually increase back to normal floor stage by October 1, 2008.

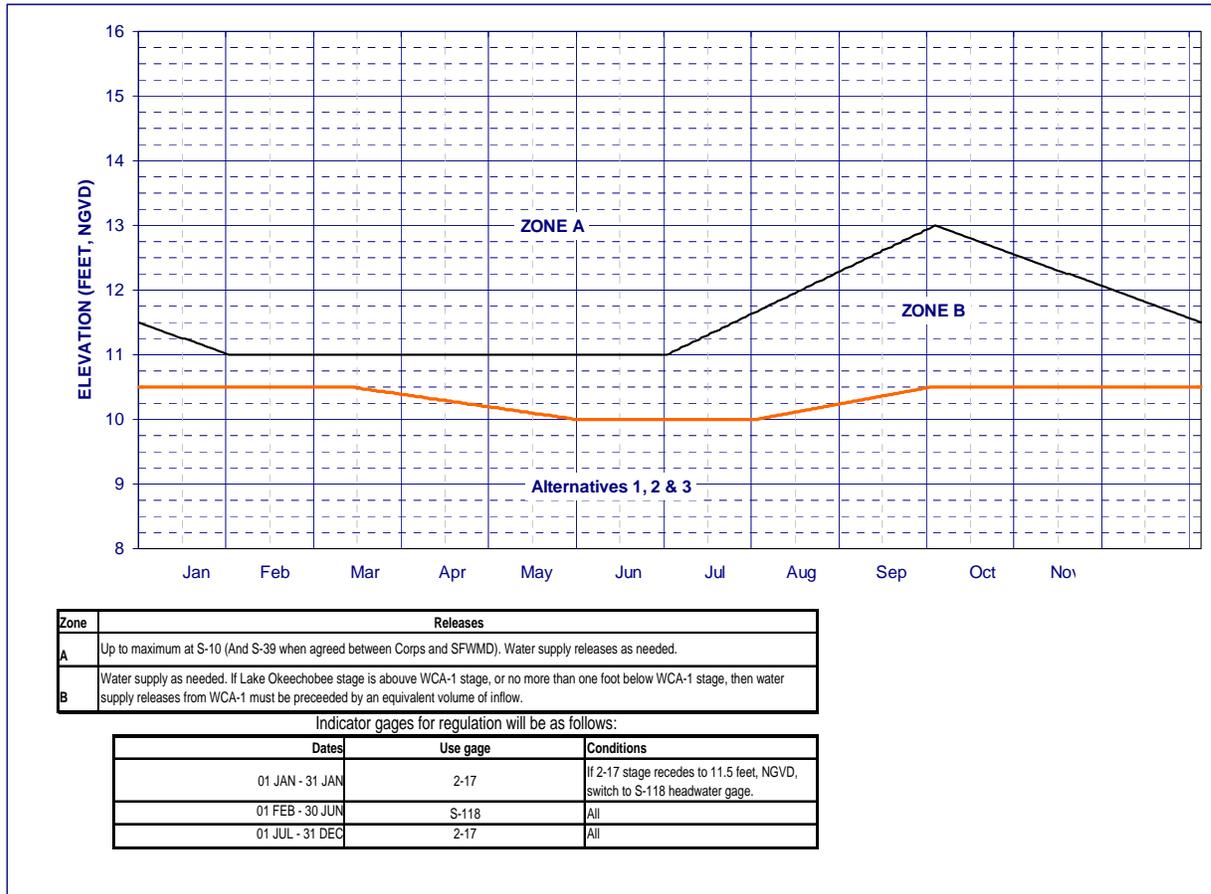


Figure 4 – Regulation Schedule showing proposed alternatives for WCA-2A

3.0 Existing Conditions

3.1 Introduction

The Water Conservation Areas were established in the late 1940's-early 1950's in Palm Beach, Broward, and Miami-Dade counties as part of the original Central & South Florida (C&SF) Project. They are diked and hydrologically controlled for flood control and water supply purposes and preserve a total of 1,337 square miles, or about 50 percent of the original Everglades. They represent most of the State-owned Everglades and are important wildlife and fish habitat as well as habitat for a number of Federally listed endangered and threatened species and state of Florida species of special concern. Although the C&SF authorizing legislation indicates authorization of their use as reservoirs for water supply, they are also expected to provide flood control and recreation (hunting, fishing, and wildlife observation).

The established regulation schedules are used to guide management of water levels in the WCA's. The water level thresholds vary depending on the time of year and trigger discharges or inflows, and were developed to meet the multiple objectives of the C&SF Project. There have been four water regulation schedules since the establishment of WCA-1, and the current approved schedule has been in place since 1995. The "environmental floors" of the WCAs are intended to provide minimum water levels suitable for sustaining native fish and wildlife and other natural values. Management of water levels in the WCA's are the responsibility of the SFWMD in accordance with regulation schedules set by the Corps.

WCA-1, is located in Southeast Palm Beach County, entirely within the Arthur R. Marshall Loxahatchee National Wildlife Refuge (the Refuge), and includes 227 square miles of Everglades wetland habitat. The U.S. Fish and Wildlife Service (FWS) is responsible for the wildlife and habitat management of the Refuge while the Florida Fish and Wildlife Conservation Commission (FWC) has those responsibilities for WCA-2.

3.2 Hydrology

Below average rainfall through the 2006 wet season resulted in the early onset of the 2007 dry season over much of South Florida (SFWMD, 2007a). Continued below average precipitation through the wet season resulted in water levels that were generally lower on average than at any time since the 2001 drought.

Ground level elevations in WCA-1 range from 16 feet NGVD at the north end to 12 feet NGVD at the south end. Currently WCA-1 stage, measured at the 1-8C gage, is 16.71 ft, NGVD (March 12, 2008). Water levels are currently above regulation schedule, and regulatory releases are expected to begin this week. The current operational minimum water level as described by the Regulation Schedule is 14 feet NGVD within the perimeter canal. Below this level, water releases are not permitted unless supplemental water is supplied from another source, usually Lake Okechobee (SFWMD April 2007).

The regulation schedule in WCA-2 ranges from 13 ft NGVD at the end of the wet season (September 15) to 11 ft NGVD during the dry season (February 1 through June 15). Currently, WCA-2A stage, as measured at the S-11B gage is 11.86 ft, NGVD. The current Corps operational minimum water level maintained within the L-35B and L-38 borrow canals is 10.5 ft NGVD, below which water releases are not permitted unless water is supplied from another source (SFWMD, 2007b).

3.2.1 Previous Temporary Deviations

During the 2000-2001 drought emergency the SFWMD requested, and the Corps approved, a deviation to the regulation schedule, similar to the current request. The approved deviation temporarily changed the floor elevation in WCA-1 from 14 feet NGVD to 11 feet NGVD. For the 2001 deviation, the Corps conducted an EA and signed a FONSI recommending the SFWMD request for modification of the water regulation schedule, which was subsequently approved at the Corps' South Atlantic Division. The FWS consultation on the EA stated that they concurred with the Corps' determination that the proposed project was not likely to adversely affect the endangered wood stork or snail kite (SFWMD April 2007). In 2007, an emergency deviation was requested during the regional drought. This deviation was deemed an emergency due to the threat of salinity intrusion in the coastal well fields. Although the deviation was granted, as a result of some rainfall along with SFWMD's strict water restrictions and prudent management of water in the system, the deviation was not implemented.

3.3 Ecological Resources

3.3.1 Plant Communities

The vegetation communities in the WCA-1 and 2A are shaped by interactions of water depth, duration of standing water (hydroperiod), frequency of dry-outs, water flow, and water quality. Areas that have deeper water for longer duration tend toward aquatic communities such as open water or sloughs. Areas that have shallower water for shorter duration or dry out more often tend toward communities such as sawgrass and brush.

Essentially, the habitats in WCA-1 and 2A are graminoid wetland habitats, interspersed with tree islands (hammocks) and willow strands. These wetlands include sloughs, wet prairies, sawgrass, cattail, and cypress swamp. Descriptions of wetlands in the study area include riverine lower perennial unconsolidated bottom (river systems), palustrine scrub-shrub broad-leaved deciduous (shrub swamps), palustrine scrub-shrub broad-leaved evergreen (Evergreen shrub swamps), and palustrine forested deciduous (swamp systems). A mosaic of natural communities is important for the wide range of species that are supported.

3.3.2 Wildlife

WCA-1, also referred to as the Refuge, is home to many species of wildlife including deer, otter, mink, raccoon, and turtles. Migratory birds often concentrate on the tree islands in the sawgrass marsh. The USFWS Comprehensive Conservation Plan (2000) states that the Refuge provides nearly 150,000 acres of wetland habitat for a wide array of

species including as many as 257 bird species including waterfowl and wading birds, 23 species of mammals, 11 frog and toad species, 10 turtle species, as many as 24 snake species, approximately 40 butterfly species, 23 dragonfly species, and 46 fish species. WCA-2A covers 173 square miles and supports a fish and wildlife population similar to that of WCA-1, although tree islands are scarcer.

3.3.3 Wading Birds

The WCAs provide important foraging, roosting, and nesting habitat for a number of colonial nesting wading birds, including the following wading bird species from the state list of endangered species (E), threatened (T), and species of special concern (SSC): white ibis (*Eudocimus albus*, SSC), roseate spoonbill (*Platalea ajaja*, SSC), tri-colored heron (*Egretta tricolor*, SSC), little blue heron (*Egretta caerulea*, SSC), snowy egret (*Egretta thula*, SSC), and the wood stork (*Mycteria Americana*, E), which is also listed as a Federally Endangered species. The majority of wading bird species require shallow water for efficient feeding. White ibis rarely forage in waters deeper than 6 inches, while almost all of the smaller heron species are too short to wade in waters deeper than 8 inches. Construction of water management canals and levees have rendered many areas of the WCAs unsuitable as wading bird feeding habitat due to the ponded, deep-water conditions that prevail in these areas. Wading birds commonly nest during the winter-spring dry season, when receding water levels in the marsh help to concentrate fish and make foraging more productive. During severe droughts these birds may abandon their nests or fledglings when forage becomes scarce or unavailable.

White ibis, the most abundant wading bird found in the WCAs, feeds primarily on crayfish (*Procambarus alleni*). In contrast, wood storks feed almost exclusively on fish (Ogden et al., 1976). Although both species are tactile foragers, differences in prey preference and foraging strategies allow both species to utilize drying wetlands with minimum competition. The diet of sight-feeding wading birds (herons and egrets) generally includes forage fish (topminnows, killifish, and mosquitofish), small reptiles (snakes and lizards) and frogs, crustaceans (crayfish and freshwater prawns), snails, and insect larvae.

Florida Atlantic University (FAU) staff, in coordination with SFWMD, conducted regular aerial wading bird surveys in the Everglades and Lake Okeechobee during the 2007 drought. Dale Gawlik (FAU) stated that FAU will not be conducting aerial bird surveys in the WCA's during 2008 and will be focusing on Lake Okeechobee only. The 2007 South Florida Wading Bird Report summary concluded that the estimated number of wading bird nests in South Florida in water year 2007 was 37,623 (excluding cattle egrets because they are not dependent on wetlands). This was a 31% decrease relative to the 2006 season, and 46% less than the 68,750 nests of 2002, which was the best nesting season on record in South Florida since the 1940's.

3.3.4 Endangered Species.

A number of Federally listed species may occur in the WCAs, including the Everglade snail kite (*Rostrhamus sociabilis plumbeus*), wood stork (*Mycteria Americana*), Eastern

indigo snake (*Drymarchon corais couperi*), and Florida panther (*Felis concolor coryi*). In the context of the drought, however, the WCAs and Everglades National Park are most important as foraging and reproductive habitat for the snail kite and the wood stork. These species nest in late winter through spring and early summer and are considered most vulnerable to drought conditions. The Corps anticipates no effect to occur to the Eastern Indigo Snake or the Florida Panther in conjunction with this temporary deviation. However, the additional decrease in water levels that would occur if a temporary deviation were implemented may adversely affect the snail kite and the wood stork.

3.3.4.1 Everglade Snail Kite

Prior to 1995, the environmental “floor” elevation in WCA-1 was 11 feet NGVD. In 1995, a higher floor elevation was implemented as part of the change to the WCA-1 regulation schedule, to improve wildlife habitat. The WCA-1 floor elevation was increased from 11 feet NGVD to 14 feet NGVD, in part to protect and promote aquatic vegetation that supports apple snail habitat that in turn supports the endangered snail kite (SFWMD April 2007). WCA-2A contains over 100,000 acres of designated critical habitat for the snail kite.

From 1997-1999, the snail kite population was estimated to be about 3,000 birds (USFWS, 2006). From 1999 through 2002, the population estimates declined each year until they reached a level of approximately 1,400 birds in 2002 and 2003. The population in 2006 was estimated at approximately 1,600 birds. The observed declines in the kite population coincided with a regional drought that affected South Florida in 2000-2001. During the drought, nest success was low, juvenile survival rates were low, and adult survival also declined during 2001 (USFWS, 2006). Even following the end of the drought, and a return to normal or wetter than normal hydrologic conditions from 2002-2006 that generally provide favorable snail kite nesting conditions, snail kite nest success, juvenile survival rates, and population estimates all remained low.

3.3.4.2 Wood Stork

Wood storks are highly colonial species that usually nest in large rookeries and feed in flocks. These large wading birds do best in tropical or subtropical zones with distinct wet and dry seasons. Their nesting success is linked closely with hydrology, and with wood storks, which are one of the indicator species used to assess the overall condition of the Everglades. Successful reproduction depends on ample rains during the wet season to saturate the ground, followed by receding waters during the dry season. During the dry season, fish are concentrated in pools as water levels in the marsh recede, concentrating fish within depressions. These high concentrations of fish allow the birds to locate their food by groping, not by sight. Wood storks consume vast amounts of fish (approximately 443 pounds per pair of nesting wood storks), and if sufficient amounts of food are not available, they will not nest. Often when water levels rise during the dry season (reversals), or food supply becomes scarce, they will abandon their nests and try to find better feeding conditions (Mazotti, 2002).

The Water Conservation Areas appear to be critical foraging habitat for wintering storks, especially during drought years when the majority of South Florida is very dry (Ogden,

1992). Ogden observed that the water conservation areas contained at least 8-10% of the total southeastern U.S. population in wet years, and possibly as much as 55% in dry years. The South Florida Wading Bird Report (2007) reported that wood stork nesting in 2007 was down 79% as compared to 2006. In general, it summarized that 2007 was a poor wading bird breeding season in terms of nesting effort compared to the past ten years, with WCA-1 supporting 44% of wading bird nests and WCA-3 supporting 47% of wading bird nests in South Florida.

3.4 Muck Fires

There are generally two types of fire that occur in the Everglades - surface fires and peat-burning or muck fires, which are less frequent, more intensive, and result in longer lasting disturbances to the vegetative community. A surface fire will burn the vegetation and not the peat soil, so this does not generally cause succession to occur. These less severe fires are used as management techniques to maintain current plant communities in conjunction with other factors such as hydroperiod and nutrient levels. Severity of muck fires depends on the fuel load available and the water level. Muck fires burn soil or peat away and can destroy hammocks and tree islands. Inches of peat can be burned, depending on the location and intensity of the fire. The oxidation of peat resulting from severe fires can lower ground elevations, resulting in different hydroperiods, and lead to succession of plant communities (ie wet prairies becoming emergent marshes). Invasions of exotic vegetation and cattail are also a concern after severe muck fires.

4.0 Environmental Effects

4.1 General

The drought itself has already caused adverse effects on natural plant communities, fish, and wildlife all over Florida. Deviations from the Regulation schedules will intensify the adverse effects of the drought and adverse effects would depend largely on the acceleration of the recession rate caused by additional water withdrawals (over and above evaporation and seepage losses) as well as the amount of rainfall received. In this section, the Corps will attempt to identify and quantify (when possible) the impacts that will occur over and above the drought if an action alternative were implemented.

The following paragraphs summarize anticipated environmental effects for the WCA's and take into consideration hydrologic conditions at the time this EA was written.

4.2 Hydrology

4.2.1 WCA-1

Currently, the WCA-1, at the 1-8C gage is 16.71 ft, NGVD, which is slightly above regulation schedule, and approximately 6 inches higher than it was at this time last year. *Figures 5 and 6* are simulation model results showing amounts of water that could be

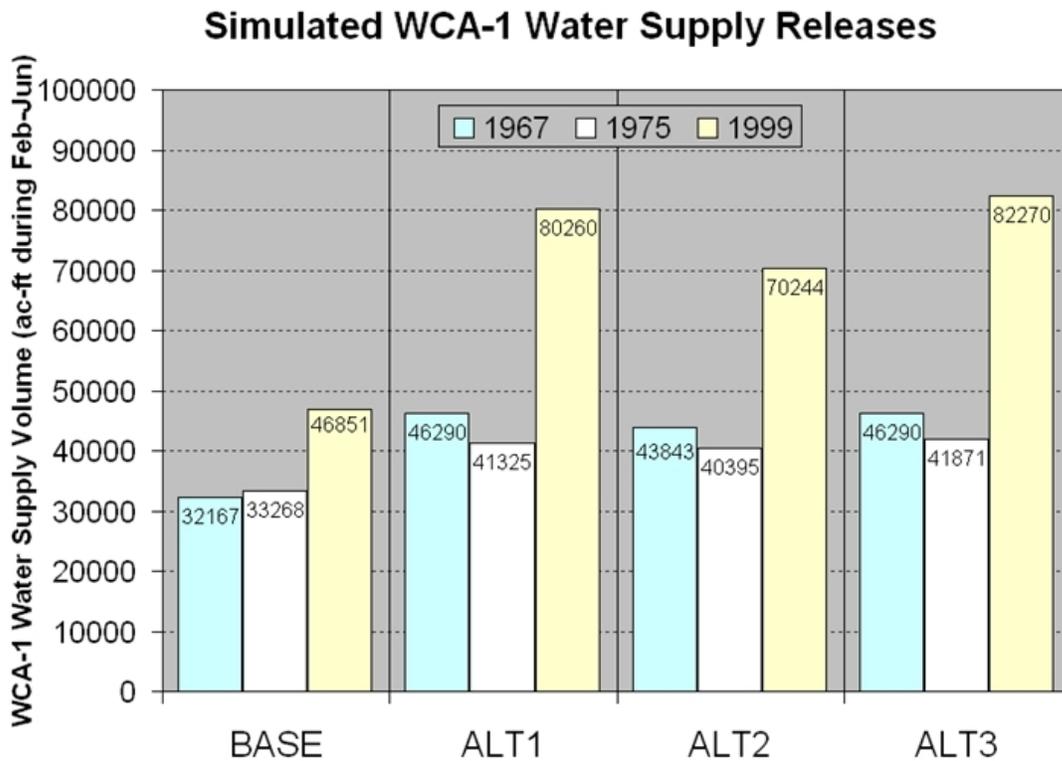


Figure 5 – Projected Water Supply Releases for dry year model runs

made available under the base and different alternatives evaluated, using different dry years as indicators of what might be expected. Alternative 1 is the preferred alternative of the SFWMD. Alternative 3 does provide the most days of water supply, but it is neither requested nor is it being recommended. Between the remaining 2 alternatives, the amount of water supply made available during dry years varies from no difference in 1965 to 10,000 acre-feet in 1999.

Base		Alt1		Alt2		Alt3	
Feb-Jun of	Delivery	Feb-Jun of	Increase	Feb-Jun of	Increase	Feb-Jun of	Increase
1999	46851	1999	33409	1999	23393	1999	35419
1967	32167	1967	14123	1967	11676	1967	14123
1975	33268	1975	8057	1975	7127	1975	8603
1971	34162	1971	1767	1971	1801	1971	1767
1965	27376	1965	1624	1965	1624	1965	1624

Figure 6 – Deliveries from WCA-1 during Dry years
(Feb-June, when CA1 stage is below Floor Elevation)

Lowering the regulatory floor would first reduce the depth of the Refuge perimeter canals. The deepest point across the shallowest cross-section of the canal joining the L-7 and L-40 Canals at the northern end of the Refuge is slightly above 9 feet; therefore at a floor of 11 feet there is slightly less than 2 feet of water in the canal. The deepest point across the shallowest cross-section of the L-40 Canal occurs 8.3 miles below the G-300, or just over 3 miles below the STA-1E discharge. At this point, the minimum bottom elevation is 6.7 feet. University of Florida researchers have measured 5 feet of soft highly-organic sediments that have accumulated over the nearly half-century since the L-40 Canal and Levee were constructed at this site.

With lower water levels in the perimeter canal, more of the canal bottom and associated phosphorus-laden sediments would be exposed. When the rainy season commences, heavy rains falling directly on the exposed banks and sediments, as well as stormwater directed into the Refuge, would potentially cause scouring and re-suspension of total phosphorus, other nutrients, and contaminants that have settled in the canal soils. A significant rain event could move that water into the marsh interior. A related water quality concern is the potential risk from mercury methylation upon rehydration of exposed soils within the Refuge.

4.2.2 WCA-2

Some rain has been received in South Florida over the past week or two, and currently the S11-B gage is 11.86 ft, NGVD, slightly above regulation schedule. In all action alternatives, WCA-2 would go from 10.0 ft, NGVD to 10.0 ft, NGVD.

4.2.3 Minimum Depth Area Index (MDAI)

The MDAI is an index generated by the Water Depth Animation Tool (WDAT) to estimate the area of the various Everglades compartments that meet selected criteria of the Everglades Minimum Flows and Levels (MFL's). This information is included in the *Ecological Analysis for Potential WCA-1 and WCA-2A Deviations* provided by SFWMD.

The MDAI is calculated by using water depths and durations of time below ground elevations combined with the type of soil in that particular area (peat or marl prairie). More than 90% of the soils of the Everglades are comprised of either peat or marl, and these minimum water levels will indicate if the area is in danger of over-drainage, which results in soil oxidation, fires which consume peat, lower ground elevations, and impacts to wetlands. Excessive drying of hydric soils, which lead to soil oxidation and subsidence, impact plant and animal communities of the Everglades and this resource could require many years or decades to recover (SFWMD, 2008). *Figure 7* shows a summary of the MDAI and the different alternatives evaluated. If the water depth is above ground level then the area is reported as good.

a WCA1 Water Volume & Depth Statistics

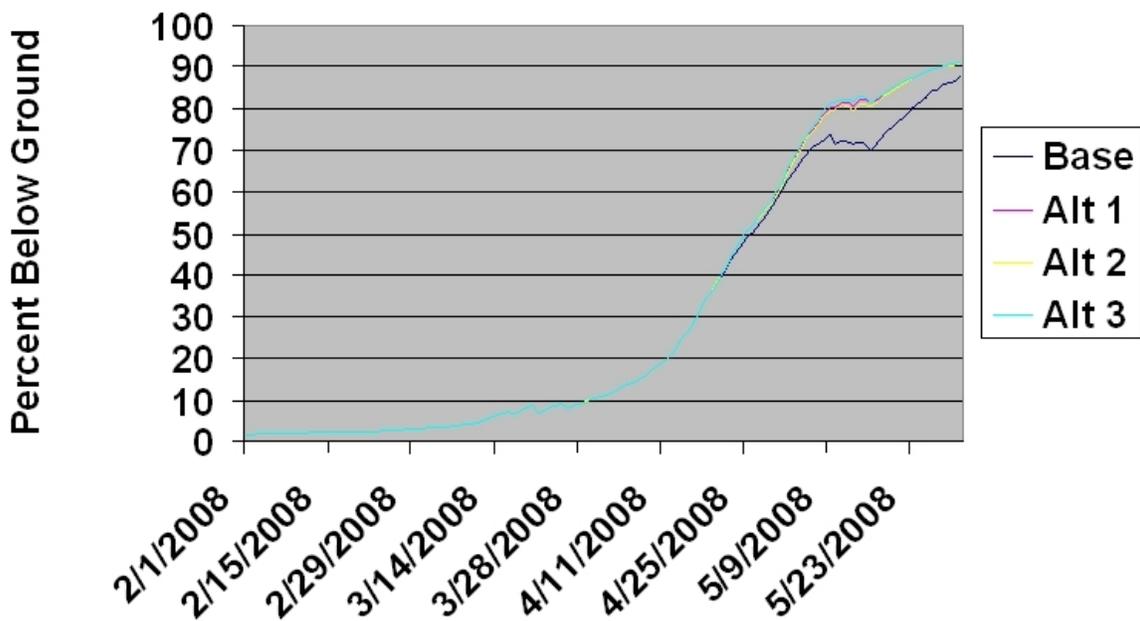


Figure 7 – Minimum Depth Area Index (MDAI)

If the water depth drops below ground level for longer than 2 days, it then becomes a trend. As the water table continues to drop, areas with peat soils greater than 1 foot below ground level for more than 30 days duration are classified as “bad”, and marl soils greater than 1.5 foot below ground level for more than 90 days duration are classified as “bad”. Up to 10% of WCA-1 could recede to below ground elevation (as opposed to the no-action alternative, and the MDAI of up to 10% of this area could also go from Good to Fair/Poor category as opposed to the no-action alternative.

4.3 Ecological Effects

At a stage of 14 ft, NGVD, approximately 70% of the Refuge is dry. Aquatic refugia, such as alligator holes, hold water when the surface of the marsh is dry and vary in depth

generally between 6 and 36 inches (USFWS, 2007a). As water levels drop further below the approved regulation schedule bottom, there is a potential loss of these alligator holes within the interior of the marsh and in the canal. These holes provide habitat for small fish and amphibians that provide food for wading birds, alligators, and other wildlife during the dry season. In instances where it would become so dry that there is no aquatic refuge areas, entire aquatic fauna populations could be lost.

4.3.1 Plant Communities

Decreasing the hydroperiod in areas along the perimeter may increase the recruitment and spread of exotic vegetation, such as melaleuca. Exposed peat provides an ideal germination site for melaleuca. In addition, extended and successive periods of dry down may result in changes in vegetative communities because of succession. Shrubs, such as wax myrtle, colonize wet prairie and sawgrass habitat during dry conditions (FWS, 2007a). Colonization of areas by shrubs resulting from prolonged dry conditions provide for undesirable changes to the interior marsh of the Refuge. All of these effects, to the extent that they may have already occurred, are due to the drought, rather than the proposed deviation.

4.3.2 Wildlife

Extremely dry conditions in the interior will affect alligator reproduction through a number of mechanisms including increased difficulty for males to successfully locate females. Of particular importance, lower levels in the canal will likely prevent alligator nesting along the canal perimeter (nesting is from late June with hatching in August/September), and alligators that attempt nesting within the Refuge may construct nests with clutches at low elevations because of lack of water, only to be flooded once the wet season begins.

Although not federally listed species, several wading bird nesting colonies composed of thousands of individuals, including State-listed species, are located within the WCAs. Nesting birds include white ibis, great egret, and little blue heron. The deviation may result in more rapid and excessive drying of soils along the perimeter canals, beneath nesting colonies, which could potentially result in nest abandonment or predation. This may also further contribute to a decrease in forage fish populations necessary for nesting success. The drought itself is anticipated to cause some nest abandonment, but any deviation could worsen the situation.

Even after the drought ends and water levels return to within schedule, it is anticipated that the drought will have lingering impacts to wildlife and habitats. In areas where there are few or no refugia, or where conditions became so dry that even the alligator holes dry, entire aquatic fauna populations may be lost. Small fish such as mosquitofish may recover within one year, while other species may take 3-5 years or longer to recover. The result is lower productivity (food for higher trophic levels) and potentially a depleted recreational fishery. Lower productivity can contribute to low nesting success in wood storks and other wading birds in future years. A large number of fish within the marsh interior are expected to perish in the drought, and the deviation could potentially increase this number. For example, fish densities in the canal will increase and water

temperatures will rise as summer progresses. Depending on the duration of the drought and deviation, these conditions could result in an increase in disease and/or internal and external parasite infections, as well as a decrease in dissolved oxygen levels. These effects will result in stress to native fish populations (including forage and sport fish) and could ultimately result in fish kills within the Refuge canal system (USFWS May 9, 2007).

4.3.3 Wading Birds

WCA-1 and WCA-2 serve as important wading bird foraging and colony nesting sites. Although WCA-2 does not typically support colonial nesting sites, it does provide important foraging habitat for nesting wading birds in nearby WCA's 1 & 3. Many of the larger wading bird rookeries in the WCA's are located in areas that typically remain flooded throughout the nesting season, and canal level changes can reduce the suitability of the adjacent marshes for foraging or colony sites. The timing of the deviation during the normal wading bird nesting season could increase the risk of colony failures or lack of colony formation. Wading birds require approximately 60-120 days to successfully nest. Wading bird reproduction is linked to both the appropriate dry season as well as hydrologic conditions of the proceeding wet season, and extended dry seasons with water levels below ground surface for prolonged periods may lead to lower prey populations for subsequent breeding seasons (FWC, 2008). Slow recession rates could reduce nest abandonments and minimize the loss of foraging areas as well as provide adequate time for the birds to complete nesting.

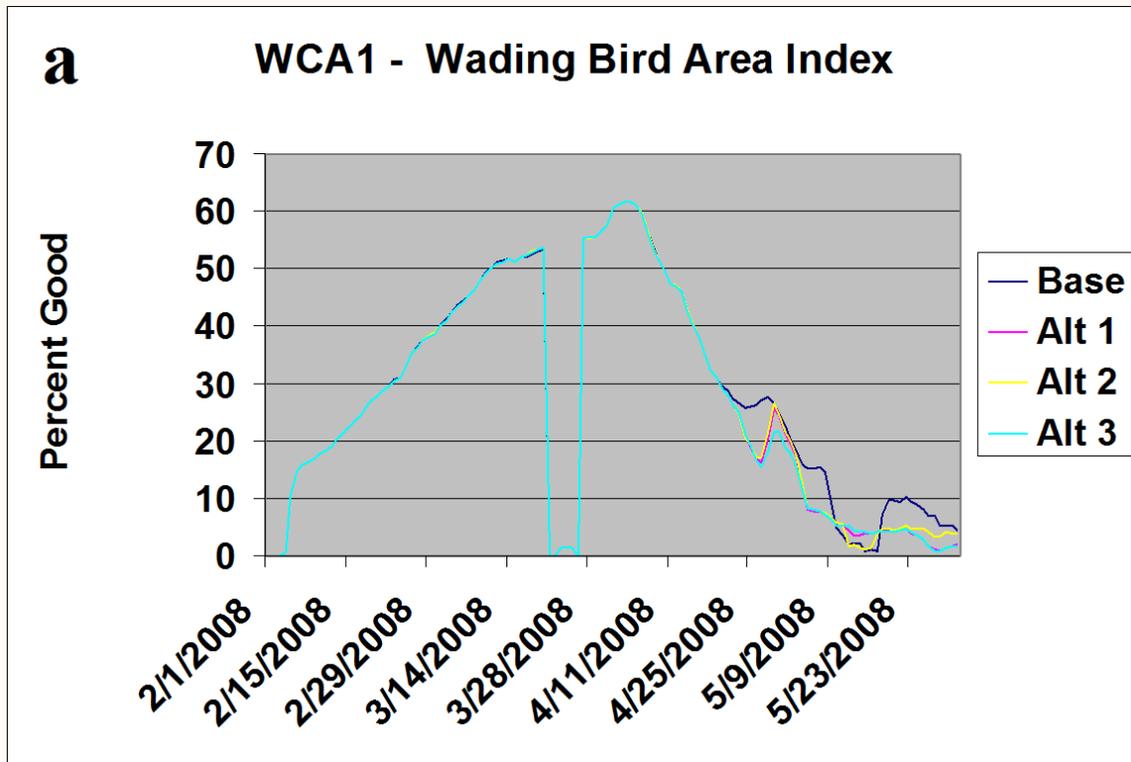


Figure 8 – Wading Bird Area Index

The Wading Bird Area Index (WBAI) is a calculation derived from water depth and weekly water recession rates that can give us a general idea of the conditions for wading birds. Additional details on calculating the WBAI are outlined in the *Ecological Analysis for Potential WCA-1 and WCA-2A Deviations* provided by the SFWMD as a supporting document with their deviation request. Results for the WBAI are reported in acreages designated as good, fair or poor. For the purpose of this study, a graph was created that plots the evaluated alternatives over the duration of the deviation. Although between the base and any action alternatives, there is as much as a 5% difference in “Good” wading bird habitat, as seen in **Figure 8**, it is difficult to see a quantifiable difference between Alternatives 1-3. This is due in part because the WBAI is dependent on water depth, and once the water is below the surface, it is within the “Bad” category.

4.3.4 Endangered Species

4.3.4.1 Snail Kites

The continuing drought conditions in South Florida are having negative impacts on snail kite nesting in the WCA’s. Last year, the majority (approximately 80%) of observed snail kite nesting occurred in the Kissimmee Chain of Lakes, largely in Lake Tohopekaliga, with few nests observed in Lake Okeechobee, St. Johns Marsh, Grassy Waters, or the WCA’s (USFWS, 2007). This apparent shift in breeding population to the north suggests a level of adaptability and resilience in the population in response to the severe stress of the drought. At the time of this writing, a conclusion on the 2007 nesting data was not available, but preliminary information suggested that although there were fewer nesting attempts overall by kites, there was a higher nest success rate than in recent years, with over 95% of successful nests occurring in the Kissimmee Chain of Lakes.

Apple snails (*Pomacea paludosa*), are the primary food source of snail kites and are highly impacted by timing of receding water levels. Apple snail populations can be decimated by quickly receding water levels and/or timing of receding water levels, and this can lead to 3-5 years of decreased food source for the snail kites, even if hydrologic conditions improve within one year.

Apple snail laying season typically starts in late February, and their critical growth period is the first 2-3 months. After that, they are better able to survive dry downs. Model results for the proposed deviations show that water levels are above ground until early May and this provides excellent conditions to promote egg cluster and also gives the majority of hatchlings enough time to grow and survive the approximate 2-3 month dry-down (Darby, 2008). Dr. Phil Darby, who has studied apple snail ecology for many years, reviewed the alternatives being evaluated in this study and recommended Alternative 2 due to the fact that if the 2008 wet season does not provide adequate rains, there is a possibility that the drying period may extend longer than predicted, resulting in a catastrophic mortality to the apple snails. With a dry-out of less than 6 weeks survival rates for adult snails are 90%, whereas survival rates for juvenile snails are 50-75%. If the dry-out is 3 months survival rates are 75% for adults, but only 25% for juveniles (Darby, 2008).

4.3.4.2 Wood Storks

If a deviation is implemented, rapid recession rates may result in negative impacts to nesting wading birds, including wood storks. Although temporary deviations are generally approved with a gradual decrease in water levels, it is desirable to have an adaptive approach that considers implementing slower recession rates during critical nesting periods for snail kites, wood storks, and wading birds and allows for a faster recession rate once critical nesting periods are over, instead of relying only on dates on a regulation schedule.

4.4 Muck Fires

The Muck Fire Area Index (MFAI) estimates the probability of a peat fires based on criteria that evaluate water levels and the organic content of the peat soil at different

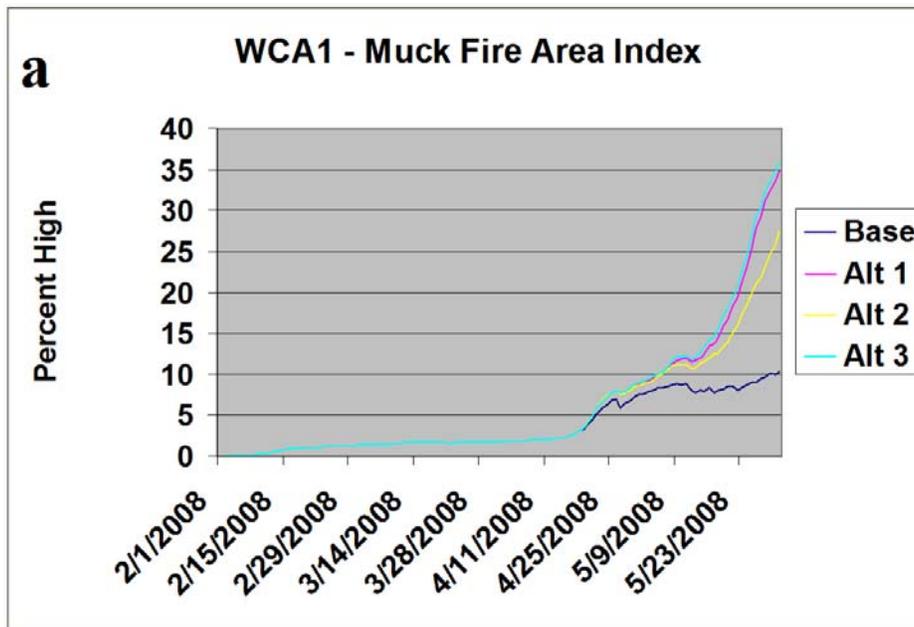


Figure 9 – Muck Fire Area Index

locations. Additional details on calculating the MFAI can be found in the *Ecological Analysis for Potential WCA-1 and WCA-2A Deviations*, located in Appendix B. There are three reporting categories for the MFAI: Green (low risk), yellow (moderate risk), and red (high risk). **Figure 9** summarizes the muck fire index through the 2008 dry season for the different alternatives considered. As outlined in the *Ecological Analysis for Potential WCA-1 and WCA-2A Deviations*, as much as 25% more of the fringe marshes in WCA-1 could be at high risk for muck fire under Alternatives 1 and 3 as compared to the no-action alternative.

Under Alternative 3 there would no available water in the northern portion of the canals for fire suppression, as northern canal sediments would be exposed. The additional lowering of stage in the Refuge Canal from Alternative 3 could result in more rapid and extreme marsh drying along with potential ecological ramifications.

5.0 The Recommended Action

The Jacksonville District, U.S. Army Corps of Engineers, has considered the temporary deviations request received from the South Florida Water Management District on December 7, 2007. The Corps recommends Alternative 2. Under alternative 2, the floor of WCA-1 will be temporarily lowered to 12.5 feet NGVD, while maintaining the pace of this recession as gradual as possible to reduce fire risk. The floor of WCA-2A will be temporarily lowered from 10.5 feet to 10 feet. According to the request, the deviations if implemented would continue through August 31, 2008 for WCA-1 and July 31, 2008 for WCA-2, when a gradual increase would begin with the onset of the wet season. The Corps recommends that water conservation measures be continued for the duration of the temporary deviation

Reasons for recommending Alt-2 deviations for WCA-1 and 2A include: Current water levels in the WCA's are above regulation schedule and approximately six inches higher than last year at this time. In short, the conditions are better than last year, and the deviation that was requested last year was not implemented. The amount of water provided under Alternative 1 vs. Alternative 2 is not a significant amount when the ecological impacts that could occur are considered. Under Alternatives 1 and 3, WCA-1 and WCA-2 would be expected to suffer more adverse effects on plant communities, habitat and forage species for wildlife, including listed endangered species, with each deeper increment of deviation. Water supply withdrawals would also increase the danger of muck fires as more and more surface area becomes exposed directly to the atmosphere, with water well below the surface, and this would also result in little or no water available in the canals to suppress fire.

6.0 Scoping and Coordination

A scoping letter was sent out January 14, 2008 to interested agencies, tribes, as well as the Florida State Clearinghouse. Responses are summarized below and also in Appendix C:

Department of Environmental Protection – stated they would like to see discussion of proposed monitoring that will evaluate the effects of the deviations on the Everglades ecosystem as well as monitoring for impacts to snail kites and apple snails. Discussion of potential water quality impacts should be discussed as well as consideration for potential improvements to phosphorous impacted areas. *Response: Monitoring will be required as outlined in the Biological Opinion. Water Quality Impacts are not anticipated as a result of lowering the water levels an additional 1.5 feet lower than regulation schedule would allow for such a short duration. The amount of actual exposed acreage as a result of the recommended deviation (1.5 foot lower than the approved regulation schedule allows) for such a short duration of time, is not expected to result in water quality issues.*

Florida Fish and Wildlife Conservation Commission – expressed concern on impacts to snail kite nesting, apple snail populations, wading bird nesting success, peat fire

incidents, fish and wildlife habitats, and recreational access. *Response: Impacts to these resources is covered in Section 4.*

South Florida Regional Planning Council – Recommends that impacts to natural systems be minimized to the greatest extent possible. *Response: The Corps concurs with this response and therefore recommends implementing Alternative 2, which will result in significantly less impacts to natural systems.*

7.0 Preparers

Catherine Byrd	Biologist	Main Author	USACE
Luis G. Cadavid, Ph.D.	Chief Engineer, Model Application Unit	Hydrologic Modeling & Reviewer	SFWMD
Barbara Cintron	Supervisory Biologist	Reviewer	USACE
Susan Hohner	Senior Geographer	Ecological Assessment, Reviewer	SFWMD
Trent Ferguson	Civil Engineer	Reviewer	USACE
Sally Kennedy	Senior Planner	Reviewer	SFWMD
Calvin J. Neidrauer, P.E.	Chief Engineer, Operations	Technical Information, Reviewer	SFWMD
Ken Rutchey	Lead Environmental Scientist	Ecological Assessment, Reviewer	SFWMD
Olice Williams	Civil Engineer	Reviewer	USACE

8.0 Compliance of the Proposed Action with Environmental Law, Regulations, and Policies

- National Environmental Policy Act of 1969, as amended. Environmental information on the project has been compiled and an Environmental Assessment, dated March 2008 has been prepared. The project is in compliance with the National Environmental Policy Act.
- Endangered Species Act of 1973, as amended. Endangered Species Emergency consultation with USFWS was initiated on March 6, 2008 for the wood stork and the snail kite. This project is in full compliance with the Act.
- Fish and Wildlife Coordination Act of 1958, as amended. There are no structural changes for this temporary deviation. This project is in full compliance with this Act.
- National Historic Preservation Act of 1966, (PL 89-665), the Archeological and Historic Preservation Act (PL 93-291), and Executive Order 11593. Temporary water deviation will have no effect on historical resources; therefore, this action is in compliance with this act.
- Clean Water Act of 1972, as amended. There are no structural changes or diversion of water as part of this temporary deviation. This project is in full compliance with this act.
- Coastal Zone Management Act of 1972, as amended. State consistency review was performed during the scoping phase of this project and the State has determined that the project is consistent with the Florida Coastal Zone Management Program.
- Farmland Protection Policy Act of 1981. No prime or unique farmland would be impacted by implementation of this project. This act is not applicable.
- Marine Mammal Protection Act of 1972, as amended. Marine mammals would not be affected by this action; therefore, this Act is not applicable.
- E.O. 11990, Protection of Wetlands. No wetlands would be permanently impacted by this action. This project is in compliance with the goals of this Executive Order.

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