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ENVIRONMENTAL AND CULTURAL RESOURCES

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APPENDIX C.1

EXISTING AND FUTURE WITHOUT PROJECT CONDITIONS

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C.1 EXISTING AND FUTURE WITHOUT PROJECT CONDITIONS

C.1.1 EXISTING CONDITIONS OF RESOURCES

The study area for the Central Everglades Planning Project (CEPP) encompasses the Northern Estuaries (St. Lucie River and Indian River Lagoon and the Caloosahatchee River and Estuary), Lake Okeechobee, a portion of the Everglades Agricultural Area (EAA), the Water Conservation Areas (WCAs), Everglades National Park (ENP), the Southern Estuaries (Florida Bay and Biscayne Bay), and the Lower East Coast (LEC). The following describes the existing physical, ecological, and socioeconomic conditions within this large study area. The existing conditions are presented in a regional or area specific content depending on the nature of the resource or the anticipated effect of that resource. Existing conditions are summarized in **Section 2.0** (**Exiting and Future Without Conditions**) of the main report.

C.1.1.1 Vegetative Communities

C.1.1.1.1 Lake Okeechobee

The vegetation and cover types within the Lake Okeechobee region have been greatly altered during the last century. Historically, the natural vegetation was a mix of freshwater marshes, hardwood swamps, cypress swamps, pond apple forests, and pine flatwoods. The freshwater marshes were the predominant cover type throughout, especially along the southern portion of Lake Okeechobee where it flowed into the Everglades. These marshes were vegetated primarily with sawgrass (*Cladium jamaicense*) and scattered clumps of Carolina willow (*Salix caroliniana*), sweetbay (*Magnolia virginiana*) and cypress (*Taxodium* spp.). Hardwood swamps dominated by red maple (*Acer rubrum*), sweetbay, and sweet gum (*Liquidambar styraciflua*) occurred in riverine areas feeding Lake Okeechobee, while cypress swamps were found in depressional areas throughout the region. Pine flatwoods composed of slash pine (*Pinus elliottii*), cabbage palm (*Sabal palmetto*) and saw palmetto (*Serenoa repens*) were prevalent in upland areas, especially to the north.

The majority of the surface of Lake Okeechobee is not vegetated and provides open water (pelagic) habitat. Open water habitat within Lake Okeechobee covers about 75 % of the lake's surface area.

Lake Okeechobee currently has an extensive littoral zone that occupies approximately 150 square miles (about 25 percent) of the lake's surface (Milleson 1987). Littoral vegetation occurs along much of Lake Okeechobee's perimeter, but is most extensive along the southern and western borders (Milleson 1987). The littoral zone plant community is composed of a mosaic of emergent, submergent and native plant species. Emergent vegetation within the littoral zone is dominated by herbaceous species such as cattail (*Typha* spp.), spike rush (*Eleocharis cellulosa*), and the invasive exotic torpedo grass (*Panicum repens*). Other emergent vegetation includes bulrush (*Scirpus californicus*), sawgrass, pickerelweed (*Pontedaria cordata*), duck potato (*Sagittaria* spp.), beakrush (*Rhynochospora tracyi*), wild rice (*Zizania aquatic*), arrowhead (*Sagittaria latifolia*), buttonbush (*Cephalanthus occidentalis*), sand cordgrass (*Spartina bakeri*), fuirena (*Fuirena scirpoidea*), rush (*Scirpus cubensis*), southern cutgrass (*Leersia hexandra*), maidencane (*Panicum hemitomon*), white vine (*Sarcostemma clausum*), dogfennel (*Eupatorium capillifolium*), and mikania (*Mikania scandens*). Woody vegetation consists of primrose willow (*Ludwigia peruviana*), Carolina willow, and the invasive exotic melaleuca (*Melaleuca quiquenervia*). Over the years, there has been an on-going effort to eradicate melaleuca in the Lake Okeechobee region. The eradication effort has been extremely effective.

Submerged vegetation within Lake Okeechobee is composed almost entirely of hydrilla (*Hydrilla verticillata*), an invasive exotic species, pondweed (*Potoamogeton illinoensis*), bladderwort (*Utricularia foliosa*), Chara (*Chara* spp.) and tape grass (*Vallisneria americana*).

The floating, component of the littoral zone consists of lotus lily (*Nelumbo lutea*), fragrant water lily (*Nymphaea odorate* and *N. mexicana*), the invasive exotic water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), duckweed (*Lemna* spp.), coinwort (*Hydrocotyle umbellate*), and ludwigia (*Ludwigia leptocarpa*).

C.1.1.1.2 Northern Estuaries

Submerged aquatic vegetation (SAV), which collectively includes seagrass and macroalgae, is one of the most important vegetation communities of the St. Lucie River, Indian River Lagoon, and the Caloosahatchee River and Estuary (IRL CCMP 1996). These communities are highly productive and provide food for fish, sea turtles, manatees, a myriad of invertebrates, and other species. Seagrass meadows improve water quality by removing nutrients, dissipating the effects of waves and currents, and by stabilizing bottom habitats thereby reducing suspended solids. Seagrass beds support some of the most abundant and diverse fish populations in the Indian River Lagoon. Many commercial and recreational fisheries (e.g. clams, shrimp, lobster, and fish) are associated with healthy seagrass beds (US Fish and Wildlife Service (USFWS 1999). Currently, many SAV beds are stressed and have been reduced or eliminated from their former areas by extreme salinity fluctuations, increased turbidity, sedimentation, dredging, damage from boats, and nutrient enrichment which causes algal blooms that, in turn, restrict light penetration.

C.1.1.1.2.1 Upper Caloosahatchee River and Estuary

In terms of distribution and abundance tape grass has been the dominant species in the upper Caloosahatchee River and Estuary, colonizing littoral zones in water of less than one meter (Chamberlain and Doering 1998a). In the early 1990s, tape grass covered approximately 1,000 acres and about 60% of the coverage occurred within an 8-kilometer (km) stretch between Beautiful Island and the Fort Myers Bridge (Hoffacker 1994). Total longitudinal cover ranged from 14 to 32 km upstream from Shell Point (Chamberlain and Doering 1998b). Tape grass can typically tolerate salinities of 3 to 5 practical salinity units (psu) with few long-term effects if light conditions are sufficient (Haller et al. 1974, French and Moore 2003, Jarvis and Moore 2008). Dramatic declines in tape grass were observed beginning in late 2006 as a result of salinities exceeding the species' tolerance (Bourn 1932, Haller et al. 1974, Doering et al. 1999, Kraemer et al. 1999, Doering et al. 2001). During this period, widgeon grass, (*Ruppia maritime*) was the dominant species although it never achieved even the minimum abundance recorded for tape grass (Burns et al. 2007).

The effects of hurricane water releases in 2005 resulted in decreased plant cover and density in the latter half of 2005. Compounding the high turbidity effects from freshwater releases in 2005, drought conditions caused precipitous increases in salinities beginning in October 2006 raising salinity levels to 10 to 25 psu from November 2006 through April 2008. During the December 2005 to April 2006 period, lower water clarity due to high turbidity was associated with lower shoot density and cover. The loss of plants was quite rapid with a significant end-of-year dieback in 2006 followed by no regrowth in spring 2007. Salinities finally declined between April and October 2008, but tape grass recovery has been slow. This may be related to a lack of propagules as nearly all the tape grass was lost during the late 2006 to 2008 high salinity period. It may also be related to

herbivory or other impacts on the initial recolonization of recruits into the area as leaves were sometimes noted as missing their tips (RECOVER 2009).

C.1.1.1.2.2 Lower Caloosahatchee River Estuary

Historically, two species of SAV have been routinely reported during surveys in the lower Caloosahatchee River Estuary upstream of Shell Point. These include shoal weed *(Halodule beuadettei*) or shoal grass (*H. wrightii*) and turtle grass (*Thalassia testudinum*) (Chamberlain and Doering 1998a, Wilzbach et al. 2000, Burns et al. 2007). In more recent reports, manatee grass (*Syringodium filiforme*) has been reported in San Carlos and Tarpon Bays (Wilzbach et al. 2000, Burns et al. 2007). Shoal grass coverage, described as abundant, has been at 300 acres; about 75% of this occurred between two and eight kilometers (km) upstream of Shell Point (Chamberlain and Doering 1998b).

From 2004 to 2008, the lower estuary was dominated by shoal grass. Although widgeon grass was observed occasionally (Burns et al. 2007); only very low densities of widgeon grass were found in the lower estuary when surveys were searching specifically for it. High salinity fluctuations with tides and shading by shoal grass may limit its growth. Low salinities during higher rainfall periods and discharge events observed since 2004 likely prevented the survival of seagrass species such as turtle grass (Burns et al. 2007). Water clarity was poor in 2004 and 2005 preventing SAV growth in waters greater than 0.7 meter deep. Water clarity conditions improved in 2007 and were sufficient for growth down to 1.2 meters.

Hurricane effects lowering SAV abundance in 2005 and 2006 and subsequent shoal grass recovery in 2007 are evident with cover in 2007 exceeding 2004 levels. Salinities of one psu or less occurred each year from 2004 to 2006 due to high rainfall within the watershed.

C.1.1.1.2.3 St. Lucie Estuary

The St. Lucie Estuary and Southern Indian River Lagoon support six species of seagrass including shoal grass, manatee grass, turtle grass, paddle grass, star grass *(Halophila engelmannii*), and the threatened Johnson's seagrass (*Halophila johnsonii*). Johnson's seagrass was listed as threatened under the Endangered Species Act (ESA) in 1998, and critical habitat was designated in 2000. The species has a very limited distribution along the east coast of Florida from central Biscayne Bay to Sebastian Inlet. Major threats include propeller scarring, dredging, sedimentation, and degraded water quality. Shoal grass and manatee grass are the dominant canopy species in the lagoon (Thompson 1978, Dawes et al. 1995, Morris et al. 2000). While all of these species are most successful in salinities greater than 20 psu, shoal grass can tolerate a wide range of salinity and salinity variations. However, manatee grass is not as tolerant of low salinities or widely varying salinities (Irlandi 2006).

The SAV distribution has been mapped in the St. Lucie Estuary and the Southern Indian River Lagoon every two to three years since 1986, including annual mapping from 2005 through 2007 to help assess hurricane impacts. Historic SAV maps show SAV extending throughout the estuary. In 2007, very sparse (< 10% cover in most areas) SAV was present in the lower and middle estuary. Three seagrass species occurred within the estuary: shoal grass, Johnson's seagrass, and paddle grass. The majority of the SAV occurred in small isolated patches. The dominant SAV species in 2007 was Johnson's seagrass. It also extended farther upstream than any other SAV species.

This region was impacted by hurricanes and associated freshwater discharges in 2004 and 2005. Following the hurricanes, observed impacts to southern Indian River Lagoon SAV communities included large coverage and density declines and smaller direct impacts due to burial by shifting bottom sediments. Lush manatee grass beds were documented through 2004, however, low salinities and associated poor water quality following the 2004 and 2005 hurricanes greatly impacted manatee grass in the area. The hurricanes also altered bathymetry on the east and west edges of the estuary, covering seagrasses. The steepest decline in percent occurrence of manatee grass occurred in 2005 after Hurricane Wilma. Johnson's seagrass followed by shoal grass colonized the former manatee grass habitat and recruited throughout the site. Available data indicates a clear trend toward recovery of the manatee grass beds.

C.1.1.1.3 Everglades Agricultural Area

Currently, much of the native south Florida landscape has been destroyed or substantially reduced by development, hydrologic change, increased nutrients, and the invasion of exotic plants. South of Lake Okeechobee, the historic pond apple swamps and sawgrass marshes have been converted to agriculture. Habitat types within the EAA are divided into five general groups: aquatic, wetland, upland, disturbed (mostly agricultural), and urban/extractive.

The aquatic communities within the EAA include both natural and man-made areas of open water such as canals, ditches, and ponds. The primary canals include Bolles, Cross, Hillsboro, Miami, North New River, and West Palm Beach Canals. The storage and treatment management measures for CEPP south of Lake Okeechobee are recommended to be located on and maximize the usage of the previously purchased A-1 and A-2 Compartments of the EAA land south of Lake Okeechobee that are owned by the State of Florida (See **Section 3.0 Formulation of Alternative Plans**). All of Compartment A of the Talisman Land Exchange property is considered to be atypical jurisdictional wetlands based on hydric soils and hydrology. Wetland vegetation is anticipated to return to the site should agricultural practices cease. Upland land cover classes include dry prairie, hardwood hammock and forests, pinelands, and mixed hardwood pine forests. Disturbed communities consist of mostly agricultural lands including pasture (improved and unimproved), row crops, sugarcane, citrus, and other agricultural lands. Most of the urban and extractive lands are concentrated around the Belle Glade area. Low impact urban areas consist of either vegetated or non-vegetated lands within areas such as lawns, golf courses, road shoulders, and grassy areas surrounding development. High impact urban areas are non vegetated sites such as buildings, roads, and parking lots. Extractive cover areas consist of surface mining operations such as limestone quarries, phosphate mines, and sand pits as well as the associated industrial complexes.

C.1.1.1.4 Greater Everglades

The Everglades landscape is dominated by a complex of freshwater wetland communities that includes open water sloughs and marshes, dense grass and sedge dominated marshes, forested islands, and wet marl prairies. The primary factors influencing the distribution of dominant freshwater wetland plant species of the Everglades are soil type, soil depth, and hydrological regime (USFWS 1999). These communities generally occur along a hydrological gradient with the slough/open water marsh communities occupying the wettest areas (flooded more than nine months per year), followed by sawgrass marshes (flooded six to nine months per year), and wet marl prairie communities (flooded less than six months per year) (USFWS 1999). The Everglades freshwater wetlands eventually grade into intertidal mangrove wetlands and sub tidal seagrass beds in the estuarine waters of Florida Bay.

Development and drainage over the last century have dramatically reduced the overall spatial extent of freshwater wetlands within the Everglades, with approximately half of the predrainage 2.96 million acres of wetlands being converted for development and agriculture (Davis and Ogden 1997). Alteration of the normal flow of freshwater through the Everglades has also contributed to conversions between community types, invasion by exotic species, and a general loss of community diversity and heterogeneity.

Many areas of WCA 3A still contain relatively good wetland habitat consisting of a complex of tree islands, sawgrass marshes, wet prairies, and aquatic sloughs. Water lilies (*Nymphaea alba*) were originally widespread in sloughs throughout many areas of WCA 3A (McVoy et. al. 2011). Reduced freshwater inflow and drainage by the Miami Canal have overdrained the northern portion of WCA 3A, resulting in increased fire frequency and the associated loss of tree islands, wet prairie, and aquatic slough habitat. Northern WCA 3A is currently dominated largely by mono-specific sawgrass stands with large areas of shrubs and monotypic cattail. Northern WCA 3A lacks the diversity of communities that exists in southern WCA 3A. In southern WCA 3A, Woods and Tanner (1990) documented the trend toward deep water lily dominated sloughs due to impoundment. In approximately 1991, the hydrology of southern WCA 3A shifted to the deeper water and extended hydroperiods of the new, wet hydrologic era resulting in a northward shift in slough vegetation communities within the WCA 3A impoundment (Zweig and Kitchens 2008). Typical Everglades vegetation, including tree islands, wet prairies, sawgrass marshes, and aquatic sloughs also occur throughout WCA 3B. However, within WCA 3B, the ridge and slough landscape has been severely degraded by the virtual elimination of overland sheetflow due to the L-67 canal and levee system. WCA 3B experiences very little overland flow and has become primarily a rain-fed system predominated by shorter hydroperiod sawgrass marshes with relatively few sloughs or tree islands remaining. Water levels in WCA 3B are also too low and do not vary seasonally, contributing to poor ridge and slough patterning. Loss of sheetflow to WCA 3B has also accelerated soil loss reducing elevations of the remaining tree islands in WCA 3B and making them vulnerable to high water stages.

Vegetative trends in ENP have included a substantial shift from the longer hydroperiod slough/open water marsh communities to shorter hydroperiod sawgrass marshes (Davis and Ogden 1997, Armentano et al. 2006). Flows through Shark River Slough (SRS) under current system compartmentalization and water management practices are greatly reduced when compared with pre-drainage conditions. The result has been lower wet season depths and more frequent and severe dry downs in sloughs and reduction in extent of shallow water edges (McVoy et.al. 2011). Over-drainage in the peripheral wetlands along the eastern flank of Northeast Shark River Slough (NESRS) has resulted in shifts in community composition, invasion by exotic woody species and increased susceptibility to fire. Areas within the eastern marl prairies along the boundary of ENP suffer from over-drainage, reduced water flow, exotic tree invasion and frequent human-induced fires (Lockwood et al. 2003; Ross et al. 2006). In addition, invasion of sawgrass marshes and wet prairies by exotic woody species has led to the conversion of some marsh communities to forested wetlands (Gunderson et al. 1997).

The estuarine communities of Florida Bay have also been affected by upstream changes in freshwater flows through the Everglades. A reduction in freshwater inflows into Florida Bay and alterations of the normal salinity balance have affected mangrove community composition and may have contributed to a large-scale die-off of seagrass beds (USFWS 1999).

In contrast to the vast extent of wetland communities, upland communities comprise a relatively small component of the Everglades landscape and are largely restricted to Long Pine Key, the northern shores of Florida Bay, and the many tree islands scattered throughout the region. Vegetative communities of Long Pine Key include rockland pine forest and tropical hardwood forest. In addition, substantial areas of tropical hardwood hammock occur along the northern shores of Florida Bay and on elevated portions of some forested islands.

C.1.1.1.4.1 Slough/Open Water Marsh

The slough/open water marsh community occurs in the lowest, wettest areas of the Everglades. This community is a complex of open water marshes containing emergent, floating aquatic, and submerged aquatic vegetation components. The emergent marsh vegetation is typically dominated by spikerushes (*Eleocharis cellulosa* and *E. elongata*), beakrushes, and maidencane. Common floating aquatic dominants include fragrant water lily, floating hearts (*Nymphoides aquatica*), and spatterdock (*Nuphar lutea*); and the submerged aquatic community is typically dominated by bladderwort (*Utricularia foliosa*) and periphyton. As shown by Davis et al. (1994), vegetative trends in ENP have included the conversion of slough/open-water marsh communities to shorter hydroperiod sawgrass marshes.

C.1.1.1.4.2 Sawgrass Marsh

Sawgrass marshes are dominated by dense to sparse stands of *Cladium jamaicense*. Sawgrass marshes occurring on deep organic soils (more than one meter) form tall, dense, nearly monospecific stands. Sawgrass marshes occurring on shallow organic soils (less than one meter) form sparse, short stands that contain additional herbaceous species such as spikerush, water hyssop (*Bacopa caroliniana*), and marsh mermaid weed (*Proserpinaca palustris*) (Gunderson et al. 1997). The adaptations of sawgrass to flooding, burning, and oligotrophic conditions contribute to its dominance of the Everglades vegetation. Sawgrass-dominated marshes once covered an estimated 300,000 acres of the Everglades. Approximately 70,000 acres of tall, monospecific sawgrass marshes have been converted to agriculture in the EAA. Urban encroachment from the east and development within other portions of the Everglades has consumed an additional 79,000 acres of sawgrass-dominated communities (Davis and Ogden 1997).

C.1.1.1.4.3 Wet Marl Prairies

Wet marl prairies occur on marl soils and exposed limestone and experience the shortest hydroperiods of the slough/marsh/prairie wetland complex. Marl prairie is a sparsely vegetated community that is typically dominated by muhly grass (*Muhlenbergia capillaris*) and short-stature sawgrass. Additional important constituents include black sedge (*Schoenus nigricans*), arrowfeather (*Aristida purpurascens*), Florida little bluestem (*Schizachyrium rhizomatum*), and Elliot's lovegrass (*Eragrostis elliottii*). Periphyton mats that grow loosely attached to the vegetation and exposed limestone also form an important component of this community. Marl prairies occur in the southern Everglades along the eastern and western periphery of SRS. Approximately 146,000 acres of the eastern marl prairie have been lost to urban and agricultural encroachment (Davis and Ogden 1997). Pollen data indicate that the marl prairies west of SRS are not a natural feature of the Everglades landscape but developed after twentieth century hydrologic modification of the system reduced flow to the region (Bernhardt and Willard 2006). Prior to the modifications, plant communities at the sites analyzed by Bernhardt and Willard (2006) in western SRS consisted of sawgrass marshes. Based on their analysis of pollen records, the authors concluded that “the current spatial distribution and community composition of marl prairies are a response to water management and land cover changes of the twentieth century; and further sampling of modern

marl prairie communities and adjacent communities is necessary to document the pre- and post-drainage distribution of marl prairie" (Bernhardt and Willard 2006).

C.1.1.1.4.4 Tree Islands

Tree islands occur within the freshwater marshes in areas of slightly higher elevation relative to the surrounding marsh. The lower portions of tree islands are dominated by hydrophytic, evergreen, broad-leaved hardwoods such as red bay (*Persea palustris*), sweetbay, dahoon holly (*Ilex cassine*), and pond apple (*Annona glabra*). Tree islands typically have a dense shrub layer that is dominated by coco-plum (*Chrysobalanus icaco*). Additional constituents of the shrub layer commonly include buttonbush and large leather fern (*Acrostichum danaeifolium*). Elevated areas on the upstream side of some tree islands may contain an upland tropical hardwood hammock community dominated by species of West Indian origin (Gunderson et al. 1997), with species composition shifting toward the north toward more temperate hardwood hammock species. Extended periods of flooding may result in tree mortality and conversion to a non-forested community. In the over-drained areas of WCA 3A, historic wildfires have consumed tree island vegetation and soils. Overall, the spatial extent of tree islands in WCA 3 declined by 61% between 1940 and 1995 (Patterson and Finck 1999). Portions of the WCAs have been flooded to the extent that many forested islands have lost all tropical hardwood hammock trees. Tree islands are considered an extremely important contributor to habitat heterogeneity and overall species diversity within the Everglades ecosystem because they provide nesting habitat and refugia for birds and upland species and serve as hotspots of plant species diversity within the Greater Everglades (Sklar and van der Valk 2002, USFWS 1999). Tree islands also contain extraordinarily high levels of total phosphorpus (TP) in their soil suggesting that they may play a major role in the biogeochemical cycles of nutrients in the Everglades (Trexler and Childers 2010, Wetzel et al. 2009, 2011). Wetzel et al. (2011) found that soil TP levels within WCA 3A and WCA 3B tree islands were approximately 4 times higher than the surrounding marsh TP levels. Tree islands within WCA 3B may help to capture and focus nutrients, assisting to minimize potential effects on sawgrass and wet prairie communities within this region (Wetzel et al. 2011).

C.1.1.1.4.5 Mangroves

Mangrove communities are forested wetlands occurring in intertidal, low-wave-energy, estuarine and marine environments. Extensive mangrove communities occur in the intertidal zone of Florida Bay. Mangrove forests have a dense canopy dominated by four species: red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*), and buttonwood (*Conocarpus erectus*). Mangrove communities occur within a range of salinities from 0 to 40 psu. Florida Bay experiences salinities in excess of 40 psu on a seasonal basis. Declines in freshwater flow through the Everglades have altered the salinity balance and species composition of mangrove communities within Florida Bay, favoring more salt tolerant species. Changes in freshwater flow can lead to an invasion by exotic species such as Australian pine (*Casuarina equisetifoli*a) and Brazilian pepper (*Schinus terebinthifolius*).

C.1.1.1.4.6 Seagrass Beds

Seagrasses are submerged vascular plants that form dense rooted beds in shallow estuarine and marine environments. This community occurs in sub tidal areas that experience moderate wave energy. Within the action area, extensive seagrass beds occur in Florida Bay. The most abundant seagrasses in south Florida are turtle grass, manatee grass, and shoal grass. Additional species include star grass, paddle grass, and Johnson's seagrass. Widgeon grass may also occur in seagrass beds in areas of low salinity. Seagrasses have an optimum salinity range of 24 to 35 psu, but can tolerate considerable short-term salinity fluctuations. Large-scale seagrass die-off has occurred in

Florida Bay since 1987, with over 18 percent of the total bay area affected. Suspected causes of seagrass mortality include high salinities and temperatures during the 1980s and long-term reductions of freshwater inflow to Florida Bay (RECOVER 2009).

C.1.1.1.4.7 Rockland Pine Forest

Pine rocklands within the action area occur on the Miami Rock Ridge and extend into the Everglades as Long Pine Key. Pine rocklands occur on relatively flat terrain with moderate to well-drained soils. Most sites are wet for only short periods following heavy rains (Florida Natural Areas Inventory 1990). Limestone bedrock is close to the surface and the soils are typically shallow accumulations of sand, marl, and organic material. Pine rockland is an open, savannah-like community with a canopy of scattered south Florida slash pine and an open, low-stature understory. This is a fire-maintained community that requires regular burns to maintain the open shrub/herbaceous stratum and to control hardwood encroachment (Gunderson et al. 1997). The overstory is comprised of scattered south Florida slash pines. The shrub layer is comprised of a diverse assemblage of tropical and temperate species. Common shrubs include cabbage palm, coco-plum (*Chrysobalanus icaco*), myrsine (*Rapanea punctata*), saw palmetto, southern sumac (*Rhus copallinum*), strangler fig (*Ficus aurea*), swamp bay (*Persea palustris*), wax myrtle (*Myrica cerifera*), white indigo berry (*Randia aculeata*), and willow-bustic (*Sideroxylon salicifolium*). The herbaceous stratum is comprised of a very diverse assemblage of grasses, sedges, and forbs. Common herbaceous species include crimson bluestem (*Schizachyrium sanguineum*), wire bluestem (*S. gracile*), hairy bluestem (*Andropogon longiberbis*), bushy bluestem (*A. glomeratus* var. *pumilis*), candyweed (*Polygala grandiflora*), creeping morning-glory (*Evolvulus sericeus*), pineland heliotrope (*Heliotropium polyphyllum*), rabbit bells (*Crotolaria rotundifolia*), and thistle (*Cirsium horridulum*) (USFWS 1999b). This community occurs on areas of relatively high elevation and consequently, has been subject to intense development pressure. In addition, fragmentation, fire suppression, invasion by exotic species, and a lowered water table have negatively affected the remaining tracts of pine rockland (USFWS 1999b).

C.1.1.1.4.8 Tropical Hardwood Hammock

Tropical hardwood hammocks occur on upland sites where limestone is near the surface. Tropical hardwood hammocks within the action area occur on the Miami Rock Ridge, along the northern shores of Florida Bay, and on elevated outcrops on the upstream side of tree islands. This community consists of a closed canopy forest dominated by a diverse assemblage of hardwood tree species, a relatively open shrub layer, and a sparse herbaceous stratum. This community is dominated by native south Florida species that represent the northern extension of the ranges of species that occur throughout the West Indies, but nowhere else in the continental United States. Common canopy species include gumbo limbo (*Bursera simaruba*), paradise tree (*Simarouba glauca*), pigeon-plum (*Coccoloba diversifolia*), strangler fig, wild mastic (*Sideroxylon foetidissimum*), willow-bustic, live oak (*Quercus virginiana*), short-leaf fig (*Ficus citrifolia*), and wild tamarind (*Lysiloma bahamense*). Common understory species include black ironwood (*Krugiodendron ferreum*), inkwood (*Exothea paniculata*), lancewood (*Ocotea coriacea*), marlberry (*Ardisia escallonoides*), poisonwood (*Metopium toxiferum*), satinleaf (*Chrysophyllum oliviforme*), and white stopper (*Eugenia axillaris*). Common species of the sparse shrub/herbaceous layer include shiny-leaf wild-coffee (*Psychotria nervosa*), rouge plant (*Rivinal humilis*), false mint (*Dicliptera sexangularis*), bamboo grass (*Lasciacis divaricata*), and woods grass (*Oplismenus hirtellus*). This community occurs on areas of relatively high elevation and consequently, has been subject to intense development pressure. Fragmentation of remaining tracts, invasion by exotic species, and alterations of water table elevations have also had negative impacts on this community. Tropical

hardwood hammocks on the Miami Rock Ridge have been affected by a lowered water table associated with the reduction of freshwater flow through the Everglades. In contrast, tree islands in the WCAs have been flooded to the extent that many have lost all tropical hardwood hammock trees.

C.1.1.2 Fish and Wildlife Resources

Aquatic macroinvertebrates form a vital link between the algal and detrital food web base of freshwater wetlands and the fishes, amphibians, reptiles, and wading birds that feed upon them. Important macroinvertebrates of the freshwater aquatic community include crayfish (*Procambarus alleni*), riverine grass shrimp (*Palaemonetes paludosus*), amphipods (*Hyallela aztecus*), Florida apple snail (*Pomacea paludosa*), Seminole ramshorn (*Planorbella duryi*), and numerous species of aquatic insects (USACE 1999).

Small freshwater marsh fishes are also important processors of algae, plankton, macrophytes, and macroinvertebrates. Marsh fishes provide an important food source for wading birds, amphibians, and reptiles. Common small freshwater marsh species include the native and introduced golden topminnow (*Fundulus chrysotus*), least killifish (*Heterandria formosa*), Florida flagfish (*Jordenella floridae*), golden shiner (*Notemigonus crysoleucas*), sailfin molly (*Poecilia latipinna*), bluefin killifish (*Lucania goodei*), oscar (*Astronotus ocellatus*), eastern mosquitofish (*Gambusia holbrookii*), and small sunfishes (*Lepomis* spp.) (USACE 1999). The density and distribution of marsh fish populations fluctuate with seasonal changes in water levels. Populations of marsh fishes increase during extended periods of continuous flooding during the wet season. As marsh surface waters recede during the dry season, marsh fishes become concentrated in areas that hold water through the dry season. Concentrated dry season assemblages of marsh fishes are more susceptible to predation and provide an important food source for wading birds (USACE 1999).

Within the Greater Everglades, numerous sport and larger predatory fishes occur in deeper canals and sloughs. Common species include largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), redear sunfish (*Lepomis microlophus*), black crappie (*Pomoxis nigromaculatus*), Florida gar (*Lepisosteus platyrhincus*), threadfin shad (*Dorosoma petenense*), gizzard shad (*Dorosoma cepedianum*), yellow bullhead (*Ameiurus natilis*), white catfish (*Ameiurus catus*), bowfin (*Amia calva*), and tilapia (*Tilapia* spp.) (USACE 1999). Larger fishes are an important food source for wading birds, alligators, otters, raccoons, and mink.

The freshwater wetland complex supports a diverse assemblage of reptiles and amphibians. Common amphibians include the greater siren (*Siren lacertina*), Everglades dwarf siren (*Pseudobranchus striatus*), two-toed amphiuma (*Amphiuma means*), pig frog (*Rana grylio*), southern leopard frog (*Rana sphenocephala*), Florida cricket frog (*Acris gryllus*), southern chorus frog (*Pseudacris nigrita*), squirrel tree frog (*Hyla squirela*), and green tree frog (*Hyla cinerea*) (USACE 1999). Amphibians represent an important forage base for wading birds, alligators, and larger predatory fishes (USACE 1999).

Common reptiles of freshwater wetlands include the American alligator (*Alligator mississippiensis*), snapping turtle (*Chelydra serpentina*), striped mud turtle (*Kinosternon bauri*), mud turtle (*Kinosternon subrubrum*), cooter (*Chrysemys floridana*), Florida chicken turtle (*Deirochelys reticularia*), Florida softshell turtle (*Trionys ferox*), water snake (*Natrix sipidon*), green water snake (*Natrix cyclopion*), mud snake (*Francia abacura*), and Florida cottonmouth (*Agkistrodon piscivorus*) (USACE 1999).

The alligator was historically most abundant in the peripheral Everglades marshes and freshwater mangrove habitats, but is now most abundant in canals and the deeper slough habitats of the central Everglades. Drainage of peripheral wetlands and increasing salinity in mangrove wetlands as a result of decreased freshwater flows has limited the occurrence of alligators in these habitats (Mazzotti and Brandt 1994).

The freshwater wetlands of the Everglades are noted for their abundance and diversity of colonial wading birds. Common wading birds include the white ibis (*Eudocimus albus*), glossy ibis (*Plegadus falcenellus*), great egret (*Casmerodius albus*), great blue heron (*Ardea herodius*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), snowy egret (*Egretta thula*), green-backed heron (*Butorides striatus*), cattle egret (*Bubulcus ibis*), black-crowned night heron (*Nycticorax nycticorax*), yellow-crowned night heron (*Nycticorax violacea*), roseate spoonbill (*Ajaia ajaja*), and wood stork (*Mycteria americana*) (USACE 1999). The number of wading birds nesting in the Everglades has decreased by approximately 90 percent, and the distribution of breeding birds has shifted away from ENP into the WCAs (Bancroft et al. 1994). The WCAs support fewer numbers of breeding pairs with relatively lower reproductive success (USACE 1999). Water management practices and wetland losses are believed to be the primary cause of the declines (Bancroft et al. 1994).

Mammals that are well-adapted to the aquatic and wetland conditions of the freshwater marsh complex include the rice rat (*Oryzomys palustris natator*), round-tailed muskrat (*Neofiber alleni*), and river otter (*Lutra canadensis*). Additional mammals that may utilize freshwater wetlands on a temporary basis include the white-tailed deer (*Odocoileus virginianus*), Florida panther (*Puma concolor coryi*), bobcat (*Lynx rufus*), and raccoon (*Procyon lotor*).

Many of the fish and wildlife resources that inhabit the freshwater aquatic community of the Everglades are also common to Lake Okeechobee, the Northern Estuaries, and the EAA. Native habitat for fish and wildlife does not comprise a significant amount of the EAA as the alteration of the landscape for agricultural uses has resulted in the removal of nearly all historically occurring native vegetation. Although abundant wetland habitat has been replaced by agriculture, the creation of ditches, canals, and the flooding of fallow agricultural fields provides some habitat for fish and wildlife, particularly during the rainy season.

The Northern Estuaries are also home to fish and wildlife species found in estuarine and marine habitats. Sea grasses and other submerged aquatic vegetation within the Northern Estuaries provide important habitat and nursery grounds for several fish species. Many fish species spend part or all of their life in the estuary. Common recreational and commercial fish species include mutton snapper (*Lutjanus analis*), yellowtail snapper (*Ocyurus chrysurus*), lane snapper (*Lutjanus synagris*), yellowtail parrot fish (*Sparisoma rubripinne*), gag grouper (*Mycteroperca microlepis*), pinfish (*Lagodon rhomboids*), tarpon (*Megalops atlanticus*), common snook (*Centropomus undecimalus*), crevalle jack (*Cranx hippos*), spotted sea trout (*Cynoscion nebulosus*), redfish (*Sciaenops ocellatus*), mullet (*Mugil spp*.), and sheepshead (*Archosargus probatocephalus*). In addition to finfish, the estuaries support a variety of shellfish. Blue crabs (*Callinectes sapidus*), stone crabs (*Menippe mercenaria*), hard clams (*Mercenaria mercenaria*), and oysters (*Crassostrea virginica*) are important estuarine commercial species. Submerged aquatic vegetation and algal communities are also common foraging areas for the green sea turtle (*Chelonia mydas*). The Northern Estuaries provides forage for sea birds (gulls, terns, pelicans, and others), in addition to a

large number of wading birds. The Northern Estuaries are also home to marine mammals such as the Atlantic bottlenose dolphin (*Tursiops truncatus*).

C.1.1.3 Invasive and Exotic Species

Executive Order (E.O.) 13112, entitled *Invasive Species*, states an "invasive species means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." Alien species (exotic) means, with respect to a particular ecosystem, any species, including its seeds, eggs, spores or other biological material capable of propagating that species and is not native to that ecosystem. Invasive species are broadly defined and can be a plant, animal, fungus, plant disease, livestock disease or other organism. A native species is defined as a species that historically occurred or currently occurs in a particular ecosystem and is not the result of an introduction.

Significant scientific evidence and research document that invasive non-native plants are degrading and damaging south Florida natural ecosystems (Doren and Ferriter 2001). Many species are causing significant ecological impacts by crowding out and displacing native plants, altering soil types and soil/water chemistry, altering ecosystem functions such as carbon sequestration, nutrient cycling and fire regimes, and reducing gene pools and genetic diversity. Non-native invasive animal distribution, extent and impacts are not well understood, however implications of invasive animals are apparent in south Florida. In addition to environmental impacts, invasive species impact human health, reduce agricultural production and property values, degrade aesthetic quality, decrease recreational opportunities and threaten the integrity of human infrastructure such as waterways/navigation channels, locks, levees, dams and water control structures.

Florida is particularly vulnerable to the introduction, invasion and naturalization of non-native species. This is due to several factors including a subtropical climate, dense human population centers, major ports of entry and the pet, aquarium and ornamental plant industries. Major disturbance to the landscape has also increased Florida's vulnerability to invasive species. Alteration of the landscape for urban development, flood control and agricultural uses has exacerbated non-native plant and animal invasions. On average, 10 new organisms per year are introduced into Florida that are capable of establishing and becoming invasive and causing environmental harm. Approximately 90% of the plants and animals that enter the continental United States enter through the port of Miami (Cuda 2009). Stein, Kutner & Adams (2000) estimated that over 32,000 exotic species (25,000 plants and 7,000 animals) have been introduced into Florida. There are approximately 4,000-5000 native species of plants and animals in Florida. The number of non-native species that have been introduced is eight times the total number of native species in the entire state. The Atlas of Florida Vascular Plants (Wunderlin and Hansen 2008) documented 4,289 plant species in Florida. Of the 4,289 plant species, 1,419 were considered non-native and were naturalized (freely reproducing) populations. The Florida Exotic Pest Plant Council (FLEPPC) identifies 76 of the 1,419 species of non-native plants as Category I species in the 2011 Invasive Plant List. Searches through existing data and resources indicate 156 non-native plant species have been documented to occur within the project area. Other non-native species are probably present; however, documented citations could not be located. Of the 156 species of plants documented to occur within the project area, there are 76 FLEPPC Category I species, 38 FLEPPC Category II species, and 28 Florida Noxious Weed species.

According to the 2013 South Florida Environmental Report, there are four species of non-native invasive plants infesting more than 144,770 acres within the Everglades Protection Area (EPA).

These species include Australian pine (*Casuarina equisetifolia*), Old World climbing fern (*Lygodium microphyllum*), melaleuca, and Brazilian pepper (*Schinus terebinthifolius*). The acreage of these plants was estimated by the South Florida Water Management District (SFWMD) and the National Park Service (NPS) through regional invasive plant surveys utilizing digital aerial sketch mapping (DASM). There were 224 surveys completed within the EPA, which is approximately 2.8 million acres in size, between March 2010 and February 2012. Management areas surveyed included Holeyland, Rotenberger and Southern Glades. Other areas surveyed included Big Cypress Seminole Indian Reservation, Loxahatchee National Wildlife Refuge (LNWR), Everglades Wildlife Management Area (WCAs 2 and 3), the Miccosukee Reservation, Big Cypress National Preserve (BCNP), ENP, East Coast Buffer Lands, South Dade Wetlands and several other areas (SFER 2013). Other non-native plant species of concern within the project area include torpedo grass, tropical American water grass (*Luziola subintegra*), roundleaf toothcup (*Rotala rotundifolia*), and cogon grass (*Imperata cylindrical*).

A primary native nuisance species within the project area is cattail. Many areas within the project area have been invaded by cattails. This is attributed to water with increased phosphorus being delivered to these areas beginning in the late 1950s. Areas where water control structures, conveyance features, and levees exist provide a suitable habitat for invasion and expansion of cattail. Examples of areas that have been impacted include WCA 2, WCA 3A, and ENP canal and levee banks.

Searches through existing data and resources indicate 89 non-native animal species have been documented to occur within the project area. Other non-native animal species are probably present however documented citations could not be located. Information regarding species presence and distribution is largely incomplete for most taxonomic groups of animals. Not all of the 89 non-native animal species identified and documented to occur in the CEPP area will have a significant impact on the ecosystem.

Key species of carnivorous reptiles, such as the Argentine black and white tegu (*Tupinambis merianae*), the Burmese python *(Python molurus bivittatus*) and Nile monitor *(Varanus niloticus*) are currently present within the project area and have potential to cause significant impacts to the ecosystem. These species are among south Florida's most threatening invasive animals and are considered top predators and increase pressures on native wildlife populations, particularly threatened and endangered species (SFER 2013). Other species of concern include the island apple snail (*Pomacea insularum*), purple swamphen (*Porphyrio porphyrio*), Asian swamp eel (*Monopterus albus*), monk parakeet (*Myiopsitta monachus*), feral pig (*Sus scrofa*), and redbay ambrosia beetle (*Xyleborus glabratus*) and associated fungus (*Raffaelea lauricola*). The redbay ambrosia beetle and fungus are of special concern since they are killing bay species on tree islands in ENP and the WCAs.

C.1.1.4 Threatened and Endangered Species

C.1.1.4.1 Federally Protected Species

USACE has coordinated the existence of federally listed species with the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS), as appropriate. Federally listed threatened and endangered species are either known to exist or potentially exist within the project area and, subsequently, may be affected by the proposed project. Many of these species have been previously affected by habitat impacts resulting from wetland drainage, alteration of hydroperiods, wildfire, and water quality degradation. A number of candidate animal and plant

species are also known to exist or potentially exist within the project area. For a complete list of federally threatened and endangered species, their critical habitat, and candidate species refer to the Biological Assessment (BA) included in **Annex A**. The BA also includes descriptions for each species.

C.1.1.4.2 State Listed Species

The study area also provides habitat for several state listed species. For a complete list of state listed species and a description for each species refer to the BA (**Annex A**).

C.1.1.5 Essential Fish Habitat

Essential Fish Habitat (EFH) located within the area affected by CEPP occurs within both the Northern Estuaries (St. Lucie River and Indian River Lagoon and the Caloosahatchee River and Estuary) and the Southern Estuaries (Biscayne Bay and Florida Bay) (National Marine Fisheries Service [NMFS] 2000).

C.1.1.5.1 St. Lucie River and Indian River Lagoon

This portion of the study area is within the jurisdiction of the South Atlantic Fishery Management Council (SAFMC) and is located in areas designated as EFH for wormrock, live bottom habitat, for the American oyster, pink shrimp (*Penaeus duorarum*), white shrimp (*Penaeus* sp.), brown shrimp (*Penaeus aztecus*), redfish , grouper (*Epinephelus* spp.), gray snapper (*Lutjanus griseus*), white grunt (*Haemulon plumieri*), red porgy (*Pagrus pagrus*), spiny lobster (*Panulirus argus*), and the snapper-grouper complex. In addition, the nearshore hardbottom habitat outside of the St. Lucie Estuary is designated as Essential Fish Habitat-Habitat Areas of Special Concern (EFH-HAPC) for the snapper-grouper complex.

C.1.1.5.2 Caloosahatchee River and Estuary

This portion of the study area is within the jurisdiction of the Gulf of Mexico Fishery Management Council (GMFMC) and is located in areas designated as EFH for juvenile brown shrimp, juvenile gray snapper, juvenile pink shrimp, adult and juvenile redfish,, adult and juvenile Spanish mackerel (*Scomberomorus maculatus*), and juvenile stone crab. Downstream habitats include oyster reefs and seagrass.

C.1.1.5.3 Biscayne Bay and Florida Bay

This portion of the study area is within the jurisdiction of the SAFMC and is located in areas designated as EFH for corals, coral reef and live bottom habitat, red drum, penaeid shrimps, spiny lobster, and other coastal migratory pelagic species and the snapper-grouper complex. Species generally present in the southern estuaries region include brown shrimp, pink shrimp, white shrimp, spiny lobster, stone crab, gulf stone crab (*Menippe adina*), redfish, Spanish mackerel, and gray snapper. Essential fish habitat in the southern estuaries is comprised of seagrasses, estuarine mangroves, intertidal flats, the estuarine water column, live/hard bottoms, and coral reefs.

C.1.1.6 Climate

The subtropical climate of south Florida, with its distinct wet and dry seasons, high rate of evapotranspiration, and climatic extremes of floods, droughts, and hurricanes, represents a major physical driving force that sustains the Everglades while creating water supply and flood control issues in the agricultural and urban segments.

Seasonal rainfall patterns in south Florida resemble the wet and dry season patterns of the humid tropics more than the winter and summer patterns of temperate latitudes. Of the 53 inches of rain that south Florida receives on average annually, 75% falls during the wet season months of May through October. During the wet season, thunderstorms that result from easterly tradewinds and land-sea convection patterns occur almost daily. Wet season rainfall follows a bimodal pattern with peaks during May through June and September through October. Tropical storms and hurricanes also provide major contributions to wet season rainfall with a high level of interannual variability and low level of predictability. During the dry season (November through April), rainfall is governed by large-scale winter weather fronts that pass through the region approximately weekly. However, due to the variability of climate patterns (La Niña and El Niño), dry periods may occur during the wet season and wet periods may occur during the dry season. Multi-year high and low rainfall periods often alternate on a time scale approximately on the order of decades (USACE 1999).

High evapotranspiration rates in south Florida roughly equal annual precipitation. Evapotranspiration removes between 70% and 90% of the rainfall in undisturbed south Florida wetlands (Duever et. al. 1994). Evaporation from open water surfaces peak annually in the late spring when temperatures and wind speeds are high and relative humidity is low. Evaporation is lowest during the winter when the temperatures and wind speeds are low (Duever et. al. 1994). Recorded annual rainfall averaging 53 inches in south Florida has varied from 37 to 106 inches, and interannual extremes in rainfall result in frequent years of flood and drought. Mean sea level is increasing an average of 2.2 mm/year or approximately nine inches over the last 100 years in Florida (NOAA 2001).

Mean annual temperature for the south Florida ecosystem ranges from 72 ° Fahrenheit (F) (22 ° Celsius (C)) in the northern Everglades to 76 ° F (24 °C) in the southern Everglades (Thomas 1974). Mean monthly temperatures range from a low of 63° F (17 °C) in January to a high of 85 ° F (29 ° C) in August (Thomas 1974). Infrequently, freezing temperatures and frost occur when arctic air masses follow winter cold fronts into the area.

C.1.1.7 Physical Landscape: Regional Soils and Geology

This section presents the subsurface data necessary to effect the most practicable and efficient construction of works within the area of investigation. Some geologic data has been obtained from previous core borings and probings along all levee alignments in the agricultural and conservation areas south and east of Lake Okeechobee. Specific areas of focus in this report are study areas north of the EAA, between the Red, Blue, and Yellow Line, and slightly south of the Blue Line. Levee L-28 will serve as the western boundary of the project features. Soil types and their locations within the project area were determined from laboratory tested samples. This data, along with descriptions and recommendations to the geologic feasibility of construction in these areas, are presented in this section. Geotechnical investigations in the vicinity of current features are sparse, with nothing more recent than information gained from the EAA A-1 Reservoir Area studies performed in 2006. The design values are tentative, and characterization of the subsurface materials is valid only for preliminary estimation and analysis purposes. A complete and thorough analysis of the subsurface conditions during the Pre-Construction Engineering and Design (PED) phase will be required based on the results of a new, design level, geotechnical exploration program.

C.1.1.7.1 Soil Types

The soils in the Everglades are primarily composed of peats and mucks. Deep, clean sands characterize the area east of the Everglades and to the south of Lake Okeechobee with wet, gray or grayish-brown, sandy soils underlain by sandy clay cover the area west of the Everglades. The peat and muck soils, which are dark brown to nearly black, cover approximately 90% of the area being considered in the study area. They were formed in marshes or swamps by the partial decay of plant materials, with some mixture of mineral soil in the case of muck. Peat, by definition, consists of 65% or more organic material with relatively little mineral matter. Muck on the other hand, consists of 25 to 65% plant material mixed with sand, silt, and clay. The peat and muck soils may differ from each other in the kind of plant material that they contain, in the corresponding depths, and/or in the nature of the underlying material. The peat and muck may rest directly on limestone or on an intermediate layer of sand or marl.

The highly organic soils have been divided into four types: Okeechobee muck, Okeelanta peaty muck, Everglades peaty muck, and Everglades peat. Okeechobee muck is a nearly black mixture of organic material and fine mineral soil. The organic portion of the soil is formed from the remains of water plants, while the mineral content probably results from the deposition of fine sediment during overflows from Lake Okeechobee. Okeelanta peaty muck consists of finely fibrous, well-decomposed organic matter over a layer of black plastic muck; it usually overlies hard limestone. Everglades peaty muck contains somewhat less mineral matter than Okeelanta peaty muck. The surface layer rests on brown, fibrous peat, and it usually lacks the subsurface layer of black plastic muck. Everglades peat, the most extensive of the organic soils, is formed mostly from partially decayed sawgrass. The upper 12 inches is a nearly black, finely fibrous peat which contains approximately 10% mineral soil. The subsoil is brown, fibrous peat which rests on the underlying rock, sand, or marl. A fifth type of organic soil, which is not extensive in the area, is Loxahatchee peat. It is a brown, spongy peat, composed of the remains of water lilies, water grasses, and other aquatic plants. Ordinarily, the area occupied by Loxahatchee peat is covered by water most of the year.

Most of the characteristics, properties, and composition of the muck and peat soils depend on the fact that those types of soils are essentially mixtures of water and partly decomposed plant materials. When saturated, the soil is a little heavier than water. One of the outstanding characteristics of the peat soil is its light weight when dry. The oven-dry weight of peat is about 7 pounds per cubic foot, and the mineral content is about 10 to 15% by weight of the dry material. Another important property is the high shrinkage value. Peat soils will shrink as much as 75% of their original volume when dried, and will not expand to their original volume when water is added.

Another important property is their high propensity for water retention. Peats vary considerably in that respect, depending on their origin, degree of decomposition, and chemical composition. While a dry mineral soil will absorb and hold from one-fifth to two-fifths its weight of water, a peat soil will retain many times its dry weight of moisture, depending on conditions. On an oven-dry weight basis, some of the peats have as much as 1,200% water when saturated, with the average having about 750%.

Laboratory permeability tests and field pumping tests indicate that seepage through peat soil is much greater vertically than horizontally. That can reasonably be attributed to the fibrous nature of the soil and its characteristic vertical root channels. Peat and muck material presented in less recent geotechnical exploration reports provide a general idea of the thickness of organic surface materials

in the region. However, there are selected areas where the organic soil has been reduced due to recent construction, development, fire, erosion, compression, or removal. In other areas, there may be accretion of organic materials.

Where peat is encountered in a borrow area within the project area, it would be removed and not used as construction material. The available geotechnical information indicate suitable materials for embankment construction and other fills, mainly interbedded sands and/or marls with limestone, are available throughout the project area. In some areas, in-situ materials may have to be processed to achieve feature performance requirements.

Seepage movement in the Everglades is largely through the porous rock and sands beneath the peat. The sands, in general, are fine-grained and poorly graded having intermediate coefficients of permeability. The marl soils are widely distributed under the organic soils, and in places are consolidated into a hard limestone just under the peat. Usually, however, the marl is a soft, grayish-white, calcareous silt of fresh-water origin. Other marls, with inclusions of sand, silt, clay, and shell, appear within the area. The marl is not uniformly distributed and it often pinches out into the peat and muck. Generally it is quite impermeable, acting as a seal that retards movement of water.

C.1.1.7.1.1 Field Explorations

Previous field explorations of soils in the vicinity of the study area consisted of undisturbed sample borings, drive sample borings, auger borings, disturbed sampling of blasted limestone, and general reconnaissance along levee alignments in the area of investigation. Field exploration core logs, field and laboratory test results and geotechnical information available at this time include:

1. EAA Reservoir A-1 Geotechnical Data Report of March 2006
2. C&SF Part I Agricultural and Conservation Areas
3. Supplement 1 – Geology and Soils, December, 1951
4. C&SF Part I Agricultural and Conservation Areas, Supplement 7 – Permeability Investigations by Well Pumping Tests, February, 1953
5. Report of Investigations No. 13 (RI-13), Water Resources of Palm Beach County, Florida, 1954,
6. USACE, WCA 3 DECOMP Status Report, Appendix A, February 2012
7. USACE, L-31N (L-30) Pilot Project Design Report, May 2009.
8. Wolf WPC, 2009, Draft Conceptual Geotechnical Data Report, Miami Canal Decompartmentalization, Contract W912EP-05-D-0009, Miami-Dade County, Florida.
9. Nodarse and Associates, 2000, Stormwater Treatment Area No. 3 and 4 East WCA-3A Hydropattern Restoration L-5 Canal, Boring Profiles.
10. U.S. Army Corps of Engineers, 2011b, Core Borings along L-5/L-4/L-23 Waterway
11. Water Conservation Area 3 Decompartmentalization (DECOMP) and Hydrologic Sheet Flow Enhancement Part 1Broward County, FL.

A geotechnical exploration specific to this project has not yet been initiated, but will be required and conducted during the PED phase. The data contained in previous reports, although dated, is useful for preliminary planning purposes.

C.1.1.7.1.2 Laboratory Investigations

Samples of typical materials, obtained during the field exploration program, were tested by the South Atlantic Division (SAD) laboratory, and private Architect/Engineer (A/E) laboratories for classification and determination of physical properties. Unit weight, specific gravity, ignition loss

and mineral content, grain-size distribution, and maximum density and optimum moisture are available in C&SF Part I Supplement 1.

C.1.1.7.1.3 Office Analysis

Previous analyses of existing conditions are available in the C&SF Part I Agricultural and Conservation Areas, Supplement 1 – Geology and Soils, December, 1951. A seepage analysis for the Flow Easement Basin (FEB) is contained in this section.

C.1.1.7.1.3.1 Everglades Agricultural Area

The subsurface soil conditions at the FEB and nearby areas are most closely approximated by the subsurface conditions in the adjacent EAA Reservoir A-1. The EAA Reservoir A-1 Project site has been investigated in a progressive sequence of borings spaced throughout the site area. One hundred forty-five borings were completed for the SFWMD around the reservoir perimeter in 2003 and early 2004. Twenty borings to a depth from 50 to 100 ft below ground surface (bgs) were completed at the EAA Reservoir A-1 Project Test Cell site for the Test Cell Project design in December 2004, and an additional eight borings were completed during the Test Cell construction in early 2005. The borings generally penetrated through about 1/2 to 2 feet of surficial peat/muck and marl, then through 22 to 26 feet of primarily carbonate sand and limestone, and then into primarily shelly quartz sand with sparse limestone to their completed depths. The upper carbonate sand and limestone constitutes the Fort Thompson Formation at the site. Below this, the shelly sand and sparse limestone constitutes the Caloosahatchee Formation and possibly part of the Tamiami formation. The top of the Fort Thompson Formation consists of a limestone layer about 4.5 to 5 ft thick, which is locally called caprock. The caprock is generally white, light gray, tan or yellowish brown with variable amounts of weathering; it is occasionally fractured and contains voids and inconsistencies. The caprock is underlain by a silty carbonate sand extending to about 23.5 to 24.5 ft deep, where another hard limestone layer 1.5 to 3 ft thick is encountered. A thinner, hard limestone layer about 1/2 to 1 foot thick is often encountered at around 16 to 17 feet deep. The sand and lower limestone layers are generally white to very pale brown. Laboratory testing of the sand sampled in the borings averaged 84.2% calcium carbonate content with an average of 22% passing the #200 sieve in gradation tests. Visual inspection of the sand samples from the borings reveals that they include shell fragments, and tend to be angular and platy. The sands of the Fort Thompson Formation exposed in the seepage collection canals and dewatering sumps is abundantly fossiliferous with gastropods, pelecypods, corals, and echinoderms.

The top of the Caloosahatchee Formation is composed of fine grained, subrounded, shelly quartz sand that is mixed with shelly carbonate sand similar to that in the Fort Thompson Formation. The Caloosahatchee Formation at the site is 30 to 60 ft thick; however, the interface between this formation and the underlying Tamiami Formation is difficult to define. The proportions of carbonate to quartz sand vary. Laboratory testing on the sampled sand indicated an average calcium carbonate content of 30.1%, and an average 12.1% of material passing the #200 sieve. The primary color of the geologic material in the Caloosahatchee Formation is light greenish gray.

Preliminary estimates of soils engineering properties of materials in the EAA/FEB area and features north of the red line are derived from previously referenced documents and are summarized in **Table C.1-1**.

Table C.1-1. Preliminary Soil Properties for the CEPP

Region: EAA, FEB Areas – North of Red Line									
Location	Organic Materials					Sands**			
	Specific Gravity	Unit Weight (lb/ft^3)	Natural Moisture (%)	Organic Matter (%)	Mineral Content (%)	Moist Weight (lb/ft^3)	Buoyant Weight (lb/ft^3)	Effective Friction Angle (degrees)	Cohesion (lb/ft^2)
Levees L-4 and L-5	1.54	58	779	89	11	109.5	62.9	35	0
Levees Southeast of Lake Okeechobee (near Levee L-8)	1.46	60	436	91	9	-	-	-	-
Levees L-6 and L-7	1.5	61	920	93	7	-	-	-	-
Region: DECOMP – L-67A/C, L-5 Areas - Areas South of the Red Line and North of the Blue Line.									
Areas Below the Red Line to the Blue Line-Levees L-28 and L-29	1.94	62	479	52	48	109.5	62.9	35	0
Area of Levee L-30- Along the Yellow Line	1.5	60	686	75	25	110	62.8	38	-
Areas Near Levees L-33 and L-37	1.58	62	430	85	15	110	62.8	38	-
Limestone tested in the vicinity of L-30 and L-37**	-	-	-	-	-	122.3	-	38	980

*Values are averages from results of Laboratory Tests from the 1951 Supplement 1 Report

**All material properties are for sands except for limestone as noted

C.1.1.7.1.3.2 L-67A/C, L-5 Areas

All of the recent and previous geotechnical investigations concentrated on the levee areas of WCA 3 which includes WCA 3A and WCA 3B, and not in the undisturbed areas of WCA 3 where the soils are situated. Within WCA 3, the majority of the soils are histosols which includes Everglades peats and Loxahatchee peats. Everglades peats are typically brown to black with minimal mineral content. Loxahatchee peats are found in topographic low areas and are composed of the remains of the roots and rhizomes of Nymphea, a white water lily. The western margin of WCA 3A is mixed marl peats that are derived from the underlying limestone Based on the information provided by standard penetration test borings, continuous core boring, and test pit excavations, the subsurface stratigraphy at WCA 3A is summarized below based on the 2000 geotechnical investigation by Nodarse (Nodarse, 2000) the March 2011 geotechnical investigation conducted by USACE personnel (USACE, 2011b), and Wolf personnel (Wolf WPC, 2009):

1. Layer 1 - Fill: This layer consists of localized areas of fill adjacent to existing canals at the time of the construction of these canals. The material is predominately sandy fill with some gravel, trace clay, some gravel and some shell in the northern hydropattern restoration area (L-4 and L-5). By the Miami Canal (L-23) in Broward County the fill is predominately limestone (crushed rock) fill. Both materials vary in thickness from 0.5 ft to 6 ft. The fill has standard penetration N-values between 8 and 84 blows per foot in the hydropattern restoration area, depending upon the degree of material compaction. If groundwater is present in the fill, it normally occurs between 2 and 4.5 ft below grade.
2. Layer 2 - Interbeds of Organic Sand and Clay Including “Peaty” Clay: This layer consists of alternating beds of organic sand and clay. The sand unit is predominately well-graded (poorly sorted) with some shell fragments and trace clay. Thickness ranges from 0.1 to 9 ft. In the northern hydropattern restoration area, standard penetration test N-values vary between 2 and 68 blows per foot. The clay unit has trace gravel, sand and some shell fragments. In some places, the clay unit is carbonaceous or “peaty” (fibrous) and in some places, “fat” clay is present. Thickness ranges from 0.2 to 4.5 ft for the clay unit. Standard

penetration N-values range from 0 to 11 blows per foot in the northern hydropattern restoration area. In Broward County this clay unit appears to be laterally continuous. If groundwater is present, it occurs between 6.6 and 8.5 ft below grade within these units.

3. Layer 3 - Limestone: Underlying the unconsolidated material of fill/organic sand and clay is limestone that is fossiliferous, vuggy, and moderately to intensely weathered that is also slightly to highly fractured. Clay infilling of the voids is apparent in some areas. No unconfined compressive strength tests were conducted. Rock quality designations ranged from 0 to 77% with an average value of 25 percent. In some places, the limestone is interbedded between the organic sand/clay units.

Previous geotechnical data compiled by Nodarse and Associates in 2000 are summarized below for the L-5 area for comparison with the WCA 3 data above:

1. Layer 1 fill parameters: Standard penetration test N-value – 18 to 67 blows per foot.
2. Layer 2 Sand/Clay/Peat parameters: Peat-N values ranged from 1 to 10 blows per foot, clay N values ranged from 1 to 6 blows per foot, and sand N values ranged from 10 to 40 blows per foot.
3. Layer 3 Limestone Parameters: Standard penetration test N –values of 50 blows per 0" to 50 blows per 8"and rock quality designations (RQD): 0 to 17 percent.

Preliminary estimates of soils engineering properties of materials in the DECOMP WCA 3 and L-5 Areas, as well as features south of the EAA and north of Tamiami Trail, are derived from previously referenced documents and summarized in **Table C.1-1**.

C.1.1.7.1.3.3 L-31N Area

The high transmissivity of the Biscayne Aquifer allows for rapid recharge of the Lower East Coast (LEC) well fields, while promoting significant hydro-geologic interaction between the Everglades and Biscayne Bay. The LEC area is located to the east of the L-31N, L-31W, and C-111 canals. The end result is the need for seepage management. The LEC on the Atlantic Coastal Ridge is mostly underlain by thin sand and Miami Limestone that are highly permeable and are moderately to well drained. To the west of the coastal ridge, soils of the LEC contain fine and loamy material, and have poor natural drainage. Rockland areas on the coastal ridge in Miami-Dade County are characterized by weathered limestone surfaces and karst features such as solution holes and sinkholes. Higher elevation marshes of the southern Everglades, on either side of Shark River Slough, are characterized by calcitic marl soils deposited by calcareous algal mats and exposed limerock surfaces with karst features, such as solution pits and sinkholes. In agricultural areas of Miami-Dade County, it is common to encounter mixed soils called "rock plowed" soil, such as Chekika and Krome. This soil is a manmade material created by farmers excavating and crushing the soft underlying Miami Limestone, and mixing/tilling it along with the natural overburden soils.

Consequently, the overburden thickness is somewhat higher in these areas. In most cases, the underlying Miami Limestone controls the infiltration of rain or introduced stormwater due to the high permeability of the rock-plowed soils. These rock-plowed soils have very gravelly textures (34-76% limestone fragments, 2 mm or larger in diameter), and their organic content is usually less than 2%. West of L-31N, muck and marl predominate. The muck and marl soils have been classified as hydric soils. A hydric soil refers to "a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile that favor the growth and regeneration of hydrophytic vegetation." In addition, there are areas where rock outcrops or weathered rock surfaces occur. Rock outcrops are characterized by karst features such

as solution pits, caves, and sinkholes, leaving a rock surface that is extremely rugged and pitted. Pits in the rock surface range from several inches to several ft in diameter and depth. Where soil development has occurred on these surfaces, soils are primarily entisols, but may also include alfisols and histosols. The Miami Limestone is a thin, wedge-shaped limestone layer 20 ft in thickness near the Florida Turnpike, and 12 ft thick along the L-31N Levee This very porous limestone is marked by numerous vugs that is soft to moderately hard, moderately to highly weathered, thick bedded with occasional cross bedding, white to yellow, and riddled with solution cavities. The solution cavities are typically filled with loose sands and peat. Below the Miami Limestone and the Fort Thompson Formation consist of alternating layers of shallow marine, brackish, and fresh water limestones comprised of thick units of soft to hard, moderately weathered, light gray, sandy, clayey limestone, and calcareous sandstone with a few thin beds of fresh water limestone. Underlying the Fort Thompson Formation is the Tamiami Formation, which is composed of two members in the area: (1) the Pinecrest Sands, and (2) the Ochopee Limestone. The Pinecrest Member lies below the Fort Thompson Formation and is comprised of quartz sand, reefal fragments, and sandstone that is moderately hard and creamy white to greenish gray with occasional soft layers of silty, clayey, shelly sands. The Ochopee Limestone is moderately to well-indurated, slightly phosphatic, occasionally sandy and fossiliferous (Scott, 1997).

Preliminary estimates of soils engineering properties of materials in the L-31N Area, and features south of Tamiami Trail and along the East Coast Protection Levee, are derived from previously referenced documents and summarized in **Table C.1-1**.

C.1.1.7.2 Geology

Surficial geology of the CEPP area of investigation consists of fossiliferous limestones interlayered with siliciclastic sediments that were deposited and reworked during Quaternary sea level fluctuations. Rocks formed in a shallow marine depositional environment under tropical and subtropical environmental conditions. Three geological formations comprise this sedimentary package: (1) the Pamlico Sand, (2) the Miami (Oolite) Limestone, and (3) the Fort Thompson Formation. This sedimentary package rests unconformably on quartz sands of the Pliocene Tamiami Formation, which serves as basement for this study. The areal distribution of geological formations that comprise this sediment package is shown in **Figure C.1-1**. The thickness of the sediment package increases north to south from approximately 40 ft at the boundary between the EAA and WCA 3A to approximately 100 ft at Tamiami Trail. This unit also forms an eastward thickening wedge toward the Atlantic Coast (Reese and Cunningham, 2000; Reese and Wacker, 2009). The Pamlico Sand forms a linear geomorphic feature called the Atlantic Coastal Ridge that extends from Palm Beach County to southern Miami-Dade County. However, the western margin of this feature generally follows the Florida Turnpike, and is not within the CEPP area of investigation.

The character of the marginal marine sediments changes from north to south. Near the boundary between the EAA and WCA 3A, the sediment thickness consists of poorly consolidated marine limestone, quartz sandstone, and sandy limestone with abundant mollusk fossils (Reese and Wacker, 2009), and is known as the Fort Thompson Formation. South of central Broward County to Tamiami Trail, the composition of the Fort Thompson Formation changes to predominantly marine limestones that were deposited in marine platform margin and open marine tropical conditions similar to those observed in the present-day southern Florida Keys. The oolitic Miami Limestone often outcrops at the surface near Tamiami Trail and forms approximately 10 to 15 ft of caprock overlying the Fort Thompson Formation. The Fort Thompson Formation is a karstic limestone in southern Broward and Miami-Dade Counties, and has been characterized by Cunningham et al.

(2006) into 16 distinct lithofacies representing freshwater, platform margin, ramp, and open marine carbonate depositional environments. Subsequent dissolution of these limestones during low sea levels resulted in the development of karst, with extensive vugs and conduits throughout the vertical sequence of rock. The gradation of lithologies, from mixed clastic-carbonate near the boundary between the EAA and WCA 3A to karstic marine carbonates at Tamiami Trail, affects the porosity and permeability of the sedimentary package.

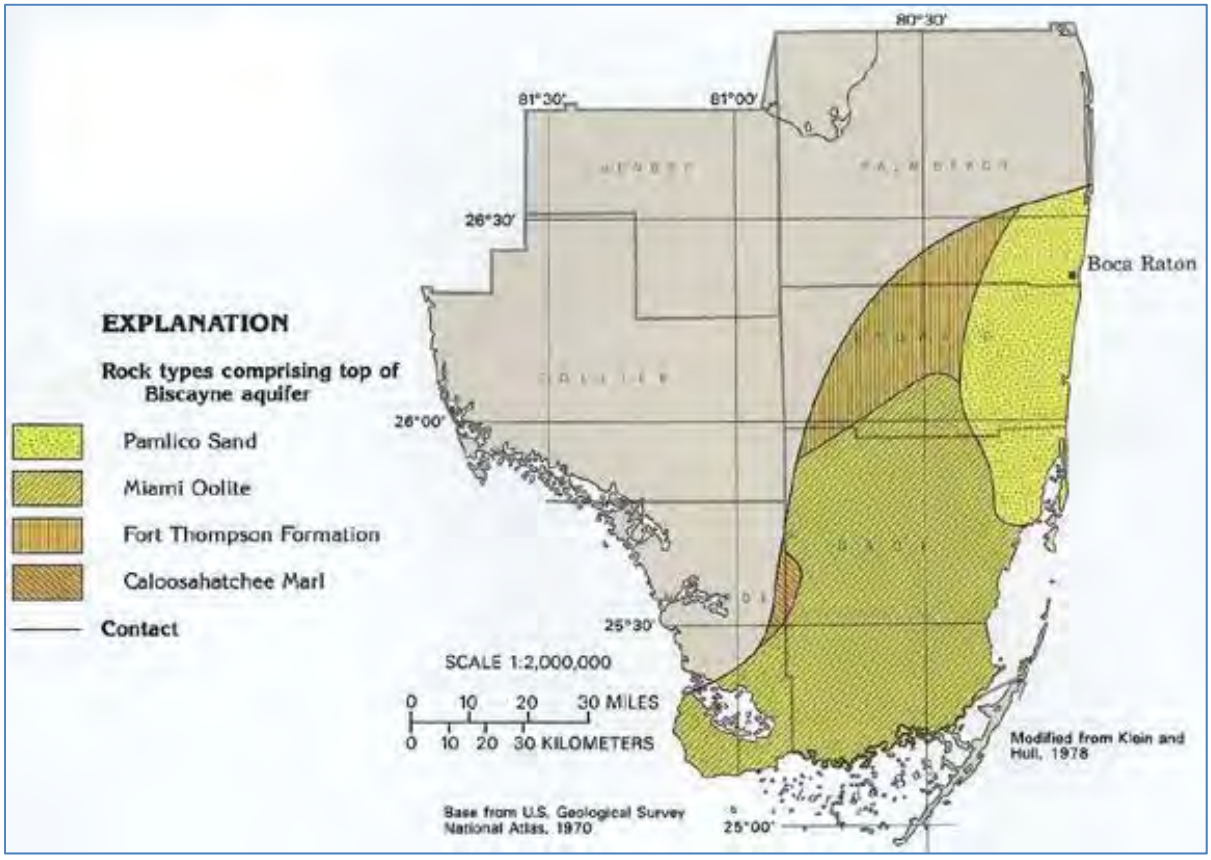


Figure C.1-1. Map Showing Surficial Geology of Project Area (Source Miller 1990)

C.1.1.7.3 Hydrogeologic Setting

The Fort Thompson Formation changes in texture and composition from north to south, with quartz sand and sandy carbonate more abundant in the area of the boundary between the EAA and WCA 3A, and marine carbonates dominating toward Tamiami Trail. The transition from sands to carbonate affects the permeability characteristics of the surficial aquifer system that is included within these sediments.

Near the boundary between the EAA and WCA 3A, Reese and Wacker (2009) recognize a major permeable zone within the Fort Thompson Formation (permeable zone 2), at depths less than 80 ft below land surface. This permeable zone is the upper portion of the surficial aquifer system of south Florida. Very large pore spaces are common, characterized by interconnected vugs or cavities. Estimated transmissivity from aquifer performance tests conducted in southwest Palm Beach County varies widely, between 30,000 and 60,000 ft^2/day (Reese and Wacker, 2009). Hydrologic data (estimates of transmissivity, storage coefficient and leakance) are sparse near the boundary

between the EAA and WCA 3A. Permeable zones in this area are not typically defined as the Biscayne Aquifer.

The Biscayne Aquifer is recognized as "the contiguous, highly permeable section of the Pliocene (Tamiami Formation) and Pleistocene age from land surface downward, where at least 10 ft of the section has a hydraulic conductivity of 1,000 ft/day or more" (Fish and Stewart, 1991). This aquifer underlies most of the CEPP area of investigation south of northern Broward County (**Figure C.1-1**). The Biscayne Aquifer is interpreted as a dual-porosity pore system, with matrix porosity providing water storage, and "touching vug" porosity forming preferential flow zones (**Figure C.1-2**; Cunningham et al., 2006; Renken et al., 2008). Measured permeability values from rock samples vary over 13 orders of magnitude (Sukop and Cunningham, 2011). The heterogeneous nature of permeability in the Biscayne Aquifer makes characterization of aquifer parameters difficult. Site-specific test borings and aquifer characterization are required to evaluate hydrologic characteristics.

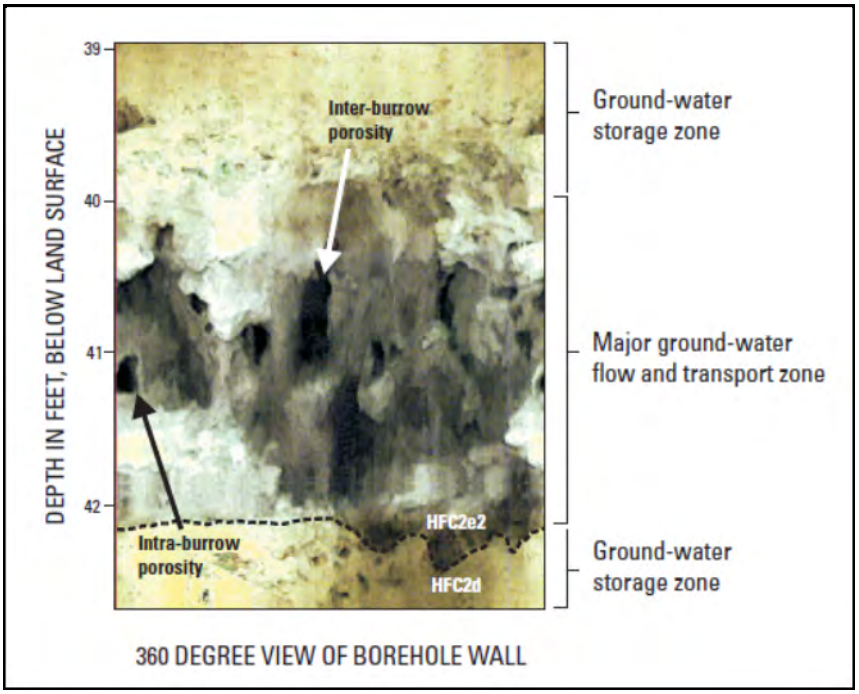


Figure C.1-2. Direct Image of Borehole in the Fort Thompson showing Dual Porosity of Biscayne Bay Aquifer (Well G-1386) (Source Cunningham et.al. 2006)

C.1.1.8 Hydrology

The major characteristics of south Florida's hydrology are: (1) local rainfall, (2) evapotranspiration, (3) canals and water control structures, (4) flat topography, and (5) the highly permeable surficial aquifer along a thirty to forty mile-wide coastal strip. Local rainfall is the source of all of south Florida's fresh water. The surface water that is not removed from the land by evapotranspiration and seepage to the underlying aquifer is drained to the Atlantic Ocean, Florida Bay, or the Gulf of Mexico by very slow, shallow sheetflow through wetlands or relatively quickly through man-made canals.

Levees and canals constructed during the last 60 years under the Central and Southern Florida (C&SF) Project have divided the former Everglades into areas designated for development and areas for fish and wildlife benefits, natural system preservation, and water storage. The natural areas

consist of the three WCAs located north of Tamiami Trail ENP to the south. The WCAs provide detention storage for water from Lake Okeechobee, the EAA, and parts of the east coast region. Detention of water helps prevent floodwaters from inundating the east coast urban areas; provides water supply and detention for east coast urban and agricultural areas and ENP; improves the water supply for east coast communities by recharging underground freshwater reservoirs; reduces seepage; and provides control for saltwater intrusion in coastal aquifers. While the WCAs may reduce the severity of the drainage of the Everglades caused by the major canal systems, thus reducing impacts to fish and wildlife caused by the major drainage systems, the levees surrounding the WCAs still function to impound the Everglades, precluding the historic flow patterns. The C&SF Project infrastructure makes it difficult to provide natural timing, volume and distribution. In wet periods, water is impounded in the WCAs and then discharged to ENP or coastal canals for eventual release to tide. During dry periods, water can flow through the canals to coastal areas and bypass the ENP wetlands.

Throughout CEPP formulation, C&SF infrastructure modifications to achieve CEPP project objectives have been primarily focused within WCA 3, and the hydrology of this area is discussed in greater detail than other areas more peripheral to CEPP formulation efforts.

C.1.1.8.1 Lake Okeechobee and the Northern Estuaries

Lake Okeechobee is a subtropical lake in south central Florida with a surface area of 730 square miles and an average depth of nine feet (ft). Lake Okeechobee is a major feature of the Kissimmee-Okeechobee-Everglades system, which is a continuous hydrologic system extending from central Florida south to Florida Bay. Lake Okeechobee provides a number of values to society and nature including water supply for agriculture, urban areas and the environment, flood protection, a multi-million dollar sport fishery, and habitat for many birds and animals, including endangered and threatened species.

Lake Okeechobee is managed as part of the C&SF Project for water supply and flood protection. The Herbert Hoover Dike (HHD) and several water control structures allow management of Lake Okeechobee to meet project purposes which include flood control, water supply, navigation, recreation, and environmental enhancement. Inflows to Lake Okeechobee average 2.1 million acre-feet per year. Nearly half the inflow to Lake Okeechobee is through the Kissimmee River. The Upper and Lower Kissimmee River watersheds cover more than 2,300 square miles of central Florida. The remaining inflow to Lake Okeechobee is received from Lake Istokpoga, Fisheating Creek, the Taylor Creek-Nubbin Slough Basin, and reverse flows from the Caloosahatchee River, the St. Lucie Canal, and the EAA.

The primary outflows from Lake Okeechobee are east to the St. Lucie Canal and west to the Caloosahatchee River. The main outflows south are through the Miami Canal, North New River Canal, Hillsborough Canal, and the West Palm Beach Canal. Inflows to Lake Okeechobee frequently exceed total outflow capacity. The approximately 35-mile St. Lucie Canal, part of the Okeechobee Waterway, is the main eastern flood control outlet for Lake Okeechobee. The St. Lucie Estuary is located within portions of both Martin and St. Lucie counties on the southeast coast of Florida. The two forks of the St. Lucie Estuary, the North Fork and South Fork, flow together near the Roosevelt Bridge at the City of Stuart, and then flow eastward approximately six miles to the Indian River Lagoon and Atlantic Ocean at the St. Lucie Inlet. The Caloosahatchee River, part of the Okeechobee Waterway, is the only flood control outlet leading west from Lake Okeechobee. Combined with the St. Lucie Canal and Lake Okeechobee, the Caloosahatchee River completes the only navigable

passage between the Gulf of Mexico and the Atlantic Ocean. The river extends approximately 70 miles from Lake Okeechobee, through the Caloosahatchee Estuary, to the lower Charlotte Harbor Basin at San Carlos Bay. The Caloosahatchee River passes through parts of Glades, Hendry, and Lee counties.

Water management decisions regarding Lake Okeechobee are highly dependent upon the HHD. The HHD is an approximately 70-year-old earthen levee that was constructed around the southern portion of Lake Okeechobee for flood control purposes. Heightened concern with the structural integrity of the HHD was emphasized after several hurricanes passed through south Florida during 2004 and 2005, as well as consideration of the levee damage around New Orleans caused by Hurricane Katrina in 2005. Prior to these devastating hurricanes, the USACE conducted a lengthy study of the HHD condition which resulted in a 1999 report titled "Major Rehabilitation Evaluation Report" (MRR). This report documented the condition of the dike, and identified needed repairs. In response to the findings in the MRR and associated Reach 1 EIS (USACE 2005), a Major Rehabilitation Project was approved, and HHD rehabilitation is currently underway. In April 2008, the 2008 Lake Okeechobee Regulation Schedule (2008 LORS) was implemented in response to high lake levels that resulted in integrity issues and concerns with the HHD, high volume releases to the estuaries, and impacts to Lake Okeechobee littoral zones. The 2008 LORS attempts to manage Lake Okeechobee water levels between 12.5 and 15.5 ft National Geodetic Vertical Datum 1929 (NGVD) throughout the year in an effort to balance competing objectives including flood control, water supply, navigation, and enhancement of fish and wildlife resources. LORS 2008 was determined to represent the best operational compromise at the time to improve the environmental health of certain major ecosystems, while providing for public health and safety as it pertains to the HHD. The USACE expects to operate under the interim 2008 LORS schedule until the earlier of (1) implementation of a new Lake Okeechobee schedule as a component of the system-wide operating plan to accommodate the Comprehensive Everglades Restoration Plan (CERP Band 1 projects) and the State of Florida's fast track Acceler8 projects, or (2) completion of HHD seepage berm construction or equivalent dike repairs for reaches 1, 2 and 3.

C.1.1.8.2 Everglades Agricultural Area

The EAA is located south of Lake Okeechobee primarily in western Palm Beach County, extending south to WCA 3A. It is bounded on the east by the WCA 1, WCA 2A, the Western C-51 Basin, the L-8 Basin, and on the west by the C-139 Basin. Historically, the EAA was swampland before it was drained and put into agricultural production. The former swampland produced the rich organic peat and muck soils that today make it a highly productive agricultural area, with approximately 620,000 acres of agricultural land. The agricultural area designation was formally established in the 1950s and associated water management infrastructure had been substantially completed in 1962.

Water in the EAA is managed to provide flood protection, irrigation, and fresh water for the EAA and surrounding environmentally sensitive areas through a series of canals, levees, culverts, gates, and pumps. The larger primary canals within the EAA are managed by the SFWMD and convey water from Lake Okeechobee and the EAA to the WCAs and other downstream areas/users and/or to nearby coastal waters. Primary canals in the project area include the L-1, L-2, and L-3 Canals that form the west boundary of the EAA; the Hillsboro Canal; the North New River Canal; the West Palm Beach Canal; the Miami Canal, and the L-8 Canal that forms the eastern boundary of the EAA. Smaller secondary canals are also managed by the SFWMD and connect the primary canals. The connections may be open or may have water control structures. Secondary canals in the project area include the Bolles (L-21), Cross (L-16), Ocean (L-13), and L-1 East Canals. Small, numerous

agricultural canals (usually unnamed) are the responsibility of the individual landowners and are used to provide water management of adjacent individual farming operations.

Stormwater runoff from the EAA, which contains relatively high levels of nutrients (mainly phosphorus and nitrogen from particulate matter and fertilizers), drain from the agricultural canals, to the secondary canals, into the six main primary canals, and are eventually discharged into the EPA or to tide. In addition to flood protection for and water supply to the EAA, the canals and water control structures convey regulatory releases from Lake Okeechobee to the WCAs; water supply releases to the EAA and eastern Palm Beach, Broward, and Dade Counties for municipal water supply and to prevent saltwater intrusion; and water supply releases to ENP. There are eight existing Stormwater Treatment Areas (STA 1E, STA 1W, STA 2, STA 3/4, STA 5, STA 6, Compartment B, and Compartment C) that capture the majority of water in the primary canals for biological water quality treatment prior to discharge into the WCAs. For additional information regarding the hydrology of the STAs, refer to the USACE January 2009 Final EIS to Construct Stormwater Treatment Areas on Compartments B and C of the Everglades Agricultural Area.

C.1.1.8.3 Water Conservation Area 1

WCA 1, also known as the Arthur B. Marshall Loxahatchee National Wildlife Refuge (LNWR), is approximately 21 miles long from north to south and comprises an area of approximately 221 square miles. The West Palm Beach Canal lies at the extreme northern boundary, and on the south, the Hillsboro Canal separates WCA 1 from WCA 2A. Ground elevations slope approximately five feet in ten miles, both to the north and to the south from the west center of the area, varying from over 16 feet in the northwest to less than 12 feet NGVD in the south. The area, which is enclosed by approximately 58 miles of levee, approximately 13 miles of which are common to WCA 2A, provides storage for excess rainfall runoff from areas that drain to EAA canals, the West Palm Beach Canal (230 square miles) and the Hillsboro Canal (146 square miles). In addition, WCA 1 may receive water from Lake Okeechobee under certain conditions. Discharges from WCA 1 to meet water supply demands can occur to the West Palm Beach Canal, Hillsboro Canal, and the canal infrastructure east of WCA 1, in accordance with the WCA 1 Regulation Schedule (USACE 1996). The WCA 1 Regulation Schedule also defines when excess water in WCA 1 can be discharged to WCA 2A and to tide via the Hillsboro Canal. Due to its limited discharge capacity and its relatively small size compared to the watershed from which it receives water, consecutive rainfall events have the potential to quickly utilize storage within WCA 1, resulting in discharges from WCA 1 to WCA 2A via the S-10 structures.

C.1.1.8.4 Water Conservation Areas 2A and 2B

Covering an area of 210 square miles, WCA 2 is comprised of two areas, 2A and 2B, and measures approximately 25 miles from north to south. WCA 2A is separated from the other WCAs by the Hillsboro Canal to the north and the North New River Canal to the south. Ground elevations slope southward approximately two to three feet in ten miles, ranging from over 13 feet NGVD in northwest WCA 3A to less than 7 feet NGVD in southeast WCA 3B. The area is enclosed by approximately 61 miles of levees, of which approximately 13 miles are common to WCA 1 and 15 miles to WCA 3.

The upper pool, WCA 2A, provides an area of approximately 173 square miles for storage of excess water from WCA 1 and a portion of the EAA (125 square miles) which drains to the North New River Canal. Water supply to the east coast urban areas of Broward County is provided by WCA 2A, in accordance with the WCA 2A Regulation Schedule (USACE 1996). Due to its limited discharge capacity and its relatively small size compared to the watershed from which it receives water,

consecutive rainfall events have the potential to quickly utilize storage within WCA 2, resulting in discharges from WCA 2A to WCA 3A via the S-11 structures.

Ground elevations in WCA 2B range from 9.5 feet NGVD in the northern portions to seven feet NGVD in the southern portions of the area. The area experiences a high seepage rate, which does not allow for the long-term storage of water, and as a result, water is not typically released from WCA2 B.

C.1.1.8.5 L-28 Triangle

The L-28 Triangle (Triangle) area is located entirely within the boundaries of the Miccosukee Federal Indian Reservation and encompasses 7,830 acres of Tribal lands and approximately 230 acres of Big Cypress National Preserve (BCNP). The L-28 Triangle area is confined on north by Interstate 75, the west by L-28 Interceptor Canal (L-28I) and the BCNP, and the east by the L-28 Canal.

The L-28 Interceptor Canal is bound by levees on both sides and maintains no direct connection to wetlands in the Triangle. Within the L-28 Triangle Area, the L-28 Canal is bound on the east side by a confining levee separating the wetlands of the L-28 Triangle from WCA 3A. Wetlands interior to the L-28 Triangle do maintain a connection to the L-28 canal along the west side of the L-28 canal. The L-28 canal terminates at the southern tip and is not connected to the L-28 canal. Historically the S-140 pump station maintained flood protection within the Triangle. A weir was installed in 2009 within the L-28 Canal and immediately south of Interstate 75 to restrict regional pumping and maintain water levels within the Triangle.

C.1.1.8.6 Big Cypress National Preserve

The BCNP spans approximately 1,205 square miles from southwest of Lake Okeechobee to the Ten Thousand Islands in the Gulf of Mexico. The 1,125 square miles of the BCNP was originally created in 1974 by Public Law (PL) 93-440 and subsequently expanded in 1988 by the Big Cypress National Preserve Addition Act. BCNP was established to protect natural and recreational values of the Big Cypress watershed to allow for continued traditional uses, such as hunting, fishing, and oil and gas production, and to provide an ecological buffer zone and protect the water supply to ENP. BCNP is a large, flat area with maximum elevations of 22 feet NGVD in the northern region which gradually slope south to sea level in the BCNP coastal region along the Gulf of Mexico.

The L-28 Levee presently separates WCA 3A and the BCNP. Surface water flows from BCNP are introduced to WCA 3A from Mullet Slough; WCA 3A is also hydrologically connected to BCNP through three degraded gaps along the northern tie-back of the L-28 Levee and seasonally through water management operations of S-343A, S-343B, and S-344 along the southern L-28 Levee. Surface water flows introduced to the L-28 Canal from these three structures and upstream inflows to BCNP from the L-28 gaps may additionally contribute to deeper water depths and prolonged hydroperiods within the western portion of the CSSS-A habitat, as this water is directed south to the Tamiami Trail section between the Forty-mile bend (located west of S-12A) and Fifty-mile bend. Tamiami Trail and Loop Road, which include bridges and culvert connections to allow southerly flow west of Forty-mile bend, also affect hydropatterns within southern BCNP.

C.1.1.8.7 Water Conservation Areas 3A and 3B

The largest WCA is WCA 3, which is divided into two parts, 3A and 3B. It is approximately 40 miles long from north to south and covers approximately 915 square miles. Ground elevations slope southeasterly one to three feet in ten miles ranging from 13 feet NGVD in northwest WCA 3A to six

feet NGVD in southeast WCA 3B. The area is enclosed by approximately 111 miles of levees, of which 15 miles are common to WCA 2. An interior levee system across the southeastern corner of the area reduces seepage into an extremely pervious aquifer.

The upper pool, WCA 3A, provides an area of approximately 752 square miles for storage of excess water from WCA 2A; rainfall excess from approximately 750 square miles in Collier and Hendry counties (through Mullet Slough), and from 71 square miles of the former Davie agricultural area lying east of Pump Station S-9 in Broward County; and excess water from a 208 square mile agricultural drainage area of the Miami Canal and other adjacent areas to the north. WCA 3A provides water supply to the Lower East Coast (LEC) as well as the South Dade Conveyance System (SDCS) in accordance with the WCA 3A Regulation Schedule and provides water supply to ENP in accordance with the Rainfall Plan and the WCA 3A Regulation Schedule (USACE 2006). Due to its limited discharge capacity compared to the watershed from which it receives water, consecutive rainfall events have the potential to quickly utilize potential storage within WCA 3A resulting in discharges from WCA 3A to SRS and/or the South Dade Conveyance System (SDCS) via the S-12 structures and/or S-333 and S-334.

The outer perimeter levees of WCA 3 are the L-4, L-5, L-38 (separating WCA 3 from WCA 2A and WCA 2B), L-37, L-33, L-30, L-29 and L-28 (southern L-28, south of Mullet Slough, contains three gaps to allow for natural drainage from Collier County to the west). Interior parallel levees, L-67A and L-67C, along with their associated borrow canals subdivide WCA 3 into two parts: WCA 3A and WCA 3B. The L-67A and L-67C levees were originally constructed (completed in 1962 and 1966, respectively) for several reasons, including as a step-down system to reduce seepage to the east to allow for urban and agricultural developments in Miami-Dade County, and to increase storage of water in WCA 3A to provide water supply to an expanding urban population to the east. The construction of Tamiami Trail and WCA 3 impounded and altered the historic SRS, effectively creating a barrier through the Everglades, between the northern Everglades (i.e. WCAs) and ENP. The Miami Canal extends from Lake Okeechobee to the Atlantic Ocean and crosses WCA 3 from northwest to southeast. To remedy excessive drainage caused by the Miami Canal, two structures, S-339 and S-340, were built across the C-123 Canal to block water from flowing directly down the canal, except at times of extreme high water or when increased conveyance capacity is needed to deliver water for the ENP and/or the LEC. Upstream from each structure, water was expected to flow laterally from the canal into the marsh through 100 foot gaps that had been left at 500 foot intervals in the canal's spoil piles. South of WCA-3 and within ENP, the northern portion of SRS is also partially divided by the remaining 5.5 miles of the L-67 Extension Levee, which extends south from the southern terminus of L-67A at Tamiami Trail. Outflows from WCA 3A to ENP are regulated according to the WCA 3A Regulation Schedule, with some additional WCA 3A outflows to ENP from groundwater seepage across Tamiami Trail and seasonal surface water flows through the L-28 gaps, which then continue south along the L-28 borrow canal.

Stage variability within WCA 3 typically follows an annual cycle; the levels vary from high stages in the late fall and early winter to low stages at the beginning of the wet season (typically late May or early June). The cycle is primarily driven by rainfall, though it is also heavily influenced by water management operations designed to maintain congressionally authorized project purposes, including water supply to the LEC and ENP and flood protection to the adjacent EAA and LEC, as well as protection for tropical cyclone events and other extreme storm events. The annual cycle permits the storage of runoff during the wet season and the release of stored water to ENP during the dry season and maintains elements of the habitat essential to fish and wildlife. The distribution of water

for flood control and water supply varies seasonally. The regulation schedules for the WCAs include a minimum water level, below which water releases are not permitted unless water is supplied from another source.

Overall, water stage decreases from northwest to southeast within WCA 3, consistent with the general direction of surface water flow and prevailing topography within WCA 3. Water depth is typically between one to two and a half feet, with the shallower waters in the higher elevation northwestern portion of WCA 3. Water stages and depths in WCA 3B are typically much lower than water stages and depths in WCA 3A, due to limited surface water inflows into WCA 3B and the reduction of seepage from WCA 3A to WCA 3B due to the design of L-67A and L-67C levees. Water levels in WCA 3B are affected by seepage losses to the east towards the L-30 borrow canal and to the south towards the L-29 Canal.

Water supply deliveries from the C&SF Project (also known as the Regional system) to coastal canals are utilized to recharge coastal well fields. When canal levels drop below adequate recharge levels due to a combination of wellfield drawdowns, evaporation, and lack of rainfall, water supply deliveries are typically made from the Regional system. When canal levels drop in Miami-Dade County, regional water supply is delivered from WCA 3A through one of two delivery routes. Depending on system conditions, both routes may be utilized concurrently. For the northern delivery route from WCA 3A, water supply deliveries are either released from S-151 to the Miami Canal within WCA 3B (C-304), followed by downstream releases to either Miami-Dade County's SDCS by utilizing S-337 and/or by utilizing S-31 to release into the C-6 Canal. For the southern delivery route from WCA 3A, water supply deliveries are released from S-333 (from the upstream L-67A Canal), pass through the L-29 Canal, and are released to the SDCS by utilizing S-334.

If WCA 3A levels are at or below the 7.5 feet NGVD minimum, or WCA 3A floor level, then water supply releases from WCA 3A must be offset by equivalent inflows to WCA 3A from another source, typically Lake Okeechobee (USACE 2006a). The L-67 Borrow Canal is specified in the WCA 3A Regulation Schedule, though the WCA 3A floor elevation is traditionally measured at the S-333 headwater gauge; there is no requirement to maintain the L-67A Borrow Canal at or above the WCA 3A floor elevation during water supply deliveries. The SFWMD has indicated that drought year water supply deliveries from Lake Okeechobee can be problematic or extremely difficult if the lake stages are below the level at which pumping, rather than gravity, is needed to pass the water supply releases (typically at a lake stage of approximately 10.5 feet NGVD). If Lake Okeechobee is at levels where water cannot physically be delivered south, then no deliveries will be made from Lake Okeechobee, and no water supply releases from WCA 3A below the floor elevation will be made. If water is available from Lake Okeechobee, then water may be delivered to WCA 3A using one of two routes (both routes may be utilized concurrently, depending on conditions within the system): (1) the western route through the S-3 Structure, along the Miami Canal (within the EAA), and utilizing the S-8 Pump Station into WCA 3A to provide replacement water for the water supply delivery volume that will be delivered to C-6 and/or the SDCS once the replacement water at the north end of WCA 3A is provided; or (2) the eastern route through the S-2 Structure and along the North New River Canal (within the EAA), followed by utilizing either (a) the S-150 gated culvert structure to pass water into WCA 3A (into the L-38W Canal) or (b) utilizing the S-7 Pump Station to release into the L-38E Canal (within WCA 2A) for downstream release through the S-11 structures into WCA 3A (into a more southerly portion of the L-38W Canal than the S-150 outlet). The eastern water supply deliveries route is directly connected to the S-151 structure in the Miami Canal by the L-38W Canal

and the L-68A Borrow Canal, with the L-68 Borrow Canal tying into the L-67A Canal (slightly west of the S-9 Pump Station). These deliveries offset saltwater intrusion into the Biscayne aquifer system.

The most important component of the groundwater system within the study area is the Biscayne aquifer, an unconfined aquifer unit underlying an area of approximately 3,000 square miles in southeast Florida, from southern Palm Beach County southward through Broward County to South Dade County. This huge, freshwater, underground water body is highly productive along the coastal ridge and for a considerable distance to the west. Groundwater in WCA 3 generally flows from the northwest to the southeast, with extensive seepage across the eastern and southern levees, L-30 (southeast corner of WCA 3B) in particular. However, the direction of flow may be influenced by rainfall, drainage canals, or well fields. Fluctuations in groundwater levels are seasonal. Groundwater levels within WCA 3 are influenced by water levels in adjacent canals. Where there is no impermeable formation above the aquifer, surface water recharges the system and the groundwater level can rise freely. In times of heavy rainfall the aquifer fills and the water table rises above the land surface, contributing to seasonal inundation patterns throughout the area. Over much of its extent, the aquifer is covered by only a few inches of soil. The permeable limestone of the aquifer is shielded against upward intrusion of saline water from the Floridan aquifer by relatively impermeable beds of clay and marl.

The timing and distribution of water within WCA 3A, WCA 3B, and ENP is affected by direct rainfall, evapotranspiration, and regional water management operations. Specifics relating to the effects of inflows/releases on WCA 3A water level can be found in **Table C.1-2** below.

Table C.1-2. Effects of Inflows/Releases on WCA 3A Water Level

Inflow/Outflow WCA 3A (average daily cfs)	Duration (days)	Effect on WCA 3A (feet)*	Duration (days)	Effect on WCA 3A (feet)*
200	1	0.001	20	0.018
300	1	0.001	20	0.027
400	1	0.002	20	0.036
500	1	0.002	20	0.044
600	1	0.003	20	0.053
700	1	0.003	20	0.062
800	1	0.004	20	0.071
900	1	0.004	20	0.080
1000	1	0.004	20	0.089
1100	1	0.005	20	0.098
1200	1	0.005	20	0.107
1300	1	0.006	20	0.116
1400	1	0.006	20	0.125
1500	1	0.007	20	0.133
1600	1	0.007	20	0.142
1700	1	0.008	20	0.151
1800	1	0.008	20	0.160
1900	1	0.008	20	0.169
2000	1	0.009	20	0.178
2100	1	0.009	20	0.187
2200	1	0.010	20	0.196
2300	1	0.010	20	0.205
2400	1	0.011	20	0.214
2500	1	0.011	20	0.222
2600	1	0.012	20	0.231
2700	1	0.012	20	0.240
2800	1	0.012	20	0.249

Other specific areas within the CEPP project boundaries have distinct hydrologic conditions that could be affected by changes contemplated with CEPP for C&SF infrastructure and/or water management operations. These areas are addressed in the ensuing text.

C.1.1.8.8 Northeast Shark River Slough

NESRS is a complex area located in the northeast corner of ENP. It is currently the northern terminus of SRS, which is aligned from the northeast to southwest across ENP. Tamiami Trail is the northern boundary, the L-31N Canal the eastern boundary, and the L-67 Extension Canal the western boundary of the area. Historically, the area would be characterized as wet most of the year, but regional developments have impacted historic freshwater routes into the area. In addition, if historic levels are not maintained through the end of the wet season, significant reductions in surface water can occur during the dry season below historic dry season levels.

Water enters NESRS primarily from WCA 3A, via S-333, and then to the L-29 borrow canal and subsequent passage through culverts under Tamiami Trail. In addition, pending approval of an operational permit, S-355A and S-355B may also be used to deliver water from WCA 3B to the L-29 Canal for subsequent passage through the culverts to NESRS. The discharges made from WCA 3A

through the S-12 structures and S-333 are target flows determined from the Rainfall Plan (USACE 2006a). Under the Rainfall Plan, water deliveries would be computed and operations adjusted weekly, if necessary based on the sum of two components: a rainfall response component and a WCA 3A regulatory component. The normal operational target flow distribution is 55 percent through the S-333 into NESRS and 45 percent through the S-12 structures into ENP west of the L-67 Extension. Eastern portions of the ENP are also influenced by the system of canals and structures that provide flood control and water supply for the LEC urban and agricultural areas.

C.1.1.8.9 Western Shark River Slough

Western SRS, located to the west of L-67 Extension Levee and bounded on the north by Tamiami Trail, is primarily influenced by rainfall and water management operations at the S-12 structures (A, B, C and D). Under IOP[1], the utilization of the S-12 structures and the seasonal sequential closure periods beginning from the west at S-12A (November 1 – July 15), S-12B (January 1 – July 15), and S-12C (February 1 – July 15), respectively, is meant to move water from WCA 3A into SRS while providing conditions for Cape Sable seaside sparrow Subpopulation-A (CSSS-A) nesting and breeding. Although not required in water management operations, there is a rule-of-thumb that is often utilized that includes delivering the Rainfall Plan S-12 structure target flows from east to west with 40 percent, 30 percent, 20 percent, and 10 percent being discharged at S-12D, S-12C, S-12B, and S-12A, respectively. Releases from WCA 3A are part of a regulation schedule for WCA 3A and are typically dependent on a Rainfall Based Management Plan. This Rainfall Based Management Plan consists of a rainfall-based delivery formula that specifies the amount of water to be delivered to ENP in weekly volumes through the S-333 and S-12 structures. Under IOP, the normal operational target flow distribution is 55 percent through S-333 into NESRS and 45 percent through the S-12 structures into ENP west of the L-67 Extension.

C.1.1.8.10 Taylor Slough

Taylor Slough is in the southeast quadrant of ENP. The area through the Rocky Glades and Taylor Slough is higher in elevation compared to ground levels north, south, or west. Because of this characteristic, the area is normally drier than other areas in the ENP. The Rocky Glades and Taylor Slough are somewhat like an island or a peninsula extending from the canals into the ENP. Under IOP 2006, specified C-111 basin canal water levels/ranges and S-332D pump station operations resulted in Taylor Slough being provided water from C-111 mainly during the wet season. During the dry season, under IOP 2006, water deliveries to Taylor Slough were limited to provide conditions conducive to CSSS nesting (325 cfs from December 1 – January 31; 165 cfs from February 1 – July 15).

C.1.1.8.11 Lower East Coast Area

The LEC area is located to the east of the L-31N, L-31W, and C-111 canals. Under IOP 2006, specified canal water levels/ranges are meant to provide flood protection, water supply, and prevention of saltwater intrusion for the LEC. The LEC can be provided water supply from WCA 3A and Lake Okeechobee according to their respective regulation schedules. In wet conditions, the excess water from the LEC is discharged to tide.

[1] IOP was the governing regulation schedule for the project area at the start of the CEPP planning process. In addition, existing hydrologic conditions within the project area are a result of IOP operations from 2002-2012. ERTP was approved and implemented for operations beginning in October 2012, and ERTP operational assumptions are used in the FWO project analysis.

C.1.1.8.12 8.5 Square Mile Area

The 8.5 Square Mile Area (8.5 SMA) is a primarily residential area adjacent to, but west of, the L-31N Canal. The 8.5 SMA, which is also known as the Las Palmas community, is bordered on both the west and north by NESRS. The community has water management infrastructure consisting of a perimeter levee, a seepage collection canal, a pump station (S-357), and a southern detention cell meant to collectively provide flood mitigation as part of the MWD Project (USACE 2000).

C.1.1.8.13 Biscayne Bay

Biscayne Bay is a shallow, tidal sound located near the extreme southeastern part of Florida. Biscayne Bay, its tributaries, and Card Sound are designated by the State of Florida as aquatic preserves, while Card and Barnes Sounds are part of the Florida Keys National Marine Sanctuary. A significant portion of the central and southern portions of Biscayne Bay comprise Biscayne National Park. Under IOP 2006, specified canal water levels/ranges are meant to provide flood protection for the portions of the LEC and Miami-Dade County, which may result in discharges to Biscayne Bay.

C.1.1.8.14 Florida Bay

Florida Bay and the Ten Thousand Islands comprise approximately 1,500 square miles of ENP. The bay is shallow, with an average depth of less than three feet. To the north is the Florida mainland and to the south lie the Florida Keys. Sheet flow across the marl prairies of the southern Everglades and 20 creek systems fed by Taylor Slough and the C-111 Canal provide direct inflow of freshwater to the bay. Surface water from SRS flows into Whitewater Bay and may also provide essential recharge for central and western Florida Bay. Exchange with Florida Bay occurs when this lower salinity water mass flows around Cape Sable into the western sub-region of the bay.

C.1.1.9 Regional Water Management (Operations)

C.1.1.9.1 Lake Okeechobee

The USACE is responsible for management of the water resources contained within HHD and for the development of regulations for operation of Lake Okeechobee's outlet structures. Water management operations at Lake Okeechobee are performed to ensure that Congressionally-authorized project purposes are met. The Congressionally-authorized project purposes for Lake Okeechobee include: flood control; navigation; water supply for ENP, salinity control, regional groundwater control, agricultural irrigation, municipalities and industry; enhancement of fish and wildlife; and recreation. Since April 2008, Lake Okeechobee has been operated in accordance with the 2008 Lake Okeechobee Regulation Schedule (2008 LORS; refer to **Figure C.1-3** through **Figure C.1-7**); for additional details and complete documentation, refer to the USACE November 2007 Lake Okeechobee Final Supplemental EIS. Changes to the Lake Okeechobee Regulation Schedule with the 2008 LORS are included in the revised March 2008 USACE Lake Okeechobee and Everglades Agricultural Area Water Control Plan (WCP). The WCP, which codifies the water management operational guidance included in the November 2007 Final Supplemental EIS, defines allowable releases to the Water Conservation Areas (WCAs) and to tide (estuaries). Prior to the 2008 LORS, Lake Okeechobee operations were managed under the "Water Supply and Environment (WSE) Regulation Schedule" since July 2000.

The regulation schedule is a tool used by water managers to meet Congressionally-authorized project purposes. A regulation schedule attempts to meet all functional objectives of the particular project, acting separately or in combination with other projects in a system. The regulation schedule has been, and will continue to be, designed to balance multiple, and often competing,

project purposes and objectives. Managing for better performance of one objective often lessens the effectiveness of performance of competing objectives. For example, higher regulation schedules tend to benefit water supply, but may increase the risk to public health and safety, and can harm the ecology of the lake. Lower lake schedules may produce lake levels more desirable for the lake ecology and improved flood protection, but reduce water supply potential. Lower lake schedules may also harm the ecology of the lake during extended dry periods and downstream estuaries during extended wet periods. Therefore, the 2008 LORS was not developed to optimize performance of any single project purpose, but rather balances the performance of the multiple project purposes. The regulation schedule contains bands which vary with the time of year. Releases are outlined by flowcharts that define the allowable releases by structure within each band.

Though water supply is a project purpose, water supply release volumes are not prescribed by this regulation schedule. However, water supply releases are made to meet downstream demands that can include agricultural irrigation, municipal and industrial needs, estuary, and other environmental water supply needs.

The 2008 LORS operational study was initiated to address high lake levels, high estuarine discharges, estuary ecosystem conditions, and lake ecology conditions that occurred during the 2003 to 2005 time period. The study considered the back-to-back historically significant 2004 and 2005 hurricane seasons' effects on the recognized structural integrity issues of HHD along with effects to other project purposes. The 2008 LORS was identified to be effective at decreasing the risk to public health and safety, reducing the number of high-volume discharges to the estuaries, and providing critical flexibility to perform water management operations (November 2007 Final Supplemental EIS).

Under the 2008 LORS, management of Lake Okeechobee water levels and determination of Lake Okeechobee releases to the WCAs and to tide (estuaries) is based on seasonally varying lake elevations divided into three bands as shown on the proposed 2007 Lake Okeechobee Interim Regulation Schedule Part A. These bands include "High Lake Management", "Operational", and "Water Shortage Management". The High Lake Management Band is meant to address public health and safety, especially related to the structural integrity of HHD by providing the ability to make releases up to the maximum capacity lake outlets will allow; Lake Okeechobee outlet canals may be maintained above their optimum water management elevations. The Operational Band is meant to facilitate authorized project purposes by providing the ability to make releases of various volumes, including no release; Lake Okeechobee outlet canals should be maintained within their optimum water management elevations. The Water Shortage Management Band pertains to low lake levels which necessitate rationing water supplies; Lake Okeechobee outlet canals may be maintained below their optimum water management elevations. The water supply releases made within this band are made according to the SFWMD's Lake Okeechobee Water Shortage Management Plan (LOWSM). The 2008 Lake Okeechobee Interim Regulation Schedule Part B further defines the bands of the regulation schedule. In Part B, the Operational Band is further subdivided into sub-bands that are directly related to defining allowable Lake Okeechobee releases to the WCAs and to tide (estuaries). In general as lake levels rise through the higher sub-bands, the allowable release rates increase.

The 2008 LORS EIS analysis demonstrated that the then-proposed regulation schedule releases to the WCAs and to the estuaries would reduce the likelihood of lake levels that both increase the

probability of a breach of the HHD and also contribute to poor ecological conditions within Lake Okeechobee. For Lake Okeechobee, a high lake level can lead to the decline of emergent and submerged vegetation which is essential habitat for the lake's fish and wildlife populations. The 2008 LORS provides the ability to make long-term, low-volume releases to the Caloosahatchee Estuary, St. Lucie Estuary, and WCAs. These releases include low-volume pulse releases and base flow releases to the Caloosahatchee and St. Lucie estuaries that allow Lake Okeechobee to be maintained at more desirable levels throughout the year. A pulse release attempts to simulate a natural rainstorm event within the basins. The receiving body would respond to the pulse release in a similar fashion as if a rainstorm had occurred in the upstream watershed. Although an average flow rate is targeted for the duration of the pulse release, daily releases vary. The pulse releases and base flow releases are intended to regulate lake levels and reduce the potential for future prolonged high-volume releases to the estuaries. The base flow releases also provide a benefit of maintaining desirable salinity levels in the estuaries. By regulating lake levels, these low volume releases improve public health and safety performance by reducing risk to the HHD and provide improved benefits for the health of Lake Okeechobee and the estuaries.

C.1.1.9.2 Greater Everglades

The C&SF Project has numerous water management structures consisting of culverts, spillways, and pump stations that have specified operating criteria for managing or regulating water levels for Congressionally-authorized project purposes. The C&SF Project contains multiple water bodies created by the existing C&SF levee infrastructure and implementation of the water management operating criteria, including WCA 1, WCA 2, and WCA 3. Associated with the inflow to and discharge from the water bodies is an infrastructure of structures and canals that are managed by the implementation of water management operating criteria that can include specified water levels or ranges. The WCA 3A Interim Regulation Schedule is a compilation of water management operating criteria, guidelines, rule curves, and specifications that govern storage and release functions. Typically, a regulation schedule has water level thresholds which vary with the time of year and result in discharges. The threshold lines of regulation schedules define the discharge zones and are traditionally displayed graphically. Additionally, a corresponding table is typically used to identify the structure discharge rules for the zones. As with most regulation schedules, the WCA 1, WCA 2, and WCA 3A regulation schedules must take into account various, and often conflicting, project purposes.

The WCAs are regulated for the Congressionally-authorized C&SF Project purposes to provide: flood control; water supply for agricultural irrigation, municipalities and industry, and ENP; regional groundwater control and prevention of saltwater intrusion; enhancement of fish and wildlife; and recreation. An important component of flood control is the maintenance of marsh vegetation in the WCAs, which provide a dampening effect on hurricane-induced wind tides that have the potential to affect residential areas to the east of the WCAs. The marsh vegetation, along with the east coast protection levee, also prevents floodwaters that historically flowed eastward from the Everglades from flowing into the developed areas along the southeast coast of Florida. Modifications to the WCA 1 and WCA 2 Regulation Schedules are not under consideration with the CEPP, and the following description of existing water management operations will only include WCA 3A, WCA 3B, and ENP.

Besides releases from WCA 2A via the S-11 structures, WCA 3A receives inflow from pumping stations S-8, S-9, and S-140. The S-9 pump station removes runoff in the area west of Ft. Lauderdale known as Western C-11. The S-9A pump station, located adjacent to the S-9 pump station, returns

seepage water from WCA 3A and WCA-3B collected in the L-37, L-33 and the US 27 borrow canals. The S-140 pump station serves the 110 square mile area north and east of the interceptor canal and west of L-28. This station is used to maintain canal levels below 10.5 feet, NGVD unless gravity flow into WCA 3A is possible at an adequate rate. Water also enters northeastern WCA 3A by gravity through S-150. Discharges at S-142 are made from WCA 3A into the North New River Canal. The SFWMD can pump runoff from the North New River Canal and C-13 into WCA 3A through S-142 by operating their pump station, G-123.

Water levels in WCA 3A are managed primarily by five gated spillways: the S-12 structures (S-12A, S-12B, S-12C, and S-12D) and S-333. Additionally, S-151, S-343A, S-343B and S-344 can also be utilized to discharge from WCA 3A. The S-12 structures and S-333 are utilized to provide water deliveries to ENP, in accordance with the WCA 3A Regulation Schedule. From July 2002 through October 2012, WCA 3A was regulated according to a seasonally varying 8.75 to 10.75 feet, NGVD regulation schedule and the Rainfall Plan (initiated in 1985), as per IOP (2006 IOP Supplemental Environmental Impact Statement [EIS]; refer to Figure C.1-8). The CEPP ECB assumptions represent the system-wide infrastructure and operations that were in place at the time CEPP plan formulation was initiated, approximately January 2012. The primary objective in implementing IOP was to reduce damaging high water levels within CSSS habitat west of SRS (i.e. CSSS-A). IOP was designed to protect the CSSS to the maximum extent possible through water management operations. The purpose of IOP was to provide an improved opportunity for CSSS nesting by maintaining water levels below ground level for a minimum of 60 consecutive days between March 1 and July 15, corresponding to the CSSS breeding season. In addition, a secondary purpose of IOP was to allow CSSS habitat to recover from prolonged flooding during the mid-1990s. The IOP WCA 3A Interim Regulation Schedule utilizes a 3-gauge average elevation of Sites 63, 64, and 65 in the management of WCA 3A water levels (also known as 3A-3, 3A-4 and 3A-28, respectively). The discharges made from WCA 3A through the S-12 structures and S-333 are target flows determined from the Rainfall Plan; when WCA 3A is in Zone A, these target flows are the maximum flow possible. Under the Rainfall Plan, water deliveries are computed and operations adjusted, weekly, if necessary based on the sum of two components: a rainfall response component and a WCA 3A regulatory component. The Rainfall Plan provides for the rainfall response component within all zones of the WCA 3A Regulation Schedule, with the additional regulatory release requirement added when the WCA 3A water levels fall within the higher regulation schedule zones above Zone E, including Zone E1. Under IOP, the goal of the rainfall and regulatory components is to split the flows between the S-12 structures and S-333, with 45 percent of the total flow from WCA 3A passing through the S-12 structures to Western SRS and the remaining 55 percent to discharge through S-333 to NESRS, establishing the target flows for both the S-12 structures and S-333. IOP specifies seasonal closure of the S-12 structures, with the following rigid closure periods: November 1 – July 15 for S-12A; January 1 – July 15 for S-12B; and February 1 – July 15 for S-12C.

Water deliveries to eastern ENP are controlled by the stage in L-29 Canal, as pressure from the water within the canal (hydraulic head), is required to force water through the Tamiami Trail culverts and into ENP. As canal stage increases, more water is forced beneath the road through 19 sets of culverts (55 total culverts, three culverts per set in most locations). The L-29 Canal stage is currently limited due to concerns regarding potential flooding and seepage effects within residential or agricultural areas of Miami-Dade County and potential damage to the Tamiami Trail roadway sub-base. The water management operating criteria for the L-29 borrow canal between S-333 and S-334 is meant to limit the L-29 borrow canal stage to no more than 7.5 feet NGVD in response to roadway sub-base concerns identified by the Florida Department of Transportation (FDOT), although short-

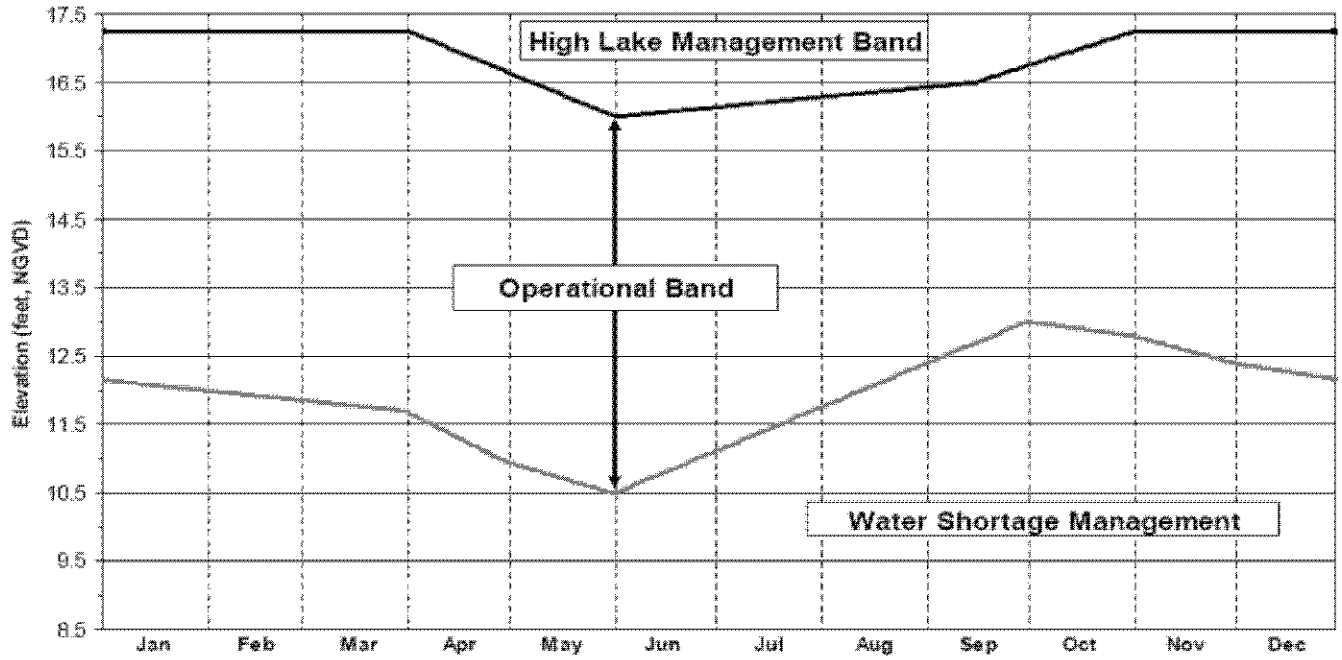
term deviations have been previously implemented in response to specific hydrologic conditions. Higher water levels within the canal may erode the roadway sub-base and create a potential safety hazard, until completion of the Modified Water Deliveries (MWD) Tamiami Trail Modifications project in 2013. In addition, the L-29 borrow canal water level has an additional constraint related to potential flooding and seepage effects within residential and/or agricultural areas of Miami-Dade County. When the G-3273 water level within NESRS reaches 6.8 feet NGVD, S-333 discharges to NESRS will be discontinued until G-3273 falls below 6.8 feet NGVD. Tamiami Trail roadway modifications, to accommodate potential maximum L-29 borrow canal water levels up to 8.5 feet NGVD are currently in progress with the ongoing MWD project. Additionally, a one-year field test to incrementally relax the G-3273 operational constraint is under consideration for 2013-2014.

When WCA 3A water levels are in Zone A of the WCA 3A Regulation Schedule (USACE 2006a), S-343A, S-343B, and S-344 can be utilized to discharge from WCA 3A into BCNP. Discharges can also be made through S-343A, S-343B and S-344 when agreed to by SFWMD, USACE, and National Park Service (NPS) to extend hydroperiods within BCNP. The S-151 gated culvert structure, which is located along the Miami Canal and operated according to the WCA 3A Regulation Schedule (USACE 2006a), is the only existing surface water connection between WCA 3A and WCA 3B. S-151 discharges into C-304 in WCA 3B for flood diversion and for the purpose of providing water supply to LEC canals and the ENP SDCS. Under existing conditions, water does not flow directly from WCA 3B into the L-29 Canal. There are two discharge structures, S-355A and S-355B, along L-29 south of WCA 3B that are designed to move water from WCA 3B into the canal, although the operation of these structures has not been previously authorized for more than short-term, temporary operations. The S-355 structures are completed components of the MWD Project, intended to function in concert with the proposed MWD S-345 structures along L-67A/L-67C to address the MWD Project objective of restoring WCA 3B as a functioning component of the Everglades hydrologic system and restoration of water deliveries to NESRS.

There are three distinct modes of water management operations for IOP: Column 1, Column 2, and water supply (USACE 2006a). Water management operating criteria within Column 1 occurs when WCA 3A discharges can be achieved by discharges from the S-12 structures, S-333, S-151, S-343A, S-343B, and/or S-344. Water management operating criteria within Column 2 occurs when WCA 3A discharges are made via S-333 to the L-29 Canal and L-31N Canal, and the ENP SDCS; Column 2 generally requires the use of pump stations S-331, S-332B, S-332C, and S-332D. Column 2 is used to offset or mitigate for adverse effects on WCA 3A related to closure periods at water management structures to protect CSSS-A. Column 2 generally occurs when any S-12 structure is closed in order to protect the CSSS (November 1 through July 15, under IOP), although Column 1 may continue until the capacity of the S-12 structures that remain open is insufficient to handle the discharge from WCA 3A. If necessary, Column 2 may continue past re-opening of the S-12 structures (July 16) to mitigate for adverse effects on WCA 3A resulting from the IOP closures of S-12A, S-12B, S-12C, S-343A, S-343B, and S-344. Water supply discharges from WCA 3A occur when water levels in the ENP SDCS fall to a level that indicates additional water is required. During droughts, a minimum elevation in the borrow canals of 7.5 feet NGVD is established in the WCA 3A Interim Regulation Schedule (USACE 2006a). Below this elevation no further releases will be permitted from WCA 3A unless an equal supply of water from another storage area is transferred to WCA-3A.

Additional information on the effects of water management within the Greater Everglades environment may be found within the South Florida Environmental Reports which are published annually by the SFWMD:

(http://my.sfwmd.gov/portal/page/portal/xweb%20about%20us/agency%20reports#previous_reports).



NOTES:

High Lake Management Band: Outlet canals may be maintained above their optimum water management elevations.

Operational Band: Outlet canals should be maintained within their optimum water management elevations.

Water Shortage Management Band: Outlet canals may be maintained below optimum water management elevations.

CENTRAL AND SOUTHERN FLORIDA PROJECT

2008 LAKE OKEECHOBEE
INTERIM REGULATION SCHEDULE

PART A

DATED: March 2008
DEPARTMENT OF THE ARMY, JACKSONVILLE DISTRICT
CORPS OF ENGINEERS, JACKSONVILLE, FLORIDA

Figure 7-1

Figure C.1-3. 2008 Lake Okeechobee Regulation Schedule Part A

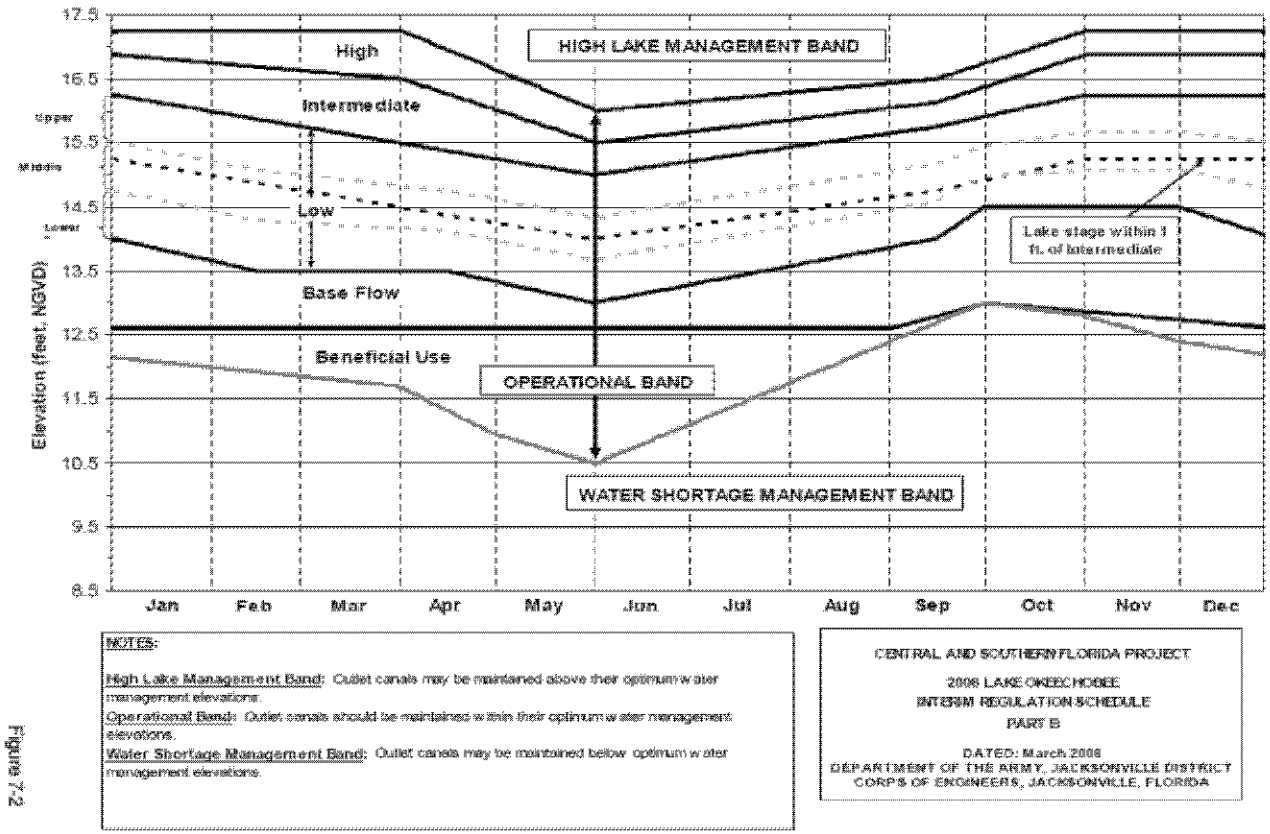


Figure C.1-4. 2008 Lake Okeechobee Regulation Schedule Part B

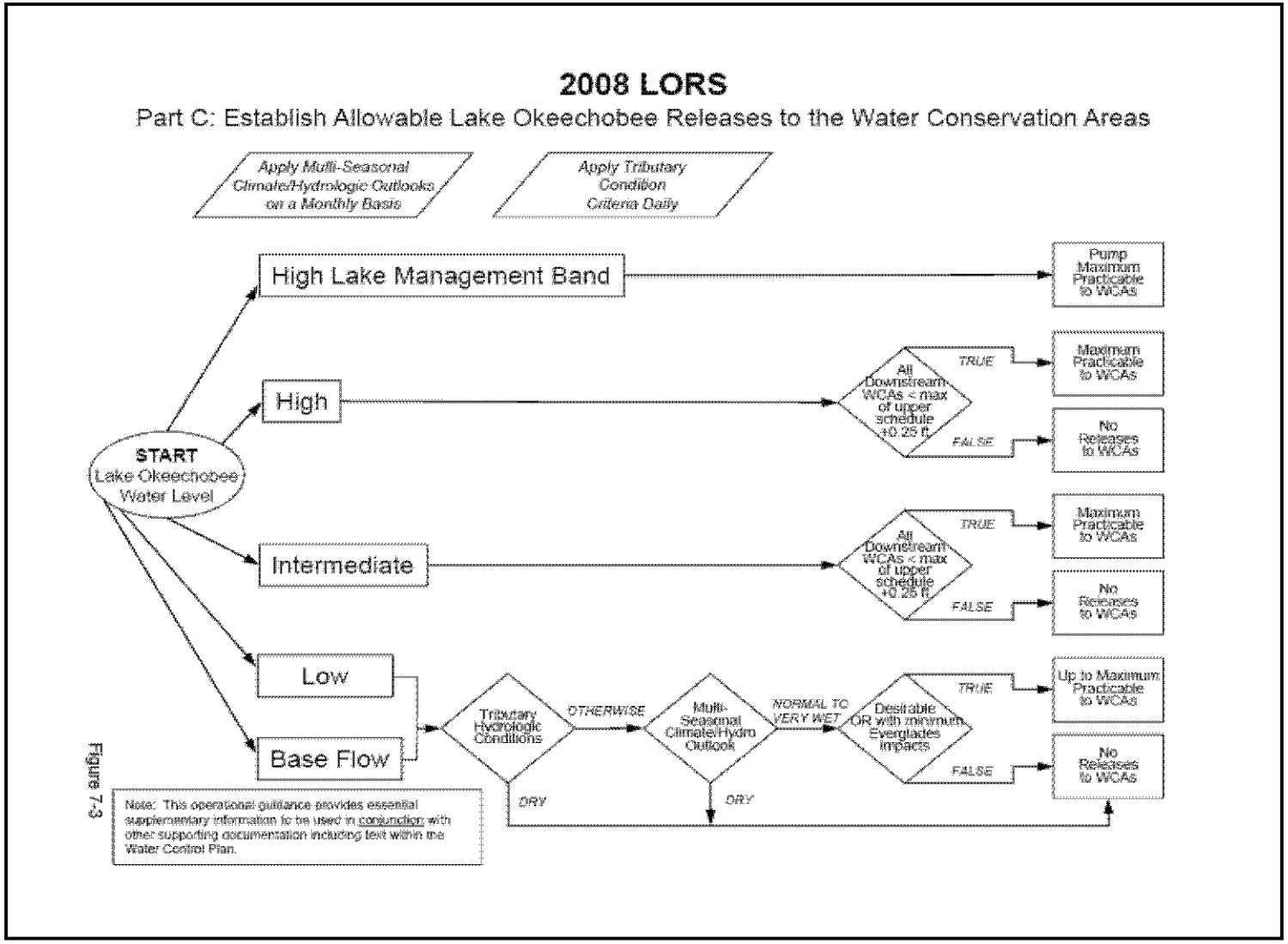


Figure C.1-5. 2008 Lake Okeechobee Regulation Schedule Part C

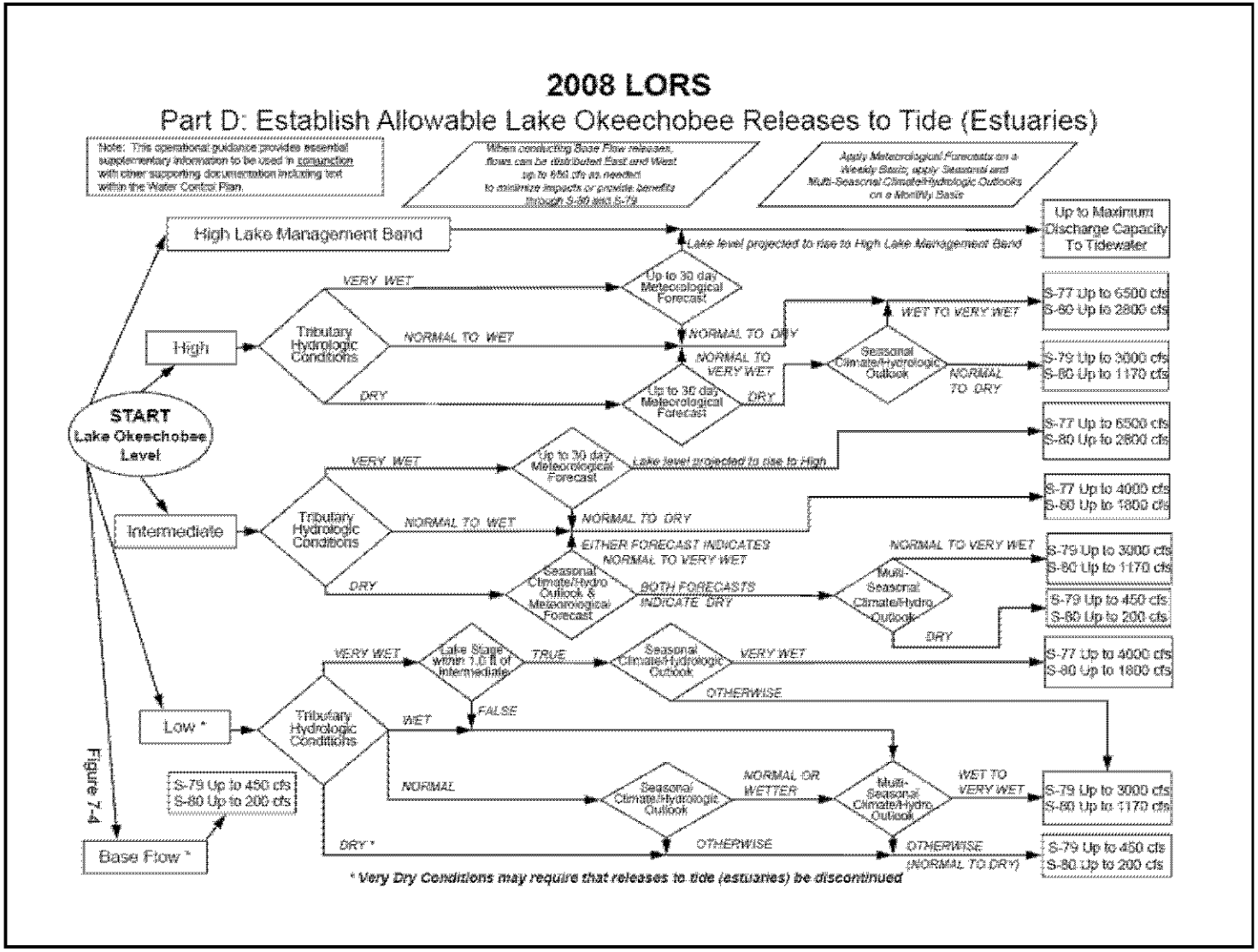
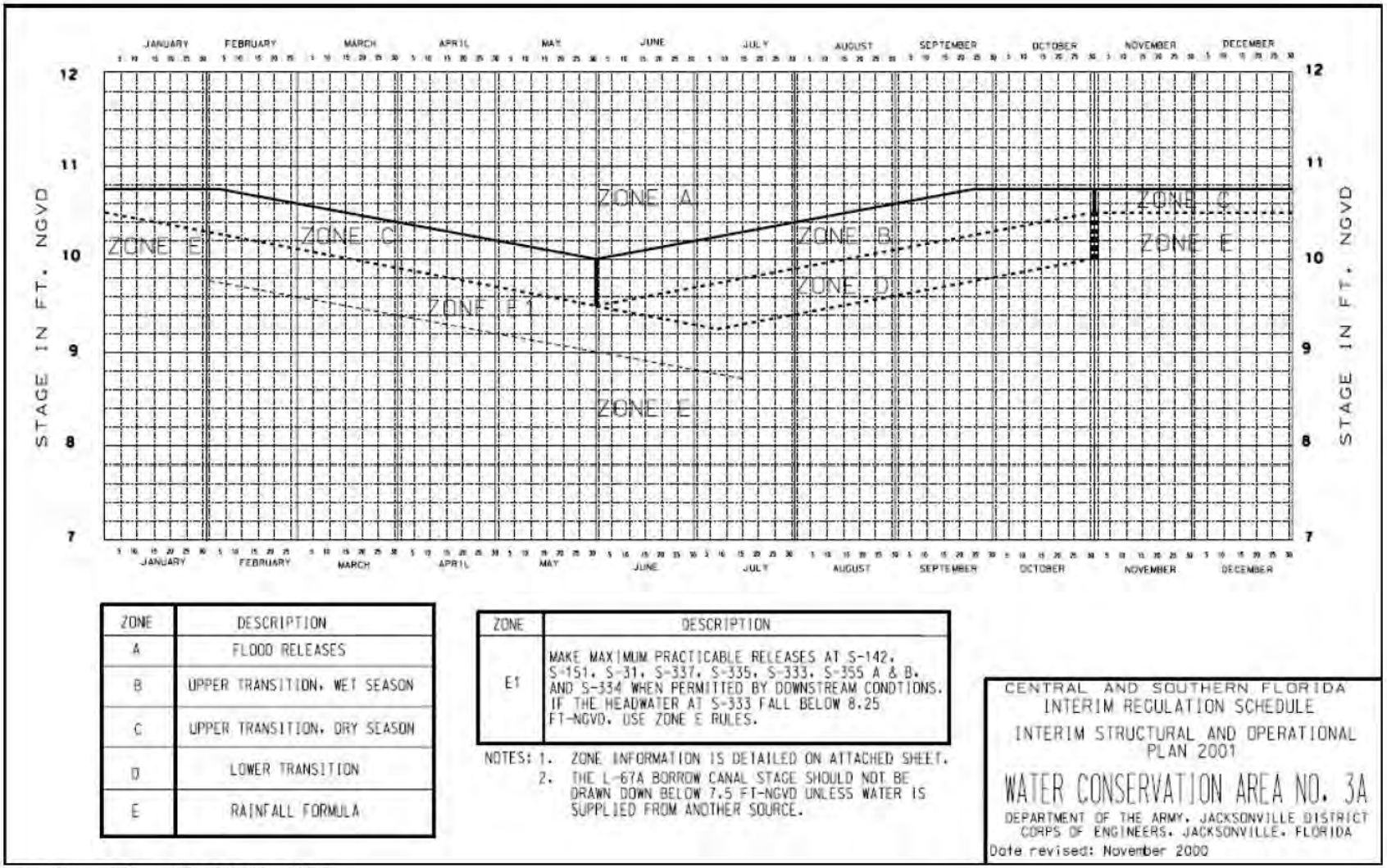


Figure C.1-6. 2008 Lake Okeechobee Regulation Schedule Part D



Note: Figure 9 from 2002 IOP Final SEIS.

Figure C.1-7. IOP Water Conservation Area 3A Interim Regulation Schedule Part A

C.1.1.10 Flood Control

Water management and flood control is achieved in south Florida through a variety of canals, levees, pumping stations, and control structures within the WCAs, ENP, and SDCS. The WCAs provide a detention reservoir for excess water from the EAA and parts of the east coast region, and for flood discharge from Lake Okeechobee to tide. The WCAs provide levees to prevent the Everglades floodwaters from inundating the east coast urban areas; provide a water supply for the east coast areas and ENP; improve water supply for east coast communities by recharging underground freshwater reservoirs; reduce seepage; ameliorate salt-water intrusion in coastal well fields; and provide mixed quality habitat for fish and wildlife in the Everglades.

The regulation schedules for the WCAs contain instructions and guidance on how project spillways are to be operated to maintain water levels in the WCAs. The regulation schedules represent the seasonal and monthly limits of storage which guides project regulation for the authorized purposes. In general, the schedules vary from high stages in the late fall and winter to low stages at the beginning of the wet season. These regulation schedules must take into account various, and often conflicting, project purposes.

The East Coast Canals are flood control and outlet works that extend from St. Lucie County southward through Martin, Palm Beach, and Broward Counties to Dade County. The East Coast Canal watersheds encompass the primary canals and water control structures located along the LEC and their hydrologic basins. The main design functions of the project canals and structures in the East Coast Canal area are to protect the adjacent coastal areas against flooding; store water in conservation areas west of the levees; control water elevations in adjacent areas; prevent salt-water intrusion and over-drainage; provide freshwater to Biscayne Bay; and provide for water conservation and public consumption. The East Coast Canals consist of 40 independently operated canals, one levee, and 50 operating structures, consisting of 35 spillways, 14 culverts, and one pump station. The project operates to prevent major flood damage; however, due to urbanization, the existing surface water management system now has to handle greater peak flows than in the past. The ENP SDCS provides a way to deliver water to areas of south Dade County. This canal system was overlaid on the existing flood control system. Many of these canals are used to remove water from interior areas to tide in times of excess water.

C.1.1.11 Water Supply

C.1.1.11.1 Lake Okeechobee

As one of the federally authorized project purposes, Lake Okeechobee supplies water for agricultural irrigation, municipalities, industry, and ENP, and for regional groundwater and salinity control. The primary water supply uses of Lake Okeechobee are to provide water supply for adjacent agricultural lands and to serve as a backup water supply for the Lower East Coast Service Area (LECSA) and west coast Florida counties when rainfall is insufficient and during dry periods (**Figure C.1-8**).

Lake Okeechobee and its connected conveyance system are the most significant surface water sources for the Lake Okeechobee Service Area (LOSA), which includes the EAA (**Figure C.1-8**). Surface water from the lake and runoff from the EAA supply water to the regional system via canals and provide recharge to the Surficial Aquifer System. Agriculture in the LOSA covered approximately 255,500 acres outside of the EAA and the 460,000 acres within EAA in 2010 (most recent data available) and is the predominate user of lake water. Agricultural water supply demands equate to approximately 480,000 acre-feet per year for LOSA, which includes 303,000 acre-feet per year for just the EAA.

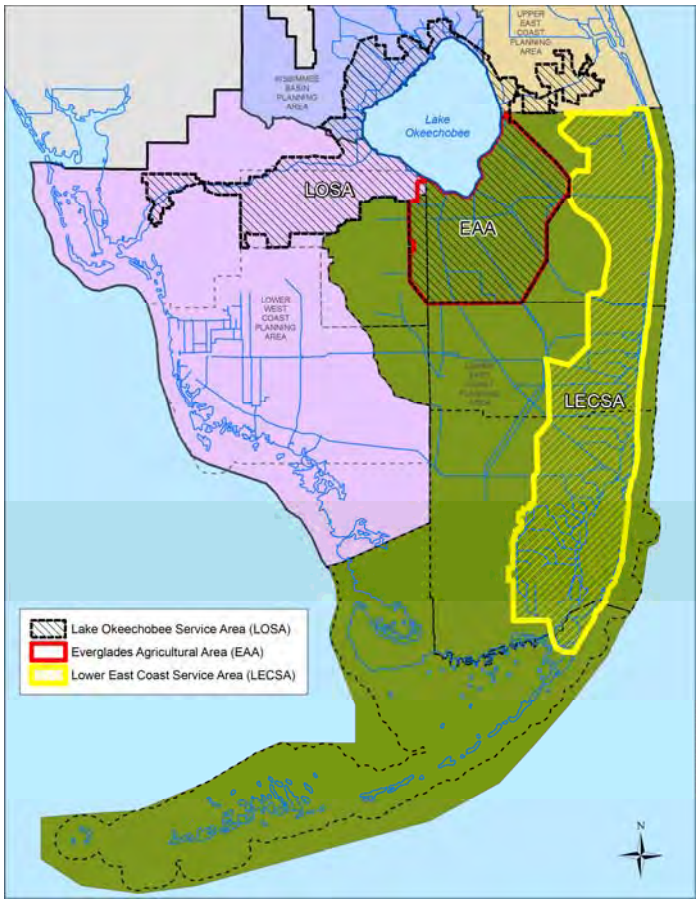


Figure C.1-8. Map of Lake Okeechobee Service Area, Everglades Agricultural Area and Lower East Coast Service Area

In 2008, the USACE implemented the 2008 Lake Okeechobee Regulation Schedule (2008 LORS). The 2008 LORS provides operational flexibility to make Lake Okeechobee releases to meet project purposes as specified in the Water Control Plan. SFWMD also provides recommendations for USACE consideration regarding releases to the Everglades or the Northern Estuaries for Lake Okeechobee regulatory releases within the low, base-flow or beneficial use sub-bands of the 2008 LORS schedule.

The right to use water within the CEPP project area is authorized by a permit issued by the SFWMD. The conditions of permit issuance are more specifically enumerated in Chapters 40E-2 and 40E-20 of the Florida Administrative Code (F.A.C.), which also incorporate by reference the current SFWMD Basis of Review for Water Use Permit Applications (SFWMD 2012a). In order to provide reasonable assurances that the conditions of permit issuance are met, applicants must meet consumptive use permitting criteria. The technical criteria used to evaluate the purpose, quantity, and source of proposed water to be used include the following: (1) saltwater intrusion, (2) wetland and other surface water body impacts, (3) pollution, (4) impacts to off-site land uses, (5) interference with existing legal users, and (6) minimum flows and levels.

Water supplies allocated from Lake Okeechobee and its connected conveyance systems are primarily for supplemental irrigation to the LOSA agricultural areas. In the LOSA, the Okeechobee Utility Authority is the only remaining Public Water Supply (PWS) utility using water directly from Lake Okeechobee.

Clewiston, South Bay, Belle Glade, and Pahokee have discontinued the use of Lake Okeechobee as their supply source and now use Floridan aquifer water treated by reverse osmosis for all of their PWS demand since 2005.

Water shortages are declared by the SFWMD Governing Board when available groundwater or surface water is not sufficient to meet users' needs or when conditions require temporary reduction in total use within the area to protect water resources from serious harm. The SFWMD's Water Shortage Plans are contained in Chapters 40E-21 and 40E-22, F.A.C. The purposes of the plans are to protect the water resources of the SFWMD from serious harm; assure equitable distribution of available water resources among all water users during times of shortage, consistent with the goals of minimizing adverse economic, social, and health related impacts; provide advance knowledge of the means by which water apportionments and reductions will be made during times of shortage; and promote greater security for consumptive use permittees. The current SFWMD water shortage management plan for Lake Okeechobee, known as the Lake Okeechobee Water Shortage Management (LOWSM) Plan (implemented in November 2007), requires various actions to be taken according to the severity of the actual and projected lake water levels. The basis of this plan is an allocation scheme that parcels out lake water based on a percentage of the 1-in-10 water demand. If the lake level continues to fall, the percentage of water restrictions increases. If the water level at the beginning of the dry season is low, then the likelihood of water restrictions is greater.

In October 2008, the SFWMD adopted Restricted Allocation Area criteria for the Lake Okeechobee Service Area as part of the Minimum Flow and Level (MFL) recovery strategy for Lake Okeechobee following an extended drought and USACE implementation of the 2008 LORS, which generally lowered the water levels in Lake Okeechobee. According to the SFWMD, without modification to the current LOWSM, the frequency of water shortage restrictions is expected to increase from 1-in-10 years to experiencing restrictions 1-in-6 years while the lake is being operated under the 2008 LORS. As a result of the potential impacts to water supply, the SFWMD enacted rules to limit future additional withdrawals from Lake Okeechobee in order to prevent further degradation of the level of certainty for existing legal users and to avoid exceeding the MFL criteria. The SFWMD rules also ensures that water necessary for Everglades restoration is not allocated for consumptive use. The regulatory criteria limit allocations from Lake Okeechobee and connected surface waters, including the Caloosahatchee River and St. Lucie River, to base condition water uses as defined within the SFWMD Basis of Review for Water Use Permit Applications for the period from April 1, 2001 to January 1, 2008 (SFWMD 2012a).

C.1.1.11.2 Seminole Tribe of Florida

The Seminole Tribe of Florida has six reservations located in Florida. The reservations include Brighton, Tampa, Fort Pierce, Immokalee, Hollywood, and Big Cypress. Hollywood is the headquarters location for the Seminole Tribe.

Two reservations of the Seminole Tribe of Florida rely on Lake Okeechobee as a secondary supplemental irrigation supply source for their surface water, with specific volumes of water identified for this purpose for the Big Cypress Seminole Reservation and an operational plan addressing drought-water shortage operations for the Brighton Reservation.

The Seminole Tribe has surface water entitlement rights pursuant to the 1987 Water Rights Compact between the Seminole Tribe of Florida, the State of Florida, and the SFWMD. (Public Law No. 100-228, 101 Stat. 1566 and Chapter 87-292 Laws of Florida as codified in section 285.165, Florida Statutes). Additional documents addressing the Water Rights Compact entitlement provisions have since been

executed. These documents include Agreements between the Tribe and SFWMD and a SFWMD Final Order. Of particular interest in this regard is the 1996 Agreement which commits the SFWMD to mitigate impacts to the Tribe's ability to obtain surface water supplies at both the Brighton and Big Cypress Reservations, which may be diminished as a result of various activities.

For the Big Cypress Reservation, SFWMD has installed forward pumps to deliver water from Lake Okeechobee at lower stages to the Miami Canal. This option remains a part of drought management alternatives. Also, real-time operational decisions made during a declared drought event include recognition of the Tribe's water rights. These decisions remain a part of the SFWMD drought management operations.

For the Brighton Reservation, various options of securing both short and long-term water supply deliveries to agricultural operations in the Southern Indian Prairie Basin are being evaluated extensively and implemented where possible. For example, other water source and conveyance options, including deviations to the Lake Istokpoga Regulation Schedule (USACE 1994) to provide for additional water supply and modifications to the C-40 canal to augment the pump station G-208 capability, continue to be explored. Preliminary discussions remain ongoing with the USACE and the USFWS in respect to deviations of the Lake Istokpoga Regulation Schedule.

C.1.1.11.3 Lower East Coast Service Areas

Fresh groundwater is the primary source of supply for potable water consumption, landscape irrigation, and industrial and commercial uses in the LECSA. The LECSA includes Northern Palm Beach County, LECSA 1 (Palm Beach), LECSA 2 (Broward County/Fort Lauderdale), and LECSA 3 (Miami-Dade) (**Figure C.1-9**). Irrigated agricultural acreage for the LECSA is shown in **Table C.1-3.** In the urban areas, PWS relies heavily on the Surficial Aquifer System (SAS), including the Biscayne aquifer. The SAS produces good quality, fresh water from relatively shallow wells. In many cases, the ambient water quality meets primary and secondary drinking water quality standards. These aquifers are recharged by local rainfall, groundwater seepage from the WCAs and Everglades National Park, and surface water deliveries from the WCAs. When sufficient water is available, surface water from Lake Okeechobee can also be routed to the WCAs, then to regional canals to maintain water levels and recharge the aquifer.

Table C.1-3. Irrigated Agricultural Acreage for LECSA (Source 2013 LECSA Draft Water Supply Plan)

Category	Acreage			
	Broward	Miami-Dade	Palm Beach	Total
Irrigated Lands				
Urban Irrigated	128,167	151,362	122,506	**403,282**
Transportation, Communication, & Utilities	3,136	7,039	2,937	**13,112**
Golf Course	7,113	3,720	13,776	**24,767**
Mixed Crops	0	23	0	**23**
Row Crops	819	28,000	10,920	**40,673**
Field Crops	40	1,974	0	**2,014**
Sugar Cane	0	0	1,104	**1,143**
Citrus	2	717	2,464	**5,165**
Other Fruit & Nuts	80	8,000	102	**8,182**
Greenhouse/Nursery	250	9,000	3,798	**13,187**
Sod	9	114	1,953	**2,076**
Specialty Farms	442	216	5,758	**6,423**
Cattle Feeding Operations	0	0	0	**51**
Irrigated Lands Total	**140,058**	**210,165**	**165,318**	**520,098**
Wastewater Reuse				
Urban	1,491	0	4,500	**5,999**
Golf Course	1,047	0	6,506	**8,002**
Transportation, Communication, & Utilities	29	0	61	**91**
Wastewater Reuse Total	**2,568**	**0**	**11,067**	**14,092**
Floridan Aquifer				
Golf Course	0	0	335	**335**
Floridan Aquifer Total	**0**	**0**	**335**	**335**
Non-Irrigated Lands				
Urban Non-Irrigated	57,990	59,437	90,873	**208,932**
Urban Under Construction	3,000	3,259	5,731	**12,258**
Transportation, Communication, & Utilities	17,953	21,526	14,758	**54,566**
Pasture	1,585	1,178	5,255	**9,239**
Abandoned Groves	460	96	2,193	**2,907**
Fallow Crop Land	1,585	12,219	7,195	**21,490**
Upland Non-Forested	1,286	3,458	7,198	**14,035**
Upland Forested	3,775	4,376	50,055	**65,779**
Open Water	31,120	34,480	38,537	**106,243**
Wetlands	25,479	120,168	102,601	**254,966**
Barren Land	738	4,053	2,701	**7,494**
Non-Irrigated Lands Total	**144,971**	**264,251**	**327,097**	**757,910**
Grand Total	**287,597**	**474,415**	**503,816**	**1,292,434**

During the wet season, well fields are recharged by local rainfall and by the regional system that provides continuous seepage from the WCAs to the regional aquifer and the canals. During the wet season, "excess" storm water is also passed through the canals and out to tide due to the limited storage capability within the LEC coastal canal system. Without sufficient storage, it has been difficult to have water available during the dry season without causing flooding during the wet season. Another concern is that, at present, the flow of water along the eastern protective levee is from the Everglades' wetlands to the coast; keeping the water levels high west of the Atlantic Coastal Ridge, and managing levels low to the east of it, results in large groundwater losses from the remnant Everglades throughout the year. This situation has reduced the coastal groundwater flows into estuaries like Biscayne Bay and has made it necessary to import regional water to the Lower East Coast to maintain adequate coastal groundwater levels to prevent saltwater intrusion.

The pattern described above occurs during wet seasons and during normal rainfall years. During extremely dry years, no water reaches the coast and the urban well fields depend heavily on deliveries from the WCAs (including the ongoing seepage from these areas) and Lake Okeechobee via the primary canals for water supplies. During droughts, lower regional groundwater levels may cause inland movement of saline water at the interface of the aquifer with seawater. Minimum stages are maintained in LEC canals principally to protect the Biscayne Aquifer from saltwater intrusion, a major threat to this water resource. Maintaining canal stages during dry conditions serves to raise local and regional groundwater levels to recharge the aquifer, which, in turn, supplies the urban well fields. Even during normal dry seasons when flood releases are minimal, the high demands on the system from urban water supply may be withdrawing water from the natural environment that could alternatively be kept in the system for late winter and spring biological rejuvenation. In addition, during drought years, the urban and agricultural areas create additional demands on the regional water supply as the need for irrigation increases, with a significant percentage of this irrigation water consumed for landscape maintenance (sourced primarily from shallow wells and surface waters). Under drought conditions, water shortage restrictions within the LEC Service Areas may be declared by the SFWMD Governing Board to conserve freshwater supplies.

Due to efficiency in application, the amount of water needed to recharge urban well fields is small compared to the tremendous volumes needed to prevent saltwater intrusion. Preventing saltwater intrusion is important to maintain the long-term viability of the primary ground water supply for the LECSA. For example, if significant saltwater intrusion occurred even once, the easternmost well fields would be contaminated indefinitely and would be replaced with wells further west. This situation has already occurred in eastern Miami-Dade County, and Broward and Palm Beach Counties.

Figure C.1-10 shows the distribution of SFWMD-permitted SAS wells for PWS utilities producing over 0.1 million gallons per day (MGD). The map reveals that well capacities generally increase from Palm Beach County to the south towards Miami-Dade County as a result of the presence of the Biscayne aquifer within SAS. The transmissivity of the Biscayne aquifer increases from north to south. In 2010 (latest information available), PWS utilities utilized 788 MGD of fresh groundwater to supply 94 percent of their total potable water demand. In addition to PWS, agriculture in Broward and Miami-Dade Counties is primarily dependent upon withdrawals from the Biscayne aquifer to supply supplemental irrigation for crops, livestock, and other purposes.

The SAS, including the Biscayne aquifer, is a source of limited availability to the extent that withdrawals result in induced seepage from the C&SF Project, except when stormwater discharge or wet season discharge occurs, as defined by Section 1.7.2.2.B of the Basis of Review for Water Use Permit

Applications within the South Florida Water Management District, commonly referred as the SFWMD Basis of Review (2012a). The SFWMD adopted the Everglades and Loxahatchee River Watershed Restricted Allocation Area criteria (Section 3.2.1.E, Basis of Review) in 2007. If a utility pursues increased withdrawals from the SAS, this source is generally limited due to potential impacts on wetlands and existing legal water users including Domestic Self-Supply and the potential for saltwater intrusion. New or increased allocations are evaluated by the SFWMD on an application-by-application basis to determine if the project meets consumptive use permitting criteria.

In addition to the regulatory limitation on water availability, there is also physical limit of water available due to regulation schedules for the WCA's. Water supply deliveries from the WCAs to coastal canals are utilized to maintain coastal canals and to recharge coastal well fields during dry hydrologic conditions. When canal levels drop below adequate recharge levels due to a combination of wellfield drawdowns, evaporation, and lack of rainfall, water supply deliveries are typically made from the regional C&SF system. When canal levels drop in Miami-Dade County, regional water supply is delivered from WCA 3A through one of two delivery routes, as previously described.

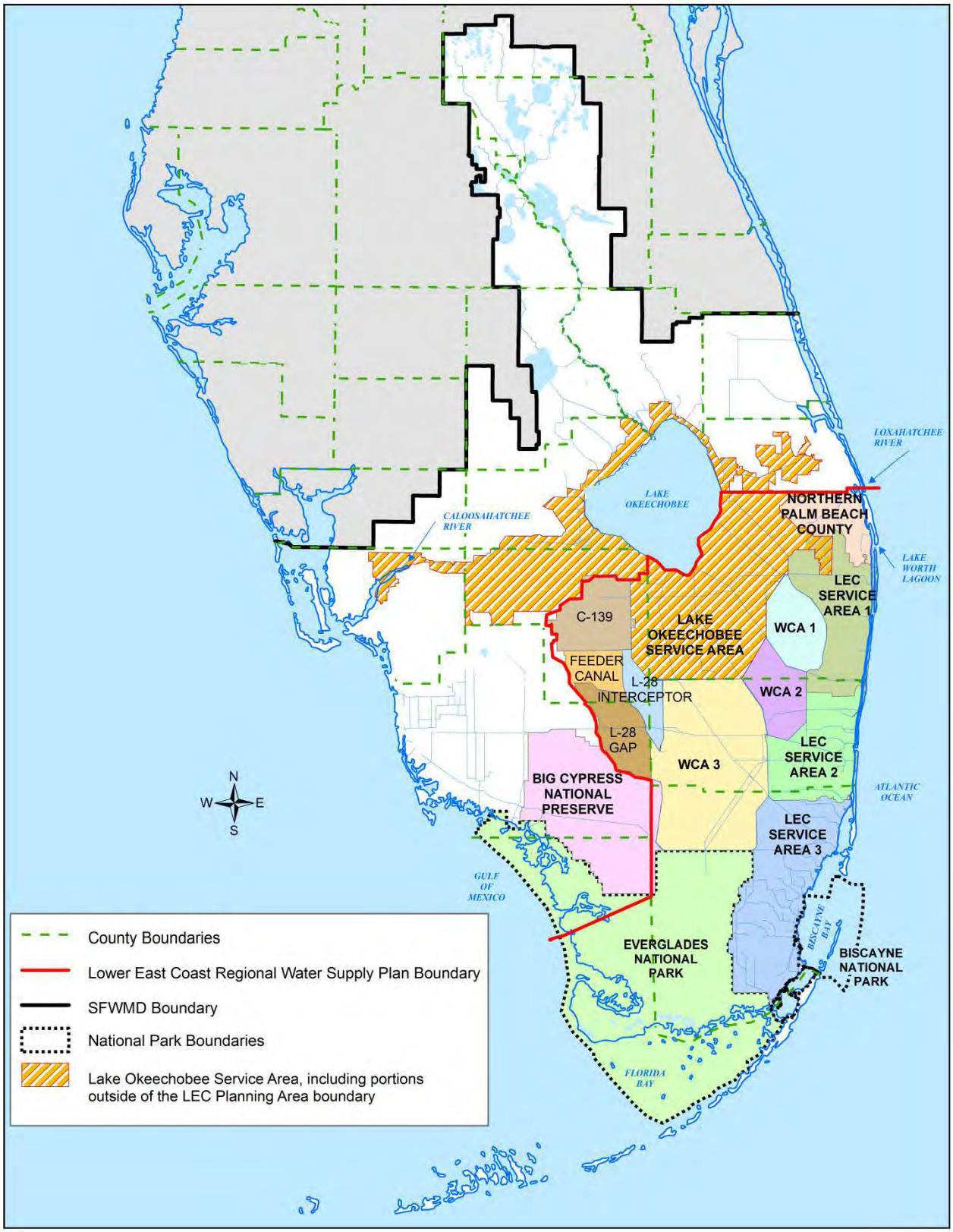


Figure C.1-9. Map of South Florida Water Management Lower East Coast Service Area

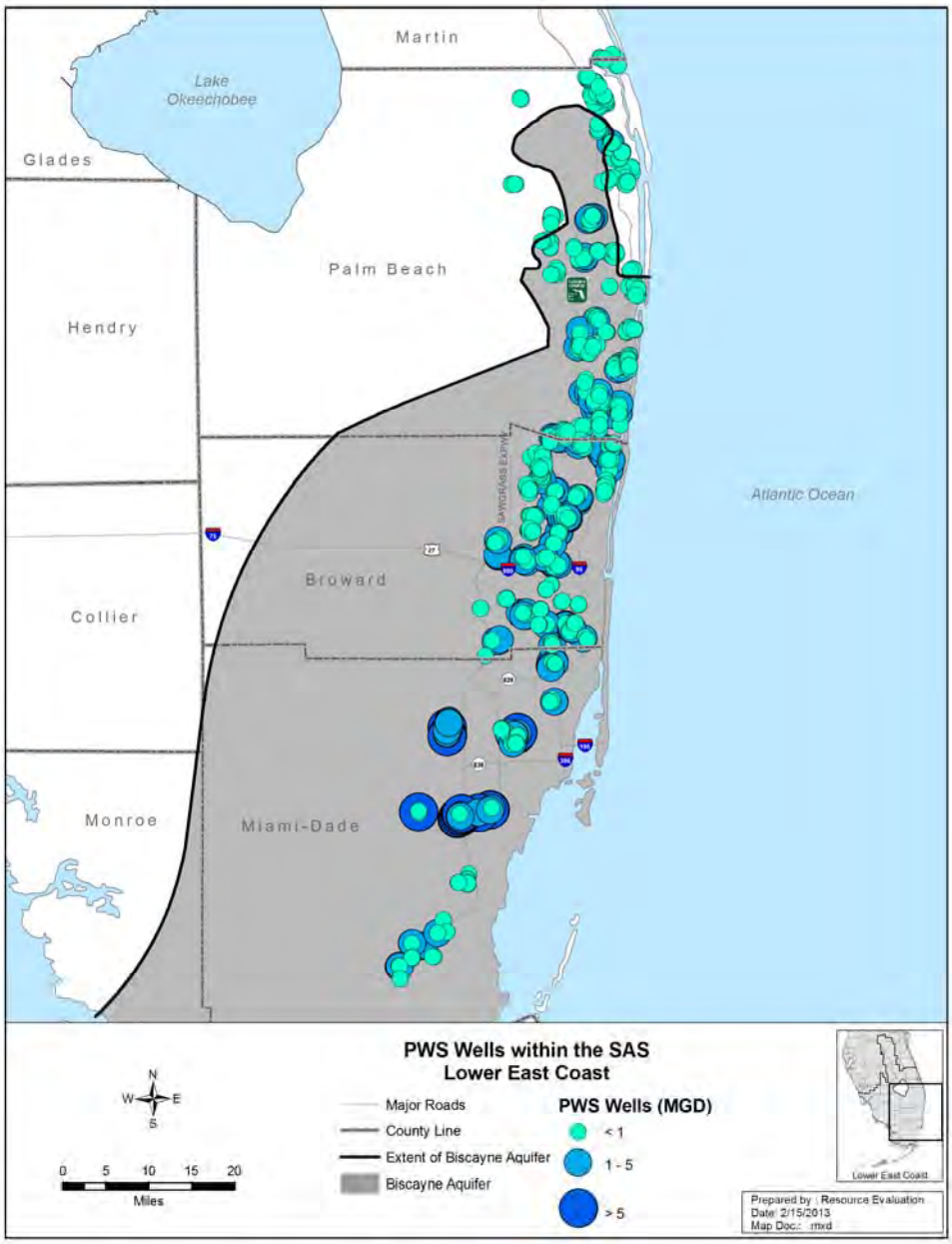


Figure C.1-10. Production from Lower East Coast Public Water Supply Wells

C.1.1.12 Water Quality

Water quality in the study area is significantly influenced by development. The C&SF Project led to significant changes in the landscape by opening large land tracts for urban development and agricultural uses, and by the construction of extensive drainage networks. Natural drainage patterns in the region have been disrupted by the extensive array of levees and canals which has resulted in further water quality degradation. The water quality of the study area is largely controlled by Lake Okeechobee and the EAA. Lake Okeechobee feeds downstream sub-basins such as the St. Lucie and Caloosahatchee River Estuaries, including Indian River Lagoon and Charlotte Harbor. The northern WCAs are fed from the lake as well as runoff from the EAA. Water quality impairment within the study area can generally be attributed to nutrients and bioavailable forms of mercury. A short discussion of each of these water

pollutants is provided below followed by a geographically referenced review of water quality within the study area.

C.1.1.12.1 Nutrients

Nutrients such as phosphorous and nitrogen compounds are a concern in the estuaries, WCAs, ENP, and Lake Okeechobee since they result in an imbalance of flora and fauna. Excess nutrients come primarily from agricultural fertilizers; the decomposition of the peat soils in the area also contributes to excess phosphorus in the system. Phosphorus is the limiting nutrient for Lake Okeechobee, the WCAs, and ENP; nitrogen is generally considered to be the limiting nutrient for the marine waters of south Florida. Prior to 1970, the background TP concentration in Lake Okeechobee was less than 0.040 milligrams per liter (mg/l) while at present it exceeds 0.090 mg/l. Within the remnant Everglades, the background phosphorus concentration in surface waters is between 0.004 mg/l and 0.006 mg/l TP. At the northern end of WCA 3, inflow TP concentrations exceed 0.020 mg/l resulting in undesirable changes to soil composition and vegetation coverage. Soil phosphorus concentrations in pristine areas of ENP are on the order of 100 to 200 milligrams per kilogram (mg/kg) while in impacted areas of the WCAs near canals, soil phosphorus concentrations exceed 500 mg/kg (Craft 2007). The discharge of elevated concentrations of TP into the WCAs has resulted in sufficient soil phosphorus concentrations (< 650 mg/kg) to support cattail invasion into formerly sawgrass and bulrush dominated areas. An example of the impact of nutrient discharges is evident from the expansion of cattails south of the S-10 inflow gates to WCA 2A.

Nitrogen is generally not considered to be a problem within the Everglades landscape. The concentration of total nitrogen (TN) varies from about 2.2 mg/l in WCA 1 to around 0.85 mg/L in pristine areas of ENP. Lake Okeechobee TN concentration is presently around 1.7 mg/l. In the Caloosahatchee and St. Lucie estuaries and portions of Florida Bay, excess nutrients cause algal blooms and depressed oxygen conditions. The Caloosahatchee and St. Lucie Estuaries are generally considered to be nitrogen limited with inorganic forms of nitrogen such as nitrate causing the most harm. The concentration of nitrogen in the discharges from the C-43 and C-44 canals into the northern estuaries is approximately 1.5 mg/l with approximately 0.5 mg/l provided by the highly bioavailable inorganic forms such as nitrate and nitrite. The average concentration of total nitrogen into Florida Bay is around 1.0 mg/l with very little provided as nitrate and nitrite.

C.1.1.12.2 Bioavailable Mercury

Mercury is widely distributed in the environment and originates primarily from sources such as volcanoes and human-induced (anthropogenic) sources such as combustion. According to the United States Geological Survey (USGS) (2010), mercury is deposited from the atmosphere primarily as inorganic mercury. Approximately 90% of atmospheric mercury in peninsular Florida is sourced internationally with the balance coming from local generators. Methylation, the conversion of inorganic mercury to organic methylmercury by naturally occurring sulfate-reducing bacteria, is the most important step in the mercury cycle because it greatly increases toxicity and potential for accumulation in aquatic biota. Nearly all of the mercury found in fish tissue is methylmercury.

Human exposure to mercury is primarily through the consumption of fish containing methylmercury. Exposure to mercury causes neurodevelopmental delays in children. Wildlife exposure to methylmercury through the consumption of fish results in reproductive, neurological, and immune system problems (SFWMD 2013). The United States Environmental Protection Agency (USEPA) has established that a concentration of mercury in fish tissue in excess of 0.3 mg/kg is detrimental to human health. Water quality impairment for mercury as measured by the incidence of fish tissue with mercury

in excess of 0.3 mg/kg is found in all 50 states (USEPA 2010). Every county within Florida has at least one water body with a fish consumption advisory (FDOH 2013). Within the CEPP study area, Lake Okeechobee, Caloosahatchee River, EAA Canals, WCAs, ENP, and portions of the southern estuaries are impaired for methylmercury.

Over the past 15 years, researchers with the FDEP, USGS, and SFWMD have investigated trends in methylmercury bioaccumulation as well as identified the chemical precursors that play a role in the rate of mercury methylation and demethylation within south Florida wetland ecosystems. Between 1997 and 2012, fish tissue mercury content has fallen significantly in response to reductions in local contributions of atmospheric mercury. Within the Everglades ecosystem, these researchers have identified sulfate as the most important precursor regulating mercury methylation. Dissolved organic carbon and phosphorus were found to play lesser roles in regulating methylmercury production.

The relationship between surface water sulfate concentration and mercury methylation rates within the Everglades marsh system is unimodal with peak methylation occurring at intermediate concentrations rather than at either lowest or highest sulfate concentrations. For instance, in WCA 3A, peak methylation occurs when water column sulfate concentrations are in the 10 to 20 mg/l range. In WCA 2A, peak methylation occurs when water column sulfate concentrations are in the 30 to 50 mg/l range. In northern ENP, peak methylation occurs when water column sulfate concentrations are in the 2 to 4 mg/l range (Orem, 2013). Below the optimum ranges cited here, it is thought that sulfate is limiting. Above the optimum ranges, sulfide concentrations begin to inhibit methylation. Differences in the optimum ranges for ENP and the WCAs are thought to be due to the lower organic matter and metals available in ENP relative to the WCAs.

Sulfate concentrations within Lake Okeechobee, the EAA, WCAs, and portions of ENP are well above the natural background levels due to the use of agricultural amendments and drainage of the Everglades marsh. **Figure C.1-11** from Corrales et. al. (2011) shows that Lake Okeechobee contributes approximately one third of sulfur loading to the WCAs while the remaining is the result of agricultural practices, soil oxidation, groundwater, and atmospheric contributions. James and McCormick (2012) estimate that the lake provides between 16 to 20 percent of the EAA sulfate load and thus a lower contribution of sulfate to the WCAs than estimated by Corrales et. al. (2011). The average concentration of sulfate which is the predominant chemical form of sulfur in Lake Okeechobee has fallen from approximately 60 mg/l, to around 25 mg/l over the past 20 years as a direct result of reducing the amount of back pumping of agricultural stormwater runoff into the lake. The concentration of sulfate in discharges into the northern end of WCA3A is significantly higher than that of the lake at around 40 to 50 mg/l.

In the WCAs organic matter and free metals tie up sulfide as organic sulfur and metal sulfides leaving less free sulfide to inhibit methylation (Orem, 2013). The FDEP currently does not have a water quality standard for sulfate in surface waters. The USEPA has a secondary standard for sulfide in surface waters of 0.002 mg/l.

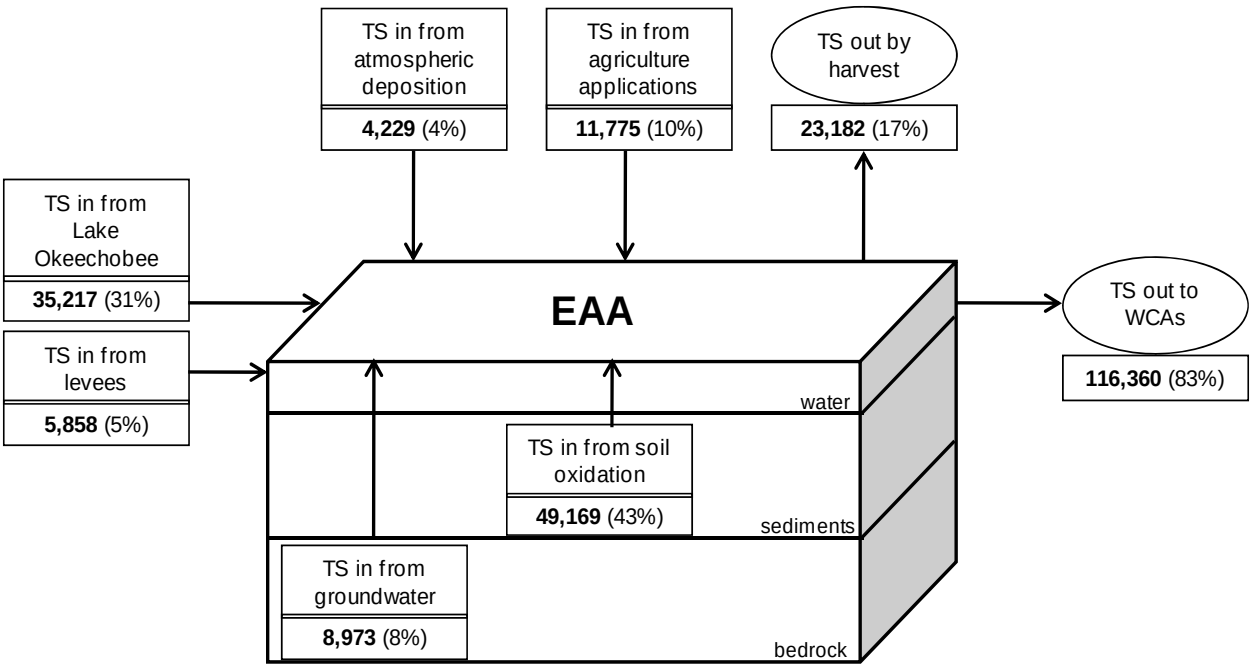


Figure C.1-11. Estimated Average Annual Total Sulfur (TS) Load in Metric Tons (Corrales et. al. 2011)

The RECOVER CERP Performance Measure for sulfate recommended one part per million, 1 mg/L, as a goal for Greater Everglades wetlands. However, the 1 mg/L concentration was recommended as a background marsh concentration without detailed technical support. While concerns have been raised that concentrations above this level could stimulate significant mercury methylation, the 1 mg/L sulfate goal is not consistently associated with any particular level of mercury in the Everglades. The 1 mg/L goal should not be propagated, at this point in time, due to the lack of empirical evidence suggesting that 1 mg/L is protective or that higher levels are consistently associated with harm. Furthermore, to date, no studies have been documented to justify either a numeric sulfate criterion of 1 mg/L, or a site-specific alternative criterion (SSAC) that incorporates other potential factors in the methylation process, for the protection of fish and wildlife in the EPA.

Sulfate arrives in Everglades marshes from several sources. These sources include agricultural and primary system water conveyance canals which deliver sulfate from soil oxidation, agricultural applications and groundwater inputs from the headwaters of the Everglades above Lake Okeechobee, down through the EAA. In addition to surface water, the atmosphere also provides sulfate in rainfall with a concentration of approximately 1 mg/L. More quantitative information is needed on regional sources and magnitudes of Everglades sulfur, and its major form sulfate, in order to determine the controllable and uncontrollable components associated with storage and export processes within the watersheds contributing to the Everglades.

Affecting significant reductions in sulfate concentrations emanating from controllable, including current anthropogenic activities, and uncontrollable sources requires further evaluation. While agricultural sulfur amendments (which lessen the amount of phosphorus needed in fertilizers) for crop production occurs throughout the various contributing watersheds at various levels, the overall contribution to the sulfur mass balance budget is likely a relatively small controllable portion. However, legacy sulfur stored in the soil will ostensibly continue to be released for many decades at significant rates within the Lake

Okeechobee watershed and EAA. Therefore, reducing sulfate applications in the EAA, or in the Lake Okeechobee watershed, may not reduce sulfate loads to the Everglades substantially due to the high inventory of sulfur in EAA soils and elsewhere. While it may take several decades to see any significant reductions in the amount of sulfur stored in the soils, the combination of the many other sources (e.g., Lake Okeechobee, groundwater inputs, and rainfall) will likely remain at sufficient levels to collectively contribute toward stimulating mercury methylation in the EPA marshes.

Control of sulfur inputs has been suggested as a possible means to reduce mercury methylation rates in the Everglades. However, sulfate and mercury data from the Everglades are highly variable and provide few patterns with predictive value. Sulfur availability is only one of many factors that influence mercury methylation in Everglades marshes. Monitoring will facilitate tracking the status of sulfate levels but will not affect the rates of mercury methylation.

The draft total maximum daily load (TMDL) addresses mercury as a pollutant and the TMDL is set at levels that would protect all affected human populations and address Florida fish consumption advisories for fresh and marine waters. While source controls in Florida will minimally contribute to solving the mercury problem, international controls are more essential in the long-term. Over 90% of atmospheric mercury is from international sources. There are no guarantees that offshore (or U.S.) airborne mercury load sources will decrease resulting in less methylmercury bioaccumulation in aquatic species. It is also highly probable that reductions in mercury methylation will be mostly achieved through a reduction in atmospheric mercury load sources far in advance of any achievable reduction in sulfur levels.

C.1.1.12.3 Lake Okeechobee

Lake Okeechobee is considered to be the hydrologic heart of south Florida. Water quality in the lake has been greatly impacted over the long-term by agricultural operations in the Kissimmee Basin to the north and the EAA to the south. Hurricane events adversely affect the lake water quality. After the hurricanes of 2004 and 2005 which passed directly over the lake, the average TP concentration increased to more than 200 parts per billion (ppb). This was due to re-suspension of some of the 30,000 tons of TP stored in the lake sediments. Current phosphorus loading to the lake is approximately 377 tons per year and the average TP concentration for the lake is currently around 92 ppb which is the lowest average concentration since 1993 (SFWMD 2013). The average total nitrogen concentration in the lake is approximately 1.4 mg/l. The FDEP has determined that the lake is impaired for nutrients and mercury in fish tissue. To date, the FDEP has established a TP loading TMDL for Lake Okeechobee with a target annual load of 140 tons per year and a target in-lake total phosphorus concentration of 40 ppb. The 40 ppb TP target was established as the level of phosphorus necessary to reduce algal blooms to less than 10 percent of the time (Havens, K.E. & Walker, W.W. 2002). Control of nitrogen inputs has not been the focus in the Lake Okeechobee basin to date. The SFWMD, in concert with FDEP and FDAC, have put together the Lake Okeechobee Protection Plan (LOPP) which describes the State's plan to achieve the TP loading TMDL for the lake (SFWMD 2011). Since the Lake Okeechobee Protection Act was enacted in 2000, over $1 billion of state and Federal contributions have been invested in the Lake Okeechobee watershed to implement nutrient removal, water storage/retention, and restoration activities in the Lake Okeechobee Watershed including, but not limited to:

- Land owners enrolled approximately 1.6 million acres (77 percent of agricultural land in the Lake Okeechobee watershed) in the FDACS adopted agricultural best management practices (BMP) program. Agricultural BMPS are practical, cost-effective actions that

agricultural businesses can use to reduce pesticides, fertilizers, animal waste and other pollutants entering our water resources.

- FDEP adopted amendments to Chapter 62-640, Florida Administrative Code (F.A.C.), to improve statewide application site accountability and management of Class B biosolids. The rule changes included requirements for site permitting, nutrient management plans, and the biosolids provisions of the 2007 legislation for Sec. 373.4595, F.S., which have resulted in a shift away from biosolids land application in the Okeechobee watershed. Since 2007, the number of active biosolids sites has decreased from 22 to 0. There are currently no permitted biosolids sites in the northern Everglades.
- Extensive data collection and technical analyses are near completion for the development of performance measures for the watershed's Pollutant Source Control Programs. This was a necessary first step in support of technical amendments to the District's regulatory program. The next step includes adoption of schedules, strategies and technical methodologies for fully implementing source controls and BMP programs (for non-FDACS participants) and quantitatively measuring the combined source control programs progress toward achieving water quality goals.
- Construction of three regional STAs designed to reduce phosphorus loading to Lake Okeechobee. These STAs are also expected to remove total nitrogen from the system.
- Implementation of six Hybrid Wetland Treatment Technology (HWTT) projects. HWTT combines the strength of both wetland and chemical treatments to maximize nutrient removal while minimizing chemical use. Based on monitoring results of the six operational HWTT projects in the northern Everglades, this effort is proving to be a promising technology. During the entire study period, results showed flow-weighted mean total phosphorus (TP) concentrations reductions of approximately 70-90 percent and total nitrogen reductions of approximately 20 to 60 percent (SFWMD, 2011).
- Approximately 138,000 acre-feet of water storage/retention has been achieved in the northern Everglades and connected watersheds since 2005 through partnerships that have provided water management alternatives and regional and sub-regional projects. Of that, approximately 91,700 acre-feet is located within the Lake Okeechobee Watershed. Additional water storage sites are currently being developed as part of the Dispersed Water Management program.
- The Northern Everglades-Payment for Environmental Services (NE-PES) program is part of the Dispersed Water Management program. The goal of the NE-PES is to establish creative collaborations via contracts with private landowners to obtain the water management services of water and nutrient retention which will reduce excess flows and nutrient loads to Lake Okeechobee and the estuaries. Payment for documented services is an innovative approach to achieve water resource improvements while providing a business opportunity for landowners to participate.
- Construction of more than 30 phosphorus reduction projects including isolated wetland restorations, Dairy Best Available Technology projects, former dairy remediation projects, evaluation of new technologies, and public-private partnership projects.
- Removal of approximately 1.9 million cubic yards of muck from Lake Okeechobee, in conjunction with the Florida Fish and Wildlife Conservation Commission (FWC), exposing thousands of acres of natural lake bottom sand and promoting the return of native plant species. These efforts were estimated to remove approximately 142 metric tons of phosphorus from the lake.

- Acquisition of more than 100,000 acres of land needed for Kissimmee River Restoration and Headwaters Revitalization is substantially complete. Three phases of the Kissimmee River Restoration Project have been completed. The remaining phases are scheduled to be complete in 2015. Once restoration construction is complete, 40 square miles of Kissimmee River and floodplain ecosystem will be restored including almost 25,000 acres of wetlands and 40 miles of historic river channel.

The State of Florida's current plan (2011 to 2013) includes source control efforts, sub-regional and regional treatment works, and storage implementation projects which will reduce TP loads to the lake by approximately 57 metric tons (mTons)/year. The long-term plan (post 2013) outlined in the 2011 LOPP includes projects that are expected to remove an additional 132 mTons/year of TP (excluding the CERP Lake Okeechobee Watershed Project). The removal of the remaining 116 m Tons/year necessary to achieve the TMDL is expected to be achieved by implementing features included in the CERP Lake Okeechobee Watershed Project as well as undertaking additional measures associated with expanding the ongoing efforts as well as implementing new treatment technologies.

Like many of Florida's freshwater lakes, Lake Okeechobee is impaired for mercury due to elevated levels of mercury found in fish. The FDOH advises limiting the consumption of fish caught from the lake.

C.1.1.12.4 Caloosahatchee River and Estuary

Water quality conditions are degraded in the upper and lower areas of the Caloosahatchee River basin due to agricultural and urban runoff, respectively. The channelized section of the river also shows degraded water quality conditions, due to agricultural inputs, as compared to tributaries lying in less developed areas of the basin. Problems associated with the degraded areas of the basin are typified by low dissolved oxygen levels, elevated conductivity, decreased biodiversity, and mercury methylation / bioaccumulation. Conditions in the urbanized sections of the basin are influenced by non-point stormwater flows, and are manifested in the river by elevated chlorophyll levels, algal blooms, periodic fish kills, and low dissolved oxygen levels. Although wastewater discharges remain a problem, the estuary is presently more seriously affected by high nutrient waters from the river and tributaries, and stormwater runoff from cities. Nutrient and chlorophyll levels are high, and small algal blooms occur regularly.

Lake Okeechobee provides approximately 60 percent of the freshwater discharged at the S-79 structure which is the upstream end of the Caloosahatchee Estuary. The remaining volume of freshwater comes from Caloosahatchee River basin runoff. FDEP has identified mercury in fish tissue, nutrients, and dissolved oxygen as verified impairments to the main stem of the Caloosahatchee Estuary. Approximately two-thirds of the nutrient load to the Caloosahatchee Estuary is contributed from sources within the basin with the remaining fraction coming from Lake Okeechobee. Given that the estuary is nitrogen limited, FDEP has focused on controlling nitrogen loads to improve water quality. FDEP has developed a TMDL for TN in the estuary that requires a reduction in load of 23% relative to the current average annual load of 5,900 tons per year. FDOH has a fish mercury consumption advisory for the Caloosahatchee River and Estuary.

C.1.1.12.5 St Lucie River and Estuary

Water quality conditions along the St. Lucie River are rated as good in less developed areas of the basin. However, conditions are degraded in urbanized areas and along the extensive network of canals that drain this area. The worst water quality conditions in Martin and St. Lucie Counties are reported in the

St. Lucie River and the canals leading from the EAA. Approximately 33 percent of total freshwater flow to the St. Lucie Estuary is provided by discharges from Lake Okeechobee through the C-44 Canal. Given its similarity to the Caloosahatchee Basin, it is reasonable to assume that at least 50% of the nutrient load comes from the St. Lucie Basin with the remainder provided by Lake Okeechobee flows. FDEP has determined that the St. Lucie River is impaired for Biochemical Oxygen Demand (BOD), TP, and TN. For the C-44 canal, FDEP established TMDL's for BOD, TP, and TN that require a reduction in load of 70, 55, and 51 percent, respectively from current conditions. Upstream portions of the St. Lucie River are impaired for mercury; however, the main portion of the St. Lucie Estuary is not included in the FDOH list of fish consumption advisories for mercury.

C.1.1.12.6 Everglades Agricultural Area

Sugar cane is grown on approximately 85 percent of the 700,000-acre EAA with the balance planted in turf grass, rice, citrus, and truck crops. The L-8, West Palm Beach, Hillsboro, North New River, and Miami Canals from Lake Okeechobee to the L-4, 5, 6, and 7 Canals, which roughly define the EAA, have poor water quality with extremely high nutrient and low dissolved oxygen levels. Other problems include pesticides, biological oxygen demand, bacteria, suspended solids, and mercury bioaccumulation. FDEP has defined most of the primary and secondary canals within the EAA (Miami, Hillsboro, North New River, West Palm Beach, Bolles, and Cross Canals) as Class III Waters with a designated use of "recreation propagation and maintenance of healthy, well-balanced population of fish and wildlife. FDEP has identified fecal coliform, ammonia, and nutrients as impaired within portions of the EAA". No draft or final TMDLs have been established for the EAA; however, as a result of extensive litigation between the State of Florida and Federal Agencies (DOI, USEPA) and other parties over the last 20 years, the State has been compelled to establish numeric criteria for total phosphorus, implement agricultural BMPs to control phosphorus discharges and build stormwater treatment systems to ensure that water leaving the EAA and entering the WCAs meets the criteria. Over the past 12 years, SFWMD has constructed approximately 60,000 acres of stormwater treatment areas to reduce total phosphorus concentration in water entering the WCAs. While the construction and operation of the STAs have significantly improved the quality of water discharged to the WCAs, the Federal Parties (DOI, USEPA) filed a brief with the Court for additional relief given continued exceedances of the original 1991 Settlement Agreement water quality limits. In 2011, the presiding judge ordered the parties to come to terms or have a settlement imposed upon them. The September 2012 Consent Order issued to the SFWMD by FDEP is the result of extensive negotiations between the state and Federal parties. The Order requires that the maximum annual flow weighted mean TP concentration be no higher than 19 ppb on an annual basis and a long-term limit of no higher than 13 ppb in three out of five years. To date, the TP concentration in the best performing STA has averaged 17 ppb which exceeds the long-term limit of 13 ppb (SFWMD, 2012b). As part of the 2012 Consent Order, the SFWMD has agreed to construct 6,500 acres of additional STA capacity and 110,000 acre-feet of FEB storage. In addition, the SFWMD has to implement measures to improve the performance of the existing STA facilities. The SFWMD's plan for complying with the 2012 Consent Order is outlined in their "Restoration Strategies" plan (SFWMD 2012c).

SFWMD maintains a water quality monitoring network for surface waters within and at the boundaries of the EAA. These water quality data are compiled in SFWMD's database DBHYDRO and available through Internet search (http://www.sfwmd.gov/org/ema/dbhydro/). The SFWMD and FDEP jointly publish the South Florida Environmental Report (SFER) which includes a summary of water quality conditions in south Florida (http://my.sfwmd.gov/portal/page/portal/xweb%20about%20us/agency%20reports). Additional data sources include: USEPA, USGS, FDEP, and numerous public and private research and monitoring efforts.

C.1.1.12.7 Greater Everglades

Water from Lake Okeechobee and the EAA flows through the WCAs to ENP and eventually into the coastal bays and estuaries. The 2011 SFWMD South Florida Environmental Report (SFER) reported water quality exceedances for ammonia, dissolved oxygen, alkalinity, pH, and specific conductance in WY2010 (SFWMD 2011b). Ten pesticides were detected in samples; however, only atrazine was detected at a concentration exceeding its toxicity based guideline at locations within WCA 1 and WCA 2. Mercury in fish tissue is a concern for all of the WCAs. Fish tissue levels of methylmercury in the WCAs have been above the USEPA human health criterion of 0.3 mg/kg for 50 percent of bass collected since 1998. Mercury levels in fish have fallen significantly over the past 15 to 20 years in the WCAs (58% relative to 1991) and ENP (43% relative to 1997) (SFWMD 2012b). The FDOH has published a "no consumption" advisory for portions of the Greater Everglades due to elevated fish tissue mercury concentrations.

Nutrient loading to the WCAs and ENP have resulted in significant degradation of the Everglades landscape by converting thousands of acres of sawgrass prairie into lesser quality habitat such as cattail marsh. The 1991 Everglades Settlement Agreement (SA) ended a 1988 Everglades lawsuit (Case No. 88-1886-CIV-Hoeveler) that was brought forward by the Federal government against the State of Florida (SFWMD and FDEP 1988) for failing to regulate discharges into ENP and the Arthur B. Marshall Loxahatchee National Wildlife Refuge. The subsequent 1992 Consent Decree, as modified in 1995, specified interim and long-term phosphorus concentration levels for the Arthur R. Marshall Loxahatchee National Wildlife Refuge, SRS, Taylor Slough and coastal basins in ENP. The SFWMD collects the required water quality data and publishes a Settlement Agreement Report on a quarterly basis as part of complying with the terms of the 1992 Consent Decree. For the last several years, discharges into the EPA have mostly complied with the requirements of the settlement agreement with the following exceptions: (1) exceedance of the June 2009 limit for Loxahatchee, and (2) exceedance of the allowable annual percentage of TP measurements exceeding 10 ppb at SRS for WY2010. In addition, the SRS Settlement Agreement calculations for WY2009 and WY2010 show that the annual flow-weighted mean TP concentration for these years was at the limits (8.2 ppb and 8.9 ppb, respectively for WY2009 and WY2010).

Compliance with the SA criteria at SRS is one of the most contentious issues for the state, Federal and Tribal parties. Recent water quality trends in WCA 3A indicate that flow-weighted mean (FWM) TP concentrations and SRS loads are decreasing (Walker 2010). **Figure C.1-12** shows that over the past 20 years, the annual FWM TP concentrations entering WCA 3A have fallen from approximately 0.050 mg/l to 0.030 mg/l while the annual FWM TP concentration measured at SRS has fallen from approximately 0.011 mg/l to approximately 0.009 mg/l. The reduction in inflow FWM and outflow FWM for WCA 3A is likely the result of the construction and operation of the STAs in the EAA. This is a slow trend and there may be periodic reversals due to weather conditions (e.g. droughts resulting in WCA dry downs, followed by wet periods flushing the mobilized nutrients). In portions of the WCAs that have historically received direct untreated discharges from the EAA, there is a large internal phosphorus load contained in the sediments. This large internal load may become a source of water column TP as inflow TP concentrations from the STAs are reduced below the 13 ppb and the sediment/pore water TP equilibrates with the water column TP.

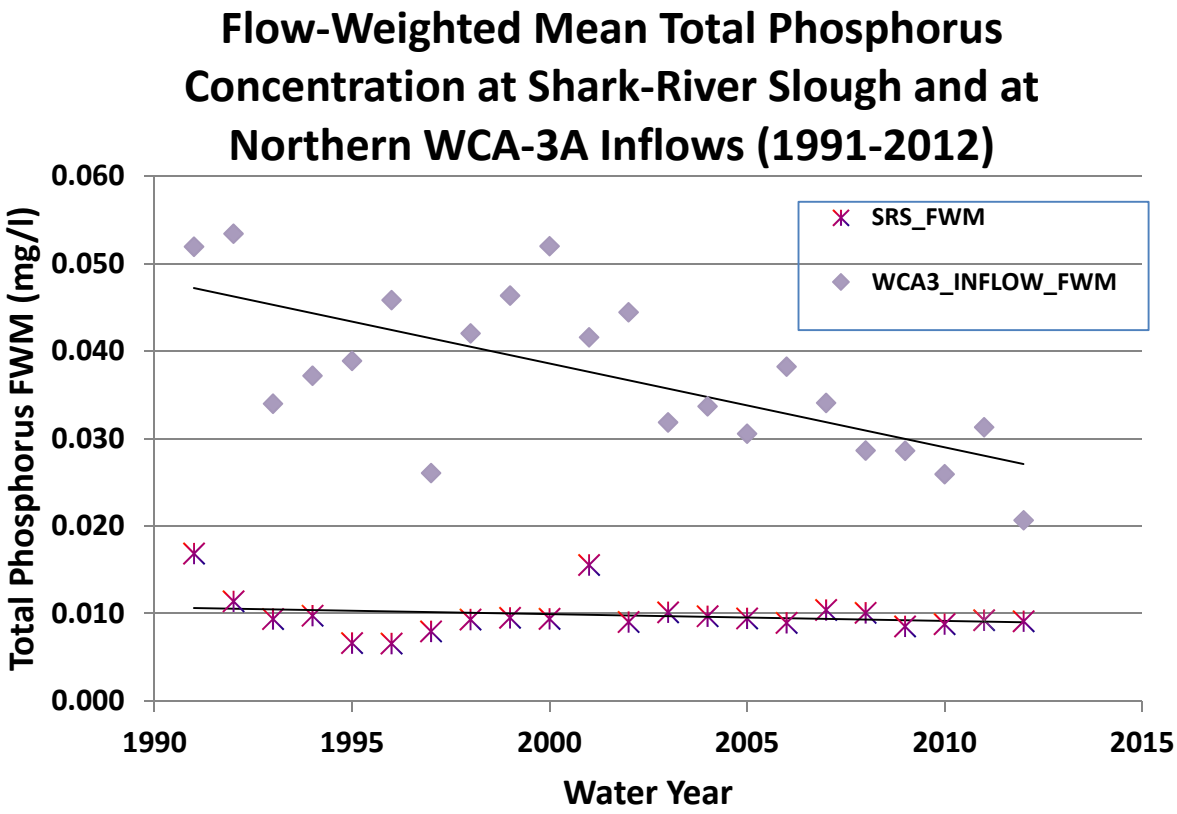


Figure C.1-12. Flow-Weighted Mean Total Phosphorous Concentration at Shark River Slough and Northern WCA 3A Inflows

C.1.1.13 Groundwater Resources

Groundwater in south Florida consists of the surficial Biscayne aquifer and the Floridan aquifer. Both are critical to the ecology and economy of south Florida. The Biscayne aquifer is highly permeable and is at or near the land surface in many locations and therefore readily susceptible to groundwater contamination. The Biscayne aquifer has been classified as a Sole Source Aquifer for Broward and Miami-Dade Counties under the Federal Safe Drinking Water Act based on the aquifer's susceptibility to contamination and the fact that it is a principal source of drinking water. The Floridan aquifer system is one of the most productive aquifers in the world and is a multi-use aquifer system. North of Moore Haven and Port Mayaca, where it contains freshwater, the Floridan is the principal source of groundwater supply. South of Lake Okeechobee, the Floridan aquifer is generally brackish and historically has not been used as a primary source of drinking water though this may change in the future as water supplies become more scarce.

C.1.1.14 Air Quality

Legal limitations on pollutant concentration levels allowed to occur in the ambient air, or air quality standards, have been established by the USEPA and the FDEP for six criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particle pollution (10 microns or less in diameter (PM_{10}), and 2.5 microns or less in diameter ($PM_{2.5}$), and sulfur dioxide (SO_2). Primary sources of air pollution in south Florida are related to transportation, stationary fuel combustion sources, and solid waste disposal. The existing air quality within south Florida is considered good, as outlined within

the FDEP 2010 Air Monitoring Report (FDEP 2010). Air monitoring reports are prepared annually by FDEP to inform the public of the air pollutant levels throughout the State of Florida. The report summarizes the results of monitoring that has been conducted to measure outdoor concentrations of those pollutants for which the USEPA and the State of Florida's Environmental Protection program have established ambient air quality standards. All areas within the state are designated with respect to each of the six pollutants as attainment (i.e., in compliance with the standards); non-attainment (i.e., not in compliance with the standards); or unclassifiable (i.e., insufficient data to classify). Attainment areas can be further classified as maintenance areas. Maintenance areas are areas previously classified as non-attainment which have successfully reduced air pollutant concentrations to below the standard. Maintenance areas must maintain some of the non-attainment area plans to stay in compliance with the standards.

Southeast Florida including Miami-Dade, Broward, and Palm Beach Counties continue to be classified by the USEPA as attainment/maintenance areas for ozone. Florida remains designated as unclassifiable for PM_{10}. Although sufficient data have been collected for attainment determinations, USEPA has not considered PM_{10} for attainment determinations in Florida yet.

C.1.1.15 Hazardous, Toxic or Radioactive Wastes

Engineering Regulation (ER) 1165-2-132 states that "construction of civil works projects in HTRW contaminated areas should be avoided where practicable." Compliance with the requirements of ER 1165-2-132 for the planning phase is demonstrated in this report. The USACE and SFWMD will continue to document HTRW conditions on the project lands such that the project will be in compliance with the ER and other applicable HTRW policies. In order to comply with the requirements of ER 1165-2-132, human health risks are typically evaluated by comparing chemical concentrations in all media (e.g., soil, groundwater, surface water, sediment) to human health-based cleanup target levels (CTLs) promulgated by FDEP in Chapter 62-777, F.A.C. Ecological risks are typically evaluated by comparing chemical concentrations to the Sediment Quality Assessment Guidelines (SQAGs) developed by FDEP for inland waters and to ecological restoration targets established by the USFWS. If warranted, lands within the project boundary are investigated in accordance with the jointly developed (FDEP, USFWS, and SFWMD) protocol, entitled "Protocol for Assessment, Remediation and Post-remediation Monitoring for Environmental Contaminants on Everglades Restoration Projects" (SFWMD 2008). The protocol, which is commonly referred to as the Ecological Risk Assessment (ERA) Protocol, is intended to provide guidance on conducting environmental site assessments on agricultural lands proposed for use in projects to be inundated with water, such as for conversion to storm water treatment areas, wetlands, reservoirs, and other aquatic features.

The ERA Protocol requires that relevant data collected during the Phase II ESA initially be compared to the human health Soil Cleanup Target Levels (SCTLs) from 62-777 F.A.C. and the ecological risk SQAG thresholds. While the SCTL's are promulgated standards under Florida law, the SQAG guidelines are not standards as defined in Section 403.803, F.S. where the results exceed the SCTLs, a risk-based approach is used by the regulator to determine if corrective action is required or if an alternative target level is appropriate based on projected exposure. Where the results exceed the SQAG screening criteria, a Screening Level Ecological Risk Assessment (SLERA) is performed as part of the Phase II ESA. The purpose of the SLERA is to evaluate potential ecological risks to benthic invertebrates and higher trophic species, particularly USFWS trust species protected under the Endangered Species Act or the Migratory Bird Treaty Act, associated with exposure to the chemicals present in the soils, after the project is constructed and the property is inundated.

A summary of the HTRW conditions in the four major areas of the project footprint are provided below.

C.1.1.15.1 A-2 Flow Equalization Basin Lands

The land for the proposed A-2 Flow Equalization Basin is located along the west side of US 27 South in unincorporated Palm Beach County and encompasses approximately 14,408 acres. The project lands consist of eight separate parcels currently owned by the State of Florida. The tract numbers, prior ownership, and acreage are shown in the **Table C.1-4** below.

Table C.1-4. Prior Ownership for A-2 Flowage Equalization Basin

A-2 Flow Equalization Basin		
Tract No.	**Former Owner**	**Acreage**
D7100-044	TALISMAN SUGAR CORPORATION	2
D7100-047	TALISMAN SUGAR CORPORATION	10
D7100-066	TALISMAN SUGAR CORPORATION	12
D7100-067	TALISMAN SUGAR CORPORATION	1
D7100-104	TALISMAN SUGAR CORPORATION	14,371.53[2]
D7100-139	TALISMAN SUGAR CORPORATION	1
D7100-141	WEINLEIN, JOAN	10
D7200-005	TALISMAN SUGAR CORPORATION	1
A-2 Total		**14,408.53**

The primary parcel (Tract D7100-104) was acquired from Talisman Sugar Company in 1999 by the SFWMD. Several of the smaller parcels listed above were also owned and operated by Talisman Sugar Corporation, but these parcels were deferred from transfer during the original transaction until environmental concerns on these small areas could be addressed. The Weinlan parcel (Tract D7100-141) was leased to Talisman Sugar at the time of the 1999 acquisition and was evaluated with the remainder of Tract D7100-104. Most of the project area has been historically cultivated in sugar cane, with occasional rotational crops of rice or corn. The property is currently under lease to New Hope Sugar Corporation for sugar cane cultivation. **Figure C.1-13** shows the site location and the parcel numbers.

The September 2012 Summary Environmental Report (PSI, 2012), the March 2013 Phase II Environmental Assessment Report (PSI, 2013a), and the May 2013 Phase II Environmental Site Assessment Report-Addendum #1 (PSI, 2013b) provide a review of the past audits and closure reports as well as the results of the cultivated soil sampling that was conducted in January of 2013. The reports cited above is the source for all of the tables and figures included within this section. Copies of these reports as well as related correspondence are found in **Annex H** (**Hazardous Toxic and Radioactive Wastes**).

[2] Acreages shown include only the portion of the tract that is within the proposed limits of construction for the A-2 FEB project. The total acreage of Tract D7100-104 is 20,525 acres, and includes lands outside the current project footprint.

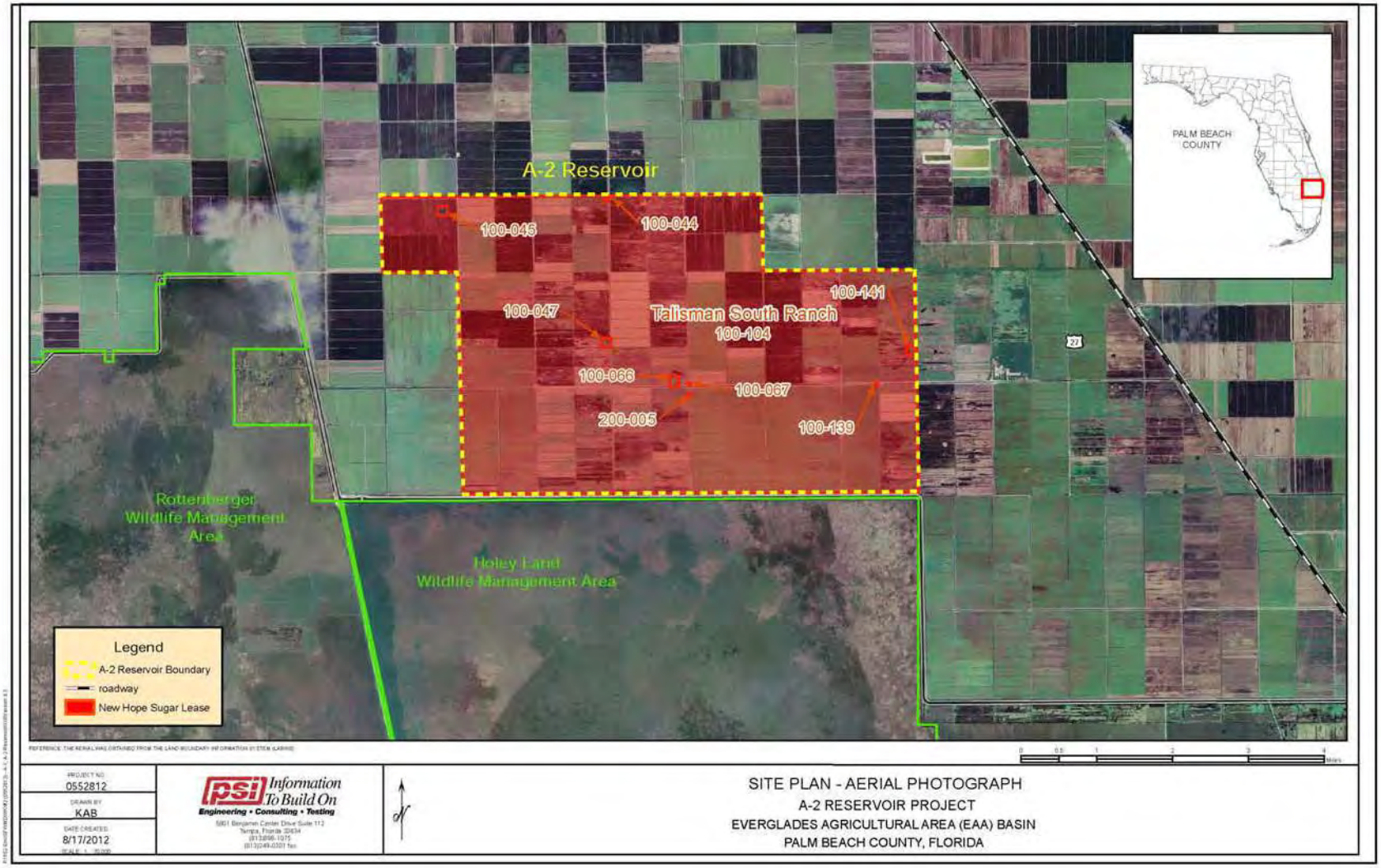


Figure C.1-13. A-2 Reservoir Tracts (PSI INC. 2012)

Table C.1-5 includes a list of the HTRW sites found on the subject property and the disposition of the remedial actions taken at each of these sites since 1999. **Figure C.1-14** shows the locations of each of these sites within the A2 footprint. The borrow pit was used in the past for disposal of solid wastes. Arsenic, lead, phenols, and petroleum hydrocarbons were found at the borrow pit. Approximately 8,100 tons of solid waste and contaminated soil was removed from this site. A groundwater treatment system was installed to remove lead but it was not fully successful. The FDEP issued a Conditional Site Remediation Closure Order (CSRCO) in July of 2012. This Order included a Non-residential Deed Restriction. **Figure C.1-15** shows the location of this deed restriction. The borrow pit is designated as T-2 on this figure.

Arsenic, petroleum hydrocarbons, and pesticides were found at the labor camp which included a pesticide mix/load site. Approximately 3,600 tons of soil was removed from the labor camp. Petroleum contamination of the groundwater was naturally attenuated and pesticide impacts to groundwater were addressed through soil removal. The FDEP issued CSRCO in July of 2006 that includes a non-residential deed restriction. **Figure C.1-15** shows the location of this deed restriction. The labor camp is designated as T-3 on the figure.

Four of the identified HTRW sites are former pump station locations. Approximately 7 tons of petroleum contaminated soils were removed from these sites. Soil samples collected at two of these pump stations were tested for the presence of organo-chlorine pesticides and no exceedances were found. The FDEP issued Site Remediation Closure Orders (SRCO) at these pump stations in December of 1999.

A pesticide mix/load area was investigated and arsenic contamination was detected in the soils. Approximately 700 tons of arsenic impacted soils were removed from the site and a groundwater pump/treat system was operated for three months at which point the groundwater arsenic concentration was below the applicable groundwater concentration target level (GCTL). The FDEP issued a CSRCO in July of 2006 and included a non-residential deed restriction. The location of the site is shown in **Figure C.1-15**. The pesticide mix/load area is designated as T-21 on the figure.

Table C.1-5. Summary of Assessment and Corrective Actions, A-2 Flowage Equalization Basin Lands, Palm Beach County (Adapted from PSI Inc. 2012).

Tract Nos.	Point Source RECs Identified in Phase I	Soil / GW Exceedances Identified in Phase II	Corrective Action Summary	Regulatory Concurrence
D7100-104, -044, -047, -066, -067, -139, -141, -005	Borrow Pit (T-2)	Arsenic and petroleum hydrocarbons detected above SCTLs, phenols and m & p cresol detected above GCTLs	Excavated: 1,009 tons of steel, 473 tons of tires, 3,895 tons of C & D debris, 3,735 tons of soil. Also installed GW treatment system (operation was abandoned due to inability to filter out lead)	CSRCO, 7-21-06, Soil above SCTL, with Non-residential Deed Restriction
	Labor Camp (T-3)	Arsenic and petroleum hydrocarbons detected above SCTLs at burn pit area and drum storage area within labor camp. Petroleum hydrocarbons / solvents and atrazine detected in GW above GCTLs at pesticide mix / load area and refueling area / runway within labor camp.	Excavated approximately 3,590 tons of soil from 5 areas within labor camp. Petroleum impacts in GW naturally attenuated below GCTLs. Source removal reduced atrazine GW concentrations below GCTL.	CSRCO, 7-21-06, Soil above SCTL, with Non-residential Deed Restriction
	Pump Station (T-6)	OCPs detected above SQAGs	20 soil samples collected around pump station; no OCPs detected above SQAGs of SCTLs	SRCO, 12-21-99
	Pump Station (T-7)	No soil or groundwater samples collected; Visual evidence of soil staining	14 surficial soil samples collected around pump station; no exceedances above SQAGs or SCTLs	SRCO, 12-21-99

Tract Nos.	Point Source RECs Identified in Phase I	Soil / GW Exceedances Identified in Phase II	Corrective Action Summary	Regulatory Concurrence
	Pump Station (T-8)	No soil or groundwater samples collected; No visual evidence of soil staining; Still included as Exclusion Area	Excavated approximately 6.36 tons of petroleum impacted soil	SRCO, 12-21-99
	Pump Station (T-24)	No soil or groundwater samples collected; No visual evidence of soil staining; Still included as Exclusion Area	Excavated approximately 0.68 tons of soil	SRCO, 12-29-99
	Pesticide Mix/Load Area (T-21)	Arsenic detected above SCTL and GCTL	Excavated approximately 692 tons of arsenic impacted soil. Installed GW pump and treat system, operated for 3 months, effectively lowered the arsenic concentrations below the GCTL	CSRCO, 7-21-06, Soil above SCTL, with Non-residential Deed Restriction

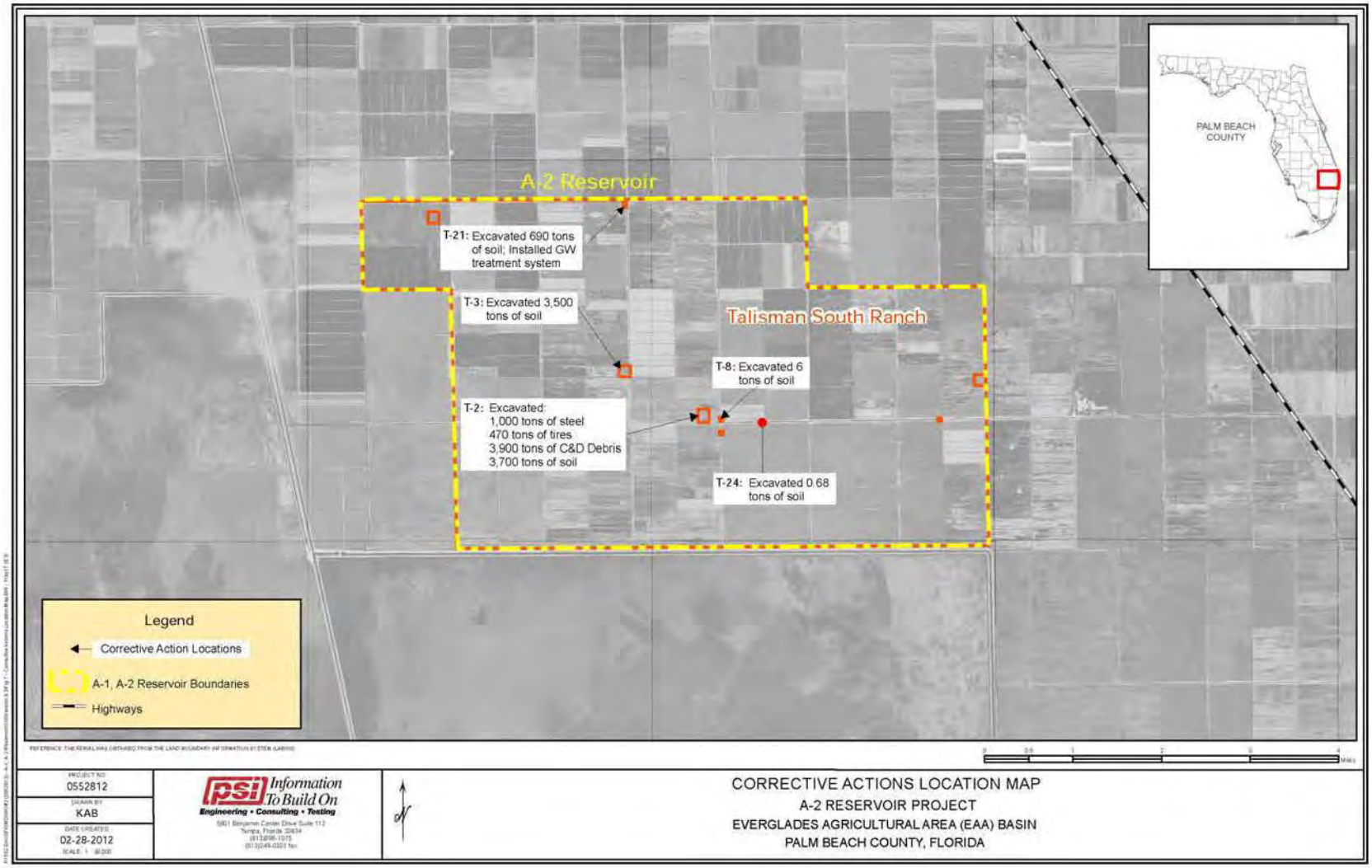


Figure C.1-14. Corrective Actions Map, A-2 Footprint (PSI INC. 2012)

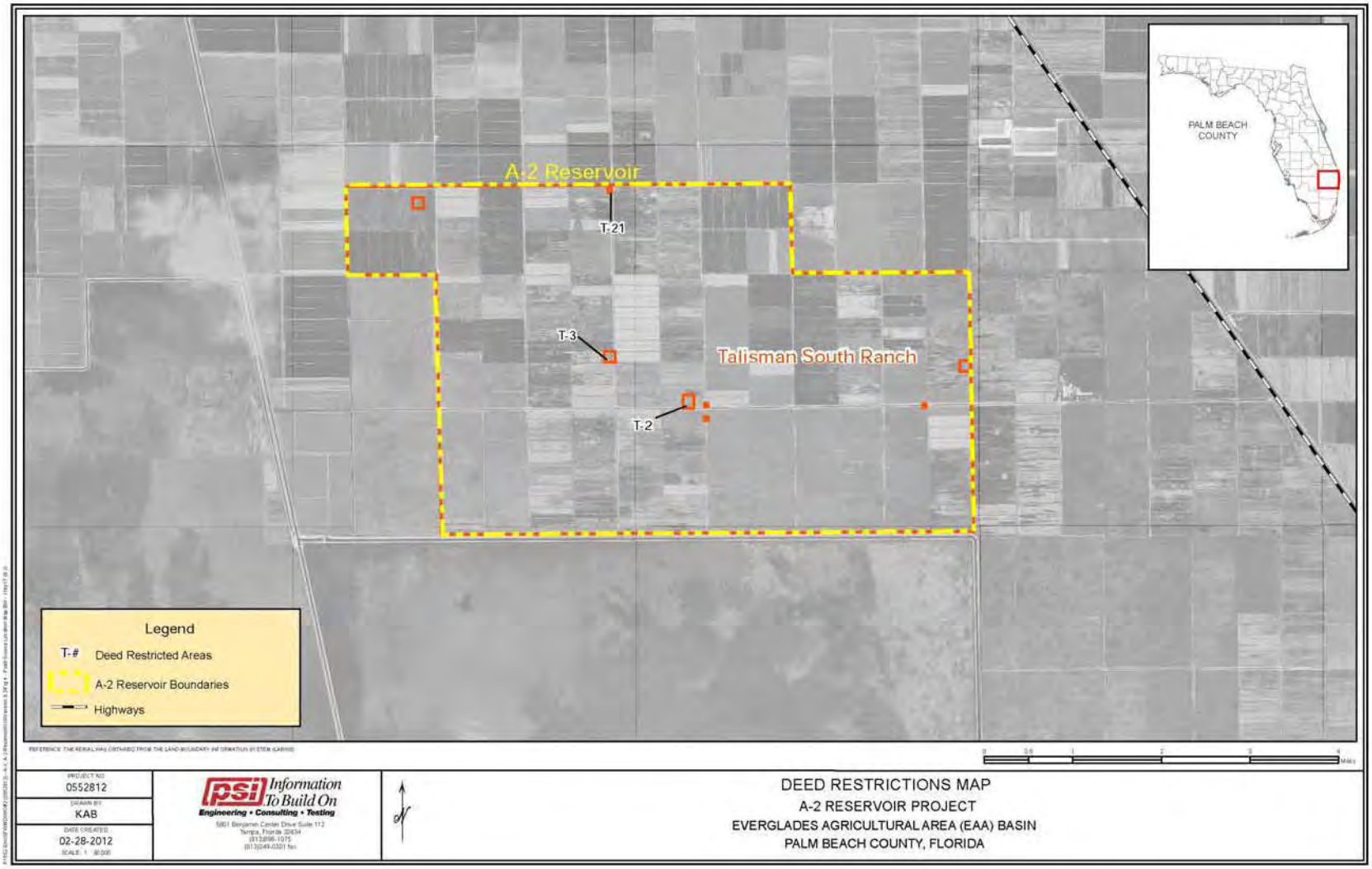


Figure C.1-15. Deed Restrictions Map A-2 Footprint (PSI INC. 2012)

Table C.1-6 shows a list of environmental audits conducted since 1998 on the A-2 lands. The environmental audits and correspondence between the SFWMD and the FDEP show that several HTRW sites have been found and remediated on the subject property. Four of the sites have SRCOs which means that no further action, monitoring, or prohibitions on future use are necessary. In August of 2012, the SFWMD prepared a draft summary report of the investigations and HTRW site remediation efforts on the property. This report recommended that soil samples be collected in the cultivated areas on the subject property to see if residual agricultural chemical concentrations exceeded any human health or environmental criteria applicable to the planned future land use (shallow reservoir). The Phase II Environmental Site Assessment Report and its addendum (PSI, 2013) found in **Annex H** (**Hazardous, Toxic and Radioactive Wastes**) is summarized below.

Table C.1-6. Summary of Environmental Reports, A-2 Flow Equalization Basin

Consultant	Report Type	Report Title	Report Date	Tract Nos.
URS/Dames & Moore	Phase I / II	Talisman Sugar Corp.- Vol. 1 - Acquisition Properties	November-98	100-104*
PSI	SRCR	Talisman Sugar Corp. - T-2 Borrow Pit	February-02	100-104*
PSI	Tank Closure Report	Talisman Sugar Corp. - Labor Camp (Abel's Flying Service	April-01	100-104*
PSI	SRCR	Talisman Sugar Corp. - T-3 (Labor Camp	March-03	100-104*
PSI	LCAR / NFA Request	Talisman Sugar Corp. - T-6 (Electric Pump Station)	August-99	100-104*
PSI	LCAR / NFA Request	Talisman Sugar Corp. - T-7 (Pump Station)	September-99	100-104*
PSI	SRCR	Talisman Sugar Corp. - T-8 (Pump Station)	September-99	100-104*
PSI	SRCR	Talisman Sugar Corp. - T-24 (Pump Station)	October-99	100-104*
PSI	SRCR	Talisman Sugar Corp. - T-21 Pesticide Mix/Load Area	May-02	100-104*
URS	Site Inspections/Environmental Assessment	Deferred Parcels - Former Talisman Property	July-07	100-104*
URS	Final Site Inspections/Environmental	Eight Deferred Parcels - Former Talisman Ranch Property	January-09	100-104*

Consultant	Report Type	Report Title	Report Date	Tract Nos.
	Assessment			
URS	Environmental Assessment Summary Document	Everglades Agricultural Area Basin Reservoir Project	March-03	--
PSI	Summary Environmental Report	Central Everglades Study, A-2 Reservoir, Palm Beach County FL	August 23, 2012	100-104*
PSI	Phase II Environmental Site Assessment	A-2 Flow Equalization Basin, Palm Beach County, FL	March 25, 2013	100-104*
PSI	Phase II Environmental Site Assessment, Addendum	A-2 Flow Equalization Basin, Palm Beach County, FL	May 3, 2013	100-104*
SRCR = Site Rehabilitation Completion Report				
LCAR = Limited Contamination Assessment Report				
* = Tract Nos. 100-149, 100-044, 100-047, 100-066, 100-067, 100-139, 100-141, 200-005, 100-143				

In January of 2013, the SFWMD's contractor, PSI, Inc., collected 30 samples from randomly selected 50 acre grids located on the A-2 FEB lands. The samples were analyzed for a comprehensive list of pesticides and the results of the analysis were compared against human health and ecological screening criteria.

Copper was detected in approximately 27% of the composite samples at concentrations exceeding the USFWS Interim Screening Level (ISL) of 85 mg/kg for the protection of the endangered snail kite. The detected copper concentrations ranged as high as 110 mg/kg and exhibited a normal data distribution with a mean concentration of 77.2 mg/kg and a 95% upper confidence limit (UCL) of 81.3 mg/kg. Spatially, the data present a random pattern, and no discernible areas of higher concentrations could be interpreted from the maps. PSI determined that based upon the relatively low level of exceeding 85 mg/kg copper and the high organic content of the soils which would tend to reduce the bioavailability of copper, that the risk to the endangered snail kite is minimal and that no remedial action to address copper was warranted.

PSI determined that arsenic concentrations across the majority of the A-2 FEB footprint are likely to exceed the FDEP Soil Cleanup Target Level for Residential Direct exposure, but the detected concentrations are all below the SQAG-TEC criterion. Arsenic concentrations are not likely to represent a human health or ecological risk, as long as the soil is managed on-site and is not disposed off-site at an uncontrolled site. The FDEP reviewed the arsenic data and recommended that a soil management plan be prepared as part of the construction plans to track the fate of arsenic impacted soils.

PSI detected a number of chemicals, including 2,4-D, atrazine, metribuzin, phorate, dieldrin, chromium, mercury, selenium, and silver in one of more of the composite soil samples at concentrations exceeding the soil cleanup target levels for leaching to surface water (SCTL-LSW). Follow up SPLP (Synthetic Precipitation Leachate Procedure) testing was performed to determine the potential for exceeding surface and groundwater quality criteria. An evaluation of the chemical data indicated that exceedances of the Class III surface water at the discharge of the A-2 FEB are very unlikely due to the following factors:

- A number of the chemicals such as 2, 4-D, atrazine, metribuzin, and phorate are relatively short-lived in the environment and were recently applied during active crop management. These chemicals are not likely to be present in the soil at significant concentrations once agricultural operations cease and the reservoir is constructed.
- Dieldrin is biologically persistent, but was only detected sporadically in the A-2 FEB footprint. The effect of dilution from incoming surface water and water overlying clean areas of the FEB are likely to dilute any leaching of these chemicals within these limited areas.
- Chromium, mercury, and selenium were consistently detected and silver was detected at a few locations at concentrations exceeding the SCTLLSW criteria. However, these metals all absorb strongly to organic matter in the soil and are not likely to leach to a significant degree from the highly organic soils in the A-2 FEB. Default SCTL-LSW criteria are based on soils with a much lower organic content than the soils on the subject property.

Overall, no evidence of elevated agrochemical contamination within the soils was found that would cause concern related to the construction of the A-2 FEB based on risk to the future aquatic community or to USFWS trust species that may utilize the future habitat provided by its construction. The USFWS and FDEP reviewed the PSI report, effectively concurred that no remedial action was warranted at this time, and recommended monitoring of copper and other contaminants during start up of the FEB. The Agricultural-Chemical section of the PIR (**Annex H**) addresses the findings of the cultivated soil sampling and how the USACE September 2011 Agricultural Chemical Policy for CERP projects applies.

C.1.1.15.2 Water Conservation Area 3A and 3B

The WCAs were created in 1945 by C&SF Flood Control District (predecessor to the SFWMD). These lands have been operated since 1945 for water supply, flood protection, and recreation and generally are inaccessible by terrestrial vehicles. Along the boundary of WCA 3A/B there are levees and canals constructed in the 1950s and 1960s that further limit vehicle access to the interior. Activity within the WCA is generally limited to fishing, hunting, and birding though there may be some illegal dumping of solid wastes along the perimeter. No soil testing for residual contaminants has been conducted within the WCA 3A/B as part of this project since the lands have no history of prior agricultural or industrial use that would cause such contamination.

There are 75 private hunting camps that are accessed primarily by boat. The Miccosukee Indian Tribe uses leased land within the area for hunting and cultural activities. None of these activities are likely to result in significant HTRW contamination. Alligator Alley (Interstate 75) runs across the northern portion of WCA 3A. An abandoned crude oil pipeline runs east-to-west across WCA 3A from Immokalee to Port Everglades in Fort Lauderdale. The pipeline was installed in the 1960s. In 1986, a spill of approximately

6,000 gallons of crude oil occurred. This spill was cleaned up by collecting free product and burning contaminated vegetation. The pipeline has not operated since 1986 and is considered to be abandoned.

During the 2nd World War, portions of WCA 3A and 3B were used as bombing ranges. Two bombing range sites are located within WCA 3A. Fort Lauderdale Bombing Target #1 is located on the L-68A canal approximately two miles south of Interstate 75. Evidence of bombing debris was found at this site during a phase I survey in 2005. Further investigation has not occurred to date because of the low probability that this site presents a human health risk given the isolated location. Fort Lauderdale Bombing Target #5 is located at the confluence of the L-68A and L-37 borrow canals. This site was investigated as part of the Formerly Used Defense Site (FUDS) program in 2005. No evidence of contamination was found during this survey and the site was closed for further investigation.

Table C.1-7 includes 14 sites within or in the vicinity of WCA 3A/B as identified from a database search of the FDEP Waste Cleanup record system performed in January 2013. Ten of the sites are listed as having petroleum contamination, while the remaining sites are listed as having other contaminants. Four of the sites are listed as pending and the remaining are listed as active. Six of the sites are roadway spills of petroleum product that occurred on Highway 27 or Interstate 75. Project features within these two highway right-of-ways are not contemplated as part of CEPP. Several of the identified locations are potentially adjacent to CEPP project features. Specifically, the petroleum cleanup site identified as "Everglades Safari" is located just south of Highway 41 (Tamiami Trail) very near the Blue Shanty Canal. The two HTRW sites identified as "Hadley Farms" are located at the northern boundary of WCA 3A and may be adjacent to CEPP hydrologic features yet to be sited and designed. Appropriate HTRW testing would be completed during the PED phase.

Canals and levees on the perimeter and interior of the WCAs have generally been constructed by excavating native soils that have not previously been used for agriculture. Given this history, sampling spoil mounds is not necessary during the planning phase of the project since the results would reflect concentrations that are at or near background conditions. It is possible that localized contamination might exist at locations where project features such as pump stations, levees, canals, and culverts will be built. Testing would be completed during the PED phase and remediation or resiting of features would occur as required.

Table C.1-7. Identified HTRW Sites within or Near WCA 3A and 3B per FDEP Waste Cleanup Database

SITE ID	CLEANUP CATEGORY	STATUS	BUSINESS NAME, ADDRESS	LATITUDE			LONGITUDE		
26368543	PETRO	ACTIVE	ABC TRANSPORT USA INC BER 10-2I-43871Z 6138 CLEAVLAND ST, MIAMI	26	19	24.7	80	31	45.7
26364823	OTHCU	PENDING	BIRD DRIVE TR 308-347 BRID DRIVE, MIAMI	25	43	8.584	80	28	13.563
26368154	PETRO	ACTIVE	EVERGLADES SAFARI 26700 SW 8TH ST, MIAMI	25	45	38.1924	80	37	33.0888
26364266	OTHCU	PENDING	FL CRYSTALS HADLEY FARMS PSH 1-1 SOUTH BAY	26	20	3.3481	80	36	43.9144
26364269	OTHCU	PENDING	FL CRYSTALS HADLEY FARMS PSH 1-2 SOUTH BAY	26	20	3.7139	80	35	45.6307
26376747	PETRO	PENDING	FL DEPT OF TRANSPORTATION US HWY 27, SOUTH BAY	26	20	16.74	80	32	27.06
26377945	PETRO	PENDING	FL DEPT OF TRANSPORTATION ROW US HWY 27, SOUTH BAY	26	20	10.22	80	32	21.17
26364107	OTHCU	PENDING	FLORIDA CRYSTALS FARM 21 & HADLEY FARM US HWY 27, SOUTH BAY	26	20	9.1597	80	37	43.2883
26377457	PETRO	PENDING	GENERAL PORTLAND-DADE CNTY PLT 5800 N KROME AVE, MIAMI	25	42	29.429	80	29	11.3536
26377413	PETRO	PENDING	PEMBROKE PINES CITY-HOLLY LAKE PUMP ST 21800 N 7TH MANOR, PEMBROKE PINES	26	0	51.8846	80	26	20.9125
26374606	PETRO	PENDING	SOUTH FL WATER MGMT DIST S-140 57005 ALLIGATOR ALLY, FORT LAUDERDALE	26	10	15.35	80	49	38.72
26378516	PETRO	PENDING	SOUTH FLORIDA TRUCK LINES SPILL-ALLIGATOR ALLEY I-75 150 YDS W OF E TOLL PLAZA, WESTON	26	8	45.4812	80	28	5.3904

SITE ID	CLEANUP CATEGORY	STATUS	BUSINESS NAME, ADDRESS	LATITUDE			LONGITUDE		
26367061	PETRO	ACTIVE	SSL CARGO EXPRESS 04-2I-0248 I-595 @ US 27 OFFRAMP, WESTON	26	8	35.2434	80	26	20.4174
26369543	PETRO	ACTIVE	T STOP SERVICES INC 4690 US HWY 27, FT LAUDERDALE	26	3	47.5347	80	25	58.4817

C.1.1.15.3 Northern Everglades National Park

The CEPP project alternatives under consideration in this PIR include construction of project features along the L-29 and the L-31N canal/levee corridors as well as along the L-67 extension levee. Highway 41 (Tamiami Trail) runs just south of the L-29 Levee/Canal and the northern ENP boundary is south of the highway. The L-29 levee was constructed in 1928 using native soils and limerock excavated from the adjacent borrow canal. The "Everglades Safari" petroleum spill site, the Bird Drive Basin HTRW site, and the General Portland site listed in **Table C.1-7** are adjacent to the northeastern boundary of ENP.

Given that the road and levee were constructed across an area that was undeveloped in 1928, the levee spoil material is considered to be free of anthropogenic contamination with the exception of isolated undiscovered spill sites. However, during construction of the first Tamiami Bridge just south of the eastern portion of WCA 3B, some of the topsoil within the highway right-of-way was determined to have elevated arsenic concentrations that are likely representative of background concentrations.

C.1.1.16 Cultural Resources

A review of the Florida State archives indicate that there are 23,499 recorded cultural resource sites and resource groups within the CEPP study area that have a survey determination and/or State of Florida Historic Preservation Office (SHPO) evaluation of other than ineligible for listing with the National Register of Historic Places, or significant under the National Environmental Policy Act (NEPA). The area of potential effect (APE) on cultural resources for the project is markedly smaller than the CEPP study area. The APE is approximately 1.5 million acres being comprised of the EAA A-2 footprint, portions of the L-6 levee and associated canal, the L-5 levee and associated canal, the L-4 levee and associated canal, the S-8 Pump Station Complex, the L-28 Triangle, portions of the Big Cypress Seminole Reservation immediately west of L-28 and north of I-75, portions of the Miami Canal, WCA 3A and 3B, L-67A and L-67C levee and associated canal, portions of the L-29 levee, the L-67 Ext levee and associated canal, portions of the Old Tamiami Trail, and portions of the L-31N levee, and Everglades National Park. For more information on existing project conditions for cultural resources, refer to **Section 2** (**Existing and Future Without Project Conditions**).

A total of 43 cultural resources surveys and/or assessments have been conducted within the CEPP APE, 14 of which included structural surveys. **Table C.1-8** below lists all currently known cultural resources within the CEPP APE that are or have the potential to be significant under NEPA.

Table C.1-8. Significant Cultural Resources within the CEPP Area of Potential Effect

	Significant	Unknown Significance*	Date Range	Notes
Archeological Sites	47	296	2500 B.C – A.D. 1950	73 remote sensing sites**
Structures	1	5	A.D. 1947–1958	
Historical Districts	5	0	2500 B.C – A.D. 1950	All NRHP Listed
Linear Resources***	12	13	A.D. 1880 – 1950	1 HRHP Listed
Traditional Cultural Properties	2	0	A.D. 1950 –present	Associated with the Modern Gladesman
World Heritage Site	1	0	-	Everglades National Park
Culturally Significant Sites	34			

*SHPO determination listed as: Not Evaluated by SHPO or Insufficient Information.
** Sites recorded using aerial photography. Presence or absence of material has not been field verified.
***Canals, roadways, or linear earthworks.

The earliest known habitation sites within the CEPP APE date to the Late Archaic period (2,500 B.C.) when the Everglades were much drier. However, within the larger area of south Florida, evidence of Paleo-Indian (12,000 to 7500 B.C.) habitation has also been recorded (i.e. Warm Mineral Springs (8SO18) and Little Salt Spring (8SO79). Some of the Late Archaic habitation sites have only recently been rediscovered as the result of managed drainage programs in south Florida.

As the climate warmed and sea level rose, many Native Americans abandoned the lowest of the tree islands as they became submerged. This process continued through what is known as the Middle Archaic, until climate conditions stabilized around 300 B.C. at the start of the Late Archaic. Today many sites from both the Early and Middle Archaic periods are no longer submerged and may have more modern Native American use (Milanich 1994).

After the Archaic period, the region became incorporated into what is known as the Glades region and remained inhabited until European contact, when Old World diseases and slave raiding heavily reduced the Native populations during the late 1500s-1700s. Many of the tree islands through this portion of the CEPP APE have sites associated to the Glades period. This period has been broken down into successive stages starting with Glades I, which dates from 500 B.C .to 750 A.D., Glades Period II dating from 750 to 1200 A.D., and Glades Period III dating from 1200 A.D. to European contact in the 1500s. Typical habitation sites through this region are commonly referred to as middens, which are the accumulation of daily life activities on these tree islands. Material remains can stretch from the surface to well over one meter below the surface on certain islands. Native American burials can also be found among these habitation sites (Milanich 1994).

After European contact, Native American populations in the region continuously declined and remained at low levels until Miccosukee and Seminole groups moved into the area while fleeing the U.S. Army and U.S. Governments' forced relocation program. Many sites associated with both the Miccosukee and Seminole tribes are known to exist throughout the region.

C.1.1.17 Socioeconomics

Florida's economy is characterized by strong wholesale and retail trade, government, and service sectors. The 2010 population estimates for each of the LEC Planning Area counties are as follows: Palm Beach County (1,340,134 residents), Broward County (1,748,066 residents), and Miami-Dade County (2,496,435 residents). The economy of south Florida is based on services, agriculture, and tourism. Florida's warm weather and extensive coastline attract vacationers and other visitors and help make the

state a significant retirement destination. The three counties that comprise the LEC (Palm Beach, Broward, and Dade) are heavily populated, and it is estimated that over 6.9 million people will reside in this region by the year 2050. A complete socioeconomic description of the C&SF Project area was completed in the Comprehensive Review Study (USACE 1999) and is incorporated into this document by reference.

C.1.1.18 Study Area Land Use

The existing land use within the study area varies widely from agricultural to high-density multi-family and industrial urban uses. Much of the land use/cover change occurring in south Florida over the past several years can be categorized as either the creation of new developments in previously natural or agricultural areas, or the change in the types of agriculture practiced. Much of the land used for agriculture is likely categorized as unique farmland based upon its location, growing season, and high value crops.

An estimated 742,668 acres of irrigated agricultural lands are located in the Lake Okeechobee Service Area (LOSA). Agricultural lands adjacent to the St. Lucie River and Indian River Lagoon and Caloosahatchee River and Estuary are cultivated for citrus, sugarcane, vegetables, sod, and greenhouse/nursery. Growth in citrus acreage is usually on land that was formerly pastureland. Vegetable crops include cucumbers, peppers, tomatoes, squash, eggplant, watermelons, snap beans, and potatoes. Wetlands, uplands, and urban uses comprise the remaining land area within LOSA and Northern Estuaries.

An estimated 447,000 acres of agricultural lands are located in the EAA. Currently, land in the EAA is primarily in agricultural production, with sugarcane being the primary crop. There are six sugar mills and one refinery (South Bay) currently operating in the EAA, with an additional mill and refinery in Clewiston also serving the area. The combined capacity of these mills is over 17 million tons. Three major entities - U.S. Sugar Corporation, Florida Crystals Corporation, and Sugarcane Growers Cooperative - provide the majority of the sugarcane production in the EAA. Secondary agricultural uses include vegetables, rice, sod, and improved pasture. Wetlands, uplands, urban and extractive uses comprise the remaining land area within the EAA.

Generally, urban development is concentrated along the LEC from Palm Beach County to Dade County (**Figure C.1-16**). The LEC extends approximately 100 miles through the coastal portions of Palm Beach, Broward, and Dade Counties. As the most densely populated sub-region in the state, the LEC is home to one-third of the state's population, more than 4.5 million people. The sub-region is primarily an urban megalopolis, but it also contains substantial agricultural acreage, particularly in southwestern Dade County (90,000 acres). Rapid population growth and land development practices have resulted in notable western urban sprawl; the predominant land use is single-family residential. The once significant rural population in the western areas of Broward County has practically disappeared, resulting in an urbanized makeup in population.

A large portion of south Florida remains natural, although much of it is disturbed land. The dominant natural features within the study area include two major management areas located south of Lake Okeechobee. These include the Everglades Complex of Wildlife Management Areas (ECWMA) and ENP. The ECWMA includes three adjacent Wildlife Management Areas (WMAs). These include the: (1) Rotenberger WMA, (2) Holey Land WMA, and (3) Everglades (WCA 3A) and Francis S. Taylor (WCA 3B) WMAs. The ECWMA is described in the next section. The Rotenberger and Holey Land WMAs are

located north of WCA 3A and south of Lake Okeechobee between the Miami and North New River Canals.

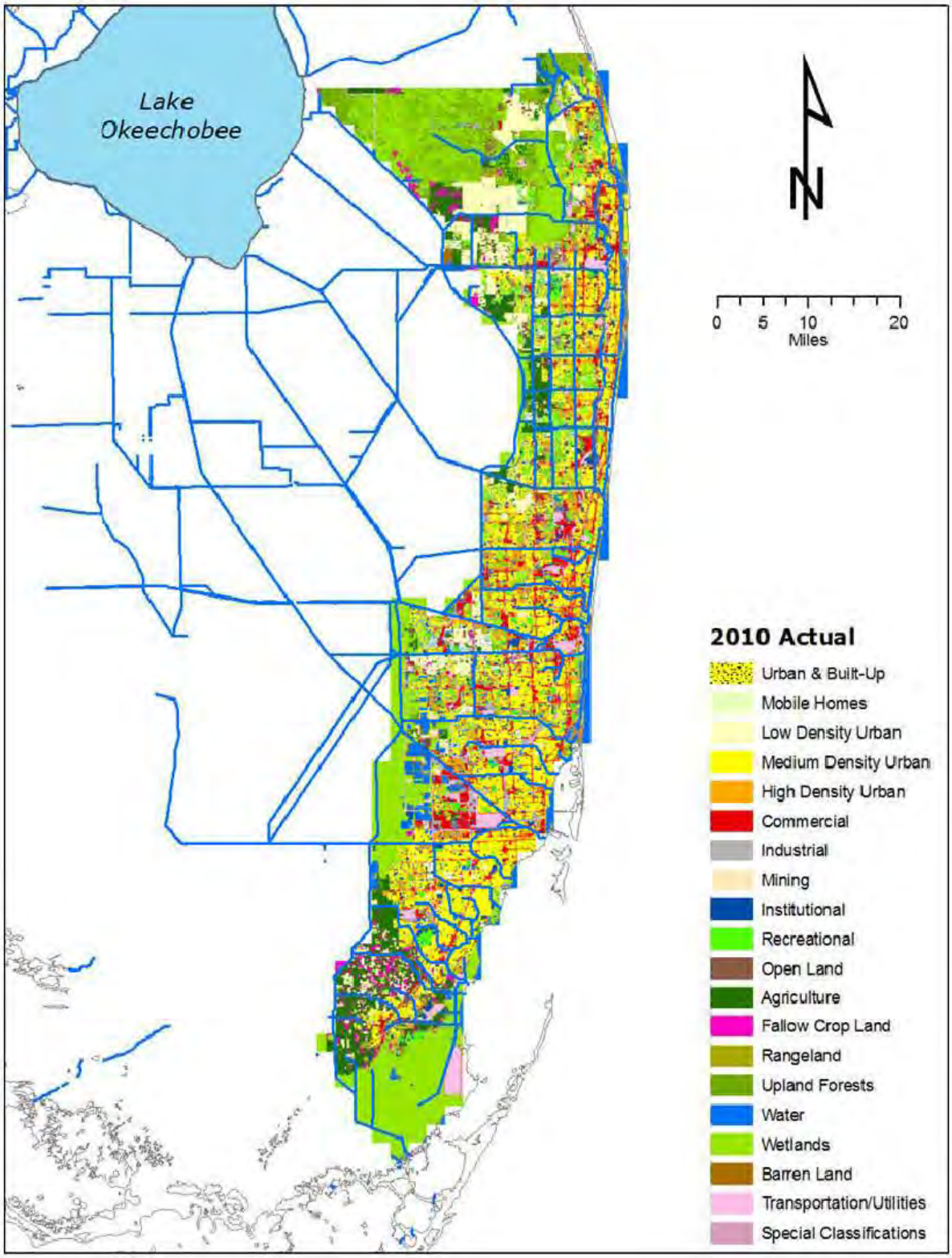


Figure C.1-16. Study Area Land Use (2010)

C.1.1.19 Public Land Management

Lands in the ECWMA are managed by the FWC under 2 leases from the State of Florida and through a 1952 cooperative management agreement with the SFWMD. An agreement was also formed among the State of Florida, the FWC, the SFWMD, and the Miccosukee Tribe in 1982 granting a perpetual lease to the Miccosukee Tribe for approximately 189,000 acres of WCA 3A.

The FWC has outlined a conceptual management plan for the ECWMA (FWC 2007) providing general information on resource management goals and objectives. Management activities within the ECWMA include the maintenance and restoration of plant and animal communities, public education, recreation, and habitat protection. Management emphases by the FWC consists of the development and recommendation of water regulation schedules to address hydrological restoration, improvement of the quality of existing habitats to benefit native fish and wildlife species through prescribed burns, control of exotic species, and plantings of native trees and shrubs. Recreational hunting is used as the primary management tool to maintain resident game populations in the ECWMA. The FWC also manages the sport fishery within the ECWMA by providing regulations pertaining to size and possession limits. The FWC also coordinates with cooperating agencies to maintain access to the canal system and public use areas to maximize boat and bank fishing opportunities.

ENP spans nearly 1.5 million acres of wetlands, uplands, and submerged lands at the southern end of the Florida peninsula. ENP, authorized by Congress in 1934 and established in 1947, was established to protect the unique tropical biological resources of the southern Everglades system. It was the first national park to be established to preserve purely biological (versus geological) resources. The Park's authorizing legislation mandated that it be managed as "wilderness, [where] no development … or plan for the entertainment of visitors shall be undertaken which will interfere with the preservation intact of the unique flora and fauna and the essential primitive natural condition now prevailing in this area." This mandate to preserve wilderness is one of the strongest in the legislative history of the National Park System. ENP has been designated a World Heritage Site, an International Biosphere Reserve, and a Wetland of National Significance. In addition, 86 % of ENP is designated wilderness under the Wilderness Act of 1964. ENP is managed by the NPS.

C.1.1.20 Recreation

There are many recreational opportunities throughout south Florida; however, with the dense urban surroundings demand often exceeds availability. Recreational resources in the Lake Okeechobee region are primarily water based. Lake Okeechobee and the Okeechobee Waterway provide approximately 154 miles of navigable waterway for commercial navigation and many more for recreational boating. Lake Okeechobee is recognized as supporting one of the best recreational fisheries in the nation. Several major sport fishing tournaments are held on the lake annually, bringing significant revenues to the surrounding area. Recreational areas are located around Lake Okeechobee offering day-use facilities, campgrounds, hiking and biking trails, and boat ramps. The Lake Okeechobee Scenic Trail (LOST) is designated as a segment of the Florida National Scenic Trail, encompassing 110 miles of the lake atop Herbert Hoover Dike (HHD). Heavy seasonal waterfowl utilization of Lake Okeechobee attracts hunters and recreational enthusiasts, as well. Lake Okeechobee has also been a popular destination for airboat rides.

Recreation opportunities in the Northern Estuaries include easy access to fresh, estuarine, and marine resources for fishing, boating, swimming, diving, camping, and sightseeing. Numerous recreation areas, such as the Ortona Lock Recreation Area, Caloosahatchee Regional Park, and W.P. Franklin Lock Recreational Area are extensively used.

STAs provide recreational opportunities within and adjacent to the EAA. Passive recreational use includes bicycling, hiking, nature photography, wildlife viewing, and fishing. Waterfowl and alligator hunting are also permitted in some STAs.

Recreational opportunities are also present within the Greater Everglades. Rotenberger and Holey Land WMAs are open to public access year round. Primary recreational opportunities include hunting, fishing, camping, hiking, and bicycling. Game species occurring in the WMAs include white-tailed deer, common snipe (*Gallinago gallinago*), feral hog (*Sus scrofa*), marsh rabbit (*Sylvilagus palustris*), blue-winged teal (*Anas discors*), mottled ducks (*Anas fulvigula*), and other game. Alligator hunting is also currently administered on Holey Land WMA. The Everglades (WCA 3A) and Francis S. Taylor (WCA 3B) WMA lands have been used for recreational activities including hunting, fishing, frogging, boating, camping, and off-road vehicle use. Fishing is a popular recreational activity and also holds numerous tournaments each year. The majority of fishing activity occurs in the canals along Interstate75, Highway 41 (Tamiami Trail), and in the Miami, L-67 A, and L-67 C canals. These canals support many species of game fish. Private camps are located throughout WCA 3. These permitted camps are primarily used as weekend retreats and hunting camps. A variety of other nature-based recreational opportunities are also provided to the public within WCA 3A and WCA 3B. These activities include wildlife viewing and nature photography. Hiking and bicycling are also permitted on existing levees within the project area where appropriate. Though hiking and bicycling opportunities are available they lack sufficient facilities and markers. There are also several recreation areas at locations along the boundary of WCA 3 including the Sawgrass Recreation Area, Everglades Holiday Park, Thompson Park and Mac's Fish Camp. These facilities, along with several on Highway 41 (Tamiami Trail), provide boat ramps, camping facilities, boat rentals, airboat tours, fishing guides, bait and tackle supplies, and food. Some of these areas are privately owned, while others are public properties leased to private providers of services.

Similar recreational opportunities are provided in ENP. ENP provides high-quality fishing, boating, camping, wildlife viewing, hiking, bicycling, and nature interpretation activities. One third of ENP is covered by water, creating excellent boating and fishing opportunities. Saltwater fishing includes Florida Bay, Ten Thousand Islands, and elsewhere in the park's coastal zone. Marinas and boat ramps are located throughout the park. Day use and camping (front and back country) facilities are also available. There are also a number of elevated camping platforms (chickees) available in various locations throughout the Park. Regularly scheduled concession or ranger guided tours are also available.

The State Comprehensive Outdoor Recreation Plan (SCORP) is the best source of information on recreation demand and supply at the state and regional scales. It divides the state into 11 planning regions, each with clusters of counties. As indicated in **Table C.1-9**, Treasure Coast and south Florida are the planning regions that encompass the study area.

Table C.1-9. Counties within SCORP Planning Regions

Region	Counties
Treasure Coast	Brevard, St. Lucie, Martin, Palm Beach
South Florida	Broward, Miami-Dade, Monroe

The SCORP organizes outdoor recreation in Florida into 47 categories that encompass a variety of recreation activities including team sports (e.g., basketball and baseball), individual sports (e.g., golf and tennis), hunting, fishing, swimming and boating. **Table C.1-10** presents descriptive information on the recreation facilities in SCORP Regions for study area specific recreation categories. These

resource-based categories were selected as those that could potentially be affected by the hydrologic changes or ecological changes associated with the alternative restoration plans. This table includes percentages of the statewide totals for the recreation categories.

Table C.1-10. Regional Outdoor Recreation Facilities 2007

Resource / Facility	Treasure Coast	South Florida	State Total
Outdoor Recreation Areas	1,314	2,054	13,235
Outdoor Recreation Acres	748,130	3,146,974	13,352,957
Land Acres	665,617	1,796,151	9,671,238
Water Acres	76,339	1,350,609	3,673,955
Hunting Acres	343,366	698,451	5,290,496
Camping			
RV / Trailer Camp Sites	7,071	12,207	162,041
Tent Camp Sites	804	1,290	20,044
Trails			
Hiking Trails (miles)	392	420	5,424
Horseback Riding Trails (miles)	163	139	2,361
Nature Trails (miles)	117	254	2,475
Freshwater Catwalks	33	45	834
Boating			
Canoe Trails (miles)	65	292	2,295
Freshwater Boat Ramp Lanes	80	110	1,739
Freshwater Marinas	22	7	457
Freshwater Slips / Moorings	937	325	11,762

C.1.1.21 Noise

Noise levels are associated with surrounding land use. Within the major natural areas of south Florida, external sources of noise are limited and of low occurrence. There is no significant noise generating land users within these areas. Existing sources of noise are limited to the vehicular traffic travelling on roads adjacent to and cutting through the project area. Other sources of noise which may occur within these natural areas include air boats, off road vehicles, swamp buggies, motor boats, and occasional air traffic. Sound levels are typically in the range of 85 to 105 decibels (dB) for motorboats and air boats, respectively. Wilderness ambient sound levels are typically in the range of 35 dB and should not be an issue for wildlife.

Rural areas have typical noise levels in the range of 35 to 55 dB. Sources of noise in rural, areas include noise associated with agricultural production such as the processing and transportation of agricultural produce. The use of farm equipment such as tractors, plows, and the use of irrigation facilities would be expected to be the dominant background noise.

Within the rural municipalities and urban areas, sound levels would be expected to be of greater intensity, frequency, and duration. Noise associated with transportation arteries, such as highways,

railroads, primary and secondary roads, airports etc., inherent in areas of higher population would be significant and probably override those sounds associated with natural emissions. Other sources of noise might be expected to include noise from everyday social and human communication and activity, operations of construction and landscaping equipment, and operations at commercial and industrial facilities. In general, urban emissions would not be expected to exceed 60 dB, but may attain 90 dB or greater in busier urban areas or near to frequently used high volume transportation arteries.

C.1.1.22 Aesthetics

The visual characteristics of south Florida can be described according to the three dominant land use categories: natural areas, agricultural lands, and urban areas. The natural areas consist of a variety of upland and wetland ecosystems, including lakes, ponds, vast expanses of marsh and wet prairie, with varying vegetative components. Uplands are often dominated by pine, although other sub-tropical and tropical hardwoods such as fig, gumbo limbo, and cypress do occur. These areas are more fully described in **Section C.1.1.1** (**Vegetative Communities**). Overall, the land is extremely flat, with few natural topographic features such as hills or other undulations. Much of the visible topographic features within the natural areas are man-made, including canals and levees. Additional man-made features include pump stations, navigation locks, secondary and primary roads, highways, electrical wires, communication towers, occasional buildings, borrow pits and other features which may or may not detract from the regional aesthetic. Visual aesthetics when possible from a high perspective such atop a levee, offer pleasant and unspoiled perspectives of Everglades marsh with numerous birds and other wildlife. Agricultural lands are cultivated for citrus, sugarcane, vegetables, sod, and greenhouse/nursery. Generally, urban development is concentrated along the LEC from Palm Beach County to Dade County. Major cities are visually congested with residential communities, major transportation arteries (i.e. heavily used roads and highways), and intensively developed commercial and industrial facilities. Visual aesthetics are marginal. Development is typically immediately adjacent to or nearby protected natural areas. These areas are more fully described in **Section C.1.1.18** (**Study Area Land Use**).

C.1.2 EXISTING CONDITIONS OF NATIVE AMERICANS

The information below is a summary compiled from the Seminole Tribe of Florida website http://www.semtribe.com/History/ and from the Ah-Tah-Thi-Ki website http://www.ahtahthiki.com/History-Seminole-Tribe-FL-Ah-Tah-Thi-Ki-Museum.html

The tribes known today as the Seminole Tribe of Florida and Miccosukee Tribe of Indians of Florida are both descendents of the Muscogee Creek people, a diverse confederation that encompassed people speaking seven languages and spread over much of the southeast. The encroachment of white settlers from the north pushed the first group of around 1200 Creek people into the peninsula of Florida around 1760 to an area east of Orlando. These Seminoles, as they all came to be known, (possibly a derivation of the Spanish cimarron, meaning runaway) were primarily seeking a solitary place to subsistence farm and raise cattle.

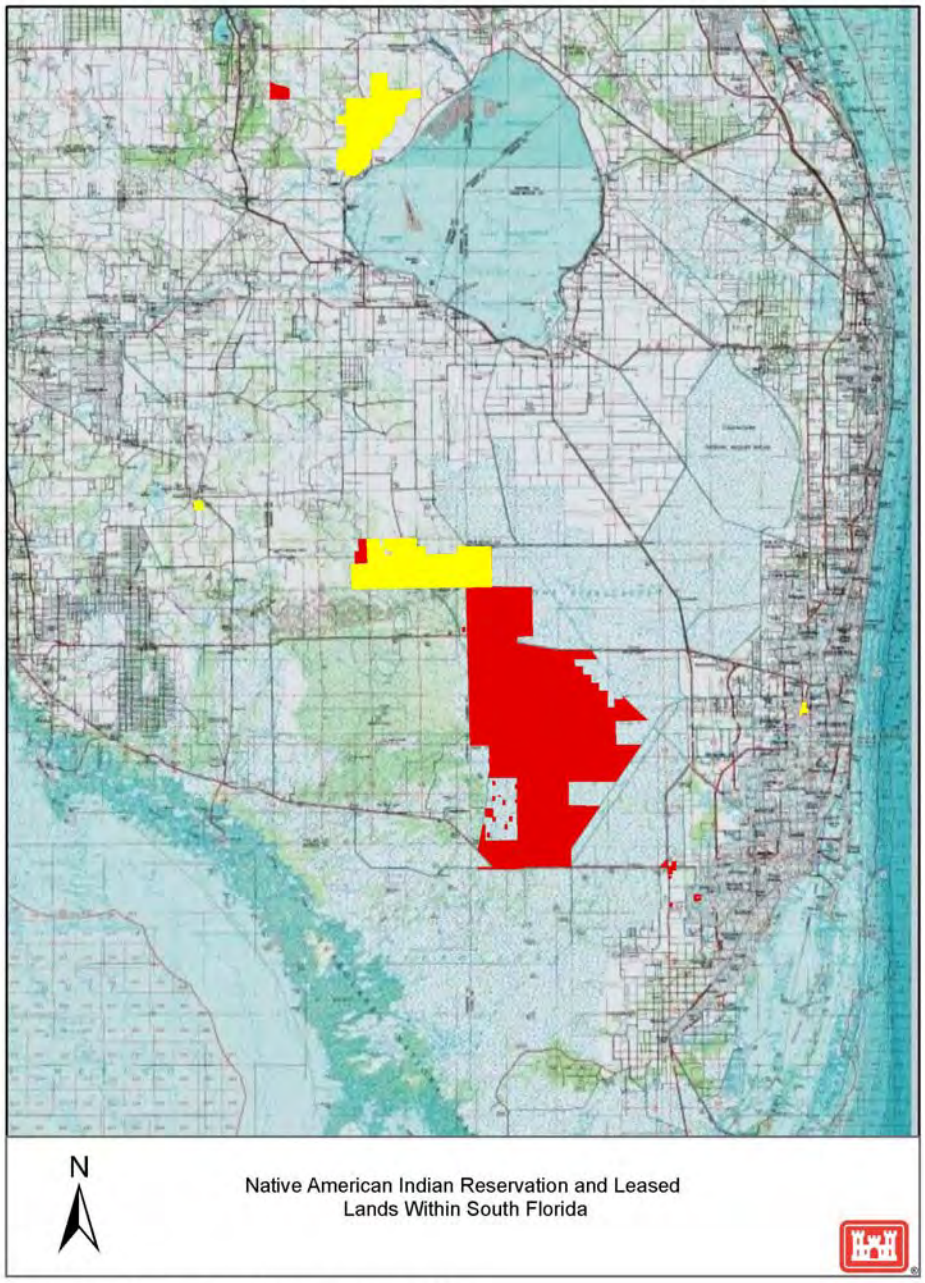
Beginning with the War of 1812 and ending with the Third Seminole War in 1858, the native people in Florida were subjected to an intensive effort by the U. S. Government to eradicate or remove them from the region. The U.S. Government reportedly spent more than $20 million on this effort and sent more than 52,000 troops to fight fewer than 2,000 Seminoles in Florida. At the end of these efforts, most of the southeastern tribes were removed west to Indian Territory and fewer than 300 Seminoles survived in the Everglades. Their descendants make up the populations of both tribes today.

The remaining native people lived a subsistence existence in the Florida Everglades for the next century. Again encroachment from white settlers by the early 1900s forced them approach the Secretary of the Interior to request reservation lands. This request for Federal reservations and other services led to the split between the Seminoles and the Miccosukees. The Miccosukees, who spoke Hitchiti and lived primarily along Tamiami Trail, objected to the acceptance of Federal monies and services in exchange for land. Despite their objections, they were removed from ENP and confined to the Reserved Area, a narrow strip of land along Tamiami Trail. Although additional lands were designated and compensation money was paid to the tribe by the U.S., the money remains unclaimed by the tribe to this day.

In the 1950s when many tribes were facing the Indian Termination Act, the Seminoles again had to fight the government for Federal recognition and services to continue their existence. The Miccosukees instead sought and received recognition as a sovereign nation from Fidel Castro and Cuba, forcing the U.S. Government to recognize them.

During this time, both tribes lived in relative poverty, continuing their subsistence lifestyle in the Everglades, and relying on the tourist trade to supplement their incomes. In 1979, the Seminoles established the first high stakes bingo operation in the nation. The passage of the Indian Gaming Rights Act in 1988 allowed them to expand into other high stakes gambling, and both tribes have financially prospered as a result.

Today most Tribal members live within the confines of their reservations located in south Florida (**Figure C.1-17**).



Source: ESRI Maps - Online Access 8 January 2013

Figure C.1-17. Map Outlining the Location of the Tribal Reservations and Leased Lands

C.1.3 FUTURE WITHOUT PROJECT CONDITIONS OF RESOURCES

The future without project (FWO) condition is the projection and forecast of what is "most likely" to occur in the study area over the planning horizon. The FWO project condition for CEPP assumes the construction and implementation of authorized CERP and non-CERP projects, and other Federal, state or

local projects constructed or approved under existing governmental authorities that occur in the CEPP study area. Construction has begun on the first generation of CERP project modifications already authorized by Congress. These include the Indian River Lagoon Project (USACE 2004a), the Picayune Strand Restoration Project (USACE 2004b), and the Site 1 Impoundment Project (USACE 2006b). Second generation of CERP projects for Congressional authorization includes the Biscayne Bay Coastal Wetlands Project (USACE 2012b), Broward County Water Preserve Areas Project (USACE 2012c), the Caloosahatchee River (C-43) West Basin Storage Reservoir (USACE 2010), and the C-111 Spreader Canal Western Project (USACE 2011). Non-CERP projects included within the FWO project assumptions consist of the SFWMD Restoration Strategies (SFWMD 2012c), C&SF Canal-51 West End Flood Control Project (USACE 1998), the C-111 South Dade Project, the Kissimmee River Restoration Project (USACE 1991), Modified Water Deliveries to ENP (MWD) Project (USACE 2000), and the DOI Tamiami Trail Modifications Next Steps Project (DOI 2010). **Table C.1-1** summarizes the status of non-CERP projects, CERP projects and operational plans assumed to differ between the existing conditions or FWO project assumptions and are incorporated below by reference unless otherwise noted. The following describes the projected physical, ecological, and socioeconomic conditions within the study area in the year 2050. The FWO project conditions are also summarized in **Section 2.0** (**Existing and Future Without Conditions**) of the main report. Refer to **Sections 2.5.1** through **2.5.15** for further information on how project features in **Table C.1-11** were represented in the hydrologic model simulation of the CEPP FWO baseline, where applicable.

Table C.1-11. Status of Non-CERP Projects, CERP Projects, and Operating Plan for Existing and Future Without Project Assumptions

CATEGORY	EXISTING CONDITION	FUTURE WITHOUT PROJECT CONDITION
Status of Non-CERP Projects	Construction complete and features operated: Modified Water Deliveries to ENP Project (MWD), including the S-355A and S-355B gated spillways, 4-mile degrade of L-67 Extension Levee, 8.5 Square Mile Area Flood Mitigation Project	Construction completed and features operated: C-111 South Dade (Contracts 8 and 9); C&SF C-51 West End Flood Control Project; Kissimmee River Restoration; SFWMD Restoration Strategies (Central Flow Path features). Construction completed (no operational changes assumed for modeling): MWD, including existing condition components plus Tamiami Trail Modifications (1-mile eastern bridge); DOI Tamiami Trail Modifications Next Steps Project (5.5 miles of additional bridges). Seepage Barrier Near the L-31 N Levee (Miami-Dade Limestone Products Association)
Status of CERP Projects	No completed projects. Construction in progress.	Construction completed and features operated: Indian River Lagoon-South Project; Picayune Strand Restoration Project; Site 1 Impoundment Project; Biscayne Bay Coastal Wetlands Project; Broward County Water Preserve Areas Project; Caloosahatchee River (C-43) West Basin Storage Reservoir; C-111 Spreader Canal Western Project.
Operations Plan for WCA 3A, ENP and the SDCS	Interim Operational Plan (IOP (2002, 2006); L-29 Canal maximum operational stage limit: 7.5 feet (ft) National Geodetic Vertical Datum (NGVD); G-3273 constraint: 6.8 ft NGVD	ERTP (2012); L-29 Canal maximum operational stage limit: 7.5 ft NGVD; G-3273 constraint: 6.8 ft NGVD

C.1.3.1 Vegetative Communities

C.1.3.1.1 Lake Okeechobee

The majority of the surface of Lake Okeechobee is not vegetated and currently provides open (pelagic) habitat. Littoral vegetation occurs along much of Lake Okeechobee's perimeter, but is most extensive along the southern and western borders. The continued use of Lake Okeechobee to store water for agricultural and flood control needs would continue to result in high water levels within the lake. High water levels within the lake would continue to adversely affect shallow littoral zone habitat, and deeper littoral zones would remain without vegetation. In addition, even with state BMP's and other projects to improve water quality within the watershed, due to legacy effects, it is anticipated that the continued storage of nutrient-rich waters would maintain reduced water clarity that in turn adversely affects SAV areas. Vegetative communities in Lake Okeechobee are not expected to change significantly from existing conditions unless the regulation schedule is updated.

C.1.3.1.2 Everglades Agricultural Area

Habitat types within the EAA are divided into five general groups: aquatic, wetland, upland, disturbed (mostly agricultural), and urban/extractive. Changes to the remnant natural communities on lands within the EAA are dependent upon the overall agricultural use of the region and resultant water management. The aquatic communities within the EAA include both natural and man-made areas of open water. With continued use of the EAA region for agriculture during the period between the present and 2050, with the exception of land utilized for the SFWMD Restoration Strategies water quality treatment implementation plan (SFWMD 2012b), no significant net increase or decrease in aquatic areas within the EAA should occur. For remnant wetlands, continued subsidence of lands surrounding existing, small isolated wetlands could slightly increase the extent of wetlands into formerly cultivated lands. Larger scale changes in wetland cover could occur if agriculture is abandoned in some portions of the EAA. Cessation of active drainage of the agricultural fields would likely cause the fallow lands to revert to wetlands. Similarly, upland community margins could change to transitional wetlands if the surrounding landscape becomes wetter. Disturbed communities consist of mostly agricultural lands. Shifts between specific agricultural cover types may occur during the period between the present and 2050. Most of the urban / extractive lands are concentrated around the Belle Glade area; increases in urban and extractive cover types may occur near existing population centers due to increased urbanization. Vegetative communities in the EAA are not expected to change significantly from existing conditions.

All of Compartment A of the Talisman Land Exchange property is considered to be atypical jurisdictional wetlands based on hydric soils and hydrology. The SFWMD Restoration Strategies water quality treatment implementation plan will be fully in place by 2050 (SFWMD 2012b). Compartment A would be converted to a FEB, known as the A-1 FEB. Wetland vegetation would be expected to become established within the A-1 FEB. Vegetative communities currently existing in the A-2 area would remain. A-2 would remain in State ownership and would continue in agricultural and open space uses.

C.1.3.1.3 Northern Estuaries

The SAV is one of the most important vegetation communities of the Caloosahatchee River and Estuary and St. Lucie River and Estuary (including the Indian River Lagoon). Currently, SAV beds have been reduced or eliminated from their former areas by extreme salinity fluctuations, increased turbidity, sedimentation, dredging, damage from boats, and nutrient enrichment which causes algal blooms that, in turn, restrict light penetration. Continued flood control regulatory freshwater releases from Lake Okeechobee to the Northern Estuaries would continue to cause salinities to drop below preferred

ranges for estuarine biota. High-level freshwater discharges during the wet-season would continue to result in increases in nutrient inflows and turbidity to the estuaries, thereby adversely affecting sea grasses. Some level of improvement is expected to occur during the period between the present and 2050 as a result of implementation of projects within the study area with the capability of improving the timing, quantity, and quality of freshwater flow to the Northern Estuaries. Improvements in water quality and salinity levels within the estuaries as a result of the C-43 West Basin Storage Reservoir Project (USACE 2010) and Indian River Lagoon South Project (USACE 2004a) would reduce stress to SAV and aid in long term health of estuarine habitat and biota.

C.1.3.1.4 Greater Everglades

The Everglades landscape is dominated by a complex mosaic of freshwater wetland communities that includes open water sloughs and marshes, dense grass and sedge dominated marshes, forested islands, and wet marl prairies. The Everglades freshwater wetlands eventually grade into intertidal mangrove wetlands and sub tidal sea grass beds in the estuarine waters of Florida Bay. Changes in the availability and distribution of freshwater and further disruption of natural sheetflow from discontinuities in hydrology due to levees, roads, and canals would further exacerbate changes occurring in the vegetative communities in the Greater Everglades. Continuation of altered hydroperiods would have adverse effects on vegetative communities such as degradation due to over drying within northern WCA 3A, WCA 3B, and ENP, and ponding and prolonged high water levels within southern WCA 3A. Sub tidal sea grass beds within Florida Bay would continue to suffer from loss of freshwater flows and high salinities. Some level of improvement to vegetative communities is expected to occur as a result of implementation of projects within the study area with the capability of improving the timing, quantity, and quality of flow to the WCAs, ENP, and Florida Bay (i.e. Broward County Water Preserve Areas Project (USACE 2012c), Biscayne Bay Coastal Wetlands Project (USACE 2012b), C-111 Spreader Canal Western Project (USACE 2011, Everglades Restoration Transition Plan (USACE 2012a), Modified Water Deliveries Project (USACE 2000), Tamiami Trail Modifications: Next Steps Project (DOI 2010)). More natural hydroperiods produced by the implementation of these projects would assist in restoring natural plant communities within the WCAs, ENP, and Florida Bay. Better-timed and greater quantities of water to regions that are now too dry would result in a more natural mosaic of plant communities. Reduction in nutrients would aid in reducing cattail and non-native vegetation that compete with native plants in the system.

C.1.3.2 Fish and Wildlife Resources

The project area supports a variety of fish and wildlife resources. Disruption of the natural hydrology has resulted in aquatic vegetation community changes and a resultant disruption of aquatic productivity and function that has had repercussions through the food chain, including effects on wading birds, larger predatory fishes, reptiles, and mammals. During the period between the present and 2050, a further reduction in habitat function is likely to result in a decrease in the abundance and diversity of fish and wildlife resources.

Desired restoration of historic water fluctuations within Lake Okeechobee would not be accomplished during the period between the present and 2050. Continued artificially high water levels within the lake reduces the availability of bedding habitat for fishes and changes the extent and composition of the emergent and submergent vegetation communities. Lower water levels would provide opportunities for foraging for wading birds and other birds dependent upon aquatic prey species by concentrating prey and exposing additional shallow water habitat.

Altered native habitats dominate the EAA; however remaining wetlands offer some native habitat for fish and wildlife species. Some displacement of wildlife could result from expansion of urban or extractive land cover types within the EAA.

Fish and wildlife resources inhabiting the Northern Estuaries would continue to be impacted by flood control regulatory freshwater releases from Lake Okeechobee. Annual variability in flow would lead to salinity extremes outside the tolerance ranges of many fish and wildlife resources resulting in decreased species diversity. Further declines in estuarine habitat (SAV and oysters) would continue to result in additional declines in the species that utilize these habitats. Seagrass communities within the Northern Estuaries provide critical refugia for juvenile fish. The long term loss of nursery habitat will result in population declines for many species of estuarine and marine fishes and macroinvertebrates, including those whose young of the year use fresher habitats. Waterfowl and wading birds are also expected to decrease by the year 2050 as estuarine habitat quality continues to decline. Some level of improvement is expected to occur as a result of implementation of projects within the study area with the capability of improving the timing, quantity, and quality of freshwater flow to estuarine systems and coastal areas (i.e. C-43 West Basin Storage Reservoir Project (USACE 2010) and Indian River Lagoon South Project (USACE 2004a)).

Throughout the pre-drainage Everglades, the depth, distribution and duration of surface flooding largely determined the distribution, abundance, seasonal movements, and reproductive dynamics of all aquatic and many of the terrestrial animals of the Everglades. Within the Greater Everglades, productivity of native fish species, many important as prey species for wading birds, has been and would continue to be depressed due to water management practices. Nest numbers and success of wading birds have decreased dramatically across south Florida over the past 100 years. Continually decreasing hydroperiods in presently over-drained areas is likely to worsen during the period between the present and 2050. Wading birds will be directly affected by the decreased foraging opportunities provided by shorter and less-frequent hydroperiods. Populations of several furbearing animals that are dependent on higher quality habitat or that require large areas of contiguous habitat to survive are also projected to decrease by 2050.

Some level of improvement to fish and wildlife resources is expected to occur as a result of implementation of projects within the study with the capability of improving the timing, quantity, and quality of freshwater flow to the study area (i.e. Broward County Water Preserve Areas Project (USACE 2012c), Biscayne Bay Coastal Wetlands Project (USACE 2012b), C-111 Spreader Canal Western Project (USACE 2011), Everglades Restoration Transition Plan (USACE 2012a), Modified Water Deliveries Project (USACE 2000), Tamiami Trail Modifications: Next Steps Project (DOI 2010)). Water that is retained in the natural system helps maintain proper hydroperiods and stages within the WCAs, ENP, and Florida Bay, thereby increasing usage by fish and wildlife resources.

C.1.3.3 Invasive and Exotic Species

Currently, many non-native invasive species are thriving and negatively affecting the ecology throughout the project area. During the period between present and 2050, it is expected that anthropogenic effects will continue to negatively impact the project area; therefore it is expected new invasions and expansion of current invasive species will continue in the future. Many factors affect future increases and decreases of populations and ranges of invasive species currently present within the project area. Each species has a complex biological heritage which influences its ability to thrive in areas outside of its native range. In addition, there are numerous factors that affect new introductions of invasive species. This constrains the ability to predict new introductions, populations, and ranges of invasive species.

Factors that affect invasive species introductions are presented below. The subtropical climate of south Florida presents a hospitable environment for non-native species from warm parts of the world to establish and become invasive.

Canals within the project area provide deep water refugia for species of tropical fish and serve as pathways for invasive species to travel, spread, and expand into previously uninhabited areas. Drier conditions experienced currently due to compartmentalization and diversion of water will continue due to a lack of restoration projects within this region. The historically wetter areas that are now experiencing drier conditions will continue to shift in vegetation composition. Woody shrubs such as willow and non-native invasive species such as melaleuca will continue to expand in these areas. Continued deliveries of nutrient rich water to the project area will further promote the expansion of cattail.

Environmental manipulation and construction activities, urban development, and agriculture will continue to promote disturbance regimes within south Florida ecosystems that facilitate biological invasions. Disturbance from natural weather events, such as floods, droughts, and hurricanes can provide avenues for invasive species introduction and expansion.

Management of invasive species within the project area is conducted by numerous Federal, state, local, and tribal agencies. However, all control programs within the project area are limited by the level of available funding and staffing. Portions of allocated funding for these programs have been and potentially will be redirected to other programs in the future. While there has been documented success in managing some invasive species (e.g. melaleuca), numerous highly invasive species continue to expand within the study area. Management activities vary in effectiveness which also influences species control and spread within the project area. Management components would be incorporated into CERP projects thereby reducing the presence of some species within those projects. This would also reduce sources for invasions into other areas. Little is known about control and management measures for some species already present, therefore these species will propagate and spread to other areas.

The large aquarium, pet, and ornamental plant industries import new non-native species into Florida on a regular basis. New, imported non-native species introductions will occur through intentional and unintentional releases. On average, 10 new non-native organisms that are capable of establishing, becoming invasive and causing environmental harm are introduced into Florida each year (Cuda 2009). Educational efforts may slightly reduce the number of intentional releases.

The deeper navigation channels and expansion of ports in Florida, such as the Port of Miami and Port Everglades, will provide new trade opportunities for the state. Deeper channels will allow larger container cargo vessels to enter the ports. As a result, it is expected the Port of Miami will double its cargo traffic over the next several years with ships coming from all over the world. Many destructive species have entered the U.S. as stowaways on cargo ships and additional cargo traffic will likely increase this problem.

C.1.3.4 Threatened and Endangered Species

Federally listed threatened and endangered species are either known to exist or potentially exist within the project area. During the period between the present and 2050, continued increase in urbanization, water management practices, direct habitat loss, and other land requirements, as well as the degradation of existing habitat function, are likely to result in the continuance of negative population

trends of threatened, endangered, and state-listed species of special concern. Future Federal actions unrelated to the proposed action but located in the study area, will require separate consultations pursuant to Section 7 of the ESA. For further information pertaining to potential impacts to federally listed threatened and endangered species as a result of changes that occur between the present and 2050 please see the BA included in **Annex A.**

C.1.3.5 Essential Fish Habitat

Estuarine systems and coastal areas within the project area support fishery resources of recreational and commercial importance. At least 70 percent of Florida's recreationally or commercially sought fishes depend on estuaries for at least part of their life histories. Current disruptions caused by flood control regulatory freshwater releases would continue to cause harm to estuarine systems and coastal areas during the period between the present and 2050. The absence of freshwater flow into estuarine systems and coastal areas would continue to promote conditions that are likely to result in a decrease in the abundance and diversity of species within those habitats. High level freshwater discharges during the wet season would continue to negatively impact species utilizing essential fish habitat. Some level of improvement is expected to occur as a result of implementation of projects within the study area with the capability of improving the timing, quantity, and quality of freshwater flow to estuarine systems and coastal areas (i.e. C-43 West Basin Storage Reservoir Project (USACE 2010), Indian River Lagoon South Project (USACE 2004a), Biscayne Bay Coastal Wetlands Project (USACE 2012b), Broward County WPA Project (USACE 2012c), and C-111 Spreader Canal Western Project (USACE 2011)).

C.1.3.6 Climate

During the period between the present and 2050, south Florida should experience a full multi-decadal cycle of Atlantic hurricane activity. Currently the area is in an active phase of this cycle that started in 1995. This active phase followed a 25-year period of low hurricane activity. This suggests that between the present and year 2050, the area would complete this active phase, pass through another low activity period and begin another active phase. There is now evidence of anthropogenic changes to global climate patterns that will likely have an impact on south Florida in terms of rainfall, evapotranspiration, and temperature (Intergovernmental Panel on Climate change 2007). Climatologists predict air temperatures will increase, with projections of summer temperatures being up to 3°F to 7°F warmer by 2100 (Twiley et.al. 2001, Union of Concerned Scientists 2008). Increases in air temperature, solar radiation, and water vapor deficit due to climate change are expected to increase evapotranspiration. Models used by Calanca et al. (2006) predict a 20 percent increase in evapotranspiration if summer temperatures increase from 4°F to 7°F. Regional surface water storage systems (lakes, rivers, canals, reservoirs, water conservation areas) will most likely experience more rapid water loss when compared to current levels, ultimately impacting availability of water supplies. Increased evapotranspiration may increase water demand for irrigation and natural wetlands areas. In addition, accelerated evaporation losses from stormwater treatment areas could impact their phosphorus removal performance, increasing the need for supplemental water for these facilities.

The Florida Oceans Council (2009) predicts more frequent intense rainfall events will occur coupled with longer dry periods in between. SFWMD data indicate that there has been an increase in heavy downpours in many parts of the region, while the percentage of the region experiencing moderate to severe drought increased over the past three decades. While periodic heavy downpours may increase overall precipitation totals, much of the water may be runoff that is eventually lost to tide. The environmental impact of changes to floods and droughts depends on the relationship between the climate extremes. If flooding and drought frequency increase together, the Everglades may return to a more natural slough-ridge-island landscape because the floods would redistribute soils and sediments

onto ridges and the droughts would allow recruitment of trees on islands. More droughts, without an increase in flooding conditions, pose a threat to the entire South Florida system. They would likely cause large shifts in community structure due to saltwater intrusion into freshwater habitats, drying of inland wetlands, disappearance of ridge and slough microtopography, and an increase in frequency of fires (both terrestrial and wetland). Without the ability to maintain minimum flows and water levels in South Florida, agriculture and public water supply well fields may not be able to function as designed. In addition, well fields may be contaminated by saltwater intrusion and higher salt levels in coastal waters may limit the usefulness of currently installed desalinization plants. More flooding may be good for the Everglades ecosystem because it would stimulate ridge-slough development and restore historic salinity regimes in Biscayne Bay and Florida Bay. However, increasing flooding alone may also create more frequent water level reversals during critical wading bird foraging periods, thus causing further declines in nesting success for wading birds.

Current research indicates overall storm frequency may decrease, while the number of strong hurricanes (due to warmer temperatures) is expected to increase. Tropical storms and hurricanes provide huge amounts of rain for the area. The loss of storm-associated rainfall could have significant implications for the SFWMD regional water supplies. If a decrease in the number of storms does occur, there may be significant changes to the distribution of rainfall, which will affect the water supply and natural ecology of South Florida. Less rainfall may mean the region is under drought conditions more often. If tropical storms and hurricanes become more intense, the potential damage to levees, canals, and other water control structures may also increase – resulting in an increased likelihood of flooding on a local and regional scale. Water supply and water quality may also be adversely affected by this extreme.

Sea-level rise is one of the more certain consequences of climate change, and because it affects the land/ocean interface, it has the potential for environmental impacts on coastal areas. Various sites along the east coast of Florida indicate that the sea level is rising at a rate above the global average (Maul and Martin 1983). USACE sea level rise projections for the period from 2015 to 2065 for Key West, Florida and the broader south Florida area for historic, intermediate and high rates of future sea level rise are +4 inches, +10 inches and +26 inches, respectively http://publications.usace.army.mil/publications/eng-circulars/EC_1165-2-212.pdf. The regional hydrologic models used to simulate with- and without project conditions require climatic and tidal data as boundary conditions. Given the uncertainty in future climatic conditions, the historic climate conditions used in the period of record are assumed to represent conditions that are expected to occur in the study area in the future. The model tidal boundary used in the regional hydrologic model was developed using historic tidal data from two primary (Naples and Virginia Key) and five secondary NOAA stations (Flamingo, Everglades, Palm Beach, Delray Beach, and Hollywood Beach). Simulation model tidal boundary conditions that reflect future sea level rise were not available for the range of potential sea level rise expected. However, the impact of sea level rise on project benefits is assessed for the FWO and with project conditions per USACE guidance EC 1165-2-212. Future rates of sea level rise are expected to result in significant impacts on coastal canals and communities, with loss of flood protection and increased saltwater intrusion being the primary effects. Additionally, coastal ecosystems and estuaries are expected to be adversely affected and require additional deliveries of freshwater to maintain desirable salinity patterns and healthy ecosystems. Sea level rise is discussed in more detail within **Section C.1.3.10** (**Flood Control**).

C.1.3.7 Physical Landscape: Regional Soils and Geology

During the period between the present and 2050, lands within the project area would be disposed and developed consistent with surrounding land use patterns. Within the Greater Everglades, continued loss of organic soils would continue as a result of oxidation. It has been observed throughout the Greater Everglades that peat loss is associated with changes in water deliveries that reduce water depths and hydroperiods. Canal construction and drainage have lead to increased drought intensity and a resultant loss of peat soils. As soil subsides, a minor lowering of topography would be expected. Characteristics of the physical landscape are not expected to change significantly from existing conditions.

C.1.3.8 Hydrology

Hydrologic modeling simulations of the existing condition baseline (ECB) and the CEPP future without project condition (FWO) were developed with the RSM-BN and RSM-GL sub-regional modeling tools, to provide baseline conditions for plan formulation, the assessment of CEPP project benefits (comparisons against FWO), and the assessment of CEPP alternative performance for the level-of-service for flood protection and water supply (comparisons against ECB). The ECB was developed to represent the system-wide infrastructure and operations that were in place at the time CEPP plan formulation was initiated, approximately January 2012. The FWO for CEPP assumes the construction and implementation of currently authorized CERP and non-CERP projects, and other Federal, state or local projects constructed or approved under existing governmental authorities that occur in the CEPP study area; the CEPP FWO therefore included first generation CERP projects already authorized and under construction (Indian River Lagoon South Project, Picayune Strand Restoration Project, Site 1 Impoundment Project), second generation CERP projects still pending Congressional authorization (Biscayne Bay Coastal Wetlands Project, Broward County Water Preserve Areas Project, Caloosahatchee River (C-43) West Basin Storage Reservoir, C-111 Spreader Canal Western Project), and non-CERP projects currently in progress (SFWMD Restoration Strategies, C&SF C-51 West End Flood Control Project, the C-111 South Dade Project, the Kissimmee River Restoration Project, Modified Water Deliveries, and the DOI Tamiami Trail Modifications Next Steps Project). The CEPP FWO also includes implementation of the Everglades Restoration Transition Strategy (ERTP) WCA 3A Regulation Schedule, which replaced the IOP in October 2012.

Operations protocols for the first and second generation CERP projects were modeled consistent with the draft Project Operating Manuals, as documented in the respective PIRs. The completed Kissimmee River Restoration project included the Headwaters Revitalization Schedule for the Kissimmee Chain of Lakes as defined for the Upper Kissimmee Chain of Lakes Routing (UKISS) modeling conducted by the Kissimmee River project team. The CEPP FWO representation of the C-111 South Dade and Modified Water Deliveries project features do not change operations from the ECB, which includes the L-29 Canal stage constraint at 7.5 feet NGVD, the G-3273 constraint at 6.8 feet NGVD, and the 2011 Interim Operating Criteria for the 8.5 SMA.

The extensive list of first and second generation CERP projects and non-CERP projects that are included in the CEPP FWO will result in hydrologic interactions between the projects. Due to the CERP PIR sequencing and the project-specific assumptions for related projects that were defined in each CERP PIR, the hydrologic interactions observed for the CEPP FWO are likely unique to the CEPP PIR. Based on these considerations, the summary of regional hydrology for the CEPP FWO includes quantitative comparisons with the CEPP ECB based on the RSM-BN and RSM-GL CEPP modeling representations of these baselines.

The portion of the Greater Everglades within the CEPP project area includes WCA 1, WCA 2A, WCA 2B, WCA 3A, WCA 3B, and ENP. This overview of FWO hydrological conditions is intended to provide a general overview of regional hydrological changes compared to the CEPP ECB. For a more detailed assessment, the reader should refer to the complete suite of RSM-GL modeling results. A map depicting the RSM-GL gage locations is provided as **Figure C.1-18**.

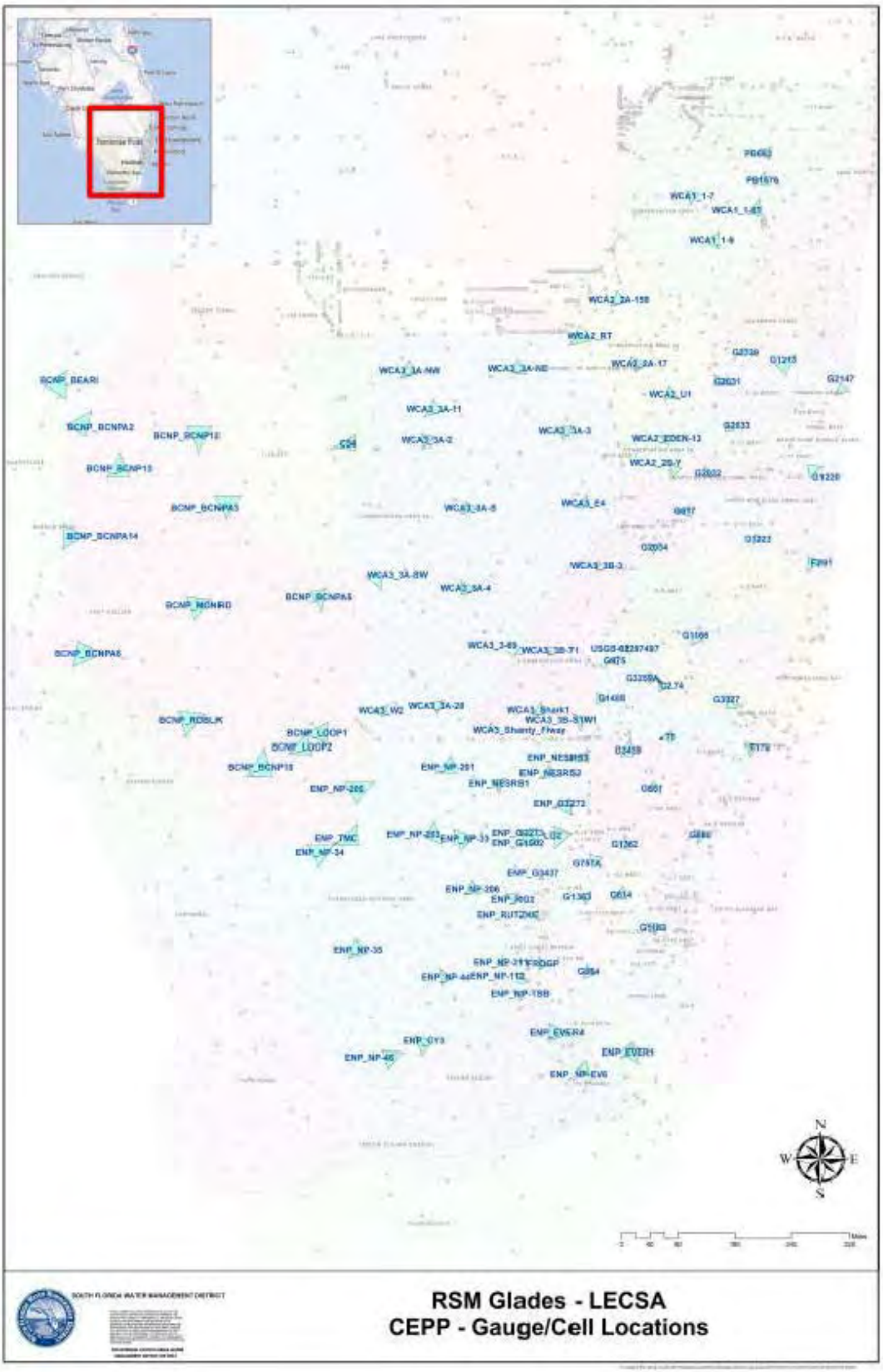


Figure C.1-18. Map of RSM-GL Monitoring Gage Locations

C.1.3.8.1 Lake Okeechobee and the Northern Estuaries

The FWO assumption for the operation of Lake Okeechobee is the Lake Okeechobee Regulation Schedule (LORS) 2008. Compared to the ECB, significant stage reduction of 0.1-0.5 feet for is observed for the upper 75% of the stage duration curve (**Figure C.1-19**), with no modifications to LORS 2008 and assumed implementation of future Kissimmee, C-43, and C-44 restoration projects. The number of days with stages above 16 feet NGVD is reduced from 870 to 696 during the 1965-2005 period of simulation.

For the Caloosahatchee Estuary, compared to the ECB, mean monthly flows above 2800 cfs and 4500 cfs are reduced by 13 and 10 months, respectively (14% and 23% reductions, respectively; **Figure C.1-20**). Mean monthly flows less than 450 cfs are reduced by 89 months (77%) with operation of the C-43 Reservoir (**Figure C.1-21**). For the St. Lucie Estuary, compared to the ECB, mean monthly flows above 2000 cfs and 3000 cfs are reduced by 10 and 12 months, respectively (11% and 28% reductions, respectively; **Figure C.1-22**). Mean monthly flows less than 350 cfs are increased by 3 months (3%) with operation of the C-44 Reservoir (**Figure C.1-23**). Note that the St. Lucie performance measures for the ECB and FWO base conditions were subsequently updated during development of the final array of alternatives, due to an identified error that the performance measure was not accounting for local groundwater flow contributions to the estuary. The correct St. Lucie estuary performance measures are shown in **Figure C.1-22** and **Figure C.1-23**, although these graphics also include display of the subsequent CEPP alternatives.

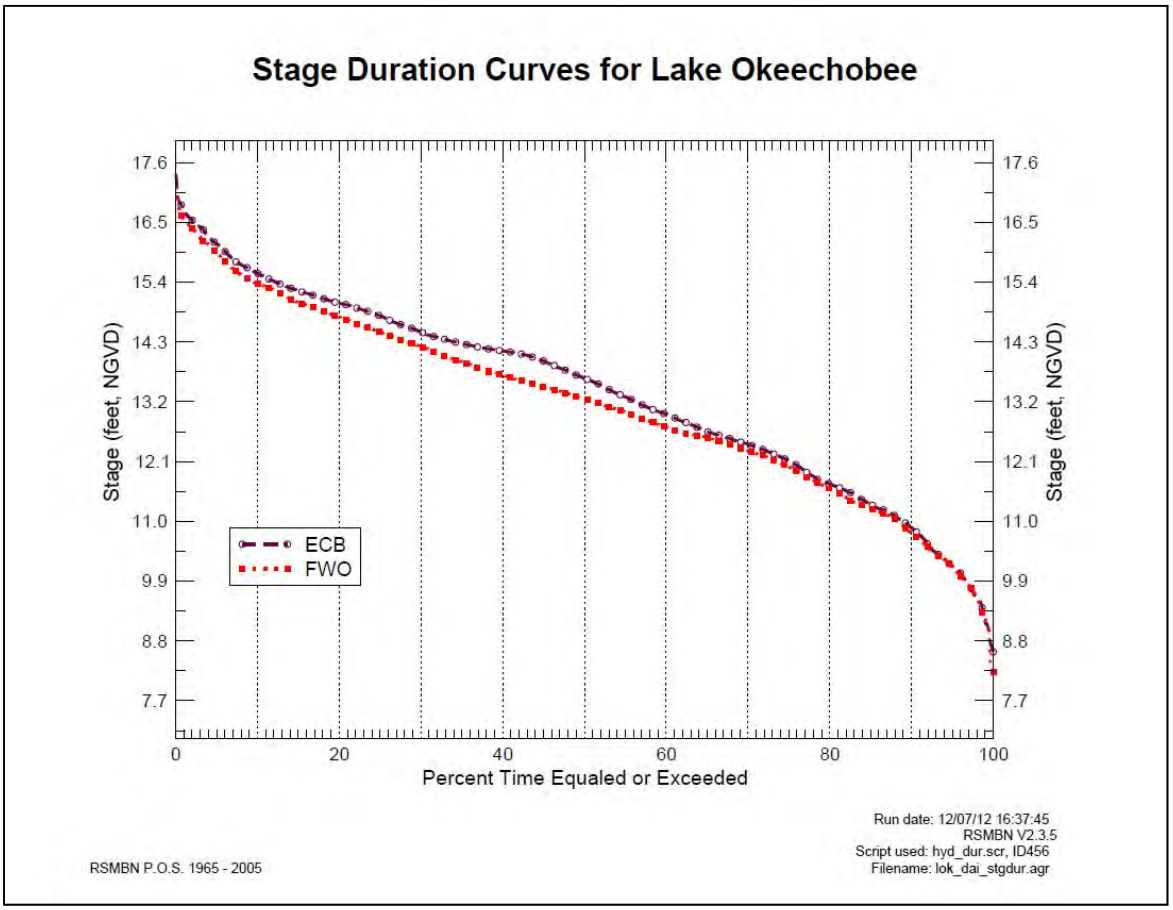


Figure C.1-19. Lake Okeechobee Stage Duration Curve for CEPP Baselines

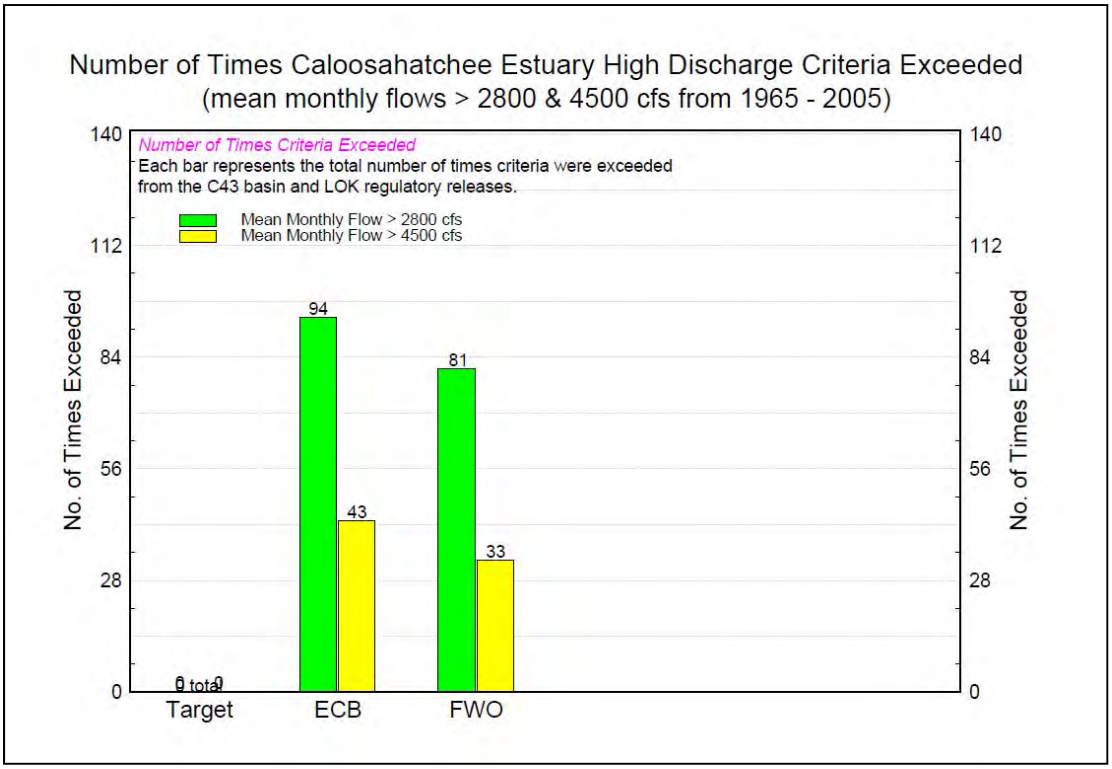


Figure C.1-20. Caloosahatchee Estuary High Discharge Frequency for CEPP Baselines

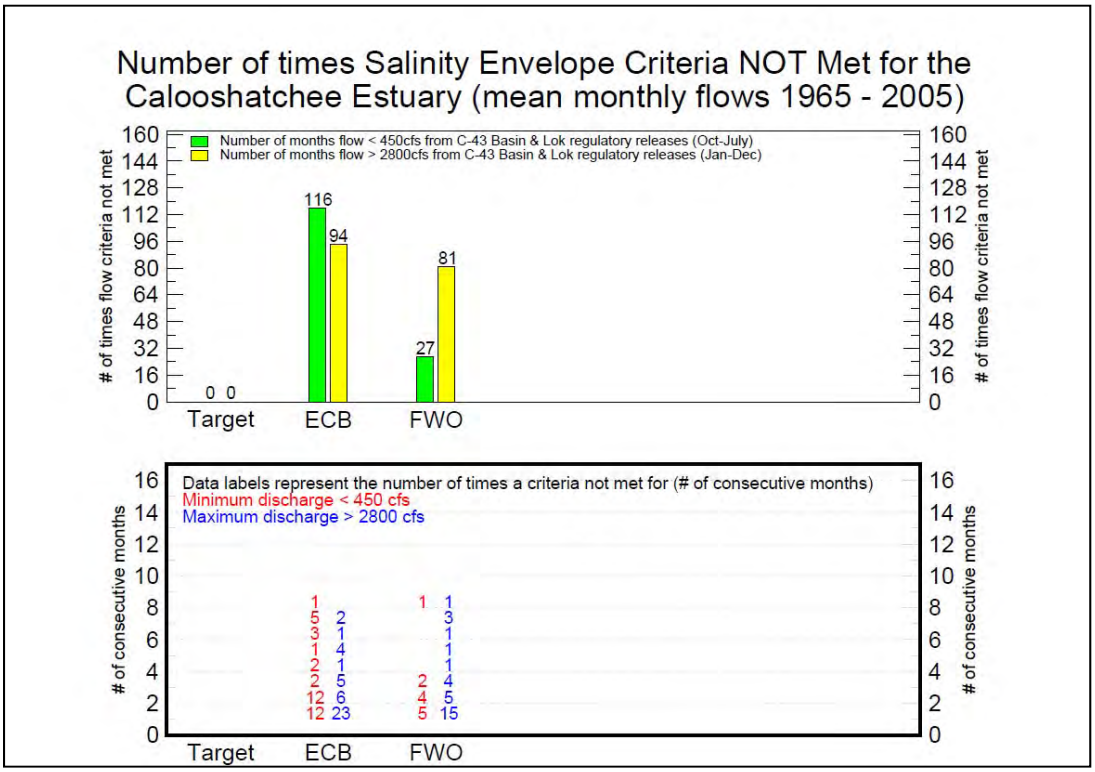


Figure C.1-21. Caloosahatchee Estuary Low Discharge Frequency for CEPP Baselines

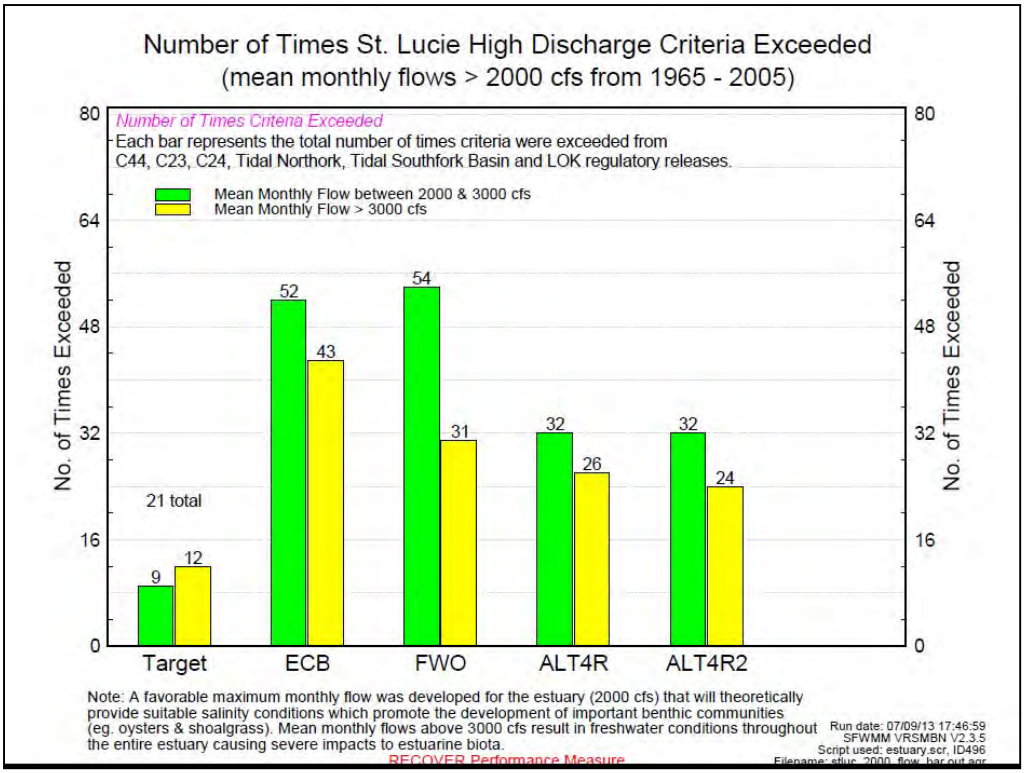


Figure C.1-22. St. Lucie Estuary High Discharge Frequency for CEPP Baselines

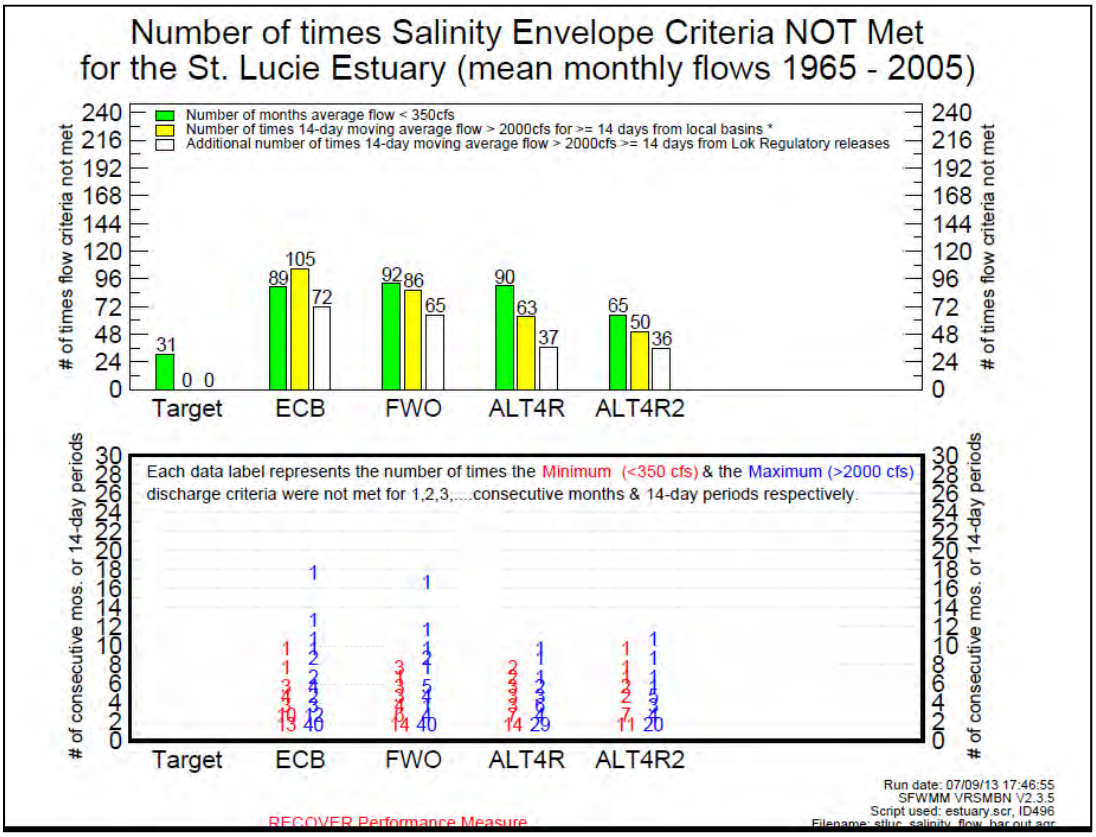


Figure C.1-23. St. Lucie Estuary Low Discharge Frequency for CEPP Baselines

C.1.3.8.2 Everglades Agricultural Area

Minor changes to groundwater levels are expected adjacent to the SFWMD A-1 FEB (15,500 acres), compared to the ECB due to increased seepage from the A-1 FEB. The A-1 FEB design includes perimeter seepage collection canals and associated seepage pumps to limit potential impacts. Detailed CEPP assessments within the EAA are not available because the RSM-BN does not simulate groundwater within the EAA.

C.1.3.8.3 Water Conservation Area 1

Compared to the ECB, no significant changes to WCA 1 stages are indicated. Average annual regulatory releases from WCA 1 to WCA 2A via the S10 structures are moderately reduced from 282,000 acre-feet (282 kAF) to 268 kAF.

C.1.3.8.4 Water Conservation Area 2A and 2B

Compared to the ECB, stages within WCA 2A are generally increased by 0.1-0.2 feet under all hydrologic conditions (**Figure C.1-24**). Average annual inflows from STA 2 (including Compartment B) to WCA-2A are increased from 230 kAF to 381 kAF (a 66% increase) following assumed implementation of the SFWMD Restoration Strategies Project, including the A-1 FEB. The S-7 pump station also contributes inflows to WCA 2A; S-7 inflows are increased from 25 kAF in the ECB to 77 kAF in the FWO. Average annual regulatory releases from WCA-2A to WCA 3A via the S11s are increased from 382 kAF to 460 kAF. Compared to the ECB, stages within WCA 2B are significantly increased by 0.25-0.50 feet under nearly all hydrologic conditions, excluding extreme wet conditions (**Figure C.1-25**). Changes within WCA 2B are directly related to the increased stages within WCA 2A and increased inflows from S-144, S-145, S-146, and seepage.

C.1.3.8.5 L-28 Triangle

Stages within the L-28 Triangle do not change significantly between the CEPP ECB and the FWO.

C.1.3.8.6 Big Cypress National Preserve

Stages within the BCNP, west of WCA 3A, do not change significantly between the CEPP ECB and the FWO.

C.1.3.8.7 Water Conservation Area 3A and 3B

The CEPP FWO includes the combined effects from implementation of the SFWMD A-1 FEB, the ERTP WCA 3A Regulation Schedule (the CEPP ECB assumed the IOP WCA 3A Regulation Schedule), and the CERP Broward WPA Project, in addition to downstream affects associated with the stage reductions in Lake Okeechobee and reduced regulatory discharges south. Compared to the ECB, average annual combined structural inflows to WCA 3A from STA 3/4, STA 5/STA 6 (including Compartment C), and WCA 2A are reduced from 1,073 kAF to 1,028 kAF (a 4% reduction) following assumed implementation of the SFWMD A-1 FEB. Average annual combined structural outflows from WCA 3A through the S-151 (to WCA-3B), S-333 (to ENP NESRS), the S-12 structures (to ENP WSS), and the S343/S344 culverts are also slightly reduced from 1,205 kAF to 1,190 kAF, consistent with the reduced inflows to WCA 3A.

Since WCA 3A covers approximately 752 square miles, hydrologic differences between the CEPP ECB and FWO are characterized at representative gages throughout WCA 3A. Within northwest WCA 3A, no significant differences are observed compared to the ECB, although stages are slightly increased during the wettest 20% of conditions (**Figure C.1-26**). By comparison, stages within northeast WCA 3A are generally decreased by 0.1-0.2 feet, with no significant change during extreme wet or extreme dry conditions (**Figure C.1-27**). Within east-central WCA 3A (3A-3), stages are generally decreased by 0.1-0.2

feet, with no significant change during extreme wet or extreme dry conditions (**Figure C.1-28**). Proceeding south within central WCA 3A (3A-4), stages are similarly generally decreased by 0.1-0.2 feet, with no significant change during extreme wet or extreme dry conditions (**Figure C.1-29**). Southern WCA 3A (3A-28) stages are generally more notably decreased by 0.2-0.3 feet, also with no significant change during extreme wet or extreme dry conditions (**Figure C.1-30**).

Stages in WCA 3B (Site 71) are generally decreased by 0.1-0.2 feet during normal to dry conditions (**Figure C.1-31**), due to the reduced structure inflows from S-151 and reduced seepage inflows resultant from the slight reduction in WCA 3A stages.

C.1.3.8.8 Northeast Shark River Slough

The normal operational target flow distribution is 55 percent through the S-333 into NESRS and 45 percent through the S-12 structures into ENP west of the L-67 Extension, although the ERTP additionally includes provisions for dry season conditions or unseasonably dry conditions when ENP recommends that the percent distribution is not limited to 55 percent to NESRS.

Compared to the ECB, stages within NESRS (NESRS-2) are slightly reduced during normal to dry conditions (**Figure C.1-32**). Similar trends are also observed further south at the NESRS-1 monitoring gage. This stage reduction within NESRS is comparable to upstream water level trends observed within WCA-3A. Inclusion of ERTP operations, in isolation, within the CEPP FWO would be expected to slightly increase WCA 3A Rainfall Plan deliveries to NESRS during dry conditions, and the FWO modeling does indicate a moderate increase in S-333 average annual discharges from 130 kAF to 137 kAF (a 5% increase). The potential increased hydrologic connectivity between WCA-3B and NESRS with the FWO-assumed completed 1-mile eastern MWD Tamiami Trail bridge and the 2.6-mile western DOI Tamiami Trail Next Steps bridge (both bridges and the associated Tamiami Trail roadway raising are included in the FWO and are not included in the ECB) is not realized in the CEPP FWO because the L-29 Canal maximum operational limit (7.5 feet NGVD) and the G-3273 stage constraint (6.8 feet NGVD) remain unchanged from the CEPP ECB, in the absence of an assumed future operational plan that integrates these features. Additional detail can be found in the ERTP EIS (USACE 2012a).

C.1.3.8.9 Western Shark River Slough

Western SRS, located to the west of L-67 Extension Levee and bounded on the north by Tamiami Trail, is primarily influenced by rainfall and water management operations at the S-12 structures (A, B, C and D). Under ERTP, the utilization of the S-12 structures and the seasonal sequential closure periods beginning from the west at S-12A (November 1 – July 14) and S-12B (January 1 – July 14), respectively, is meant to move water from WCA 3A into SRS while providing conditions for Cape Sable seaside sparrow Subpopulation-A (CSSS-A) nesting and breeding. Compared to IOP 2006, the operational plan included in the CEPP ECB, ERTP removed the seasonal closure for S-12C (February 1- July 15). Although not required in water management operations, there is a rule-of-thumb that is often utilized (although not a constraint under ERTP) that includes delivering the Rainfall Plan S-12 structure target flows from east to west with 40 percent, 30 percent, 20 percent, and 10 percent being discharged at S-12D, S-12C, S-12B, and S-12A, respectively. Releases from WCA-3A are part of a regulation schedule for WCA 3A and are typically dependent on a Rainfall Based Management Plan (USACE 2006a). This Rainfall Based Management Plan consists of a rainfall-based delivery formula that specifies the amount of water to be delivered to ENP in weekly volumes through the S-333 and S-12 structures. Under ERTP, the normal operational target flow distribution is 55 percent through S-333 into NESRS and 45 percent through the S-12 structures into ENP west of the L-67 Extension, although the ERTP additionally includes provisions

for dry season conditions or unseasonably dry conditions when ENP recommends that the percent distribution is not limited to 55 percent to NESRS.

Compared to the ECB, stages within northwest ENP (NP-201) are generally increased by 0.1-0.2 feet during normal to dry conditions (**Figure C.1-33**) due to the increased utilization of S-12C with ERTP. NP-201 stage responses are highly correlated to the increased utilization of S-12C associated with the ERTP operations. Stages further south within Central Shark River Slough (P-33) demonstrate no significant change between the ECB and FWO (**Figure C.1-34**). Compared to the ECB, no significant stage differences are noted at NP-205, aside from a slight reduction in stage during wet to normal (not extreme) hydrologic conditions.

C.1.3.8.10 Taylor Slough

Under the ECB, which includes IOP 2006 operations for the SDCS, specified C-111 basin canal water levels/ranges and S-332D pump station operations resulted in Taylor Slough being provided water from C-111 mainly during the wet season. During the dry season, under IOP 2006, water deliveries to Taylor Slough were limited to provide conditions conducive to CSSS nesting (325 cfs from December 1 – January 31; 165 cfs from February 1 – July 15). ERTP operations, as part of the CEPP FWO, slightly modify the S-332D operations by increasing the CSSS operational constraint up to 250 cfs during the period from February 1 – July 14.

Compared to the ECB, ENP stages along Taylor Slough (NP-TSB) are generally increased by 0.1-0.3 feet during nearly all hydrologic conditions (**Figure C.1-35**). Increased stages for Taylor Slough are resultant from the combined hydrologic effects of the ERTP S-332D operations, the CERP C-111 Spreader Canal Western Project, and the non-CERP C-111 South Dade L-31W Canal plug constructions, as assumed completed for the FWO condition.

C.1.3.8.11 Lower East Coast Area

The LEC area is located to the east of the L-31N, L-31W, and C-111 canals. Under IOP 2006 and ERTP, specified canal water levels/ranges are meant to provide flood protection, water supply, and prevention of saltwater intrusion for the LEC. The ERTP operations for the SDCS are unchanged from the IOP operations for the SDCS, resulting in no changes to the operational protocols between the CEPP ECB and FWO.

Observed stage changes within the LEC are separately discussed with the FWO summary of flood control and water supply performance.

C.1.3.8.12 8.5 Square Mile Area

Stages within the 8.5 SMA, located along the eastern boundary of ENP, do not change significantly between the CEPP ECB and the FWO as ERTP did not change the operations of the 8.5 SMA S-357 pump station or the adjacent SDCS structure operations. The 8.5 SMA project components and operations are unchanged between the ECB and FWO modeling assumptions.

C.1.3.8.13 Biscayne Bay

No significant changes to combined total surface water canal discharges to central and southern Biscayne Bay (S-336, S-338, S-194, S-196, and S-197) or regional groundwater stages are observed between the CEPP ECB and FWO. Average annual surface water canal discharges to northern Biscayne Bay (S-29, S-28, S-27), which are affected by the assumed operations of the CERP BCWPA project, are increased by 66 kAF in the FWO, compared to the ECB.

C.1.3.8.14 Florida Bay

Average annual surface water transect flows from southeastern ENP towards Florida Bay are unchanged for Craighead Basin (RSM-GL Transect 23-A), increased by 8 kAF (12%) from Taylor Slough (Transect 23-B), and decreased by 22 kAF (13%) for the Eastern Panhandle of ENP (Transect 23-C), resulting in a net decrease of approximately 14 kAF for the FWO, compared to the ECB. Changes in surface water transect flows towards eastern Florida Bay are resultant from the combined hydrologic effects of the ERTP S-332D operations, the CERP C-111 Spreader Canal Western Project, and the non-CERP C-111 South Dade L-31W Canal plug constructions, as assumed completed for the FWO condition. The salinity effects within Florida Bay from this overall reduction and changed spatial distribution of flows were not specifically evaluated by the CEPP ecological sub-team (with additional RECOVER support), but limited additional information for the FWO changes compared to the ECB are also shown in **Appendix G** (**Benefit Model**).

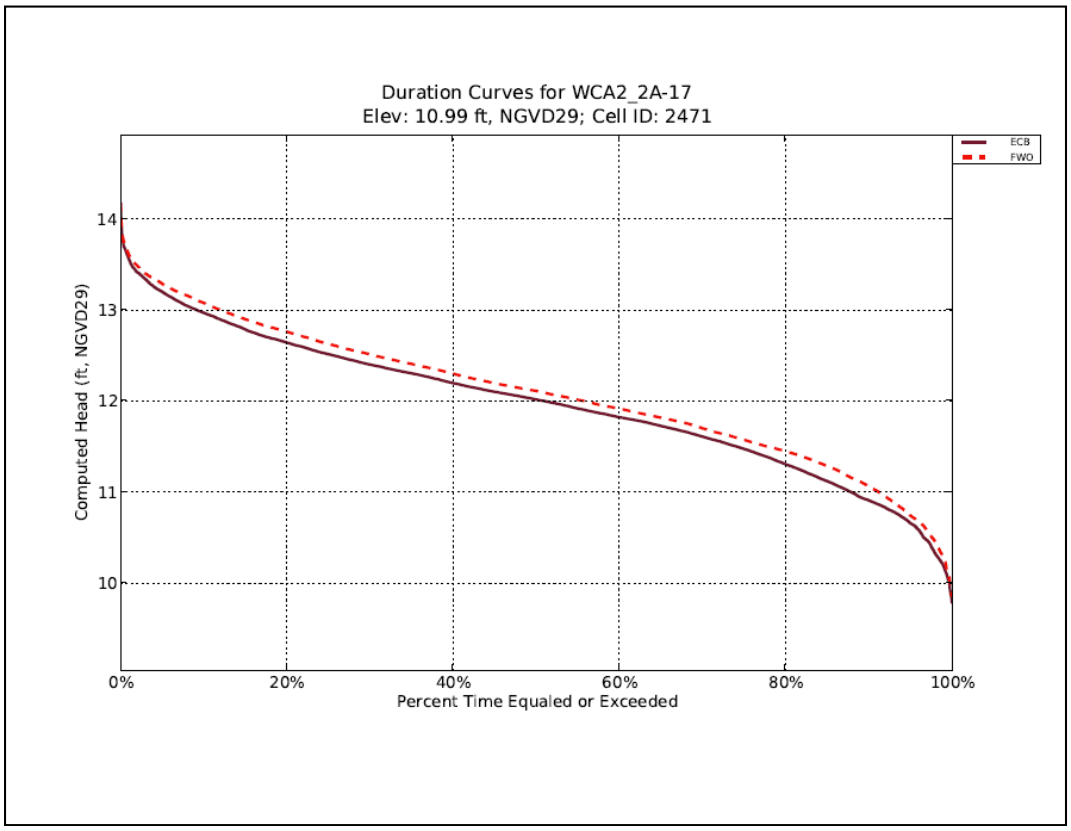


Figure C.1-24. Central WCA-2A Stage Duration Curve

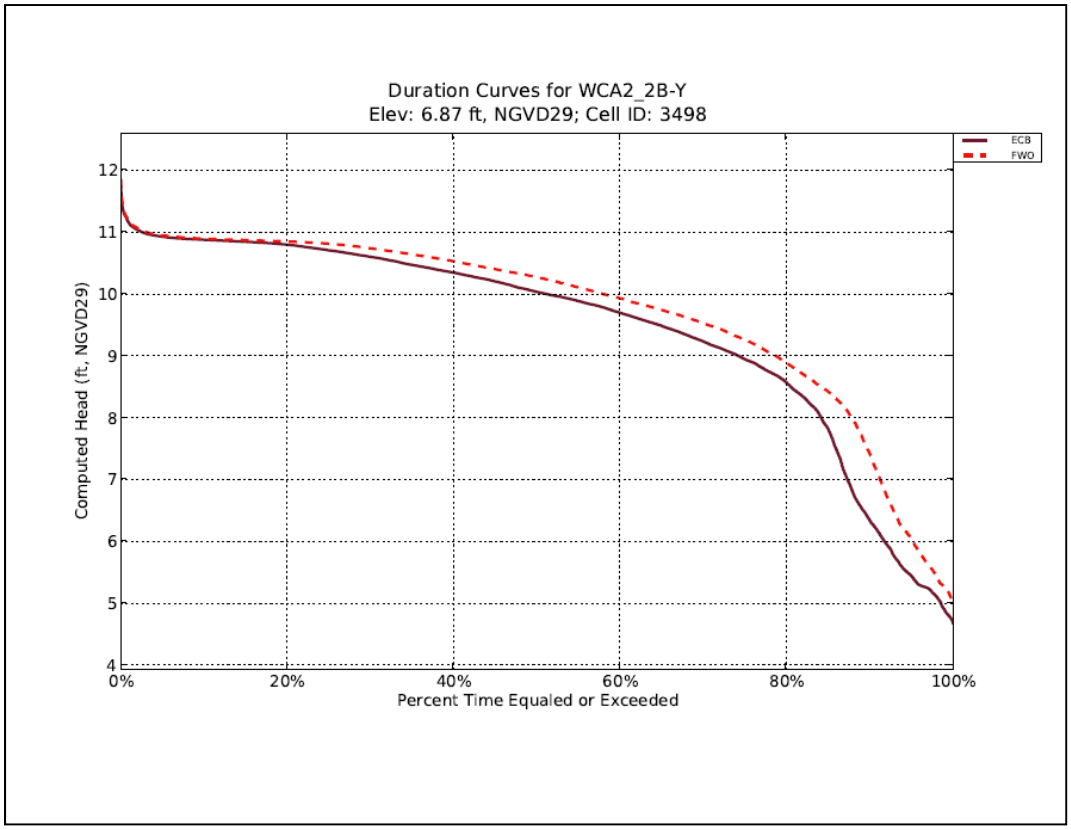


Figure C.1-25. Southern WCA-2B Stage Duration Curve

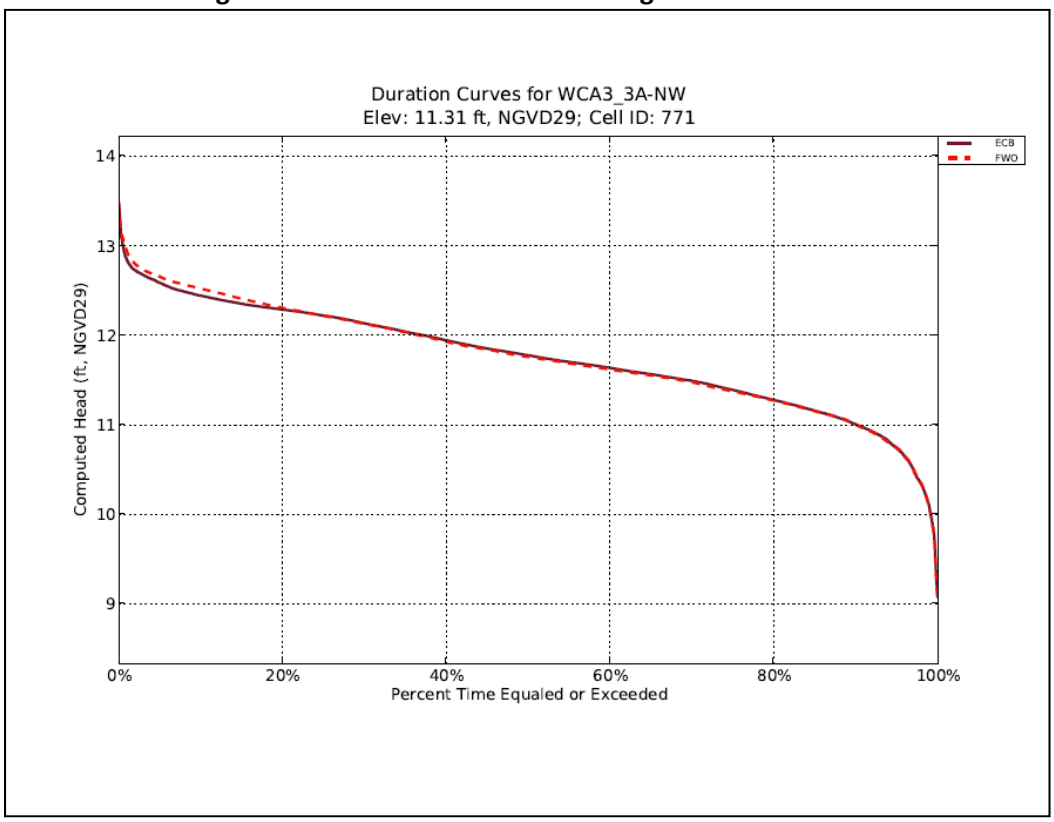


Figure C.1-26. Northwest WCA 3A Stage Duration Curve

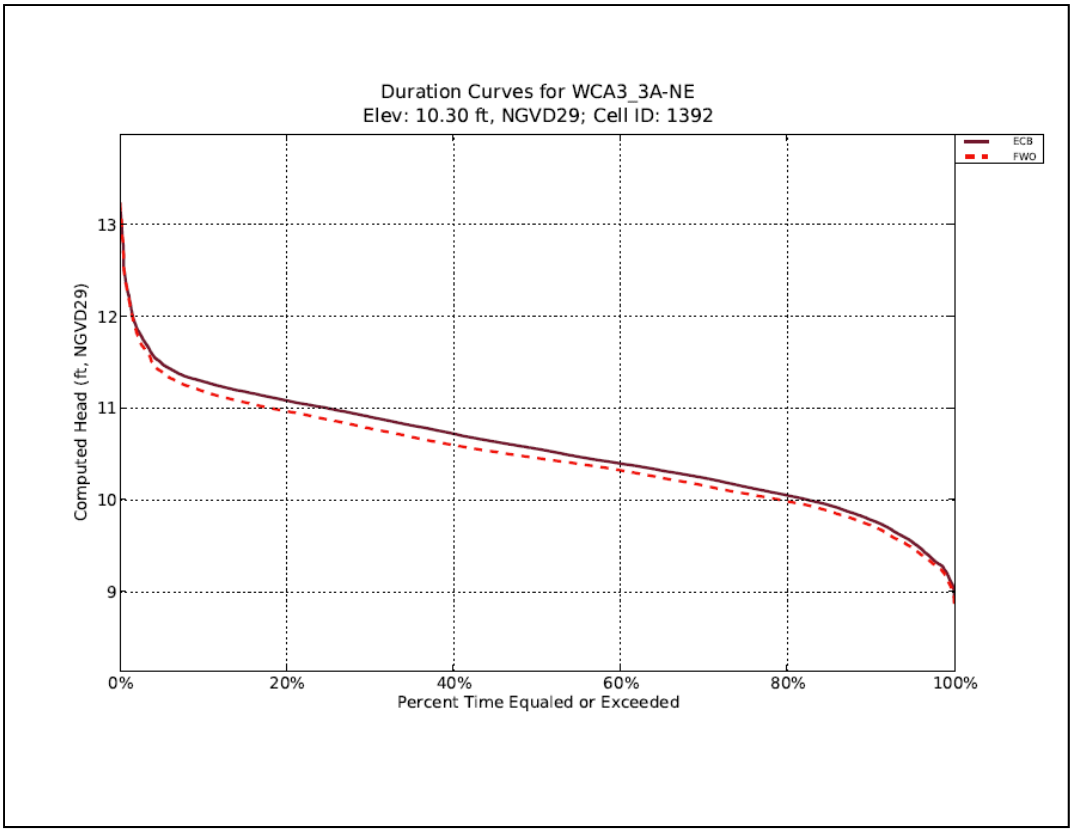


Figure C.1-27. Northeast WCA 3A Stage Duration Curve

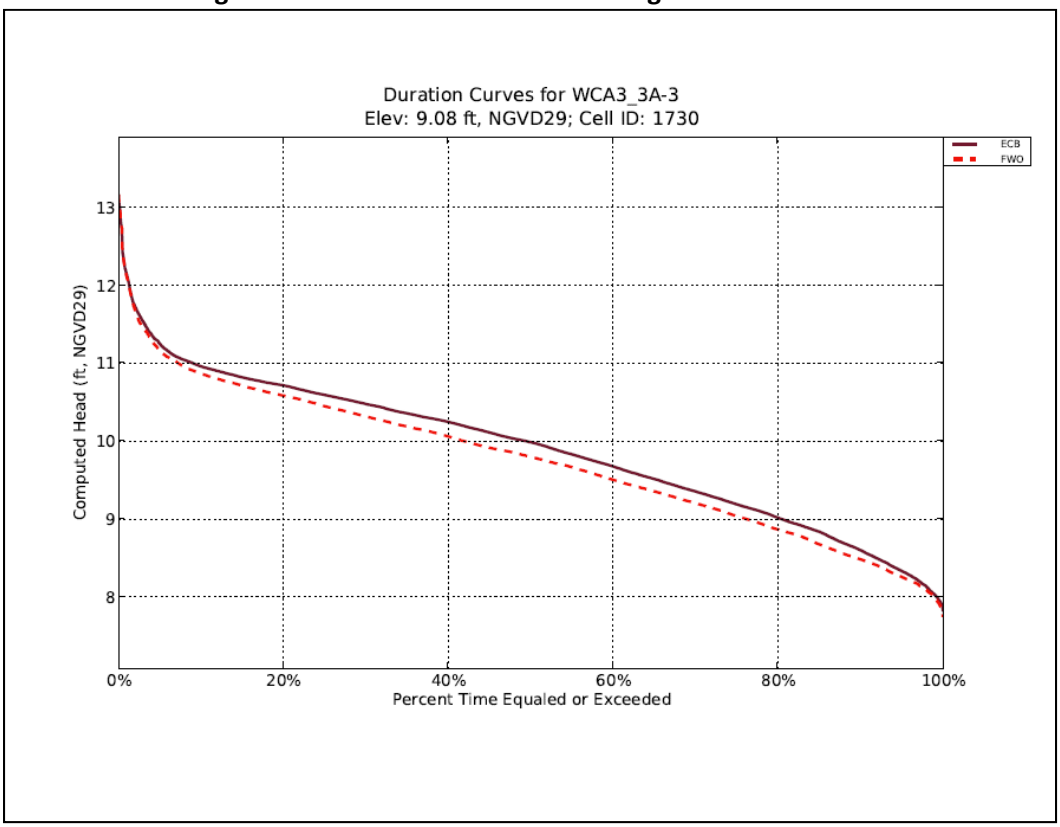


Figure C.1-28. East-Central WCA 3A Stage Duration Curve

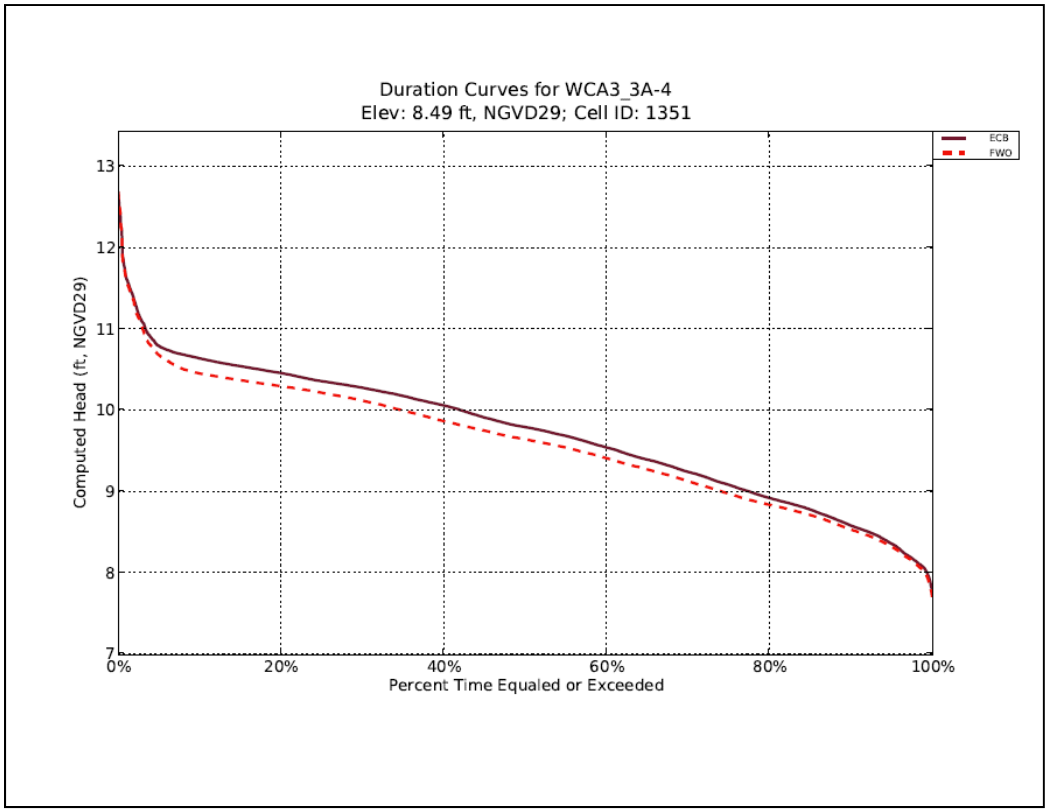


Figure C.1-29. Central WCA 3A Stage Duration Curve

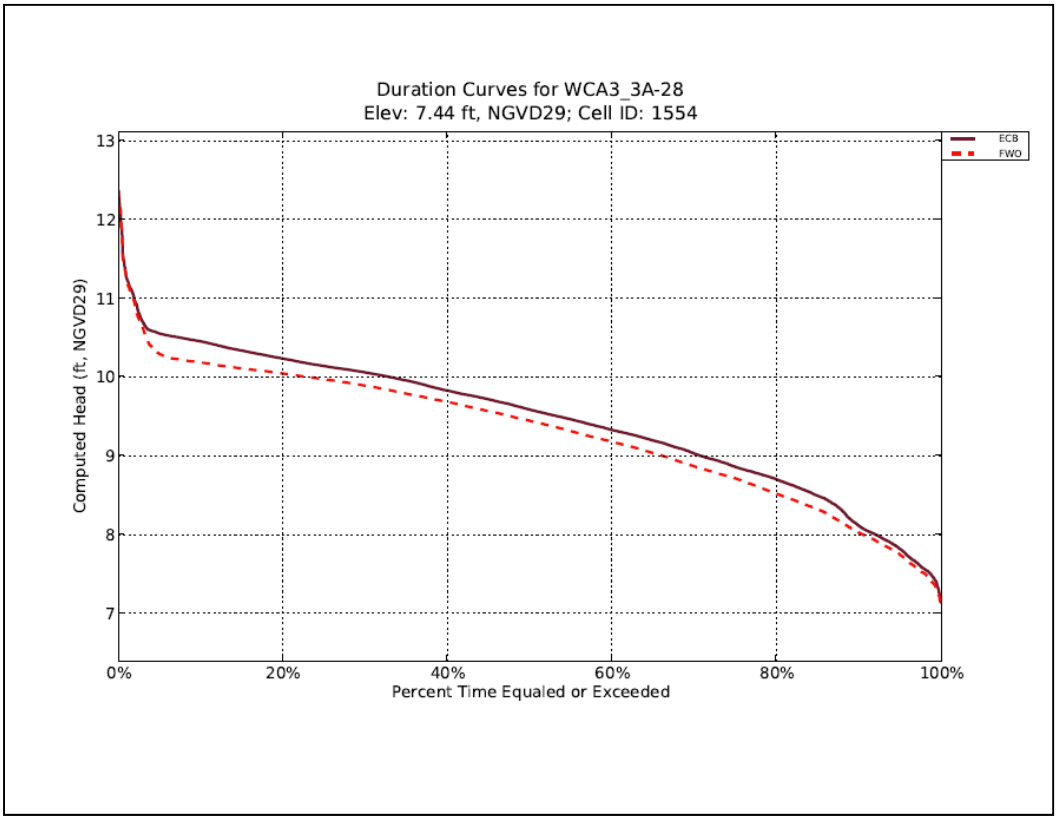


Figure C.1-30. South WCA 3A Stage Duration Curve

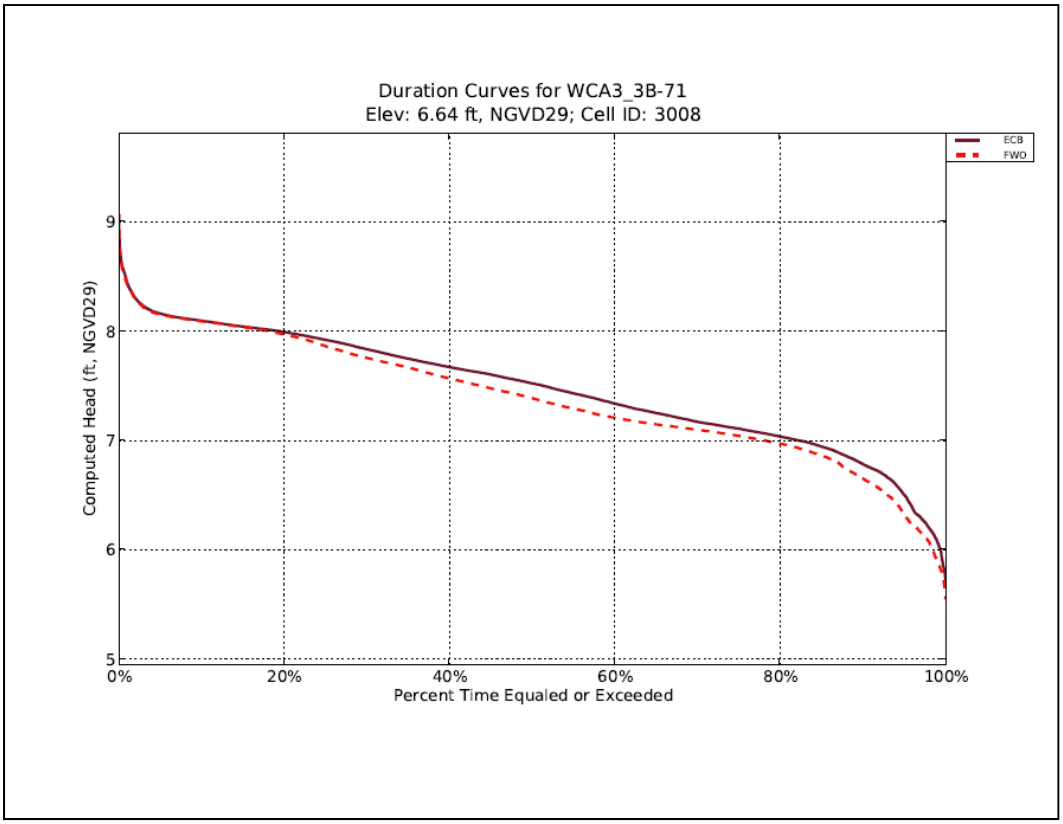


Figure C.1-31. Central WCA-3B Stage Duration Curve

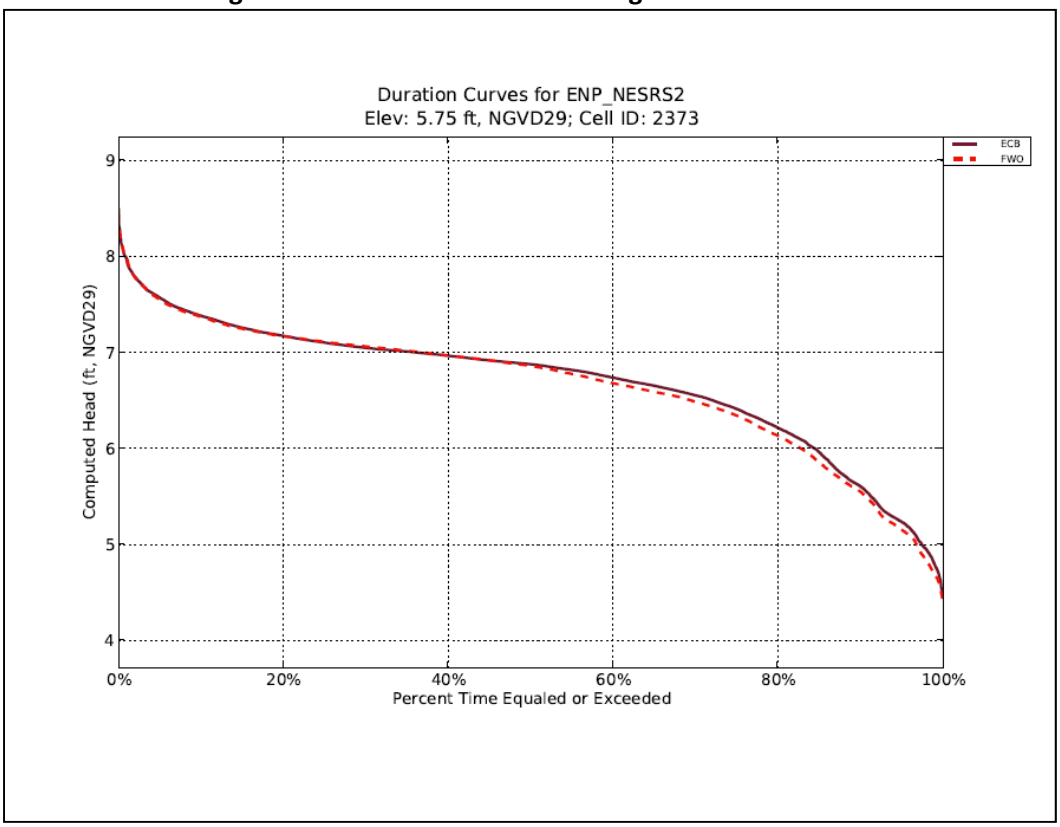


Figure C.1-32. Northeast ENP Stage Duration Curve

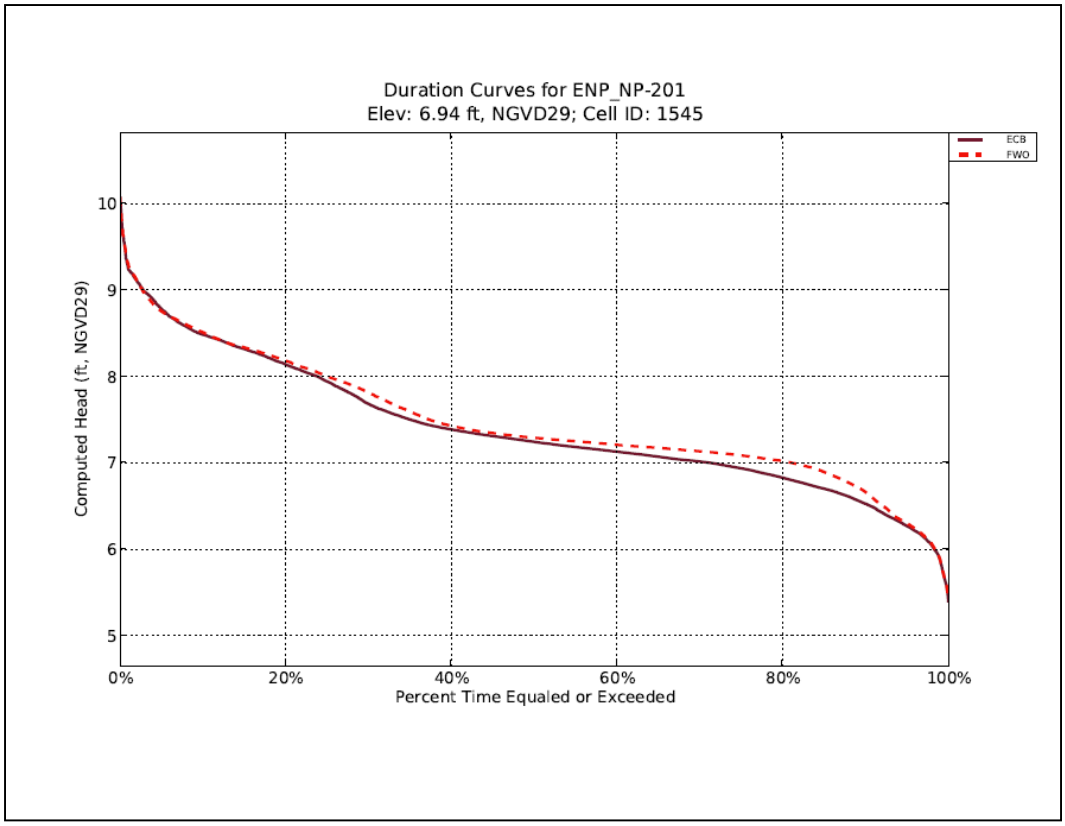


Figure C.1-33. Northwest ENP Stage Duration Curve

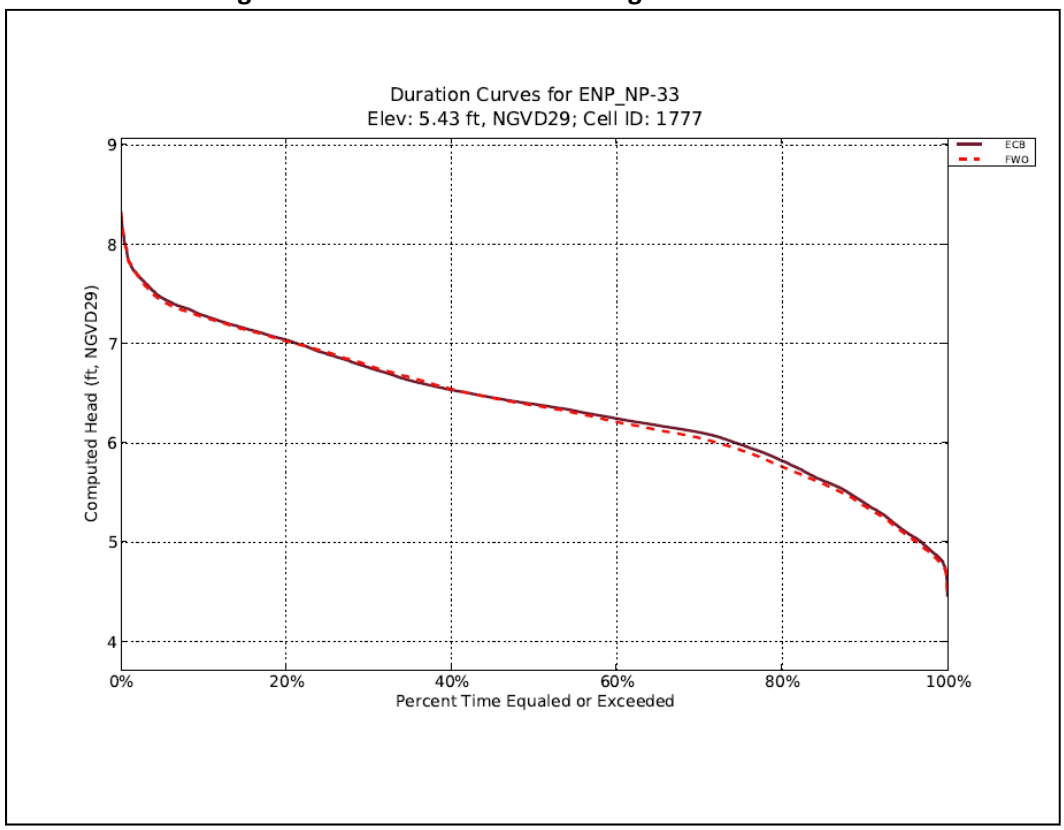


Figure C.1-34. Central ENP Stage Duration Curve

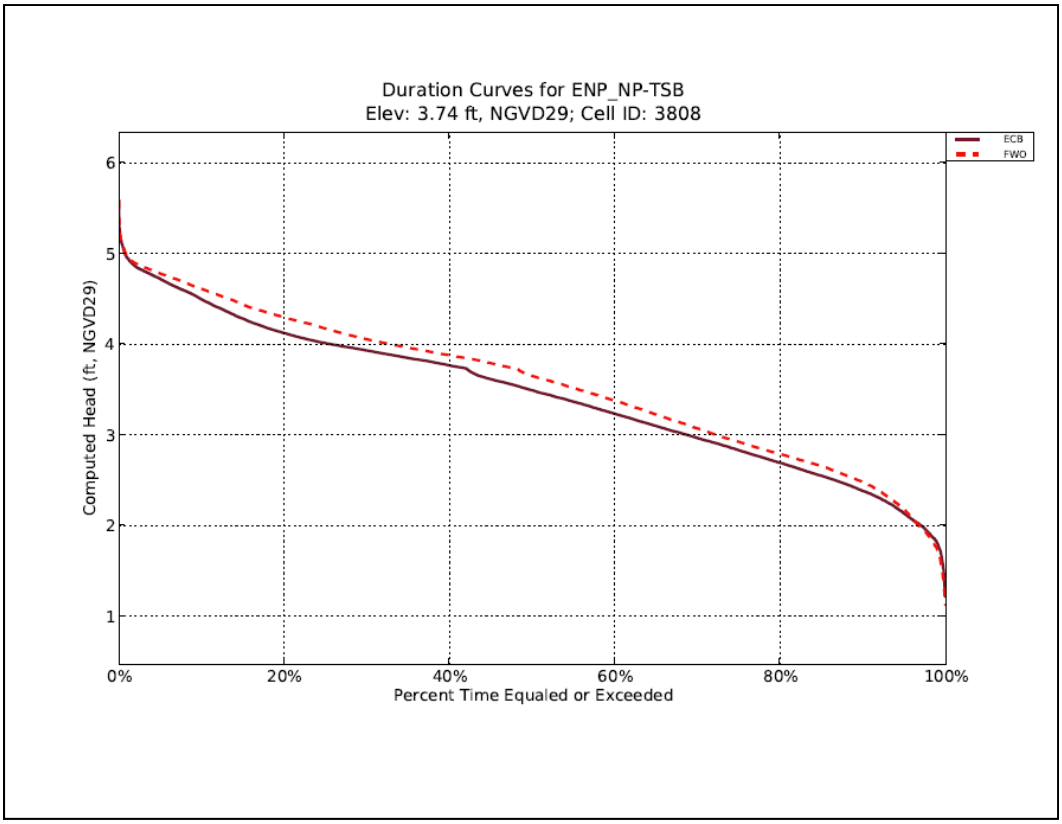


Figure C.1-35. ENP Taylor Slough Stage Duration Curve

C.1.3.9 Regional Water Management (Operations)

The FWO for CEPP assumes the construction and implementation of currently authorized CERP and non-CERP projects, and other Federal, state, or local projects constructed or approved under existing governmental authorities that occur in the CEPP study area; the CEPP FWO therefore included first generation CERP projects already authorized and under construction (Indian River Lagoon-South Project, Picayune Strand Restoration Project, Site 1 Impoundment Project), second generation CERP projects still pending Congressional authorization (Biscayne Bay Coastal Wetlands Project, Broward County Water Preserve Areas Project, Caloosahatchee River (C-43) West Basin Storage Reservoir, C-111 Spreader Canal Western Project), and non-CERP projects currently in progress (SFWMD Restoration Strategies, C&SF C-51 West End Flood Control Project, the C-111 South Dade Project, the Kissimmee River Restoration Project, Modified Water Deliveries, and the DOI Tamiami Trail Modification Next Steps Project).

For CEPP modeling of the FWO with the RSM-BN and RSM-GL models, operations protocols for the first and second generation CERP projects were modeled consistent with the draft Project Operating Manuals, as documented in the respective PIRs. The completed Kissimmee River Restoration project included the Headwaters Revitalization Schedule for the Kissimmee Chain of Lakes as defined for the UKISS modeling conducted by the Kissimmee River project team. The CEPP FWO representation of the C-111 South Dade and Modified Water Deliveries project features do not change operations from the ECB, which includes the L-29 Canal stage constraint at 7.5 feet NGVD, the G-3273 constraint at 6.8 feet NGVD, and the 2011 Interim Operating Criteria for the 8.5 SMA. Therefore, effects are as described in **Section C.1.1.9** (**Regional Water Management (Operations)**).

C.1.3.9.1 Lake Okeechobee

The FWO assumption for the operation of Lake Okeechobee is the LORS 2008. The CEPP team recognizes that when it was approved, LORS 2008 was identified as an interim schedule and that a subsequent schedule would be considered after the modifications to Herbert Hoover Dike (HHD) were completed. Until a new operating schedule is developed under a different, future study, LORS 2008 is the best estimate for operations.

The CEPP FWO modeling assumed operation of Lake Okeechobee as specified in the November 2007 LORS Final EIS (ROD approved in April 2008), with the other specified adjacent FWO projects (Kissimmee River Restoration, Caloosahatchee River (C-43) West Basin Storage Reservoir, Indian River Lagoon-South Project) in place and operational; Lake Okeechobee FWO operations were not further optimized during CEPP to consider utilization of additional operational flexibility, including potential higher lake stages. Therefore, effects are as described in **Section C.1.1.9.1** (**Lake Okeechobee**).

C.1.3.9.2 Greater Everglades

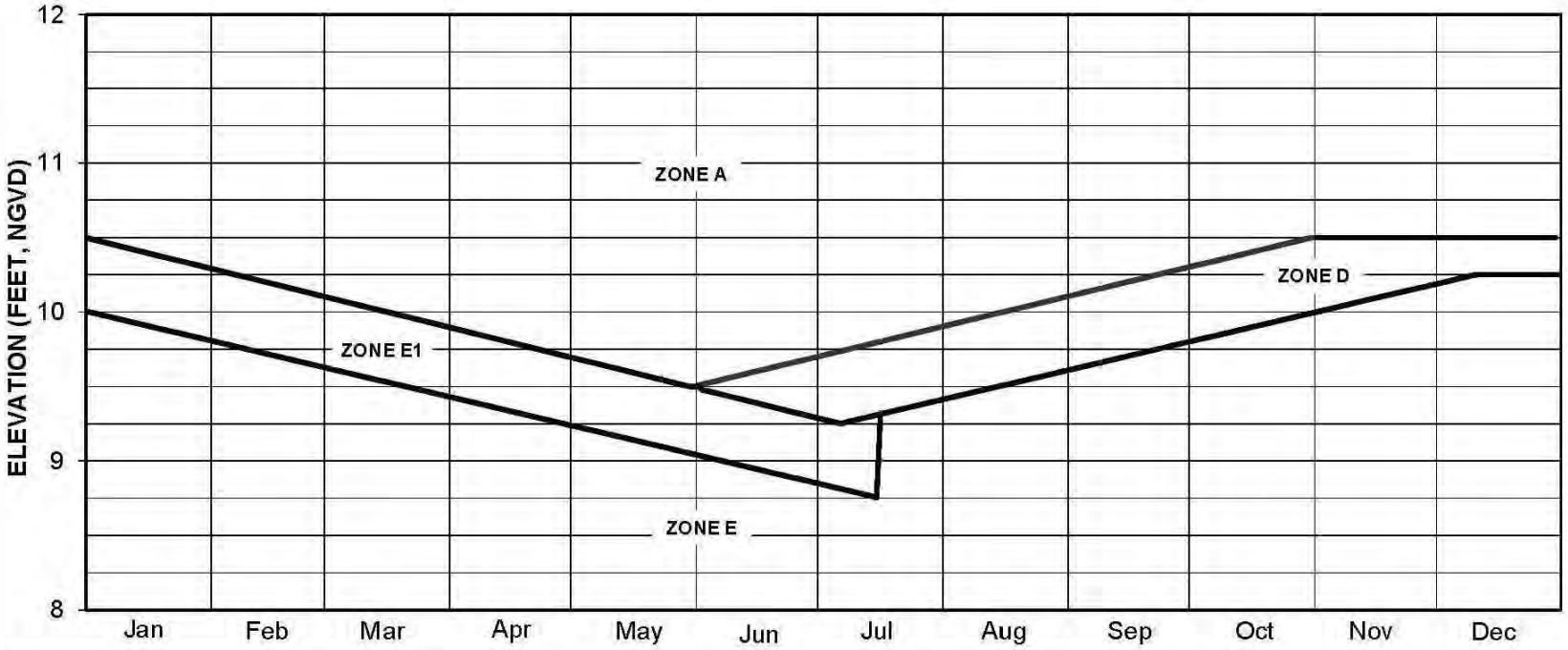
The CEPP FWO assumes implementation of the SFWMD Restoration Strategies, including construction of the A-1 FEB impoundment and 6,500 acres of additional STA treatment wetlands, within the EAA to achieve compliance with the 2012 FDEP Consent Order for water quality inflows to the EPA. The September 2012 Consent Order issued to the SFWMD by the FDEP is the result of extensive negotiations between the state and Federal parties. The Central Flow-way components of the SFWMD Restoration Strategies are included in the CEPP FWO modeling.

No modifications to the WCA 1 or WCA 2 Regulation Schedules are included in the CEPP FWO, and operations of these WCAs are consistent with the ECB. Effects would be as described in **Section C.1.1.9.2** (**Greater Everglades**) with respect to WCA 1 and 2.

In addition to the CERP and non-CERP projects previously specified, the CEPP FWO includes implementation of the ERTP operational plan for WCA 3A, ENP, and the SDCS, which has replaced the IOP. The ERTP superseded the IOP in October 2012 and is intended to be a transitional temporary plan to be used until completion of the final Operational Plan that was to be developed as part of the MWD project. Under the ERTP, WCA 3A is regulated according to a seasonally varying 8.75 to 10.50 feet NGVD regulation schedule and a slightly modified Rainfall Plan, as per the ERTP (December 2011 ERTP Final EIS; refer to **Figure C.1-36**). The most notable changes with the WCA 3A Interim Regulation Schedule under ERTP, compared to that under IOP, are the following changes (refer to the ERTP Final EIS for additional details): the top of the WCA 3A Interim Regulation Schedule (Zone A) was lowered seasonally by between 0.25-0.50 feet; the IOP Regulation Schedule transition zones (Zones B and C) were eliminated; the bottom zones (Zone D and Zone E1) were extended; the S-12C seasonal closure under IOP (February 1 through July 14) was removed; and ERTP operations will utilize the FWS Multi-species Transition Strategy (MSTS) and Periodic Scientists Calls (PSC) to provide input to assist the USACE with operational decision-making. Under the ERTP, consistent with IOP, the WCA 3A Interim Regulation Schedule utilizes a 3-gauge average elevation of Sites 63, 64, and 65 in the management of WCA 3A water levels (also known as 3A-3, 3A-4 and 3A-28, respectively). Consistent with the IOP, the goal of the rainfall and regulatory components is to split the flows between the S-12 structures and S-333, with 45 percent of the total flow from WCA 3A passing through the S-12 structures to Western SRS and the remaining 55 percent to discharge through S-333 to NESRS, establishing the target flows for both the S-12 structures and S-333. However, the ERTP additionally includes provisions for dry season conditions or unseasonably dry conditions when ENP recommends that the percent distribution is not limited to 55 percent to NESRS.

Water deliveries to eastern ENP remain controlled by the stage in L-29 Canal in the CEPP FWO assumptions. Consistent with the ECB, the water management operating criteria for the L-29 borrow canal between S-333 and S-334 is meant to limit the L-29 borrow canal stage to no more than 7.5 feet NGVD in response to existing roadway sub-base concerns identified by the Florida Department of Transportation (FDOT). Although the CEPP FWO assumes completion of the MWD Tamiami Trail Modifications project, the final Operational Plan for MWD has not been developed. Therefore, for planning purposes the CEPP FWO includes ERTP as the operational plan. Also unchanged from the ECB operations for ENP, when the G-3273 water level within NESRS reaches 6.8 feet, NGVD under FWO operations, S-333 discharges to NESRS will be discontinued until G-3273 falls below 6.8 feet, NGVD.

There are three distinct modes of water management operations for ERTP, which are consistent with the previous IOP: Column 1, Column 2, and water supply. Water management operating criteria within Column 1 occurs when WCA 3A discharges can be achieved by discharges from the S-12 structures, S-333, S-151, S-343A, S-343B, and/or S-344. Water management operating criteria within Column 2 occurs when WCA 3A discharges are made via S-333 to the L-29 Canal and L-31N Canal, the ENP SDCS; Column 2 generally requires the use of pump stations S-331, S-332B, S-332C, and S-332D. Column 2 is used to offset or mitigate for adverse effects on WCA 3A related to closure periods at water management structures to protect CSSS-A. Column 2 generally occurs when any S-12 structure is closed in order to protect the Cape Sable seaside sparrow (CSSS) (January 1 through July 14, under ERTP), although Column 1 may continue until the capacity of the S-12 structures that remain open is insufficient to handle the discharge from WCA-3A. If necessary, Column 2 may continue past re-opening of the S-12 structures (July 15) to mitigate for adverse effects on WCA 3A resulting from the ERTP closures of S-12A, S-12B, S-343A, S-343B, and S-344. All other specified operations in the CEPP FWO for WCA 3A, WCA 3B, and ENP are unchanged from the ECB. Additional detail is included in the December 2011 ERTP Final EIS and is incorporated by reference in this document.



Notes: Zones B and C do not exist. Use 3-gage average elevation (Sites 63, 64, and 65). If 3-gage average is in Zone D from 1 June through 14 July, Zone E1 operating criteria may be utilized.

Zone A: Up to maximum releases at S-12A, S-12B, S-12C, S-12D, S-333, S-334, S-343A, S-343B, S-344, and S-151 subject to attached Part C and WCA-3A, ENP, and ENP-SDCS Water Control Plan.

Zones D, E: Goal is to release 45% and 55% at S-12s and S-333, respectively, of the computed flow for Shark River Slough, subject to attached Part C and WCA-3A, ENP, and ENP-SDCS Water Control Plan.

Zone E1: Up to maximum releases at S-12C, S-12D, S-142, S-151, S-31, S-337, S-335, S-333, S-355A, S-355B and S-334 subject to attached Part C and WCA-3A, ENP, and ENP-SDCS Water Control Plan. The goal of Zone E1 is to address the reduction of WCA-3A releases due to CSSS-A structure closure periods.

CENTRAL AND SOUTHERN FLORIDA PROJECT

WATER CONSERVATION AREA NO. 3A INTERIM REGULATION SCHEDULE

PART A

DATED: March 2012
US ARMY ENGINEER DISTRICT
JACKSONVILLE, FLORIDA

Figure C.1-36. ERTP Water Conservation Area 3A Interim Regulation Schedule Part A

C.1.3.10 Flood Control

The negative effects associated with flooding are expected to increase during the period between the present and the year 2050. As agricultural and urban development continues, the volume, duration, and frequency of floodwaters may increase, and the actual levels of service for flood control may decline in some areas. If sea level rise continues as predicted, it is foreseeable that the Biscayne aquifer is likely to experience greater intrusion of saltwater possible rendering some of the current water supply well fields unusable due to contamination. Higher groundwater stages in the project area would reduce the ability of water managers to store rainfall runoff wither within wetlands or the surficial aquifer, resulting in increased intensity of stormwater discharges through the primary canals. Reduced water storage reduces the capacity of the flood control system to accommodate runoff and would likely lead to increased frequency of flooding events. Sea level rise may also impact flood control effectiveness as rising tail water conditions at the coastal canal structures reduce the effective maximum discharge rates. As additional information becomes available, these structures may be modified or replaced with pumps to ensure continued effective flood control. This may also require the implementation of forward pumping to maintain the existing level of flood protection in the future. An analysis of sea level rise on the Tentatively Selected Plan (TSP) is discussed in **Section 6** (**Tentatively Selected Plan**) and **Annex I** (**Sea Level Rise**). Sea level rise is not included in the FWO modeling for CEPP.

Future non-CERP projects, implemented through the USACE and/or the SFWMD may potentially alter the levels of service for flood control within the CEPP project area, including but not limited to: potential Lake Okeechobee Regulation Schedule changes, SFWMD Restoration Strategies, C&SF C-51 West End Flood Control Project, the C-111 South Dade Project, the Kissimmee River Restoration Project, Modified Water Deliveries, and other potential future C&SF operational plan studies. Potential flood control affects, including improved or reduced levels of service, would be thoroughly assessed through the public NEPA process. To the extent that these projects have been identified and defined, these non-CERP projects have been included in the CEPP FWO modeling assumptions; potential future operational plans for Lake Okeechobee, implementation of the Modified Water Deliveries and C-111 South Dade projects, and other potential future C&SF operational plan studies are therefore not able to be included in the CEPP FWO modeling.

The Water Resources Development Act of 2000 (section 601 of WRDA 2000) approved the CERP Plan contained in the "Final Integrated Feasibility Report and Programmatic Environmental Impact Statement" dated April 1, 1999. As stated in section 601(h) of WRDA 2000, "the overarching objective of the Plan is the restoration, preservation, and protection of the south Florida ecosystem while providing for other water-related needs of the region, including flood protection and water supply." Section 601 of WRDA 2000 required the Secretary of the Army, with the concurrence of the Secretary of the Interior and the Governor of Florida, and after notice and opportunity for public comment, to promulgate Programmatic Regulations to ensure that the goals and purposes of the Plan are achieved and to establish the processes necessary for implementing the Plan. The final Programmatic Regulations became effective on December 12, 2003 as Title 33, Part 385 of the Code of Federal Regulations (CFR).

Identifying if an elimination or transfer of existing legal sources of water will occur as a result of implementation of CERP and whether levels of service for flood protection will be reduced by implementation of CERP is required by section 601(h)(5) of WRDA 2000. The WRDA 2000 Savings Clause requires that "Implementation of the Plan shall not reduce levels of service for flood protection that are: (i) in existence on the date of enactment of this Act (December 11, 2000); and (ii) in accordance with applicable law." Consistent with the Savings Clause requirements, each CERP project included in the CEPP FWO (Indian River Lagoon-South Project, Picayune Strand Restoration Project, Site 1

Impoundment Project, Biscayne Bay Coastal Wetlands Project, Broward County Water Preserve Areas Project, Caloosahatchee River (C-43) West Basin Storage Reservoir, C-111 Spreader Canal Western Project) must independently demonstrate in the respective PIRs that implementation of these CERP projects would not adversely impact the levels of service for flood protection. Operations protocols for the first and second generation CERP projects were modeled in the CEPP FWO consistent with the draft Project Operating Manuals, as documented in the respective PIRs.

Compared to the CEPP ECB, the CEPP FWO modeling indicated no change to flood control stages within the wettest 10% of hydrologic conditions for LECSA 1 (Palm Beach) and LECSA 2 (Broward); no change to flood control stages within the wettest 10% of hydrologic conditions along the L-30 Canal in LECSA 3 (Miami); and a slight increase to flood control stages within the wettest 10% of hydrologic conditions along the L-31N Canal in LECSA 3.

C.1.3.11 Water Supply

Future non-CERP projects within the CEPP project area, implemented through the USACE and/or the SFWMD may potentially partially or entirely eliminate water supply sources or transfer water supply to new sources. Currently identified future non-CERP projects including, but are not limited to: potential Lake Okeechobee Regulation Schedule changes, the C-111 South Dade Project, the Kissimmee River Restoration Project, Modified Water Deliveries, and other potential future C&SF operational plan studies. Potential water supply affects, including improved or reduced levels of service, would be thoroughly assessed through the public NEPA process. To the extent that these projects have been identified and defined, these non-CERP projects have been included in the CEPP FWO modeling assumptions; potential future operational plans for Lake Okeechobee, implementation of the Modified Water Deliveries and C-111 South Dade projects, and other potential future C&SF operational plan studies have not been presently defined and were therefore not included in the CEPP FWO modeling.

Identifying if an elimination or transfer of existing legal sources of water will occur as a result of implementation of CERP and whether levels of service for flood protection will be reduced by implementation of CERP is required by section 601(h)(5) of WRDA 2000. The WRDA 2000 Savings Clause requires that "Until a new source of water supply of comparable quantity and quality as that available on the date of enactment of this Act is available to replace the water to be lost as a result of implementation of the Plan, the Secretary and the non-Federal sponsor shall not eliminate or transfer existing legal sources of water, including those for: (i) an agricultural or urban water supply; (ii) allocation or entitlement to the Seminole Indian Tribe of Florida under section 7 of the Seminole Indian Land Claims Settlement Act of 1987; (iii) the Miccosukee Tribe of Indians of Florida;(iv) water supply for Everglades National Park; or (v) water supply for fish and wildlife." Consistent with the Savings Clause requirements, each CERP project included in the CEPP FWO (Indian River Lagoon-South Project, Picayune Strand Restoration Project, Site 1 Impoundment Project, Biscayne Bay Coastal Wetlands Project, Broward County Water Preserve Areas Project, Caloosahatchee River (C-43) West Basin Storage Reservoir, C-111 Spreader Canal Western Project) must independently demonstrate in the respective PIRs that implementation of these CERP projects would not adversely impact the existing legal sources for water supply. Operations protocols for the first and second generation CERP projects were modeled in the CEPP FWO consistent with the draft Project Operating Manuals, as documented in the respective PIRs.

C.1.3.11.1 Lake Okeechobee

In the Lake Okeechobee Service Area, which includes the EAA, the volume of available fresh water is limited. Specifically, the Lake Okeechobee is a limited source due to implementation of the 2008 LORS,

and concerns regarding the lake's MFL criteria. As a result of the impacts to water supply, the SFWMD enacted rules to limit future additional withdrawals from Lake Okeechobee in order to prevent further degradation of the level of certainty for existing legal users.

Despite limitations on future demand (no water supply demand increases are included in the FWO modeling), compared to the ECB, the frequency of water restrictions within the Lower East Coast Service Areas is projected to slightly increase for the CEPP FWO due to Lake Okeechobee falling below the Water Shortage Trigger line as defined by LOWSM: 3 additional years with 3 or more months with restrictions for LECSA 1; 1 additional years with 3 or more months with restrictions for LECSA 2; and 3 additional years with 3 or more months with restrictions for LECSA 3. When HHD remediation of Reaches 1, 2, and 3 and replacement/removal of culverts are complete and the HHD DSAC Level 1 rating is lowered, it may be possible to allow higher maximum lake stages and increased frequency and duration of high lake stages, but this assumption was not included in the CEPP modeling (2008 LORS is assumed for the CEPP FWO, without use of additional operational flexibility). In addition, completion of the Kissimmee River Restoration Project and implementation of a new operating schedule is expected in the FWO. As a result inflows to the Lake would have a different seasonal pattern and magnitude, though the new operating schedule is not known nor included in the FWO analysis.

The CERP C-43 and C-44 reservoirs are assumed to be constructed and operational in the FWO condition, but these projects would not be expected to affect Lake Okeechobee stages. C-43 reservoir captures Lake Okeechobee regulatory releases and the C-44 reservoir captures local basin stormwater runoff. Likewise, implementation of the SFWMD Restoration Strategies' water quality treatment projects in the FWO condition are not expected to affect Lake Okeechobee stages or its ability to supply supplemental irrigation. Most of the land being converted for water quality projects has not been used for agricultural production for a number of years. In addition, the SFWMD Restoration Strategies' projects have been designed to capture existing run-off from the EAA and only the historical limit of up to 60,000 acre feet of water from Lake Okeechobee.

Based on the CEPP FWO modeling assumptions and the resulting stage reductions within Lake Okeechobee, the average annual percentage of water supply demand not met is projected to increase for the EAA and remain consistent with the ECB for the remainder of the LOSA (**Figure C.1-37**). For the eight years with the largest water supply cutbacks within the LOSA, the water supply cutback percentage is reduced for five of the eight years and increased for three of the eight years (1989, 1990, and 2001) (**Figure C.1-38**).

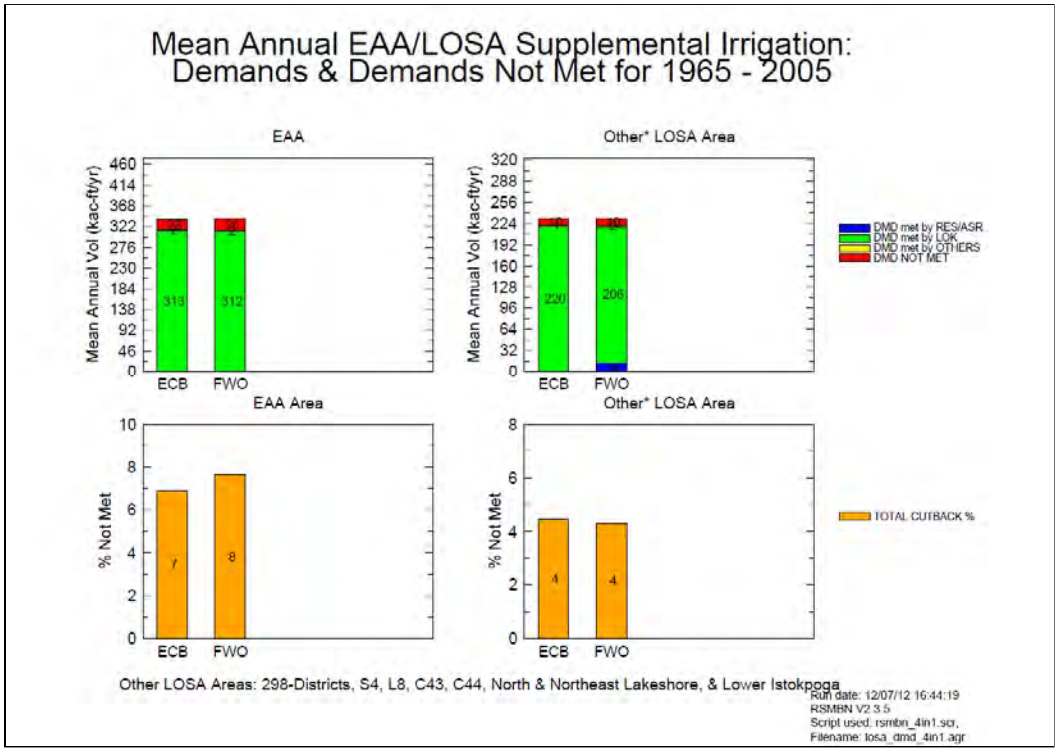


Figure C.1-37. EAA and LOSA Water Supply Performance

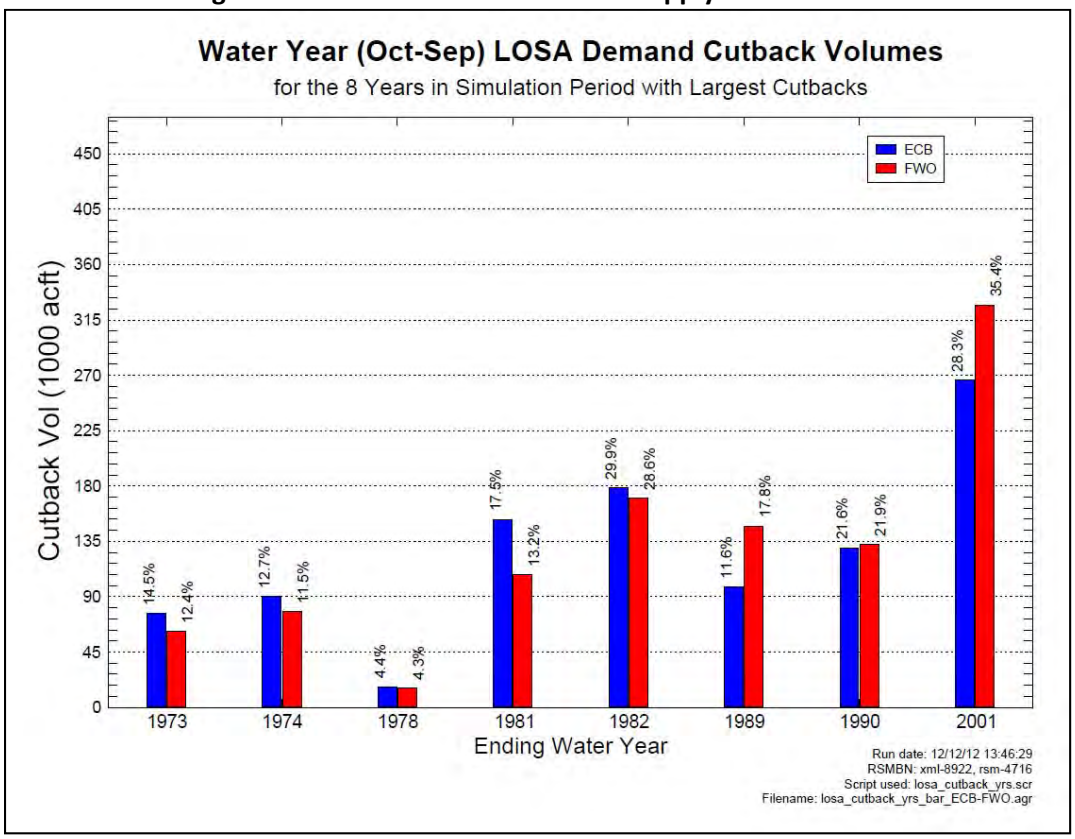


Figure C.1-38. LOSA Water Supply Performance for the Eight Largest Cutback Years

C.1.3.11.2 Seminole Tribe of Florida

Based on the CEPP FWO modeling assumptions and the resulting stage reductions within Lake Okeechobee, the percentage of water supply demand not met for the Brighton Reservation is shown to slightly increase by 0.2% (**Figure C.1-39**). The percentage of water supply demand not met for the Big Cypress Reservation is shown to be moderately reduced by 0.8% (**Figure C.1-40**). The Seminole Tribe has surface water entitlement rights pursuant to the 1987 Water Rights Compact and subsequent entitlement provisions executed between the Seminole Tribe of Florida, the State of Florida, and the SFWMD, and any potential impacts would need to be avoided or otherwise mitigated.

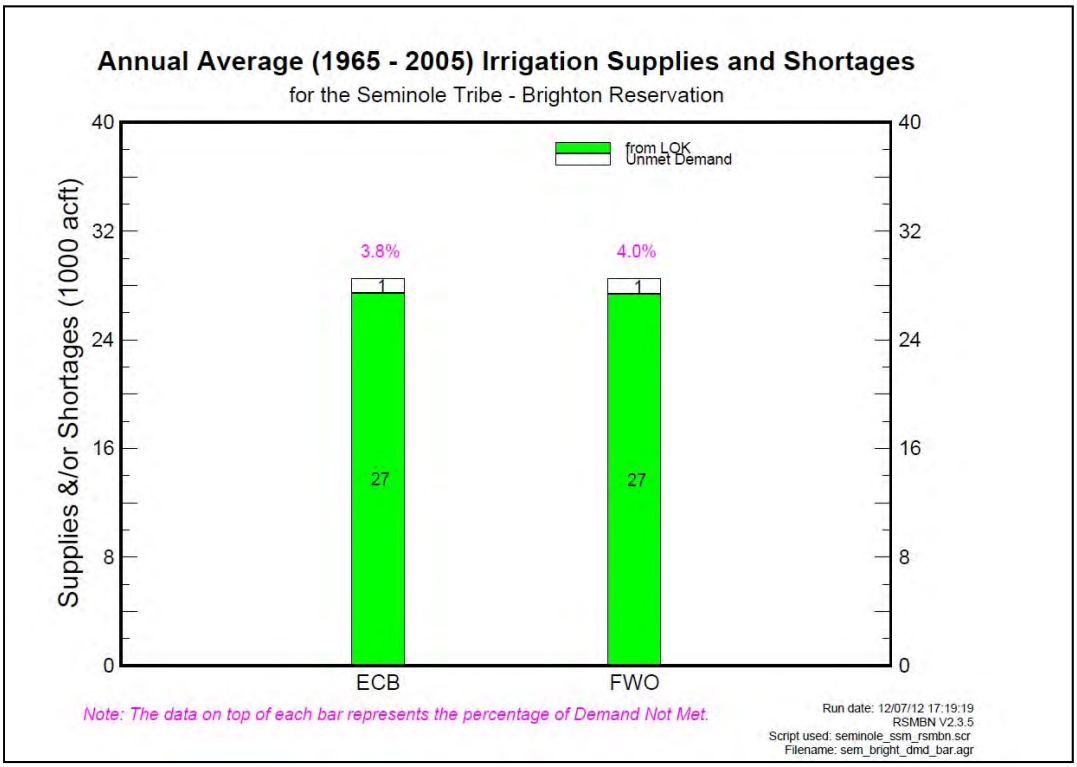


Figure C.1-39. Water Supply Demand for Seminole Tribe Brighton Reservation

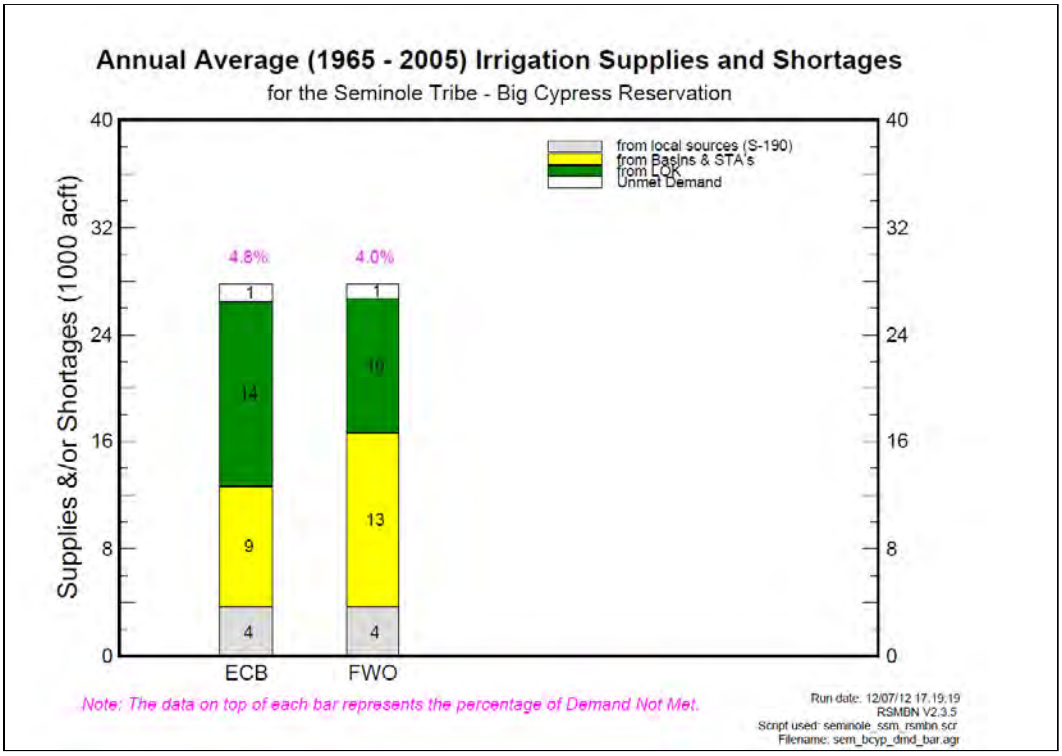


Figure C.1-40. Water Supply Demand for Seminole Tribe Big Cypress Reservation

C.1.3.11.3 Lower East Coast Service Areas

Due to the regulatory limits on withdrawals from the SAS that affect the Everglades and WCAs, the water sources will continue to diversify. The SAS was almost the sole source of PWS in the LECSA 15 years ago. Today (2013) it supplies 94% of the PWS. The diversification of sources will continue in the future. Alternative sources include the Floridan Aquifer System, reclaimed water, storage such as ASR and surface and stormwater reservoirs, and demand management through conservation. This diversification will help to protect future supplies.

The CEPP FWO includes the combined effects from implementation of the SFWMD A-1 FEB, the ERTP WCA 3A Regulation Schedule (the CEPP ECB assumed the IOP WCA 3A Regulation Schedule), and the CERP Broward WPA Project, in addition to downstream affects associated with the stage reductions in Lake Okeechobee and reduced regulatory discharges south. The moderately reduced dry season water levels within WCA 3A, resultant from the ERTP lowering the uppermost Zone A of the WCA 3A Regulation Schedule to lower the duration and peak magnitude of wet season stages, has the potential to impact water supply for natural ecosystems and downstream uses. It is expected that this schedule will remain in place for an indeterminate period of time, although the FWS Biological Opinion for ERTP expires in 2016 and re-consultation may be required.

Despite limitations on future demand (no water supply demand increases are included in the FWO modeling), compared to the ECB, the frequency of water restrictions is projected to slightly increase for the CEPP FWO due to Lake Okeechobee falling below the Water Shortage Trigger line as defined by LOWSM: 3 additional years with 3 or more months with restrictions for LECSA 1; 1 additional years with 3 or more months with restrictions for LECSA 2; and 3 additional years with 3 or more months with restrictions for LECSA 3.

The CEPP FWO modeling also indicates changes to regional groundwater conditions within the LECSA, as compared to the CEPP ECB modeling. Despite limitations on future demand, compared to the ECB local groundwater stages east of WCA-1 at PB-1576 (LECSA 1) are expected to decline by 0.2-0.5 feet for the driest 10% of hydrologic conditions (**Figure C.1-41**). Local groundwater stages south of the Site 1 CERP project (G-2739) may be reduced by 0.2 feet for normal to dry conditions and by up to 1.0 feet during extreme dry conditions (**Figure C.1-42**). Within LECSA 2, local groundwater stages are slightly reduced by for the driest 10% of hydrologic conditions. In Miami-Dade County (LECSA 3), L-30 canal stages may be reduced by 0.2-0.4 feet for normal to extreme dry conditions (Figure C.1-43); L-31N canal stages may be slightly reduced by 0.1-0.2 feet for extreme dry conditions (**Figure C.1-44**); and C-111 canal stages between S-176 and S-18C are generally lowered by 0.2-0.5 feet for normal to extreme dry conditions (**Figure C.1-45**). Reduced groundwater stages may result in increased water supply demands on the regional system, particularly Lake Okeechobee, to manage canal levels within the target range to prevent saltwater intrusion.

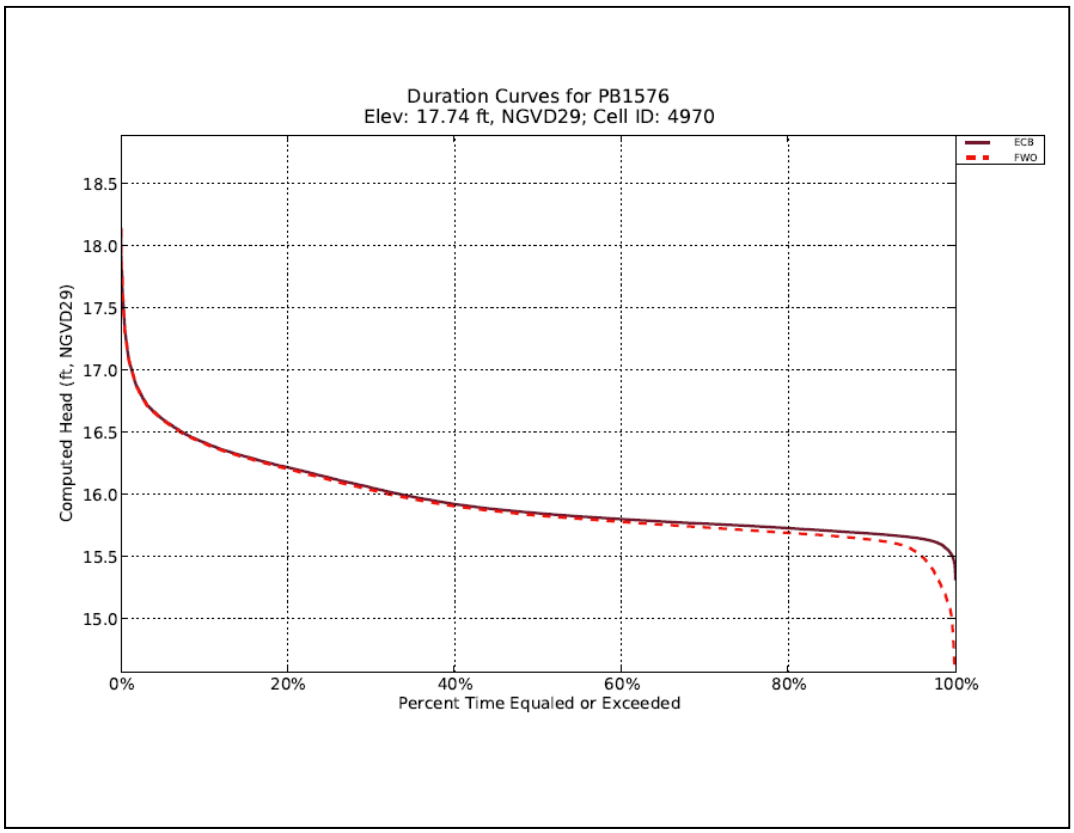


Figure C.1-41. Stage Duration Curve for PB-1576 in LECSA 1

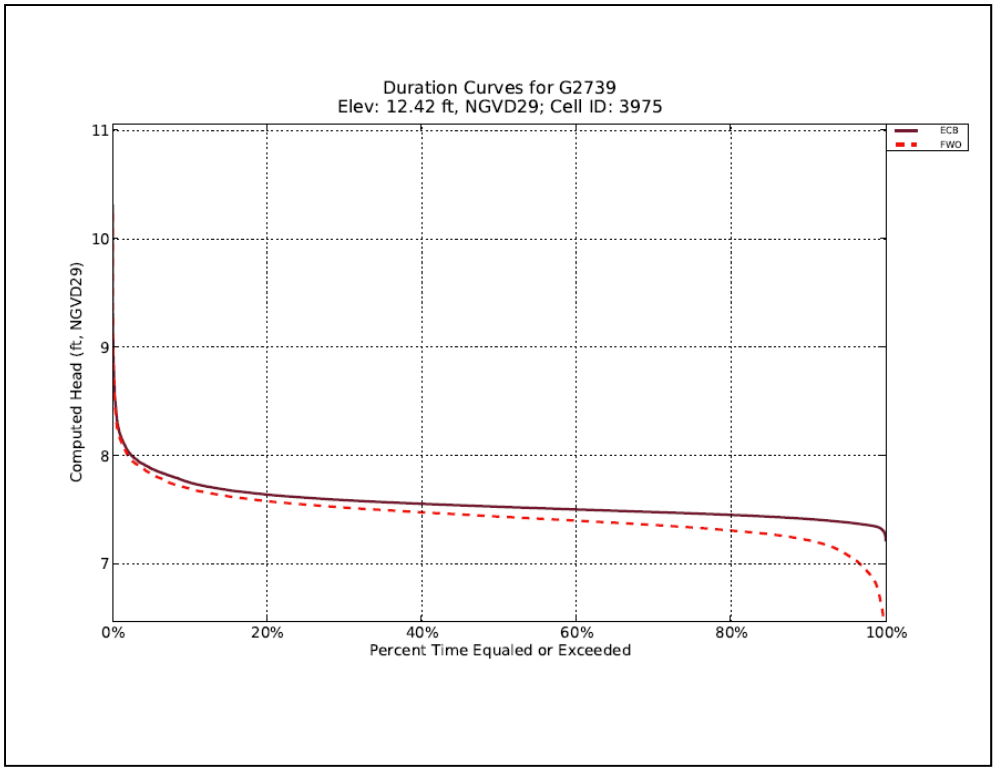


Figure C.1-42. Stage Duration Curve for G-2739 in LECSA 1

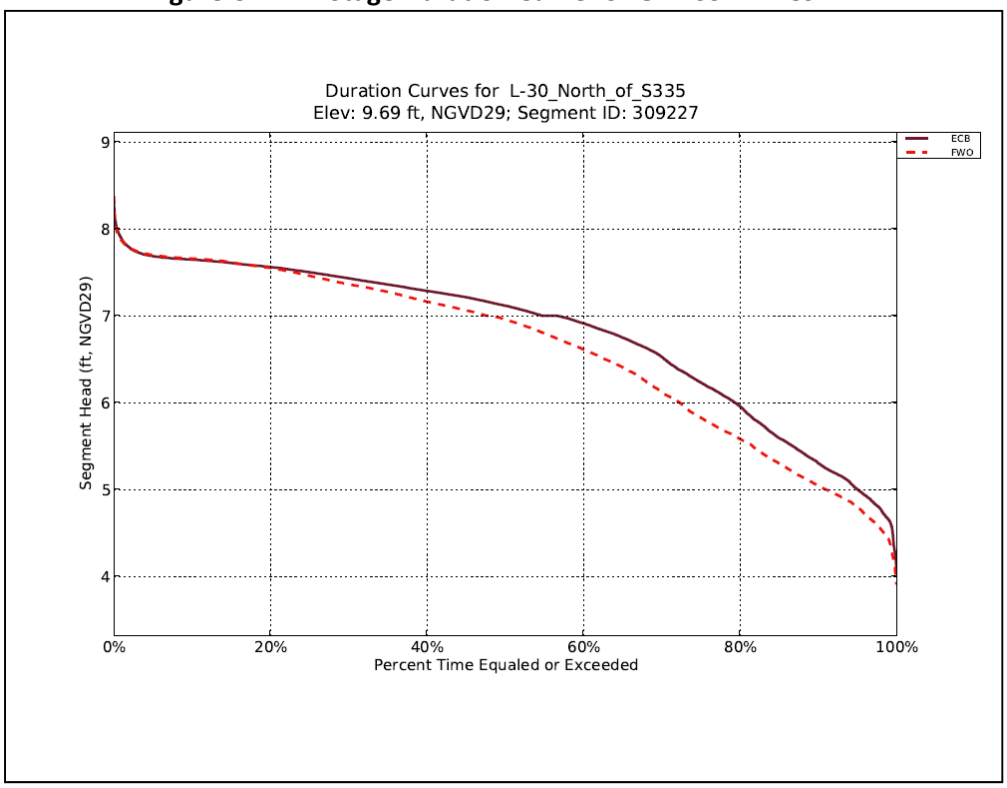


Figure C.1-43. Stage Duration Curve for L-30 Canal in LECSA 3

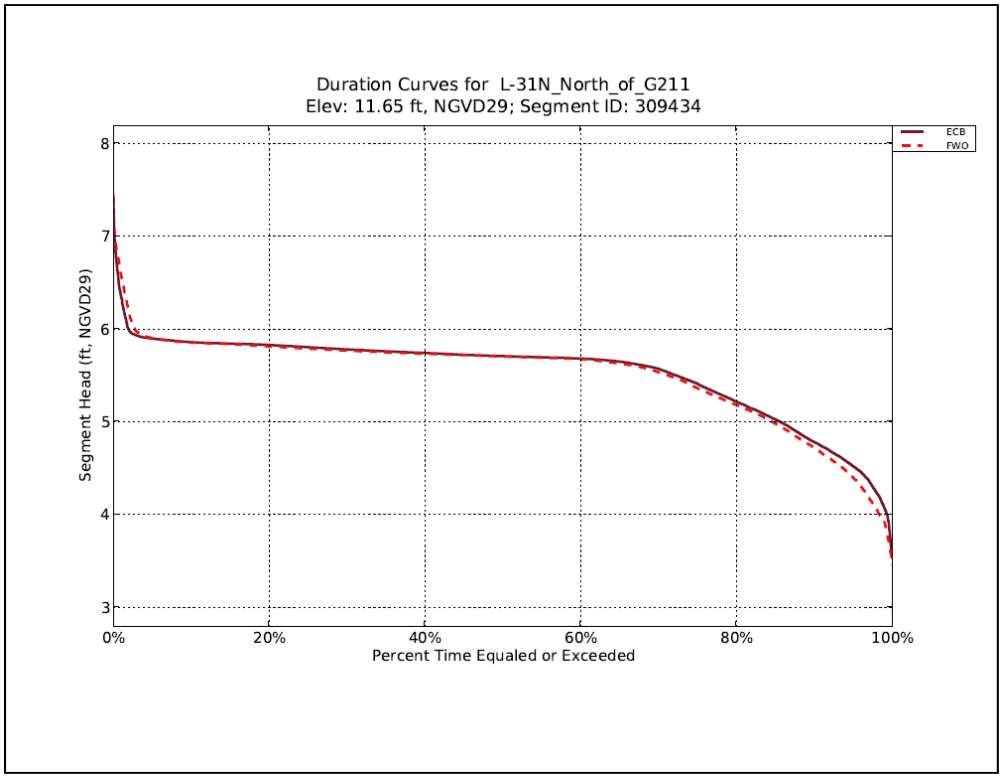


Figure C.1-44. Stage Duration Curve for L-31N Canal in LECSA 3

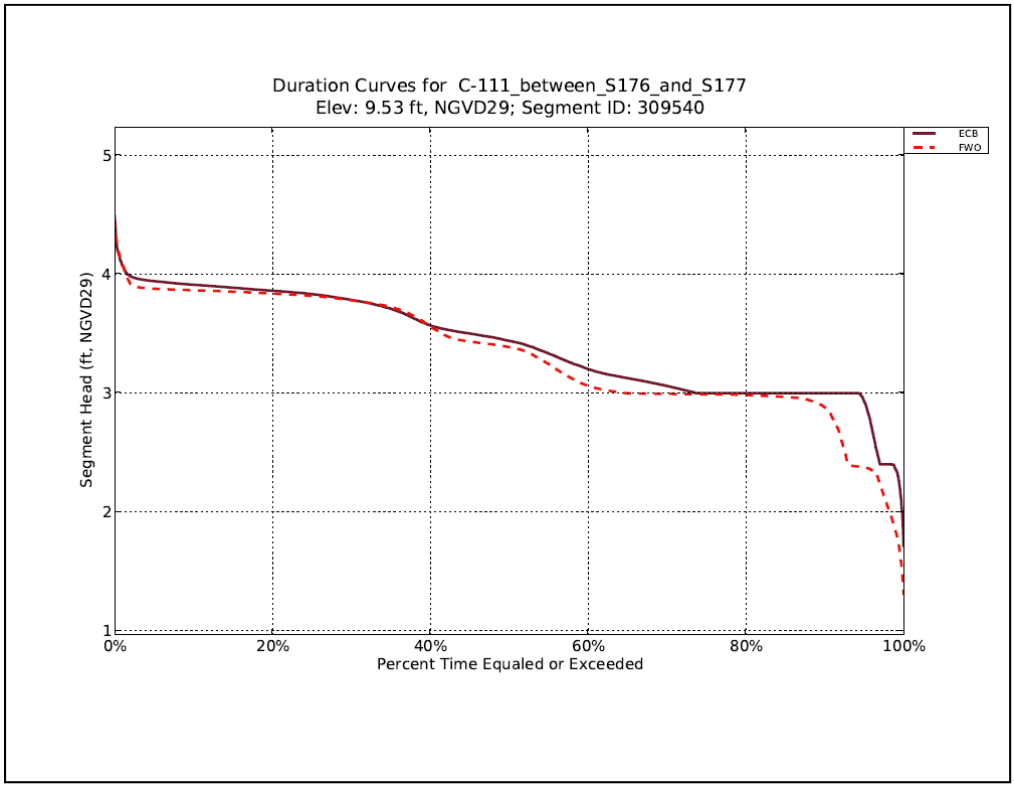


Figure C.1-45. Stage Duration Curve for C-111 Canal in LECSA 3

C.1.3.12 Water Quality

The two most significant water quality issues within the study area are associated with nutrient pollution and the bioaccumulation of mercury by fish and birds. General discussion of the phosphorus issues within the basin are provided here. More detained discussions on phosphorous can be found in **Annex F**.

C.1.3.12.1 Lake Okeechobee

Water quality in Lake Okeechobee should improve under the FWO condition relative to the existing conditions as a result of implementation and enforcement of TMDLs within the Upper Kissimmee River Basin as well as lake basin. The State of Florida has committed to achieving the phosphorus TMDL for the lake by implementing a series of source controls and treatment facilities within the basin. Achieving the TP load TMDL for the lake of 140 tons/year will result in improved dissolved oxygen conditions and reduced incidence of algal blooms.

Mercury methylation conditions within the lake should improve due to the implementation of the proposed mercury TMDL for Florida; however, the greatest reduction in methylated mercury will only come about through international controls on atmospheric emissions of mercury related to the combustion of coal and other fuels.

C.1.3.12.2 Northern Estuaries

Nutrient and dissolved oxygen conditions should improve during the wet season within the Caloosahatchee River and Estuary given the reduction in high flow events due to implementation of the C-43 Reservoir Project (USACE 2010). The frequency of dry season algal events within the upper estuary may decrease as a result of increased dry season flows through the S-79 structure during the late spring due to implementation of the C-43 Reservoir Project (USACE 2010).

Nutrient and dissolved oxygen conditions should improve during the wet season within the St. Lucie Estuary given the reduction in high flow events due to implementation of the Indian River Lagoon South Project (USACE 2004a). Low flow event conditions do not change significantly within the St. Lucie for FWO conditions; therefore no change to water quality is expected during the dry season. Mercury methylation conditions within the estuaries should improve due to the implementation of the proposed mercury TMDL for Florida; however, the greatest reduction in methylated mercury will only come about through international controls on atmospheric emissions of mercury related to the combustion of coal and other fuels.

C.1.3.12.3 Everglades Agricultural Area

Nutrient and sulfate loading into the EAA and from interbasin transfers (such as from Lake Okeechobee) should decrease as a result of the implementation and enforcement of TMDLs and BMPs. Implementation of the SFWMD's Restoration Strategies program which includes the construction of additional STA treatment and storage capacity will increase removal of nutrients and sulfate and decrease loading to the downstream Everglades. Water quality modeling done using the Dynamic Model for Stormwater Treatment Areas (DMSTA) indicates that implementation of the Restoration Strategies program will result in meeting the 2012 QBEL (Quality Based Effluent Limit) which is defined as 1) not to exceed 13 ppb AFWM (annual flow-weighted mean) in more than 3 out of 5 years, and not to exceed 19 ppb AFWM in any given year. The QBEL is applied at the discharge of each individual STA. Restoration Strategies documents produced by the SFWMD acknowledge that meeting the QBEL will be difficult given that few of the existing STAs have demonstrated the ability to consistently produce effluent that meets this standard. The cessation of agricultural activities on the A-1 FEB lands and other

U.S. Sugar Lands purchased by the SFWMD will result in the reduction of sulfate loads downstream due to reduced soil oxidation and reduced sulfate loading on those lands. Construction of the A-1 FEB may cause a short-term release of methylated mercury; however, monitoring during the start up phase should minimize this.

C.1.3.12.4 Greater Everglades

Mercury methylation will continue to be a problem within the Greater Everglades in the FWO condition. The implementation of new mercury emission criteria by the USEPA and FDEP will reduce locally sourced mercury deposition; however, internationally sourced airborne mercury sources as developing countries such as Brazil, India, and China are not projected to decrease.

C.1.3.12.4.1 Water Conservation Areas 1 and 2

Water quality conditions for the FWO should be improved in WCA 1 and WCA 2 relative to the existing baseline condition because the implementation of the SFWMD's Restoration Strategies features will reduce TP loads into these areas. Reduced sulfate loading is likely to somewhat alter the areas where mercury methylation is problematic within WCA 2.

C.1.3.12.4.2 Water Conservation Area 3A

Nutrient and sulfate concentrations and loads for WCA 3A for the FWO condition should decrease relative to the existing baseline condition because of the implementation of the SFWMD's Restoration Strategies features within the eastern flow path of the EAA. The reduction in nutrient loads to WCA 3A should reduce the rate at which native vegetation within the marsh is replaced by ecologically less desirable cattails. A summary of the existing nutrient conditions within WCA 3A is found in **Annex F** (**Water Quality Phosphorous Assessment for WCA 3 and ENP**).

Given the complexity of the methylmercury cycle, it is not possible to predict with certainty the effect of future hydrology and mercury/sulfate loading on methylmercury formation and bioaccumulation. It is likely that some areas of WCA 3A will see higher mosquitofish mercury concentrations while other areas will see lower mosquitofish mercury concentrations. Given the reduction in atmospheric mercury deposition over the last 15 years which is thought to be the cause of the reduction in bioaccumulated mercury observed in fish over this time period, it is likely that future methylation and bioaccumulation of mercury will not exceed the peak concentrations seen 15 or so years ago unless atmospheric mercury loading increases.

C.1.3.12.4.3 Water Conservation Area 3B

The FWO alternative should have some improvement in WCA 3B water quality given the expected reduction in nutrient loading from the EAA and the S-9 basin. However, increased severity of dryout events due to shortened hydroperiods as a result of water management practices is likely to result in additional marsh fire events. Fire events re-mobilize soil bound pollutants and temporarily degrade water quality by increasing water column TP and possibly increasing methylmercury formation. The effects of increased dry events on column methylmercury concentrations and total mercury body burden in fish and birds in WCA 3B cannot be predicted with certainty, though it is probable given recent downward trends in measured mercury concentrations in this area that the FWO condition is not likely to result in bioaccumulation that exceeds historic concentration maximums unless atmospheric mercury loads increase from present levels.

C.1.3.12.4.4 Everglades National Park

The quality of water entering SRS under the FWO condition should be improved relative to the baseline condition given the additional treatment capacity provided in the EAA and in the S-9 basin. Discharges from WCA 3A into SRS are more likely to meet the applicable TP criteria under the FWO condition than under baseline conditions. Sulfate concentrations in water discharged to Shark River Slough should be lower under the FWO condition than present condition given the additional removal of sulfate that will result from the expansion of STAs and construction of the A-1 FEB.

C.1.3.13 Air Quality

During the period between the present and 2050, air quality is expected to be degraded due to increased populations and urbanization. Air quality is expected to comply with air quality standards; however it is possible that regions of the project area may be classified as air quality non-attainment zones.

C.1.3.14 Hazardous, Toxic and Radioactive Wastes

The HTRW conditions under the future without project condition are expected to be very similar to the present condition. Farming operations and the accompanying HTRW contamination would continue on the A-2 FEB lands for the foreseeable future until the overlying peat soils are exhausted due to oxidation. HTRW contamination and cleanup will continue at present rates given continued agricultural, residential, and commercial use of other lands within the study area.

C.1.3.15 Cultural Resources

The conditions under the FWO conditions are expected to be very similar to the existing conditions. Farming operations would continue in EAA A-2 lands, causing adverse effects to two significant cultural resource sites. Under ERTP operations, stages are generally decreased in southern WCA 3A, therefore having a beneficial effect to tree islands currently occupied by members of the Miccosukee Tribe of Indians of Florida. Investigations mandated by the ERTP Programmatic Agreement would result in a determination of effects of fluctuating water on subsurface cultural material throughout the Everglades ecosystem. Future research will be needed to determine if prolonged dry down events in areas such as northern WCA 3A and WCA 3B adversely affects archaeological sites.

C.1.3.16 Socioeconomics

The 2010 Census count of total population as reported by the United States Census Bureau is the basis for the 2010 population estimates as reported by the University of Florida's Bureau of Economic and Business Research (BEBR). The 2010 BEBR estimates for permanent resident population (BEBR 2011) are the basis for estimating 2030 populations for each county in the LEC. **Table C.1-12** provides BEBR population projections for the low, medium, and high ranges for 2015–2040 for the LEC Planning Area.

Table C.1-12. BEBR Population Projections for the LEC Planning Area for 2010-2040.

	Projections					
	2015	**2020**	**2025**	**2030**	**2035**	**2040**
Palm Beach County						
Low	1,342,600	1,367,700	1,383,900	1,389,700	1,384,900	1,370,900
Medium	1,394,300	1,482,900	1,568,500	1,648,000	1,720,000	1,786,000
High	1,454,500	1,605,600	1,761,400	1,919,200	2,077,300	2,236,700
Broward County						
Low	1,736,800	1,726,300	1,710,600	1,689,000	1,661,600	1,632,900
Medium	1,788,200	1,834,500	1,877,700	1,916,200	1,949,700	1,982,500
High	1,844,200	1,946,700	2,048,900	2,149,600	2,248,100	2,349,700
Miami-Dade County						
Low	2,528,700	2,564,400	2,590,900	2,606,400	2,610,300	2,604,100
Medium	2,600,900	2,722,900	2,841,400	2,952,800	3,055,100	3,150,200
High	2,685,100	2,891,800	3,103,400	3,317,200	3,531,500	3,747,400

C.1.3.17 Land Use

The region, including cities within the study area, is expected to continue to grow both in population and in the development that population demands. Florida is expected to grow at a rate exceeding the national expected growth rate. But the growth rate is expected to diminish in the future. This is consistent with the concept of urban sprawl. As most highly demanded real estate is developed and an area becomes built out, its ability or willingness to absorb additional population growth through more intense methods of development becomes limited. Counties that have traditionally grown at a rate exceeding the state growth rate will slow, and the most intense future population growth will occur in other counties. Growth beyond available developable land will require changes in land use and possible rezoning of existing land. Urban or commercial development should occur within major urban service areas located within the project area. Agriculture is expected to remain a strong economic force, yet conceding some ground to urban development and conservation efforts. It is not anticipated that land use acreages will increase or decrease substantially.

C.1.3.18 Recreation

In general, the variety of recreational interests in the United States appears to be increasing along with recreational participation rates. As future recreation needs and interests develop, it is important to recognize that participation in specific types of recreational activities is often linked to demographic factors such as age and income. For example, participation in activities requiring vigorous exercise is considerably higher for young people than for senior citizens. However, the elderly population is increasing recreation participation because of the growing awareness of the importance of physical fitness. Participation in most activities is low for those with family incomes below $25,000 per year. Interestingly, participation is low for those with family incomes greater than $100,000 per year. Most outdoor recreational activities appear to be enjoyed largely by the middle class, those with family incomes between $25,000 and $75,000 per year.

The State Comprehensive Outdoor Recreation Plan (SCORP) is the best source of information on recreation demand and supply at the state and regional scales. The SCORP organizes outdoor recreation in Florida into 47 categories that encompass a variety of recreation activities including team sports (e.g., basketball and baseball), individual sports (e.g., golf and tennis), hunting, fishing, swimming and boating. Recreation demands were developed for the SCORP through surveys of residents and tourists. Participation in outdoor recreation activities is expressed in terms of user-occasions, which occur each time an individual participates in a single outdoor recreation activity.

The number of user-occasions was calculated for each planning region as well as the entire state by type of activity. Demand was estimated for 2000, 2007, 2010, 2015 and 2020 by applying the per capita participation rates to population projections. **Table C.1-13** presents Year 2007 and projected Year 2015 demands for the selected recreation activities in SCORP Planning Regions Treasure Coast and south Florida. This table includes user- occasions as well as facility/resource needs. As part of the without project conditions, all of the regions are expected to have significant increases in demands for the selected recreation activities with a commensurate need to increase development of the regions' recreation resources and facilities.

Table C.1-13. Demand and Facility Needs (2007 and 2015) Selected Recreation Activities

Activity	Units	Demand (user-occasions)		Additional Facility Needs	
		2007	2015	2007	2015
Hunting	Acres	663,841	772,849	1,041,817	100,137
RV/Trailer Camping	Camp Sites	2,203,445	2,779,565	19,278	2,231
Tent Camping	Camp Sites	888,761	1,136,981	2,094	223
Bicycling	Miles	1,502,910	1,644,911	247	29
Hiking	Miles	1,282,041	1,672,767	812	99
Horseback Riding	Miles	1,780,575	2,189,849	302	33
Nature Study	Miles	1,456,739	1,988,143	371	46
Canoeing	N/A.	108,405	142,253	357	not estimated
Freshwater Boat Ramps	Lanes	559,201	620,305	247	26
Freshwater Bank Fishing	Feet	711,215	786,890	15,755	2,801

C.1.3.19 Noise

Sources of noise associated with surrounding land use are expected to be similar to those described in existing conditions. During the period between the present and the year 2050, noise within the major natural areas of south Florida would continue to be limited and of low occurrence. Noise levels would be expected to change where land use is projected to change. Within rural municipalities and urban areas, sound levels would be expected to be of greater intensity, frequency, and duration as areas are further developed in 2050 from agricultural to residential/commercial due to increased noise from traffic, construction associated with development, and increased operations at commercial and industrial facilities.

C.1.3.20 Aesthetics

Sources of visual aesthetics are expected to be similar to those described in existing conditions. Visual characteristics would be expected to change where land use is projected to change. During the period between the present and the year 2050 the visual environment within the major natural areas of south Florida, is expected to decline as changes in the availability and distribution of freshwater would further exacerbate changes occurring in fish and wildlife resources and vegetative communities as described in **Sections C.1.2.1** (**Vegetative Communities**) and **C.1.2.2** (**Fish and Wildlife Resources**). Within rural municipalities and urban areas, the occurrence of visible topographic features would be expected to be of greater occurrence as areas are further developed in 2050 from agricultural to residential/commercial. Increased occurrence of visible topographic features (i.e. heavily used roads, highways, single-family homes, high rises, commercial and industrial facilities) may detract from the regional aesthetic.

C.1.4 FUTURE WITHOUT PROJECT CONDITIONS OF NATIVE AMERICANS

The Miccosukee Tribe of Indians of Florida and the Seminole Tribe of Florida would continue to rely upon the Everglades in its natural state to support their religious, subsistence, and commercial activities. Changes in the availability and distribution of freshwater and further disruption of natural water sheetflow due to levees, roads, and canals would further exacerbate changes occurring in the Greater Everglades. Although under ERTP, some areas within southern WCA 3A show improvement, the continuation of altered hydroperiods would have adverse effects on vegetative communities and fish and wildlife resources such as degradation due to over drying within northern WCA 3A, WCA 3B, and ENP, and ponding and prolonged high water levels within southern WCA 3A. Therefore the religious, subsistence, and commercial activities have the potential to be affected by the changing environment due to the above stated potential changes to the Everglades.

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APPENDIX C.2.1

EFFECTS OF THE ALTERNATIVES

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C.2 EFFECTS OF THE ALTERNATIVES

C.2.1 EFFECTS OF THE FINAL ARRAY OF ALTERNATIVES

This appendix provides a detailed discussion of the potential environmental effects, which can be either positive or negative, that could result from implementation of the Central Everglades Planning Project (CEPP) Alternatives. The evaluation of the effects was based on results of modeling simulations, current information including scientific literature, direct observation, project design reports, reasonable scientific judgment, the scoping process, and other environmental impact statement (EIS) documents for similar projects. The Future Without (FWO; No Action Alternative), previously discussed in Section C.1.2, considers the environmental conditions in the affected regions without the Proposed Action.

Environmental impacts include both direct and indirect effects. Under the Council on Environmental Quality (CEQ) regulations, direct effects are "caused by the action and occur at the same time and place," while indirect effects are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40 CFR 1508.8). In accordance with CEQs regulations [43 FR 56003, Nov. 29, 1978; 44 FR 874, Jan. 3, 1979], ten factors were used to determine intensity or severity of the effect. These include climate, geology, soils, vegetation, wildlife, hydrology, water quality, flood control, air quality, hazardous, toxic and radioactive waste (HTRW), noise, aesthetics, land use, agriculture, socioeconomics, recreation, cultural resources and invasive species.

C.2.1.1 Climate

Climate change is expected to alter rainfall and evapotranspiration patterns over the next 100 years. USACE sea level rise projections for the period from 2015 to 2065 for Key West, Florida and the broader south Florida area for historic, intermediate and high rates of future sea level rise are +4 inches, +10 inches and +26 inches, respectively http://publications.usace.army.mil/publications/eng-circulars/EC_1165-2-212.pdf. The regional hydrologic models used to simulate with- and without project conditions require climatic and tidal data as boundary conditions. The model tidal boundary used in the regional hydrologic model was developed using historic tidal data from two primary (Naples and Virginia Key) and five secondary NOAA stations (Flamingo, Everglades, Palm Beach, Delray Beach, and Hollywood Beach). Simulation model tidal boundary conditions that reflect future sea level rise were not available for the range of potential sea level rise expected. However, the impact of sea level rise on project benefits is assessed in **Annex I** for the FWO and with project conditions per USACE guidance EC 1165-2-212.

Since 1900, there have been two cool phases and two warm phases of the Atlantic Multidecadal Oscillation (AMO) cycle with each of these phases lasting approximately 20-40 years each. The exact year of the phase start and finish is an estimate as each phase goes through a "transition period" of a few years. South Florida was in a much drier regime from 1965 to the early 1990s when the AMO transitioned from the cool phase to the warm phase. South Florida experienced more droughts and dry weather during the cool phase, with high-water events (some extreme) being more frequent during the current warm phase. South Florida has been in a "wetter" regime since the early 1990s mostly due to the AMO. With AMO phases lasting typically 20-40 years, the current AMO warm phase has likely peaked. Thus, the generally wetter than normal conditions that Florida has experienced since the early 1990s should begin to slowly decline. After the peak, the warm phase wave will begin its gradual decline where we will see

continually cooler anomalies over the next 10-20 years. As we approach the end of the cycle, Florida will experience an increase in dry years compared to wet years. Given the temporal stage of the current phase, conditions will continue to remain wetter than average for the next 10-20 years, but with a slow and gradual decline in intensity until this phase ends and a cool phase begins. However, low frequency dry years can still occur due to other events such as La Niña, which can occur on an average of every 2-7 years.

Global climate change and variability, particularly at regional levels, are not completely understood. Over the last two decades, South Florida Water Management District (SFWMD) scientists have researched how natural, global climatic patterns such as the El Niño/La Niña-Southern Oscillation and the Atlantic Multidecadal Oscillation are linked to South Florida's weather and climate. Based on this expanded experience and knowledge, the SFWMD has already adopted progressive measures to incorporate climate outlook into its planning and operations. The CEPP features will be designed robustly to handle extreme wet and dry conditions, floods and droughts, and will be operated based on the climate outlook described above. Climate change is difficult/controversial to predict and our CEPP assessment is not an exercise to predict what the climate change will be, but to select the best plan possible whatever climate change will occur.

Implementation of any of the CEPP action alternatives would have a negligible effect on climate within the action area. Minor, localized effects to microclimate may occur under all CEPP action alternatives as a result of redistribution of water and shifts in vegetation. Potential effects may include increases in evapotranspiration and temperature changes due to an increase in spatial extent of wetlands, changes in vegetative communities, and redistribution of water as described in **Appendix C.1.1.1** and.
Appendix C.1.3.1

C.2.1.2 Geology and Soils

On the A-2 flow equalization basin (FEB) footprint, with all the action alternatives, there would be minor geologic impacts within the project area from the removal of surface cover (e.g. vegetation and soil), of caprock from blasting, and removal of limestone to obtain material for construction of levees, canals and roads. All action alternatives would result in conversion of relatively flat, uniform agricultural lands to an FEB (4 feet maximum operating depth) and exterior levees up to 10 feet above existing grade (generally 7 to 9 feet North Atlantic Vertical Datum 1988).

Improved hydroperiods and sheetflow in Water Conservation Area (WCA) 3A, WCA 3B, and Everglades National Park (ENP) reduce soil oxidation, which is expected to promote peat accretion necessary to rebuild the complex mosaic of habitats across the landscape. All action alternatives show an increase in inundation duration over the FWO that will significantly decrease soil oxidation, subsidence and peat fires. All action alternatives improved hydrologic conditions in northern WCA 3A in comparison to FWO by increasing stages and resulting hydroperiods within the area. All action alternatives scored the highest in terms of meeting the desired targets for measures of inundation duration, drought intensity, and slough vegetation suitability (**Appendix G**, **Table G-6**, **Table G-7**, and **Table G-8**). All action alternatives improved hydrologic conditions in northern and southern ENP (Zones ENP-N and ENP-S) in comparison to the FWO by significantly increasing depths and resulting hydroperiods in Northeast Shark River Slough (NESRS; **Table G-14,** and **Table G-15**). Consistent with other regions of the Greater Everglades, action alternatives scored the highest in terms of meeting the desired targets for measures of inundation duration, drought intensity, and slough vegetation suitability. Within southern ENP, Alternatives (Alts) 3 and 4 produced slightly higher depths as depicted by the normalized weekly stage

duration curve for Indicator Region (IR) 130 (**Figure G-23**). Alternative 4 produced slightly higher depths than Alternative (Alt) 3. Alternative 4 generally produced improved inundation patterns in southern ENP. Indicator region 130 was inundated for 96% of the POR for Alt 4; a 9% increase in inundation duration relative to the FWO. Alternative 3 inundated this location for 95% of the POR. Alternatives 1-2 inundated this location for 93% of the POR. Alternative 4 reduced drought intensity at IR 130 over the period of record by 676 ft-days relative to the FWO. Alternatives 3, 2, and 1 provided a reduction of 558, 477, and 456 ft-days over the POR at this location respectively. Alternative 4 improved the number and duration of dry events in NESRS relative to the remaining alternatives at several of the IRs in Zone ENP-S (**Table G-17**). Improved inundation patterns in southern ENP resulted in better suitability for slough vegetation for Alt 4 (**Figure G-24**).

C.2.1.3 Vegetation

C.2.1.3.1 Lake Okeechobee

Negligible effects to vegetation within Lake Okeechobee's extensive littoral zone are anticipated as a result of any of the alternatives. As compared with FWO, all CEPP action alternatives reveal the potential for short-term minor adverse effects to aquatic vegetation due to higher than preferred lake stages. However, these multiple day events in which Lake Okeechobee stage exceeded 15.0 feet NGVD occurred approximately 5% of the POR. CEPP maintains stage ranges described within the Lake Okeechobee Regulation Schedule (2008 LORS); therefore effects to vegetation under the action alternatives would be as described in 2008 LORS.

C.2.1.3.2 Northern Estuaries

Currently, many submerged aquatic vegetation (SAV) beds are stressed and have been reduced or eliminated from their former areas by extreme salinity fluctuations, increased turbidity, sedimentation, dredging, damage from boats, and nutrient enrichment which causes algal blooms that, in turn, restrict light penetration. All CEPP alternatives are designed to divert water that in FWO would be released to tide to the A-2 FEB and Greater Everglades, therefore as compared with FWO, all CEPP action alternatives show a slight performance improvement within the Northern Estuaries as indicated by fewer high volume flow months, providing a minor beneficial effect. Reduction in high flows and accompanying flow velocities would result in lower suspended solid loading and decreased concentration of colored dissolved organic matter, thereby allowing greater light penetration to promote growth of SAV. In addition, reduction in high volume discharge events from Lake Okeechobee would reduce extreme salinity fluctuations associated with such events. Although some SAV are tolerant of a wide range of salinity levels, a reduction in high volume discharge events would reduce stress to SAV and aid in long term health of estuarine habitat and biota. Implementation of any CEPP alternative would help to maintain the target frequency and duration of water releases to the Northern Estuaries and would help curtail continued habitat loss and allow the recovery of more desirable vegetative communities.

C.2.1.3.2.1 Upper Caloosahatchee River Estuary

Negligible effects are predicted within the Upper Caloosahatchee Estuary as a result of any CEPP action alternative.

C.2.1.3.2.2 Lower Caloosahatchee River Estuary

In the Lower Caloosahatchee Estuary, all CEPP action alternatives performed better than the FWO having fewer days at <16 practical salinity units (psu), reflecting fewer high flow events, providing minor

beneficial effects. Increases of 7.8% were predicted for seagrass shoots (shoal grass) per acre at Shell Point for all of the CEPP action alternatives.

C.2.1.3.2.3 St. Lucie Estuary

Compared to FWO, all CEPP action alternatives had a higher number of days in the preferred 12 – 20 psu envelope and fewer days at <12 psu which would benefit seagrass habitat within the estuary and Indian River Lagoon providing minor beneficial effects. In comparison with FWO, an approximate 6.5% increase in manatee grass (*Syringodium filiforme*) shoots per acre is anticipated with implementation of any CEPP action alternative. Increases in low flow violations during the dry season were indicated by the modeling effort; however, due to the infrequency of the increases in these events is expected to have a negligible effect on SAV within the St. Lucie Estuary. Although these extreme dry spells are rare in the SLE, they can occur and therefore supplemental flows during dry times may be warranted and have been accounted for in the IRLS water reservation process. Delivery of those supplemental flows should ideally take place through the North Fork St. Lucie River.

C.2.1.3.3 Everglades Agricultural Area

Negligible effects to vegetation within the Everglades Agricultural Area (EAA) are anticipated as a result of any of the action alternatives. As all of the property that will be used to construct the A-2 Flow Equalization Basin (FEB) is considered to be atypical jurisdictional wetlands based on hydric soils and hydrology; wetland vegetation is anticipated to return to the site once construction of the A-2 FEB is complete. During construction, temporary short-term effects are expected to vegetation within the construction area, however, these are considered to be minor as the land was formerly used for agriculture.

C.2.1.3.4 Greater Everglades

Due to changes in the quantity, quality, distribution and timing of water entering the Greater Everglades ecosystem, moderate effects on wetland hydrology and vegetation would potentially occur under each of the CEPP action alternatives. The primary factors influencing the distribution of dominant freshwater wetland plant species of the Everglades are soil type, soil depth, and hydrological regime (USFWS 1999). All four action alternatives improved hydroperiods and sheetflow in WCA 2A, WCA 3A, WCA 3B, and ENP which result in reduced soil oxidation and promoting of peat accretion necessary to rebuild the complex mosaic of habitats across the landscape. All four action alternative provide moderate beneficial effects in hydroperiods in WCA 2A compared to FWO. However, all action alternatives had a moderate adverse effect in WCA 2B by significantly decreasing stages compared to FWO. In the L-28 Triangle, all action alternatives showed an improvement in hydroperiod over FWO, with Alt 1 having greater improvement than Alts 2-4. In the Greater Everglades, improved hydroperiods and sheetflow in WCA 3A, WCA 3B and ENP under all CEPP action alternatives result in reduced soil oxidation, which is expected to promote peat accretion necessary to rebuild the complex mosaic of habitats across the landscape. Differences among alternatives were found within northern WCA 3A, WCA 3B and southern ENP and are described in greater detail below. These differences may be largely attributed to the location of project features and distribution of water across the landscape. For example, Alt 1 which includes a 3 mile spreader canal west of S-8 provides the greatest improvements in northwestern WCA 3A. In comparison, Alts 3 and 4 provide more water to Shark River Slough (SRS) and the southern marl prairies, improving conditions for tree islands and ridge and slough habitat within ENP and salinity within Florida Bay. Alternative 1 performed slightly better than Alternatives 2, 3, and 4 in northern WCA 3A.

As a result of reduced freshwater inflow and drainage by the Miami Canal, northern WCA 3A is currently dominated largely by mono-specific sawgrass stands, with large areas of shrubs and monotypic cattail and lacks the diversity of communities that exists in central and portions of southern WCA 3A. All of the CEPP action alternatives include features to distribute water through spreader canals in the L-5 across northern WCA 3A and backfill portions of the Miami Canal north of Interstate 75, thereby increasing hydroperiods and depths within this area providing major beneficial effects. Variation in the distribution of inflows into northern WCA 3A and backfill of the Miami Canal did not significantly influence performance among action alternatives. Implementation of CEPP is expected to rehydrate much of northern WCA 3A by providing a means for redistributing treated Stormwater Treatment Area (STA) discharges from the L-4 and L-5 in a manner that promotes sheetflow and by removing the drainage effects associated with the Miami Canal. Resumption of sheetflow and related patterns of hydroperiod and water depth will significantly help to restore and sustain the microtopography, directionality, and spatial extent of ridges and sloughs and improve the health of tree islands in the ridge and slough landscape.

Alternative 1 generally produced improved inundation patterns in northwestern WCA 3A. Indicator region 114 was inundated for 92% of the POR for Alt 1; an 18% increase in inundation duration relative to the FWO. Alternatives 2, 3, 4 showed similar results; inundating this location for 91% of the POR; representing a 17% increase in inundation duration relative to the FWO. Alternative 1 generally produced higher depths within northwestern WCA 3A as depicted by the normalized weekly stage duration curve for IR 114 (**Appendix G**, **Figure G-12**). Although none of the action alternatives would provide the necessary inundation pattern for slough vegetation restoration, all of the CEPP action alternatives act to rehydrate northern WCA 3A thereby are expected to promote peat accretion, reducing the potential for high intensity fires and promoting transition from upland to wetland vegetation.

Rehydration of previously dry areas within northern WCA 3A has the potential to temporarily mobilize nutrients within the water column; however, this is not expected to be a significant issue since portions of WCA 3A north of Interstate 75 experience annual dryout and rehydration with no significant downstream impact. One notable concern would be the introduction of phosphorus into previously unimpacted areas (i.e. central and southern WCA 3A) potentially resulting in vegetation shifts. Chaing et al. (2000) suggested that phosphorus loadings alter the Everglades plant communities through increased plant productivity, tissue phosphorus storage, soil phosphorus enrichment and shifts in plant species composition. The overall change in phosphorus loads in most areas is expected to be minor and vegetation shifts driven by water quality should be localized. Previous studies have shown that slough and sawgrass communities have been replaced by cattail-dominated communities (Davis et al. 1994; Rutchey and Vilchek 1994, Newman et al. 1998). However, Craft et al. (1995) and Chaing et al. (2000) observed no significant change in macrophyte species diversity or expansion of cattails in study plots receiving nutrient additions during the two years and four years, respectively, of their studies. Vegetation that can assimilate nutrients directly from the water column appears to be the most sensitive to nutrient enrichment and include periphyton and floating-leaved plants, such as spatterdock and water lily (Chaing et al. 2000, Newman et al. 2004). The periphyton-*Utricularia* complex may be quite sensitive to increased phosphorus, as illustrated by the disappearance of this complex from enriched study plots after the third year (Chaing et al. 2000).

Many areas of WCA 3A, particularly within central WCA 3A still contain good quality wetland habitat consisting of a complex of tree islands, sawgrass marshes, wet prairies, and aquatic sloughs. Vegetation and landscape patterning in the central portion of WCA 3A resembles pre-drainage conditions most closely and represents some of the best examples of remnant Everglades habitat in south Florida (RE-

COVER 2009). These areas remain largely unaffected by any of the CEPP Action Alternatives. Increases in depth within central WCA 3A were not as significant as increases in observed depths in northern WCA 3A; however maintenance of existing conditions within this region of the project area is desirable as ridge and slough habitat is well conserved.

In southern WCA 3A, high water levels during the wet season are important in maintaining quality wet prairie and emergent slough habitat (USFWS 2010). However, prolonged high water levels and extended hydroperiods have resulted in vegetation shifts within southern WCA 3A, negatively impacting tree islands and fragmenting sawgrass ridges, resulting in the loss of historic landscape patterning. None of the CEPP action alternatives, as stated in the FWO discussion, would provide beneficial effects to southern WCA 3A through reduction in high water levels or duration. Alternatives 2, 3, and 4 performed slightly better than Alt 1 within southern WCA 3A. Negligible effects in vegetation are anticipated within this region.

Typical Everglades vegetation, including tree islands, wet prairies, sawgrass marshes, and aquatic sloughs also occur throughout WCA 3B. However, within WCA 3B, the ridge and slough landscape has been severely degraded by the virtual elimination of overland sheetflow due to the L-67 Canal and Levee system. WCA 3B experiences very little overland flow and has become primarily a rain-fed system predominated by shorter hydroperiod sawgrass marshes with relatively few sloughs or tree islands remaining. Water levels in WCA 3B are also too low and do not vary seasonally, contributing to poor ridge and slough patterning. Loss of sheetflow to WCA 3B has also accelerated soil loss reducing elevations of the remaining tree islands in WCA 3B and making them vulnerable to high water stages.

Alternative performance varied greatly within WCA 3B due to structural and operational variations among CEPP action alternatives with respect to construction of conveyance features within L-67 A, C and L-29 levees, along with associated levee removal. Alternative 2 scored the highest in terms of meeting the desired performance measure targets within this area, followed by Alternatives 1, 3 and 4 respectively. All action alternatives improved hydrologic conditions in WCA 3B in comparison to FWO by increasing stages and resulting hydroperiods within the area as measured by the RECOVER Slough Vegetation Performance Measure providing minor beneficial effects (See **Appendix G - Figure G-19**). Increases in stages and hydroperiods would promote wetland vegetation transition, through contraction of sawgrass marshes and expansion of wet prairies, and in deeper regions, sloughs. Plant species diversity will likely increase in WCA 3B with species composition in wet prairies determined largely by peat depth and substrate type (Powers 2005). Submerged aquatic plants are commonly associated with sloughs providing structure for growth of periphyton, the main source of primary production within the freshwater Everglades (Gunderson 1994, Powers 2005).

Although none of the action alternatives met the desired dry and wet season water depths for slough vegetation in WCA 3B, Alt 2 improved inundation patterns within WCA 3B and slightly improved conditions for slough vegetation relative to Alts 3, 1, and 4 by increasing water depths in both the wet and dry season (refer to **Appendix G**, **Figure G-18** and **Figure G-19)**. The increased ability of Alt 2 to rehydrate WCA 3B and increase hydroperiods, especially relative to Alt 4, may come at a potential cost to tree islands. The potential moderate adverse effects is greatest for Alt 2 and Alt 3 because a third of the population of tree islands in WCA 3B are only 0.7-1.1 feet above the surrounding sloughs. It is hypothesized from modeling of tree islands in WCA 2A, where 90% of tree islands have been converted to sawgrass, that tree islands cannot withstand full inundation in excess of 120 days for two years in a row (Sklar and van der Valk 2002). However, it is not clear if this is appropriate for tree islands within

WCA 3B because tree island species in WCA 3B appear to be phenotypically plastic, which means they have a greater ability to adapt to longer hydroperiods (Fred Sklar, personal communication). Increasing the operational flexibility for each alternative will allow for better adaptive management and preservation of tree islands within WCA 3B.

All CEPP action alternatives include conveyance features and levee removal within L-67A and C, thereby providing new point source discharges of water into WCA 3B. At the end of the dry season, there is the potential for flushing of water and remobilization of nutrients within the water column, potentially having a minor adverse effect on vegetation within WCA 3B. As indicated for northern WCA 3A, mobilization and introduction of phosphorus are a notable concern. However, it is anticipated that Broward County Water Preserve Areas (BCWPA) Project would be constructed prior to CEPP implementation, thereby reducing discharges from S-9 into L-67A. Currently, total phosphorous (TP) within L-67A ranges between 10 and 20 ppb, depending upon the time of year. With completion of the BCWPA Project, it is anticipated that TP within L-67A will be greatly reduced and therefore minimal effects to vegetation due to changes in water quality are anticipated within WCA 3B. Cattail expansion will be monitored as outlined within Annex D, Project Monitoring and Adaptive Management Plan. Tree islands contain extraordinarily high levels of TP in their soil suggesting that they may play a major role in the biogeochemical cycles of nutrients in the Everglades (Sah 2004, Troxler and Childers 2010, Troxler and Richards 2009, Wetzel 2002, Wetzel et al. 2009, 2011). Wetzel et al. (2011) found that soil TP levels within WCA 3A and WCA 3B tree islands were approximately 4 times higher than the surrounding marsh TP levels. Tree islands within WCA 3B may help to capture and focus nutrients, assisting to minimize potential effects on sawgrass and wet prairie communities within this region (Wetzel et al. 2011).

Flows through SRS under current system compartmentalization and water management practices are greatly reduced when compared with pre-drainage conditions. The result has been lower wet season depths and more frequent and severe dry downs in sloughs and reduction in extent of shallow water edges. Over-drainage in the peripheral wetlands along the eastern flank of NESRS has resulted in shifts in community composition, invasion by exotic woody species and increased susceptibility to fire. Implementation of CEPP is expected to rehydrate much of NESRS by providing a means for redistributing flows from WCA 3B to ENP and provide a moderate beneficial effect. Resumption of sheetflow and related patterns of hydroperiod will significantly help to restore pre-drainage patterns of water depths and the complex mosaic of Everglades' vegetation communities.

As compared with FWO, all CEPP action alternatives produced significantly higher depths and inundation durations (refer to **Appendix G**, **Figure G-21** and **Figure G-22**). Within northern ENP, alternative performance was similar with all action alternatives reducing the number of dry events within SRS and extending average hydroperiods by 35 to 90 days depending upon location. Reduction in number and duration of dry events and extended hydroperiods is expected to reduce soil oxidation, decrease fire potential, promote peat accretion and aid in restoration of historic wetland vegetation communities providing a minor beneficial effect. Within southern ENP, Alts 3 and 4 produced slightly higher depths as compared with Alts 2, 1 and FWO (refer to **Appendix G**, **Figure G-23**). Improved inundation patterns produced by Alt 4 in southern ENP resulted in better suitability for slough vegetation. Although none of the action alternatives met the desired dry and wet season water depths for slough vegetation in southern ENP; Alt 4 slightly improved conditions for slough vegetation relative to Alts 1, 2 and 3 by increasing water depths in both the wet and dry season within this region.

All CEPP action alternatives include increasing capacity at S-333 from 1350 cubic feet per second (cfs) to 3000 cfs. With an increase in S-333 flow, there is an increased likelihood of increased TP entering NESRS. Potential changes in water quality due to implementation of the CEPP action alternatives have the potential to have a minor adverse effect on vegetation within ENP. The Everglades, a phosphorus-limited system, historically received most inputs of phosphorus through rainfall, with average TP concentrations of less than 0.01 milligrams per liter (mg/L) (McCormick et al. 1996, Newman et al. 2004). However, more recently, areas within ENP, including NESRS, have been exposed to TP concentrations at or in excess of 0.10 mg/L (SFWMD 2010). These concentrations and any additional inputs resulting from implementation of any of the CEPP action alternatives (refer to **Section 5.1.9, Water Quality** for details), have the potential to result in vegetation changes within NESRS. Vegetation that can assimilate nutrients directly from the water column appears to be the most sensitive to nutrient enrichment and include periphyton and floating-leaved plants, such as spatterdock and water lily (Chaing et al. 2000; Newman et al. 2004). Chaing et al. 2000 demonstrated that the periphyton-*Utricularia* complex may be quite sensitive to increased phosphorus, as illustrated by the disappearance of this complex from enriched study plots after the third year. Potential effects to vegetation and species community composition within NESRS and ENP cannot fully be determined at this time. Water quality within the CEPP action area will continue to be monitored, as described in **Annex D**, to determine any associated changes.

Non-native and invasive plant infestations in the action area may be exacerbated by soil disturbance, increased nutrients and hydrological modification. Many non-native and invasive species are flourishing in a variety of habitats and are negatively affecting the ecology throughout the Everglades. Non-native and invasive plant species are most frequently encountered in disturbed areas and areas where water quality has been impacted by increased nutrient loads. Construction and hydrological modification under each of the action alternatives may have a minor adverse effect on the growth of non-native plant species within the CEPP action area. Refer to **Section 5.1.17** and **Appendix C.2.1, Section C.2.1.18** for additional information.

C.2.1.3.4.1 Slough/Open Water Marsh

Deep slough communities formerly occurred throughout the pre-drainage Ridge and Slough region of the Everglades (McVoy et al. 2011). Sloughs within the Greater Everglades have been degraded by compartmentalization resulting in reduced sheetflow, depths and inundation durations, altering vegetation community structure and resulting in expansion of wet prairie and sawgrass marsh communities. Overland sheetflow has been virtually eliminated from WCA 3B due to the L-67 Canal and Levee system, resulting in the loss of deep water sloughs and dominance of shorter hydroperiod dense sawgrass marsh. Vegetative trends within ENP have also included the conversion of slough/open-water marsh communities to shorter hydroperiod sawgrass marshes and wet prairies (Davis et al. 1994, Davis and Ogden 1997; Armentano et al. 2006; McVoy et al. 2011). All CEPP action alternatives provide significant increases in sheetflow and hydroperiod with the greatest flows in ENP achieved with Alts 4 and 3, respectively, providing major beneficial effects. As a result of increased flows, depths and durations, it is expected that shorter hydroperiod sawgrass marshes will transition to wet prairie and slough/open water marsh communities. Shifts from one vegetation type to another may occur in a relatively short time frame (1 to 4 years) following hydrological alteration (Armentano et al. 2006, Zweig 2008, Zweig and Kitchens 2008, Sah et al. 2008). Although none of the CEPP action alternatives met desired dry and wet season water depths for slough vegetation within WCA 3B and southern ENP; Alt 4 slightly improved conditions for slough vegetation relative to Alts 1, 2 and 3 by increasing water depths in both the wet and dry season within these regions.

C.2.1.3.4.2 Sawgrass Marsh

As a result of increased flows, depths and inundation durations under the action alternatives, it is expected that shorter hydroperiod sawgrass marshes will transition to wet prairie, except where there is deep water that will transition to slough. It is expected that increased flow within northern WCA 3A and WCA 3B will aid to reduce dense sawgrass stands and help to promote a mosaic of wetland vegetation types within this area providing minor beneficial effects.

C.2.1.3.4.3 Wet Marl Prairies

Areas within the eastern marl prairies along the boundary of ENP suffer from over-drainage, reduced water flow, exotic tree invasion and frequent human-induced fires (Lockwood et al. 2003; Ross et al. 2006). To alleviate the perpetually drier conditions and associated problems, increased water flows within this area are required. Alternatives 3 and 4 provide more water to SRS and the southern marl prairies as compared with Alts 1 and 2, respectively. Increased hydroperiods within the eastern marl prairies may act to alleviate some of the problems associated with drier conditions and promote a shift in species community composition to benefit native vegetation and provide a minor beneficial effect.

Hydroperiods within the eastern marl prairies in the vicinity of Cape Sable Seaside Sparrow (CSSS), subpopulation E (CSSS-E), along the eastern edge of SRS (**Figure C.2.1-18**), reveal an increase in hydroperiod with implementation of any of the CEPP action alternatives, with an average annual increase ranging from 25 days (Alt 2) to 31 days (Alt 4) within the vicinity of IR-E1 and 18 (Alt 2) to 22 days (Alt 4) within the vicinity of IR-E2 (**Figure C.2.1-34** and **Figure C.2.1-35**). Increased hydroperiods within the eastern marl prairies may potentially result in a shift in vegetation and an adverse effect. Ross et al. (2004) noted differences in species composition within wet prairies based upon hydroperiod. Shorter hydroperiod prairies were dominated by *Muhlenbergia* (muhly grass), *Schizachyrium* (little bluestem) and *Paspalum* (bahia grass), while longer hydroperiod prairies consisted of *Cladium* (sawgrass)*, Schoenus (sedge) and Rhynchospora* (beak-rush)*.*

Analyses of hydroperiods with the northwestern marl prairies in the vicinity of CSSS, subpopulation A (CSSS-A) reveal a reduction in hydroperiod in this area as compared with the FWO. Pollen data indicate that the marl prairies west of SRS are not a natural feature of the Everglades landscape but developed after twentieth century hydrologic modification of the system reduced flow to the region (Bernhardt and Willard 2006). Prior to the modifications, plant communities at the sites analyzed by Bernhardt and Willard (2006) in western SRS consisted of sawgrass marshes. The authors concluded that "the current spatial distribution and community composition of marl prairies are a response to water management and land cover changes of the twentieth century; and further sampling of modern marl prairie communities and adjacent communities is necessary to document the pre- and post-drainage distribution of marl prairie" (Bernhardt and Willard 2006). Although in the southwestern marl prairies (A-2), the marl prairie hydroperiod target is met less frequently as compared with the FWO (9 out of 41 years for FWO compared with 8 out of 41 years for all CEPP action alternatives); the difference is not likely to result in a significant vegetation transition to historic sawgrass marshes.

C.2.1.3.4.4 Tree Islands

C.2.1.3.4.4.1 Northern WCA 3A

Since it is not yet clear how to restore the "ghost" tree islands that are indicative of where tree islands existed some 60 years ago, nor restore the density and pattern of islands that existed before drainage of

the Everglades in 1888, the objectives for CEPP restoration for tree islands is predominantly to do no more harm. It is also to create a hydrologic regime that will facilitate a return of the elevations, extent, and diversity that currently exists (as reference sites) in central WCA 3A and in regions of ENP, where islands appear to be relatively large, healthy and devoid of exotics. The problem is that restoration solutions for one region of the landscape will not work for all regions because the legacy of water management is a strongly compartmentalized ecological landscape.

For this analysis of the four CEPP action alternatives it is necessary to focus on three regions where tree islands have been struggling to survive. Due to the complexity of the management options associated with CEPP in WCA 3B, this analysis is focused on: 1) northern WCA 3A, 2) southern WCA 3A, and 3) SRS within ENP.

Over the last 100 years of drainage and water management, northern WCA 3A has been significantly drier than all the other wetlands in WCA 3. This has caused the sawgrass-plains community to expand along the Eastern boundaries of WCA 3 (Davis 1943), the ridge and slough pattern to disappear (**Figure C.2.1-1**), and tree islands to be small and extremely few in numbers (**Figure C.2.1-2**). Most of the tree islands left in northern WCA 3A are small round features with no obvious natural tear-drop shape. Many have very short hydroperiods and only support terrestrial vegetation because they "sit" on high rock pedestals, which prevent them from subsiding to the same extent as the surrounding marshes.

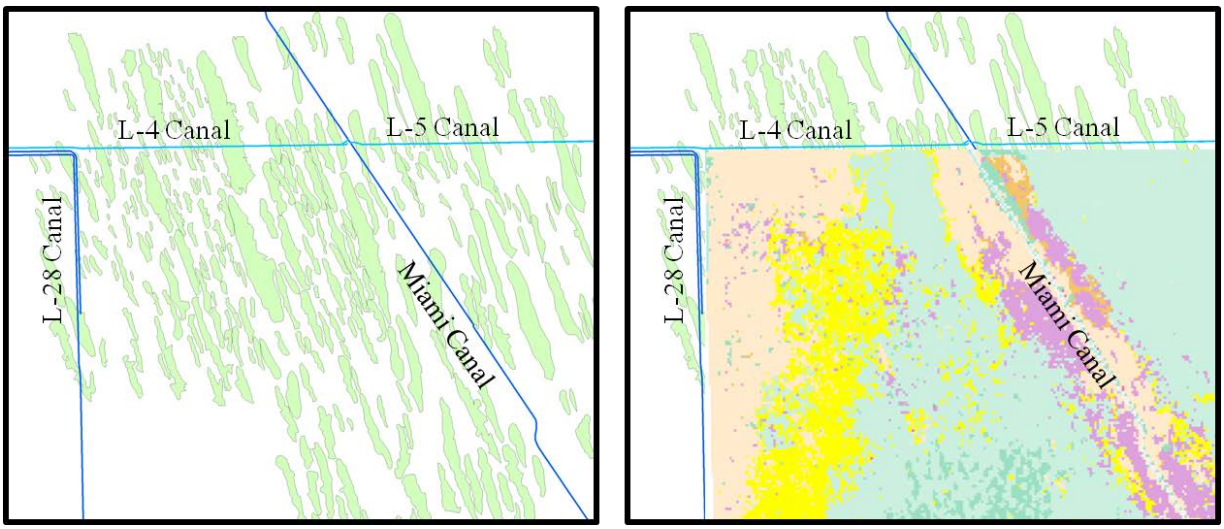

Figure C.2.1-1. Vegetation patterns seen today in NW WCA-3A (right) compared to the ridge and slough pattern observed in 1942 black & white aerial photography (left). The L-4, L-5 and L-28 canals are shown as geo-references and did not exist in 1942. Color legend for current vegetation map: Light Blue=sawgrass; Dark Blue=slough vegetation; Purple=cattail; Yellow=shrubs/sawgrass; Peach=shrubs/trees.

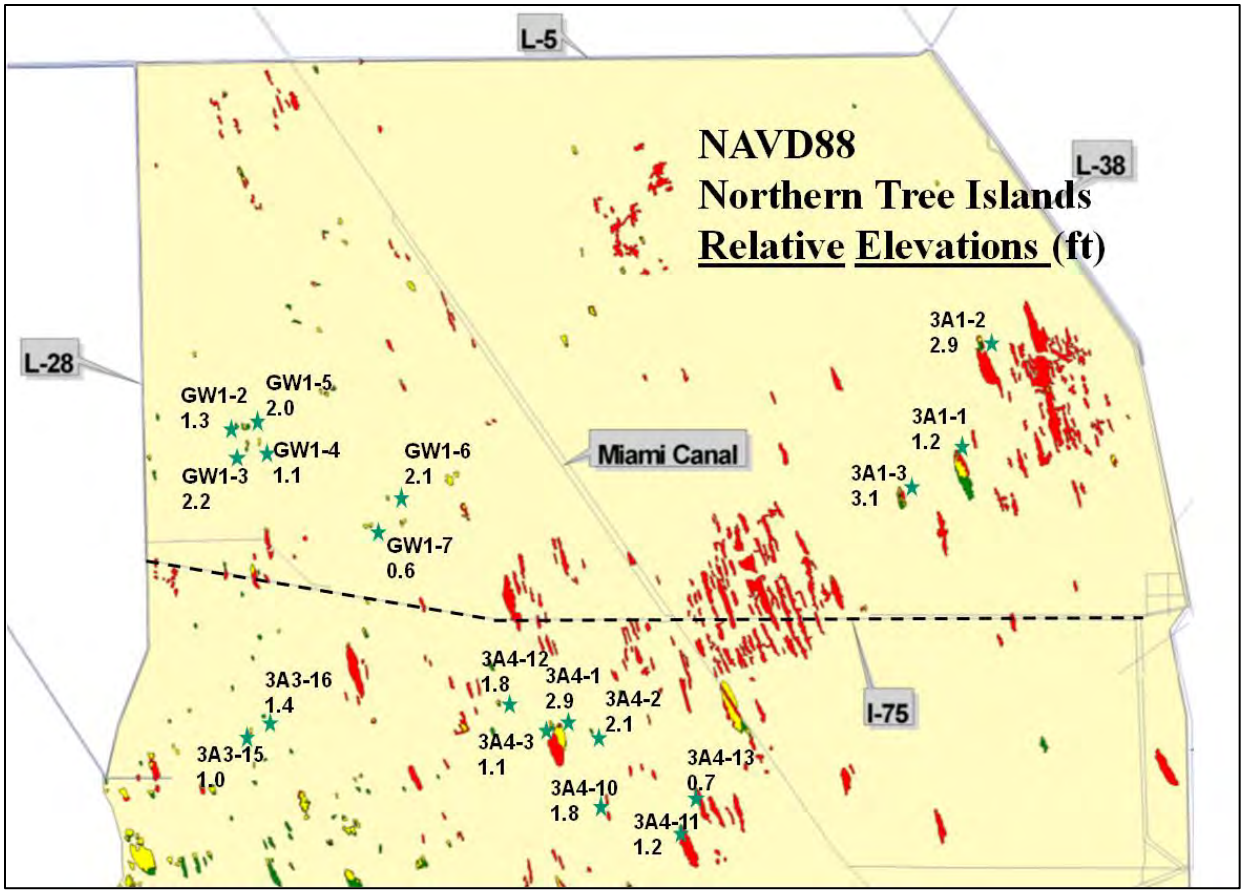

Figure C.2.1-2. Shrub-dominated ridges and tree islands in northern WCA 3A that are greater than or equal to 2 hectares are show as green (islands getting larger), yellow (islands that have not changed), or red (shrubs and trees no longer exist).

Mean annual ponding depths, comparing CEPP action alternatives and FWO within northern WCA 3A (**Figure C.2.1-3**) indicate widespread hydrological improvement and minor beneficial effect. With the exception of areas immediately downstream of the S-11 structures (separating southern WCA 2A from WCA 3A), none of the areas in northern WCA 3A under ECB and FWO conditions have an annual water depth greater than one foot. However, with the backfilling of the Miami Canal as part of the action alternatives and with all FEB waters going to the NW Spreader Canal (Alt 1) the water depths significantly increase throughout the Greater Everglades, but especially in the western areas of northern WCA 3A, where the average depth increases from 0.5 foot to 2.0 feet. This increased average water depth pattern is only slightly different than those calculated for Alts 2, 3 and 4, which all exhibited an increase in the spatial extent of the 2.0 ft average water depths along the central Miami Canal area and in northeastern WCA 3A. The increased depths are not expected to adversely affect tree islands. These water depths are not expected to create any flooding stress on islands that already exist and especially those needed by the wading birds for nesting (designated as 3A1-1, 3A1-2 and 3A1-3 in **Figure C.2.1-2**). Instead these water depths are expected to significantly increase fish habitat and density of fish and improve the potential for tree island restoration.

As indicated in **Figure C.2.1-4**, all CEPP action alternatives result in similar patterns of rehydration within northern WCA 3A and all significantly decrease the amount of time when this region goes completely

dry. Gage 3A-3 in northeastern WCA 3A, used to track droughts, indicates that with the FWO, this area will continue to be dry 40% of the time and that only 10% of the time is there more than one foot of water in the area. Tree islands are connected to the surrounding peat marshes via the roots of the trees. Although tree roots are still receiving water from wicking within the peat (unless the tree island is rocky), when the water table drops below these roots, the microclimate of these islands gets too dry and they can burn. All CEPP action alternatives create the hydrology necessary to restore tree islands and reduce the potential for devastating fires providing major beneficial effects. Under all CEPP action alternatives, the duration of water above marsh surface increases to 90%, but at the same time, tree island flooding stress (i.e., ponding depths greater than 3.0 ft) remained extremely rare.

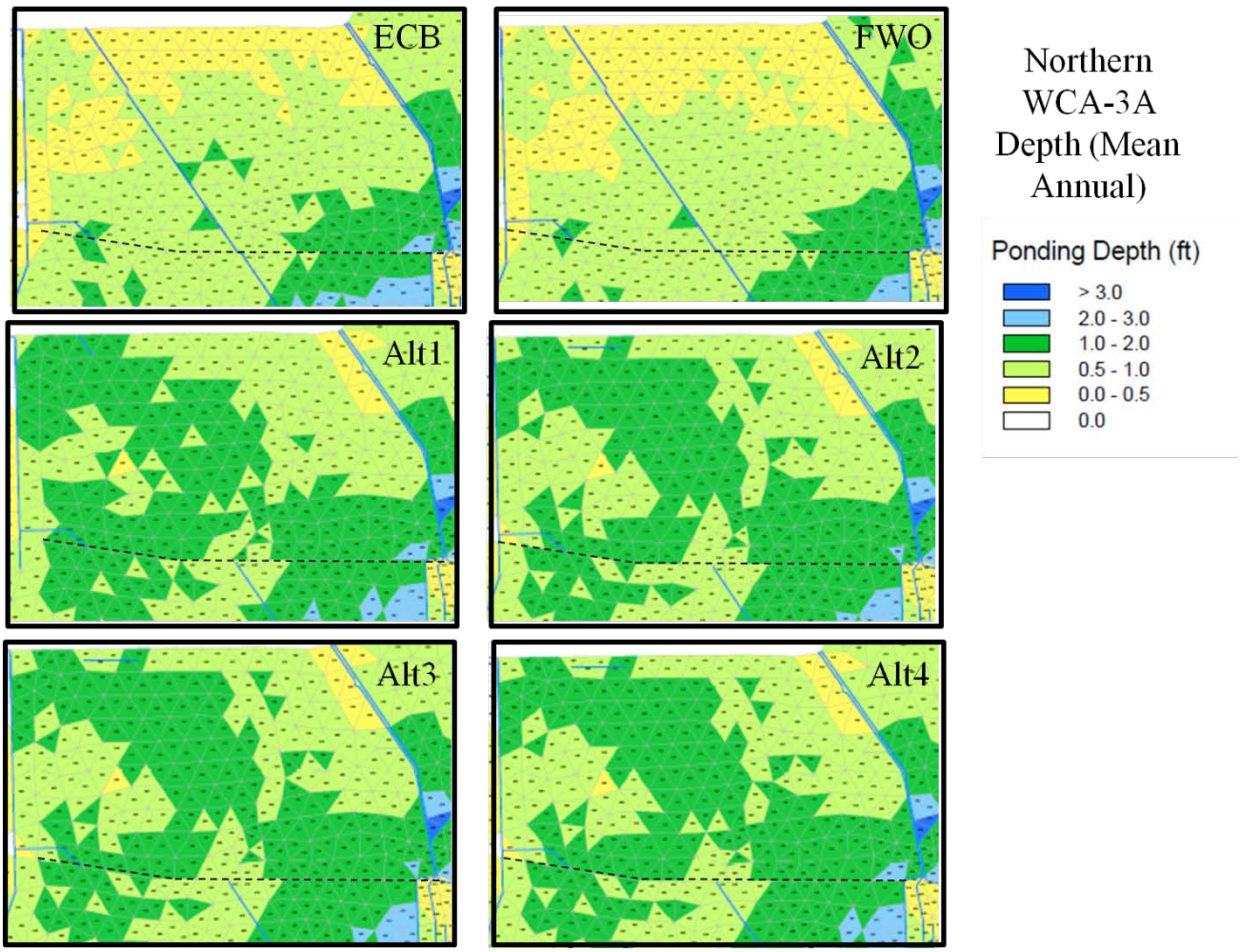

Figure C.2.1-3. The mean annual ponding depths, comparing ECB and FWO with CEPP action alternatives for northern WCA 3A.

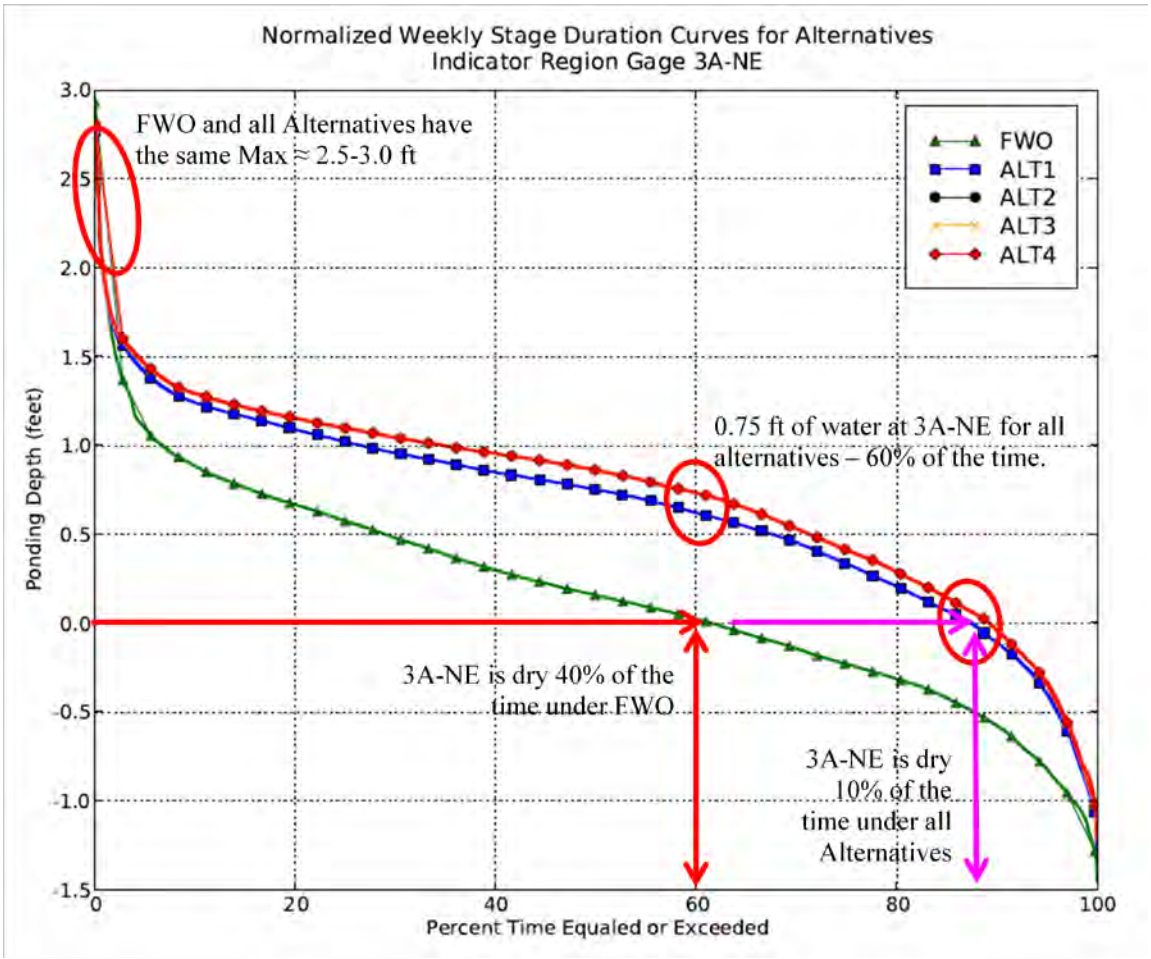

Figure C.2.1-4. All the action alternatives rehydrate this Northern Eastern WCA 3A gage location to similar amounts and all significantly decrease the amount of time when this region goes completely dry.

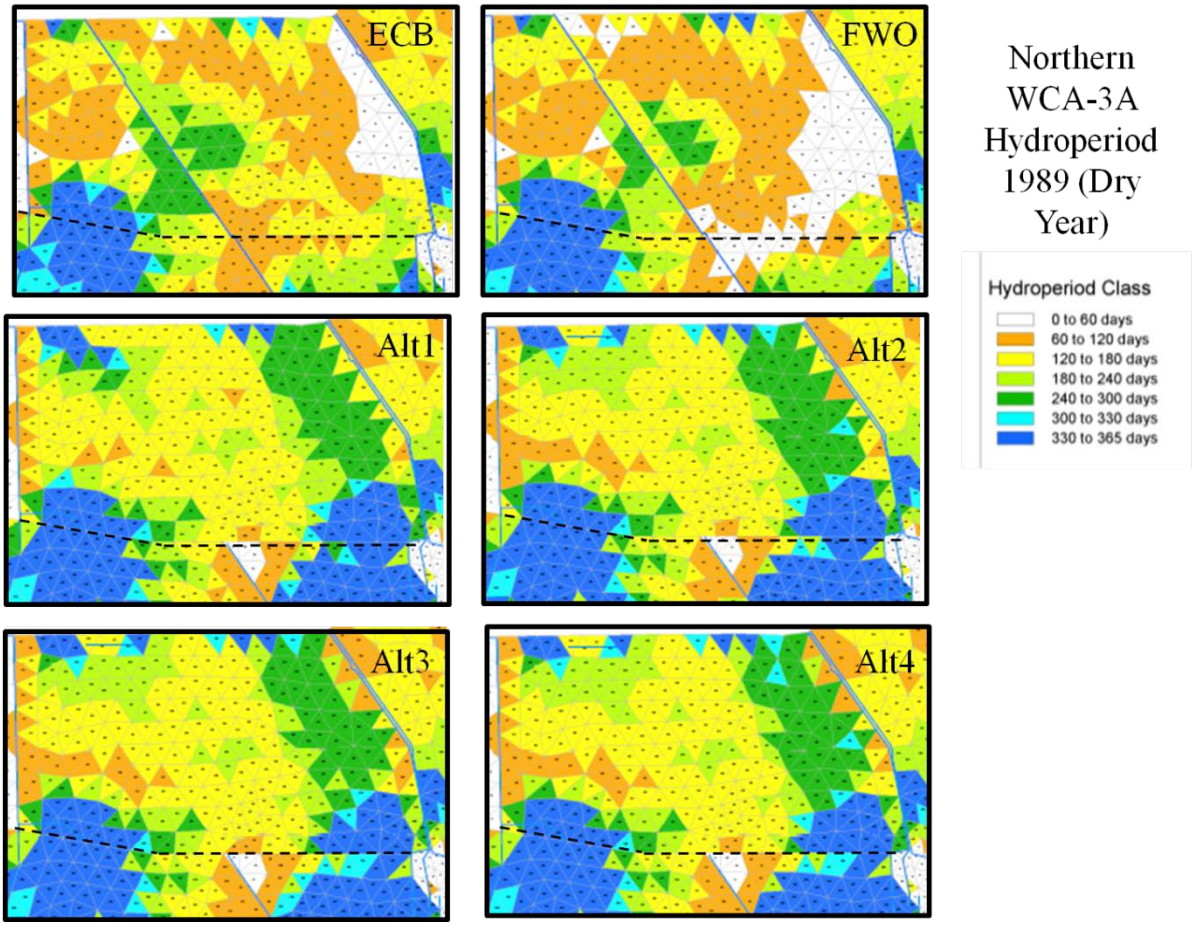

Figure C.2.1-5. During dry years, for the ECB and the FWO, this region was dominated by hydroperiods of 120 days or less. This degree of dryness makes tree islands and their associated nesting wading birds vulnerable to fires and nest predation by raccoons. All the action alternatives remove this hydrologic and predatory stress.

Rehydration of northern WCA 3A is expected to prevent further tree island degradation and peat fires, and set in motion trends to restore ridge-slough-island patterns. To consider this expectation, the hydroperiod response to a particularly dry year (1989) was evaluated (**Figure C.2.1-5**). In 1989, for ECB and FWO, this region was dominated by hydroperiods of 120 days or less. For FWO, regions downstream of S-11 became dry all year round. This degree of dryness makes the tree islands, used by large numbers of wading birds for nesting, extremely vulnerable to fires and nesting predation by raccoons. All CEPP action alternatives remove this hydrologic stress because the slope of the land in this northern region is mostly from west to east, so most of the water that enters in the west with Alts 1, 2, 3, and 4 (even during very wet years like 1995) tends to flow to regions in the east (**Figure C.2.1-6**). With all CEPP action alternatives, northern WCA 3A will no longer have extremely short hydroperiods. Instead, this area will have more spatially uniform hydroperiods that vary between 120 and 240 days providing a minor beneficial effect.

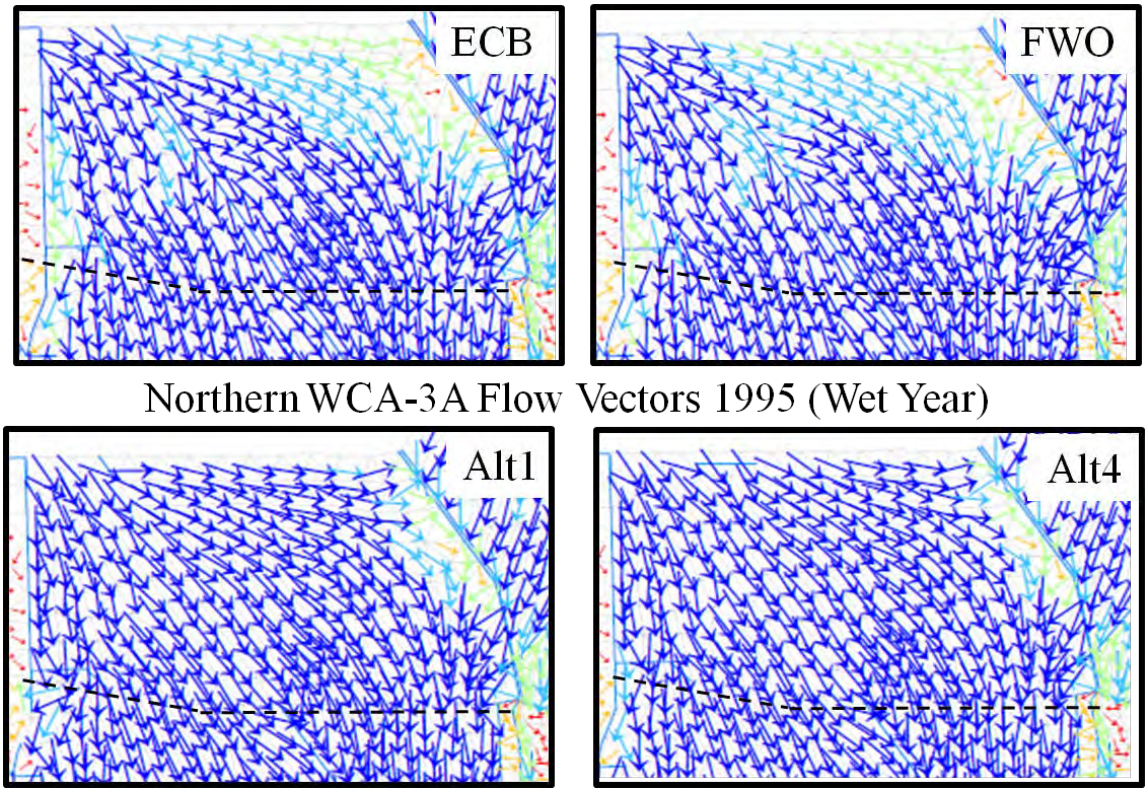

Figure C.2.1-6. Flow vector maps depicting flow patterns within northern WCA 3A for CEPP action Alternatives in comparison with ECB and FWO. Flow patterns for Alt2 and Alt3 were the same as Alt4. The ECB and FWO do a poor job of rehydrating the NE-WCA3A.

C.2.1.3.4.4.2 Southern WCA 3A

The long-term goals for CERP are to reconnect the historic flow paths along the flow lines shown in **Figure C.2.1-7**. As part of CEPP, this tree island evaluation looks at the L1 and L2 transects in relation to the known elevations of tree islands along a 2-mile swatch down each North-South transect represented in **Figure C.2.1-7**. **Figure C.2.1-7** indicates that some 60% of the tree islands in WCA 3A have been converted to marsh since 1942. It also shows the extent of currents islands throughout the landscape. Upon review of soil elevations and water depths along the L1 transect (**Figure C.2.1-8**); it is very difficult to see any differences between any of the action alternatives. The only differences were: 1) a slight reduction in water depths just north of Tamiami Trail (Highway 41) in southern WCA 3A for Alt 4; and 2) a slight increase in water depths at the very top of the L1 transect for Alt 1. Neither of these differences appears to be great enough to have any effects on tree islands. Hydrologic regimes in central WCA 3A for each alternative were not different. However, hydrologic regimes in ENP did change substantially with each alternative and potential impact to these tree islands are discussed in further detail within the SRS section. It should be noted that islands in ENP are much higher and drier than the surrounding marshes and as a result, none of the action alternatives caused any flooding stress for tree islands.

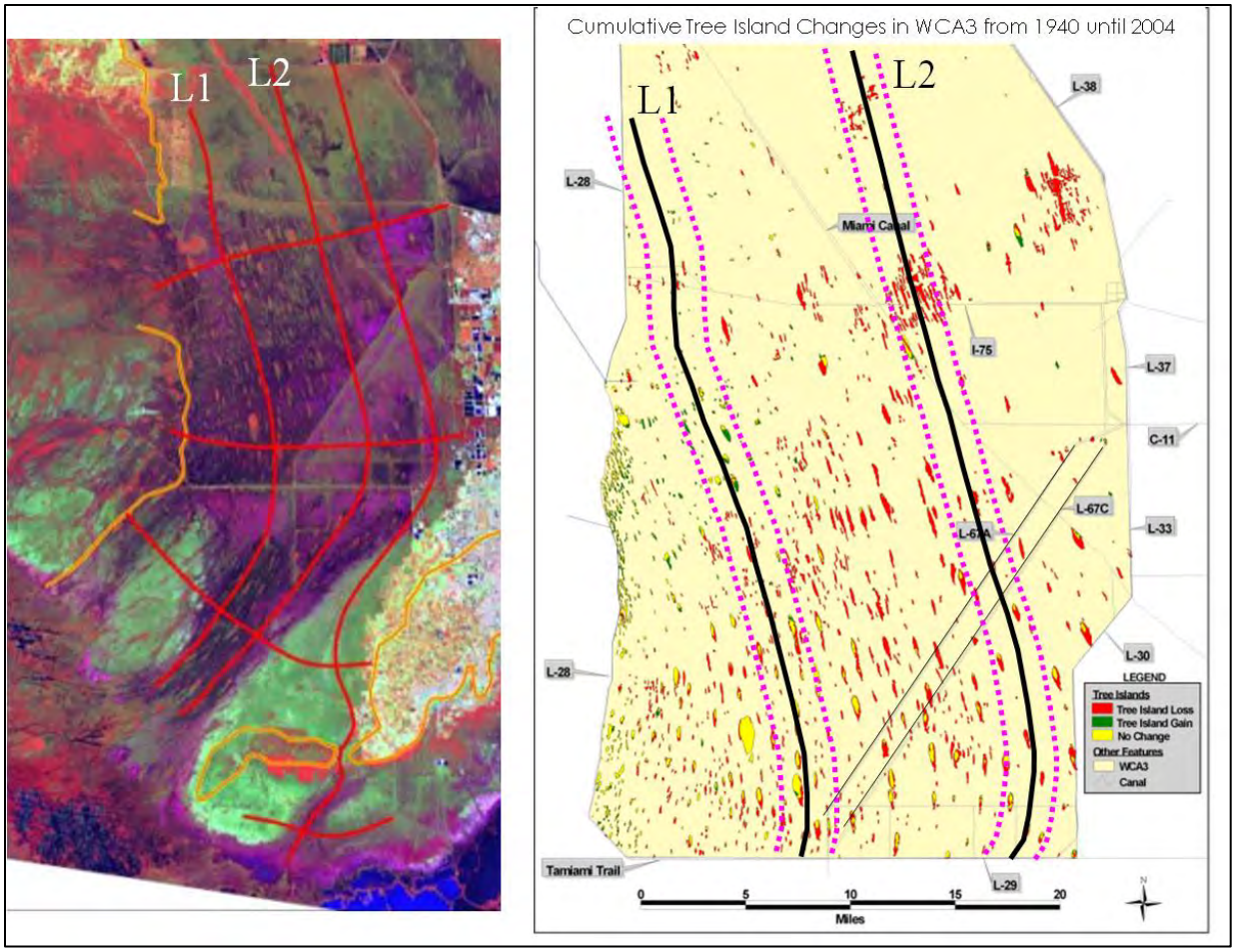

Figure C.2.1-7. L1 and L2 are historic flow paths across the extant landscape (Left) and across known elevations of tree islands within a 2-mile swatch down each N-S transect (Right).

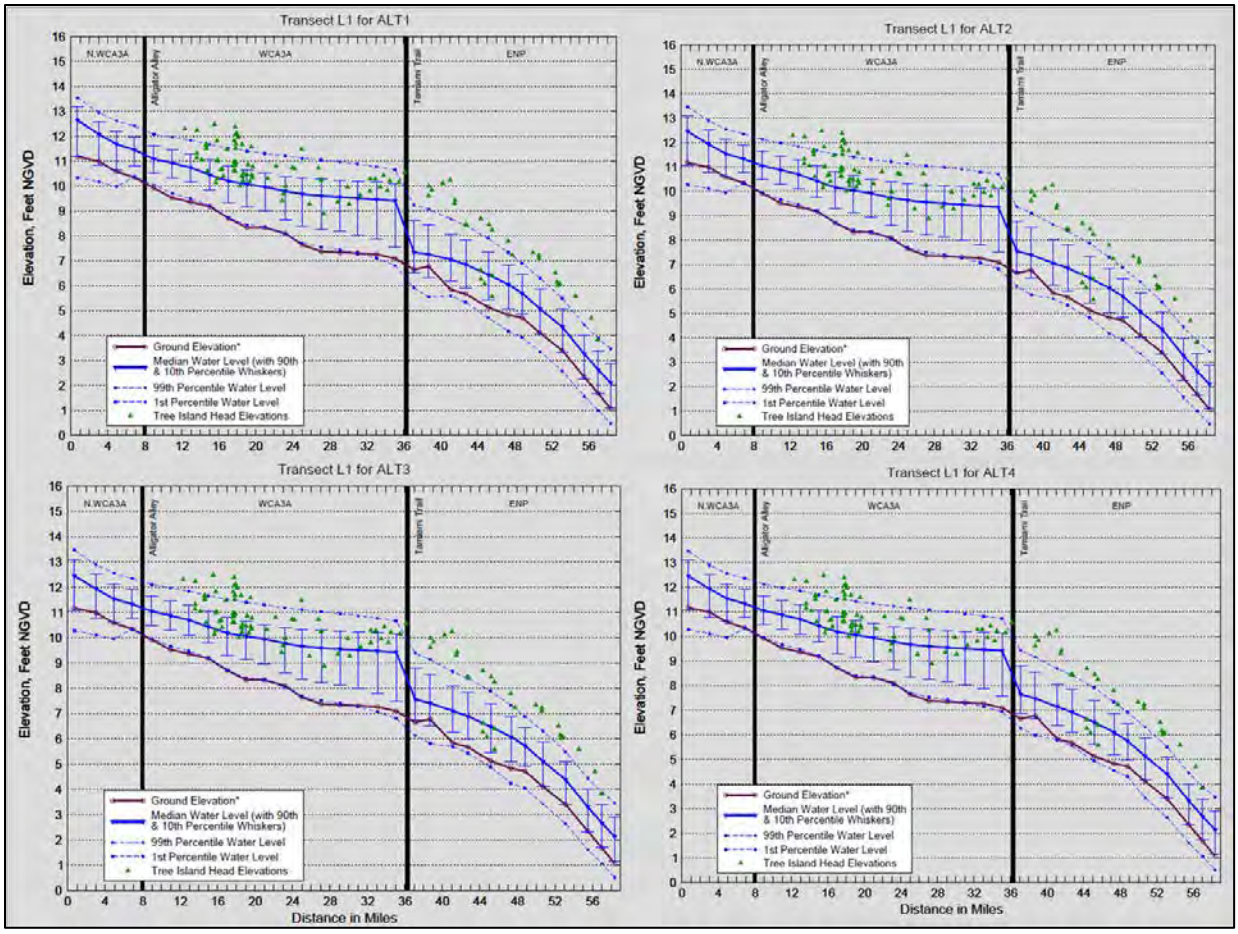

Figure C.2.1-8. The L1 "viewing window" transect going from North WCA 3A through SRS was used to see if the water depths (means and Std Deviations relative to ground elevations) for the four CEPP action alternatives were likely to increase or decrease flooding stress on tree islands (green triangles).

Changes in hydrology along the L2 transect (**Figure C.2.1-7**) in relationship to tree islands did not capture as many islands as the L1 transect, but showed the same result as Figure (**Figure C.2.1-8**) (i.e. no impacts to tree islands in WCA 3A). However, there were some small differences between Alts 1, 2 and 3 in comparison to Alt 4 in WCA 3B (**Figure C.2.1-9**). Alternative 2 (also indicative of Alt 1 and 3 results) added about 0.5 ft of depth to WCA 3B. Rehydration of WCA 3B is expected to prevent harmful fires that result in tree island loss.

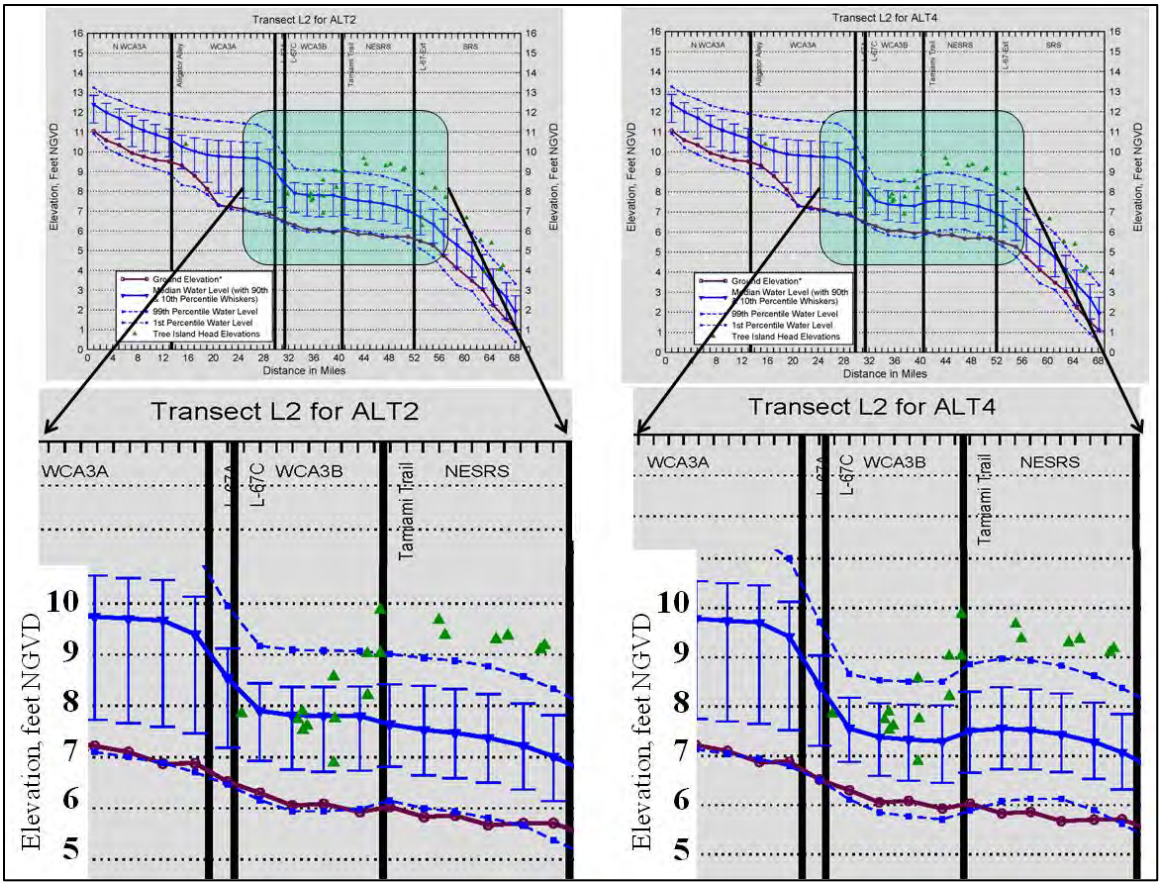

Figure C.2.1-9. The L2 flow path (Figure C.2.1-7) passes through WCA 3B, where Alterative 2 (representative of Alt-1 and Alt-3) added about 0.5 ft of additional water, which is not considered to be great enough to cause flooding stress and may instead prevent tree islands from burning.

Finally, for Southern WCA 3A, none of the action alternatives had any impact on tree islands in comparison to the FWO (**Figure C.2.1-10**). This was due to the inclusion of the 2012 Everglades Restoration Transition Plan (ERTP) WCA 3A regulation schedule in FWO. The ERTP effectively lowers the potential of flooding stress of trees on trees islands in the most southern reaches of WCA 3A. All the CEPP action alternatives provide similar benefits to tree islands within southern WCA 3A because they include ERTP.

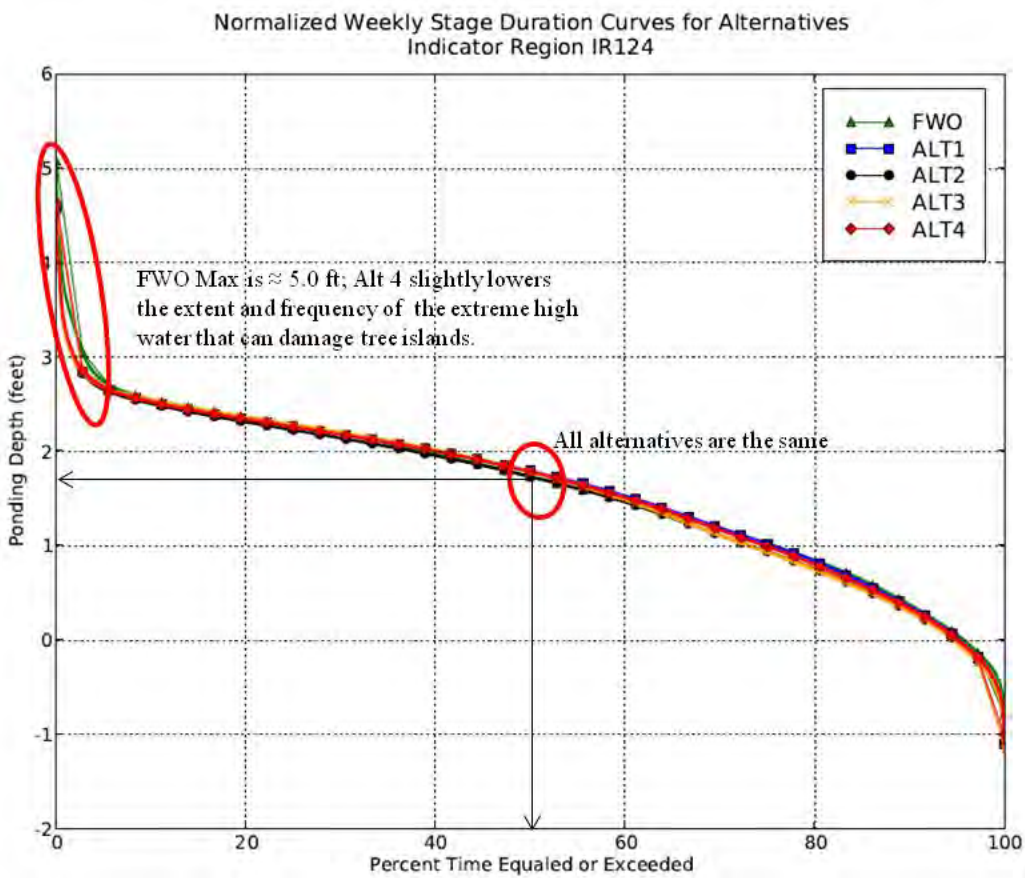

Figure C.2.1-10. Indicator Region 124 is in the southern extent of WCA 3A where tree islands can occasionally be stressed by depths greater than 2.5 ft for extended periods of time. The ERTP schedule in the FWO reduced that stress and Alt-4 was found to slightly reduce this stress even more. F or most of the time, all action alternatives were the same as the FWO.

C.2.1.3.4.4.3 Shark River Slough (SRS)

Tree islands in SRS rise high above the surrounding marsh (**Figure C.2.1-8** and **Figure C.2.1-9**). Their potential for flooding stress is practically non-existent. Instead, ENP is faced with a reduction in islands due to intensive fires that migrate across the marshes and burn tree island peat soils leaving only rocky outcroppings. The objective of CEPP action alternatives is to prevent extensive dry-downs and create extended hydroperiods. **Figure C.2.1-11** shows a 55% decline in the extent and number of tree islands in SRS since 1942 and it shows that the entire region, including the Rocky Glades along the eastern border of SRS, has a hydroperiod less than 180 days for a typical dry year under ECB and FWO conditions. The FWO expands the driest hydroperiod classification across the area during wet and dry years compared to the ECB. The Action alternatives create similar hydroperiods across the area (**Figure C.2.1-12**), and are significantly better at maintaining longer hydroperiods within SRS and of Tamiami Trail compared to the ECB and FWO. Alternative 4 appears to do the best job of creating regions with hydroperiods created than 180 days and preventing regions from completely drying out during a dry year like 1989 (**Figure C.2.1-12**).

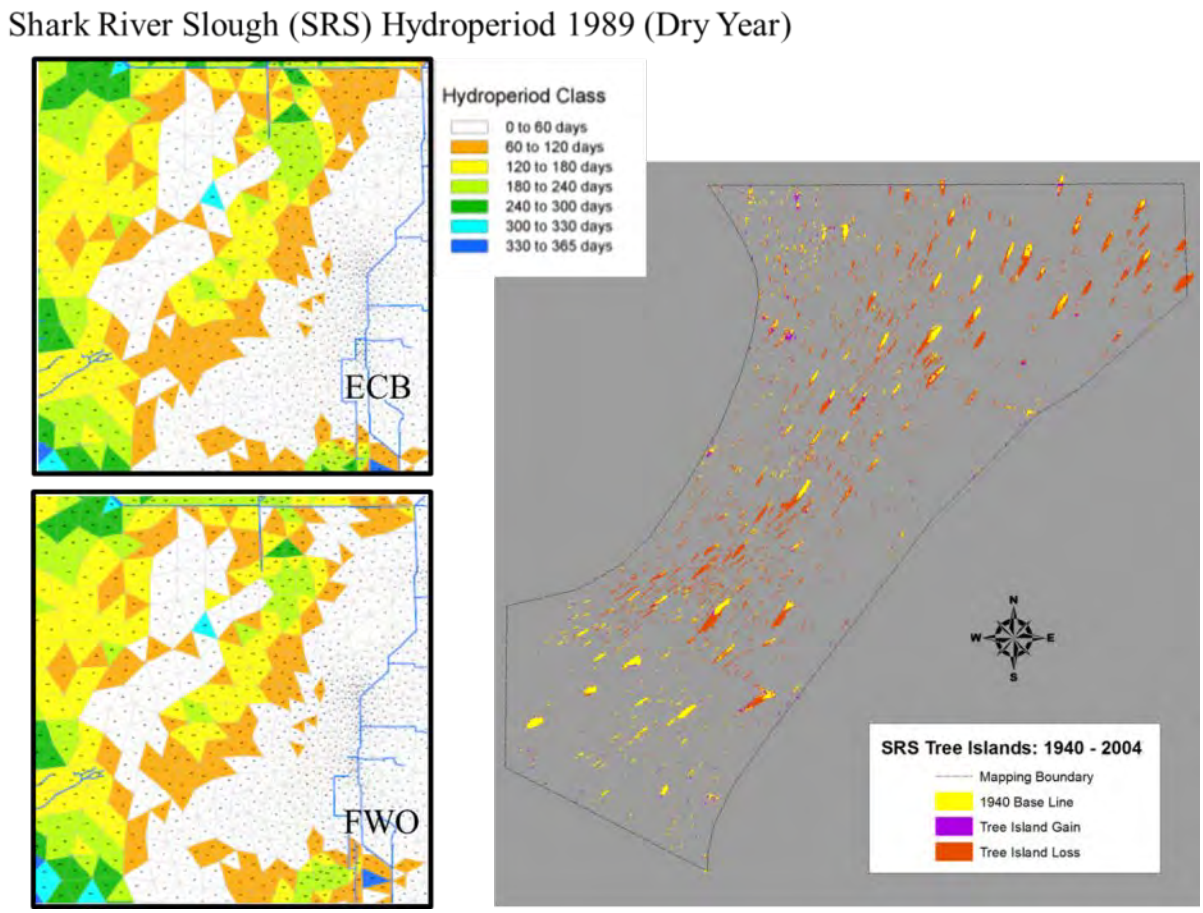

Figure C.2.1-11. Tree islands in SRS have significantly been reduced since 1940 (Right), which is believed to be caused by intense fires that occur during dry years like 1989 when hydroperiods are less than 120 days over vast areas (Left). The FWO is not an improvement over the ECB, especially immediately downstream of Tamiami Trail.

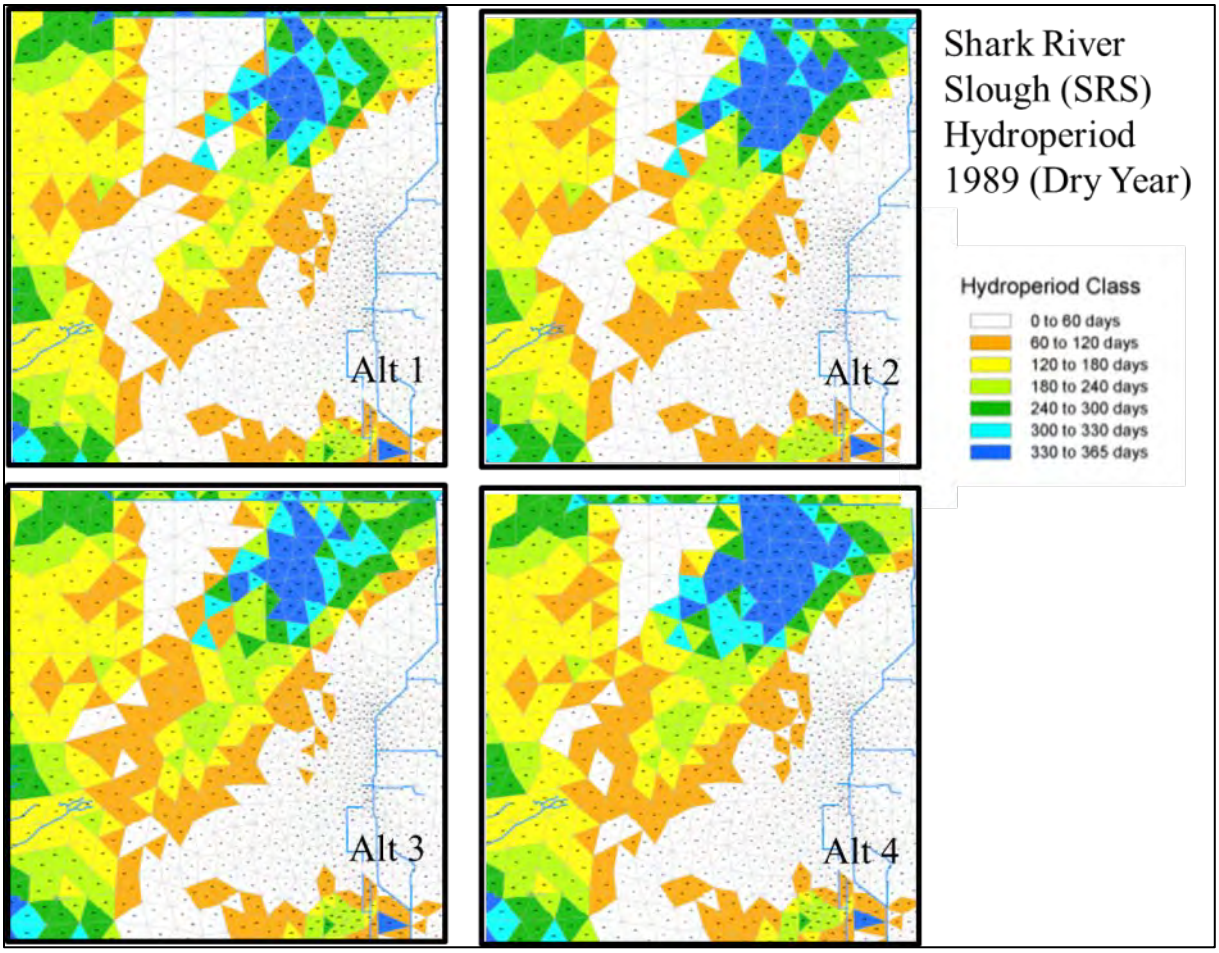

Figure C.2.1-12. Alternative 1 was the least effective at expanding the spatial extent of the 60-180-day hydroperiod classes and Alt-4 was the most effective. Alt-4 was the most effective at creating regions with hydroperiods of up to 300 days.

Figure C.2.1-13 may be the best graphic for depicting the overall hydrologic improvements in SRS, especially in the NESRS, downstream of Tamiami Trail (Gage NESRS1), associated with the CEPP action alternatives in comparison to the ECB and the FWO. This region saw significant improvements to the hydrology for tree islands because none of the action alternatives created water depths indicative of flooding stress and all the action alternatives, especially Alt 4, were able to prevent the marsh habitat surrounding tree islands from drying out for extended periods of time, thus reducing the potential for tree island degradation due to fires. Reduction of fires would be very protective of tree islands and may enhance the redevelopment of healthy tree island tails since flow fields are also expected to improve. Alternative 4 gave this region a little added protection compared to the other alternatives because it was the only alternative that prevented NESRS1 from going completely dry in 1974, a very dry year. The additional water depths of 1.0 foot associated with all the action alternatives during wet years did not increase maximum depths above 3.0 feet and as such did not represent a flooding stress to tree islands.

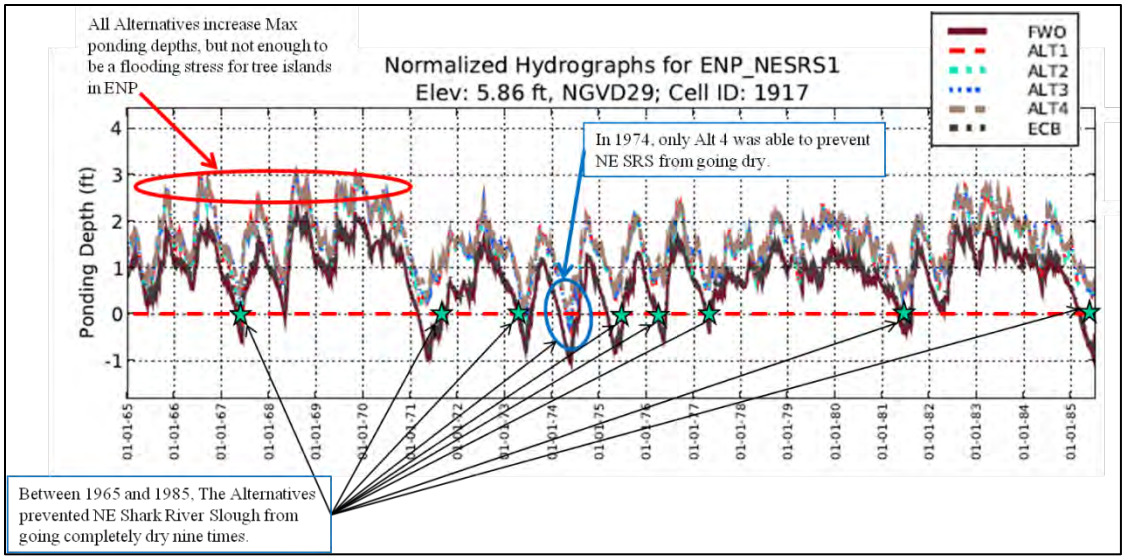

Figure C.2.1-13. Normalized hydrographs for Gage NESRS1 located with NESRS, close to Tamiami Trail. (Note: These data in Figure C.2.1-13 are shown as an example; the same trends were observed for the second half of the 41-year simulations.)

The normalized stage duration curve for central SRS Gage P-33 (**Figure C.2.1-14**) is a good summary of the hydrologic benefits of the action alternatives for tree islands in ENP. The additional 0.5 ft of water in SRS is expected to better reconnect the groundwater dynamics (roots and peat) of tree islands to the hydrology of the surrounding marshes. This has been found in tests done in the Loxahatchee Impoundment Landscape Assessment Facility to be an important natural connectivity that hydrates the island peats, transports nutrients and supports vegetative growth (Fred Sklar, Personal Communication). The action alternatives rehydrate SRS without creating any long periods of high water depths that could cause flooding stress. The FWO and all action alternatives have the same maximum water depths of approximately 3.0 ft. The advantage to tree islands of one alternative over another does not appear in the stage duration analysis until stages fall below 1.0 foot. Alternative 4 was most protective of extant tree islands and most likely to enhance tree island restoration and growth because it had the longest hydroperiod aboveground elevations and the shallowest belowground water table of any of the other alternatives.

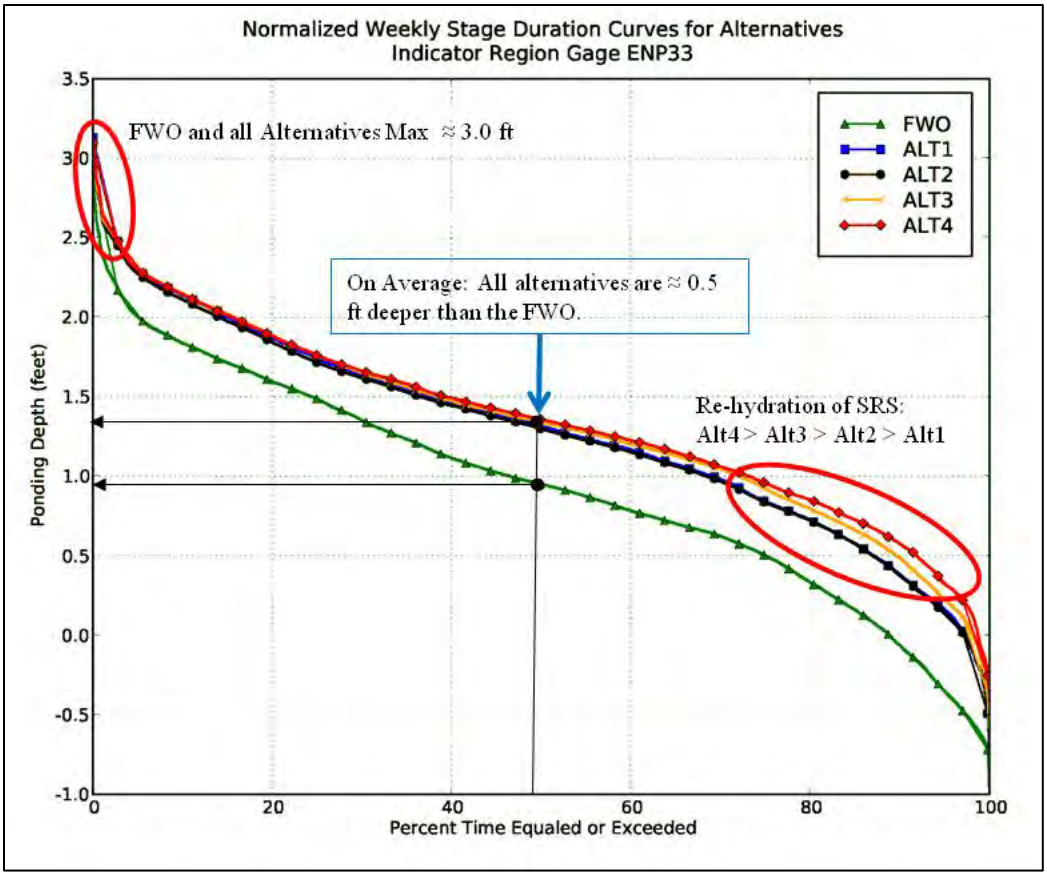

Figure C.2.1-14. **Normalized stage duration curves for CEPP action alternatives for Indicator Region Gage ENP33.**

In summary, negligible effects to tree islands within WCA 3A and ENP are anticipated to occur under any of the CEPP action alternatives; however, lower elevation tree islands within WCA 3B may have a major adverse effect by CEPP implementation, with Alts 2 and 3 resulting in the greatest potential impact. Approximately one-third of all tree islands within WCA 3B are elevated only 0.7-1.1 feet above the surrounding marsh. Due to increased stages within WCA 3B, these tree islands may suffer inundation and prolonged high water periods that may induce stress. It is hypothesized from modeling of tree islands in WCA 2A, where 90% of tree islands have been converted to sawgrass, that tree islands cannot withstand full inundation in excess of 120 days for more than two years in a row (Sklar and van der Valk 2002). According to Wu et al. (2002), when water depths on tree islands exceed one foot for greater than 120 days, even the most water tolerant species are affected. However, it is not clear if this is appropriate for tree islands within WCA 3B because tree island species in WCA 3B are considered phenotypically plastic, meaning they have a greater ability to adapt to longer hydroperiods (Fred Sklar, personal communication). Increasing the operational flexibility for each alternative will allow for better adaptive management and preservation of tree islands within WCA 3B.

Extended ponding of deep water, most notably within southern WCA 3A, has resulted in a lack of seedling establishment on tree islands due to stress from prolonged inundation (McKelvin et al. 1998). Lowering of water levels within southern WCA 3A would aid in reducing future tree island degradation due to prolonged inundation and high water depths. However, little change in water levels within southern WCA 3A will be realized with implementation of any of the CEPP action alternatives.

C.2.1.3.4.5 Rockland Pine Forest

No changes in hydrology are expected within rockland pine forest and therefore negligible effects are predicted within Rockland pine forest as a result of implementation of any of the CEPP action alternatives.

C.2.1.3.4.6 Tropical Hardwood Hammock

Tropical hardwood hammocks on the Miami Rock Ridge have been affected by a lowered water table associated with the reduction of freshwater flow through the Everglades. Since all CEPP action alternatives provide increased flow through the Greater Everglades, it is anticipated that tropical hardwood hammocks would have minor beneficial effects from implementation of any of the CEPP action alternatives. As with other vegetative communities, Alts 4 and 3, respectively, would provide the greatest rehydration benefits to ENP as compared with Alts 1, 2 and FWO.

C.2.1.3.5 Southern Coastal Systems

The estuarine communities of Biscayne and Florida Bays have been affected by upstream changes in freshwater flows through the Everglades and eastward across the Miami Rock Ridge. The estuarine communities of Biscayne Bay have been further affected by agricultural and urban development of the areas east of the current boundaries of Everglades National Park.

C.2.1.3.5.1 Mangroves

A reduction in freshwater inflows into Florida Bay and alterations of the normal salinity balance have affected mangrove community composition and may have contributed to a large-scale die-off of seagrass beds (USFWS 1999). Mangrove communities along Biscayne Bay have also seen a reduction in freshwater inflows and a reduction in historic habitat range by urban and agricultural development leaving only a remnant ribbon of suitable habitat immediately adjacent to the Bay. Mangrove communities occur within a range of salinities from 0 to 40 psu. Both bays experiences salinities in excess of 40 psu on a seasonal basis. Biscayne Bay is also subject to rapid decreases in salinity on the order of 10-20 psu from fresh water pulses delivered by the surface water management canal system.

As compared with FWO, all CEPP action alternatives provide increased freshwater flows to Florida Bay and the Southwest Coast, thereby aiding to lower salinities levels within these areas to better encompass mangrove salinity tolerance range and providing a minor beneficial effect. Alternative 4 is anticipated to provide the greatest benefit, followed by Alts 3, 1 and 2 (refer to Appendix G for Florida Bay Salinity Performance Measure results).

In Biscayne Bay, Alt2 was the only alternative that provided additional flows when compared to FWO and has a minor beneficial effect. Alts 1, 3, and 4 all provided less water than FWO, in descending order having a minor adverse effect. Flows to the coast were not evenly distributed with all alternatives showing positive benefits in the northern Biscayne Bay and negative effects in central and southern Biscayne Bay. Alternative 2 is likely to provide a benefit to the mangrove communities by providing additional flows to the coast, thereby lowering salinity levels and/or reducing the number of days salinities exceed 40 psu. Alternative 1 is likely to provide the same level of benefit as FWO and Alts 3 and 4 would likely result in a negative effect to the mangrove communities by increasing the likely hood of maintaining salinity conditions in Biscayne Bay above the preferred salinity range of mangroves for longer periods of time than FWO. All alternatives generally show an unfavorable seasonal flow pattern

with reductions in flows compared to FWO generally greater during the dry season. Refer to **Annex E** for Biscayne Bay Flow at Coastal Structures.

C.2.1.3.5.2 Seagrass Beds

Seagrasses within Biscayne and Florida Bays have long suffered from high salinities due to long-term reductions of freshwater flow. In addition, seagrass beds in Biscayne Bay are also subject to rapid decreases in salinity on the order of 10-20 psu and scouring of bottom sediments from fresh water pulses delivered by the surface water management canal system. Seagrasses have an optimum salinity range of 24 to 35 psu, but can tolerate considerable short-term salinity fluctuations.

As compared with FWO all action alternatives provide increased freshwater flows to Florida Bay and the southwestern coastal estuaries, thereby aiding to lower salinities levels within these areas to better encompass seagrass salinity tolerance range and providing a minor beneficial effect. Alternative 4 provides the greatest benefit, followed by Alts 3, 1 and 2. Refer to Appendix G for Florida Bay Salinity Performance Measure results.

In Biscayne Bay, Alt2 was the only alternative that provided additional flows when compared to FWO and has a minor beneficial effect. Alts 1, 3, and 4 all provided less water than FWO, in descending order, having a minor adverse effect. Flows to the coast were not evenly distributed spatially with all alternatives showing positive benefits in the northern Biscayne Bay and negative effects in central and southern Biscayne Bay. Alternative 2 is likely to provide a benefit to the seagrass beds by providing additional flows to the coast, thereby lowering salinity levels and/or reducing the number of days salinities exceed 40 psu. Alternative 1 is likely to provide the same level of benefit as FWO and Alts 3 and 4 would likely result in a negative effect to the seagrass beds by increasing the likely hood of maintaining salinity conditions in Biscayne Bay above the preferred salinity range of seagrasses for longer periods of time than FWO. All alternatives generally show an unfavorable seasonal flow pattern with reductions in flows compared to FWO generally greater during the dry season. Refer to **Annex E** for Biscayne Bay Flow at Coastal Structures.

C.2.1.4 Threatened and Endangered Species

The overall objective of CEPP is to rehydrate the Everglades in order to help restore the WCAs and the Everglades back to historical, pre-drainage conditions. This should improve conditions for Everglade snail kite, wood stork, and other wading birds and their habitats in south Florida, while CEPP also strived to maintain nesting season requirements for the Cape Sable Seaside Sparrow (CSSS).

Federally threatened, endangered, and candidate species that may occur within the study area include: Florida panther (*Puma concolor coryi*), Florida population of West Indian Manatee and its critical habitat (Florida manatee) (*Trichechus manatus*), Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*), Everglade snail kite (*Rostrhamus sociablis plumbeus*) and its critical habitat, Northern crested caracara (*Caracara cheriway*), piping plover (*Charadrius melodus*), red-cockaded woodpecker (*Picoides borealis*), roseate tern (*Sterna dougallii dougallii*), wood stork (*Mycteria americana*), American alligator (*Alligator mississippiensis*), Florida bonneted bat (*Eumops floridanus*), American crocodile (*Crocodylus acutus*) and its critical habitat, Eastern indigo snake (*Drymarchon corais couperi*), Miami black-headed snake (*Tantilla oolitica*), Schaus swallowtail butterfly (*Heraclides aristodemus ponceanus*), Miami blue butterfly (*Cyclargus thomasi bethunebakeri*), Florida leafwing butterfly (*Anaea troglodyta floridalis*), Bartram's hairstreak butterfly (*Strymon acis bartrami),* Stock Island tree snail (*Orthalicus reses* [not incl.

nesodryas]), crenulate lead-plant (*Amorpha crenulata*), Cape Sable thoroughwort (*Chromolaena frustrata*) deltoid spurge (*Chamaesyce deltoidea* ssp. *deltoidea*), Garber's spurge (*Chamaesyce garberii*), Okeechobee gourd (*Cucurbita okeechobeensis* ssp. *okeechobeenis*), Small's milkpea (*Galactia smallii*), tiny polygala (*Polygala smallii*), smalltooth sawfish (*Pristis pectinata*) and its critical habitat, Gulf sturgeon (*Acipenser oxyrinchus desotoi*) and its critical habitat, blue whale (*Balaenoptera musculus*), finback whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), sei whale (*Balaenoptera borealis*), sperm whale (*Physeter macrocephalus*), green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricata*), leatherback sea turtle (*Dermochelys coriacea*), Kemp's ridley sea turtle (*Lepidochelys kempii*), loggerhead sea turtle (*Caretta caretta*), Johnson's seagrass (*Halophila johnsonii*) and its critical habitat, elkhorn coral (*Acropora palmata*) and its critical habitat, and staghorn coral (*Acropora cervicornis*) and its critical habitat. Species described in the following section were determined by the Corps to potentially be affected by the project. No effect species determinations are described in Annex A, CEPP Biological Assessment and the CERP Programmatic Biological Assessment for NOAA NMFS.

The USACE and USFWS, in conjunction with the multi-agency CEPP team, used performance measures (PMs, **Table C.2.1-1**) and ecological targets (ETs, **Table C.2.1-2**) for each species and their habitat developed for the Everglades Restoration Transition Strategy (ERTP) (USFWS 2012). Performance Measures (PMs) are defined as a set of operational rules that identify optimal WCA 3A water stages and recession rates to improve conditions in WCA 3A for snail kite, wood stork, wading birds, and tree islands. The USACE believes that the depths in PM-B are too restrictive and therefore did not use that PM in our analysis of effects. Instead, we deferred to using apple snail (PM-C) PM as a more appropriate assessment since they are based upon published literature (Darby). In addition, PM-A addresses the nesting window for CSSS-A, as outlined in the 1999 USFWS Reasonable and Prudent Alternative (RPA). Ecological Targets are designed to support the intention of the PMs by providing hydroperiod guidelines to help maintain appropriate nesting and foraging habitat. As referenced in the ERTP PMs and ETs (USACE 2011), **Figure C.2.1-15** shows the locations of the gages specified within the ERTP PMs and ETs.

Table C.2.1-1. ERTP Performance Measures Used to Evaluate Potential CEPP Effects on Threatened and Endangered species.

Species	PM	Description of PM
CSSS	A	*NP-205 (CSSS-A): Provide a minimum of 60 consecutive days at NP-205 below 6.0 feet NGVD beginning no later than March 15*
Everglade Snail kite	B	WCA-3A: For Everglade snail kites, strive to reach waters levels between 9.8 and 10.3 feet NGVD by December 31, and between 8.8 and 9.3 feet between May 1 and June 1.
	C	*WCA-3A: For apple snails, strive to reach water levels between 9.7 and 10.3 feet NGVD by December 31 and between 8.7 and 9.7 feet between May 1 and June 1.*
	D	*WCA-3A (Dry Season Recession Rate): Strive to maintain a recession rate of 0.05 feet per week from January 1 to June 1 (or onset of the wet season). This equates to a stage difference of approximately 1.0 feet between January and the dry season low.*
	E	*WCA-3A (Wet Season Rate of Rise): Manage for a monthly rate of rise less than or equal to* *0 .25 feet per week to avoid drowning of apple snail egg clusters.*
Wood stork/ wading	F	*WCA-3A (Dry Season Recession Rate): Strive to maintain a recession rate of 0.07 feet per week, with an optimal range of 0.06 to 0.07 feet per week, from January 1 to June 1.*

Species	PM	Description of PM
birds	G	*WCA-3A (Dry Season): Strive to maintain areas of appropriate foraging depths (5-25 cm) within the Core Foraging Area (CFA) (18.6 mile radius) of any active wood stork colony.*
	H	*WCA-3A (Dry Season): Strive to maintain areas of appropriate foraging depths (5-15 cm) within the CFA (7 to 9 mile radius) of any active white ibis or snowy egret colony.*

*Note: All stages for WCA-3A are as measured at WCA 3- gage average [WCA-3AVG] [Sites 63, 64, 65])

Table C.2.1-2. ERTP Ecological Targets (ET) Used to Evaluate Potential CEPP Effects on Threatened and Endangered species.

Species	ET	Description of PM
CSSS	1	*NP-205 (CSSS-A): Strive to reach a water level of less than or equal to 7.0 feet NGVD at NP-205 by December 31 for nesting season water levels to reach 6.0 feet NGVD by mid- March.*
	2	*Strive to maintain a hydroperiod between 90 and 210 days (3 to 7 months) per year throughout sparrow habitat to maintain marl prairie vegetation.*

*Note: All stages for WCA-3A are as measured at WCA 3- gage average [WCA-3AVG] [Sites 63, 64, 65])

USFWS, along with Dr. Wiley Kitchens (Ph.D. of the University of Florida), Phil Darby (Ph.D. of the University of West Florida), and Dr. Christa Zweig (Ph.D. of the University of Florida), developed a series of water depth recommendations for WCA 3A that addresses the needs of the snail kite, Florida apple snail, and vegetation characteristic of their habitat, along with a wood stork component that was developed by James Beeren and Mark Cook (Ph.D.) from the SFWMD (**Figure C.2.1-16**). This water management strategy is divided into three time periods representing the height of the wet season (September 15 to October 15), the pre-breeding season (January) and the breeding season (termed dry season low, May 1 to June 1) and illustrates appropriate water depths to attain within each time period. Water depth recommendations as measured at the WCA 3AVG proposed within the USFWS 2010 Draft Multi-Species Transition Strategy (MSTS) forming the basis for ERTP PMs and ETs. Please note that these water depths are not targets, but used as guidance and represent a compromise between the needs of the three species. Inter-annual variability is extremely important in the management of the system to promote recovery of the species.

Regional Simulation Model – Glades Lower East Coast Service Area (RSMGL) model results were used to compare performance of action alternatives in relation to the ERTP PMs and ETs in order to select the alternative that best met the CEPP objectives. Microsoft Excel 2007 was used to analyze RSM results and create bar graphs to graphically compare action alternatives. All calculations are based upon the RSM 41-year POR from 1965 through 2005.

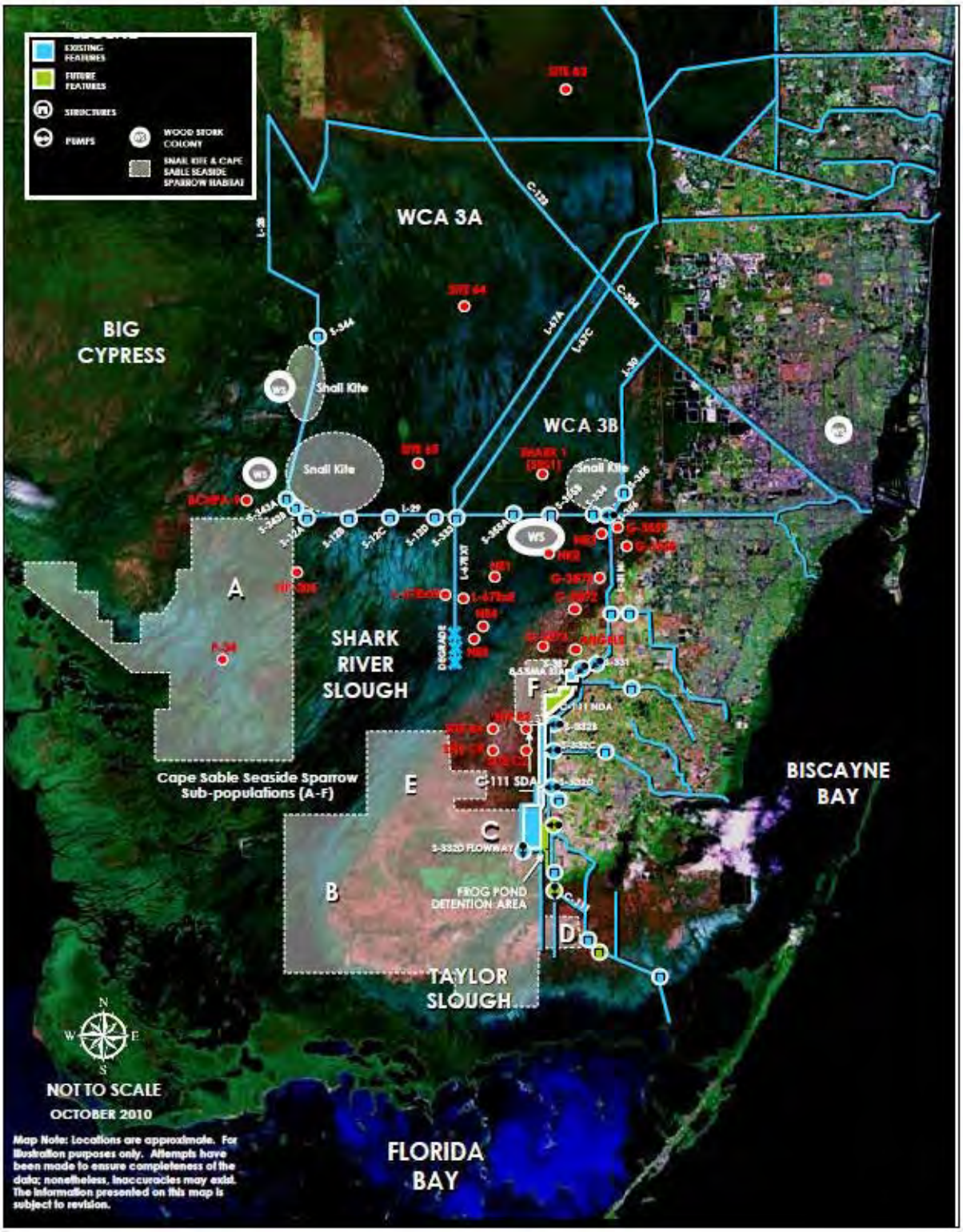

Figure C.2.1-15. Location of gages within the CEPP action area as referenced in the Everglades Restoration Transition Plan Performance Measures and Ecological Targets.

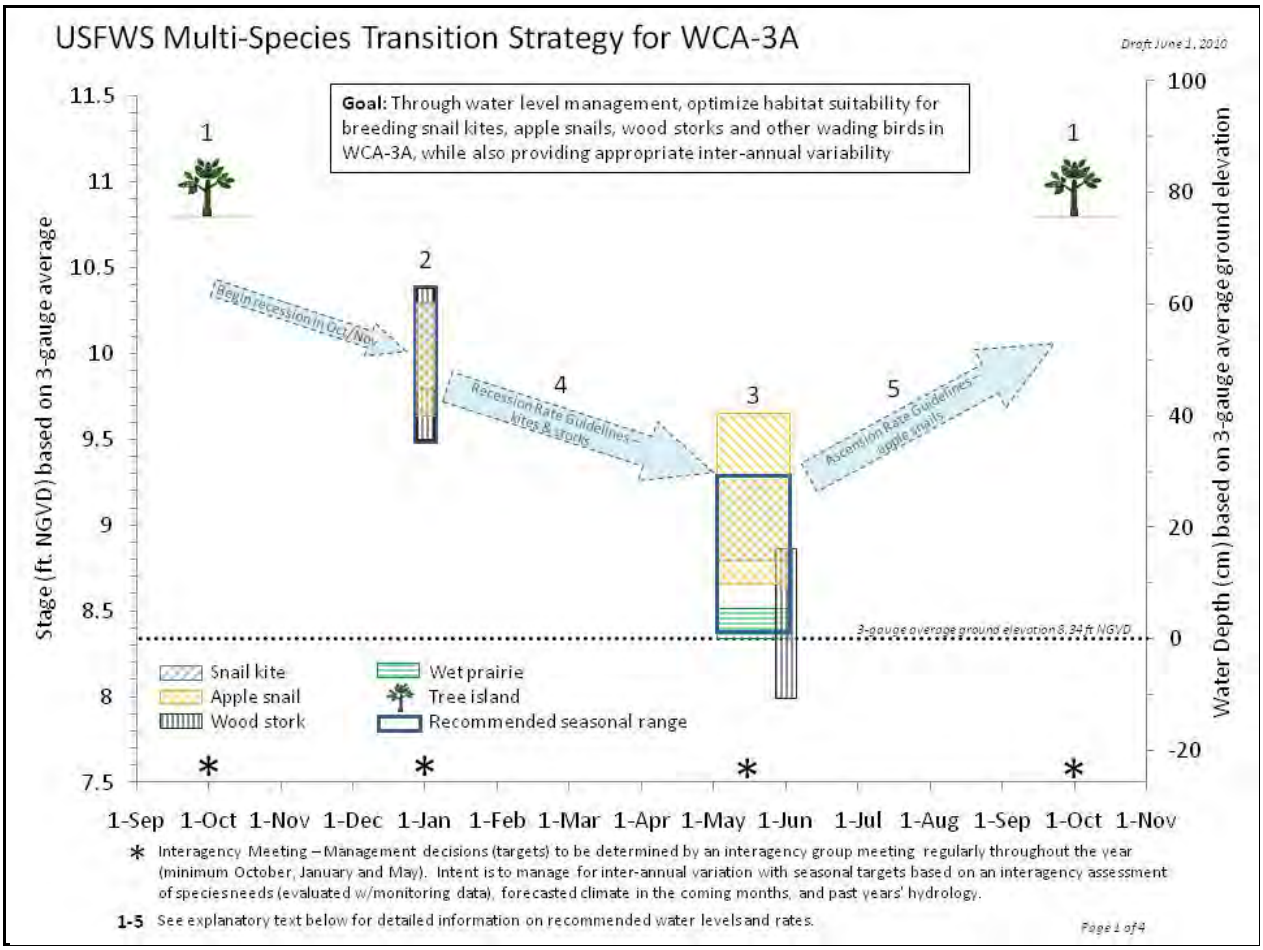

Figure C.2.1-16. U.S. Fish and Wildlife Service Multi-Species Transition Strategy for Water Conservation Area 3A.

C.2.1.4.1 Everglades Snail Kite

Snail kite habitat consists of freshwater marshes and the shallow vegetated edges of lakes where the apple snail (*Pomacea paludosa*), the snail kite's main food source, can be found. Snail kite populations in Florida are highly nomadic and mobile; tracking favorable hydrologic conditions and food supplies, and thus avoiding local droughts. Snail kites move widely throughout the primary wetlands of the central and southern portions of the State of Florida. Snail kite is threatened primarily by habitat loss and destruction. Widespread drainage has permanently lowered the water table in some areas. This drainage permitted development in areas that were once snail kite habitat. In addition to loss of habitat through drainage, large areas of marsh are heavily infested with water hyacinth, which inhibits the snail kite's ability to see its prey (USFWS 1986).

The snail kite has a highly specialized diet typically composed of apple snails, which are found in palustrine, emergent, long-hydroperiod wetlands. As a result, the snail kite's survival is directly dependent on the hydrology and water quality of its habitat (USFWS 1999). Snail kites require foraging areas that are relatively clear and open in order to visually search for apple snails. Suitable foraging habitat for the snail kite is typically a combination of low profile marsh and a mix of shallow open water. Shallow wetlands with emergent vegetation such as spike rush (*Eleocharis* spp.), maidencane, sawgrass, and other native emergent wetland plant species provide good snail kite foraging habitat as long as the vegetation is not too dense to locate apple snails. Dense growth of plants reduces the ability of the snail

kite to locate apple snails and their use of these areas is limited even when snails are in relatively high abundances (Bennetts et al. 2006). Areas of sparse emergent vegetation enable apple snails to climb near the surface to feed, breathe, and lay eggs and thus they are easily seen from the air by foraging snail kites. Suitable foraging habitats are often interspersed with tree islands or small groups of scattered shrubs and trees which serve as perching and nesting sites.

Snail kite nesting primarily occurs from December to July, with a peak in March-June, but can occur year-round. Nesting substrates include small trees such as willow, cypress (*Taxodium* spp.) and pond apple, and herbaceous vegetation such as sawgrass, cattail, bulrush (*Scirpus validus*) and reed (*Phragmites australis*). Snail kites appear to prefer woody vegetation for nesting when water levels are adequate to inundate the site (USFWS 1999). Nests are more frequently placed in herbaceous vegetation during periods of low water when dry conditions beneath willow stands (which tend to grow to at higher elevations) prevent Snail kites from nesting in woody vegetation (USFWS 1999). It is rare for a nest to collapse (not survive) in woody vegetation but common in non-woody vegetation, especially on lake margins (USFWS 1999). In order to deter predators, nesting almost always occurs over water (Sykes 1987a; Sykes et al. 1995).

Rehydration and vegetation shifts within northern WCA 3A and increased hydroperiods within ENP is likely to increase suitable habitat for apple snails, thereby increasing spatial extent of suitable foraging opportunities for snail kites providing a moderate beneficial effect. Based on this single metric, in WCA 3B, Alt 4 performed the best overall, followed by, Alts 3, 1, and 2 respectively; however, a more defined operational plan could equalize the performance between plans.

Apple snail egg production is maximized when dry season low water levels are less than 40 centimeters but greater than 10 centimeters (Darby et al. 2002; USFWS 2010). Overall, Alt 4 was the only alternative that showed improvement over the FWO in the number of years when the water depth was less than 40 cm before April 1 (**Table C.2.1-3**) (see **Figure C.2.1-17** for gage locations).

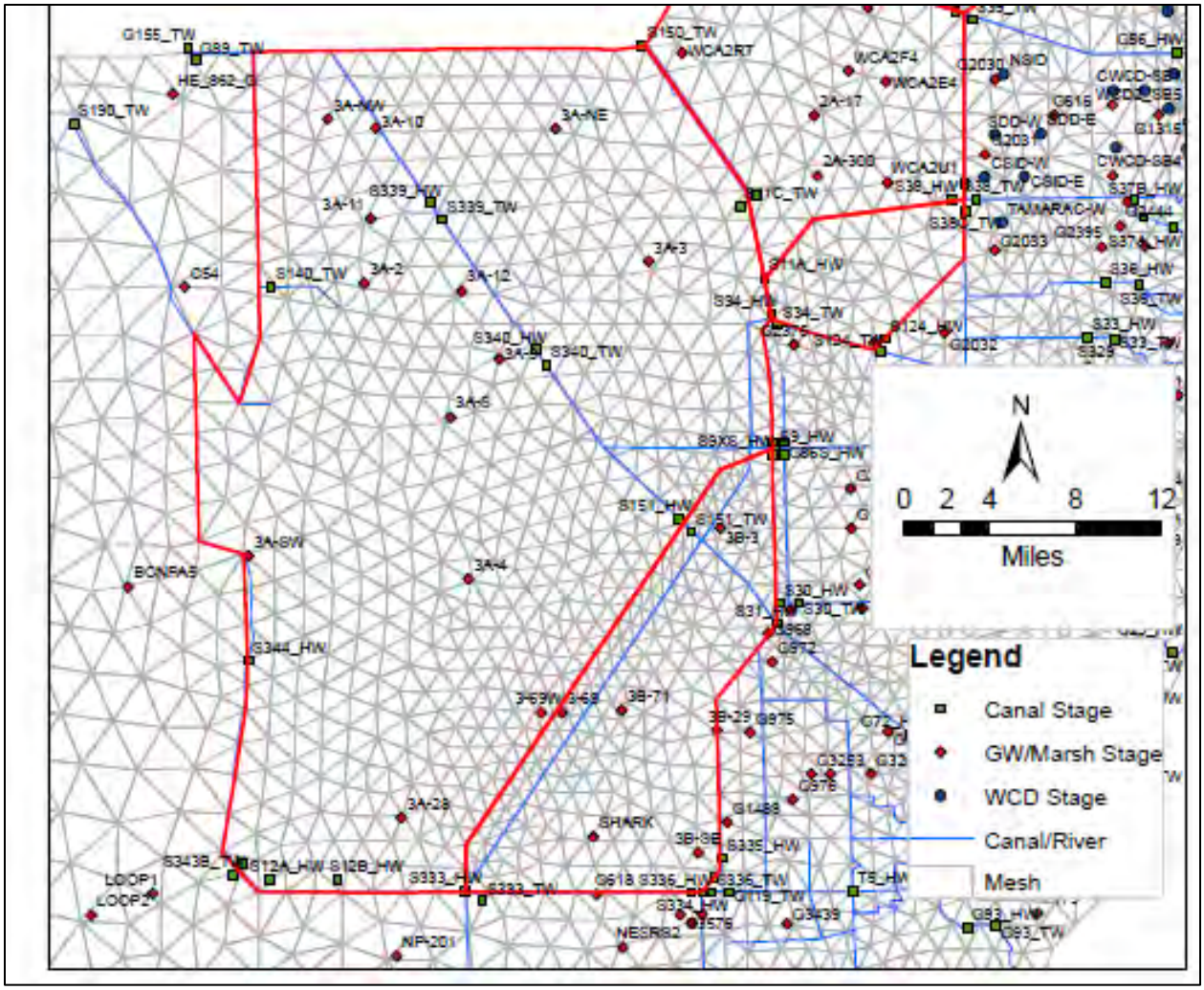

Figure C.2.1-17. Gage locations.

Table C.2.1-3. Number of years in POR met where water depths were less than 40cm before April 1. This metric is important for maximizing apple snail production.

April < 40 cm						
	ECB	FWO	ALT-1	ALT-2	ALT-3	ALT-4
Gage	3A-NE					
# years met	40	40	39	39	39	39
Gage	3A-NW					
# years met	40	40	24	36	36	36
Gage	3A-3					
# years met	35	36	35	35	35	35
Gage	3A-4					
# years met	33	34	31	32	33	32
Gage	3A-28					
# years met	12	15	16	17	17	16
Gage	3A-SW					

# years met	39	39	39	39	39	39
Gage	3B-71					
# years met	31	32	35	32	36	36
Gage	3BS1W1					
# years met	18	22	23	12	16	31
Total	**248**	**258**	**242**	**242**	**251**	**264**

The totals in **Table C.2.1-4** represent the total of all gages in meeting the apple snail depth requirements for the 41 year POR. All 4 alternative plans should lead to increased apple snail populations in northern WCA 3A. Alternatives 3 and 4 suggest that they could provide appropriate conditions for getting more apple snails into ENP compared to Alts 1 and 2 (**Table C.2.1-4**).

Table C.2.1-4. Number of years met for apple snail depth range

	May 1- June 1						**31-Dec**					
	ECB	**FWO**	**ALT-1**	**ALT-2**	**ALT-3**	**ALT-4**	**ECB**	**FWO**	**ALT-1**	**ALT-2**	**ALT-3**	**ALT-4**
Gage	3A-NE											
# years met	26	27	11	11	11	11	13	15	4	2	2	2
Gage	3A-NW											
# years met	8	6	20	25	25	25	0	0	17	5	5	5
Gage	3A-3											
# years met	15	9	22	22	22	22	15	11	10	10	11	11
Gage	3A-4											
# years met	20	18	24	23	23	24	15	22	24	22	24	24
Gage	3A-28											
# years met	15	18	17	18	18	18	4	5	3	4	4	3
Gage	3A-SW											
# years met	6	4	9	7	7	7	5	2	0	0	0	0
Gage	3B-71											
# years met	24	23	27	26	29	30	5	5	5	11	5	3
Gage	3BS1W1											
# years met	14	13	18	11	13	17	19	18	26	12	31	20
Total	**128**	**118**	**148**	**143**	**148**	**154**	**76**	**78**	**89**	**66**	**82**	**68**

In conclusion, snail kite habitat would increase with all CEPP action alternatives and provide moderate beneficial effects.

C.2.1.4.2 Cape Sable Seaside Sparrow

Presently, the known distribution of the CSSS is restricted to two areas of marl prairies east and west of SRS in the Everglades region (within ENP and BCNP) and the edge of Taylor Slough in the Southern Glades Wildlife and Environmental Area in Miami-Dade County. CSSS surveys resulted in a range map that divided the CSSS into six separate subpopulations, labeled as A through F (**Figure C.2.1-18**), with CSSS-A as the only subpopulation west of SRS (Curnutt et al. 1998).

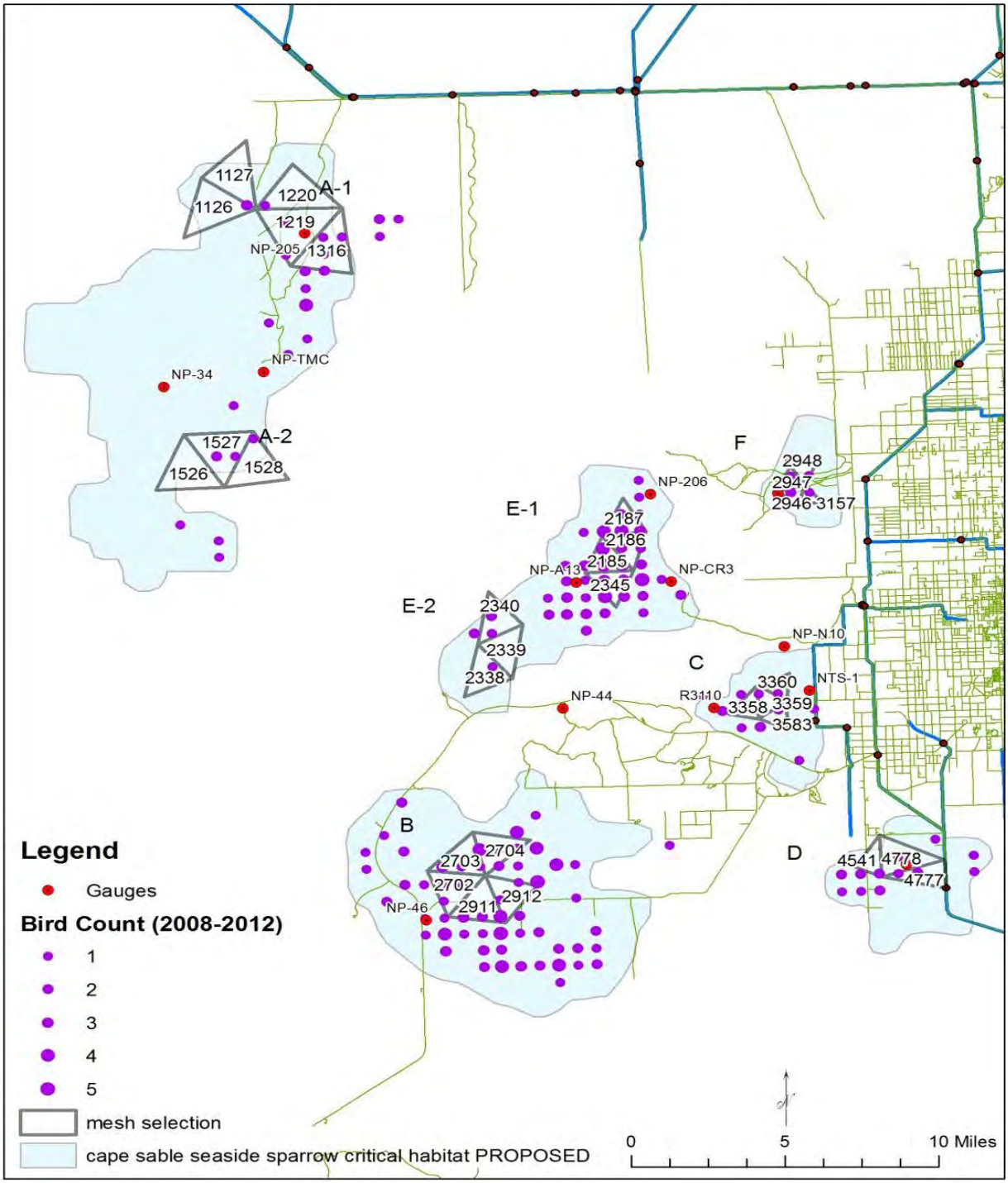

Figure C.2.1-18. Range of CSSS sub populations.

Effects of the action alternatives on the CSSS will be discussed below based on the appropriate PM.

PM-A NP-205 (CSSS-A): Provide a minimum of 60 consecutive days at NP-205 below 6.0 feet, NGVD beginning no later than March 15.

Cape Sable seaside sparrows build nests low to the ground around 14-17 cm. Male CSSS call for mates and set up territories when water levels drop below ground surface. Breeding behavior can be interrupted when water levels rise above ground surface. That is why it is important to maintain water levels below the ground surface for at least 60 days during the nesting season from March 1 to July 15. In order to compare action alternatives in relation to PM-A, the RSMGL simulated NP-205 daily stage was utilized. From this data, the number of consecutive dry days within the CSSS nesting window of March 1 through July 15 is counted. From this data, the number of years (N=41) that NP-205 was less than 6.0 feet, NGVD by March 15 was calculated (**Table C.2.1-5**) and is depicted in **Figure C.2.1-19**. **Table C.2.1-5** and **Figure C.2.1-19** compare the final array of alternatives with the FWO for 60 consecutive dry days at NP-205 between March 15 and July 15. There is little difference between the action alternatives, though Alt 2 performed slightly better than the other alternatives. However, there are differences between the action alternatives and the FWO in all action alternatives. The northern portion of the area occupied by CSSS-A and CSSS-F show a minor beneficial effect over FWO. The northern region within CSSS-A had 22-23 years met in the alternatives compared to 20 years met in the FWO. CSSS- F had 34-36 years met with the alternatives compared to 33 years met in the FWO. The southern region of CSSS- A and CSSS-E show a minor adverse effect compared to the FWO. The southern region of CSSS-A had 22-25 years met in the alternatives compared to 33 years met in the FWO. CSSS-E had 33-34 years met with the alternatives compared to 36 years met in the FWO. **Figure C.2.1-20**, **Figure C.2.1-21** and **Figure C.2.1-22** compare the duration of consecutive dry days between the alternatives and the FWO for the northern and southern regions of CSSS-A and CSSS-E, respectively, since this is where there were significant differences between the alternatives and the FWO. In the northern region of CSSS-A, there is very little difference between alternatives and a slight increase in the duration over the FWO (**Figure C.2.1-20**). However, in the southern region of CSSS-A, the FWO has significantly greater durations of dry periods over 60 days than any of the alternatives (**Figure C.2.1-21**). In CSSS-E, the FWO has a greater duration of consecutive dry days over 60 days than any of the alternatives (**Figure C.2.1-22**).

Table C.2.1-5. PM-A number of years there is a minimum of 60 consecutive days at NP-205 below 6.0 feet, NGVD beginning no later than March 15.

Sub Pop	Gage/Cell	Alt 1	Alt 2	Alt 3	Alt 4	FWO
A	IR-A1	22	23	22	22	20
	IR-A2	25	23	23	22	33
	P34	29	28	27	27	29
	TMC	28	29	26	28	32
B	CY3	40	40	40	40	40
C	R3110	39	39	39	39	39
	E112	38	39	38	40	38
D	EVER4	21	22	21	21	22
E	NE of NPA13	34	34	33	34	36
F	NE of RG2	36	35	34	35	33

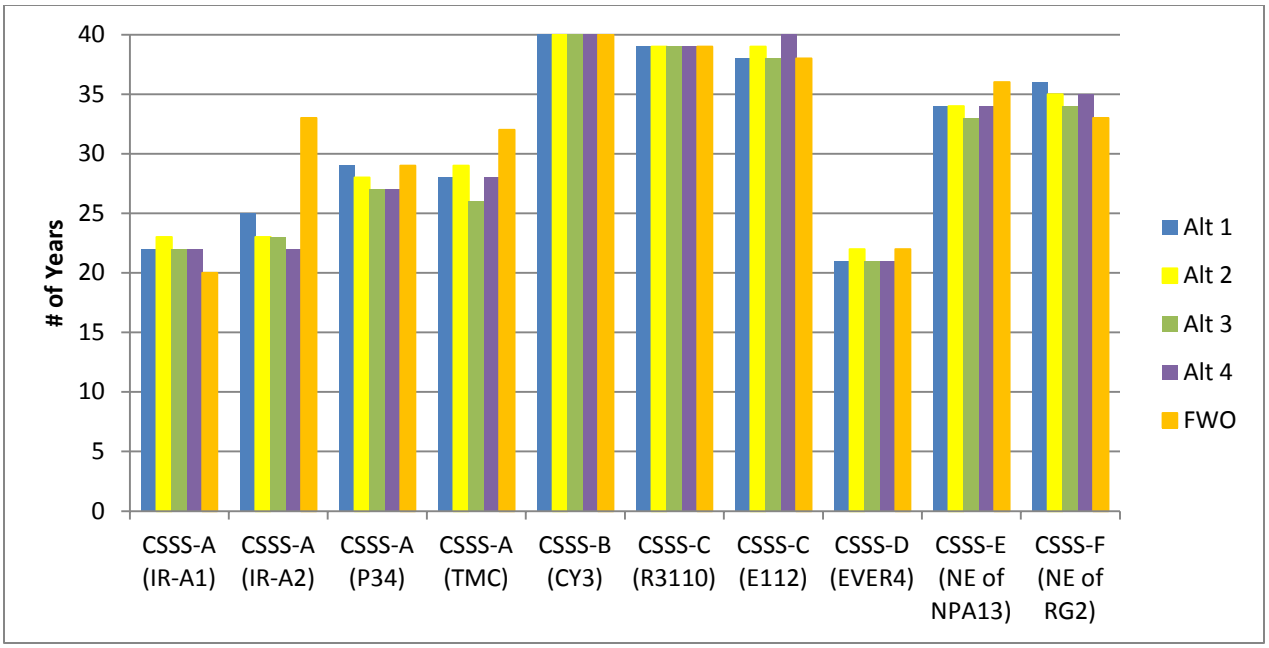

Figure C.2.1-19. PM-A: number of years a minimum of 60 consecutive days at NP-205 below 6.0 feet, NGVD beginning no later than March 15 is met out of the 40 year period of record.

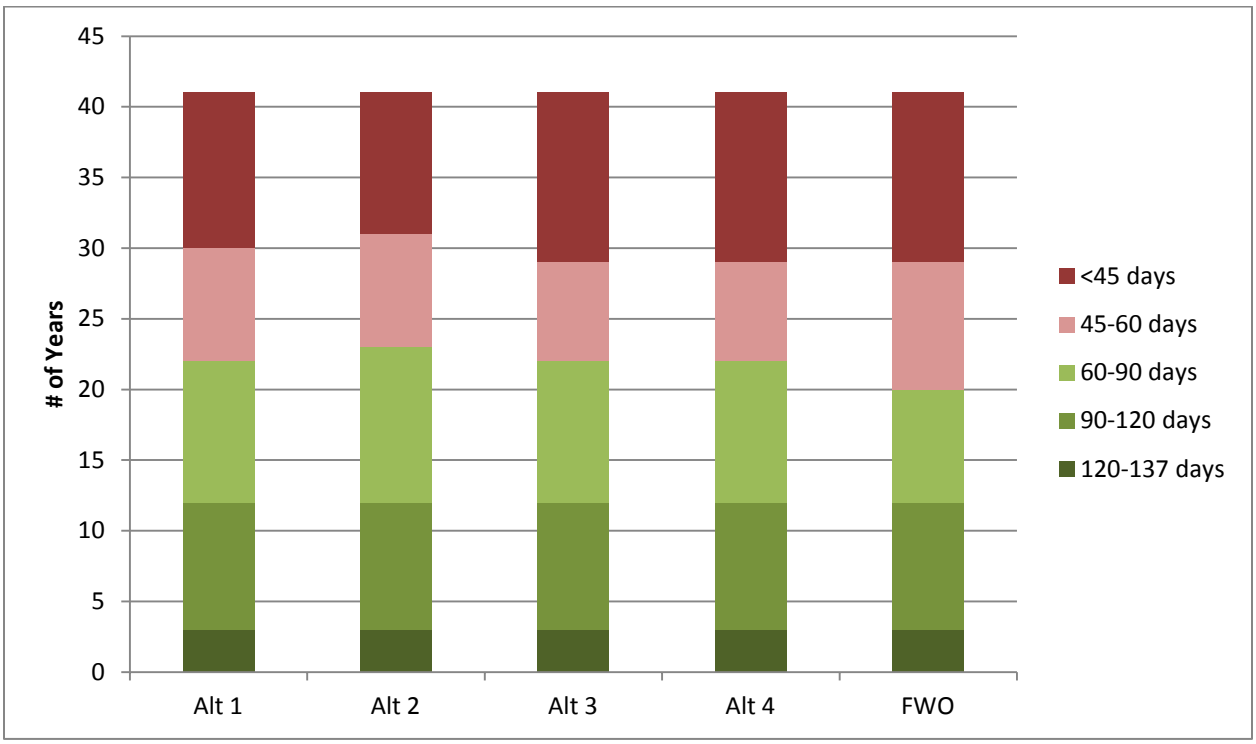

Figure C.2.1-20. Duration of consecutive dry days for the northern region of CSSS-A (IR-A1) between March 1 and July 15.

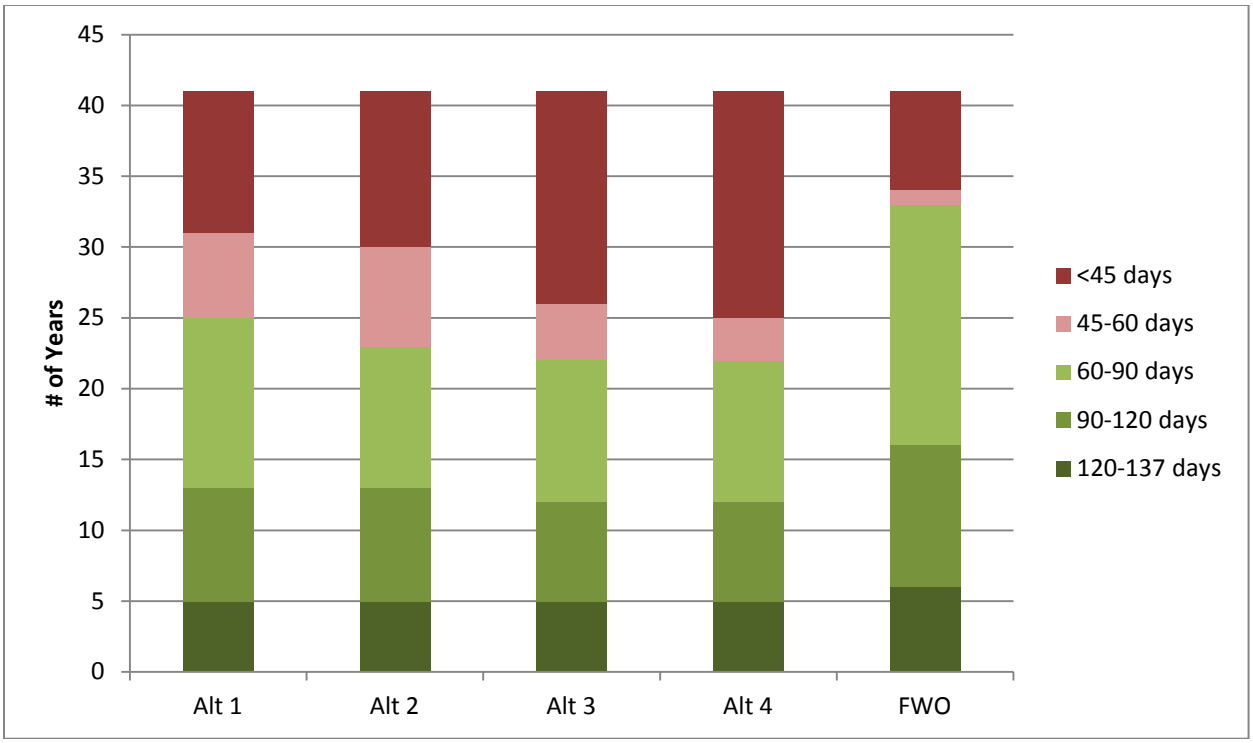

Figure C.2.1-21. Duration of consecutive dry days for the southern region of CSSS-A (IR-A2) between March 1 and July 15.

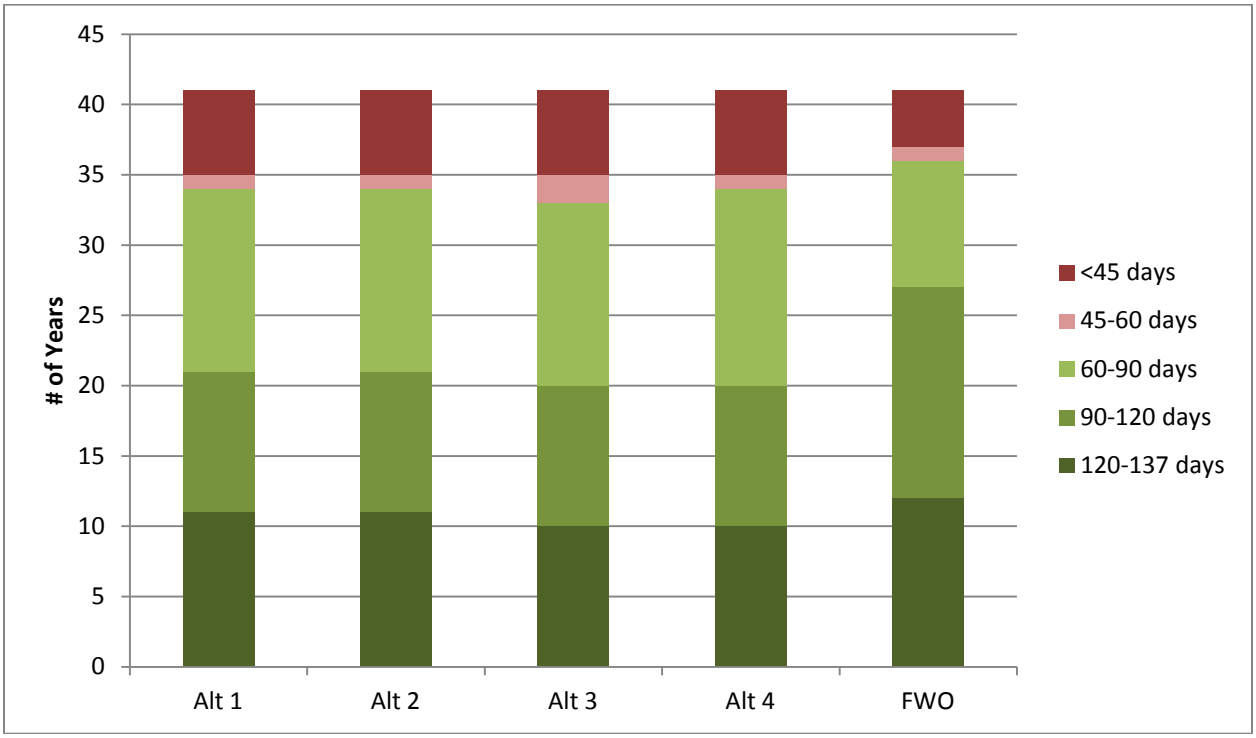

Figure C.2.1-22. Duration of consecutive dry days for CSSS-E (NE of NPA13) between March 1 and July 15.

ET-1 (NP-205, CSSS-A): Strive to reach a water level of less than or equal to 7.0 feet, NGVD at NP-205 by December 31 for nesting season water levels to reach 6.0 feet, NGVD by mid-March.

As illustrated by **Figure C.2.1-23**, ET-1 would have been achieved in 97 percent of years (39 of 40 years) under each of the CEPP action alternatives and the FWO.

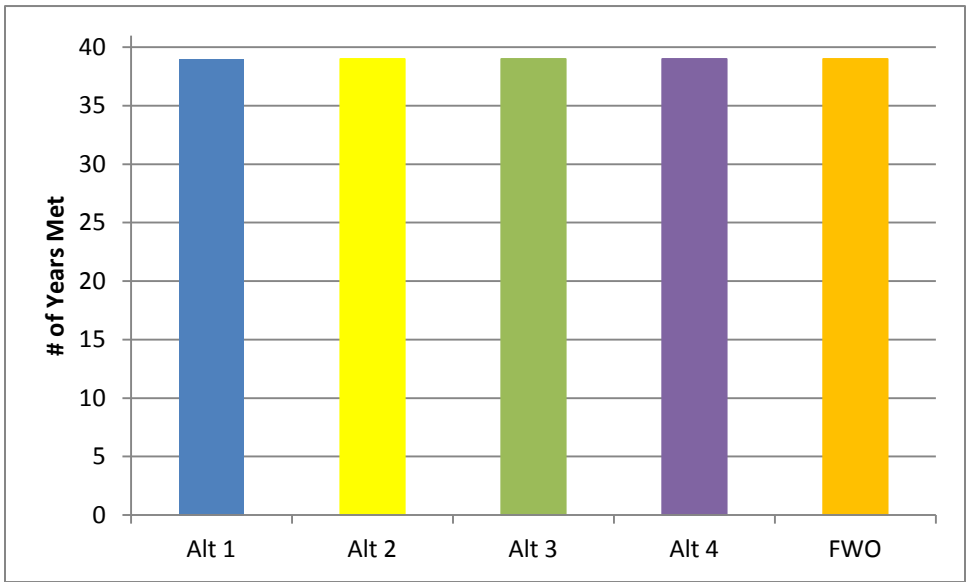

Figure C.2.1-23. ET-1 Number of years over the POR where water levels were at or below 7.0 ft at NP-205 by December 31 for nesting season water levels to reach 6.0 feet by mid-March for the four action alternatives and the FWO.

ET-2 (CSSS): Strive to maintain a hydroperiod between 90 and 210 days (three to seven months) per year throughout sparrow habitat to maintain marl prairie vegetation.

To maintain suitable habitat for CSSS, the annual hydroperiod (i.e., time above ground surface during wet season) should be between 90 and 210 days. Sparrows prefer to nest in short-stature clumped grasses such as *Muhlenbergia*, *Schizachryium*, and *Schoenus.* Habitat can tolerate infrequent years of up to 240 days and below 90 days. In order to compare action alternatives for hydroperiod throughout CSSS habitat, ETs were employed. RSM-GL results for each CSSS subpopulation are depicted in **Table C.2.1-6** and **Figure C.2.1-24** through **Figure C.2.1-35**. **Table C.2.1-6** and **Figure C.2.1-24** compare the final array of alternatives with FWO to maintain a hydroperiod between 90 and 210 days (three to seven months) per year throughout sparrow habitat to maintain marl prairie vegetation. In Northern Sub population A, all action alternatives perform the same and better than the FWO (10 years met compared to 6 years met in FWO) having a negligible or minor beneficial effect. In the southern Sub population A, all action alternatives perform the same, but slightly worse than FWO (8 years met compared to 9 years met in FWO) having a negligible or minor adverse effect. In Sub population B Alts 1, 3, and 4 perform slightly worse (24 years met) than Alt 2 and FWO (25 years met) having a negligible or minor adverse effect. In Sub population C, Alts 3 and 4 perform slightly better (20 years met) than Alt 2 and FWO (19 years met). Alternative 1 performs slightly worse (18 years met) than FWO (19 years met). In sub population D, Alts 2, 3, 4 and FWO performed slightly better (16 years met) than alternative 1 (15 years met). In sub population F, alternative 1 performed slightly better (20 years met) than alternatives 2 and 3 (19 years met), which performed slightly better than Alternative 4 and FWO (18 years met).

Table C.2.1-6. Number of years out of the period of record that the hydroperiod was between 90 and 210 days (three to seven months) each year throughout sparrow habitat in order to maintain marl prairie vegetation.

CSSS Sub Population	*Alt 1*	*Alt 2*	*Alt 3*	*Alt 4*	*FWO*
Northern A	10	10	10	10	6
Southern A	8	8	8	8	9
B	24	25	24	24	25
C	18	19	20	20	19
D	15	16	16	16	16
Northern E	19	19	19	19	24
Southern E	9	9	9	9	12
F	20	19	19	18	18

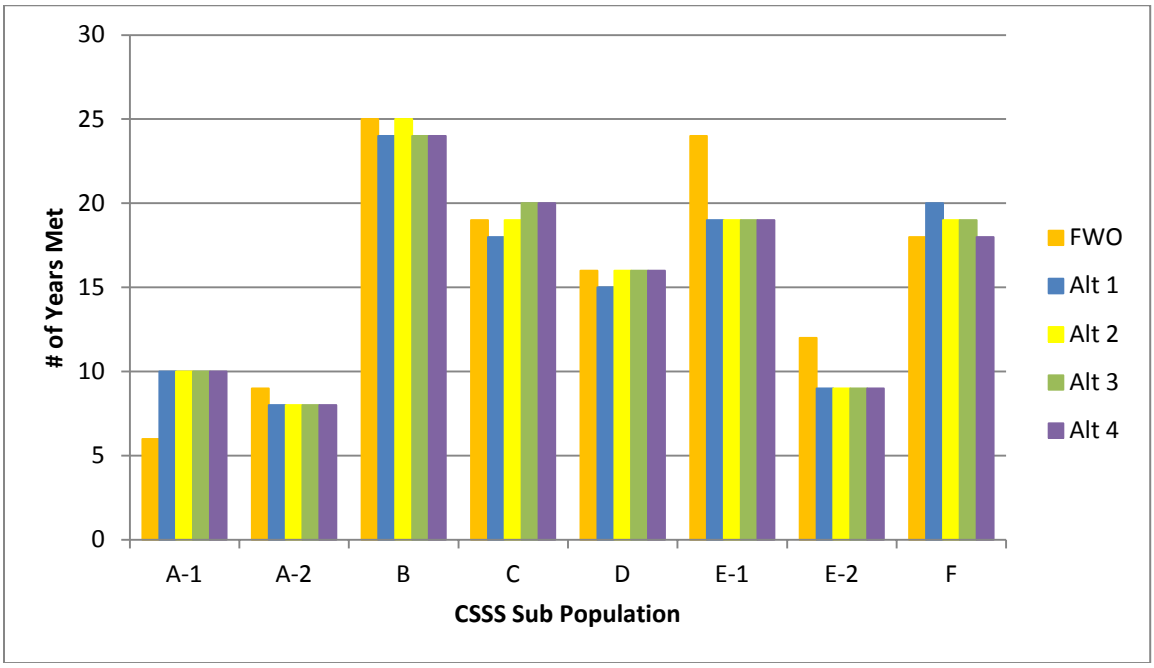

Figure C.2.1-24. Number of years out of the period of record that the hydroperiod was between 90 and 210 days (three to seven months) each year throughout sparrow habitat in order to maintain marl prairie vegetation.

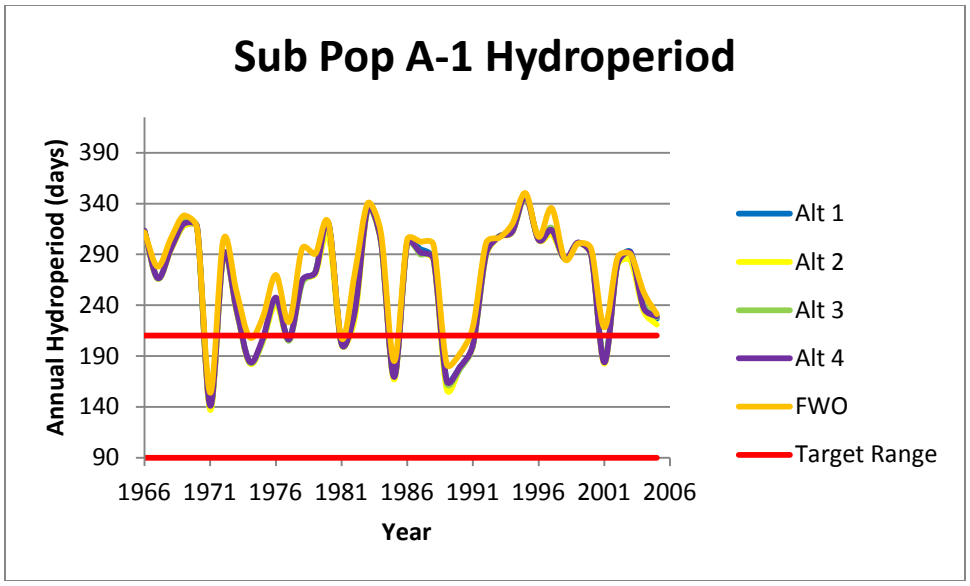

Figure C.2.1-25. Annual hydroperiod for the northern CSSS sub population A over the POR.

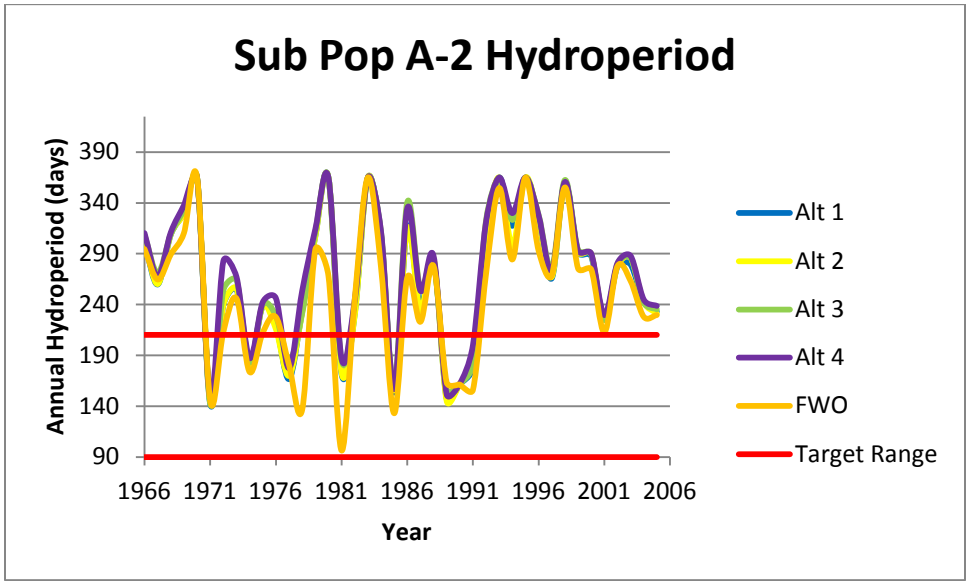

Figure C.2.1-26. Annual hydroperiod for the southern CSSS sub population A over the POR.

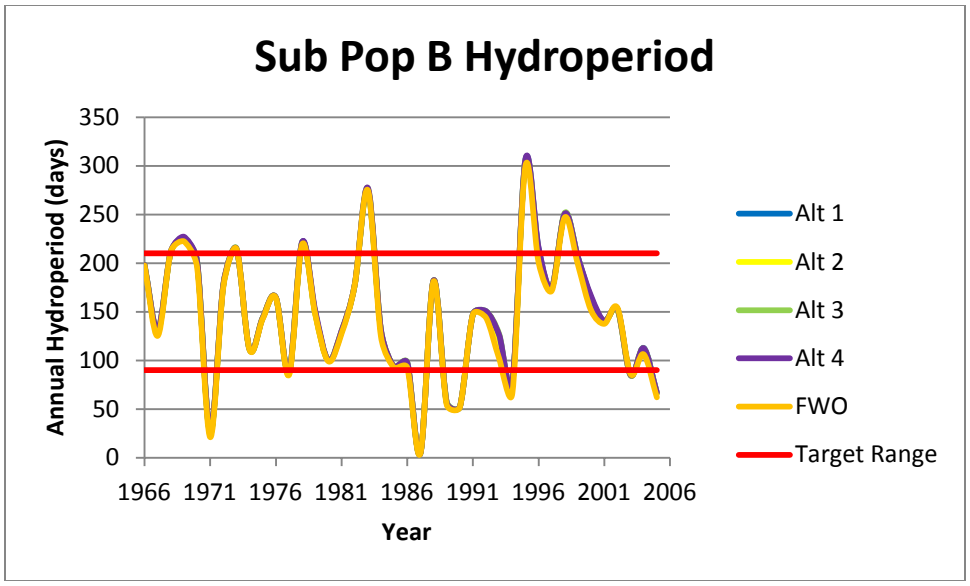

Figure C.2.1-27. Annual hydroperiod for the CSSS sub population B over the POR.

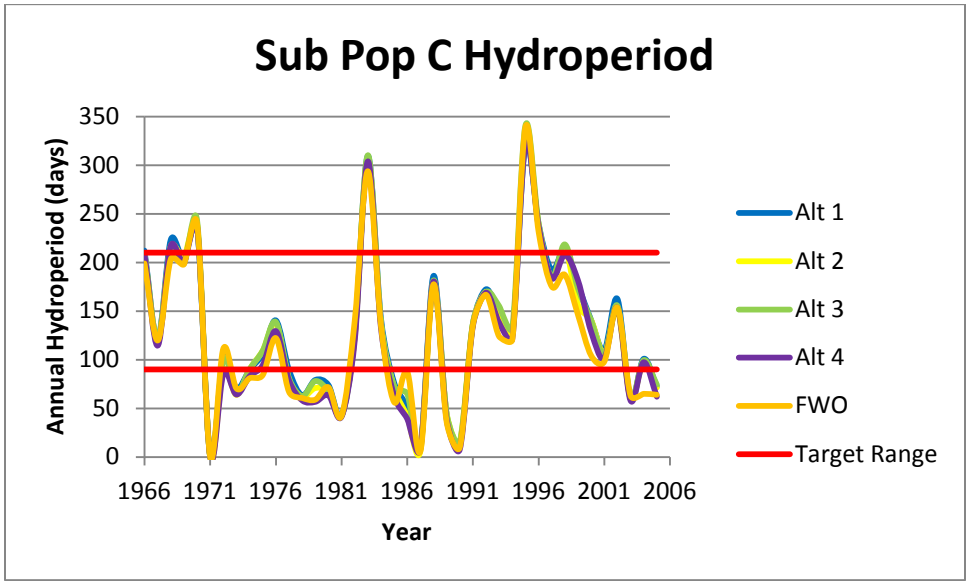

Figure C.2.1-28. Annual hydroperiod for the CSSS sub population C over the POR.

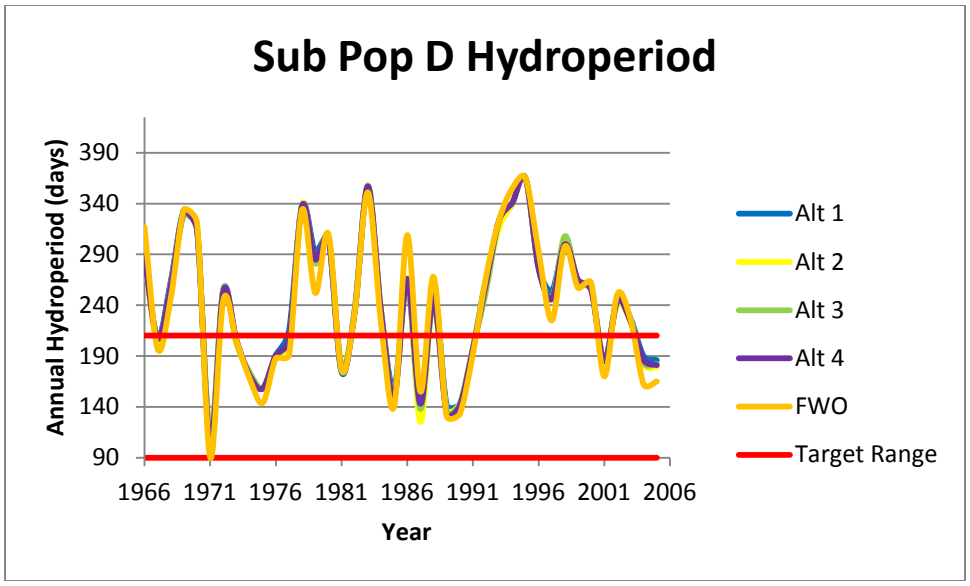

Figure C.2.1-29. Annual hydroperiod for the CSSS sub population D over the POR.

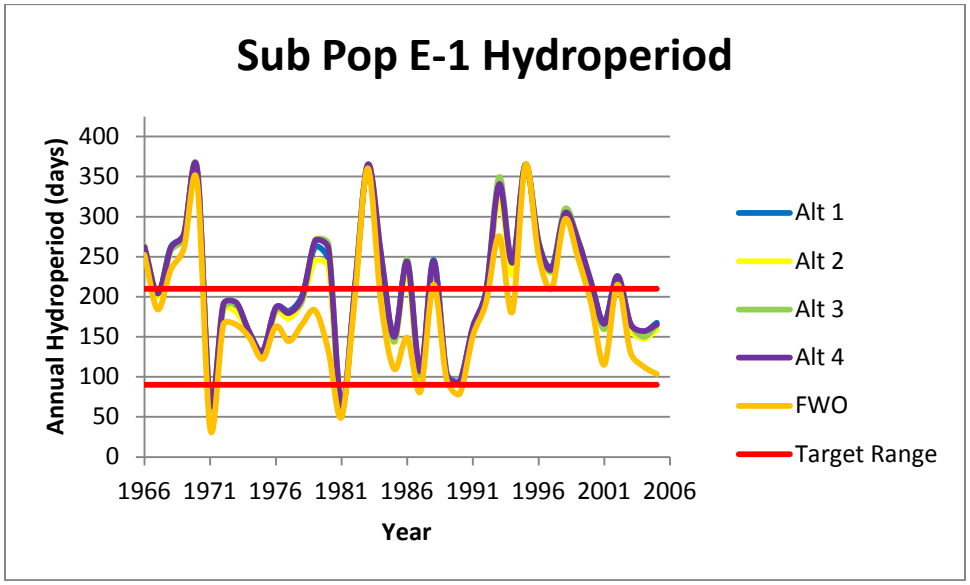

Figure C.2.1-30. Annual hydroperiod for the northern CSSS sub population E over the POR.

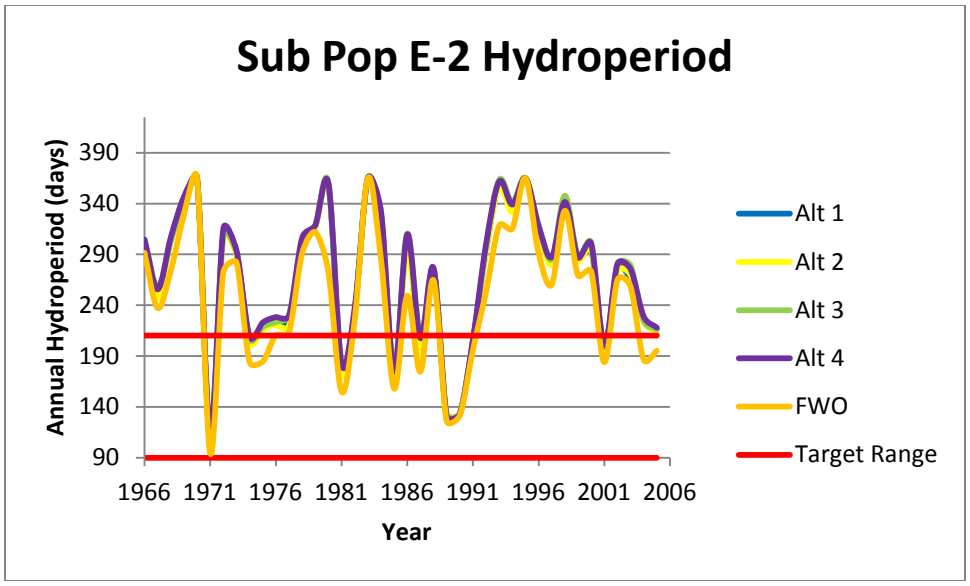

Figure C.2.1-31. Annual hydroperiod for the southern CSSS sub population E over the POR.

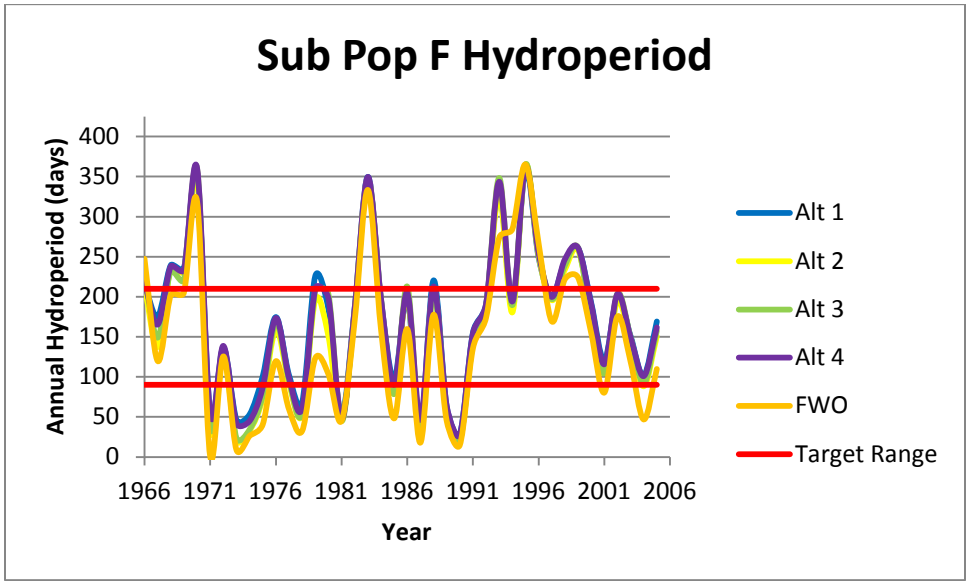

Figure C.2.1-32. Annual hydroperiod for the CSSS sub population F over the POR.

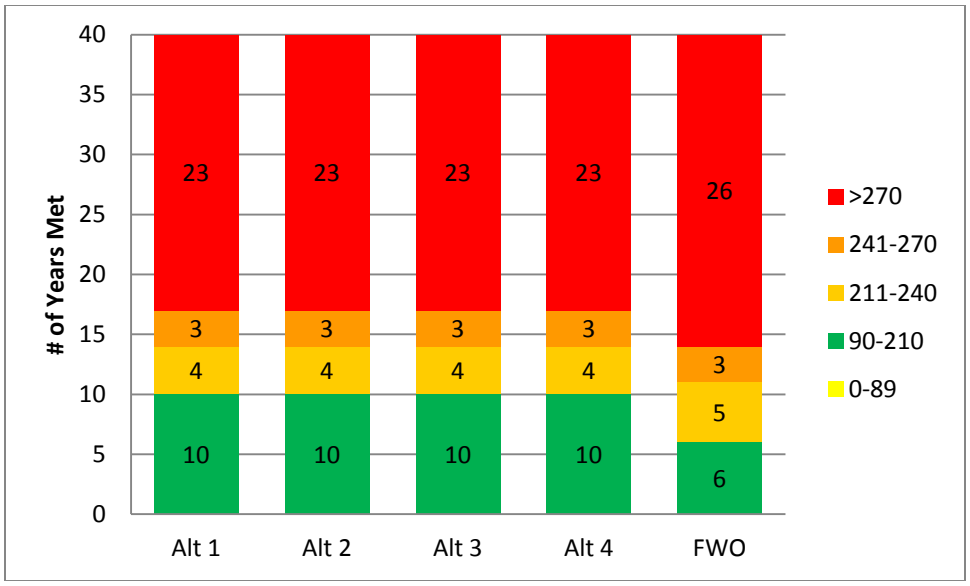

Figure C.2.1-33. Sub population A-1 hydroperiod.

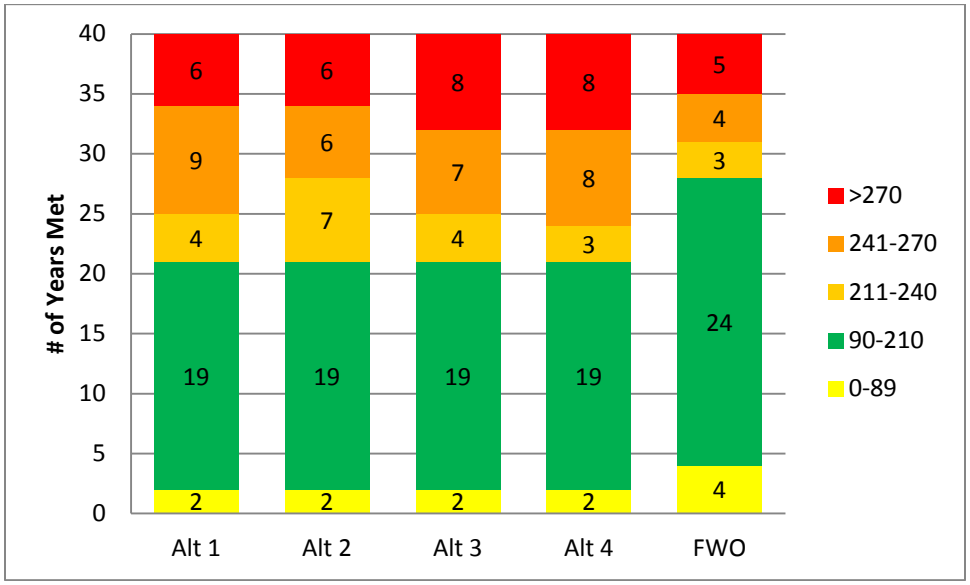

Figure C.2.1-34. Sub population E-1 hydroperiod.

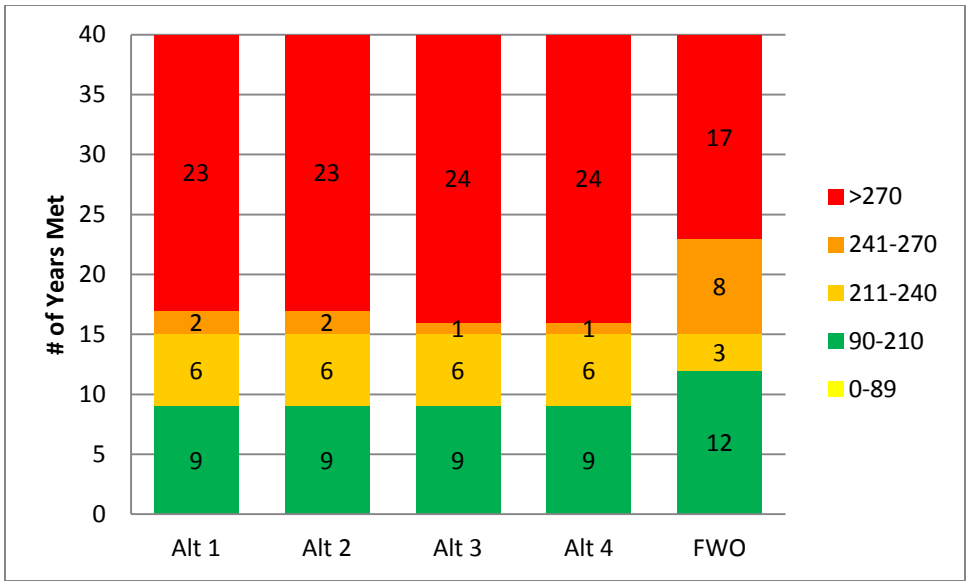

Figure C.2.1-35. Sub population E-2 hydroperiod.

In summary, implementation of any action alternative, with currently defined operations, has the potential to provide a major adverse affect on hydroperiods within the marl prairies adjacent to NESRS. Longer hydroperiods than the FWO are predicted within CSSS-E and southern portions of CSSS-A. Hydroperiods within northern CSSS-A are slightly reduced over the FWO, providing slightly better, but overall too wet conditions for marl prairie habitat and nesting CSSS. Alt 2 is slightly better performing overall, followed by Alts 1, 3, and 4. Nesting condition (or number of dry nesting days) proved to be a less sensitive metric than hydroperiod. Minor improvements were seen in northern CSSS-A and CSSS-F while performance was reduced in southern CSSS-A and E. Alternatives 1 and 2 were slightly better performing than Alts 3 or 4.

C.2.1.4.3 Wood Stork

Historically, the short hydroperiod wetlands within ENP have been important for wood stork foraging during the pre-breeding season with the storks shifting to longer hydroperiod wetlands as the dry season progresses. Hydrological patterns that produce a maximum number of patches with high prey availability (i.e. high water levels at the end of the wet season and low water levels at the end of the dry season) are necessary for high reproductive outputs (Gawlik 2002; Gawlik et al. 2004). Depending upon the elevation and microtopography throughout the WCAs and ENP, implementation of CEPP will produce a variety of wetland habitats that would support prey densities conducive to successful wading bird foraging and nesting.

Water depth and recession rate are the two most important hydrological variables for wood storks (Gawlik et al. 2004) and wading birds. In their analysis of habitat suitability, Gawlik et al. (2004) identified feeding sites where the weekly average water depths from November to April (pre-breeding and breeding season) were between 0.0 and 0.5 feet as the most suitable. Suitability drops to 0.0 when water depths are -0.3 feet below marsh surface or greater than 0.8 feet. Wood storks and other wading birds require recession to condense their prey items into shallow pools for more effective foraging. It is recognized that areas of suitable foraging habitat will vary both within and between years due to microtopography, antecedent conditions, hydrological and meteorological conditions, and water

management actions. It is anticipated that these provisions within CEPP will help to improve foraging conditions within WCA 3A and provide a direct benefit to the wood stork and other wading bird species. Implementation of all action alternatives would be expected to significantly improve conditions for wood storks throughout much of the Greater Everglades. Overall, Alts 3 and 4 perform the best in comparison with Alts 1 and 2.

Several models of wading birds were used to assess potential affects to wading birds within the Greater Everglades as a result of implementation of CEPP action alternatives including: 1) Wood Stork Foraging Probability Index model (South Florida Natural Resources Center 2013); 2) wading bird species distribution (Beerens 2013); and 3) wading bird nesting success (Beerens 2013). ERTP PMs are captured within the Beerens models.

An analysis of wood stork foraging potential was performed to predict improvements to foraging habitat with CEPP implementation (South Florida Natural Resources Center 2013b). The Wood Stork Foraging Probability Index (STORKI v. 1.0) was developed to provide rapid simulations of wood stork foraging conditions in response to modeled CERP scenarios (LoGalbo et al. 2012). The Wood Stork Foraging Probability Index indicates that northeastern WCA 3A and Miami Canal show the most substantial improvements to foraging habitat with all action alternatives performing between 70% to 130% better than FWO and providing moderate beneficial effects (**Figure C.2.1-36**). Improvements are also seen in northwestern WCA 3A, WCA 3B and southern ENP. Alternative 1 does not perform as well in northwestern WCA 3A as the other alternatives, portions of this area remain too wet during some portions of the breeding season. Alternatives 3 and 4 provided 50% to 68% more foraging habitat in WCA 3B and southern ENP respectively. However, in WCA 3B, Alt 2 appears to create conditions that are generally too wet for optimal foraging in most years. All action alternatives performed worse than the FWO in northern ENP (-85%) and WCA 3A South (up to -20%).

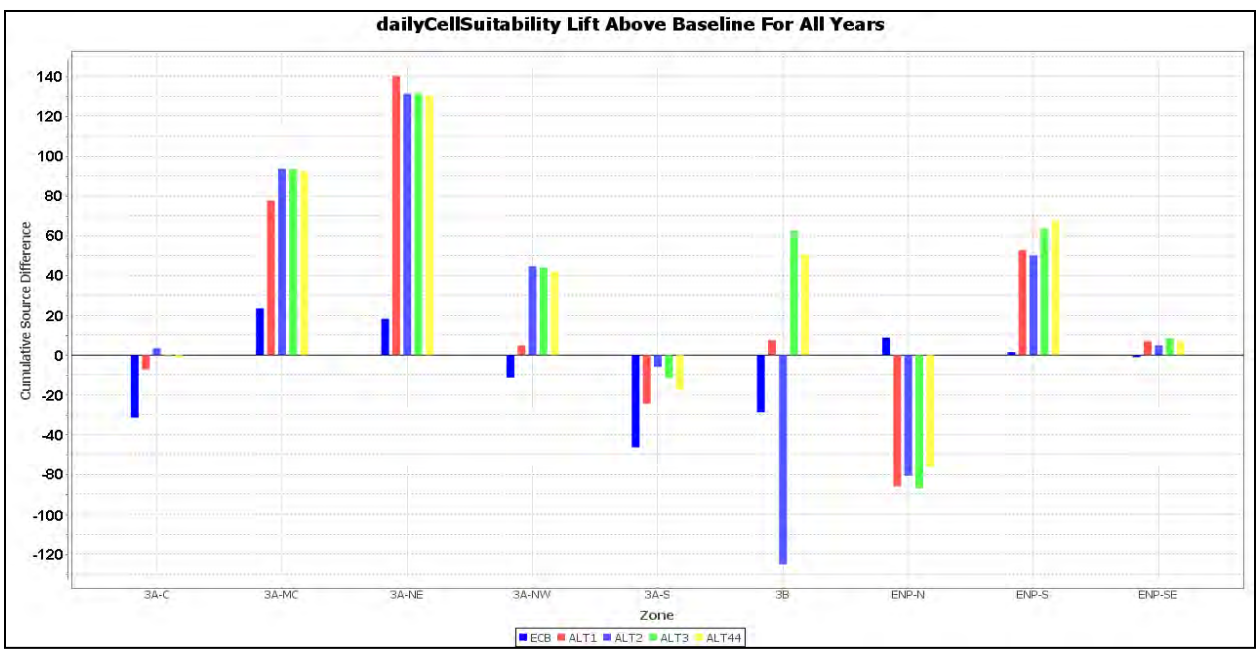

Figure C.2.1-36. Wood stork suitable habitat cumulative (1965-2005) lift above FWO for the action alternatives within each CEPP zone. A maximum score of 1327 is possible if FWO has a suitability score of 0.0 every week and the alternative has a suitability score of 1.0 every week of the 41 year hydrologic model runs. (South Florida Natural Resources Center 2013b)

The situation is less obvious than it appears in **Figure C.2.1-37** for northern ENP. **Figure C.2.1-38** illustrates weekly suitability scores for all the action alternatives at ENP N. FWO exhibits a wide fluctuation of suitability scores over the breeding season. The gravity-driven flowway of Alt 4 results in even larger score fluctuations. High scores are sometimes offset from FWO/ECB, and Alt 4 high foraging scores substantially exceed those of FWO or any of the other alternatives. Alternatives 1, 2, and 3, in contrast, moderate both the highs and lows and, in doing so, reduce the overall foraging suitability for wood stork, as is reflected in **Figure C.2.1-37**. **Figure C.2.1-38** is substantially misleading with respect to Alt 4. Rather than being less desirable than FWO, Alt 4 substantially improves habitat during appropriate parts of the season and reflects a more natural system dynamic over the entire season providing moderate beneficial effects. For comparison, **Figure C.2.1-39** plots the weekly time series of foraging suitability for the Miami Canal CEPP zone. Here, all of the action alternatives are in close agreement and generally, though not always, exceed FWO. (South Florida Natural Resources Center 2013b)

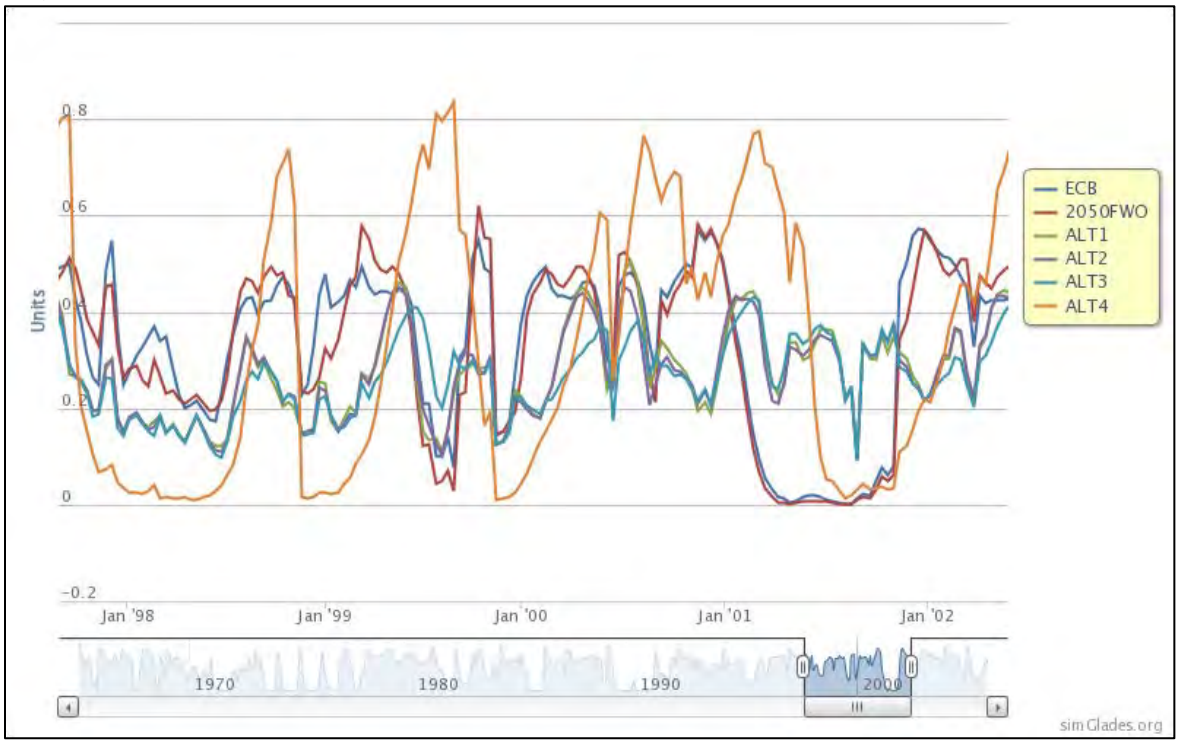

Figure C.2.1-37. Time series of wood stork foraging suitability scores at CEPP zone ENP-N. Scores vary from 0.0 (not suitable) to 1.0 (optimal foraging). To improve clarity, the plot focuses on an abridged time period between July 1997 and July 2002. Other time periods have similar relationships among the action alternatives. (South Florida Natural Resources Center 2013b)

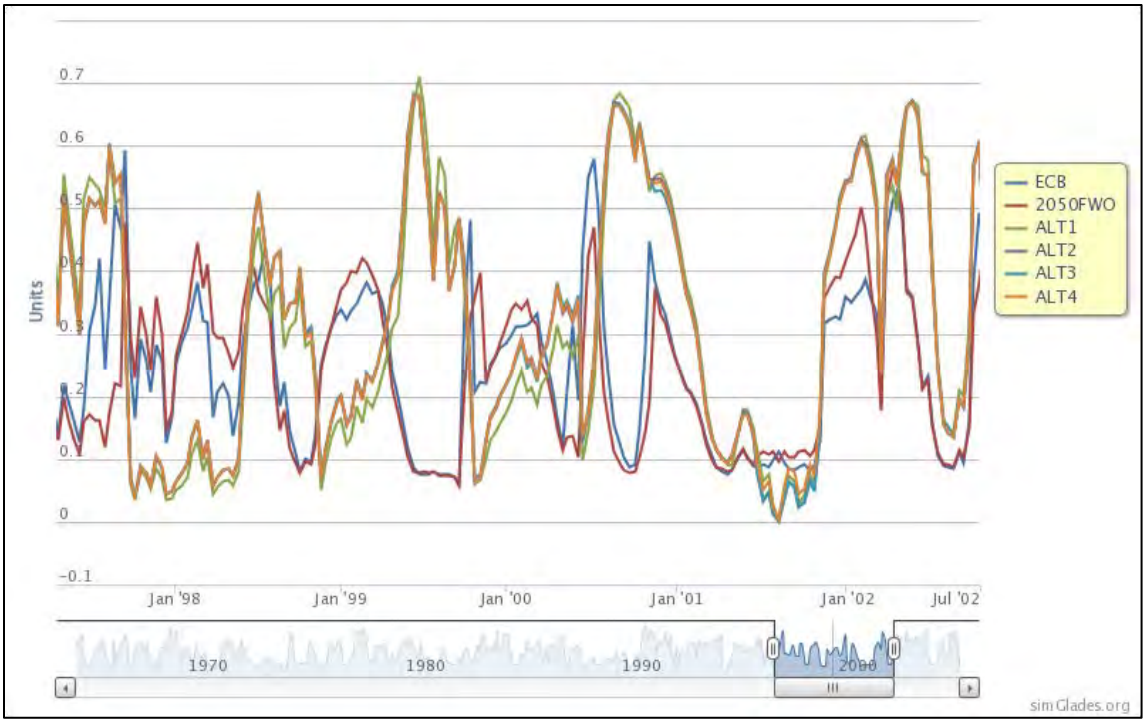

Figure C.2.1-38. Time series of wood stork foraging suitability scores at CEPP zone WCA3A-MC. (South Florida Natural Resources Center 2013b)

When scores are aggregated by WCA the trends are similar (**Figure C.2.1-39**), but lifts are compressed by aggregation over a larger area. **Figure C.2.1-39** includes the addition of WCA 2 and WCA 1 which are outside CEPP action area. WCA 2 has a small (1%) loss of forage suitability resulting from water being redirected from WCA 2 to WCA 3A. WCA 1 foraging suitability change is negligible (ENP 2013).

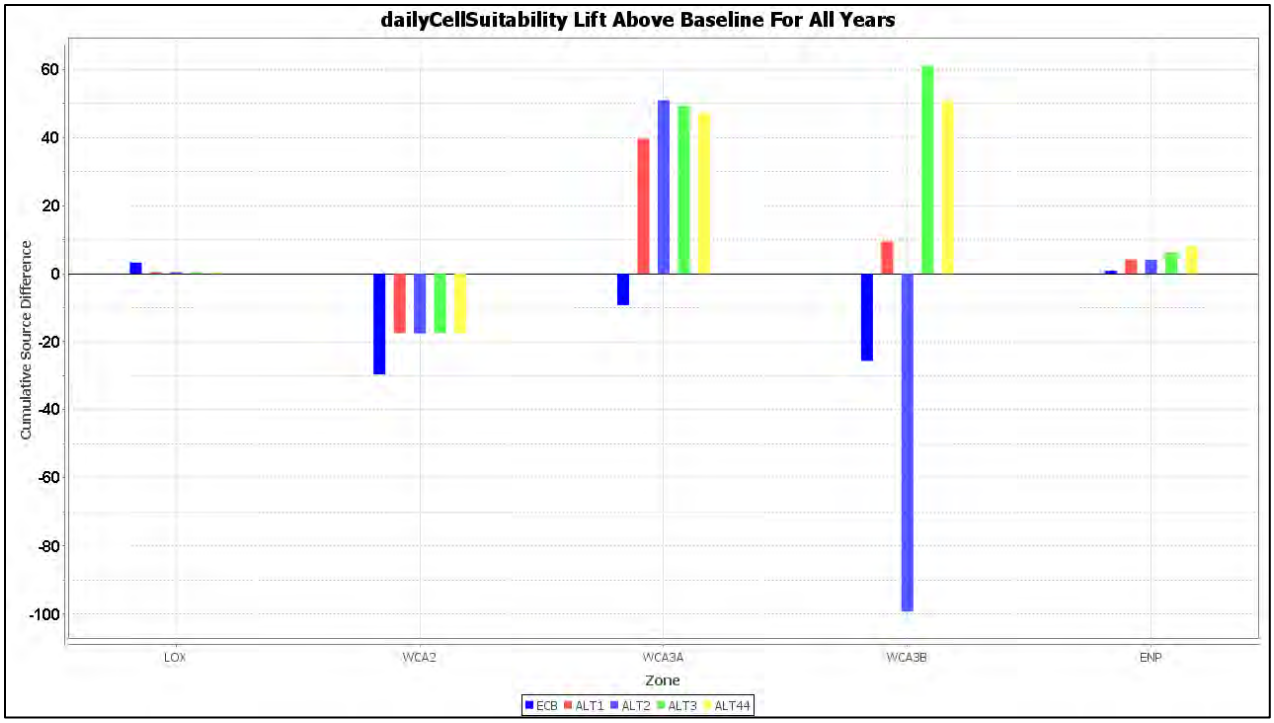

Figure C.2.1-39. Wood stork suitable habitat cumulative (1965-2005) lift above FWO for the action alternatives within each water conservation area (WCA) and ENP. (South Florida Natural Resources Center 2013b)

Wood stork, white ibis, and great egret species distribution were modeled by Beerens et al. 2013 in support of the RECOVER Greater Everglades ecological evaluation. Wood storks generally showed increased numbers in northern WCA 3A and southern ENP for the four action alternatives compared to the FWO. White ibis numbers were also greater in northern WCA 3A and southern ENP, but also in part of central WCA 3A for all action alternatives. The great egret model showed improvements in northern WCA 3A, southern ENP, Central WCA 3A, and WCA 3B, but also indicated reductions in presence in northern ENP.

The wading bird nesting models predict the number of nests for the wood stork, white ibis, and great egret species (Beerens 2013). All four action alternatives generally performed better for great egret, white ibis, and wood stork nesting than FWO providing moderate beneficial effects. In the northern Everglades each alternative showed fewer nests than FWO for white ibis and wood storks, but more nests than FWO for egrets. However, in the southern Everglades, the action alternatives performed better than FWO. The Great Egret nesting model showed the biggest benefit in raw numbers of nests but the Wood Stork model showed a more significant benefit relative to its population size (Beerens 2013). This pattern of better wading bird nesting in the southern Everglades than northern Everglades is not unexpected and is consistent with the prediction that nesting trends in a restored Everglades would increase in the coastal zone, rather than system wide (RECOVER 2009). In the southern Everglades, Alt 3 performed best for white ibis and great egret, whereas Alts 1 and 2 performed best for wood storks.

As compared with FWO, all CEPP action alternatives reveal the potential for short-term negative effects to aquatic vegetation within Lake Okeechobee due to higher than preferred lake stages. As a result, temporary reductions in foraging habitat for shorebirds and short-legged wading birds could occur.

However, these multiple day events in which Lake Okeechobee stage exceeded 15.0 feet NGVD occurred approximately 5% of the POR.

C.2.1.4.4 Eastern Indigo Snake

The Eastern indigo snake is the largest native non-venomous snake in North America. It is an isolated subspecies occurring in southeastern Georgia and throughout peninsular Florida. The Eastern indigo snake prefers drier habitats, but may be found in a variety of habitats from xeric sandhills, to cabbage palm hammocks, to hydric hardwood hammocks (Schaefer and Junkin 1990). Eastern indigo snakes need relatively large areas of undeveloped land to maintain their population. The main reason for its decline is habitat loss due to development. Further, as habitats become fragmented by roads, Eastern indigo snakes become increasingly vulnerable to highway mortality as they travel through their large territories (Schaefer and Junkin 1990).

In south Florida, the Eastern indigo snake is thought to be widely distributed. Given their preference for upland habitats, Eastern indigo snakes are not commonly found in great numbers in the wetland complexes of the Everglades region, even though they are found in pinelands, tropical hardwood hammocks, and mangrove forests in extreme south Florida (Duellman and Schwartz 1958; Steiner et al. 1983).

One of the CEPP project features in all action alternatives is a FEB in A-2. This would convert approximately 14,000 acres of former agricultural land to a wetland functioning area. The proposed A-2 FEB consists almost exclusively of drained marsh that has been converted to agriculture. Currently, the main crop is sugar cane, although rice has also been observed in some fields. A few areas have become overgrown with exotic Brazilian pepper, willow, dog fennel, and grasses including invasive exotic Napier grass. Only two soil types occur in the project area: Pahokee Muck and Lauderhill Muck (NRCS 2012). Both types consist of very poorly drained organic materials that commonly occur in broad freshwater marshes. These soil types indicate hydric soils/wetland areas, which was originally in place prior to human actions. One of the CEPP goals is to help restore lands back to a more natural condition, which in the FEB area, would be considered wetlands.

No natural standing water features are present in the A-2 FEB project area. Natural sloughs and channels are evident in aerial photographs from the 1940s as well as those taken as recently as 2012. These natural sloughs and channels are much drier due to drainage changes, but are the first areas to be inundated during rains. Man-made drainage features such as ditches and narrow canals traverse the A-2 FEB and are continually being modified and created in response to agricultural needs.

Since Eastern indigo snakes occur primarily in upland areas, their presence within the Greater Everglades portion of the project area is somewhat limited. The hydrologic effects of the proposed project are expected to benefit existing or historic wetlands. Once the Miami Canal is backfilled, created tree islands will be constructed, which would potentially provide habitat for the indigo snakes, perhaps offsetting the increased hydroperiods within WCA 3. In addition, improvements to mangrove communities adjacent to Florida Bay may also benefit Eastern indigo snakes within those areas. However, eastern indigo snakes have a high probability of occurrence within the proposed A-2 FEB site and as a result of construction of the A-2 FEB are likely to be displaced, thereby removing approximately 14,000 acres of potential habitat and having a major adverse effect.

C.2.1.4.5 Florida Manatee

The federally endangered Florida manatee is a large, plant-eating aquatic mammal that can be found in the shallow coastal waters, rivers, and springs of Florida. Florida manatees live in freshwater, brackish, and marine habitats, and can move freely between salinity extremes. Florida manatees have been observed in conveyance canals within the action area, specifically in the lower C-111 Canal just downstream of S-197; and adjacent nearshore seagrass beds throughout Florida Bay including all waters of Card, Barnes, Blackwater, Little Blackwater, Manatee and Buttonwood sounds. The extensive acreages of seagrass beds in the bay provide important feeding areas for Florida manatees. Decreased salinities within the Northern Estuaries that reduce stress on SAV and promote increases in seagrass shoots have the potential to increase foraging opportunities for manatees in this region and provide a minor beneficial effect. Similarly, increased freshwater flows to Florida Bay and the southwestern coastal estuaries resulting in lowered salinity levels that better encompass seagrass salinity tolerance ranges would also increase foraging opportunities for manatees and provide a minor beneficial effect. Alternative 4 provides the greatest benefit, followed by Alts 3, 1 and 2 (refer to **Section C.2.1.3.5.2, Seagrass Beds** for further information).

Florida manatees also depend upon canals as a source of freshwater and resting sites. It is highly likely that Florida manatees also depend on the deep canals as a cold-weather refuge. The relatively deep waters of the canals respond more slowly to temperature fluctuations at the air/water interface than the shallow bay waters. Thus, the canal waters remain warmer than open bay waters during the passage of winter cold fronts. **Figure C.2.1-40** illustrates canals that Florida manatees have access to within CEPP action area. All CEPP action alternatives include backfilling of portions of the Miami Canal north of Interstate 75. Although **Figure C.2.1-40** shows that manatees can access portions of the Miami Canal, backfilling as described under CEPP is not likely to adversely affect manatees.

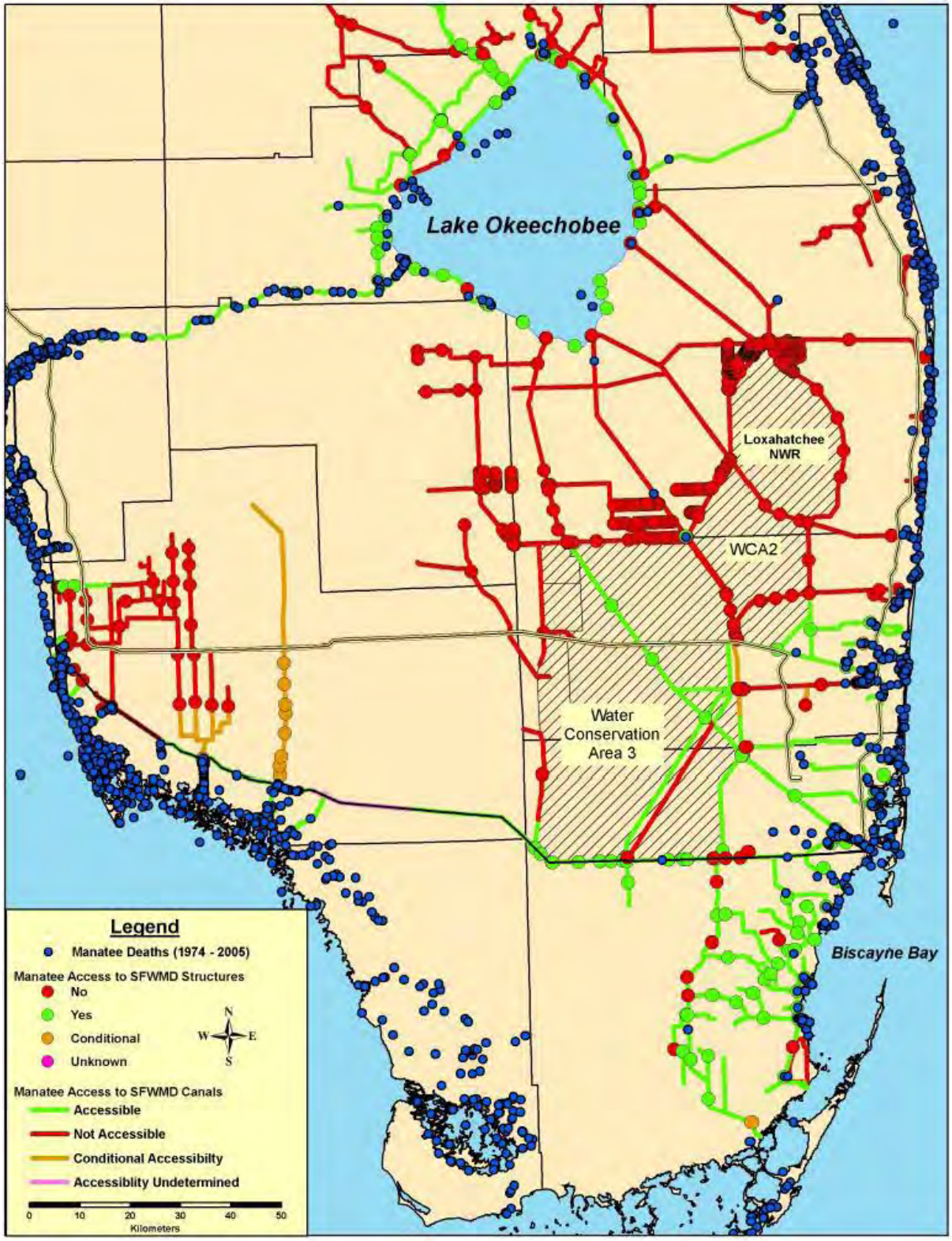

Figure C.2.1-40: Canals that Florida manatee have access to within CEPP action area.

C.2.1.4.6 Florida Panther

The federally endangered Florida panther (*Puma concolor cory)* was once the most widely distributed mammal (other than humans) in North and South America, but it is now virtually exterminated in the eastern United States. Habitat loss has driven the subspecies known as the Florida panther into a small area, where the few remaining animals are highly inbred, causing such genetic flaws as heart defects and sterility. Recently, closely-related panthers from Texas were released in Florida and are successfully breeding with the Florida panthers. Increased genetic variation and protection of habitat may save the subspecies. Florida panthers presently inhabit lands in ENP adjacent to the Southern Glades, and radio tracking studies have shown that they venture into the Southern Glades on occasion during post-breeding dispersion. Reference is made to the revised Panther Key and Panther Focus Area Map for use in determining effects to the Florida panther.

All action alternatives have the potential to have a minor adverse effect on both the Primary and Secondary Zones for Florida panther habitat. Construction of the 14,000 acre FEB within the A-2 parcel in EAA would result in conversion of upland habitat that could be potentially used by Florida panther to transverse the area to wetland habitat, thereby eliminating potential habitat within the panther secondary zone in this region. In addition,

Since potentially suitable habitat occurs within the action area, increased water deliveries under all CEPP action alternatives to ENP could affect Florida panther habitat, with the greatest potential affects viewed under Alts 4 and 3. However, as lands within CEPP action area become restored to their more historic natural values, the concomitant improved prey base would result in greater use by the Florida panther utilizing these areas. Based on this information, and the fact that the Florida panther is a wide-ranging species with the majority of sightings west of the action area, the proposed action may affect the Florida panther.

C.2.1.4.7 American Alligator

A keystone species within the Everglades ecosystem, the American alligator (*Alligator mississippiensis*) is dependent on spatial and temporal patterns of water fluctuations that affect courtship and mating, nesting, and habitat use (Brandt and Mazzotti 2000). Historically, American alligators were most abundant in the peripheral Everglades marshes and freshwater mangrove habitats, but are now most abundant in canals and the deeper slough habitats of the central Everglades. Water management practices including drainage of peripheral wetlands and increasing salinity in mangrove wetlands as a result of decreased freshwater flows has limited occurrence of American alligators in these habitats (Craighead 1968, Kushlan 1990, Mazzotti and Brandt 1994). A HSI for alligators was employed to predict potential effects of implementation of CEPP action alternatives. The HSI measures habitat suitability annually for five components of alligator production: (1) land cover suitability, (2) breeding potential (female growth and survival from April 16 of the previous year - April 15 of the current year), (3) courtship and mating (April 16 – May 31), (4) nest building (June 15 – July 15), and egg incubation (nest flooding from July 01 – September 15). (South Florida Natural Resources Center 2013a).

Results indicate that all CEPP action alternatives improve alligator habitat suitability as compared with FWO and provide a minor beneficial effect. Although the greatest improvements were seen in WCA3A with Alt 1, the results were not significantly different from those provided by Alts 4, 2 and 3 respectively. The greatest increase in benefits for all action alternatives as compared with FWO is visible within northern WCA 3A (CEPP Zones 3A-MC, 3A-NE and 3A-NW). All of the alternative plans improve alligator habitat by as much as 20% (**Figure C.2.1-41**) due to additional water deliveries within this region. In

northwestern WCA 3A, Alt 1 provided the greatest increase in habitat suitability as compared with Alts 2, 3 and 4, which is likely due to the location of the western spreader canal concentrating flow within that region. Gains are smaller in central WCA 3A, WCA 3B, and northern ENP with modest variations in which alternative best improves scores (**Figure C.2.1-42**). Changes within southern WCA 3A and south-eastern ENP are negligible. In southern WCA 3A, Alt 1 performed best overall with a decline in habitat suitability viewed for Alt 3 as compared with FWO. In contrast, in WCA 3B, the greatest improvements over FWO were viewed in order of greatest improvement with Alt 3, 2, 1 and 4. Within ENP, Alts 4 and 3 provided the greatest benefit, respectively, as compared with Alts 2 and 1 which showed similar results. In summary, increasing freshwater flow through the Greater Everglades into ENP under all CEPP action alternatives would provide increased benefits to alligators within these habitats in comparison with FWO. (South Florida Natural Resources Center 2013a)

Minor adverse effects to alligators that utilize the Miami Canal would occur under all of the CEPP action alternatives due to backfilling of the Miami Canal. However, these effects are expected to be short-term as alligators will expand into other areas of suitable habitat created as a result of CEPP implementation. Alternatives 1 would provide the least impact to alligators within the Miami Canal due to lesser extent of backfill.

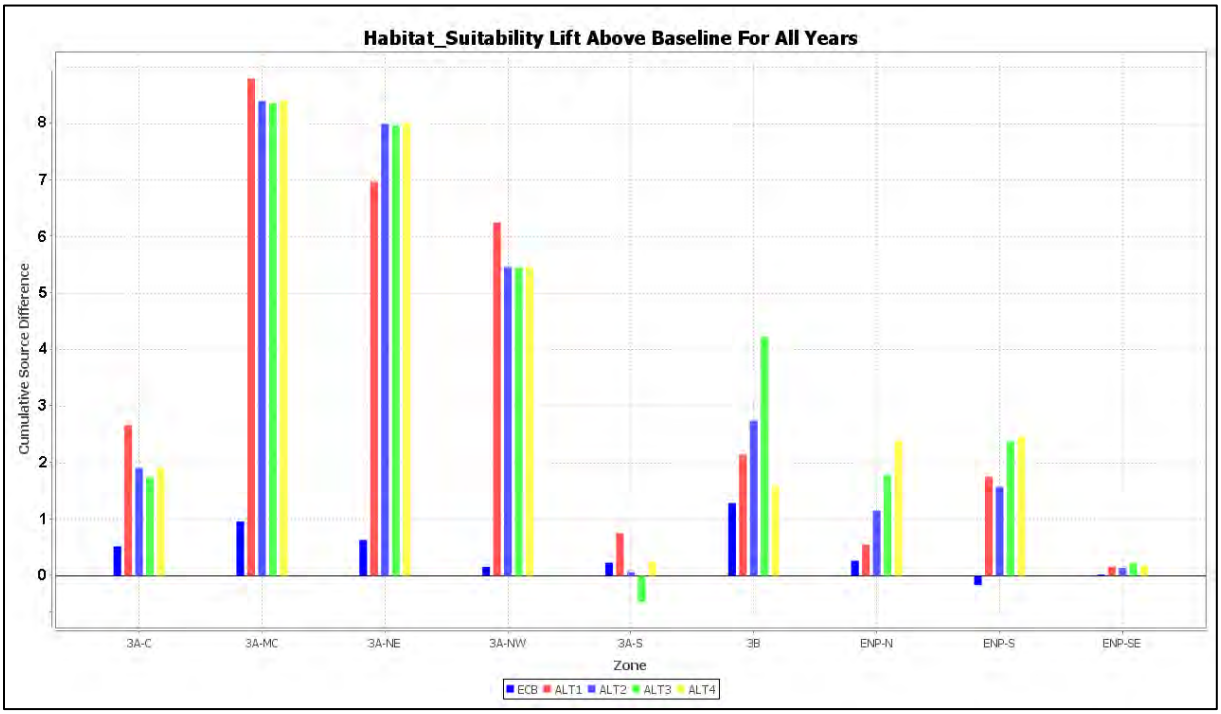

Figure C.2.1-41. Alligator suitable habitat cumulative (1965-2005) lift above FWO for the action alternatives within each CEPP zone. A maximum score of 41 is possible if FWO has a suitability score of 0.0 every year and the alternative has a suitability score of 1.0 every year. (South Florida Natural Resources Center 2013a)

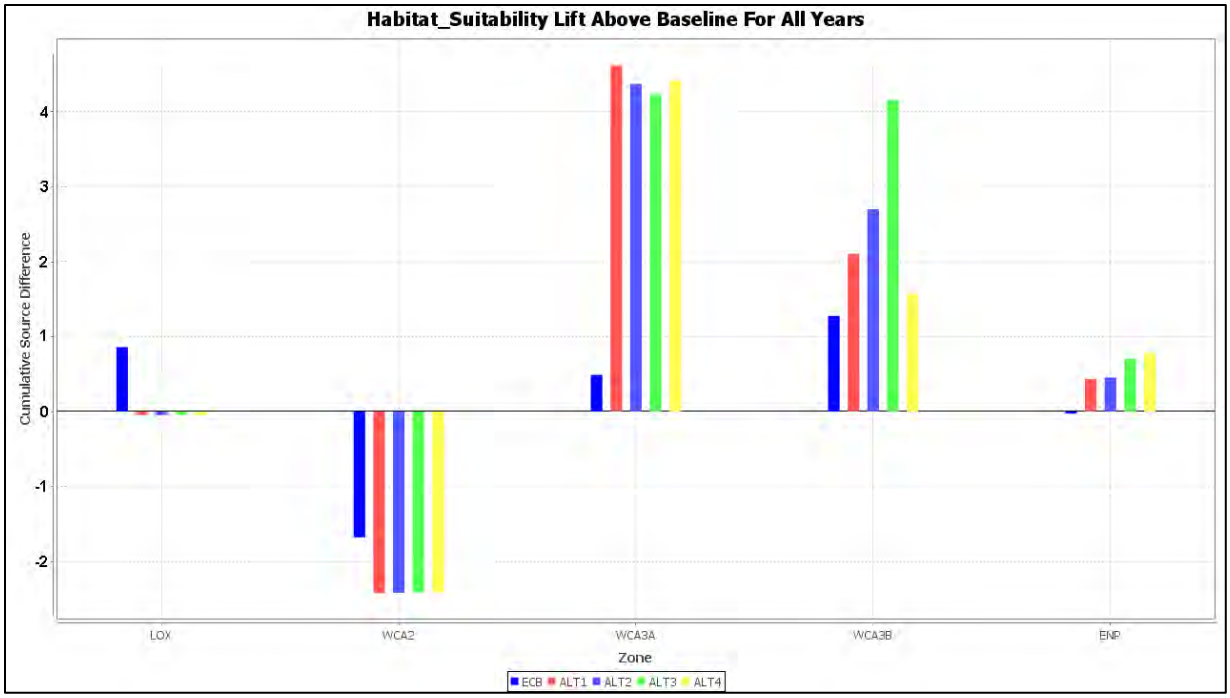

Figure C.2.1-42. Alligator suitable habitat cumulative (1965-2005) lift above FWO for the action alternatives within each water conservation area (WCA). (South Florida Natural Resources Center 2013a)

C.2.1.4.8 American Crocodile

A HSI for juvenile American crocodiles (*Crocodylus acutus*) was employed to predict potential effects of implementation of CEPP Alts 1-4 (Brandt 2013). The crocodile growth and survival index used in this analysis is one of the components of a crocodile HSI that characterizes suitable habitat for crocodiles based on habitat, location of known nest sites, salinity, and prey biomass. The growth and survival index is calculated for August through December, the period following hatching when hatchlings are most vulnerable to high salinities (Moler 1992; Mazzotti 1999; Mazzotti et al. 2007). For this analysis, data from salinity monitoring stations at Joe Bay, Trout Cove, Little Madeira Bay (the stations among the available stations closest to where the highest densities of crocodile nests are) and Long Sound, Little Blackwater Sound, Terrapin Bay and Garfield Bight (generally closer to shoreline stations in areas where crocodiles could occur) are used as input to HSI. Each day between August 1 through December 31 is assigned a score based on the following salinity ranges: salinity <20 psu was assigned the highest score of 1 because salinity in this range is considered most favorable for juvenile crocodile growth and survival (Moler 1992; Mazzotti 1999; Mazzotti et al. 2007); salinity ≥ 20 and <30 psu was assigned a score of 0.6; ≥30 and <40 psu was assigned a score of 0.3, and >40 psu a score of 0. Average yearly and an average overall score were calculated.

Results from applying the salinity data into the juvenile crocodile HSI is shown in **Figure C.2.1-43.** The plot shows the lift (Alternative minus FWO) of an index of juvenile crocodile growth and survival at sites along the northern Florida Bay shoreline for all years of the model runs. Sites in the orange box historically have had the most crocodile nesting. For the four sites with the highest predicted growth and survival, Alt 4 appears to perform better than the other alternatives. However, the difference in performance between alternatives is very subtle. For example, the maximum difference between Alt 4 and Alt 2 occurred in Terrapin Bay and is only about 0.02 units of the 0-1 scale index. Also,

determination of any statistical significance between action alternatives is not possible. Not surprisingly, the ranking of action alternatives follows the salinity performance measure ranking (Alt 4>Alt 3>Alt 1>Alt 2) because salinity is the only driver for HSI. Note that for the three locations that have the lowest crocodile HSI performance, there is almost no difference between alternatives, with Alts 3 and 4 performing nearly identically.

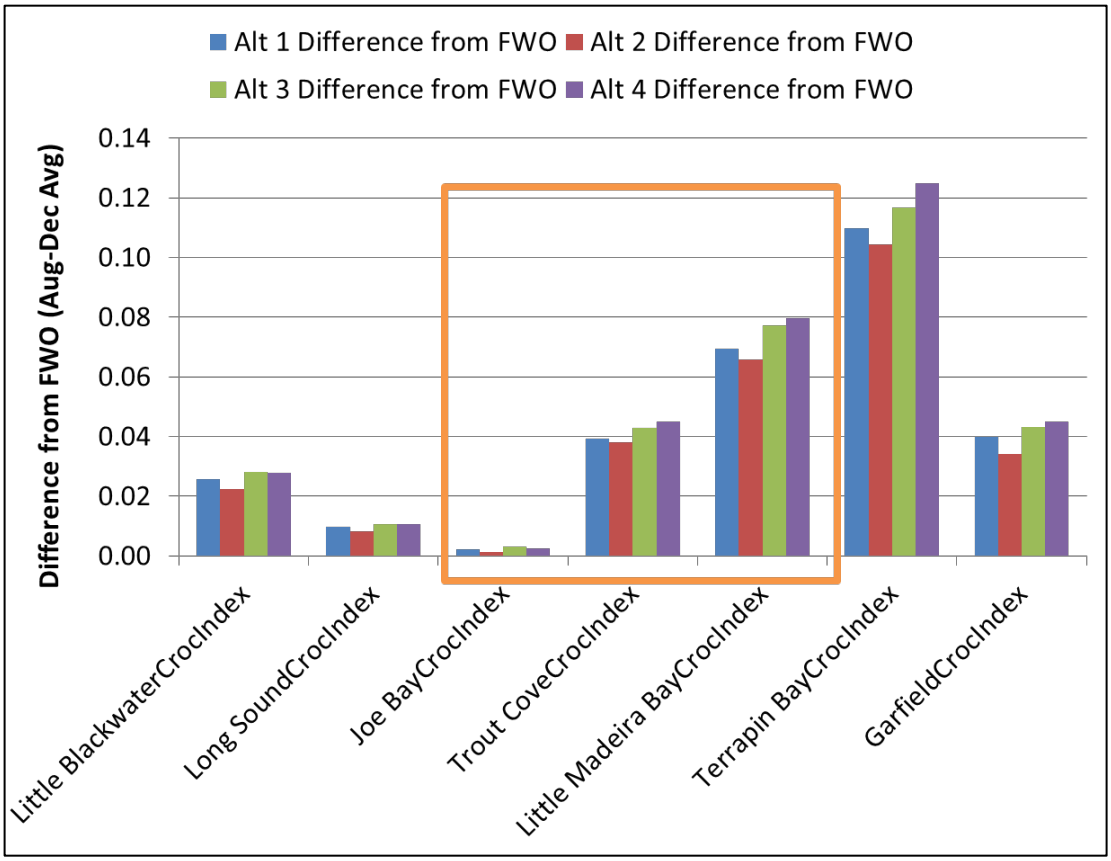

Figure C.2.1-43. Histogram showing the results of the juvenile crocodile HSI for 7 locations of known crocodile nesting areas. Index values show lift provided by action alternatives compared to FWO. (Brandt 2013)

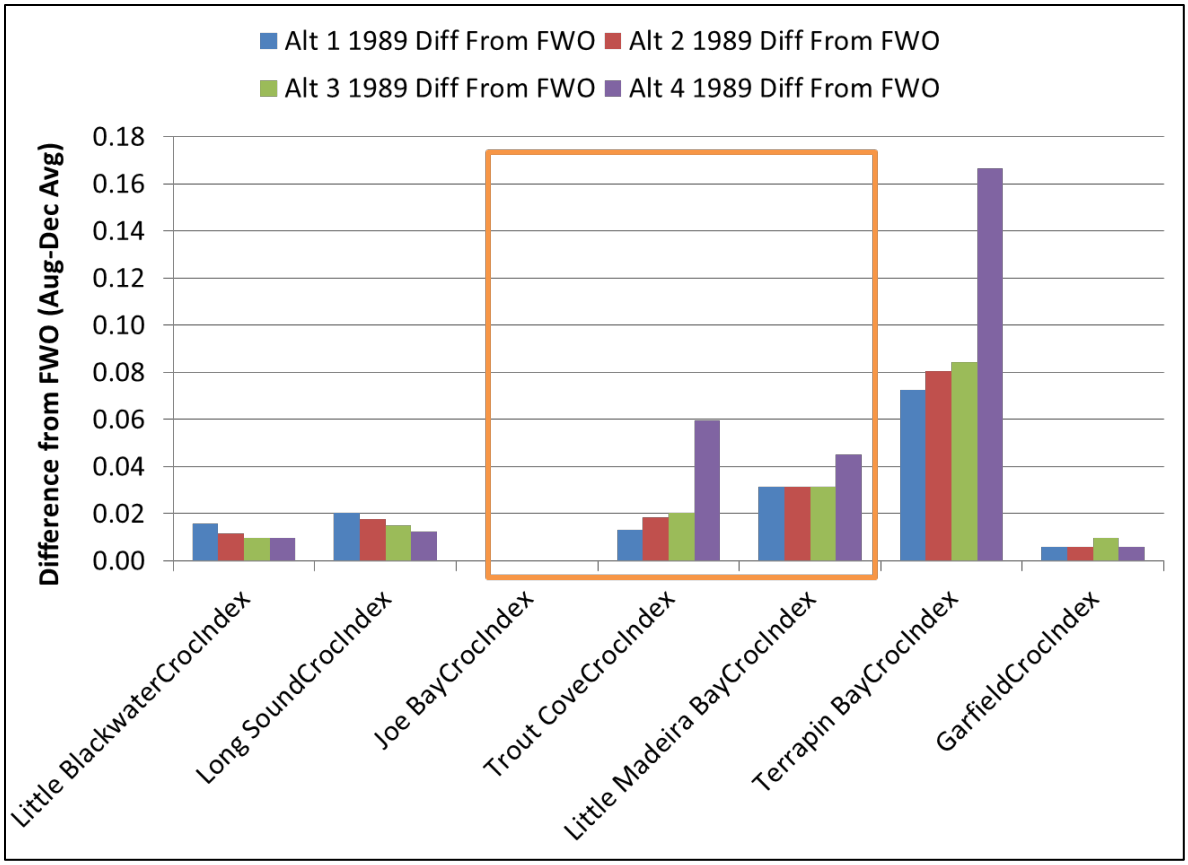

Figure C.2.1-44. Histogram showing the results of the juvenile crocodile HSI for 7 locations of known crocodile nesting areas during 1989 (very dry year). Index values show lift provided by action alternatives compared to FWO. (Brandt 2013)

Results of the juvenile crocodile HSI performance for an extremely dry (1989) year are shown in **Figure C.2.1-44**. For the three highest performing locations (Trout Cove, Little Madiera Bay, and Terrapin Bay), Alt 4 performed noticeably better than the other three alternatives. However, determination of any statistical significance between action alternatives is not possible. At sites with very low lift values (<0.02), differences between action alternatives was minimal (Brandt 2013). All action alternatives provide minor beneficial effects.

C.2.1.4.9 Smalltooth Sawfish

Implementation of the proposed project, the smalltooth sawfish may benefit from increased freshwater flows into the coastal wetlands adjoining Florida Bay, which would provide more natural and historic overland flows. All action alternatives have the potential to benefit the smalltooth sawfish by reducing excessive freshwater flows and improving the salinity regime throughout the Caloosahatchee estuary; and by increasing freshwater flows into the coastal wetlands adjoining Florida Bay, subsequently reducing the duration and occurrence of hypersaline conditions and provide minor beneficial effects.

Discharging large volumes of freshwater from Lake Okeechobee to the Caloosahatchee River during the wet season significantly reduces salinities and increases nutrient loading; all of which has a profound adverse effect on estuarine flora and fauna. As a result, the smalltooth sawfish may benefit from the

project's ability to reduce excessive freshwater flows by improving the salinity regime throughout the Caloosahatchee estuary.

C.2.1.4.10 Green Sea Turtle

The green sea turtle weighs approximately 150 kilograms and lives in tropical and sub-tropical waters. Areas that are known as important feeding areas for the green turtles in Florida include the Indian River Lagoon, the Florida Keys, Florida Bay, Homosassa, Crystal River and Cedar Key. Green turtles occupy three habitat types: high energy oceanic beaches, convergence zones in the pelagic habitat, and benthic feeding grounds in the relatively shallow, protected waters. Females deposit eggs on high energy beaches, usually on islands, where a deep nest cavity can be dug above the high water line. Hatchlings leave the beach and move in the open ocean. Green sea turtles forage in pastures of seagrasses and/or algae, but small green turtles can also be found over coral reefs, worm reefs, and rocky bottoms.

Although green sea turtles are expected to be found foraging in nearshore seagrass habitats within Florida Bay, the increased freshwater flows associated with all action alternatives may alter seagrass species composition but should have a negligible effect on the overall biomass available for sea turtle feeding habits. Additionally, no green sea turtles would attempt to utilize areas for nesting purposes since there is no suitable habitat for nesting in the project area. With the expectation of improved nearshore habitat, no utilization of the project area for nesting purposes, and the implementation of agency approved Sea Turtle and Smalltooth Sawfish Construction Conditions, the Corps has determined green sea turtle may be affected, but is not likely to be adversely affected, by the proposed project.

C.2.1.4.11 Hawksbill Sea Turtle

The hawksbill sea turtle is a small to medium-sized marine turtle weighing up to 15 kilograms in the United States. The hawksbill lives in tropical and sub-tropical waters of the Atlantic, Pacific, and Indian Oceans. Areas that are known as important feeding areas for hawksbill turtles in Florida include the waters near the Florida Keys and on the reefs off Palm Beach County. Hawksbill turtles use different habitat types at different stages of their life cycle. Post hatchlings take shelter in weed lines that accumulate at convergence zones. Coral reefs are the foraging habitat of juveniles, sub-adults, and adults. They are also known to inhabit mangrove-fringed bays and estuaries, particularly along the eastern shore where coral reefs are absent. Hawksbills feed predominantly on sponges and nest on low and high energy beaches, frequently sharing 94 the high-energy beaches with green sea turtles. Nests are typically placed under vegetation.

Although hawksbill sea turtles are expected to be found foraging near hardbottom habitats within Florida Bay, the increased freshwater flows associated with all action alternatives may reduce nearshore salinity concentrations but should have a negligible effect on sponges or other food sources utilized by this species. Additionally, no hawksbill sea turtles would attempt to utilize areas for nesting purposes since there is no suitable habitat for nesting in the project area. With the expectation of improved nearshore habitat, no utilization of the project area for nesting purposes, and the implementation of agency approved Sea Turtle and Smalltooth Sawfish Construction Conditions, the Corps has determined hawksbill sea turtle may be affected, but is not likely to be adversely affected, by the proposed project.

C.2.1.4.12 Leatherback Sea Turtle

The leatherback sea turtle is the largest living turtle and weighs up to 700 kilograms. The leatherback lives in tropical and sub-tropical waters. Habitat requirements for juvenile and post-hatchling leather-

backs are virtually unknown. Nesting females prefer high-energy beaches with deep unobstructed access. Leatherbacks feed primarily on jellyfish.

Although leatherback turtles are expected to be found foraging in nearshore habitats within Florida Bay, the increased freshwater flows associated with all action alternatives may reduce nearshore salinity concentrations but should have a negligible effect on jellyfishes or other food sources utilized by this species. Additionally, no leatherback sea turtles would attempt to utilize areas for nesting purposes since there is no suitable habitat for nesting in the project area. With the expectation of improved nearshore habitat, no utilization of the project area for nesting purposes, and the implementation of agency approved Sea Turtle and Smalltooth Sawfish Construction Conditions, the Corps has determined leatherback sea turtle may be affected, but would not likely be adversely affected, by the proposed project.

C.2.1.4.13 Kemp's Ridley Sea Turtle

The Kemp's ridley sea turtle is the smallest of all sea turtles and weighs up to 45 kilograms. This species is a shallow water benthic feeder consuming mainly algae and crabs. Juveniles grow rapidly. Juveniles and sub-adults have been found along the eastern seaboard of the United States and in the Gulf of Mexico. However, the major nesting beach for the Kemp's ridley sea turtle is on the northeastern coast of Mexico. This species occurs mainly in coastal areas of the Gulf of Mexico and in the northwestern Atlantic Ocean. The post-pelagic stages are commonly found dwelling over crab-rich sandy or muddy bottoms. Juveniles frequent bays, coastal lagoons, and river mouths. 95

Although Kemp's ridley sea turtles could be found foraging in nearshore habitats within Florida Bay, this species is not expected to be found within the direct area of influence associated with CEPP. Additionally, no Kemp's ridley sea turtles would attempt to utilize areas for nesting purposes since their main nesting location is on a single stretch of beach on the Gulf Coast of Mexico. With the expectation of improved nearshore habitat, no utilization of the project area for nesting purposes, and the implementation of agency approved Sea Turtle and Smalltooth Sawfish Construction Conditions, the Corps has determined Kemp's ridley sea turtle may be affected, but would not likely be adversely affected, by the proposed project.

C.2.1.4.14 Loggerhead Sea Turtle

Loggerhead sea turtles inhabit the continental shelves and estuarine environments along the margins of the Atlantic, Pacific, and Indian Oceans. Females select high energy beaches on barrier strands adjacent to continental land masses for nesting. Steeply sloped beaches with gradually sloped offshore approaches are favored. After leaving the beach, hatchlings swim directly offshore and eventually are found along drift lines. They migrate to the near-shore and estuarine waters along the continental margins and utilize those areas as the developmental habitat for the sub-adult stage. Loggerheads are predators of benthic invertebrates.

Although loggerhead sea turtles are expected to be found foraging in nearshore habitats within Florida Bay, the increased freshwater flows associated with all action alternatives may reduce nearshore salinity concentrations but should have a negligible effect on crustaceans, mollusks or other invertebrate food sources utilized by this species. Additionally, no loggerhead sea turtles would attempt to utilize areas for nesting purposes since there is no suitable habitat for nesting in the project area. With the expectation of improved nearshore habitat, no utilization of the project area for nesting purposes, and the implementation of agency approved Sea Turtle and Smalltooth Sawfish Construction Conditions, the

Corps has determined loggerhead sea turtle may be affected, but would not likely be adversely affected, by the proposed project.

C.2.1.4.15 State Listed Species

The CEPP project area contains habitat suitable for the presence, nesting, and/or foraging of 16 state-listed threatened and endangered species and 15 species of special concern. Threatened and endangered animal species include the Florida mastiff bat, Miami blue butterfly Florida black bear, Everglades mink, snowy plover, least tern, white-crowned pigeon, and rim rock crowned snake. Species of special concern include the Florida mouse, American oystercatcher, brown pelican, black skimmer, limpkin, reddish egret, snowy egret, little blue heron, tricolored heron, white ibis, roseate spoonbill, mangrove rivulus, gopher tortoise, gopher frog and the Florida tree snail.

Threatened and endangered plant species include the bracted colic root, which lives in open muhly-dominated marl prairies and rocky glades; pine-pink orchid, which frequents the edges of the farm roads just above wetland elevation; the lattice-vein fern which is found occasionally in the forested wetlands; Eaton's spikemoss, and Wright's flowering fern, both found in the Frog Pond natural area; along with the Mexican vanilla plant and Schizaea tropical fern located on tree islands in the upper Southern Glades region.

While small foraging or nesting areas utilized by many of these animal species may be affected by this project, Alts1-4 are not likely to adversely affect protected state species. Impacts to wading birds species will be similar to those affecting the wood stork. Overall, negligible adverse impacts are anticipated to state listed species as a result of this project.

C.2.1.5 Fish and Wildlife Resources

A comparison of FWO and CEPP action alternatives and their potential effects on wildlife within the CEPP action area are summarized below. Effects to state and federally listed species are described in further detail in **Section C.2.1.4, Threatened and Endangered Species** and within **Annex A**. Changes in water quality also have the potential to affect prey forage base through altering of vegetation composition or structure. Implementation of CEPP action alternatives would significantly benefit fish and wildlife resources within the CEPP action area, particularly within the greater Everglades. These benefits are described in greater detail in the sections below. Water quality will continue to be monitored under CEPP; potential effects are largely uncertain at this time.

C.2.1.5.1 Invertebrates

Negligible effects to the invertebrate community within Lake Okeechobee or EAA are anticipated under any CEPP action alternative. As compared with FWO, all CEPP action alternatives show a minor beneficial effect with performance improvement within the Northern Estuaries as indicated by fewer high volume flow months. Reductions in high volume discharges and salinity fluctuations would likely benefit oysters within the Northern Estuaries. Reduction in high flows and accompanying flow velocities would help lessen the current problem of flushing of oyster spat into outer areas of the Northern Estuaries that experience high salinities levels during the dry season resulting in increased predation and disease in the oyster population. In the St. Lucie Estuary a minor adverse effect is expected due to increases in low flow violations during the dry season were indicated by the modeling effort. Recent oyster monitoring data during extended dry conditions in the area has shown an increase in oyster disease related to the duration and severity of high salinity conditions. Although these extreme dry spells are rare in the SLE, they can occur and therefore supplemental flows during dry times may be

warranted and have been accounted for in the IRLS water reservation process. Delivery of those supplemental flows should ideally take place through the North Fork St. Lucie River.

Within the Greater Everglades aquatic invertebrates would rapidly colonize newly re-hydrated areas with implementation of any CEPP action alternative providing a moderate beneficial effect, directly benefitting aquatic invertebrates within the action area. Increases in stages and hydroperiods within WCA 2, northern WCA 3A, WCA 3B and ENP would promote wetland vegetation transition through contraction of sawgrass marshes and expansion of wet prairies, and in deeper regions, sloughs. Submerged aquatic plants are commonly associated with sloughs providing structure for growth of periphyton, the main source of primary production within the freshwater Everglades (Gunderson 1994; Powers 2005).

Periphyton is a primary component of invertebrate diets, including apple snails. In addition to the potential for increased foraging opportunities, changes in vegetation resulting in expansion of wet prairie and increases in emergent vegetation would also provide habitat structure critical for apple snail aerial respiration and egg deposition (Turner 1996; Darby et al. 1999). Apple snails tend to avoid areas where water depths are greater than 50 centimeters (Darby et al. 2002). Avoidance of deeper depths may be related to the type and density of vegetation in deeper water areas, food availability or energy requirements for aerial respiration (van der Walk et al. 1994; Turner 1996; Darby 1998; Darby et al. 2002). Water-lily sloughs support lower apple snail densities as compared with wet prairies (Karunaratne et al. 2006). Limited food quality and lack of emergent vegetation in sloughs may account for the lower densities. Research indicates that apple snails depend upon periphyton for food (Rich 1990; Browder et al. 1994; Sharfstein and Steinman 2001), which may be limited within deeper water environments. Karunaratne et al. (2006) observed little or no submerged macrophytes and epiphytic periphyton in the sloughs they studied in WCA 3A. In contrast, species commonly encountered within wet prairie habitat (e.g. *Eleocharis* spp., *Rhynchospora tracyi*, *Sagittaria* spp.), along with sawgrass that grows within the ecotones between the two vegetative communities, support abundant populations of epiphytic periphyton (Wetzel 1983; Browder et al. 1994; Karunaratne et al. 2006). A reduction in the number of available emergent stems for egg deposition would also contribute to the observed lower snail densities within sloughs. Drying events are needed to maintain the emergent plant species characteristic of typical apple snail (Wood and Tanner 1990; Davis et al. 1994). As shown by Darby et al. (2008), apple snails can survive these events and it is the timing and duration of the dry down event that are critical determinants of apple snail survival and recruitment. All CEPP action alternatives provide increased opportunities for apple snails within northern WCA 3A; while Alts 3 and 4 provide greater potential for providing appropriate conditions for increased apple snail populations in ENP as compared with Alts 1 and 2 and a minor beneficial effect.

Crayfish are important components within the Everglades food web, serving as primary dietary components of higher trophic level species including fish, amphibians, alligators, wading birds and mammals such as raccoons and river otters (Kushlan and Kushlan 1979). Crayfish are particularly important forage resource for nesting white ibis (*Eudocimus albus*), therefore the availability of crayfish is an important component for recovery of this species. Crayfish species composition and abundance within the Greater Everglades are linked to hydroperiod. Two species of freshwater crayfish are found within the Greater Everglades: Everglades crayfish (*Procambarus alleni*) and slough crayfish (*Procambarus fallax)*. Everglades crayfish is commonly found in marshes that dry seasonally, generally with a hydroperiod of less than 10 months. When surface water recedes, the Everglades crayfish burrows to escape drying conditions. The slough crayfish is commonly found in perennially flooded

habitats. Both species have been found co-occurring in areas with hydroperiods ranging between 9 and 11 months, as well as in sites that remained flooded during the dry season.

Increases in hydroperiod associated with implementation of any CEPP action alternative would likely increase crayfish density with northern WCA 3A, WCA 3B and ENP, particularly within the marl prairies and provide a minor beneficial benefit. Research by Acosta and Perry (2001) revealed that environmental changes associated with shortened hydroperiod have affected growth, survival, dispersal and productivity within Everglades marl prairies and within the rocky glades. Results from this study indicate that crayfish productivity would increase substantially if hydroperiods within marl prairies wetlands were extended by 3 to 4 months. Although none of the CEPP action alternatives would extend hydroperiods within marl prairies by this duration, all CEPP action alternatives, especially Alts 4 and 3 would increase hydroperiods within this region resulting in increased Everglades crayfish productivity.

Everglades crayfish biomass also declines during periods of extended high water. During extended periods of inundation, populations of large predatory fish species may increase, thereby increasing predation pressure on crayfish populations (Kushlan and Kushlan 1979). Under CEPP, areas in which hydroperiods will be extended sufficiently to support increases in large predatory fish (refer to **C.2.1.5.2**), there will likely be associated declines in Everglades crayfish biomass. In contrast, areas within southern WCA 3A that currently endure deeper water depths and extended hydroperiods due to ponding, may experience increases in Everglades crayfish biomass due to reduction in water depth and hydroperiods with implementation of any CEPP action alternative.

Within Florida Bay, a habitat suitability index model was employed to simulate growth, survival and potential harvest of a cohort of shrimp as a function of salinity and temperature (Browder et al. 1999; 2002). Results of the 41-year POR simulations of potential harvests from two representative Florida Bay basins, Whipray Basin in north central Florida Bay and Johnson Key Basin in western Florida Bay, are shown in **Figure C.2.1-45** and **Figure C.2.1-46**, respectively. Results show the lift above FWO (as percent of FWO) in potential harvests from each of the four action alternatives providing a minor beneficial effect. The equation for calculating lift as percent of FWO follows: $100 \times (ALT_x - FWO) / FWO$, where ALT_x is simulated potential harvest from a given alternative and FWO is simulated potential harvest from FWO salinity conditions. Each alternative provides substantial lift in potential harvest over FWO. The lift in each case is a small percentage of FWO (i.e., 1.05%, at most). In both areas, the lift provided by Alt 4 is greater than that of the other three action alternatives. Alternative 1 provides the least lift. Variation across alternatives in most years is less than inter-annual variation. (RECOVER 2013, **Annex E**).

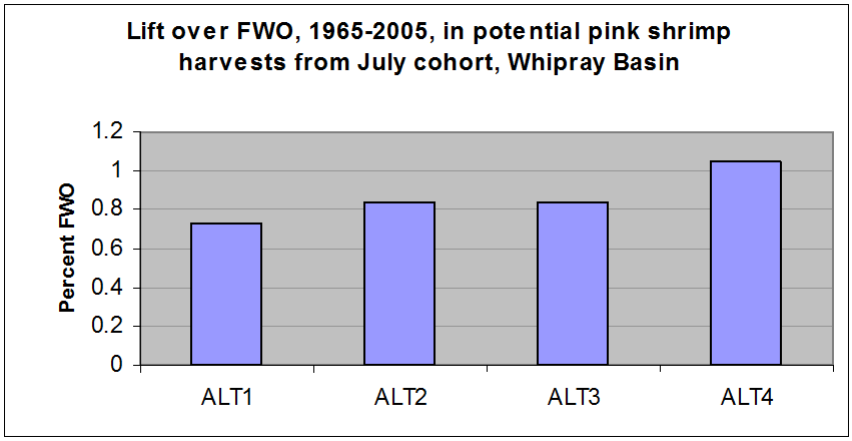

Figure C.2.1-45. Histogram showing the results of the potential pink shrimp harvest in Whipray Basin for the 1965-2005 period of record for model output.

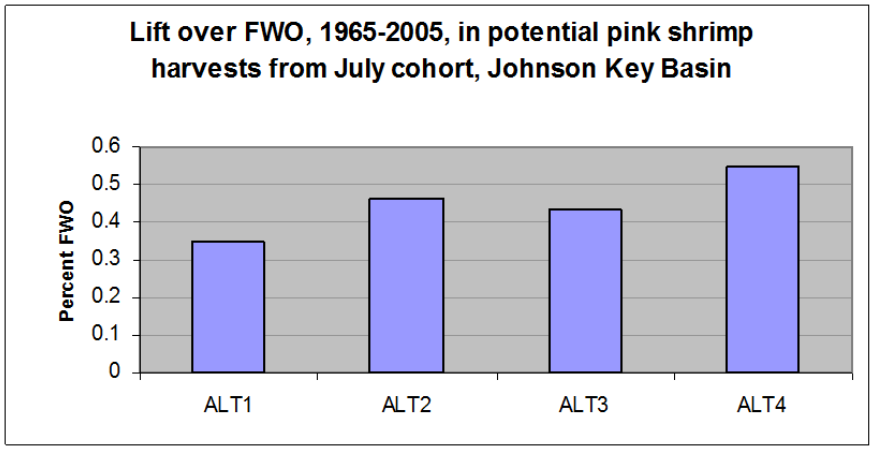

Figure C.2.1-46. Histogram showing the results of the potential pink shrimp harvest in Johnson Key Basin for the 1965-2005 period of record for model output.

In Biscayne Bay, Alt2 was the only alternative that provided additional flows when compared to FWO and a minor beneficial effect. Alts 1, 3, and 4 all provided less water than FWO, in descending order and a minor adverse effect. Flows to the coast were not evenly distributed spatially with all alternatives showing positive benefits in the northern Biscayne Bay and negative effects in central and southern Biscayne Bay. Alternative 2 is likely to provide a benefit to the invertebrate population by providing additional flows to the coast, thereby lowering salinity levels and/or reducing the number of days salinities exceed 40 psu. Alternative 1 is likely to provide the same level of benefit as FWO and Alts 3 and 4 would likely result in a negative effect to the invertebrate population by increasing the likely hood of maintaining salinity conditions in Biscayne Bay above the preferred salinity range of the resident invertebrate population for longer periods of time than FWO. All alternatives generally show an unfavorable seasonal flow pattern with reductions in flows compared to FWO generally greater during the dry season. Refer to Annex E for Biscayne Bay Flow at Coastal Structures.

C.2.1.5.2 Fish

Implementation of any CEPP action alternative is expected to significantly improve conditions for fish species throughout much of the Greater Everglades and have a moderate beneficial effect. The largest percent gains in daily average fish density were predicted within northern WCA 3A and NESRS. In these areas fish densities increased in excess of 30%, with extremes over 80%. Other areas within SRS also experienced appreciable gains in fish density due to increased flows. In comparison, all CEPP action alternatives resulted in lower fish densities within WCA 3A along L-67A. Regional percent changes in fish densities were highest in SRS (16-23%) and southern marl prairies (17-31%) as compared with FWO, with Alts 3 and 4 exhibiting the largest percent increases. Taylor Slough experienced negligible positive changes (<1%). (Catano and Trexler 2013, **Annex E**).

Introduction or expansion of non-native fish species due to changes in water distribution and increased connectivity within WCA 3A, WCA 3B and ENP is likely to occur; however, the extent of invasion is uncertain at this time providing a minor adverse effect. In contrast to FWO, new access points will be created under all CEPP action alternatives, with the highest connectivity achieved under Alts 3 and 4. Alternative 1 would provide the fewest number of new access points, thus limiting the potential for spread of invasive and or exotic fish species as compared with the other action alternatives.

Within Florida Bay, a habitat suitability index (HSI) was employed to predict responses of juvenile spotted seatrout (*Cynoscion nebulosus*) with implementation of any CEPP alternative and predict improvements in habitat suitability in comparison with FWO. The spotted seatrout HSI is a qualitative model that uses a logistic regression to assess how the frequency of occurrence of juvenile spotted seatrout varies in response to environmental parameters including turbidity, temperature, salinity, and spatial coverage and density of three species of seagrass (RECOVER 2013, **Annex E**). The model calculates the area of habitat suitable for juvenile spotted seatrout based on the above parameters. For this analysis, all parameters were held constant except for salinity. For juvenile spotted seatrout, there are five biologically relevant ranges for salinity as determined by the linear response in cumulative frequency of seatrout to salinity. HSI index scores were then calculated by taking the frequency of occurrence for each of these five ranges and dividing by the highest frequency of occurrence for any of the ranges. For example, the range from a salinity of 32 to 39 had the highest frequency of occurrence at 0.255 and received an SI=1 (0.255/0.255); however, the range from a salinity of 40 to 52 had a frequency of occurrence of 0.145 and an SI=0.57 (0.145/0.255).

The juvenile spotted seatrout HSI was run on monthly average salinities from May through November to coincide with spotted seatrout juvenile recruitment for all CEPP action alternatives. The HSI output from the salinity monitoring stations in Florida Bay was gridded to produce spatial distributions of HSI scores for each month. This allowed for the calculation of area of optimal juvenile spotted seatrout habitat in square kilometers. The mean area of optimal juvenile spotted seatrout for each scenario for the entire POR is shown in **Figure C.2.1-47.** The error bars reflect the standard error for the data set. The natural system model serves as the target for this analysis. It had the largest mean area of optimal juvenile spotted seatrout habitat at 368 km^2. All four CEPP action alternatives showed improvements over FWO providing a minor beneficial effect. A Mann-Whitney U-test was applied to conduct pair-wise comparisons among all of the scenarios. All four CEPP action alternatives had significantly higher areal extent of optimal habitat for juvenile spotted seatrout (α=0.1) compared to FWO. However, there were no significant differences among any of the action alternatives (α=0.1). (RECOVER 2013, **Annex E**)

To ease in the interpretation of the spotted seatrout data, the percent increase in area of optimal juvenile spotted seatrout relative to FWO is depicted in **Figure C.2.1-48**. The four CEPP action alternatives showed increases from 44% for Alt 1 up to 65% for Alt 4. Alternatives 2 and 3 showed a 49% and 52% increase, respectively. The juvenile spotted seatrout analysis shows that all CEPP action alternatives showed statistically significant improvement over FWO. The differences among the alternatives were not statistically significant, but suggest Alt 4 has the highest potential to show the greatest gains for spotted seatrout in Florida Bay.

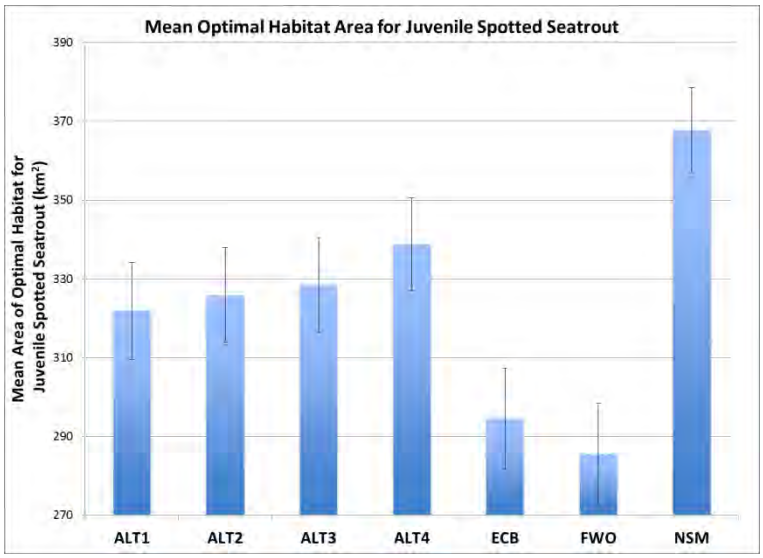

Figure C.2.1-47. Histogram showing the mean optimal habitat area of the juvenile spotted seatrout HSI for NSM (target), ECB, FWO and the four CEPP action alternatives. (RECOVER 2013, Annex E)

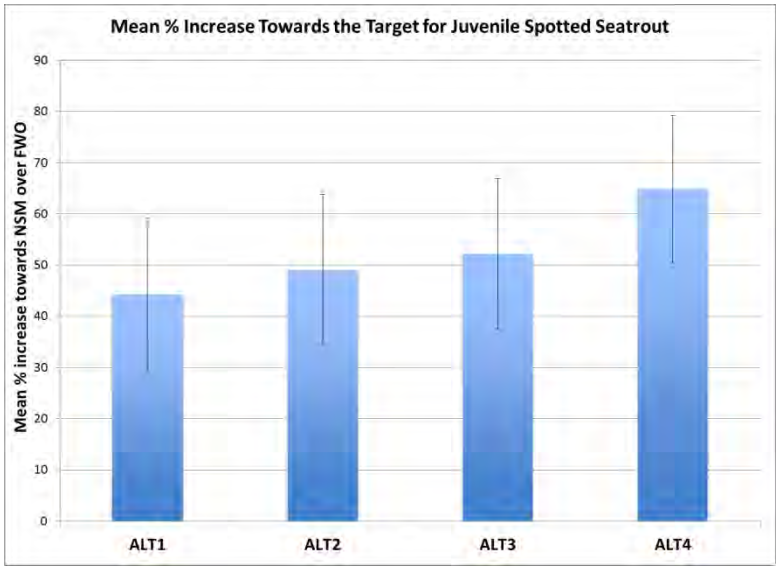

Figure C.2.1-48. Histogram showing the mean increase towards the target for the juvenile spotted seatrout HSI for the four CEPP action alternatives relative to FWO. (RECOVER 2013, Annex E)

In Biscayne Bay, Alt2 was the only alternative that provided additional flows when compared to FWO and minor beneficial effect. Alts 1, 3, and 4 all provided less water than FWO, in descending order and a minor adverse effect. Flows to the coast were not evenly distributed spatially with all alternatives showing positive benefits in the northern Biscayne Bay and negative effects in central and southern Biscayne Bay. Alternative 2 is likely to provide a benefit to the fish population by providing additional flows to the coast, thereby lowering salinity levels and/or reducing the number of days salinities exceed 40 psu. Alternative 1 is likely to provide the same level of benefit as FWO and Alts 3 and 4 would likely result in a negative effect to the fish population by increasing the likely hood of maintaining salinity conditions in Biscayne Bay above the preferred salinity range of the resident fish population for longer periods of time than FWO. All alternatives generally show an unfavorable seasonal flow pattern with reductions in flows compared to FWO generally greater during the dry season. Refer to Annex E for Biscayne Bay Flow at Coastal Structures.

C.2.1.5.3 Amphibians and Reptiles

Minor beneficial effects to amphibian and reptile communities are anticipated under all CEPP action alternatives. All action alternatives showed improved conditions for amphibians within WCA 3 and ENP as compared with FWO. Rehydration within previously dry areas within northern WCA 3A would increase spatial extent of suitable habitat for aquatic amphibian species in this area. Similarly, increased hydroperiods within ENP would also benefit aquatic amphibian species. As hydrology improves within WCA 3 and ENP it is expected that amphibian species richness will also change. However, declines in some amphibian species will be offset by favorable habitat conditions for other species. Increase in forage prey availability (i.e. crayfish and other invertebrates, fish) in areas rehydrated by CEPP implementation will also directly benefit amphibian and reptiles species.

Introduction or expansion of non-native amphibian species due to changes in water distribution and increased connectivity within WCA 3A, WCA 3B and ENP is likely to occur; however, the extent of invasion is uncertain at this time and may have a minor adverse effect. In contrast to FWO, new access points will be created under all CEPP action alternatives, with the highest connectivity achieved under Alts 3 and 4. Alternative 1 would provide the fewest number of new access points, thus limiting the potential for spread of invasive and or exotic amphibian species as compared with the other action alternatives.

Submerged aquatic vegetation and algal communities are also common foraging areas for the green sea turtle. Reductions in high and low flow violations within the Northern Estuaries reduce stress on SAV and promote increases in seagrass shoots that have the potential to increase foraging opportunities for green sea turtles in this region. Similarly, increased freshwater flows to Florida Bay and the southwestern coastal estuaries resulting in lowered salinity levels that better encompass seagrass salinity tolerance ranges, would also increase foraging opportunities for green sea turtles. Alternative 4 provides the greatest benefit, followed by Alts 3, 1 and 2 (refer to **C.2.1.3.5.2, Seagrass Beds** for further information).

C.2.1.5.4 Birds

The freshwater wetlands of the Everglades are noted for their abundance and diversity of colonial wading birds. Nesting and foraging activities of resident bird species are anticipated to show a moderate beneficial effect with implementation of any CEPP action alternative. Impacts to the CSSS, snail kite, wood stork and wading birds are further discussed in **Section C.2.1.4, Threatened and Endangered Species** and within **Annex A**. Changes in water quality also have the potential to affect birds through altera-

tion of vegetation composition or structure or impacts to their forage base. Water quality would continue to be monitored under CEPP and potential effects are largely uncertain at this time.

As predicted by the Trophic Hypothesis (RECOVER 2004) an increase in density of small fishes would directly benefit higher trophic level predators such as wading birds. Therefore, it is predicted that the action alternatives that provide the greatest benefit to small fishes as described in **Section C.2.1.5.2, Fish**, would also perform best overall for wading birds. Crayfish are a particularly important forage resource for nesting white ibis (*Eudocimus albus*). Appropriate foraging conditions and crayfish densities within core foraging areas of nesting wading birds colonies can reduce foraging flight distance, thereby enhancing overall body condition. As indicated in **Section C.2.1.5.1, Invertebrates**, increases in hydroperiod associated with implementation of any of the CEPP action alternatives would likely increase crayfish density within northern WCA 3A, WCA 3B and ENP, particularly within the marl prairies.

The largest wading bird rookery within the Everglades ecosystem is Alley North. Under current and FWO conditions, a large dry area within northeastern WCA 3A creates a significant hazard for nesting birds due to egg predation by mammals. All CEPP action alternatives show significant hydrological improvement within northeastern WCA 3A. Associated increased depths, hydroperiods and sheetflow with Alley North decrease the potential for nest predation and provide a minor beneficial effect.

As compared with FWO, all CEPP action alternatives reveal the potential for short-term minor adverse effects to aquatic vegetation within Lake Okeechobee due to higher than preferred lake stages. As a result, temporary reductions in foraging habitat for shorebirds and short-legged wading birds could occur. However, these multiple day events in which Lake Okeechobee stage exceeded 15.0 feet NGVD occurred approximately 5% of the POR.

C.2.1.5.5 Mammals

As compared with FWO, potential minor beneficial effects to mammals within the CEPP action area are anticipated with implementation of any CEPP action alternative. Small mammals including raccoons and river otters would benefit from increased crayfish and small prey fish biomass in rehydrated areas within northern WCA 3A, WCA 3B, and ENP. Effects to state and federally listed species are described in further detail in **Section C.2.1.5, Threatened and Endangered Species** and within **Annex A**. Changes in water quality also have the potential to affect prey forage base through altering of vegetation composition or structure. Water quality would continue to be monitored under CEPP; potential effects are largely uncertain at this time. However, it is predicted that restoration of sheetflow will aid to remove nutrients within the water column.

CEPP implementation, however, could have a moderate adverse effect on mammals dependent upon upland habitat. Due to increased water flow and changes in water distribution it is anticipated that overdrained areas in northern WCA 3A would be rehydrated, triggering a vegetation transition from upland to wetland habitat. Although, mammals occurring within the action area are adapted to the naturally fluctuating water levels in the Everglades; there is an increased potential for this vegetation transition to negatively affect mammals utilizing upland habitat. This is a particular concern for deer populations within northern WCA 3A that utilize tree islands. However, as discussed in **Section C.2.1.4.4, Tree Islands**, no significant effects to tree islands within WCA 3A and ENP are anticipated to occur under any CEPP action alternative; but, lower elevation tree islands within WCA 3B may be adversely affected by CEPP implementation, with Alts 2 and 3 resulting in the greatest potential impact. Deer populations that utilize the lower elevation tree islands within WCA 3B may suffer from habitat

loss. In addition, deer that utilize levees slated for removal (L-67C, L-29, L-67 Extension) also have the potential to be negatively affected. Loss of these levees may be offset by the construction of the Blue Shanty Levee in WCA 3B. Deer are highly mobile and would migrate to find suitable habitat. No significant negative effects on mammals in the remainder of the CEPP action area are anticipated under any CEPP action alternative.

C.2.1.6 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act, 16USC 1801 et seq. Public Law 104-208 reflects the Secretary of Commerce and Fishery Management Council authority and responsibilities for the protection of essential fish habitat (EFH). Federal agencies that fund, permit, or carry out activities that may adversely impact EFH are required to consult with the National Marine Fisheries Service (NMFS) regarding the potential effects of their actions on EFH. In conformance with the 1996 amendment to the Act, the information provided in this Integrated Environmental Impact Statement (EIS) will comprise the required EFH assessment and has been coordinated with NMFS.

Consultation for the Central Everglades Planning project (CEPP) was initiated on January 10, 2012 through a NEPA scoping letter. The NMFS has indicated that beneficial effects to fish resources and EFH may occur as a result of this project. The NMFS requested an evaluation of potential impacts to living marine resources, including mangroves, seagrasses, live bottom communities, and the marine/estuarine water column that may be impacted by activities or operations of the project action alternatives. The preparation of an EFH assessment will be contained within the project PIR/EIS, and submitted to the NMFS for coordination.

Essential Fish Habitat in the Project Area:

The project area includes three distinct regional estuarine and nearshore coastal systems: The southern estuaries including Biscayne Bay and Florida Bay; and the northern estuaries including the Caloosahatchee River and the St. Lucie Estuary.

The southern estuaries comprise Biscayne National Park and a large portion of Everglades National Park, and are a shallow estuarine system (average depth less than 3 feet). Florida Bay is the main receiving water of the greater Everglades, heavily influenced by changes in timing, distribution, and quantity of freshwater flows into the southern estuaries. Lake Okeechobee discharges into the two northern estuaries. The St. Lucie Canal feeds into the St. Lucie Estuary, and the Caloosahatchee Canal/River feeds into the Caloosahatchee Estuary to the west.

<u>Biscayne Bay and Florida Bay</u>

The southern estuaries contain essential fish habitat for corals; coral reef and live bottom habitat; red drum (*Sciaenops ocellatus*); penaeid shrimps; spiny lobster (*Panulirus argus*); other coastal migratory pelagic species and the snapper-grouper complex. Species generally present in the southern estuaries region include brown shrimp (*Penaeus aztecus*), pink shrimp (*Penaeus duorarum*), white shrimp, spiny lobster, stone crab, gulf stone crab, red drum, Spanish mackerel, and gray snapper (*Lutjanus griseus*). Essential fish habitat in the southern estuaries is comprised of seagrasses, estuarine mangroves, intertidal flats, the estuarine water column, live/hard bottoms, and coral reefs.

<u>Caloosahatchee River</u>

The Caloosahatchee River estuary contains essential fish habitat for juvenile brown shrimp (*Penaeus aztecus*), juvenile gray snapper (*Lutjanus griseus*), juvenile pink shrimp (*Penaeus duorarum*), adult and

juvenile red drum, (*Sciaenops ocellatus*), adult and juvenile Spanish mackerel (*Scomberomorus maculatus*), and juvenile stone crab (*Menippe mercenaria*). Downstream habitats include oyster reefs and seagrass beds (submerged aquatic vegetation).

St. Lucie Estuary

The proposed project is within the jurisdiction of the South Atlantic Fishery Management Council (SAFMC) and is located in areas designated as EFH for wormrock, live bottom habitat, for the American oyster (*Crassostrea virginica*); pink shrimp (*Penaeus duorarum*); white shrimp (*Penaeus* sp.) and brown shrimp (*Penaeus aztecus*); Florida red drum (*Sciaenops ocellatus*); grouper (*Epinephelus* spp.); gray snapper (*Lutjanus griseus*); white grunt (*Haemulon plumieri*); red porgy (*Pagrus pagrus*); spiny lobster (*Panulirus argus*); and the snapper-grouper complex. In addition, the nearshore hardbottom habitat outside of the St. Lucie Estuary is designated as Essential Fish Habitat-Habitat Areas of Special Concern (EFH-HAPC) for the snapper-grouper complex.

Assessments of Effects on Essential Fish Habitat:

Southern Estuaries

Project construction activities should have no effect on the nearshore communities or essential fish habitat downstream of the project areas in Biscayne Bay and Florida Bay. However, this project is expected to have a minor beneficial indirect effect by increasing overland flow into Eastern Florida Bay. The increased flow is anticipated to stabilize the water quality and salinities required to improve and sustain nearshore biological communities.

Seagrasses are expected to benefit from the re-direction and dispersion of fresh water across the wetland systems prior to entering Biscayne Bay and Florida Bay. Seagrass habitats are heavily utilized by both juvenile and adult fishes and invertebrates for feeding and shelter (SAFM 1998). Species that depend on seagrass habitats include the penaeid pink and brown shrimp, and spiny lobster (SAFM 1998). Seagrass performs as an important nursery habitat for red drum, snook (*Centropomus undecimalis*), bonefish (*Albula vulpes*), tarpon (*Megalops atlanticus*) and several species of snapper and grouper, and is critical to the health of Biscayne Bay, Florida Bay, and a number of commercial and recreational fisheries (SAFM 1998).

The restored hydrology provided by this project would also increase the periodic inundation of the downstream mangrove wetlands. Mangrove wetlands depend on this periodic inundation; the lack of freshwater from upstream sources contributes to their degradation (SAFM 1998). Mangrove habitats are important because they provide food and refuge to a large variety of species. These species include: spiny lobsters, pink shrimp, snook (*Centropomus undecimalis*), goliath grouper (*Epinephelus itajara*), tripletail (*Lobotes surinamensis*), leatherjack (*Oligoplites saurus*), gray snapper (*Lutjanus griseus*), dog snapper (*L. jocu*), sailor's choice (*Haemulon parra*), bluestriped grunt (*H. sciurus*), sheepshead (*Archosargus probatocephalus*), black drum (*Pogonias cromis*) and red drum (SAFM 1998).

The estuarine water column is typically characterized by four salinity categories: oligohaline (< 8 psu), mesohaline (8-18 psu), and polyhaline waters (18-30 psu) with some euhaline water (>30 psu) around inlets (SAFM 1998). Saline boundaries in the estuarine water column are variable, but are generally maintained by sea water transported through inlets by tide and wind mixing with fresh water supplied by land runoff' (SAFM 1998). This project will improve quantity, timing, and distribution of water delivered to Eastern Florida Bay. It is likely that this will result in an improvement to the salinity characteristics of the estuarine water column. This habitat is utilized by larvae of commercially

important fishes for feeding, and is an important means of conveying organisms and nutrients from inland to offshore areas (SAFM 1998).

This project is not expected to have an effect on coral reef or hard bottom communities in the southern estuaries. There are no coral reefs or hard bottom communities located within the proposed project site or the nearshore waters affected by the project. Corals found within Florida Bay and Biscayne Bay are outside the area of potential effect.

Northern Estuaries

Aquatic habitats within the Caloosahatchee Basin have been altered through the channelization of the river. Nevertheless, the basin continues to support fishery resources of some recreational and commercial importance. Seagrass communities within the Caloosahatchee estuary provide critical refugia for juvenile fishes such as redfish, grouper, snook, and spotted seatrout. The decline in juvenile abundance and distribution of these and other species, along with an overall decrease in species richness may be related to the loss of seagrass habitat and/or a result of alterations in the salinity regime and the timing of the freshwater discharges from the S-79 structure. Implementation of the project would reduce the frequency of high volume freshwater discharges during the wet season, ultimately resulting in minor beneficial effects to essential fish habitat within the Caloosahatchee estuary.

Another primary goal of this project is to reduce high nutrient freshwater flows to the St. Lucie estuary. No direct impacts are anticipated, rather the restoration potential of seagrass beds, oyster reef, and the estuarine water column itself. Increases in seagrass and oyster reef would provide a large number of benefits to the essential fish habitat species. The proposed project significantly increases the acres of SAV, oyster, and healthy benthic habitat.

Conclusion:

Southern Estuaries

Previous water management operations have resulted in an inland migration of saline conditions in both groundwater and surface waters. This has caused the expansion of moderate to high salinity zones and has diminished the spatial extent of freshwater wetland habitats in the southern estuaries. Landward expansion of saltwater and mangrove wetlands, including low-productivity, sparsely vegetated dwarf mangrove communities typical of the hypersaline 'white zone' has also occurred in the southern estuaries.

The proposed project components would improve freshwater delivery to coastal wetlands and adjacent estuaries in Northern Biscayne Bay and Eastern Florida Bay. Implementation of the project would redistribute flow to salt water wetlands and nearshore bay areas and result in favorable changes to salinity levels. These changes may affect essential fish habitat, although the impacts to the aquatic resources are anticipated to be beneficial.

Northern Estuaries

The Caloosahatchee and St. Lucie estuaries both receive excessive discharges from Lake Okeechobee as well as their local basins during wet years, and suffer from too little discharge on excessively dry years.

Restoration goals in the Caloosahatchee estuary include; re-establishment of a salinity range favorable to juvenile marine fish, shellfish, oysters and submerged aquatic vegetation (SAV), re-establishment of

seasonally appropriate freshwater flows of favorable quality that maintain low salinities in the upper estuary and re-establishment of more stable salinities and ranges in the lower estuary. Restoration goals for the St. Lucie estuary include maintaining a salinity range favorable to fish, benthic invertebrates, oysters and SAV. This requires a reduction of high volume, long duration discharge events from Lake Okeechobee, the C-44, C-23 and C-24 watersheds.

In summary, CEPP may improve conditions for estuarine and marine resources throughout the Northern Estuaries by restoring more natural timing, volume, and duration of freshwater flows to the Caloosahatchee and St. Lucie estuaries and provide minor beneficial effects. It has the potential to reduce excess nutrient loading and provide a more appropriate range of salinity conditions by reducing extreme salinity fluctuations and durations. The improvement of estuarine conditions will ultimately have a beneficial effect to essential fish habitat resources.

C.2.1.7 Hydrology

Hydrologic modeling simulations of the existing condition baseline (ECB) and the CEPP future without project condition (FWO) were developed with the RSM-BN and RSM-GL sub-regional modeling tools, to provide baseline conditions for plan formulation, the assessment of CEPP project benefits (comparisons against FWO), and the assessment of CEPP alternative performance for the level-of-service for flood protection and water supply (comparisons against ECB). The ECB was developed to represent the system-wide infrastructure and operations that were in place at the time CEPP plan formulation was initiated, approximately January 2012. The FWO for CEPP assumes the construction and implementation of currently authorized CERP and non-CERP projects, and other Federal, state or local projects constructed or approved under existing governmental authorities that occur in the CEPP study area. Selection of the TSP is conducted based on comparisons between the CEPP action alternatives and the CEPP FWO. The reader should refer to Section 2 of the CEPP PIR main report and Appendix C.1 for additional documentation of the ECB and FWO conditions.

The portion of the Greater Everglades within the CEPP project area includes WCA 1, WCA 2A, WCA 2B, WCA 3A, WCA 3B, and ENP. This overview of CEPP hydrological conditions is intended to provide a general overview of regional hydrological changes for the CEPP action alternatives compared to the CEPP FWO. RSM-BN and RSM-GL hydrologic modeling simulations for the CEPP final array of action alternatives were developed starting from the FWO modeling simulations. Since all of the components north of the red line are the same for the CEPP preliminary final array of action alternatives (Alts 1 through 4), a single RSM-BN simulation for Lake Okeechobee, the northern estuaries, and the EAA was completed to represent all of the action alternatives and provide boundary conditions to the RSM-GL modeling. Hydrologic performance within any specific spatial area is due to the combined effect of CEPP alternative components and operations identified throughout the project area. Deduction of cause-effect relationships between CEPP alternative components were conducted throughout the CEPP preliminary screening and alternative formulation effort (refer to Sections 3 and 4 of the CEPP PIR main report). For a more detailed assessment, the reader should refer to the complete suite of RSM-GL modeling results. A map of the RSM-GL gage locations is provided in **Figure C.2.1-49**.

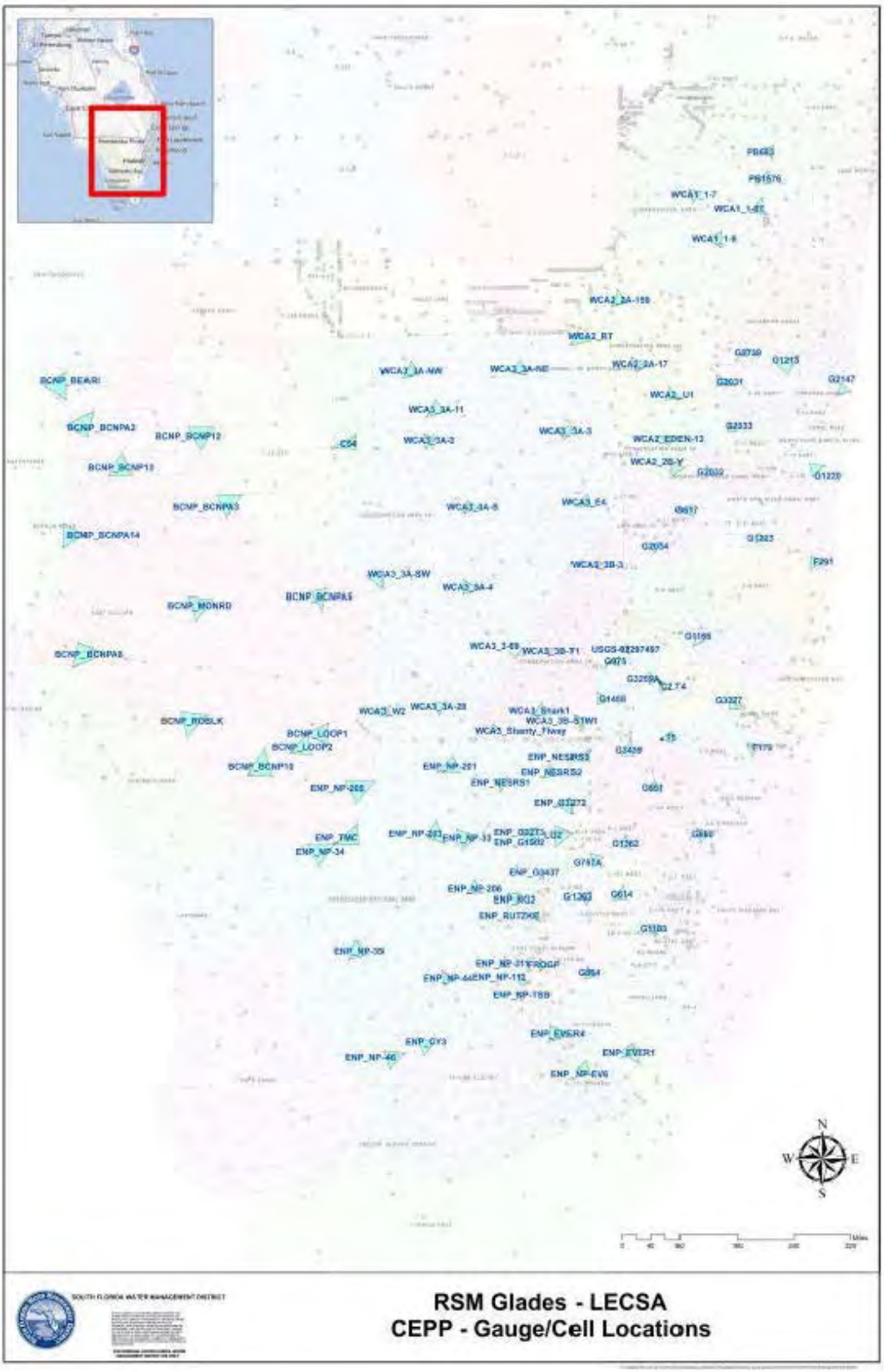

Figure C.2.1-49. **Map of RSM-GL monitoring gage locations.**

C.2.1.7.1 Lake Okeechobee and the Northern Estuaries

For the modeling of the final array of alternatives, operational changes to Lake Okeechobee were limited to changes within the flexibility of the Lake Okeechobee Regulation Schedule (LORS) 2008, with no adjustments to the defined LORS zones. Lake Okeechobee operational assumptions applied consistently for the final array modeling include changes to the decision tree outcome maximum allowable discharges dependant on Lake Okeechobee inflow forecasts, time of year (wet season or dry season), stage level (regulation zone), and/or stage trends (receding or ascending). The changes are all assumed to occur within the flexibility of LORS 2008 (Regulation Schedule zones unchanged), for the purpose of increasing CEPP potential benefits. Details pertaining to the proposed CEPP operations for Lake Okeechobee are separately addressed in the draft Preliminary Operations Manual (refer to **Annex C**).

Compared to the FWO, Lake Okeechobee stages are increased by 0.2-0.4 feet for the upper 60% of the stage duration curve, excluding extreme wet hydrologic conditions (**Figure C.2.1-50**). Peak lake stage increased from 17.50 feet NGVD in the FWO to 17.64 feet NGVD in the action alternatives. The number of days with stages above 16 feet NGVD is increased from 696 to 1096 during the 1965-2005 period of simulation.

For the Caloosahatchee Estuary, compared to the FWO, mean monthly flows above 2800 cfs and 4500 cfs are reduced by 13 and 2 months, respectively (16% and 6% reductions, respectively; **Figure C.2.1-51**). Mean monthly flows less than 450 cfs are reduced by 2 months (6%) (**Figure C.2.1-52**).

For the St. Lucie Estuary, compared to the FWO, mean monthly flows above 2000 cfs and 3000 cfs are reduced by 22 and 3 months, respectively (26% and 10% reductions, respectively; **Figure C.2.1-53**). Mean monthly flows less than 350 cfs are increased by 30 months (33%; **Figure C.2.1-54**). Note that the St. Lucie performance measures for the ECB and FWO base conditions were subsequently updated during development of the final array of alternatives, due to an identified error that the performance measure was not accounting for local groundwater flow contributions to the estuary. The correct St. Lucie estuary performance measures are shown in **Figure C.2.1-53**and **Figure C.2.1-54**, although these graphics also include display of the subsequent CEPP action alternatives.

Hydrologic effects to Lake Okeechobee and the Northern Estuaries would be the same for all action alternatives.

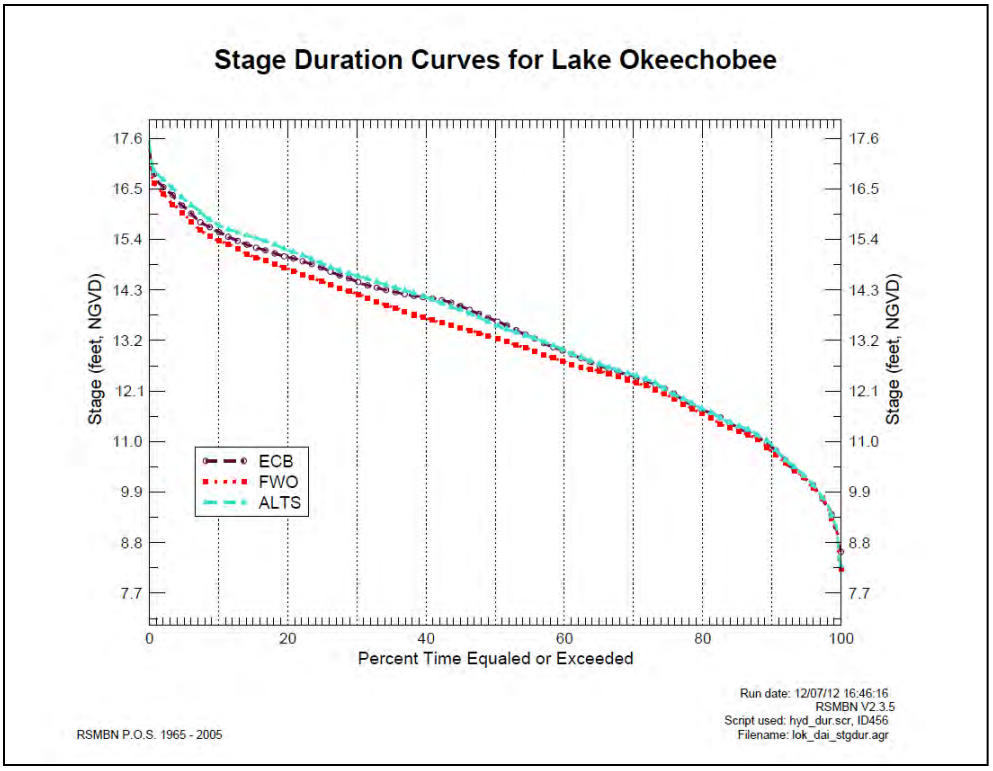

Figure C.2.1-50. Lake Okeechobee Stage Duration Curve for CEPP Action alternatives.

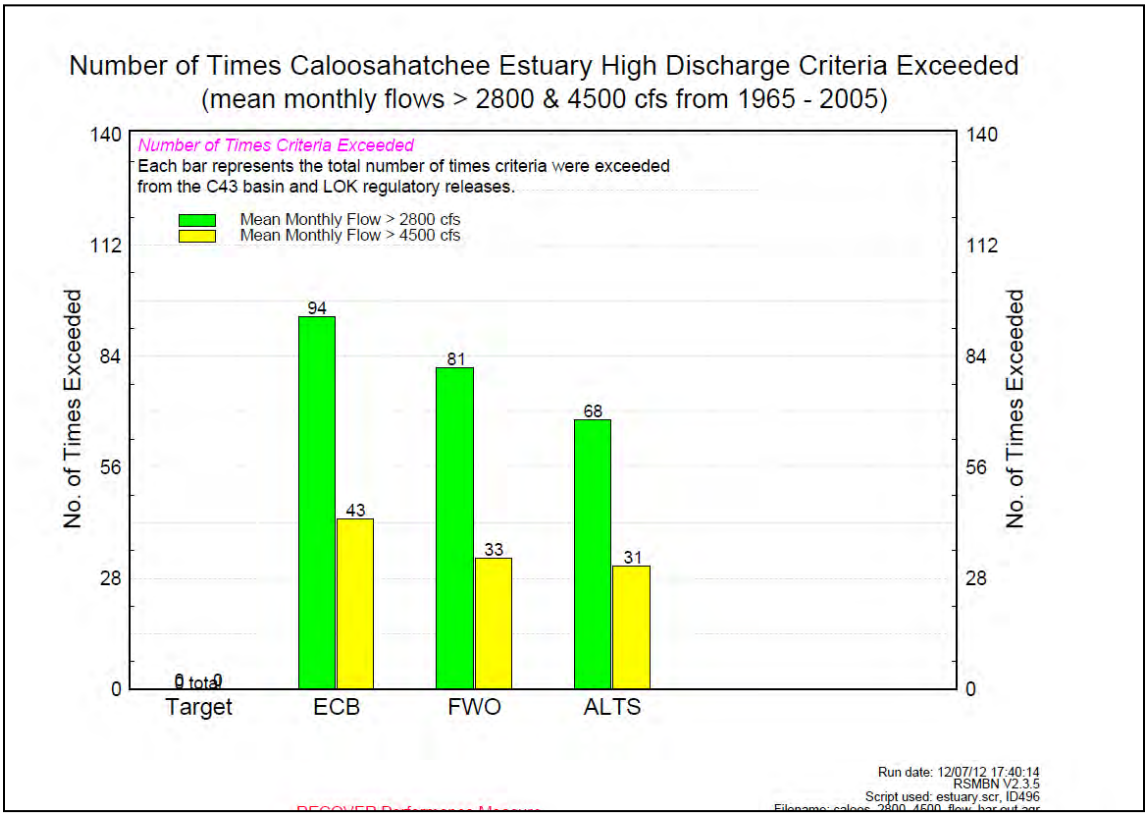

Figure C.2.1-51. Caloosahatchee Estuary High Discharge Frequency for CEPP Action alternatives.

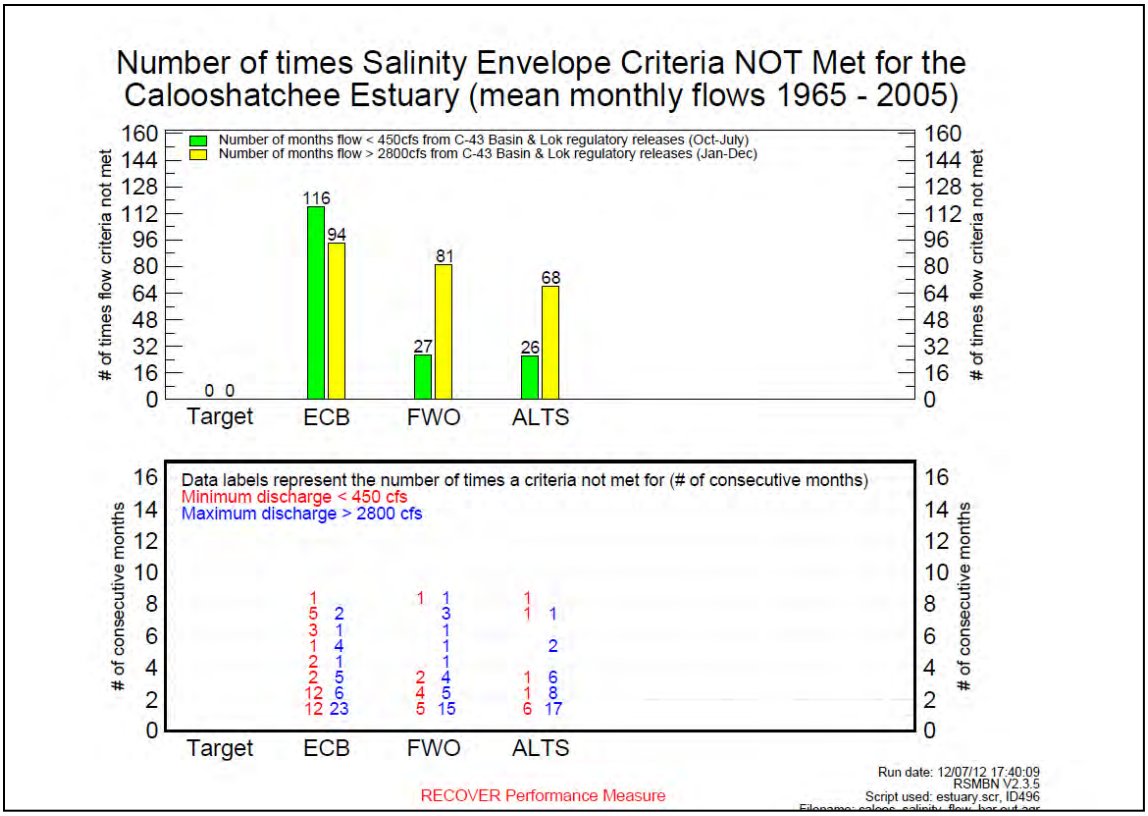

Figure C.2.1-52. Caloosahatchee Estuary Low Discharge Frequency for CEPP Action alternatives.

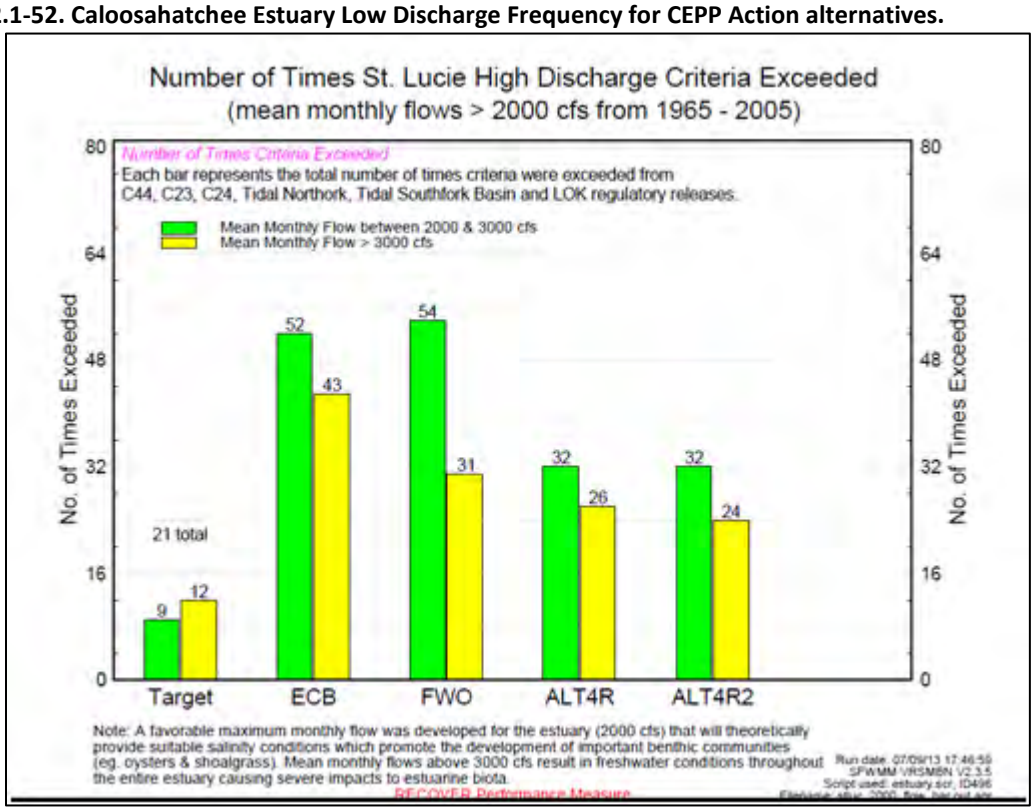

Figure C.2.1-53. St. Lucie Estuary High Discharge Frequency for CEPP Action alternatives.

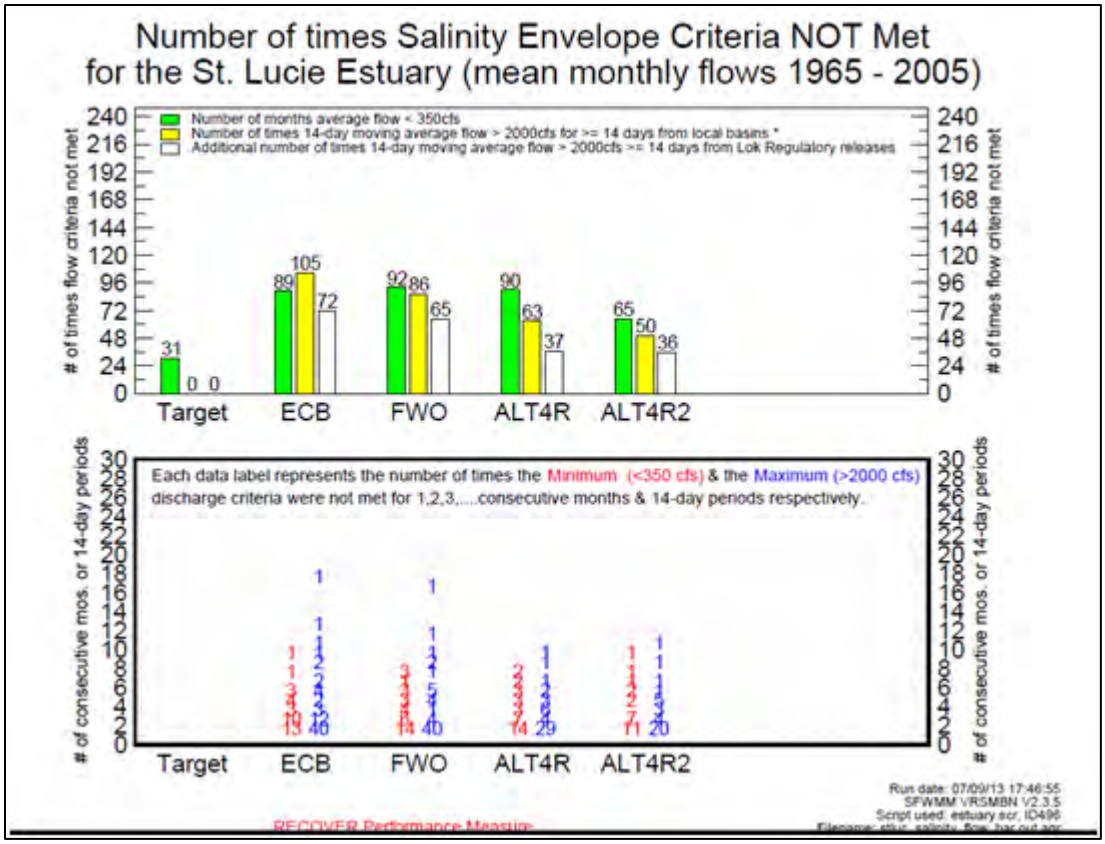

Figure C.2.1-54. St. Lucie Estuary Low Discharge Frequency for CEPP Baselines.

C.2.1.7.2 Everglades Agricultural Area

Minor changes to groundwater levels are expected adjacent to the proposed CEPP A-2 FEB (14,000 acres), compared to the FWO. The FWO condition and all action alternatives include the SFWMD Restoration Strategies A-1 FEB. The A-2 FEB design includes perimeter seepage collection canals and associated seepage pumps to limit potential impacts. Detailed CEPP assessments within the EAA are not available because the RSM-BN does not simulate groundwater within the EAA. Hydrologic effects to the Everglades Agricultural Area would be the same for all action alternatives.

C.2.1.7.3 Water Conservation Area 1

Compared to the FWO, no significant changes to WCA 1 stages are indicated with the action alternatives. Average annual regulatory releases from WCA 1 to WCA 2A via the S10 structures are slightly reduced from 268,000 acre-feet (268 kAF) to approximately 266 kAF with all action alternatives.

C.2.1.7.4 Water Conservation Area 2A and 2B

Compared to the FWO, WCA 2A stages are moderately decreased by 0.1-0.3 feet under all hydrologic conditions for Alts 1 through 4 (**Figure C.2.1-55**). Average annual inflows from STA 2 (including Compartment B) to WCA 2A are significantly decreased from 381 kAF to 218 kAF (a 43% decrease) with the assumed implementation of the L-6 diversion from WCA 2A to WCA 3A. The S-7 pump station also contributes inflows to WCA 2A; S-7 inflows are reduced from 77 kAF in the FWO to 16 kAF in Alts 1 through 4, due to operations to redirect a portion of STA-3/4 discharges away from WCA 2A to WCA 3A via the S-8 pump station. Average annual regulatory releases from WCA 2A to WCA 3A via the S11s are significantly decreased from 460 kAF to 287-288 kAF for Alts 1 through 4.

Compared to the FWO, stages within WCA 2B are significantly decreased by 0.50-0.75 feet under nearly all hydrologic conditions, excluding extreme wet conditions, for Alts 1 through 4 (**Figure C.2.1-56**). Changes within WCA 2B are directly related to the decreased stages within WCA 2A and decreased inflows from S-144, S-145, S-146, and seepage.

C.2.1.7.5 L-28 Triangle

The L-28 Triangle area is located entirely within the boundaries of the Miccosukee Federal Indian Reservation and encompasses 7830 acres of Tribal lands and approximately 230 acres of BCNP. The L-28 Triangle area is confined on north by Interstate 75, the west by L-28 Interceptor Canal (L-28I) and the BCNP, and the east by the L-28 Canal.

The L-28 Interceptor Canal is bound by levees on both sides and maintains no direct connection to wetlands in the Triangle. Within the L-28 Triangle Area, the L-28 Canal is bound on the east side by a confining levee separating the wetlands of the L-28 Triangle from WCA 3A.Wetlands interior to the L-28 Triangle do maintain a connection to the L-28 canal along the west side of the L-28 canal. The L-28 canal terminates at the southern tip and is not connected to the L-28I canal. Historically the S-140 pump station maintained flood protection within the Triangle. A weir was installed in 2009, within the L-28 Canal and immediately south of Interstate 75, to restrict regional pumping and maintain water within the Triangle.

Alternative 1 includes removal of two segments of the L-28 Levee along the eastern boundary of the L-28 Triangle (9000 feet total) and complete backfill of the L-28 Canal segment located between the levee gaps, as shown in **Figure C.2.1-57**. By re-establishing a surface water hydrologic connection between WCA 3A and the L-28 Triangle, stages within the Triangle are generally increased by 0.2-0.5 feet during nearly all hydrologic conditions, excluding the driest 25% of hydrologic conditions, with no significant change to stages within the adjacent WCA 3A (**Figure C.2.1-58**). Although Alts 2 through 4 do not include modifications to the L-28 Levee or the adjacent canal, stages within the L-28 Triangle are slightly increased by 0.1-0.2 feet during normal to dry conditions, due to groundwater interactions with the down-gradient western WCA 3A marsh.

C.2.1.7.6 Big Cypress National Preserve

Stages within the BCNP, west of WCA 3A and Western Shark River Slough (ENP), do not change significantly between the CEPP FWO and the CEPP action alternatives.

C.2.1.7.7 Water Conservation Area 3A and 3B

The hydrologic effects of the CEPP action alternatives include the combined effects from implementation of the A-2 FEB, the L-6 Diversion, the northern WCA 3A hydropattern restoration components along L-4 (all action alternatives) and L-5 (Alts 2 through 4), the Miami Canal backfill (north of Interstate 75), and the proposed new or expanded WCA 3A outlet structures along L-67A, along with the associated operations. Compared to the FWO, average annual combined structural inflows to WCA 3A from STA 3/4, STA 5/ STA 6 (including Compartment C), and WCA 2A are significantly increased from 1,028 kAF to 1,274-1,275 kAF (a 24% increase) following implementation of the CEPP components. In order to avoid adverse increases to the frequency, duration, and peak stages of WCA 3A high water conditions with this net increase in WCA 3A inflows, average annual combined structural outflows from WCA 3A through S-151 (to WCA 3B), S-333 (to ENP NESRS), the S-12 structures (to ENP WSRS), and the

S343/S344 culverts are also significantly increased from 1,190 kAF in the FWO to 1,303-1,482 kAF for Alts 1 through 4 (1,425 kAF for Alt 1; 1,482 kAF for Alt 2; 1,303 kAF for Alt 3; and 1,436 kAF for Alt 4).

Since WCA 3A covers approximately 752 square miles, hydrologic differences between the CEPP FWO and Alts 1 through 4 are characterized at representative gages throughout WCA 3A.

Within northwest WCA 3A, compared to the FWO, stages are generally significantly increased by 0.6-0.8 feet for Alt 1 and significantly increased by 0.5-0.7 feet for Alts 2 through 4 **(Figure C.2.1-59**). Stages within northeast WCA 3A are generally significantly increased by 0.4-0.7 feet for Alt 1 and significantly increased by 0.5-0.8 feet for Alts 2 through 4, with no significant change during extreme wet conditions and a slight increase in stage for extreme dry conditions (**Figure C.2.1-60**). Within east-central WCA 3A (3A-3), stages are generally significantly increased by 0.2-0.6 feet, with no significant change during the wettest 20% of conditions for Alts 1 through 4 (**Figure C.2.1-61**). Proceeding south within central WCA 3A (3A-4), stages are generally increased by 0.1-0.2 feet during average to dry conditions, with a slight depth reduction during the wettest 10% of conditions and no significant change during extreme dry conditions for Alts 1 through 4 (**Figure C.2.1-62**). Southern WCA 3A (3A-28) stages are decreased by 0.1-0.2 feet during the wettest 5% of conditions and slightly decreased during normal to dry conditions for Alts 1 and 4 (**Figure C.2.1-63**); for Alts 2 and 3, southern WCA 3A stages are decreased by 0.1-0.2 feet during the wettest 5% of conditions and decreased by 0.1-0.2 feet during wet, normal, and dry conditions.

The CEPP FWO includes the existing S-151 gated culvert as the sole structural inflow to WCA 3B (327 kAF average annual) and the existing S-355 A and B spillways as the only structural outflows from WCA 3B (<2 kAF average annual). By contrast, the CEPP action alternatives have between 1 and 4 new inflow structures to WCA 3B along L-67A (in addition to increased capacity at S-333), resulting in an additional WCA 3B inflow design capacity of between 750-2,000 cfs. The WCA 3B outflow configurations also incorporate a similar wide range of variability: the existing S-355s only (FWO, Alt 1); one additional 500 cfs western gravity structure (Alt 2); two additional 500 cfs pump stations (Alt 3); and additional removal of the L-29 Levee within the Blue Shanty flowway (Alt 4). Water budget maps with surface water flow vectors for Alts 1 through 4, focusing primarily on the structure flows (kAF average annual) and locations (levee seepage flux along L-30 and L-29 is also indicated), are provided in **Figure C.2.1-64** through **Figure C.2.1-67**. Only Alt 3 (with L-29 pumps) and Alt 4 (with the Blue Shanty flowway and L-29 Levee Gap) achieve any significant degree of north-to-south surface water flow directionality within WCA 3B, due to the CEPP prescribed limitations on WCA 3B high water stages (east of the Blue Shanty flowway only in Alt 4) and the increased down-gradient water stages in the L-29 Canal. Peak stages within central WCA 3B (Site 71) exceed 9.0 feet NGVD between 0-2% of the RSM-GL 1965-2005 period of simulation, and only Alt 2 results in WCA 3B stages above 8.0 feet NGVD for more than 20% or the period of simulation.

The WCA 3B hydrologic effects, resultant from the water budget differences, also vary significantly between the action alternatives. At Site 71 for Alt 1, WCA 3B stages are increased by 0.1-0.2 feet during the wettest 10% of conditions and during normal to dry conditions, compared to the FWO; for Alt 2, stages are significantly increased by 0.3-0.5 feet under all hydrologic conditions; for Alt 3, stages are significantly increased by 0.2-0.3 feet during the wettest 10% of conditions and during normal to dry conditions; for Alt 4, stages are slightly increased during the wettest 10% of conditions and increased by 0.1-0.2 feet during normal to dry conditions (**Figure C.2.1-68**). For Alt 4, the stage duration curves for stages within the interior of the Blue Shanty flowway and the down-gradient L-29 Canal stages are

shown in **Figure C.2.1-69**; for Alt 4, the peak stage within the Blue Shanty flow-way is 9.73 feet NGVD and stages exceed 8.0 feet NGVD for approximately 45% of the period of simulation.

C.2.1.7.8 Northeast Shark River Slough

The CEPP action alternatives assume the L-29 Canal maximum operational limit at 9.7 feet NGVD (7.5 feet NGVD is used for the ECB and FWO) and removal of the G-3273 stage constraint (6.8 feet NGVD is used for the ECB and FWO). Total net structural inflows to NESRS (via the L-29 Canal; computed as the sum of S-333, S355A, S-355B, L-29SA, L-29PA, L-29PB, L29 Levee Gap, and S-356 minus S-334) are significantly increased compared to the CEPP FWO (94 kAF average annual): 736 kAF for Alt 1; 740 kAF for Alt 2; 797 kAF for Alt 3; and 717 kAF for Alt 4. Only Alt 3 (with L-29 pumps) and Alt 4 (Blue Shanty flowway and L-29 Levee Gap) deliver a significant portion of these NESRS deliveries through WCA 3B, with 52% and 23% respectively (Alt 1 – 1%; Alt 2 – 4%), due to the CEPP prescribed limitations on WCA 3B high water stages (east of the Blue Shanty flowway only in Alt 4) and the increased down-gradient water stages in the L-29 Canal.

Stage duration curves for the L-29 Canal are provided in **Figure C.2.1-70** and **Figure C.2.1-71** (upper 25% only) (note: for Alt 4, L-29 Canal stages are indicated west of the proposed L-29 divide structure). For the CEPP action alternatives, peak stages in the L-29 Canal range between 9.57-9.63 feet NGVD (the FWO peak stage is 8.43 feet NGVD). Based on the assumed operational constraints, the CEPP FWO L-29 Canal stage exceeds the maximum operational limit of 7.5 feet NGVD approximately 6% of the 1965-2005 RSM-GL period of simulation (due to direct rainfall); by contrast, the maximum operational limit prescribed for the CEPP action alternatives is not constraining during any period within the period of simulation, and L-29 Canal stages exceed 8.5 feet NGVD during only approximately 10-13% of the period of simulation.

Compared to the FWO, stages are significantly increased by 0.7-1.0 feet under all hydrologic conditions at NESRS-2 for Alts 1 through 4 (**Figure C.2.1-72**). Similar trends are also observed further south at the NESRS-1 monitoring gage. Changes to the average annual overland flow to NESRS across RSM-GL transect 18 are shown in **Figure C.2.1-74**; a reference map for the RSM-GL transects (which are consistent with the SFWMM model transects, adjusted for the RSM grid resolution) is provided as **Figure C.2.1-73**.

C.2.1.7.9 Western Shark River Slough

Western SRS (WSRS), located to the west of L-67 Extension Levee and bounded on the north by Tamiami Trail, is primarily influenced by rainfall and water management operations at the S-12 structures (A, B, C and D). Under ERTP, the utilization of the S-12 structures and the seasonal sequential closure periods beginning from the west at S-12A (November 1 – July 14) and S-12B (January 1 – July 14), respectively, is meant to move water from WCA 3A into SRS while providing conditions for Cape Sable seaside sparrow Subpopulation-A (CSSS-A) nesting and breeding. Modification to the ERTP seasonal closure periods for the S-12A and S-12B was not considered during CEPP preliminary screening and alternative formulation, based on USACE consideration of the USFWS Biological Opinion for ERTP.

Changes to the average annual overland flows to WSRS across RSM-GL transect 17 are shown in **Figure C.2.1-75**. Compared to the FWO, stages within northwest ENP (NP-201) are generally significantly decreased by 0.1-0.4 feet under all hydrologic conditions for Alt 1 (**Figure C.2.1-76**). For Alt 2 and Alt 3, NP-201 stages are slightly decreased during wet conditions, slightly increased during normal conditions, and decreased by 0.1-0.3 feet under normal to dry conditions; similarly, for Alt 4, NP-201 stages are

slightly decreased during extreme wet conditions, increased by 0.1-0.2 feet during normal conditions, and decreased by 0.1-0.2 feet under normal to dry conditions. To the south and west, the NP-205 monitoring gage (used as an indicator for CSSS -A hydrology) indicates a potentially significant stage decrease of 0.1-0.2 feet under all hydrologic conditions for all action alternatives, compared to the FWO (**Figure C.2.1-77**). Stages further south within Central Shark River Slough (P-33) are generally significantly increases by 0.2-0.6 feet under all hydrologic conditions for all action alternatives (**Figure C.2.1-78**). Stages within Central Shark River Slough demonstrate a combined hydrologic response to the hydrologic changes previously indicated for both NESRS and WSRS; the resultant combined average annual transect flows within Central Shark River Slough (Transect 27) are significantly increased compared to the FWO (average annual 594 kAF): 812 kAF for Alt 1 (37% increase); 786 kAF for Alt 2 (32%); 842 kAF for Alt 3 (42%); and 856 kAF for Alt 4 (44%) (**Figure C.2.1-79**).

C.2.1.7.10 Taylor Slough

Compared to the FWO, ENP stages along Taylor Slough (NP-TSB) are slightly increased by approximately 0.1 feet during the wettest 20% of hydrologic conditions for Alt 1 through 3 (**Figure C.2.1-80**). By comparison, for Alt 4, which includes the Blue Shanty flowway and the L-29 divide structure to direct surface water flows further west within NESRS, ENP stages along Taylor Slough are slightly decreased by approximately 0.1 feet during the wettest 30% of hydrologic conditions.

C.2.1.7.11 Lower East Coast Area

The LEC area is located to the east of the L-31N, L-31W, and C-111 canals. Under the FWO (ERTP), specified canal water levels/ranges are meant to provide flood protection, water supply, and prevention of saltwater intrusion for the LEC. For the CEPP final array of alternatives, the operations for the SDCS are changed from the FWO operations for G-211 and the coastal canals are utilized to convey seepage water to Biscayne Bay to offset for reduced flows caused by implementation of CEPP.

Observed stage changes within the LEC are separately discussed with the summary of flood control and water supply performance for the CEPP action alternatives, included in **Section C.2.1.8**.

C.2.1.7.12 8.5 Square Mile Area

The CEPP action alternatives modify the FWO operations of the S-357 pump station, in an effort to increase discharges from the 8.5 SMA detention cell to the C-111 South Dade North Detention Area and reduce the reliance on the S-331 pump station in L-31N to provide flood mitigation for the 8.5 SMA protected area. Details of the S-357 operations are provided with the documentation of the modeling assumptions for the CEPP action alternatives, located in Annex A-2 of the Engineering Appendix (Appendix A). The protected portion of the 8.5 SMA is represented by three model grid cells in the RSM-GL (**Figure C.2.1-81**), and the resolution of the RSM-GL is extremely limiting for adequate representation of the 8.5 SMA project features. Prior to implementation of CEPP, further technical investigations will likely be needed for the 8.5 SMA operations, and additional hydrologic/hydraulic modeling with a higher resolution model may be required.

Stages within the 8.5 SMA, located along the eastern boundary of ENP, are lowered by approximately 0.25 feet during wet conditions for RSM-GL grid cells 2965 and 2962, compared to the FWO (**Figure C.2.1-81**); within the resolution of the RSM-GL model, these grid cells represent northern and eastern 8.5 SMA respectively. However, stages within the southwest portion of the 8.5 SMA protected area, represented by RSM-GL grid cell 2749, are increased by approximately 0.3-0.6 feet under all hydrologic conditions.

C.2.1.7.13 Biscayne Bay

Combined total average annual surface water canal discharges to central and southern Biscayne Bay (S-336, S-338, S-194, S-196, S-197) are reduced by between 23-24 kAF for Alts 1 and 2, reduced by 44 kAF for Alt 3, and reduced by 37 kAF for Alt 4. Average annual surface water canal discharges to northern Biscayne Bay (S-29, S-28, S-27), which are affected by the assumed operations of the CERP BCWPA project, are unchanged for Alt 1, increased by 14 kAF for Alt 2, slightly reduced by 3 kAF for Alt 3, and reduced by 7 kAF for Alt 4R2.

C.2.1.7.14 Florida Bay

For the CEPP action alternatives, average annual surface water transect flows from southeastern ENP towards Florida Bay are increased by 2-3 kAF (7-11%) for Craighead Basin (RSM-GL Transect 23-A), increased by 5 kAF (7%) from Taylor Slough (Transect 23-B), and increased by 0-2 kAF (<1%) for the Eastern Panhandle of ENP (Transect 23-C), resulting in a net increase of approximately 7-10 kAF for the action alternatives, compared to the FWO. The salinity effects within Florida Bay from this overall increase and changed spatial distribution of flows were also evaluated by the CEPP ecological sub-team (with additional RECOVER support), and additional information for the changes observed between the CEPP action alternatives and the FWO is discussed in **Appendix G, Environmental Benefits Model**.

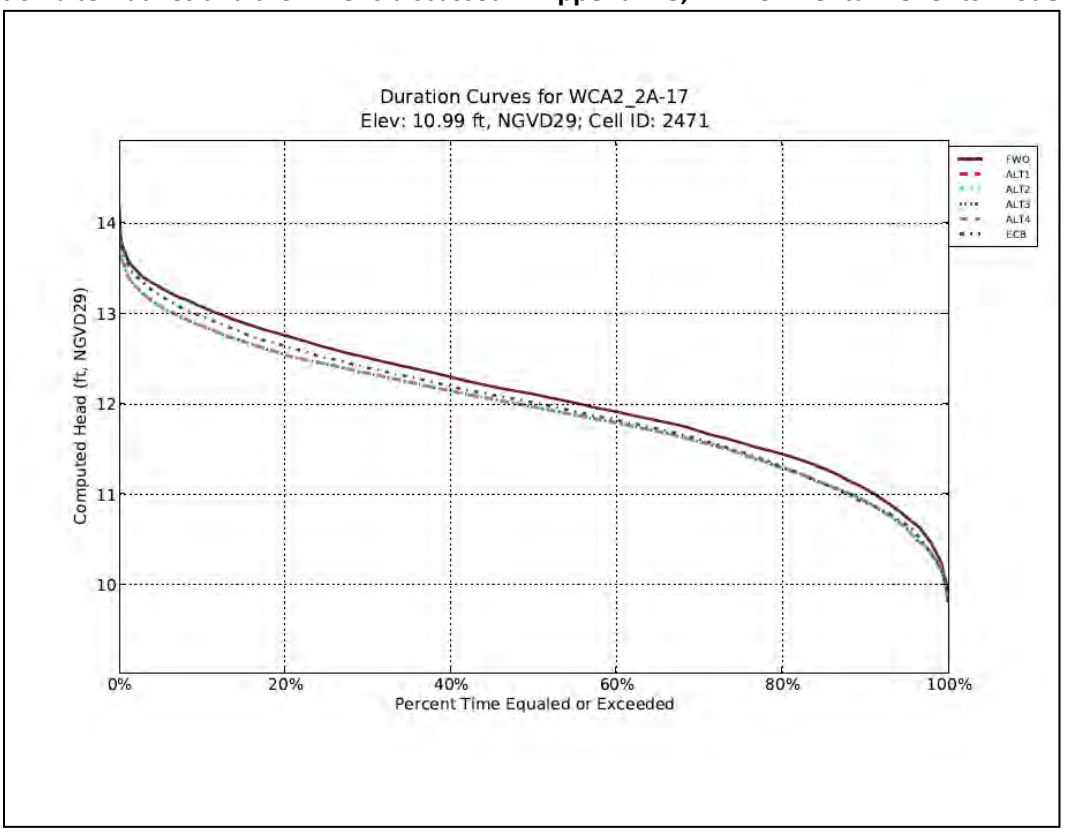

Figure C.2.1-55. Central WCA 2A Stage Duration Curve.

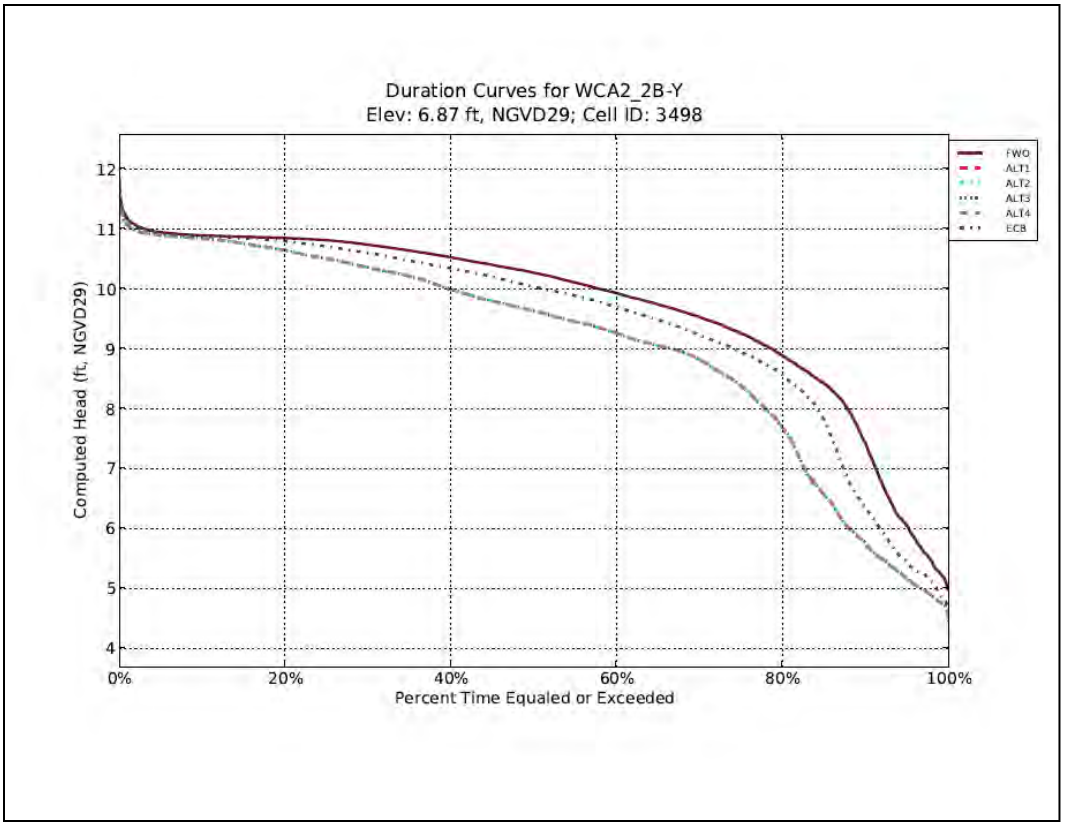

Figure C.2.1-56. **Southern WCA 2B Stage Duration Curve.**

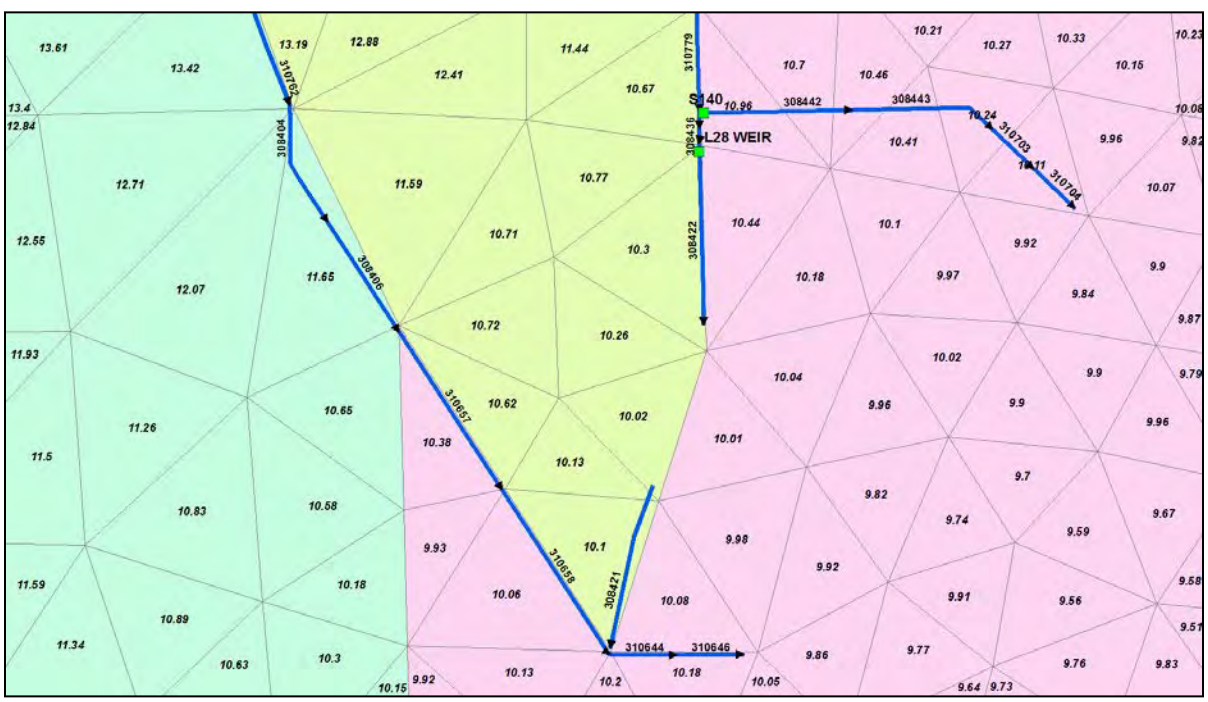

Figure C.2.1-57. L-28 Triangle Modification for Alt 1.

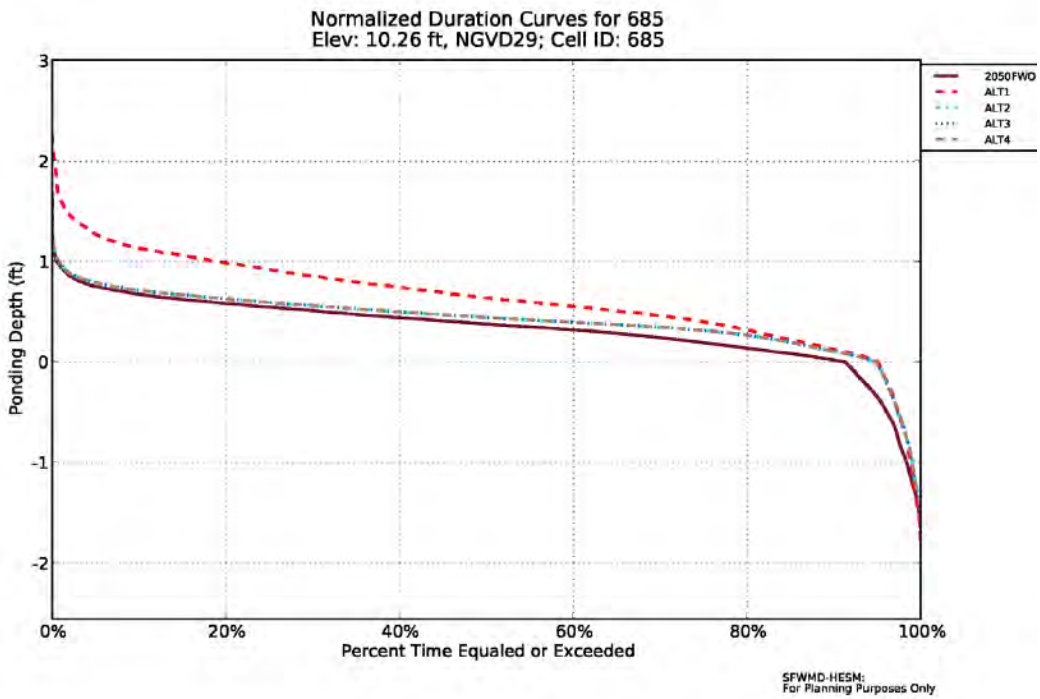

Figure C.2.1-58. L-28 Triangle Stage Duration Curve.

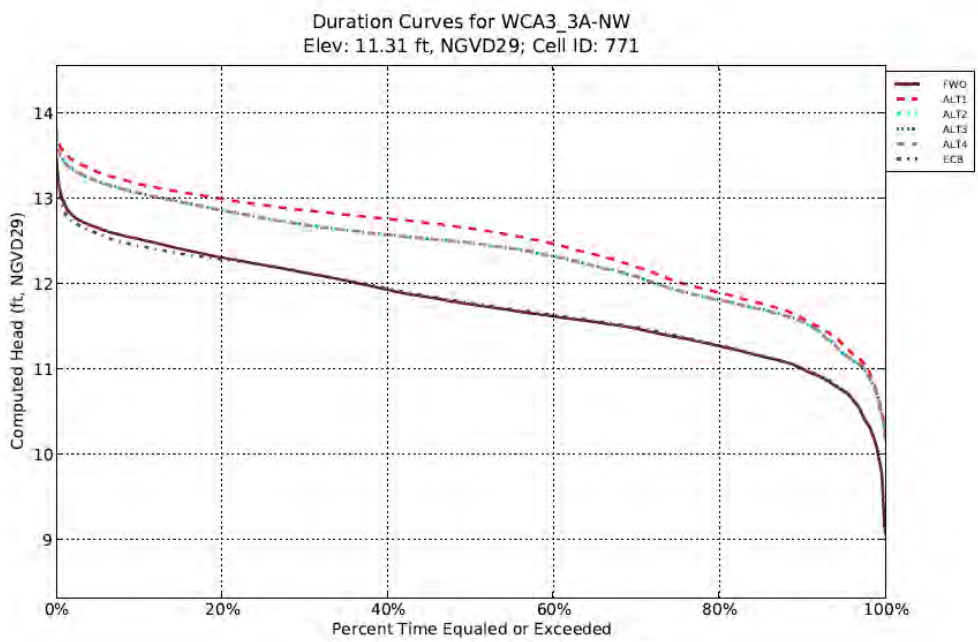

Figure C.2.1-59. **Northwest WCA 3A Stage Duration Curve.**

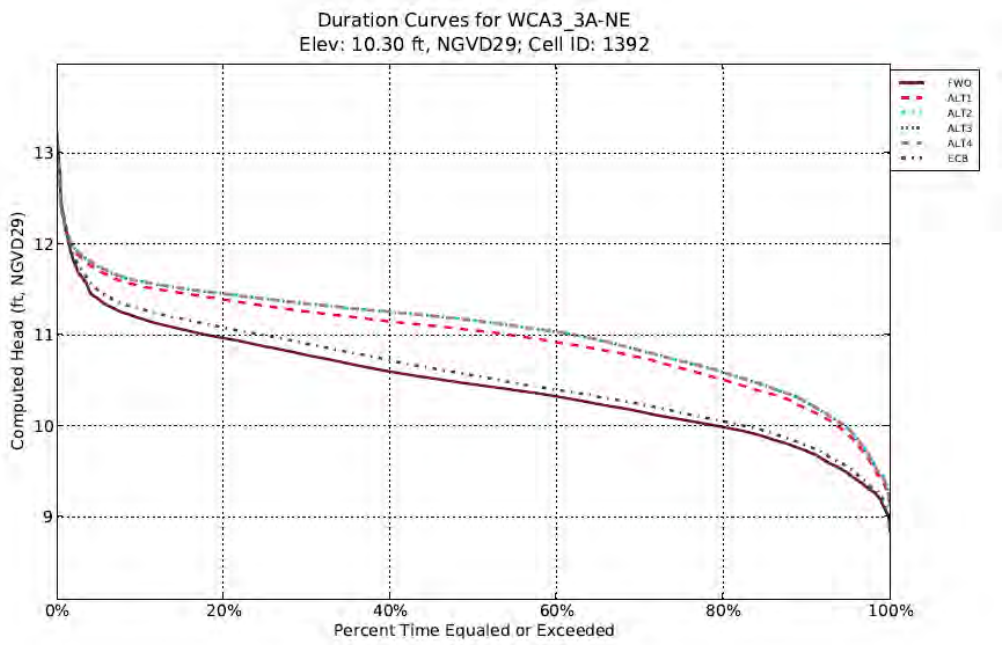

Figure C.2.1-60. Northeast WCA 3A Stage Duration Curve.

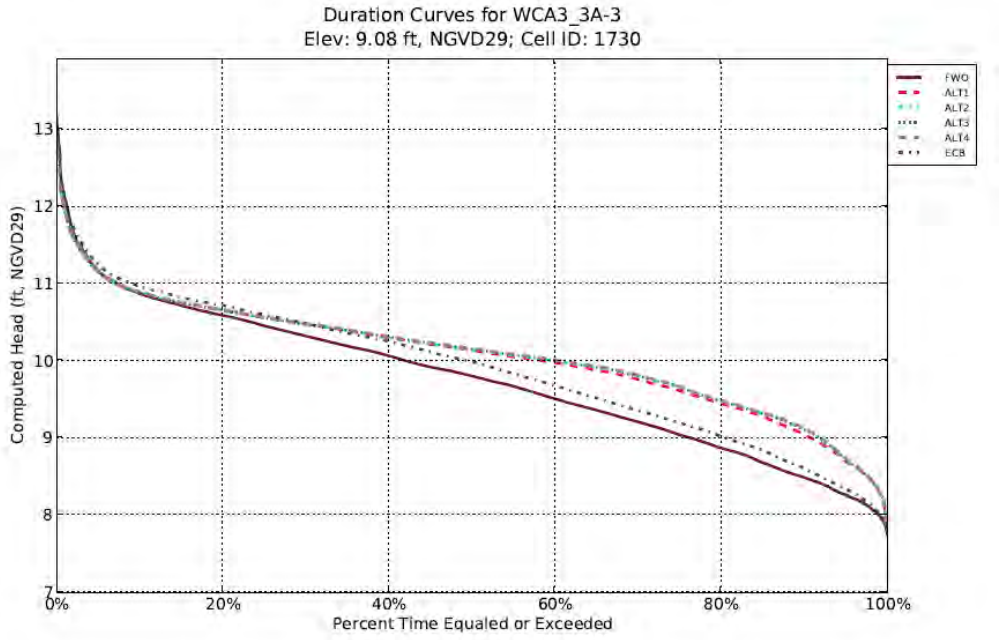

Figure C.2.1-61. East-Central WCA 3A Stage Duration Curve.

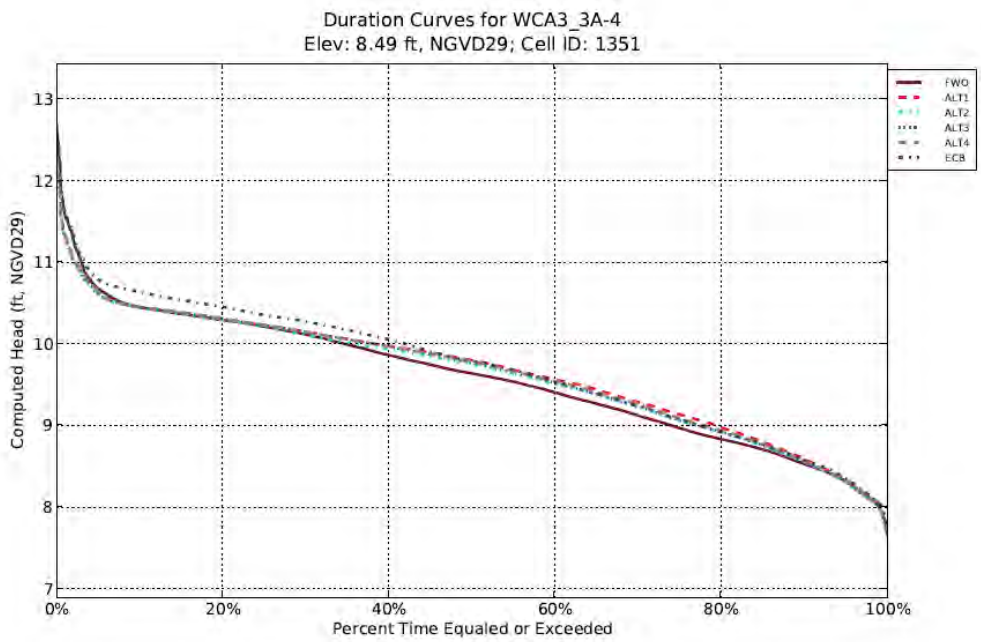

Figure C.2.1-62. **Central WCA 3A Stage Duration Curve.**

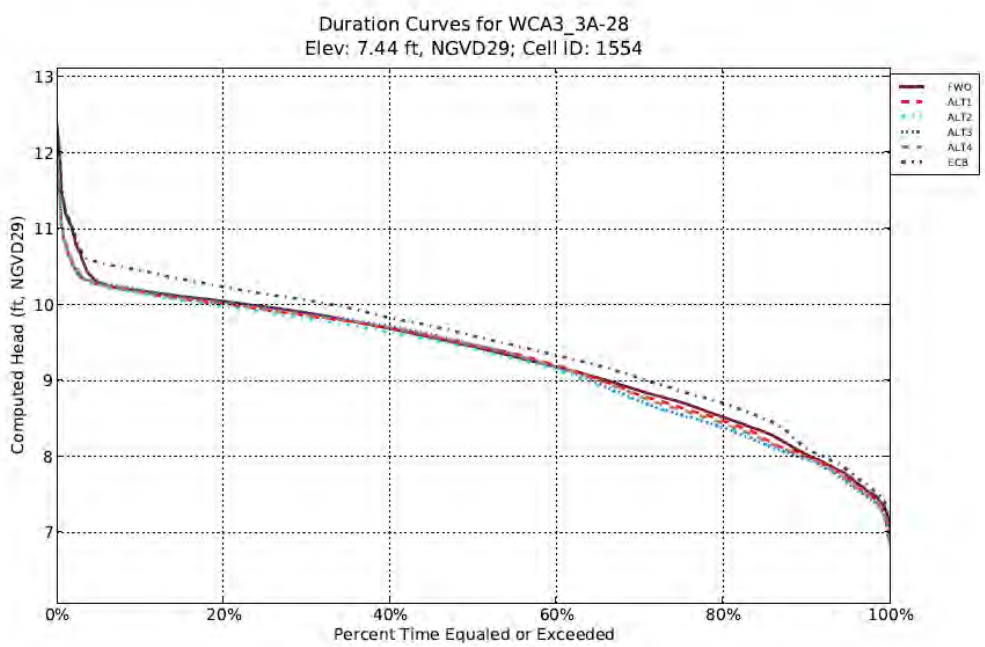

Figure C.2.1-63. South WCA 3A Stage Duration Curve.

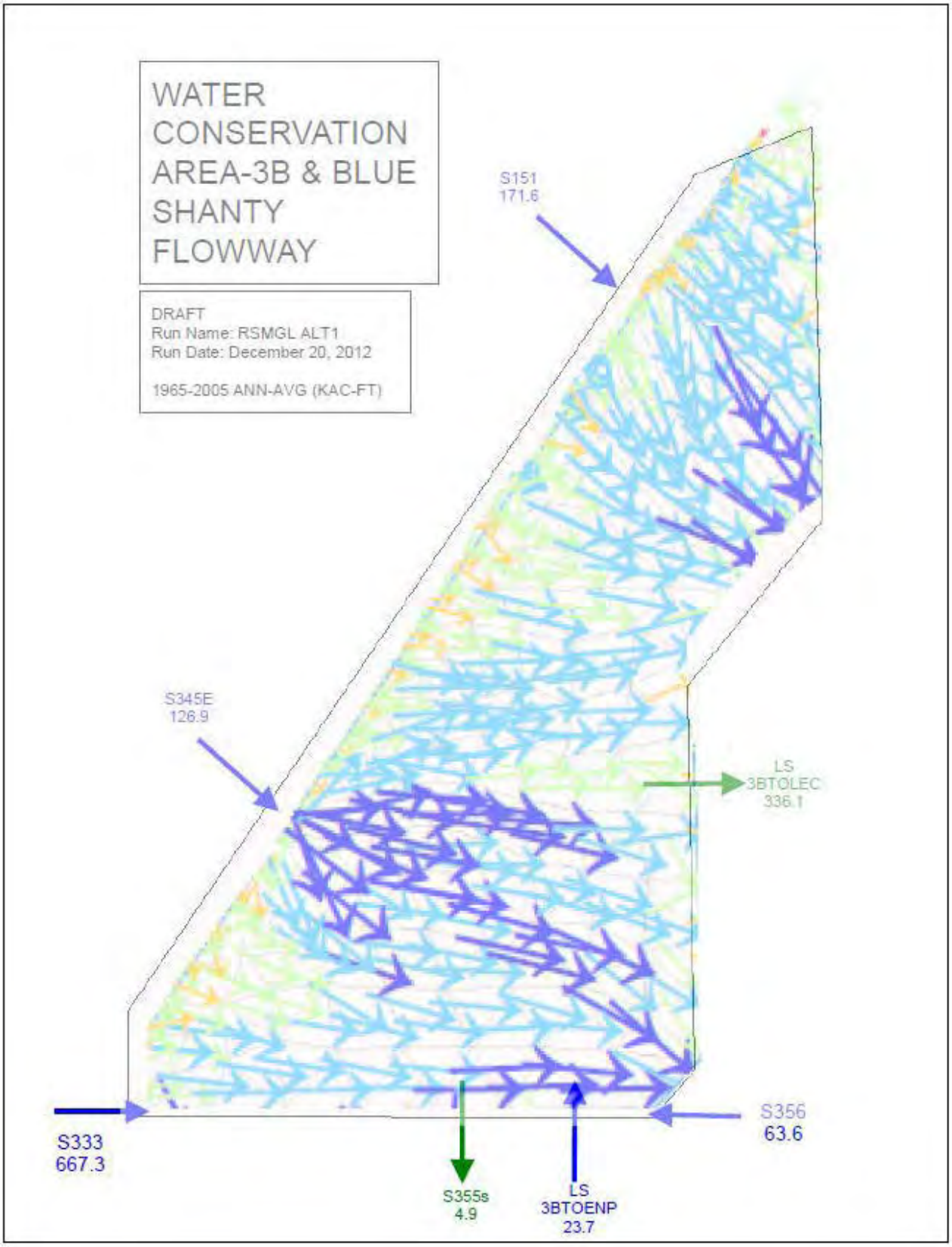

Figure C.2.1-64. WCA 3B Water Budget and Flow Vector Map for Alt 1.

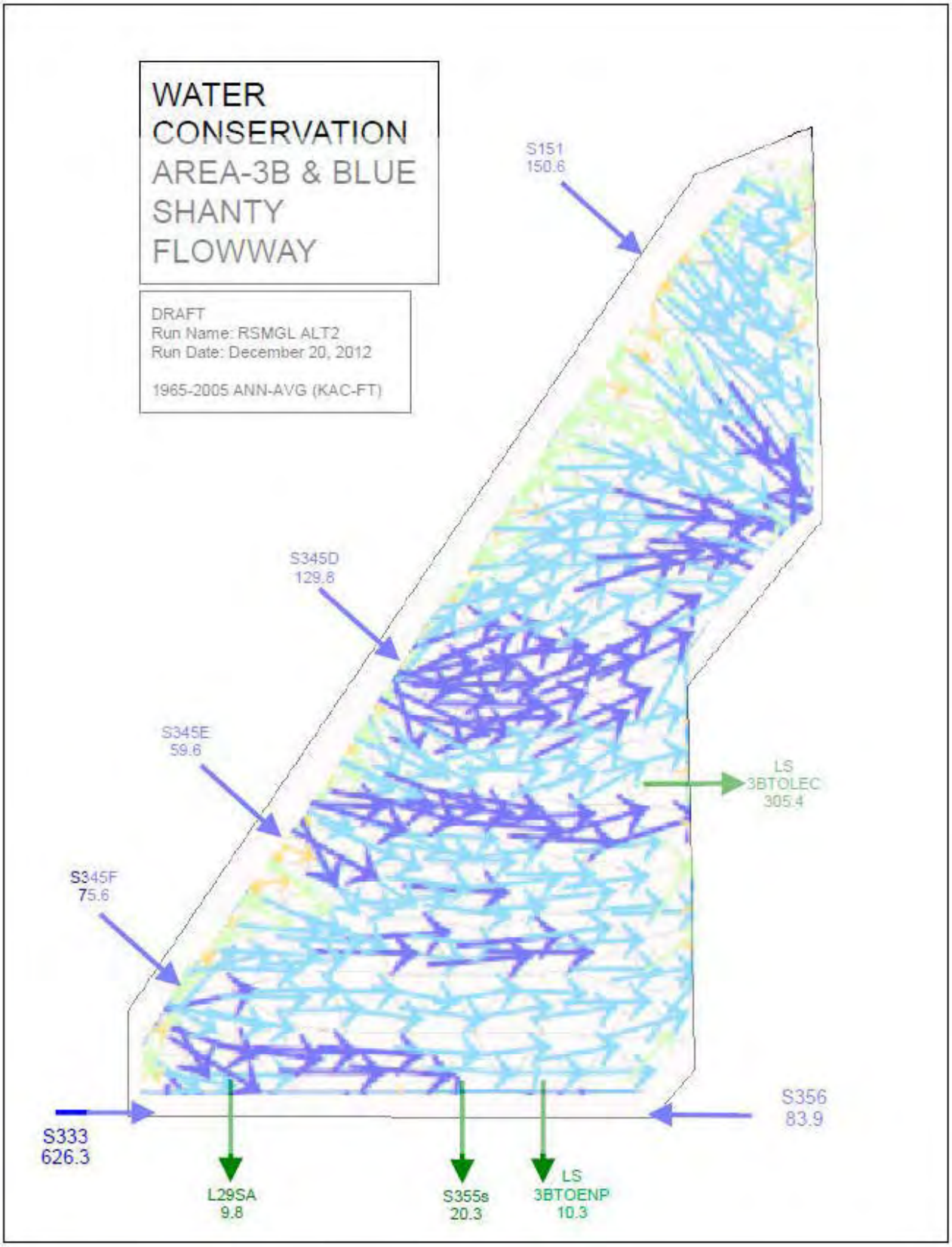

Figure C.2.1-65. WCA 3B Water Budget and Flow Vector Map for Alt 2.

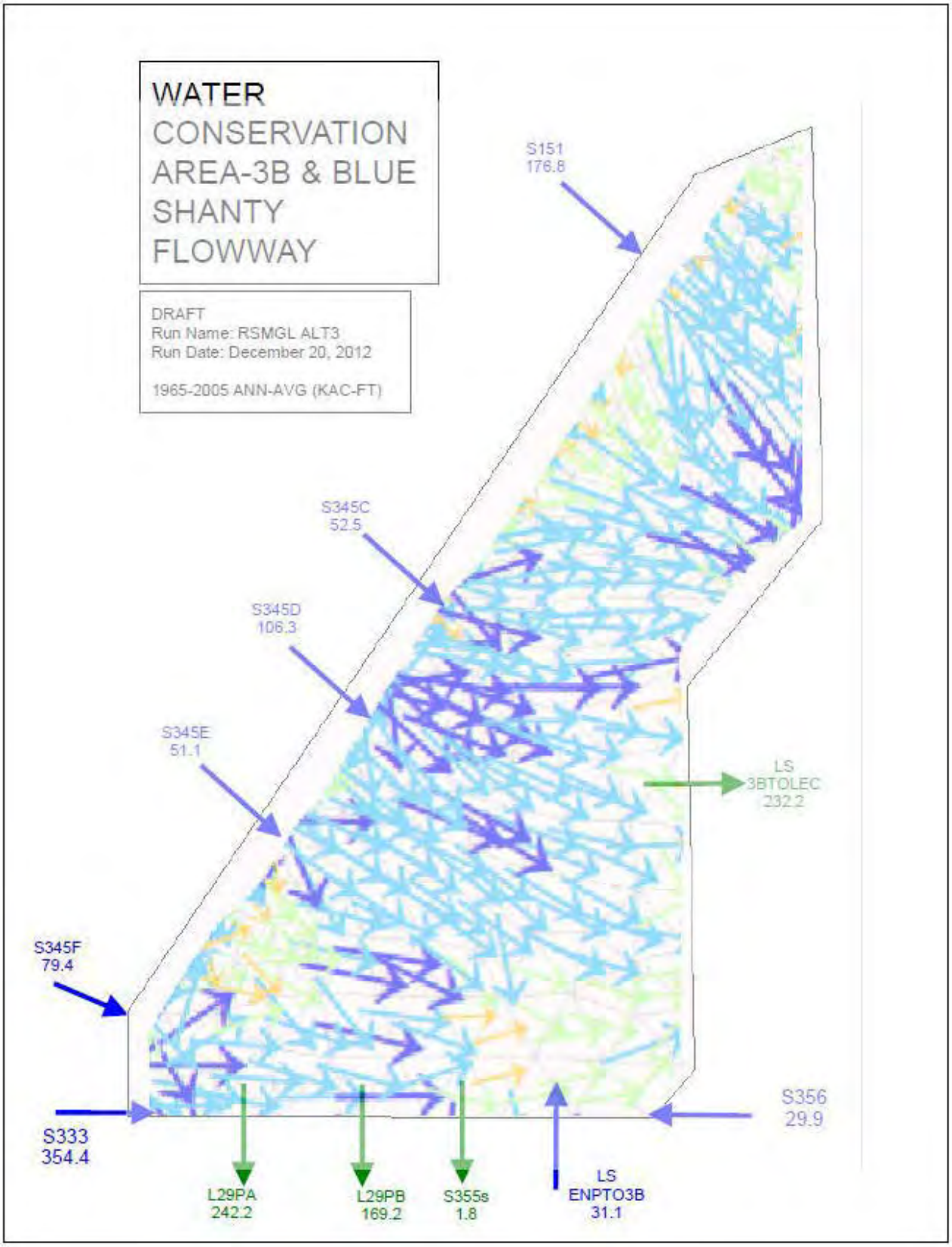

Figure C.2.1-66. WCA 3B Water Budget and Flow Vector Map for Alt 3.

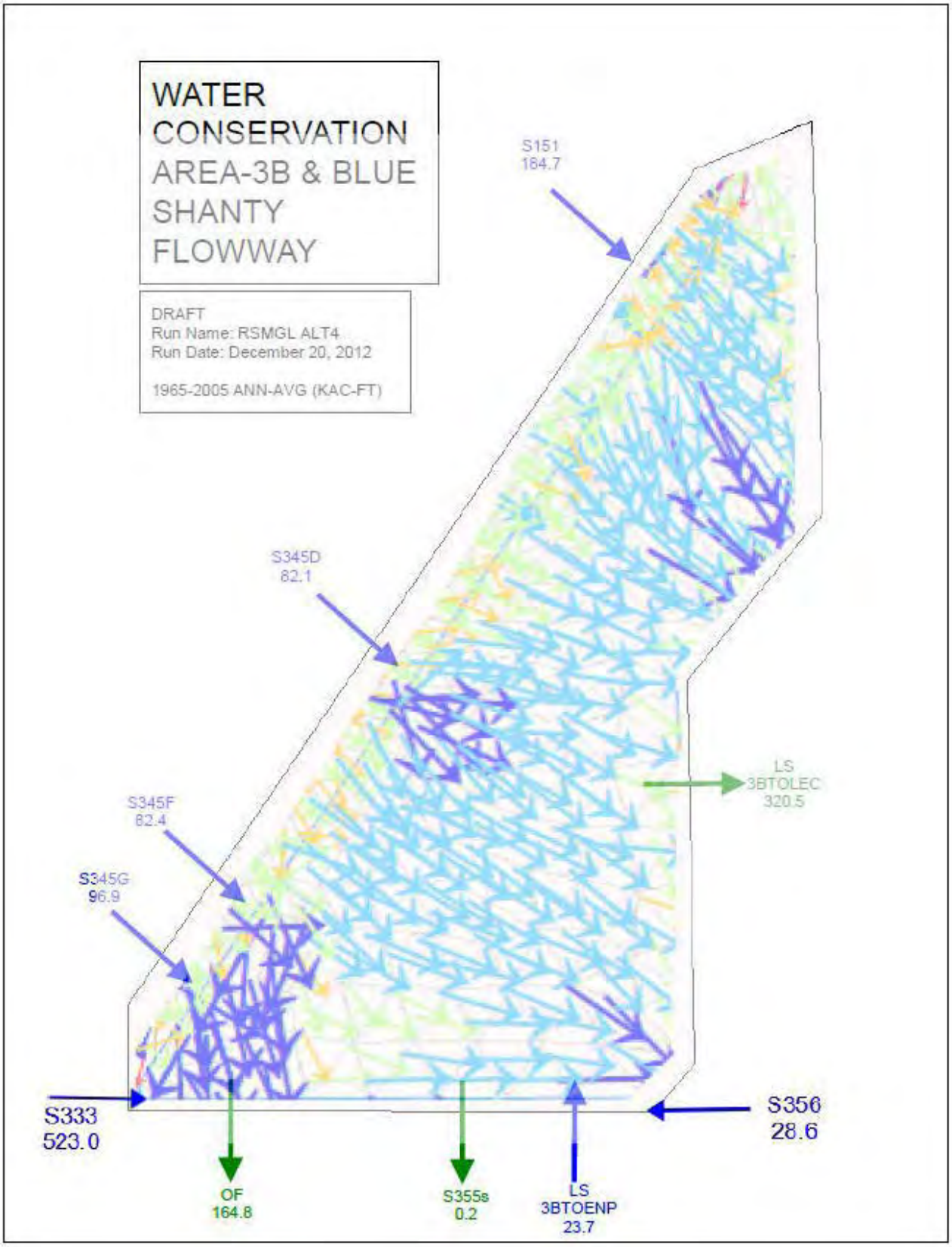

Figure C.2.1-67. WCA 3B Water Budget and Flow Vector Map for Alt 4.

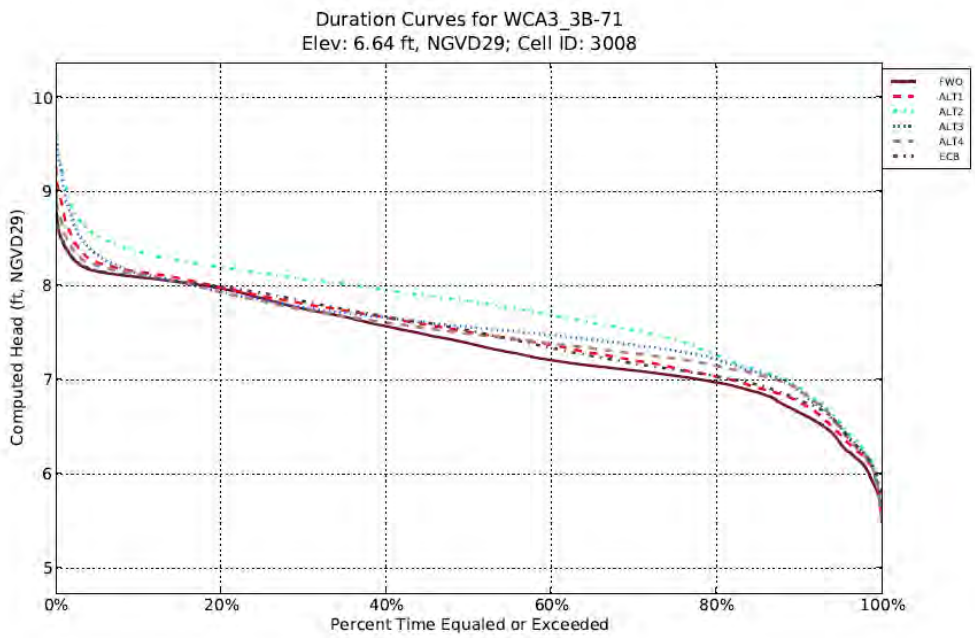

Figure C.2.1-68. Central WCA 3B Stage Duration Curve.

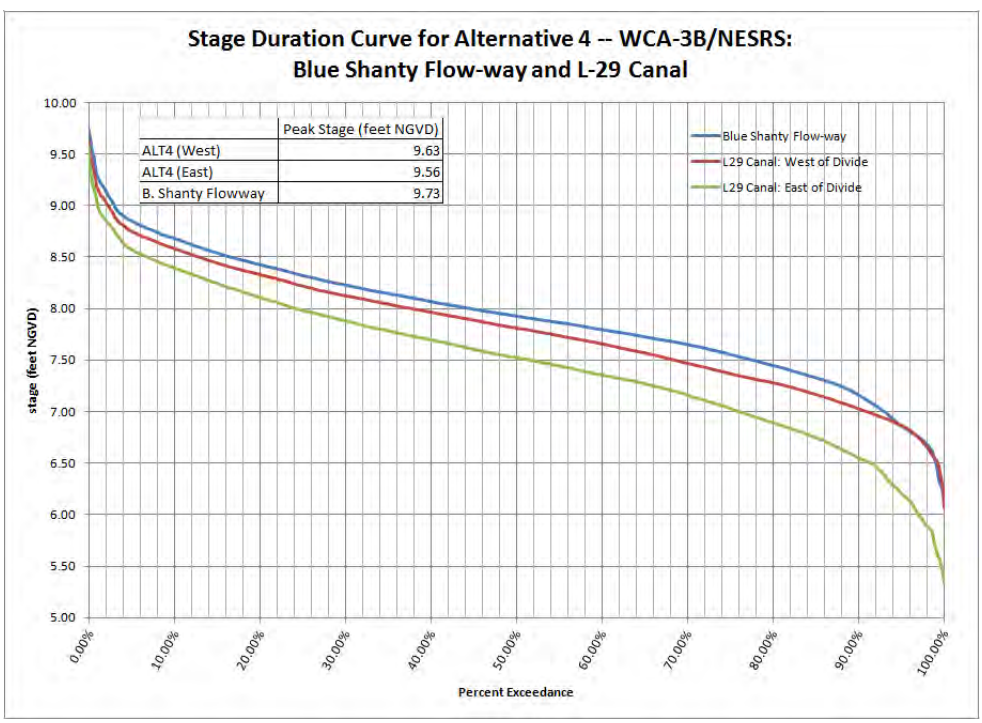

Figure C.2.1-69. WCA 3B Blue Shanty Flow-Way Stage Duration Curve (Alt 4).

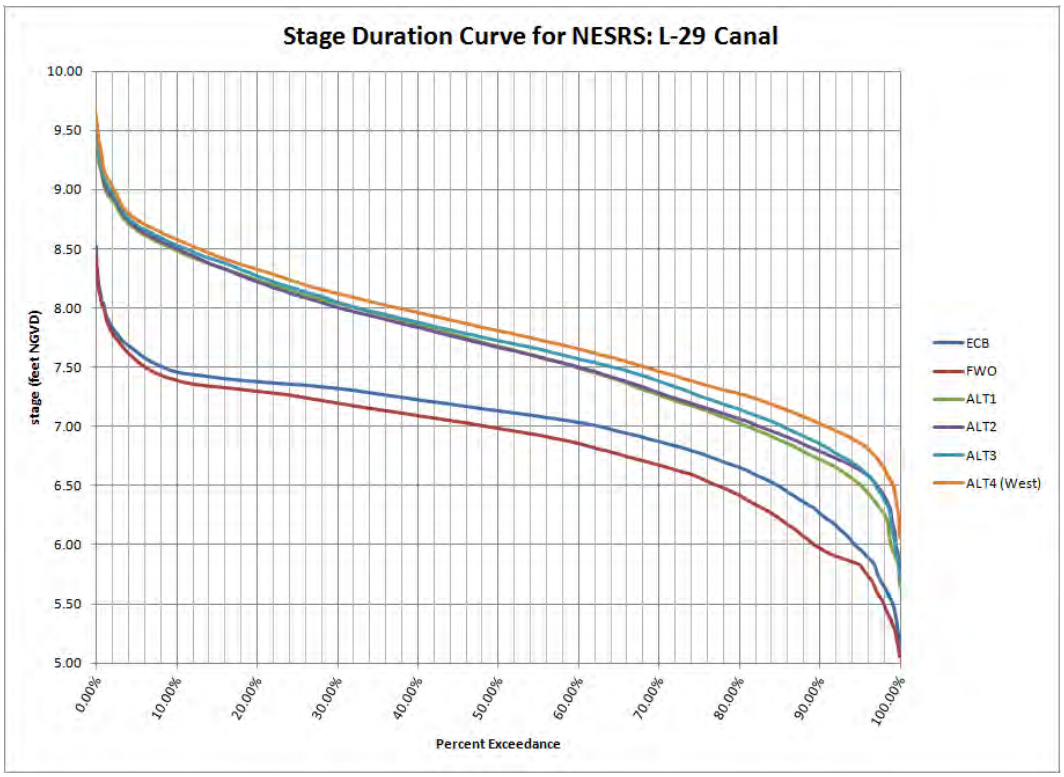

Figure C.2.1-70. L-29 Canal Stage Duration Curve.

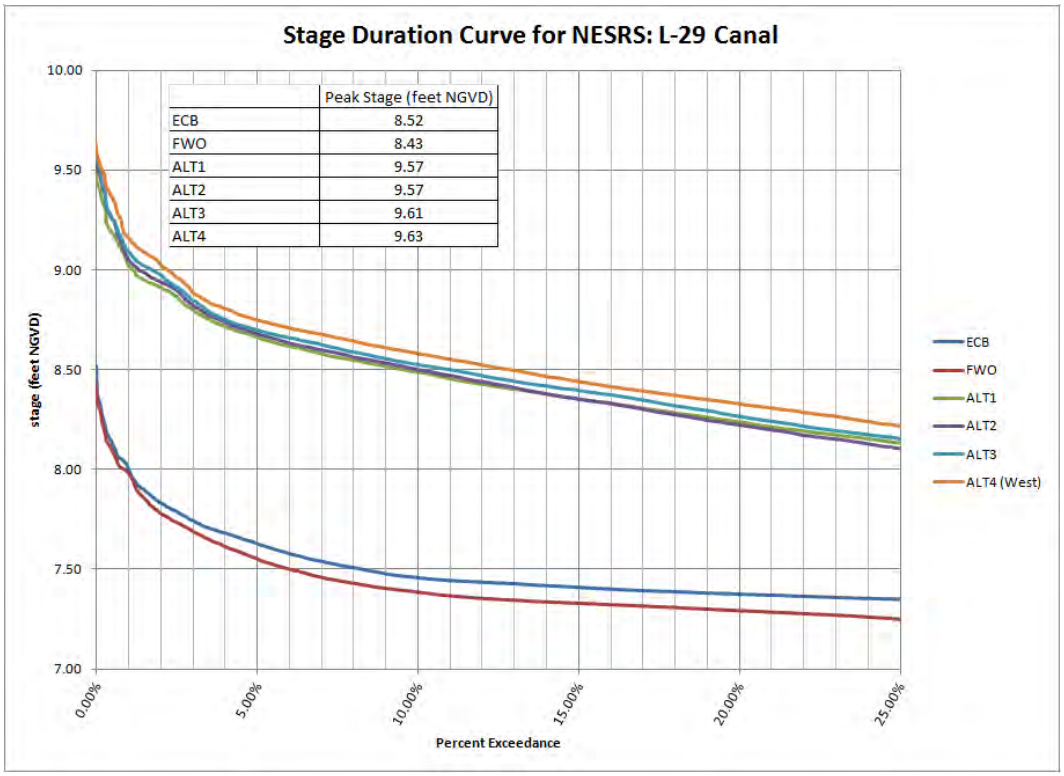

Figure C.2.1-71. L-29 Canal Stage Duration Curve (upper 25%).

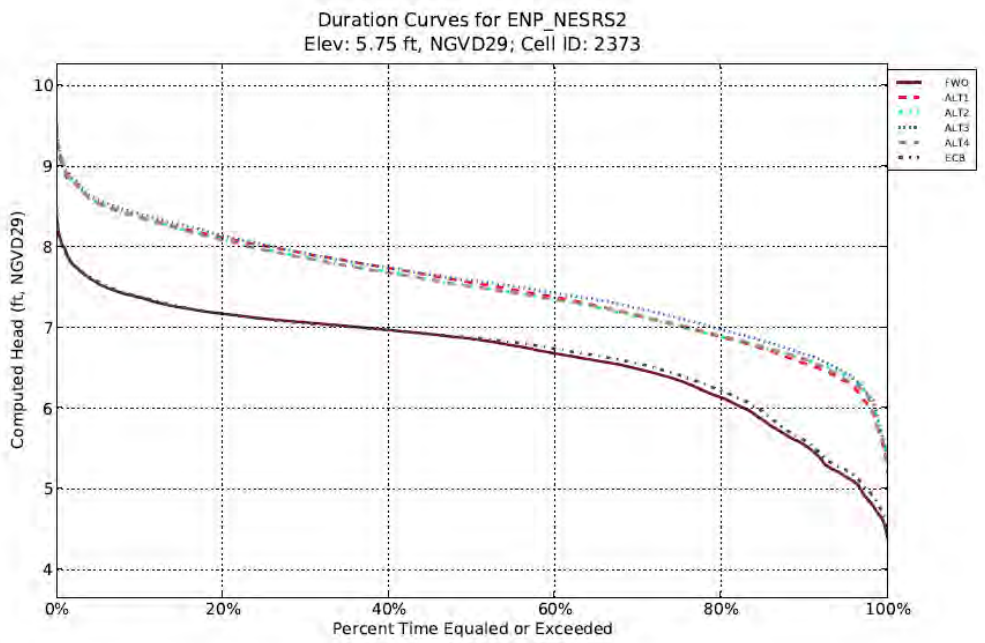

Figure C.2.1-72. Northeast ENP Stage Duration Curve.

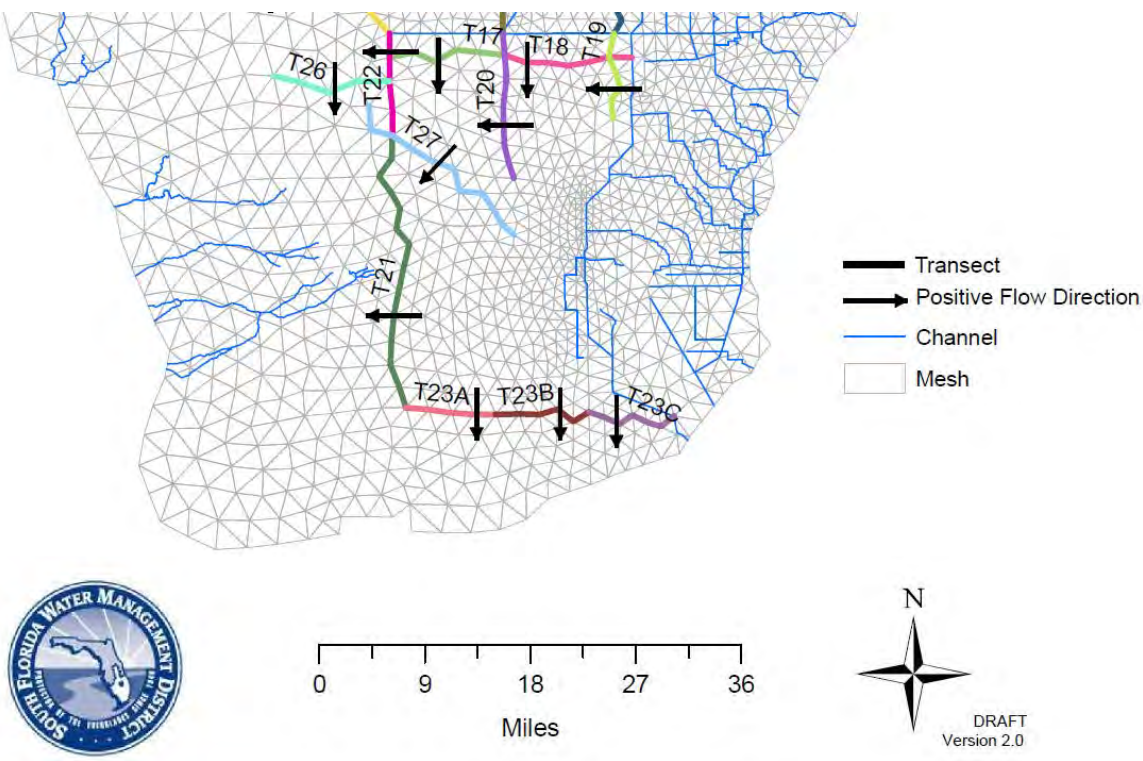

Figure C.2.1-73. RSM-GL Overland Flow Transects for ENP.

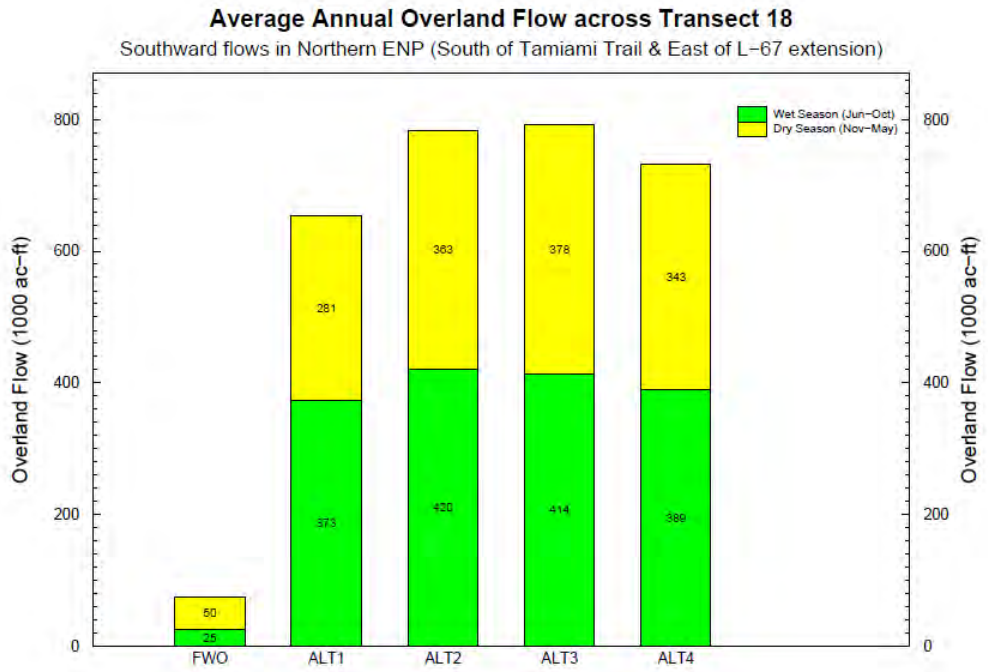

Figure C.2.1-74. **Average Annual Overland Flow to NESRS.**

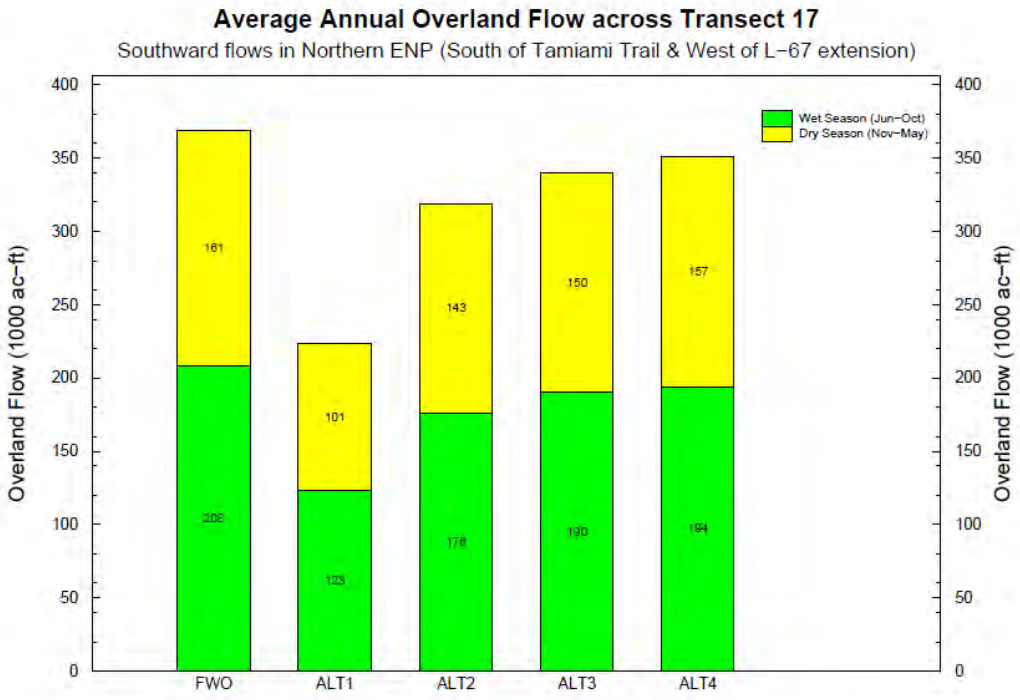

Figure C.2.1-75. **Average Annual Overland Flow to WSRS.**

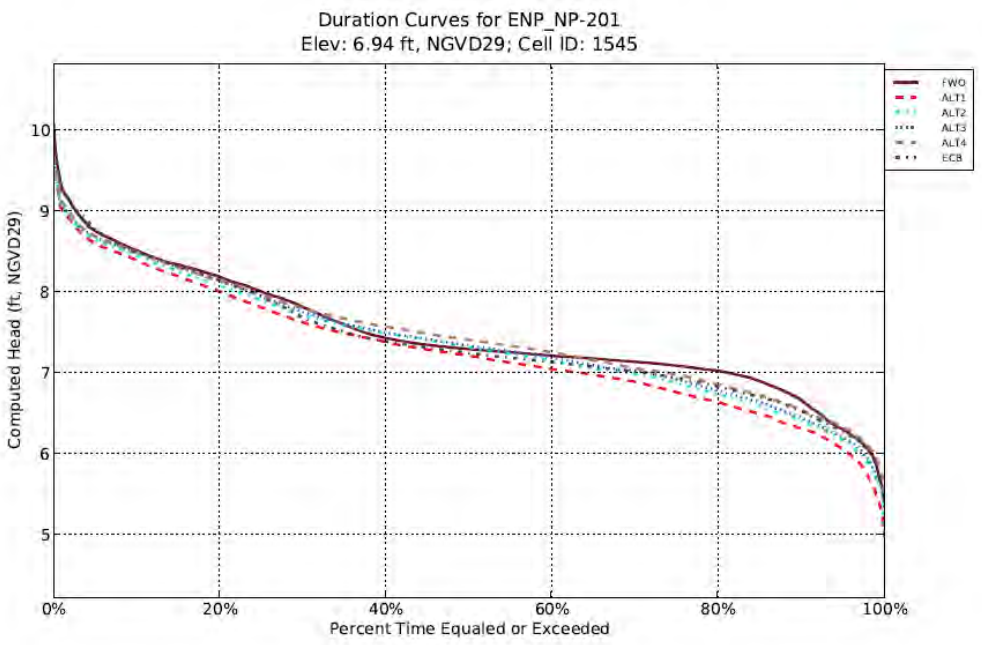

Figure C.2.1-76. Northwest ENP Stage Duration Curve (NP-201).

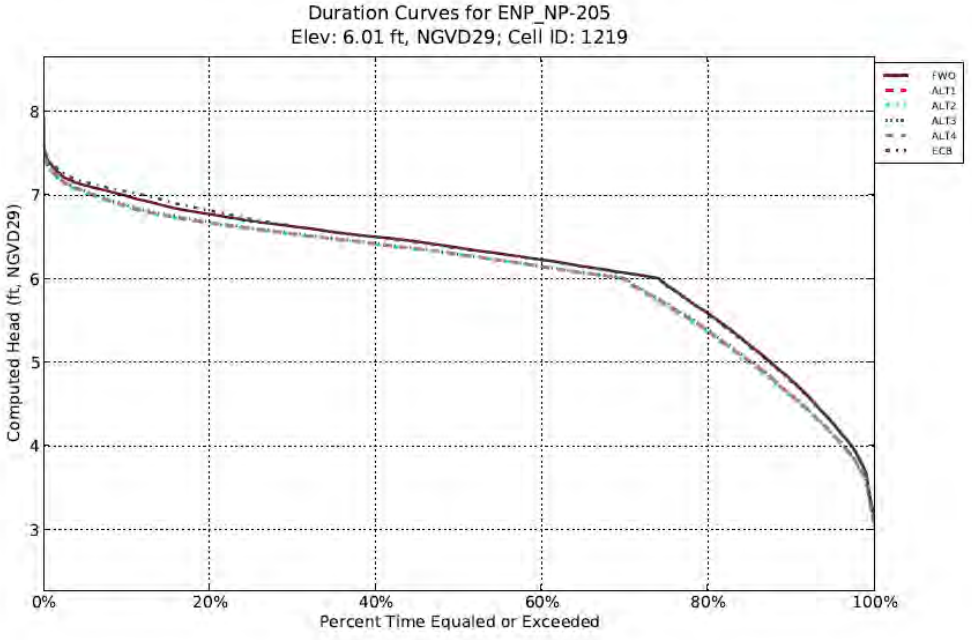

Figure C.2.1-77. Northwest ENP Stage Duration Curve (NP-205).

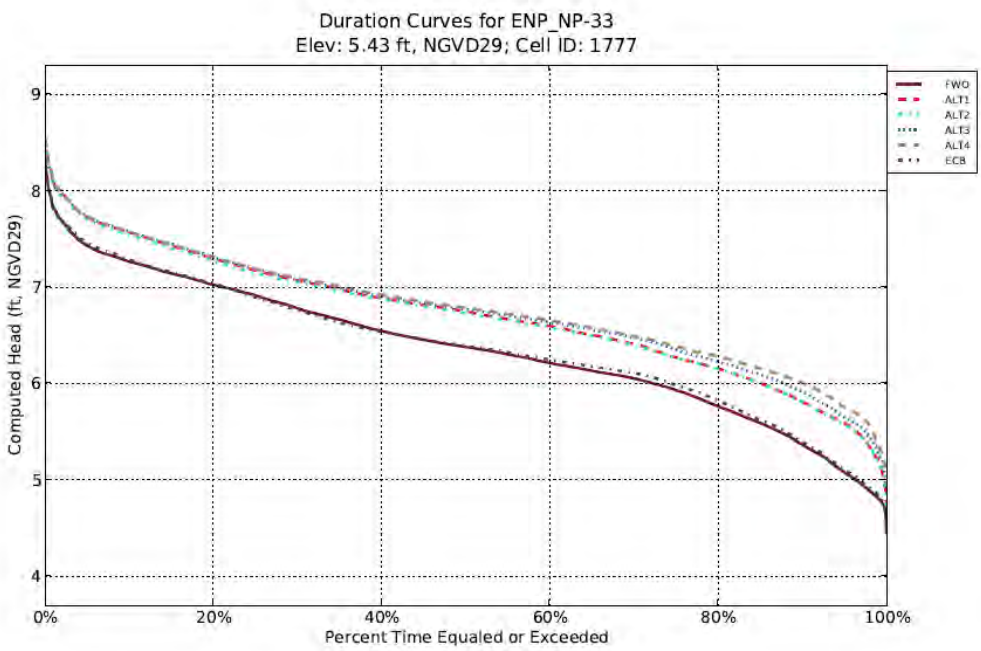

Figure C.2.1-78. Central ENP Stage Duration Curve.

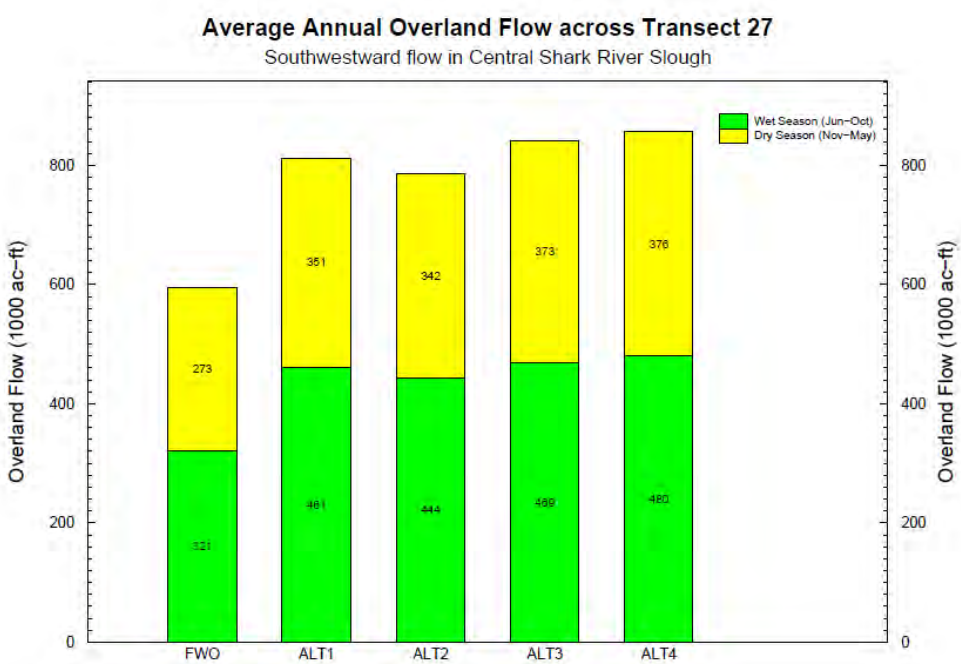

Figure C.2.1-79. Average Annual Overland Flow Transect for Central Shark River Slough.

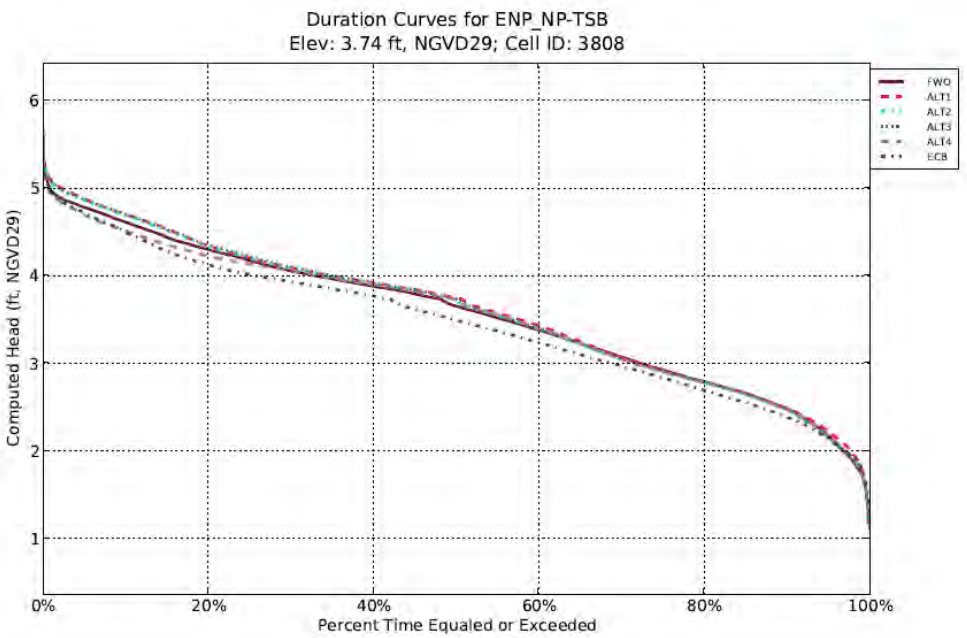

Figure C.2.1-80. ENP Taylor Slough Stage Duration Curve.

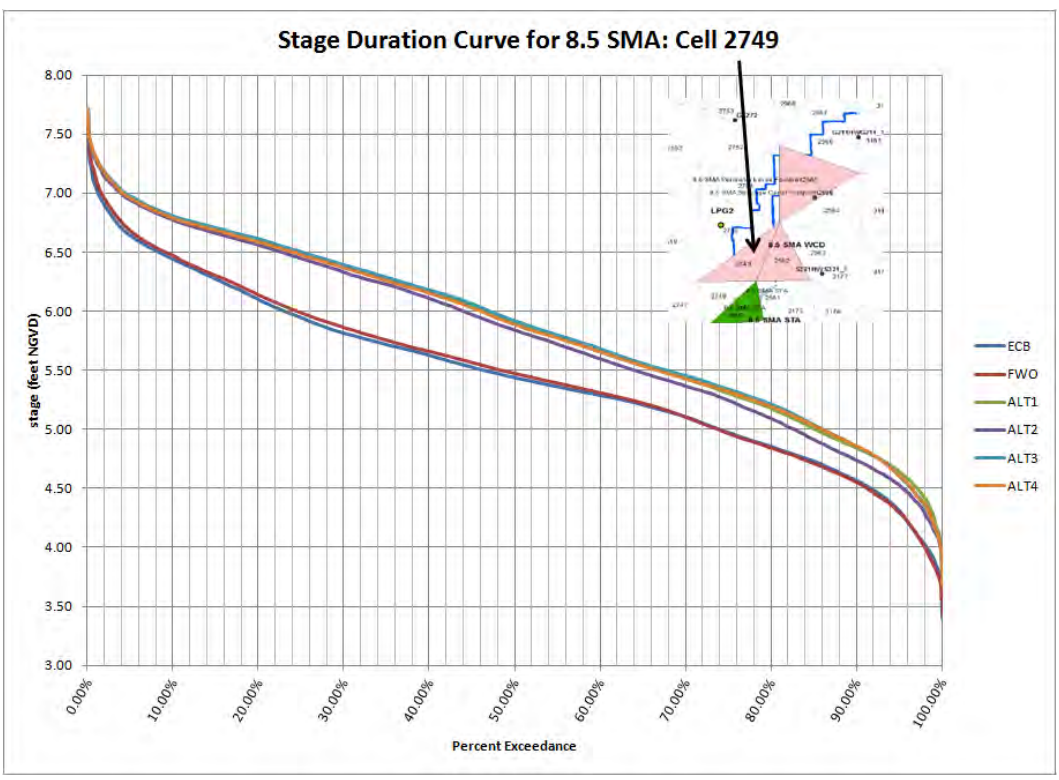

Figure C.2.1-81. Stage Duration Curve for Southwest 8.5 SMA.

C.2.1.8 Water Supply and Flood Control

Consistent with the Savings Clause requirements for CERP, each CERP project included in the CEPP FWO (Indian River Lagoon-South Project, Picayune Strand Restoration Project, Site 1 Impoundment Project, Biscayne Bay Coastal Wetlands Project, Broward County Water Preserve Areas Project, Caloosahatchee River (C-43) West Basin Storage Reservoir, C-111 Spreader Canal Western Project) must independently demonstrate in the respective PIRs that implementation of these CERP projects would not adversely impact the existing legal sources for water supply or the levels of service for flood protection. Operations protocols for the first and second generation CERP projects were modeled in the CEPP FWO consistent with the draft Project Operating Manuals, as documented in the respective PIRs. Operations and components of the previously listed CERP projects are retained in the CEPP final array of alternatives, and the inclusion of the components is therefore implicit to the analyses within this section.

To address the Savings Clause requirements for CERP, the CEPP draft PIR/EIS includes a detailed and comprehensive analysis of potential effects of the CEPP TSP, where applicable, to existing legal sources for water supply and/or the levels of service for flood protection (refer to Section 5 of the main report). The general hydrologic overview of water supply and flood control performance of the action alternatives in this section is separate and distinct from the content of the TSP Savings Clause analysis contained in **Section 6.7**. Areas within the CEPP project area that are not specifically discussed in this section may be presumed to have insignificant impacts to water supply or flood control.

C.2.1.8.1 Lake Okeechobee

Based on the action alternative modeling, compared to the FWO, the frequency of water restrictions enacted by the SFWMD Governing Board due to Lake Okeechobee falling below the Water Shortage Trigger line as defined by LOWSM is projected to slightly decrease for the CEPP action alternatives: one fewer year with three or more months with restrictions for LECSA 1 (note: two additional years with restrictions, compared to the ECB); no change in the number of years with three or more months with restrictions for LECSA 2 (note: one fewer year with restrictions, compared to the ECB); and two fewer years with three or more months with restrictions for LECSA 3 (note: one additional year with restrictions, compared to the ECB).

Lake Okeechobee operational assumptions applied consistently for the final array modeling (note: a single RSM-BN simulation was completed for the CEPP action alternatives) include changes to the decision tree outcome maximum allowable discharges dependant on Lake Okeechobee inflow forecasts, time of year (wet season or dry season), stage level (regulation zone), and/or stage trends (receding or ascending). The changes are all assumed to occur within the flexibility of LORS 2008 (Regulation Schedule zones unchanged), for the purpose of increasing CEPP potential benefits. Details pertaining to the proposed CEPP operations are separately addressed in the draft Preliminary Operations Manual (refer to **Annex C**).

Based on the CEPP alternative modeling assumptions and the resulting moderate stage increase within Lake Okeechobee, the average annual percentage of water supply demand not met is projected to decrease for the EAA and the remainder of the LOSA (**Figure C.2.1-82**). For the eight years with the largest water supply cutbacks within the LOSA, the water supply cutback percentage is reduced for seven of the eight years and increased for one of the eight years (1981), compared to the FWO (**Figure C.2.1-83**).

Lake Okeechobee stage duration curves for the RSM-BN model representation of the CEPP ECB (LORS 2008), CEPP FWO (LORS 2008, plus additional CERP and non-CERP projects), and the CEPP final array of action alternatives (LORS 2008, additional CERP and non-CERP projects, and prescribed operational flexibility) are shown in **Figure C.2.1-84**. A single RSM-BN simulation was completed for all of the CEPP components north of the red line for the final array of alternative. The CEPP action alternatives indicate a slight stage increase of 0.1-0.2 feet for the upper 40% of the stage duration curve. Peak stages for the CEPP baselines and the CEPP final array of alternatives are summarized as follows: 17.54 feet NGVD for the ECB; 17.50 feet NGVD for the FWO; and 17.64 for the CEPP Alts 1 through 4. The CEPP baselines and CEPP action alternatives all show simulated stages above 17.25 feet NGVD: 18 days for the ECB; 9 days for the FWO; and 23 days for CEPP Alts 1 through 4 (note: 14,975 days in the RSM-BN 41-year period of simulation). The LORS 2008 EIS assessment recognized that minimizing the frequency of exceedance of the 17.25 feet elevation offers additional protection for public safety and the HHD, for the condition prior to completion of the current approved and planned HHD remediation measures, and this criterion was evaluated as a LORS project performance measure. Extreme high lake stages have also been documented to adversely impact the plant and animal communities, through processes which include the following: physical uprooting of emergent and submerged plants; reduced light levels in the water column due to increased suspended sediment; and littoral zone exposure to increased nutrient levels from the water column. The number of days with stages above 16 feet NGVD is increased from 696 to 1096 during the 1965-2005 period of simulation.

Following completion of the HHD remediation of Reaches 1, 2, and 3, the degree to which higher maximum lake stages and increased frequency and duration of high lake stages would be accepted, if at all, will be contingent on the conclusions identified in the USACE 2014 Dam Safety Modification Report (DSMR) for the Herbert Hoover Dike (HHD). Any changes to the Lake Okeechobee Regulation Schedule would be analyzed and coordinated with the public through the NEPA process.

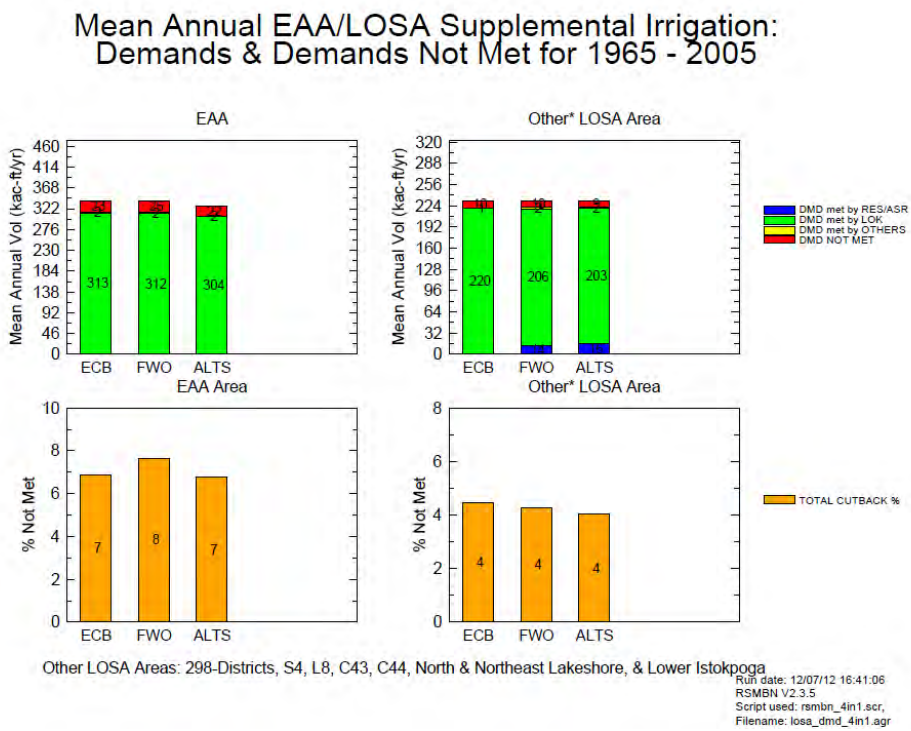

Figure C.2.1-82. EAA and LOSA Water Supply Performance.

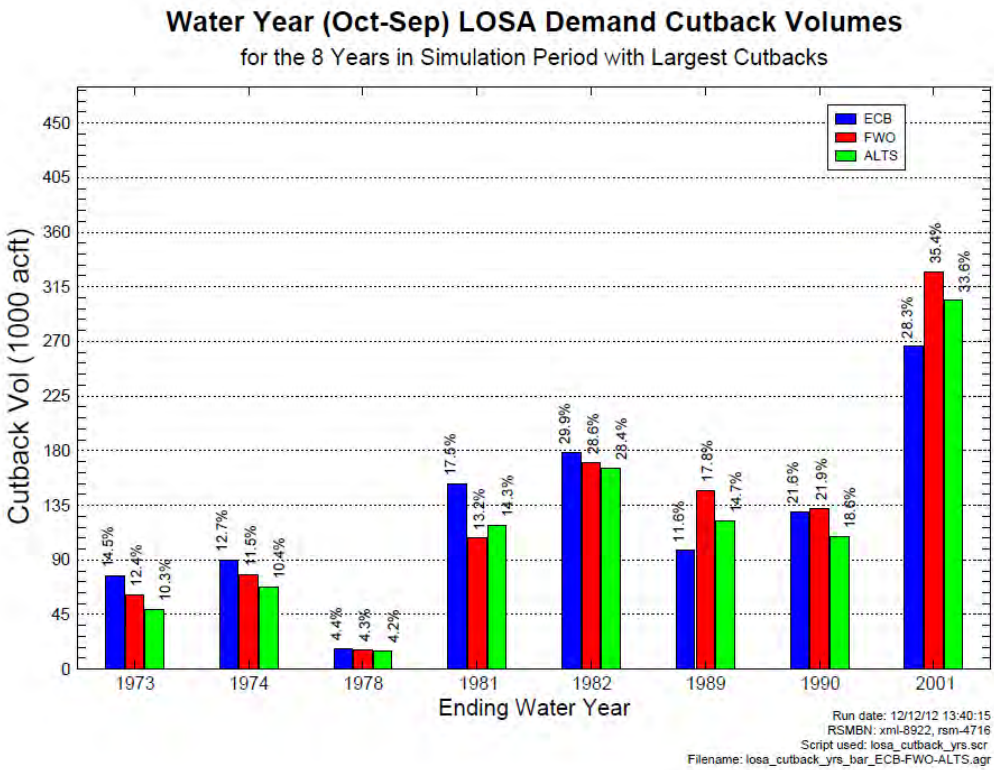

Figure C.2.1-83. LOSA Water Supply Performance for the Eight Largest Cutback Years.

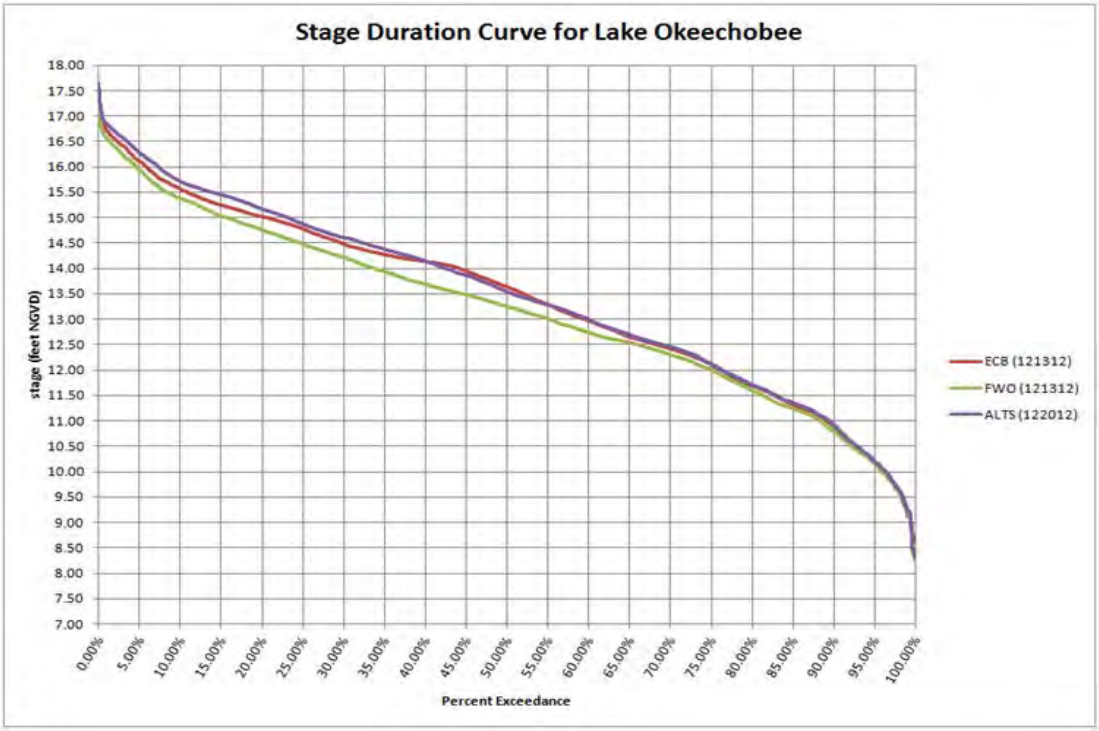

Figure C.2.1-84. Lake Okeechobee stage duration curves.

C.2.1.8.2 Seminole Tribe of Florida

Based on CEPP alternative modeling assumptions regarding Lake Okeechobee operational flexibility and the resulting moderate stage increase within Lake Okeechobee, the percentage of water supply demand not met for the Brighton Reservation is shown to slightly decrease by 0.4% compared to the FWO (**Figure C.2.1-85**) (note: demand not met is also 0.2% lower than the ECB). The percentage of water supply demand not met for the Big Cypress Reservation is shown to be slightly reduced by 0.2% (**Figure C.2.1-86**) (note: demand not met is also 1.0% lower than the ECB). The Seminole Tribe has surface water entitlement rights pursuant to the 1987 Water Rights Compact and subsequent entitlement provisions executed between the Seminole Tribe of Florida, the State of Florida, and the SFWMD. Impacts are not expected for the CEPP action alternatives based on the hydrologic modeling.

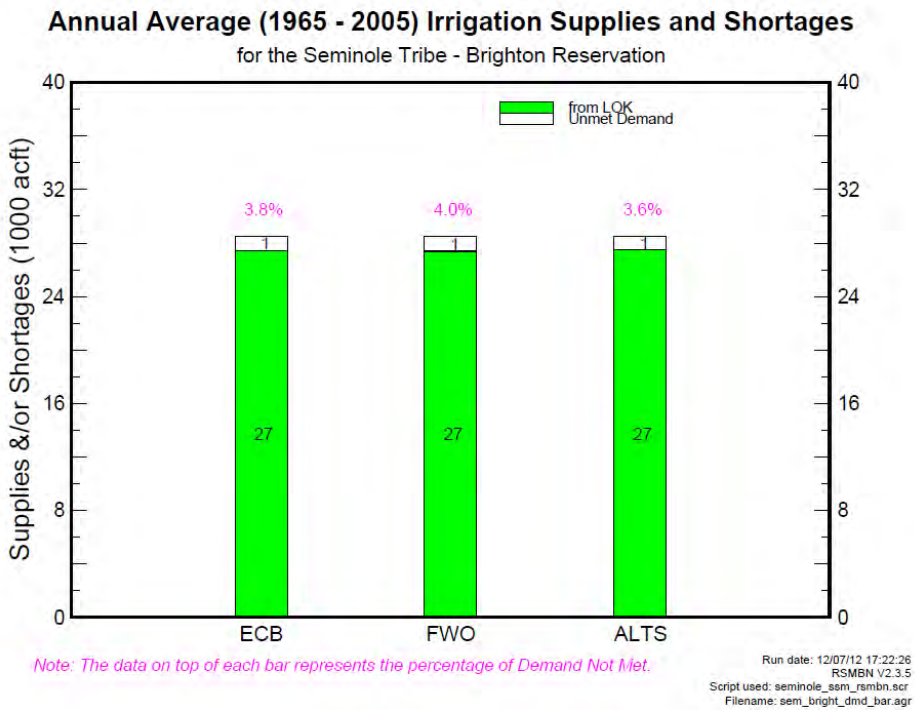

Figure C.2.1-85. Water Supply Demand for Seminole Tribe Brighton Reservation.

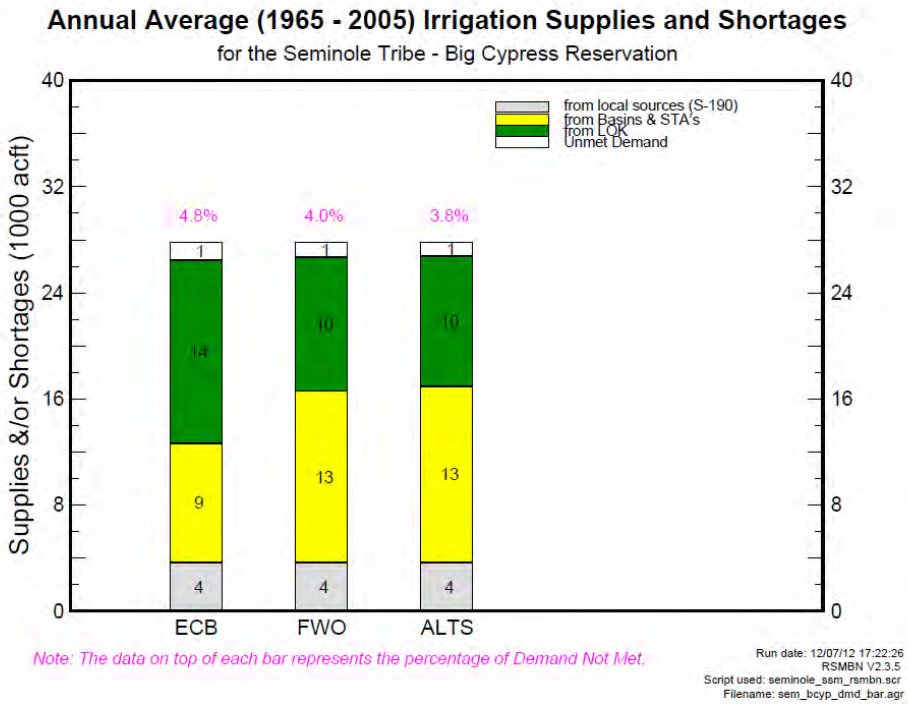

Figure C.2.1-86. Water Supply Demand for Seminole Tribe Big Cypress Reservation.

C.2.1.8.3 Lower East Coast Service Areas

Based on the alternative modeling, compared to the FWO, the frequency of water restrictions enacted by the SFWMD Governing Board due to Lake Okeechobee falling below the Water Shortage Trigger line as defined by LOWSM is projected to slightly decrease for the CEPP action alternatives: one fewer year with three or more months with restrictions for LECSA 1 (note: two additional years with restrictions, compared to the ECB); no change in the number of years with three or more months with restrictions for LECSA 2 (note: one fewer year with restrictions, compared to the ECB); and two fewer years with three or more months with restrictions for LECSA 3 (note: one additional year with restrictions, compared to the ECB).

The CEPP modeling for Alts 1 though 4 also indicates no significant reductions to regional groundwater stages during dry conditions (assumed as a surrogate for water supply conditions for this discussion) for most portions within the LECSA, as compared to the CEPP FWO condition. No significant changes were indicated within LECSA 1, LECSA 2, and LECSA 3 that were prevalent through normal to dry hydrologic conditions, although some reduced stages were indicated during the driest 5-10% of hydrologic conditions for areas east of WCA 2A and WCA 2B (monitoring gages G2031, G2033, and G2032). Lowered regional groundwater stages during dry conditions that were apparent for the FWO when compared to the ECB are not further exacerbated by the CEPP action alternatives.

For the action alternatives, L-30 Canal stages (north of S-335) are generally observed to increase for normal to extreme dry conditions (**Figure C.2.1-87**): stages are moderately increased by 0.2-0.4 feet for Alt 1; significantly increased by 0.3-1.0 feet for Alt 2; significantly increased by 0.3-0.7 feet for Alt 3; and slightly increased by 0.1-0.2 feet for Alt 4. L-30 Canal stages are highly correlated to hydrologic conditions within central and eastern WCA 3B. L-31N Canal stages (north of G-211) are increased by 0.3-0.5 during dry conditions for Alt 1; however, L-31N Canal stages are generally decreased under normal

to dry conditions for the other Alternatives: Alternative 2 stages are lowered by 0.2-0.3 feet for normal to dry conditions; Alt 3 stages are lowered by 0.2-0.3 feet for wet, normal, and dry conditions, with a 0.1-0.2 increase in extreme dry conditions; and Alt 4 stages are lowered by 0.2-0.3 feet for wet, normal, dry, and extreme dry conditions (**Figure C.2.1-88**). No significant stage reductions within the C-111 Canal (between S-176 and S-18C) are indicated during normal to dry hydrologic conditions that would affect water supply deliveries (**Figure C.2.1-89**).

The modeling of Alts 1 through 4 indicates no significant increases to regional groundwater stages during wet conditions which would impact the levels of service for flood control within the LECSA, as compared to the CEPP FWO condition. No significant changes were indicated within LECSA 1, LECSA 2, and significant reductions were observed for portions of LECSA 3. The L-30 Canal stages (north of S-335) indicate a general moderate reduction of 0.2 feet to flood control stages within the wettest 10% of hydrologic conditions (**Figure C.2.1-87**), and the L-31N Canal stages (north of G-211) indicate a significant (up to 1.0 feet) reduction to flood control stages within the wettest 5% of hydrologic conditions (**Figure C.2.1-88**).

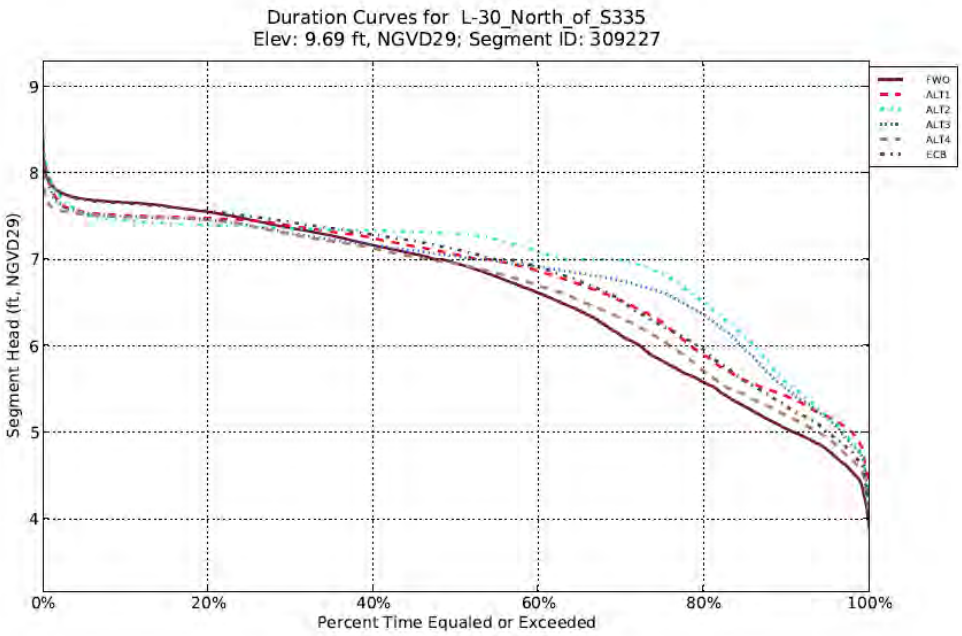

Figure C.2.1-87. Stage Duration Curve for L-30 Canal in LECSA 3.

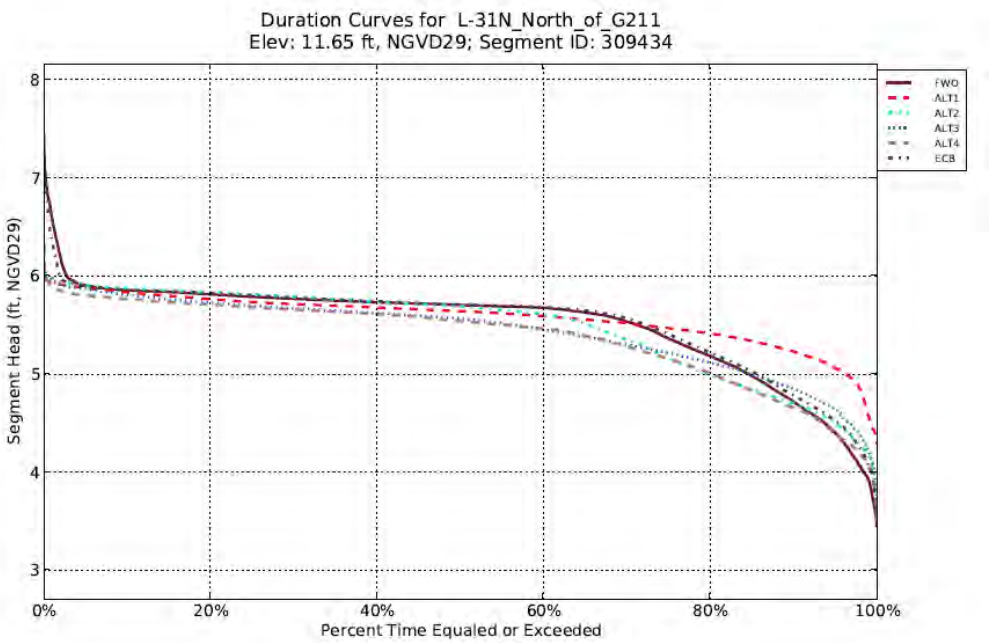

Figure C.2.1-88. Stage Duration Curve for L-31N Canal in LECSA 3.

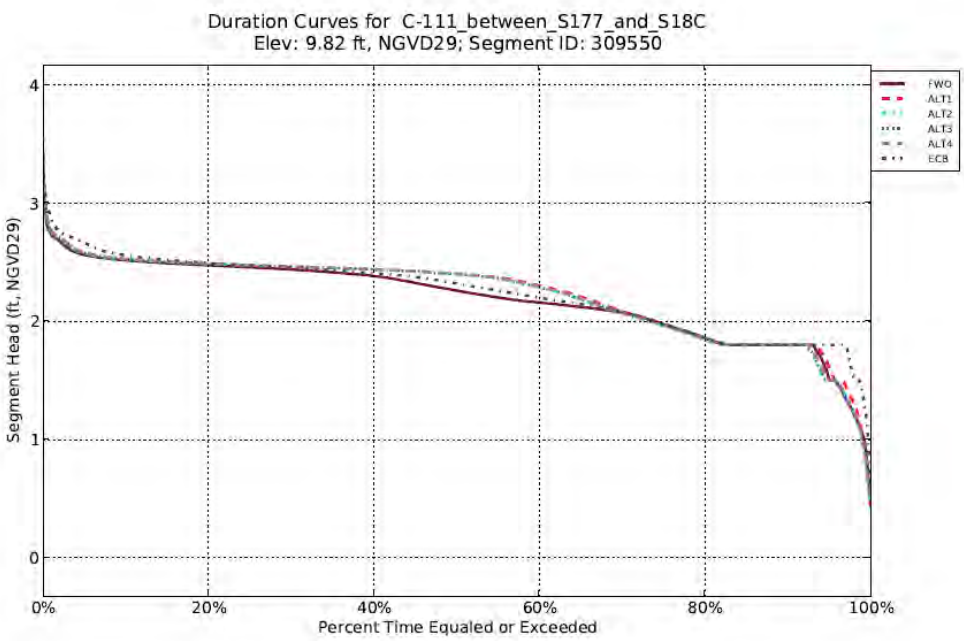

Figure C.2.1-89. Stage Duration Curve for C-111 Canal in LECSA 3

C.2.1.9 Water Quality

C.2.1.9.1 Lake Okeechobee

Relative to the FWO project, the with-project action alternatives will likely result in some improvement in Lake Okeechobee water quality as a result of reduced extreme lake stage events. However, the expected improvement in Lake Okeechobee water quality will likely not be very significant since nutrient loading conditions are not expected to differ significantly between the with- and without-project conditions. All with-project action alternatives are expected to result in the same water quality conditions since lake operations are nearly the same for all of them. As discussed in the existing conditions section for Lake Okeechobee, there is an existing TMDL for phosphorus. This TMDL requires a reduction in annual phosphorus loading from more than 500 metric tons per year to 140 metric tons per year. The average annual S-308 backflow quantity into the lake under the ECB condition is 95 kac-ft/yr which results in approximately 13 metric tons of phosphorus load per year. The S-308 backflow phosphorus load to the under the FWO condition is estimated to be 1.9 metric tons per year which is in line with the USEPA's 2008 TMDL allocation (USEPA-Region 4, 2008) of 2.6 metric tons per year. The CEPP with-project action alternatives will increase the S-308 backflow into the lake to approximately 95 kac-ft/yr. This will result in an estimated 4.6 metric tons of phosphorus per year which is higher than the TMDL allocation for the S-308 structure. The increase of 2 metric tons per year amounts to less than 1.5 percent of the phosphorus TMDL target of 140 metric tons/yr. In terms of the existing phosphorus loading at 380 metric tons/yr, it is less than 1 percent. Though the CEPP does increase TP loading from the S-308 basin which is contrary to the requirements of the TMDL, the amount is relatively small in relation to the total loading TMDL and it is likely that this additional load can be addressed through reductions in loads attributed to other sources.

C.2.1.9.2 Northern Estuaries

Caloosahatchee: Improved salinity conditions within this estuary as a result of a reduction in the number of high flow events and a reduction in the number of extreme low flow events as characterized by flows through the S-79 structure. Nutrient and dissolved oxygen conditions should improve during the wet season within the estuary given the reduction in high flow events. The frequency of dry season algal events within the upper estuary may change as a result of increased dry season flows through the S-79 structure during the late spring.

St. Lucie Estuary: Improved salinity conditions within this estuary as a result of a reduction in the number of high flow as characterized by flows through the S-80 structure. Nutrient and dissolved oxygen conditions should improve during the wet season within the estuary given the reduction in high flow events. The number of months of flow less than 300 cfs increases which may alter the frequency of algal blooms during the later part of the dry season.

C.2.1.9.3 EAA

Relative to the FWO, the EAA nutrient loads should decrease somewhat due to the cessation of agricultural practices from the A-2 lands as well as other lands that will no longer be farmed in 2050. The with-project action alternatives all include the A-2 FEB integrated into the A-1 FEB and the same volume of additional Lake Okeechobee water distributed south of the EAA. Dynamic Model for Stormwater Treatment Areas (DMSTA) water quality modeling indicates that the with-project action alternatives will meet the 2012 Water Quality-based Effluent Limits (QBEL). The risk that the QBEL will not be met under with-project conditions is similar to risk for the FWO condition. Construction of the A-

2 FEB may cause a short-term release of methylated mercury; however, monitoring during the start of phase will minimize potential adverse impact to downstream biota.

C.2.1.9.4 Greater Everglades

C.2.1.9.4.1 WCA 1, WCA 2

Water quality conditions for WCA 1 are not expected to be significantly changed by any of the With-Project Action alternatives since none of them include features that influence flows and treatment within the eastern flow path. Nutrient and sulfate loading conditions in WCA 2 should improve somewhat given the reduction in hydrologic load sent to this water conservation area. Reduced sulfate loading is likely to somewhat alter the areas where mercury methylation is problematic within WCA 2.

C.2.1.9.4.2 WCA 3A

Alternative 1 vs. FWO

Nutrient loading into the northern portion of WCA 3A is expected to increase relative to the FWO condition as a direct result of the increase in hydrologic loading; however, relative to the existing condition, nutrient loads into WCA-3A will decrease by approximately 30 and 25 percent for FWO and the Alt 1, respectively. Sulfate concentrations into the northern portion of WCA 3A are expected to decrease with Alt 1 as a result of the additional dilution of EAA runoff with Lake Okeechobee discharges which have sulfate concentrations roughly half that of the EAA runoff; however, the increase in flow will result in a slight increase (approximately 3 percent) in total sulfate load into the WCA 3A.

Figure C.2.1-90 shows the average annual flow across three transects in WCA 3A. Relative to the FWO condition, Alt 1 shows significant increases in flow crossing the northern and southern transects as a result of backfilling of a portion of the Miami Canal. Increased uptake in the northern portion of WCA 3A will likely result in reduced TP concentrations at the southern end of this WCA as compared with the FWO condition which has significant canal flows that provide little in the way of nutrient uptake. It is likely that northern portions of the WCA 3A marsh that are adjacent and south of the L-4, and L-5 canals will experience higher TP loads as compared to the FWO. The effects of the with-project action alternatives on WCA 3A compliance with the four-part TP criterion defined in Section 62- 302.540, F.A.C. are expected to be similar. A detailed discussion of phosphorus impacts to WCA3A due to CEPP are found in **Annex F**.

The methylmercury cycle is very complex with many factors affecting bioaccumulation in fish. Changes in hydrology can impact the formation of methylmercury. For instance, Alt 1 will reduce dryout/rewetting cycles in northern WCA 3A which will reduce sulfate and Hg remobilization due to soil oxidation. Project related changes to the timing, distribution, and loading of sulfate in WCA 3A will likely alter the locations where methylated mercury is found at high concentrations in the water column. This is illustrated in **Figure C.2.1-91** from the 2013 SFER report which shows the impact to mosquitofish mercury body burden of reducing by 50 to 100 percent the agriculturally sourced sulfate discharged into the Everglades Protection Area. This figure shows that significant decreases in sulfate loading would both increase and decrease mosquitofish mercury concentrations in WCA 3A primarily because the existing sulfate concentrations are near the optimum for maximizing methylmercury production. A 100 percent reduction in agricultural sulfate loading is projected to result in an overall reduction in average water column sulfate concentrations within the Everglades Protection Area from 2.4 mg/L to 0.78 mg/L; however, the average mosquitofish mercury concentration is estimated to be reduced from 85.7 ng/g to 80.0 ng/g which is a relatively insignificant change in proportion to the reduction in sulfate. Though

these projections are for decreases in sulfate rather than increased sulfate loading, they are indicative of the relative insensitivity of mosquitofish methylmercury bioaccumulation to relatively small changes (<10 percent increase) in sulfate loading as contemplated with Alt 1.

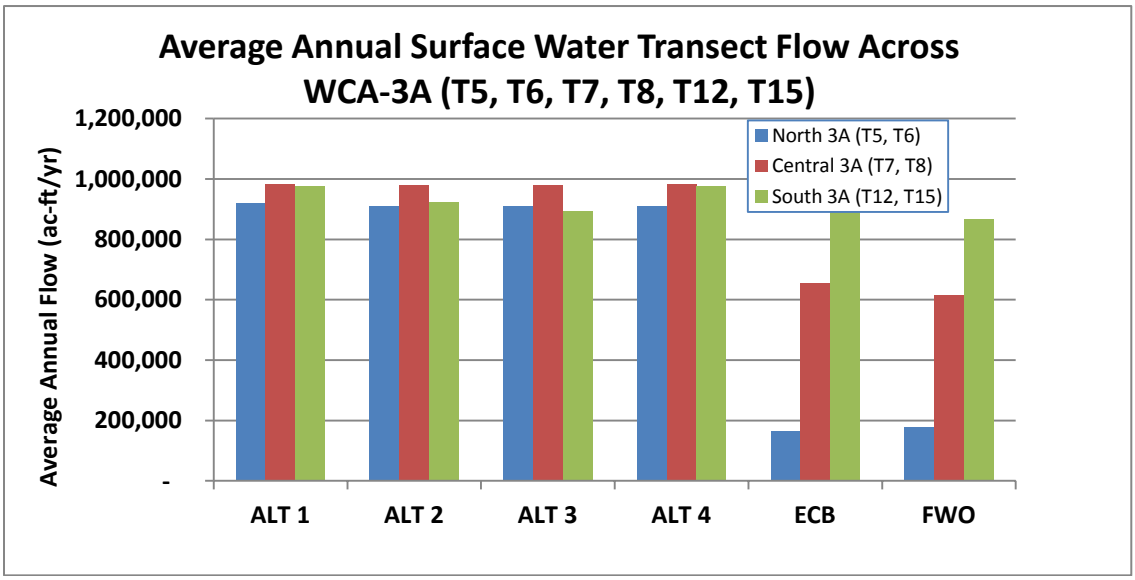

Figure C.2.1-90. Average Annual Surface Water Transect Flows for WCA 3A.

Given the complexity of the methylmercury cycle, It is not possible to predict with certainty the effect of CEPP related changes to sulfate timing, distribution, and loading within WCA 3A. It is likely that some areas of WCA-3A will see higher mosquitofish mercury concentrations while other areas will see lower mosquitofish mercury concentrations. Give the reduction in atmospheric mercury deposition over the last 15 years which is thought to be the cause of the reduction in bioaccumulated mercury observed in fish over this time period, it is likely that future methylation and bioaccumulation of mercury that occurs after implementation of Alt 1 will not exceed the peak concentrations seen 15 or so years ago unless atmospheric mercury loading increases.

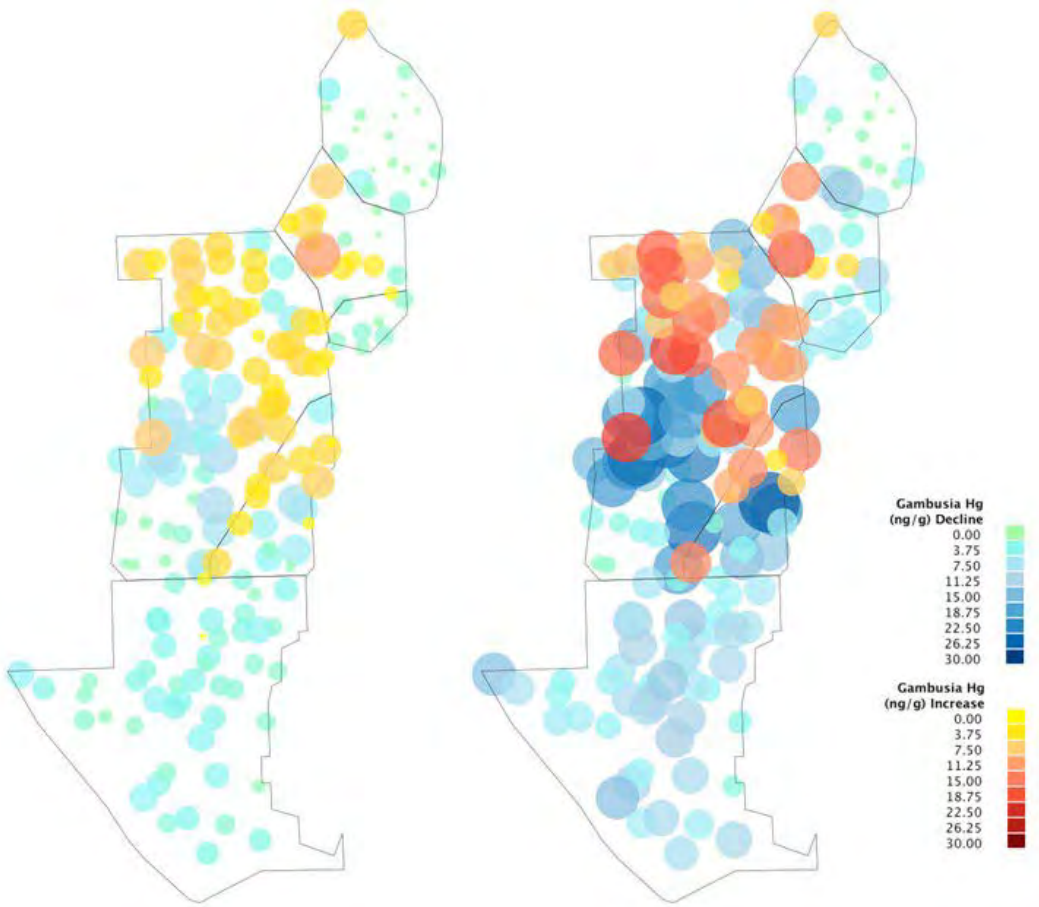

Figure C.2.1-91. Predicted changes in *Gambusia* Hg concentrations in response to 50 and 100 percent reductions in excess (non-marine) sulfate exported from the EAA (left and right, respectively) using R-EMAP Cycles 6 and 7 data. (from SFWMD, 2012)

Alternative 2 vs. FWO

Alternative 2 performs similarly to Alt 1 in WCA 3A for nutrients, sulfate, and other water quality constituents.

Alternative 3 vs. FWO

Alternative 3 performs similarly to Alt 1 in WCA 3A for nutrients, sulfate, and other water quality constituents.

Alternative 4 vs. FWO

For WCA 3A, this alternative performs very similar to Alt 1 for nutrients, sulfate, and other water quality constituents.

C.2.1.9.4.3 WCA 3B

Alternative 1 vs. FWO

Additional water flow into WC 3B will result from the breaches of the L-67A and L-67C levees. Relative to the FWO condition, flows through these breaches will be composed of more water that passes through the northern WCA 3A marsh and less water from the Miami Canal and the S-9 basin since these flows are reduced by approximately 50% at S-151 and 9% from S-9/S-9A pumps. Increased hydration of

WCA 3B will reduce the risk for severe drydown and thus reduce fire risk relative to FWO. Water quality degradation such as the release of TP into the water column and increased Methylmercury (MeHg) in the water column associated with fire events and their aftermath will be reduced. Additional flow into WCA 3B will increase nutrient loads relative to the FWO condition. ANNEX F includes a detailed discussion of the impact of CEPP on phosphorus within WCA 3B.

Like WCA 3A, sulfate loads are likely to increase in WCA-3B due to increased flows into this area relative to the FWO condition. The reduction in dryout/rewetting cycles within this area should reduce soil oxidation and the resulting recycling of sulfate and mercury back into the water column. The effects of additional sulfate on water column methylmercury concentrations and total mercury body burden in fish and birds in WCA-3B cannot be predicted with certainty. In light of this uncertainty, there is no reason to predict that the CEPP project will result in bioaccumulation that exceeds historic mercury concentration maximums unless atmospheric mercury deposition increases over present rates. The recent downward trends in measured water and tissue mercury concentrations in this area are encouraging.

Alternative 2 vs. FWO
This alternative's water quality performance is expected to be very similar to that provided by Alt 1 in WCA 3B.

Alternative 3 vs. FWO
This alternative's water quality performance is expected to be very similar to that provided by Alt 1 in WCA 3B.

Alternative 4 vs. FWO
This alternative's water quality performance is expected to be very similar to that provided by Alt 1 in WCA 3B.

C.2.1.9.4.4 Everglades National Park

C.2.1.9.4.4.1 Shark River Slough

Alternative 1 vs. FWO
Water entering Shark River Slough (SRS) from WCA 3 is likely to have lower concentrations of TP as compared with the FWO condition due to the backfilling of the Miami Canal which will result in more water passing through the marsh areas and less water flowing directly from upstream canal sources. Additional discussion of the effect of the CEPP project on total phosphorus concentrations in ENP is provided in **Annex F**.

Fish mercury concentrations within ENP have not decreased as much as that observed in WCA 3. The reasons for continued higher concentrations of bioaccumulated mercury in ENP fish are not well understood at this time. The range of sulfate concentrations that maximize methylmercury formation in ENP is significantly lower than optimal sulfate concentration ranges for the water conservation areas. Thus, smaller changes to sulfate concentrations in ENP may result in greater changes to mercury methylation and bioaccumulation than would occur in the water conservation areas.

Sulfate loading into ENP under the Alt 1 condition is likely to decrease somewhat relative to the FWO condition primarily because most of the flows into northern ENP will have been routed through the WCA

3 marsh which is likely to remove more sulfate than the additional sulfate provided by the increased flow from Alt 1. The additional flow will increase stages within Shark River Slough by an average of 0.5 ft which should significantly reduce areas that are subject to dryout and rewetting. Reduced dryout and rewetting will reduce the recycling of sulfate and mercury that exacerbates mercury bioaccumulation. The effects of Alt 1 on formation and bioaccumulation of methylmercury cannot be predicted with certainty since the mechanisms that affect mercury methylation rates in ENP are not fully understood at this time. However, if sulfate loads do not increase with Alt 1 and the additional flow reduces dryout/rewetting cycles, it is likely that future with-project mercury methylation conditions will not exceed the peak concentrations observed in ENP in 1999 unless atmospheric deposition of mercury increases in the future. Continued monitoring and scientific investigation of mercury within the Everglades Protection Area will provide more certainty regarding potential project impacts well before the additional flows from Alt 1 are realized.

Alternative 2 vs. FWO

This alternative's water quality performance is expected to be very similar to that provided by Alt 1 in WCA 3B.

Alternative 3 vs. FWO

This alternative's water quality performance is expected to be very similar to that provided by Alt 1 in WCA 3B.

Alternative 4 vs. FWO

This alternative's water quality performance is expected to be very similar to that provided by Alt 1 in WCA 3B.

C.2.1.10 Air Quality

Direct emissions from the proposed construction of the CEPP project features would be confined to exhaust emissions of labor transport equipment, and construction equipment (dump trucks, excavators, graders, bulldozers, etc.). Clean Air Act pollutants considered in this air quality assessment are SO_x; volatile organic compounds (VOCs); nitrogen oxides (NOx), CO, PM10, and PM2.5. Green house gas emissions are also considered. Volatile organic compounds, sulfur oxides, and nitrogen oxides are important since they are precursors to ozone generation. These criteria pollutants are generated by the construction and operational activities associated with the proposed action alternatives.

In Lake Okeechobee and the Northern Estuaries, population growth in the area is expected in the FWO condition relative to existing conditions baseline, this is an increase in air pollution. However, air quality compliance is expected. All action alternatives are expected to have no change relative to FWO conditions in Lake Okeechobee and the Northern Estuaries. In the Everglades Agricultural Area (EAA) no change in compliance with air quality standards is expected in the FWO compared to the baseline condition. For Alts 1-4, no change in air quality compliance is expected. Reduction in farming equipment use on A-2 FEB lands in FWO condition will be offset by increase in air pollutants from new pump stations. Particulate loading should be reduced since sugar cane cultivation will no longer done on FEB land and thus annual burning during harvesting will no longer be done. In the Greater Everglades, increased Lower East Coast (LEC) development in the FWO will result in air quality degradation relative to baseline conditions. Enforcement of the Clean Air Act should limit impacts. For Alts 1-4 a decrease in drying event severity relative to FWO condition should result in reduced fire

incidence within wetlands which should improve air quality. No changes in air quality are expected in the FWO and Alts 1-4 in the Southern Estuaries. A detailed analysis of Air Quality impacts has been prepared for the TSP in **Section 6** and **Appendix C.2.2.10.** The air quality analysis done for the TSP is applicable for Alts 1-4 given their similarities to Alt 4R.

C.2.1.11 Hazardous, Toxic and Radioactive Waste

The FWO and with-project alternative conditions will have similar hazardous, toxic and radioactive waste (HTRW) conditions in the future with the exception of the lands used for the A-2 FEB. (See **Appendix C.1** for the expanded HTRW assessment and **Annex H** for HTRW reports and correspondence.) Under the FWO condition, the A-2 FEB lands will likely continue to be farmed which will result in the additional application of agricultural pesticides in the cultivated portions of this property and the inadvertent release of petroleum and pesticides in operation and maintenance areas. During the construction of project features, is possible that undiscovered HTRW contamination will be found. Per EC 1165-2-132, the non-federal sponsor will be required to remediate these sites at their sole expense. There is also the potential for HTRW release associated with the operation of project pump stations; however, with modern facilities and best management practices, this presents a minor risk to the environment.

C.2.1.11.1 Residual Agricultural Chemicals

All of the with-project action alternatives include the use of the A-2 FEB lands. Soil sampling has shown that residual agricultural chemicals are in the cultivated soils on the A-2 FEB lands. A discussion of residual agricultural chemicals on the A-2 FEB lands is found in **Appendix C.2.2**.

C.2.1.12 Noise

For the action alternatives there would be minor and short term increases in noise during construction activities. All CEPP action alternatives include additional pump stations which would result in long-term, localized increases in noise. Since Alt 4 adds the fewest number of pump stations (two), it would have the least effect with Alt 3 that adds 5 additional pump stations having the greatest effect.

C.2.1.13 Aesthetics

Aesthetic effects refer generally to impacts on the visual qualities of the environment. Restoration of the south Florida ecosystem is expected to result in a healthier environment that would support vigorous plant communities, larger fish and aquatic animal populations, large numbers of wading birds, alligators, and sustainable populations of wide-ranging mammals, in a natural setting, in perpetuity. Viewing wildlife, wetlands and open, relatively pristine spaces are valued by people, as supported by tourism statistics for south Florida. During construction of all features there will be a temporary short-term impact to aesthetic values in the construction areas. All action alternatives show a significant increase in aesthetic value over the FWO due to restoration of hydropatterns and sheetflow throughout the project area and provide a minor beneficial effect. The restoration of sheetflow provides additional habitat for native plants and animals and opportunities for wildlife viewing.

There would be no effects due to CEPP in Lake Okeechobee. In the Northern Estuaries, the action alternatives would increase the aesthetic value due to decreased high flow events and provide minor beneficial effects. Reductions in high volume discharges to the estuaries would result in lower suspended solids, increased water clarity and the correct salinity envelope that maintain healthy SAV beds. These benefits could also and lead to an increase in wildlife viewing opportunities (Orth et al., 2006). Within the EAA, the existing aesthetic character of the A-2 footprint is similar to the EAA as a whole; the land-

scape is flat and has a predominantly uniform and organized appearance. For the action alternatives, wetland vegetation is anticipated to colonize the A-2 FEB increasing wildlife utilization and opportunities for wildlife viewing within the area, providing a major beneficial effect. In the southern estuaries, the action alternatives provide minor beneficial effects would increase the aesthetic value due to an increase in native plants and animals due to increased flows in Florida Bay providing an increase in potential wildlife viewing as well as providing a potential for the reduction in red tide occurrences.

Within the Greater Everglades, Alt 1 would produce minor increases in aesthetic value due to the removal of the L-4 levee by providing a more natural landscape view. Alternatives 3 and 4 had a greater potential negative effect on aesthetics as compared with Alts 1, 2 and FWO due to the addition of 2 pump stations along the L-29 levee in Alt 3 and the construction of a new levee (Blue Shanty levee) in Alt 4. For all action alternatives there would be temporary, short-term, localized effects to aesthetics during construction of all features. All action alternatives show a significant increase in aesthetic value over the FWO due to restoration of hydropatterns and sheetflow throughout the project area and provide minor beneficial effects. The restoration of sheetflow provides additional habitat for native plants and animals and increased opportunities for wildlife viewing. Restoration of flows within Florida Bay and the southwestern coastal estuaries that reduce extreme salinity ranges improves habitat within these regions, increase potential opportunities for wildlife viewing. All action alternatives include backfilling portions of the Miami Canal, thereby improving aesthetics due to removal of this unnatural landscape feature, providing minor beneficial effects.

For Alt 2, the removal of the L-4 levee and the construction of a spreader canal to the east of S-8 would provide a moderate increase in aesthetic value by providing a more natural landscape view over a larger area than Alt 1, however there would be an additional minor affect due to the addition of a pump station on the L-5 canal. The Miami Canal backfill for Alt 2 includes an additional 1.5 miles at the very northern portion adding a slight increase in aesthetic value as compared with Alt 1. There would be a moderate negative impact with the addition of a pump station on L-31N and a partial depth seepage barrier by adding man-made features in the natural landscape. The complete degradation of L-67 Extension levee provides a long-term increase in aesthetics due to the restoration of sheetflow increased native plants and animals and viewing potential.

The aesthetic effects of Alt 3 are the same as those for Alt 2 with respect to removal of L-4 and construction of a spreader canal, backfilling of the Miami Canal and the complete degradation of the L-67 Extension levee. Alternative 3 has a major negative aesthetic effect due to the addition of 2 pumps on L-29. Along the L-31N, Alt 3 would have a minor aesthetic effect due to a full and partial seepage barrier. The aesthetic effects of Alt 4 are the same as Alts 2 and 3 for L-4 removal and construction of a spreader canal, the backfilling of the Miami Canal and the complete degradation of L-67 Extension levee. The construction of the Blue Shanty Levee (~8 mile levee) in WCA 3B has a major negative effect on aesthetic value due to the addition of a levee within a wetland, however, it creates a flowway to the west that provides wildlife viewing opportunities and water flowing under Tamiami Trail. The seepage barrier in Alt 4 provides a moderate negative effect to the aesthetics.

C.2.1.14 Socioeconomics

Effects are provided in the main report in **Section 5.1.5**.

C.2.1.15 Recreation

In Lake Okeechobee and the Northern Estuaries, FWO and Alts 1-4 have a negligible effect on current recreation opportunities. Alternatives 1-4 may provide enhanced fishing opportunities due to better salinity conditions in the Caloosahatchee and St. Lucie Estuaries. Reductions in high flows to the Northern Estuaries would enhance fish populations and subsequently improve related recreational opportunities such as fishing, boating and kayaking. In the Everglades Agricultural Area (EAA), currently no recreation exists on the project site so any effects would be positive for public access meeting the identified needs according to Florida's Statewide Comprehensive Outdoor Recreation Plan (SCORP) for all action alternatives.

In the Greater Everglades, in the FWO condition recreational fishing would be affected little if at all. Hiking, biking and camping will not be affected directly. Any changes in recreation would be due to degraded quality of wetlands and the aesthetic values that could decrease as wildlife viewing and nature study would be degraded. In the Greater Everglades Alt 1 affects to recreation will be negative or positive depending on the activity and location. Recreational fishing by boat will have a major adverse effect by back filling the Miami canal. Bank Fishing opportunities would have a minor beneficial effect by addition of access points around proposed structures. Alternative 1 has the least negative effect on current Northern WCA 3A furbearer hunting opportunities. Furbearer hunting (deer, hog, rabbit, etc.) could have a major adverse effect in the short term by increased hydration in areas that have been dryer. In the long term if not better hydration peat loss to oxidation and fire would degrade current habitat further. Waterfowl hunting should improve with better hydration throughout the greater everglades during the early part of the dry season. This is good for bird watching as well. Improved access and designation of blue and greenway trails will be positive minor beneficial effect. Alternative 2 has similar effects to Alt 1 however, furbearer hunting (deer, hog, rabbit, etc.) could be affected negatively in the short term by increased hydration in areas that have been dryer. In the long term if not better hydration peat loss to oxidation and fire would degrade current habitat further. Waterfowl hunting should improve with better hydration throughout the Greater Everglades during the early part of the dry season. This is good for bird watching as well. Improved access and designation of blue and greenway trails will be positive. Alternative 3 effects are similar to Alt 2. Alternative 4 effects to recreation will be negative or positive depending on the activity and location. Alternative 4's Blue Shanty Levee will bisect L67C. Recreational fishing by prop boat to the northern end of L67C canal would continue to be available from a new public boat ramp located in the northern end of L67C at the S151, providing a minor beneficial effect. Also at the S151 a new public boat ramp will allow access into the northern 5 miles of the Miami Canal south of S151 not previously served by a public boat ramp**.**. Bank fishing opportunities could be positively increased by addition of access points around proposed structures. Furbearer hunting (deer, hog, rabbit, etc.) could be affected negatively in the short term by increased hydration in areas that have been dryer. In the long term if not better hydration peat loss to oxidation and fire would degrade current habitat further. Waterfowl hunting should improve with better hydration throughout the greater everglades during the early part of the dry season. This is good for bird watching as well. Improved access and designation of blue and greenway trails will be positive.

In the Southern Estuaries there is no effect on recreation with the FWO. For Alts 1-4 access to the Southern Estuaries would not change based on CEPP, however, impacts to existing quality of recreation can be impacted negatively or positively depending on location and changes to fish habitat as identified above for the Greater Everglades, however additional flows to Florida Bay are expected to provide enhanced fishing opportunities and a minor beneficial effect. A Recreation Plan is included in **Appendix F**.

C.2.1.16 Land Use

C.2.1.16.1 Wetlands and uplands

Much of the future development within the study area is expected to occur on lands that were formerly in agricultural use. For all action alternatives, publically owned lands are being utilized. **Table C.2.1-7** summarizes the impacts to wetlands for the final array of alternatives. All action alternatives show a major beneficial effect with an increase in wetland/upland habitat over the FWO. Alternative 3 provides the greatest increase in acreage with 675 acres followed by Alt 2 with 671 acres, Alt 4 with 650 acres and Alt 1 provides the least with 531 acres. There is only about 144 acres difference between all the action alternatives and these are estimates at this time until detailed design is completed. The differences stem from different project features (lengths of backfilling, gaps, number of structures, etc) as detailed below. While there are some minor adverse effects due to the construction of features, most notably the Blue Shanty Levee in WCA 3B, the construction of other features, the degradation of levees and the backfilling of canals reconnects and adds wetland acreage providing the needed topography for sheetflow to restore the natural system.

In addition to gains in wetlands, all action alternatives shift approximately 13,800 acres of agricultural land use with wetland soils to a higher quality wetland with the construction of the A-2 FEB. The A-2 FEB would alter the land use from agriculture to an FEB that includes wetland habitat. The degradation of the L-4 levee adds ~35 acres due to the reconnection of the wetlands in northwestern WCA 3A. The backfilling of the Miami Canal would provide an additional 469 acres of wetlands for Alts 2, 3 and 4 and an additional 417 acres of wetlands for Alt 1. The difference in acreages is due to leaving the northern 1.5 miles open along the Miami Canal in Alt 1. The backfilling of the Miami Canal would restore the wetland habitat and reestablish sheetflow in northern WCA 3. For all action alternatives spoil mounds on both sides of the Miami Canal from S-8 to S-339 would be removed and 22 spoil mounds (the highest priority/highest functioning Florida Fish and Wildlife Conservation Commission (FWC) enhanced spoil mounds) would be maintained while the others will be removed. In addition to the removal of the selected spoil mounds in order to promote sheetflow across the backfilled Miami Canal, additional mounds (1.5 feet above the marsh surface) would be created every mile from S-8 to Interstate 75 to prevent hydraulic channelization of flow and provide upland animal habitat. This would provide an additional 49 acres of upland habitat for Alts 2, 3 and 4 and an additional 45 acres of upland habitat for Alt 1. Alternative 1 has one less mound due to starting the backfilling of the Miami Canal 1.5 miles south of S-8. This additional upland habitat provides refuge for furbearing mammals during periods of high water. These mounds also align with the historic ridge habitat and there is the possibility that the placement of the mounds would help reestablish the ridge and slough pattern in WCA 3A.

In southern WCA 3A and WCA 3B, several features increase wetland habitat while other features remove/impact wetland habitat while connecting WCA 3A to WCA 3B and ENP. The proposed L-67A culverts will have a slight negative impact to the wetland of 4.5 acres/gated culvert. Due to the different number of culverts proposed in each alternative, the impact varies per alternative. Alternative 3 has the greatest loss of wetlands of 18 acres due to 4 culverts along the L-67A. Alternatives 2 and 4 have 3 culverts and a loss of 13.5 acres and Alt 1 has 1 culvert, thus a loss of 4.5 acres. However, the culverts are critical to connecting WCA 3A and WCA 3B and in conjunction with the gated culverts in L-67A levee, there are 6,000 foot gaps in the L-67C levee that will increase wetland habitat. Each 6,000 foot gap will provide an additional 9 acres of wetland habitat. Alternatives 1 and 4 provide 9 additional acres of wetlands. Alternative 4 has only one 6,000 foot gap because the other two gated culverts are included in the Blue Shanty flow way discussed below. Alternative 2 provides 27 acres of wetlands from its three

gaps and Alt 3 provides 36 acres for its four gaps. The degradation of approximately six miles of the L-67C in Alt 4 provides an additional 49 acres of wetlands. The degradation of the L-29 levee provides an additional 32 acres of wetlands in Alt 4 (approximately three miles). The construction of the Blue Shanty Levee to create the flow way between WCA 3B and ENP removes 84 acres of wetlands in WCA 3B in Alts 4 (approximately 6.25 mile levee). If the new levee is not constructed and water stages are not raised substantially within WCA 3B, then significant southward movement of water into NESRS from WCA 3B cannot be achieved by gravity flow alone due to higher wet season stages in the L-29 Canal associated with the implementation of the TTNS Project implementation; it must instead be driven by pumps. These pumps in turn would require additional dredging of former remnant agricultural ditches within southern WCA 3B to create expanded intake canals. The disturbance footprint would potentially be similar to that of the new levee. Focusing instead on Alt 4, we note that creation of the new levee enables the removal of a similar length of existing levee (L-67C).

In Everglades National Park, the backfill of the entire L-67 Extension canal provides an additional 104 acres of wetlands in Alts 2, 3 and 4. In Alt 1, only the southernmost 1.5 miles is backfilled, adding 29 acres of wetlands.

Table C.2.1-7. Impacts to Wetlands/Uplands (acres) for each project feature for each alternative.

Project Feature	FWO Acres of Wetland Gain (Loss)	Alternative 1 Acres of Wetland Gain (Loss)	Alternative 2 Acres of Wetland Gain (Loss)	Alternative 3 Acres of Wetland Gain (Loss)	Alternative 4 Acres of Wetland Gain (Loss)
L-4 Degrade	0	35	35	35	35
Miami Canal Backfill	0	417	469	469	469
Miami Canal Spoil Mounds	0	45	49	49	49
L-67A Culverts	0	(4.5)	(13.5)	(18)	(13.5)
L-67C Gaps	0	9	27	36	9
L-67C Flow Way Degrade	0	0	0	0	49
L-29 Degrade	0	0	0	0	32
Blue Shanty Levee	0	0	0	0	(84)
L-67 Extension Backfill	0	29	104	104	104
Total Net Change	**0**	**531**	**671**	**675**	**650**

C.2.1.16.2 Agriculture

The entire CEPP project area consists of lands currently under public ownership. 14,000 acres in the A-2 FEB footprint are currently in production for sugar cane. All action alternatives would convert 14,000 acres of agricultural lands to wetlands due to construction of the A-2 FEB. As described in **Section 5.1.8**, Hydrology, negligible changes were noted for water stages within the SDCS; therefore no indirect effects to agriculture within this region are anticipated. Coordination with the United States Department of Agriculture (USDA) and National Resources Conservation Service (NRCS) to meet the requirements of the Farmland Protection Policy Act, is ongoing. When detailed design information that locates each of

the plan components is completed, it can then be determined how many acres of unique farmland would be affected by the Project. (Refer to **Appendix C.4.12**).

C.2.1.17 Cultural Resources

The Everglades and associated ecosystems are a nationally significant resource and have been severely impacted by human activities for over a hundred years, primarily through drainage practices and agriculture. A review of the Florida State Master Site Files (FSMSF) indicate that there are 23,499 recorded cultural resource sites and resource groups within the CEPP study area that have a survey determination and/or State of Florida Historic Preservation Office (SHPO) evaluation of other than ineligible for listing with the National Register of Historic Places (NRHP).

In conjunction with the National Historic Preservation Act (NHPA), consultation was initiated with the Seminole Tribe of Florida's Tribal Historic Preservation Office (THPO), the Miccosukee Tribe of Indians of Florida's NAGPRA Representative, the SHPO, Everglades National Park, Chief of Cultural Resources (ENP) and Florida Bureau of Archaeological Research, resulting in a determination that additional surveys were needed to identify cultural resources within specific areas of potential effect (**Appendix C.5**). It was also decided that as the CEPP project progressed, additional surveys may be needed, specifically during the detailed design phase for construction, when feature designs were finalized and construction staging areas were determined. It was understood that Section 106 Compliance with the NHPA would not be completed during the current feasibility phase of the project, however would be complete prior to construction.

Area of Potential Effect

The area of potential effect (APE) for cultural resources differs greatly from the overall CEPP study area. For this project, the APE for cultural resources covers 1.5 million acres, which includes the EAA A-2 footprint, portions of the L-6 levee and associated canal, the L-5 levee and associated canal, the S-8 Pump Station Complex, portions of the L-4 levee and associated canal, the L-28 Triangle, portions of the Big Cypress Seminole Reservation immediately west of L-28 and north of I-75, portions of the Miami Canal, WCA 3A and 3B, L-67A and L67C levee, portions of the L-29 levee, the L-67 Extension levee and associated canal, portions of the Old Tamiami Trail, and portions of the L-31N levee, and Everglades National Park (see **Table C.2.1-7** in **Appendix C.1.16**).

Comparison of Proposed Action Alternatives and FWO

Impacts to cultural resources vary by individual components within Alts 1 – 4. Therefore, impact evaluations were based on a review of the individual components of each Alt to determine if actions would potentially result in impacts to significant cultural resources (which include sites eligible or potentially eligible for NRHP listing), described below. Throughout the development and selection of the components, mitigation measures that would eliminate or lessen adverse cultural resource effects were utilized.

The following significance thresholds have been used in determining whether components proposed for each Alt would result in a significant impact to cultural resources. The use of the term cultural resources includes historic properties eligible or potentially eligible for NRHP listing and culturally significant sites. A cultural resource impact is considered significant if implementation of a component of an Alt would result in any of the following when compared to FWO:

- Result in a change in the significance or eligibility for NRHP, including but not limited to any contributing elements, of a historic resource

- Result in an adverse change in the significance or eligibility for NRHP of a historic resource
- Disturb any human remains, including but not limited to those outside of formal cemeteries
- Disturb memorials determined to hold public significance regardless of age
- Result in adverse changes to sites identified through consultation with the Seminole Tribe of Florida and/or the Miccosukee Tribe of Indians of Florida as having cultural significance.

For each component discussion, the environmental effect is determined compared to future without conditions.

*Consultation is currently ongoing with regards to the determination of effects and potential mitigation of effects listed below, and therefore should be considered preliminary. While the effects associated with each Alt have been preliminarily considered for this feasibility study, a final determination of effects as required under Section 106 of the NHPA will not be determined until the project is authorized and subsequent project design phase begins. Due to the project schedule (**Section 6.7 and 6.11.2.3**), each suite of features will be consulted on as they arise. This will ensure that the most up to date information will be considered in the determination of effects. Also, based on final designs or modifications, additional work may be required for compliance with the NHPA.*

C.2.1.17.1 Draft Preliminary Operations Manual (DPOM)

This component of CEPP involves the development of a draft preliminary operation plan for each component or feature of the project. More information about the draft preliminary operation plan is recorded in **Section 6.6.5**. It should be noted that currently there are approximately 350 significant or NRHP eligible cultural resource sites, including five districts and one World Heritage site (ENP) recorded within the APE for CEPP. Effects: For this component of CEPP, there are many uncertainties similar to those described in the ERTP EIS. The uncertainty centers around what effects fluctuating water would have on subsurface cultural material, which is being addressed by ongoing investigations for ERTP. Another uncertainty is the velocity that water will be flowing from the L-4 Spreader feature and from within the Blue Shanty flowway. Water velocity can cause erosional effects and is considered an adverse long term effect to archeological sites. Once a determination of effects of fluctuating water on cultural resources has been identified for ERTP and the project enters into the design phase, Section 106 consultation for the CEPP DPOM should continue. Mitigation of Effects: Unknown at this time.

North of the Redline

C.2.1.17.2 Lake Okeechobee

There are no changes from the future without conditions for this component of CEPP. Effects: There will be no effect to cultural resources for Alts 1 through 4.

C.2.1.17.3 Northern Estuaries

This component of CEPP proposes to redirect a percentage of water currently flowing from Lake Okeechobee into the eastern and western northern estuaries, south into the Miami Canal and the North New River Canal. Effects: This decrease of freshwater into the estuaries will have no effect to cultural resources for Alts 1 through 4.

C.2.1.17.4 EAA A-2 FEB

The EAA A-2 FEB consists of a perimeter levee to confine the water, potential grading within the interior of the FEB footprint, improvements to existing agriculture canals, and improvements to existing and/or constructing new structures or features. A cultural resource Phase I Survey of this project component was conducted specifically for CEPP in 2013 to identify and assess cultural resources within the FEB

footprint. As a result, four historic sites were identified, two of which are considered significant (8PB16039, 8PB16040) under NEPA. Effects: Effects to sites 8PB16039 and 8PB16040 for Alts 1 through 4 are considered long-term. Mitigation of Effects: Due to the lack of knowledge of prehistoric occupation sites within the area, Phase III Investigations are recommended for 8PB16039, which would result in a no effect determination. Site 8PB16040 contains human remains and is therefore a culturally significant resource. Mitigation of effects are unknown at this time and will be determined through consultation once the project is implemented.

A new structure (S-623) associated with the operation of A- 2 FEB would potentially be constructed along the NRHP eligible Miami Canal (8PB13369). Effects: There would be no effect to cultural resources for Alts 1 through 4. The proposed new structure would not alter either directly or indirectly the characteristics which make the Miami Canal (8PB13369) significant.

Existing structures G-373, G-372 and G-372HL are associated with the operations of STA 3/4 and date to the 1990's, and are therefore not significant. Effects: There would be no effect to significant cultural resources for Alts 1 through 4.

C.2.1.17.5 L-28 Triangle (levee and borrow canal)

The L-28 Triangle area is located entirely within the boundaries of the Miccosukee Federal Indian Reservation and encompasses 7830 acres of Tribal lands. The L-28 Triangle area is confined on north by Interstate 75, the west by L-28 Interceptor Canal (L-28I, and the east by the L-28 Canal or WCA 3A. Alternative 1 includes removal of two segments of the L-28 Levee along the eastern boundary of the L-28 Triangle (9000 feet total) and complete backfill of the L-28 Canal segment located between the levee gaps. By re-establishing a hydrologic connection between WCA 3A and the L-28 Triangle, stages within the Triangle are generally increased by 0.2-0.5. Although Alts 2 through 4 do not include modifications to the L-28 Levee or the adjacent canal, stages within the L-28 Triangle are slightly increased by 0.1-0.2 feet during normal to dry conditions, due to groundwater interactions with the down-gradient western WCA 3A marsh. Effects: Effects to cultural resource for Alt 1 is unknown. Through consultation with the NAGPRA representative to the Miccosukee Tribe, areas within the footprint of the L-28 levee and associated borrow canal are considered low. Based on previous research within the immediate area and/or similar areas ecologically, tree islands (either historic or modern) are considered to have a high potential for cultural resources. Therefore, cultural resource investigations within high probability areas impacted by the original construction of the L-28 levee and canal would need to be conducted. If significant sites are located within the area of potential effect, long-term damage could occur as a result of degrading the levee. This component is not a feature in Alts 2 through 4, therefore there would be no effect. Mitigation of Effects: If significant historic properties are located, effects to the sites could be mitigated down to no effect by avoidance. To avoid potential inadvertent discoveries, it is recommended that should the levee be removed within the historic footprint of tree islands, that degrading be terminated at tree island grade, not marsh grade. Previous research has shown that compacted spoil material can extend well below tree island grade. Additionally, a professional archaeologist should monitor construction activity to ensure that any discovery is recorded.

South of the Redline

C.2.1.17.6 L-4 Levee and Canal

This component involves degrading the western 2.9 miles of the southern L-4 levee, resulting in the creation of a water spreader feature at the northwestern most boundary of WCA 3A. A pump station near the western terminus of the L-4 degrade would also be constructed. Exact placement of the pump

station has not been determined. Effects: There would be no effect to cultural resources for Alts 1 through 4 in the degrading of the southern L-4 levee, nor for the placement of the proposed L-4 Pump Station, regardless of location along the levee/canal.

C.2.1.17.7 S-8 Complex

This component of CEPP involves modifications to the S-8 Pump Station and potentially other structures within the S-8 Complex to permit flows to the west. The S-8 Complex consists of G-357, G-404, the L-5 bridge, the S-8 Crane System, and the S-8 Pump Station, all of which are considered significant or NRHP eligible are an integral part of the Miami Canal FMSF # 8BD4840 (see C.2.1.1.9 below). Effects: For Alts 1 through 4, changes to any features within the S-8 Complex (listed above) would be considered long-term adverse effects. Mitigation of Effects: If effects to any component of the S-8 Complex are unavoidable, a qualified architectural historian should conduct a Historic American Engineering Record (HAER) and/or Historic American Buildings Survey (HABS). This documentation packet will then be entered into the Library of Congress as well as Florida Master Site Files. These measures would reduce the effects determination to no effect.

C.2.1.17.8 L-5 Levee , Canal and Spreader Feature

Alternative 1 of this component involves improvements to accommodate L-6 and STA 3/4 conveyances, by deepening the L-5 borrow canal and the placement of a gravity pump. The L-5 levee and associated borrow canal are not significant, however the L-5-1 bridge that joins the L-5 north levee to the L-5 south levee is potentially eligible for NRHP listing as part of the Miami Canal FMSF # 8BD4840 and is therefore considered significant. Effects: Effects to historic properties for this component of the Alts 1 through 4 are no effect. Currently there is no plan to remove the bridge or alter the L-5 levee or canal in a way that would cause adverse effect to the property.

Alternatives 2 through 4 are similar in that they call for the same conveyance and improvement features as Alt 1, with the addition of a separate spreader feature constructed approximately 600 ft. south and parallel to portions of the existing L-5 south levee. Phase II Excavations were carried out specifically for the CEP Project on three previously recorded historic resource sites (8BD4836, 8BD4837, and 8BD4838) located within the APE of this project feature. A determination of significance or NRHP eligibility is ongoing. Two of sites contain human remains. Effects: Effects on cultural resources for Alts 1 through 4 are unknown. Research to determine historic significance is ongoing and should be completed by September 2013. Once the ongoing site assessment is complete, further consultation would be required and an effects determination would be revisited. Mitigation of Effects: If any or all of these sites are determined to be significant historic properties, potential effects to cultural resources for Alts 2 through 4 may be mitigated down to a determination of negligible to no effects by considering the placement of the spreader features and water velocity in relation to the significant site locations. Mitigation of effects to the culturally significant sites are unknown.

C.2.1.17.9 L-6 Levee and Canal

This component involves deepening and/or widening the L-6 borrow canal, replacement or redesign of the G-336G culverts and removal of the L-6 canal plug. The G-336G and the L-6 canal plug were originally constructed in association with WCA2 operations and are not historic. The L-6 borrow canal appears on historic aerial photographs (Armando Ramirez, personal communication 2013) and therefore would require additional work to determine significance or NRHP eligibility. Effects: Effects to historic properties for this component of the Alts are unknown. Cultural resource investigations would be needed to assess significance of the L-6 levee and associated borrow canal. Mitigation of Effect: If

determined a significant historic property, it is recommended that a Level I Historic American Engineering Record (HAER) document is written and submitted to the Library of Congress and the Florida State Archives. This action would reduce the effects of the proposed action to no effect.

C.2.1.17.10 Miami Canal (8BR4840/8DA6525)

To improve sheet flow throughout WCA 3A, a portion of the Miami Canal (8BR6525) would be backfilled using spoil material originally excavated during the construction and maintenance of the canal and dredged material from the L-5 modifications. The Miami Canal and associated features/structures have been investigated during seven separate surveys (FMSF Survey # 5844, 14404, 17583, 19090, 19276, and 2 surveys with FMSF Survey # pending). As a result, it has been determined that the Miami Canal and specific features/structures associated with the canal are eligible for the National Register of Historic Places (NRHP) and are therefore considered significant. Effects: Effects to historic properties for Alt 1 are considered long-term adverse effects to the Miami Canal and three significant features of the Canal. Effects to historic properties for Alts 2, 3, and 4 would be similar to the effects of Alt 1, with differences being a larger portion of the Canal would be adversely effected, including one additional significant feature. Through consultation with the Tribes (**Appendix C.5**), it has been determined that the spoil mounds associated with the Miami Canal do not contain culturally significant sites (i.e., culturally significant flora and/or other culturally sensitive uses), therefore a determination of no effect to culturally significant sites is listed for the use of the spoil material. Mitigation of Effects: It is recommended that a Level I or II Historic American Engineering Record (HAER) document is written and submitted to the Library of Congress and the Florida State Archives. This would reduce the effects of the proposed action to no effect.

Greenline/Blueline

C.2.1.17.11 L-67A Levee and Canal

This component involves the placement of gated structure(s) within the L-67A levee and the removal of spoil material deposited during the original construction or maintenance of the L-67A borrow canal and will span approximately 0.5-miles on each side of the structure(s).

Three cultural resource surveys are listed with the State for WCA 3A, one conducted via aerial photographs (FMSF Survey # 602), a Phase I Survey conducted in 2011 (FMSF Survey # pending) and a Phase I and Phase II Survey conducted in 2012 specifically for CEPP (FMSF Survey # pending). During the 2011 survey, the L-67A levee and associated canal was assessed and determined to be not significant. Results of the 2012 cultural resources survey conducted specifically for CEPP included testing portions of tree islands impacted by the original levee/borrow canal construction. In some cases this involved portions of tree islands with recorded sites that were identified during Survey # 602 using aerial photography. These sites have not been field verified. Only areas of potential effect for sites recorded during Survey # 602 were investigated for CEPP. It also should be noted that existing As-Built Plans for the L-67A and C show that the area immediately underneath the existing levee, and areas between the levee and borrow canal were degraded prior to construction. During the CEPP specific 2012 Survey (FMSF Survey # pending), no significant cultural resources were identified.

Two culturally significant sites actively used by the Miccosukee Tribe of Indians of Florida are located on two of the spoil mounds west of the borrow canal. Effects: Potential effects to the culturally significant sites for Alts 1 through 4 are considered potentially long-term adverse effects. Mitigation of Effects: Effects to the culturally significant sites could be mitigated down to a determination of no effect by avoiding the spoil mounds associated with the sites during the design-build phase of CEPP. Also, to

avoid potential inadvertent discoveries, it is recommended that should spoil mounds be removed within the historic footprint of tree islands, that degrading be terminated at tree island grade, not marsh grade. Previous research conducted by the Corps' archaeologist has shown that compacted spoil material can extend well below tree island grade. Additionally, a professional archaeologist should monitor construction activity within historic tree island footprints to ensure that any discovery is recorded and assessed for significance.

C.2.1.17.12 L-67C Levee and Canal

This project component involves degrading portions of the L-67C Levee, lengths of which are dependent upon the Alt.

Two surveys have been conducted to identify significant historic properties within WCA 3A, one conducted via aerial photographs (FMSF Survey # 602) and a Phase I and Phase II Survey conducted in 2012 specifically for CEPP (FMSF Survey # pending). For tree islands impacted by the original levee/borrow canal construction, only areas of potential effect were investigated. In some cases this involved portions of tree islands with recorded sites that were identified during Survey # 602 using aerial photography. These sites have not been field verified. Sites previously identified during Survey #602 were only investigated in the area of potential effect for this component of CEPP only. Therefore, although it is known based on As-Built Plans which show that the area immediately underneath the existing levee, and area between the levee and borrow canal were degraded prior to construction. During the CEPP specific 2012 Survey (FMSF Survey # pending), no cultural resources were identified within the APE for this feature. It was also determined that the L-67C was not historically significant. Also, regardless of the amount or location of levee removal, which will depend on the Alt, the effects are the same.

Effects: There would be no effect to cultural resources for Alts 1 through 4. However, to avoid potential inadvertent discoveries, it is recommended that should levee material be removed within the historic footprint of tree islands, that degrading be terminated at tree island grade, not marsh grade. Previous research has shown that compacted spoil material can extend well below tree island grade. Additionally, a professional archaeologist should monitor construction activity within historic tree island footprints to ensure that any discovery is recorded.

C.2.1.17.13 L-29 Levee

This component involves degrading of portions of the L-29 Levee (Alt 4 only) and/or new structures (Alts 2-4) located east of S-333. This component is not applicable to Alt 1. The original construction of the L-29 impacted two large tree islands. Through consultation with the Cultural Resource Representative to the Miccosukee Tribe of Indians of Florida, these islands have been identified as being culturally significant. Multiple surveys have been conducted to identify cultural resources within WCA 3A and 3B, one conducted via aerial photographs (FMSF Survey # 602), Survey # 17032, Survey # 283, a Phase I Survey conducted in 2011 (FMSF Survey # pending), and a Phase I and Phase II Survey conducted in 2012 specifically for CEPP (FMSF Survey # pending). With information gathered from these surveys and others in similar environments, it is highly probably that historic sites will also be located on these islands.

The ValuJet Flight 592 Crash Memorial is also located along the L-29 levee. Although the Memorial is not historic, it is frequently visited by those directly or indirectly affected by the accident. Therefore, the Memorial is considered culturally significant and should be preserved in place. If preservation is not

viable, consultation with all family members of the victims, and local residents should occur prior to completion of the design-build phase.

Two significant traditional cultural properties, Airboat Association of Florida and Coopertown, associated with the modern Gladesmen culture group, and one Miccosukee Tribe of Indians of Florida residential camp (Osceola Camp) are located south of the L-29 levee and therefore are within the area of potential effect of the levee removal. There is also one Miccosukee Tribe of Indians of Florida residential camp (Tigertail Camp) located atop the L-29 levee. These properties are considered significant.

Effects: Alternative 1 would have no effect to significant cultural resources. Alternative 2 -4 could potentially have long-term adverse effects to two sites deemed culturally significant to members of the Miccosukee Tribe. These sites were originally impacted by the levee and borrow canal construction. Based on previous research, it is highly probable that these two tree islands contain historic resources of unknown significance. Cultural resource investigations on these islands would require further consultation prior to fieldwork. Based on preliminary design plans for Alternatives 2 through 4, there would be no effect to the Valujet Flight 592 Crash Memorial, or the Tiger Tail Camp. Mitigation of Effects: Avoid placing structures within known culturally significant sites, significant historic properties, currently occupied camps, and/or within the footprint of the Valujet Flight 592 Crash Memorial could downgrade the determination to no effect. Potential adverse effects to potential historic properties impacted by the original levee construction could be mitigated down to a determination of no effect by avoiding tree islands and/or by limiting the depth of levee removal to not exceed tree island grade.

C.2.1.17.14 S-333 Modifications

This component of CEPP involves constructing an additional structure (S-333N) to increase the S-333 capacity and is a feature of Alts 1 - 4. The S-333N would be located just north of the S-333. Exact placement of the structure is unknown.

There are no known high probability areas for cultural resource sites located within the APE. The ValuJet Flight 592 Crash Memorial is also located along the L-29 levee just east of the S-333 structure. Although the Memorial is not historic, it is frequently visited by those directly or indirectly affected by the accident. Therefore, the Memorial is considered culturally significant and should be preserved in place. If preservation is not viable, consultation with all family members of the victims, and local residents should occur prior to completion of the design and build phase. Effects: Based on preliminary design plans for Alternatives 2 through 4, there would be no effect to the Valujet Flight 592 Crash Memorial.

C.2.1.17.15 L-67D Levee and Flow way within WCA 3B (Blue Shanty)

This component is a feature of Alt 4 only and involves constructing a levee within WCA 3B to connect the L-67A levee with the L-29 levee, thereby creating a flow way for water to pass from WCA 3A into Shark River Slough. Working closely with project engineers, areas of concern have been identified in an effort to avoid significant cultural resources or areas of high probability (i.e. tree islands impacted by the canal/levee construction and areas currently in use by the Miccosukee Tribe of Indians of Florida) within the footprint of the proposed levee. Based on the multiple surveys conducted within similar environmental areas (FMSF # 602, 286, 1616, 17032, 18093, 1615, 904, 1009, 1014, 1187, 1307, 6968, 7667, and the CEPP specific 2012 Survey (FMSF # pending) and in conjunction with consultation with the Tribes, there is a high probability for significant cultural resources to be located within the flow way.

Also, modeling results indicate that water depth could exceed current stages to the point that it could prove detrimental to lower elevated tree islands within the flow way that have not undergone a Phase I Survey. The exact footprint of this feature is unknown at this time. Effects: Alternatives 1 through 3 would have no effect. Alternative 4 effects are unknown. Once the footprint of the L-67D levee and the APE for the flow way is determined, and prior to completion of the design and build phase, an integrated Phase I and Phase II Survey would be conducted to identify and assess significant cultural resources that may be located on high probability areas (tree islands) within the proposed flow way. Mitigation of Effects: Unknown at this time.

C.2.1.17.16 L-67 Ext. Levee Removal

This component involves the backfilling of the L-67 Extension borrow canal using associated levee material to varying degrees depending on the Alt. This component is located within ENP. In January 2013, USACE and ENP employees conducted a survey (FMSF # pending) of potential high probability areas impacted by the original construction of the L-67 Extension levee and associated borrow canal. The L-67 Extension levee and associated borrow canal, and associated features S-347, and S-346 are not significant or NRHP eligible properties (FMSF site # pending). No significant cultural resource sites were located. Effects: There would be no effect to cultural resources for Alts 1 through 4. However, to avoid potential inadvertent discoveries, it is recommended that should levee material be removed within the historic footprint of tree islands, that degrading be terminated at tree island grade, not marsh grade. Previous research has shown that compacted spoil material can extend well below tree island grade. Additionally, a professional archaeologist should monitor construction activity within historic tree island footprints to ensure that any discovery is recorded.

Yellowline

C.2.1.17.17 L-31N Seepage Barrier / L-31N Pump Station(s)

This component involves the construction of a seepage barrier within the existing L-31N levee for all Alts and/or the construction of pumps for Alts 1 and 2. Three surveys have been conducted along the L-31N Levee (FMSF # 11698, 16709, and 18093), which resulted in the identification of one site recommended as potentially eligible for the National Register. The USACE concurs with this recommendation and considers 8BD2104 as eligible for NRHP listing. Effects: For Alts 1 through 4 seepage barrier, there would be no effect to cultural resources. There could potentially be long-term adverse effects to the Levee Cut Site (8BD2104) dependent upon placement of the proposed structures for Alts 1 and 2. Mitigation of Effects: Consideration should be given to the placements of the proposed structures during the design and build phase. If placement avoids direct or indirect impact to site 8DA2104, then a no effect determination would be made. The effect determination for 8DA2104 should be revisited once feature specific plans and specification for the project are developed.

C.2.1.17.18 S-356 Relocation

This component involves changes to the S-356 Pump Station. Based on examination of historic aerial photographs, the original construction of the pump station did not impact any tree islands within the construction footprint. As previously stated, based on previous research, tree islands are considered high probability for cultural resource locations. Effects: The S-356 Pump Station is not a historic structure, nor did original construction impact areas of high probability areas. Therefore, there would be no effect to cultural resources for Alts 1 through 4.

C.2.1.17.19 G-211 Operational Refinements

This component involves the utilization of current coastal infrastructure (canals and associated features) to convey seepage south. Effects: For Alts 1 through 4, there would be no effect to cultural resources.

C.2.1.17.20 S-334 to S-335 Seepage Barrier

This component involves the construction of a seepage barrier within the existing levee between structures S-335 and S-334. This component is located adjacent to the Miccosukee Tribe of Indians of Florida lands and casino. Effects: This is not a feature of Alts 1, 3, and 4. For Alt 2, there would be no effect to cultural resources.

C.2.1.18 Invasive and Native Nuisance Species

Alternatives 1, 2, 3, and 4 have the potential and likelihood for establishment and spread of non-native invasive and native nuisance species. Proposed restoration activities may affect ecosystem drivers that directly or indirectly influence the invasiveness of non-native species. These factors may affect invasive species positively or negatively, depending on the unique characteristics of individual species and the environmental conditions for a given biological invasion (Doren et al. 2009). For example, shortened surface water drawdowns may reduce the recolonization rates of melaleuca in sawgrass marsh while increasing habitat suitability for Old World climbing fern on tree islands. Many of the areas where features are proposed are currently inhabited by non-native invasive and native nuisance species. Construction of the proposed features has the potential to spread the existing non-native invasive and native nuisance species on site as well as introduce new invasive species via contaminated equipment. Disturbed areas resulting from construction are likely to become established with non-native invasive and native nuisance species. New flows created by operations of the proposed features may serve as vectors to spread invasive and native nuisance species into new areas. The large number of existing and potential invasive plant and animal species and the often incomplete knowledge of invasive mechanisms for each species create moderate to high uncertainty in this evaluation. Long-term monitoring in an adaptive management framework is critical to ensure efficient management of the most threatening non-native invasive species in the restoration footprint.

C.2.1.18.1 Lake Okeechobee and the Northern Estuaries

Alternatives 1, 2, 3, and 4 would reduce freshwater flows from Lake Okeechobee to the Caloosahatchee and St. Lucie estuaries, allowing for slightly higher salinity levels in the estuaries. The reduced freshwater outflows are not expected to have an impact on non-native invasive or native nuisance species. Existing invasive species under active management are expected to persist at baseline levels if current funding levels are sustained (e.g., melaleuca). Existing species not under active management or which are ineffectively controlled are expected to increase in abundance and spatial extent (tropical American water grass). New invasions of non-native plant and animal species are expected but estimates of species number and severity of impacts are conjectural.

C.2.1.18.2 A-2 Flow Equalization Basin

Alternatives 1, 2, 3, and 4 include this feature. There are invasive and native nuisance species to consider with the proposed Flow Equalization Basin (FEB), to be called A-2. Species of concern include Brazilian pepper, torpedo grass, tropical American watergrass, water hyacinth, water lettuce, and hydrilla. The FEB lands currently are agricultural lands. Brazilian pepper exists along the agricultural canals. Once the FEB is operational, the water levels are likely to inhibit growth and recruitment of Brazilian pepper. All upland sites (e.g., levees) are expected to experience colonization of Brazilian pepper, torpedo grass, paragrass, and other invasive species common in ruderal sites. The proposed

four-mile spreader canal would require continual maintenance of floating, emergent, and potentially, submersed plant species in order to maintain the function of the canal. It is expected that increased sedimentation immediately downstream of the spreader would result in succession to large stands of Carolina willow and cattail and this area may require maintenance to achieve target flow rates. In addition, the seepage canal would require continual maintenance to control both non-native invasive and native nuisance species. Due to eutrophic conditions and variable hydroperiods, many invasive species would aggressively invade and are likely to be costly and difficult to control. Therefore, control efforts focused at maintaining the primary functions of the FEB (e.g., conveyance capacity) are preferred over aggressive eradication efforts typically applied to natural areas. Invasive/nuisance species in this category include, but are not limited to torpedo grass, hydrilla, water hyacinth, and water lettuce. In all action alternatives, these species have the potential to interfere with surface water conveyance immediately upstream of water control structures. There are many species that could establish both in the FEBs and WCAs. Establishment of these species in the FEB could be part of an invasion pathway to natural areas downstream (i.e. WCA 3A/3B, ENP). For this reason, diligent monitoring and rapid response control measures for these species would need to be carried out during construction and operations phases. Examples of such species include tropical American watergrass, Wright's nutrush, West Indian marshgrass, Nile monitor, and bullseye snakehead.

There are two recreational access points proposed for the FEB. Access points provide opportunity for the introduction of invasive species, such as hydrilla and torpedo grass. Boats and trailers can serve as a vector for new species introductions.

C.2.1.18.3 Diversion of L-6 Flows and L-5 Improvements

This feature is proposed for Alts 1, 2, 3, and 4. Deepening of the L-5 has the potential to reduce productivity of various species of SAV (including hydrilla), but would not eliminate suitable habitat for their establishment and growth (Langeland 1996). All of the action alternatives may improve habitat for non-native tropical fish species which utilize deep water zones to avoid cold temperature events (Trexler et al. 2000).

C.2.1.18.4 L-4 / L-5 – Spreader Canal and Levee Degradation

The effects to invasive species with this feature would be similar for Alts 1, 2, 3, and 4. Northwest WCA 3A has dried out significantly since the area was compartmentalized. The vegetation has shifted from ridge and slough to woody shrubs and small trees including Carolina willow, wax myrtle, Brazilian pepper, and melaleuca. The flows provided by the spreader canal into northwest WCA 3A are expected to increase wet season stages and decrease duration of surface water draw downs in the northern portions of WCA 3A. This may reduce recruitment rates of some invasive or nuisance species, such as Carolina willow and Brazilian pepper, and may facilitate expansion of other invasive or nuisance species, such as cattail and paragrass. The proposed spreader canal would require continual maintenance of floating, emergent, and potentially, submersed plant species in order to maintain the function of the canal. It is expected that increased sedimentation immediately downstream of the spreader would result in succession to stands of Carolina willow and cattail and this area may require maintenance to achieve target flow rates. Similar areas in ENP are also invaded by Brazilian pepper and Old World climbing fern. The remaining portions of the levee would offer suitable habitat for Burmese pythons. Invasive species could be introduced into northern WCA 3A with the new flows from the spreader canal. The degraded levee area may be invaded by non-native invasive and native nuisance obligate wetland plant species.

Model output for WCA 3A suggests substantial decreases in dry out periods in the northern reaches of WCA 3A. This is likely to reduce the rate of spread for certain species, especially Brazilian pepper, Australian pine, torpedo grass, and Napier grass. Melaleuca recruitment would also continue but at a reduced rate. Other species more suited to longer periods of inundation may find conditions more favorable for establishment and spread. These include but are not limited to Old World climbing fern, Island apple snail, West Indian marsh grass, paragrass, and potentially Peruvian primrose willow. Diligent monitoring and control efforts would be recommended to minimize establishment of new plant species in these areas.

Continued maintenance of the remaining portions of the L-4 levee is assumed. If regular mowing is not carried out, this segment of levee would become invaded by a number of invasive plants and animals, such as Brazilian pepper, napier grass, bishopwood, cogongrass, Burmese pythons, feral hogs, and Nile monitors.

C.2.1.18.5 Miami Canal Backfill – S-8 to Interstate 75

The effects to invasive species would be the same for Alts 1, 2, 3, and 4. Backfilled portions of the Miami Canal may be invaded by non-native invasive and native nuisance wetland plant species. Invasion by paragrass, torpedograss, and cattail is expected if backfill operations result in elevated nutrient availability. Spoil mounds along the Miami Canal in WCA 3A currently supports high densities of Brazilian pepper and other invasive plants. Degradation of these spoil deposits would result in the removal of approximately 200 acres of Brazilian pepper. This will reduce an important seed source and lower bird dispersal to nearby tree islands. While there is uncertainty about the impacts of non-native fish species on native fauna (Trexler et al. 2000), backfilling the canal would reduce available deep water habitat for non-native fish species and could reduce further expansion.

Preserved planted tree islands and the proposed spoil island creation efforts would experience immediate and long-term susceptibility for biological invasion. Elevated nutrient regimes on the new islands would promote invasion of numerous invasive species, including Brazilian pepper, Napier grass, climbing cassia, Peruvian primrose willow, and torpedograss. These elevated areas are also expected to provide excellent habitat for Burmese pythons and Nile monitors.

C.2.1.18.6 L-28 Levee Degradation / Backfill

Continued maintenance of the remaining portions of the L-28 levee in Alts 1 is assumed. If regular operations and management (O&M) vegetation management is not carried out, fallow segments of levees are likely to be invaded by a number of invasive plants and animals, such as Brazilian pepper, napier grass, bishopwood, cogongrass, Burmese pythons, feral hogs, and Nile monitors. Backfilled portions and the degraded levee area may be invaded by non-native invasive and native nuisance wetland plant species.

C.2.1.18.7 Increase Capacity of S-333

Alternatives 1, 2, 3, and 4 propose increasing the capacity of the S-333 structure. The additional flows are expected to have a minimal effect on invasive species populations. Existing invasive species under active management are expected to persist at baseline levels if current funding levels are sustained (e.g., water hyacinth). Existing invasive species not under active management, or which are ineffectively controlled, are expected to increase in abundance and spatial extent (e.g. roundleaf toothcup). New invasions of non-native plant and animal species are expected but estimates of species numbers and severity of impacts are conjectural.

C.2.1.18.8 L-67A Gated Structures / Spoil Removal

Alternatives 1, 2, 3, and 4 include building one or more gated structures on the L-67A and spoil removal on the west side of the L-67A canal. The effects to invasive species would be same for Alts 1, 2, 3, and 4. The proposed gated structure(s) on L-67A has the potential to spread cattail, torpedograss, and non-native fish species downstream of the structure and into the gap between L-67A and L-67C. Cattail and torpedo grass are also expected to colonize spoil removal areas. It is expected that non-native fish species would establish at the outflow, where water levels are deeper. Existing non-native fish species could move from the canal into the gap, but they are not expected to maintain substantial populations in the marsh due to seasonal drawdowns. Many non-native fish are documented to move from canals to the marsh during the wet season, but do not venture too far from the canal and return to the canal as water levels recede (Trexler 2000). There is a potential for invasion by new aquatic species capable of tolerating seasonal drawdowns, but the number of species and severity is conjectural.

C.2.1.18.9 L-67C Levee Degradation

Alternatives 1, 2, 3, and 4 propose to degrade sections of the L-67C levee. Effects to invasive species due to this feature would be the same for all of the action alternatives. The proposed gap(s) would also provide a pathway for aquatic species currently present in the L-67C canal to spread into WCA 3B. Existing invasive species under active management in WCA 3B are expected to persist at baseline levels if current funding levels are sustained (e.g., melaleuca). Existing species not under active management or which are ineffectively controlled are expected to increase in abundance and spatial extent (Old World climbing fern). New invasions of non-native plant and animal species are expected but estimates of species numbers and severity of impacts are conjectural. The proposed 6,000-foot gap(s) in the L-67C levee would provide an open pathway for cattail spread into WCA 3B. The extent of spread is uncertain.

C.2.1.18.10 Outflow structures out of WCA 3B

Outflow structures are proposed in Alts 1, 2, 3, and 4. Agricultural canals in WCA 3B currently release water into the L-29. There is potential for new non-native invasive species to be transferred from WCA 3A or L-67A through the new culverts and levee degrade area into WCA 3B, L-29 and eventually into ENP.

C.2.1.18.11 Build North-South Levee in WCA 3B

This feature is only proposed for Alt 4. The construction of a north-south levee in WCA 3B would cause significant disturbance within the construction footprint and adjacent marsh. Regular maintenance would be required to ensure non-native invasive plant species do not establish along the levee. Cattail is likely to establish along the entire eastern side of the levee. Existing invasive species in the affected area that are under active management should persist at baseline levels if current funding levels are sustained (e.g., melaleuca). Existing species not under active management or which are ineffectively controlled are expected to increase in abundance and spatial extent. New invasions of non-native plant and animal species are expected but number of species and severity of impacts are undetermined.

C.2.1.18.12 L-67 Extension – Levee Degradation / Backfill

Alternatives 1, 2, 3, and 4 include some degree of degrading the L-67 Extension levee. This canal and levee system extends south into ENP. This area is now invaded by numerous non-native invasive plants and also serves as habitat for Burmese pythons and feral hogs. Removal of the L-67 Extension levee would remove suitable habitat for Brazilian pepper, napier grass, climbing cassia, torpedo grass, guava, and Australian pine. Removal of the L-67 Extension levee would also reduce habitat for the Burmese

python, feral hogs, and potentially, the Argentine black and white tegu. Island apple snails may find the degradation footprint as suitable habitat if final grade is lower than the surrounding marsh.

C.2.1.18.13 L-29 Levee Degradation

Alternative 4 proposes some degree of degradation of the L-29 levee. This feature would open surface water connectivity between the L-29 canal and WCA 3B (Blue Shanty flowway). This is likely to promote the expansion of several invasive species currently limited to the L-29 canal, particularly roundleaf toothcup, island apple snail, and numerous non-native fish species. There is uncertainty whether these species would be able to persist far from the canal since many are unable to tolerate conditions during dry season drawdowns.

C.2.1.18.14 Divide Structure on L-29

This feature applies only to Alt 4. This feature is expected to have minimal effect on invasive species. Maintenance of submersed and floating vegetation would be required to ensure operational functionality of the structure.

C.2.1.18.15 Increase S-356 Capacity to 1,000 cfs

Alternatives 1, 2, 3, and 4 propose to increase the capacity of the existing S-356 structure. The additional flows may slightly reduce recruitment rates of melaleuca and other invasive plants in northern portions of ENP.

C.2.1.18.16 L-31N – New Pump Stations

Alternatives 1 and 2 propose two 250-cfs pumps on the L-31N. The two proposed 250 cfs pumps have high a probability of promoting cattail expansion and introducing non-native aquatic species downstream of the structure and into northeast Shark River Slough. It is likely that non-native fish species would establish at the outflow, where water levels are deeper. The addition of these structures along with new water flow would cause changes in vegetation composition immediately downstream. It is likely growth of Carolina willow and cattail would occur downstream of the structures. Brazilian pepper and Old World climbing fern may also establish if vegetation succeeds to willow swamp.

C.2.1.18.17 G-211 Operational Modifications / Coastal Canals Conveyance

This feature is proposed for Alts 1, 2, 3, and 4, and is expected to have minimal effects on non-native invasive and native nuisance species. Existing invasive species under active management are expected to persist at baseline levels if current funding levels are sustained (e.g., hygrophila). Existing species not under active management, or which are ineffectively controlled, are expected to increase in abundance and spatial extent (e.g., roundleaf toothcup). New invasions of non-native plant and animal species are expected but number of species and severity of impacts are undetermined.

C.2.1.18.18 Penetrating Seepage Barrier

This feature is proposed for Alts 2, 3, and 4. The depth and duration of surface water drawdowns in north eastern ENP are expected to decrease with Alts 2, 3, and 4. These changes in hydroperiods are expected to reduce recruitment rates of Australian pine, Brazilian pepper, and to a lesser extent, melaleuca. These changes may improve conditions for other invasive plant species such as tropical American water grass, West Indian marsh grass, and roundleaf toothcup.

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APPENDIX C.2.2

EFFECTS OF THE OPERATIONAL REFINEMENTS TO ALTERNATIVE 4

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C.2.2 EFFECTS OF THE OPERATIONAL REFINEMENTS TO ALTERNATIVE 4

This appendix provides a detailed discussion of the potential environmental effects, which can be either positive or negative, that could result from implementation of Alternative (Alt) 4R and Alt 4R2, the Tentatively Selected Plan (TSP). The evaluation of alternatives 1 through 4 identified the need to revise the operations of Alt 4 to ensure the project savings clause constraints are met, to minimize localized adverse ecological effects, and to identify additional opportunities to provide for other water related needs. Alternative 4 was initially refined with operational changes to avoid potential impacts to water supply levels of service in the LOSA and LEC, resulting in Alt 4R. Alt 4R was then refined further to determine if water supply cutbacks to the LOSA could be further reduced and to determine the quantity of additional LECSA 2 and LECSA 3 public water supply able to be provided while maintaining the natural system performance realized for Alt 4R. Alternatives 4R and 4R2 were compared to and evaluated against the FWO to describe changes to existing conditions with implementation of each Central Everglades Planning Project (CEPP) action alternative. The evaluation of the effects was based on results of modeling simulations, current information including scientific literature, direct observation, project design reports, reasonable scientific judgment, the scoping process, and other environmental impact statement (EIS) documents for similar projects. The Future Without- Project (FWO) or No Action Alternative considers the environmental conditions in the affected regions without the Proposed Action and is fully discussed in **Appendix C.1.2**.

The features of the TSP are described in **Section 6.1 Description of the Plan** with specific features located in **Figures 6-1** through **6-4**. The tentatively selected plan (TSP) would decrease the large pulses of Lake Okeechobee water that currently are sent east to the St. Lucie and west to the Caloosahatchee estuaries and send this water southward through Everglades Agricultural Area (EAA) canals to flowage equalization basins (FEB). The FEBs would provide storage capacity, attenuation of high flows, and limited pre-treatment prior to delivery of this redirected water to existing stormwater treatment areas (STAs), which would reduce phosphorus concentrations in the water to meet required water quality standards. The treated water would be distributed across the northwestern boundary of Water Conservation Area (WCA) 3A to flow through and help restore more natural quantity, timing and distribution of waters to WCA 3A, WCA 3B, Everglades National Park (ENP), and Florida Bay. Several existing levees, canals, culverts, and pump stations would be constructed, modified, or removed to improve the flow of water through the system and provide for other water related needs. The TSP is referenced throughout the document as Alternative 4R2 (Alt 4R2).

Environmental impacts include both direct and indirect effects. Under the Council on Environmental Quality (CEQ) regulations, direct effects are “caused by the action and occur at the same time and place,” while indirect effects are “caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems” (40 CFR 1508.8).

C.2.2.1 Climate

The historic climate conditions used in the period of record are assumed to be representative of 2050 future scenario climate conditions. South Florida was in a much drier regime from 1965 to the early 1990s when the Atlantic Multidecadal Oscillation (AMO) transitioned from the cool phase to the warm phase. South Florida experienced more droughts and dry weather during the cool phase, with high-water events (some extreme) being more frequent during the current warm phase. South Florida has been in a “wetter” regime since the early 1990s mostly due to the AMO. With AMO phases lasting

typically 20-40 years, the current AMO warm phase has likely peaked. Thus, the generally wetter than normal conditions that Florida has experienced since the early 1990s should begin to slowly decline. After the peak, the warm phase wave will begin its gradual decline where we will see continually cooler anomalies over the next 10-20 years. As we approach the end of the cycle, Florida will experience an increase in dry years compared to wet years. Given the temporal stage of the current phase, conditions will continue to remain wetter than average for the next 10-20 years, but with a slow and gradual decline in intensity until this phase ends and a cool phase begins. However, low frequency dry years can still occur due to other events such as La Niña, which can occur on an average of every 2-7 years. Features of Alts 4R and 4R2 are the same. Implementation of Alts 4R and 4R2 would have a negligible effect on climate within the action area. Minor, localized effects to microclimate may occur as a result of redistribution of water and shifts in vegetation. Potential effects may include localized increases in evapotranspiration and temperature changes.

C.2.2.2 Geology and Soils

Features of Alts 4R and 4R2 are the same. On the A-2 footprint, there would be minor geologic impacts within the project area from the removal of surface cover (e.g. vegetation and soil), of the caprock from blasting, and removal of limestone to obtain material for construction of levees, canals and roads. Alternatives 4R and 4R2 would result in conversion of relatively flat, uniform agricultural lands to a Flow Equalization Basin (FEB; 4 feet maximum operating depth) and exterior levees up to 10 feet above existing grade (NGVD29).

Improved hydroperiods and sheetflow in Water Conservation Area (WCA) 3A, WCA 3B, and Everglades National Park (ENP) reduce soil oxidation, which promotes peat accretion necessary to rebuild the complex mosaic of habitats across the landscape. On the A-2 footprint, Alts 4R and 4R2 would result in conversion of relatively flat, uniform agricultural lands to a FEB (4 feet maximum operating depth) and exterior levees up to 10 feet above existing grade. Alternatives 4R and 4R2 show an increase in inundation duration over the FWO that will significantly decrease soil oxidation, subsidence and peat fires, providing a minor beneficial effect. Alternatives 4R and 4R2 improve hydrologic conditions in northern WCA 3A in comparison to the FWO by increasing stages and resulting hydroperiods within the area (refer to **Appendix G**, **Table G-22** and **Table G-24**). Inundation duration for Alts 4R and 4R2 ranged from 76% of the period of record to 96% of the period of record in northern ENP (Zone ENP-N) and from 91% to 93% in southern ENP (ENP-S). Inundation duration for the FWO within this same region varied from 78% to 83% of the period of record in northern ENP (Zone ENP-N) and from 86% to 91% in southern ENP (ENP-S). Alternatives 4R and 4R2 produced significantly higher depths than the FWO as depicted by the normalized weekly stage duration curve for IRs 129 (**Figure G-38**) and IR 130 (**Figure G-39**); example IRs for northern (Zone ENP-N) and southern (Zone ENP-S) ENP. Alternatives 4R and 4R2 also consistently improved the number and duration of dry events in Northeast Shark River Slough (NESRS) in comparison to the FWO (**Table G-31**).

C.2.2.3 Vegetation

C.2.2.3.1 Lake Okeechobee

Negligible effects to vegetation within Lake Okeechobee's extensive littoral zone are anticipated as a result of implementation of Alts 4R and 4R2. As compared with FWO, Alts 4R and 4R2 reveal the potential for short-term minor adverse effects to aquatic vegetation due to higher than preferred lake stages. However, the days in which Lake Okeechobee stage exceeded 15.0 feet NGVD occurred approximately 25% of the Period of Record (POR, 1965-2005) in comparison with FWO which occurred approximately 20% of the POR (**Figure C.2.2-52**).

C.2.2.3.2 Northern Estuaries

Currently, many submerged aquatic vegetation (SAV) beds are stressed and have been reduced or eliminated from their former areas by extreme salinity fluctuations, increased turbidity, sedimentation, dredging, damage from boats, and nutrient enrichment which causes algal blooms that, in turn, restrict light penetration. As compared with FWO, Alts 4R and 4R2 show a slight performance improvement within the Northern Estuaries as indicated by fewer high volume flow months and provides a minor beneficial effect. Reduction in high flows and accompanying flow velocities would result in lower suspended solid loading and decreased concentration of colored dissolved organic material, thereby allowing greater light penetration to promote growth of SAV. In addition, reduction in high volume discharge events from Lake Okeechobee would reduce extreme salinity fluctuations associated with such events. Although some seagrasses are tolerant of a wide range of salinity levels, a reduction in high volume discharge events would reduce stress to SAV and aid in long term health of estuarine habitat and biota. Implementation of Alts 4R and 4R2 would help to maintain the target frequency and duration of water releases to the Northern Estuaries and would help curtail continued habitat loss and allow the recovery of more desirable vegetative communities.

C.2.2.3.2.1 Caloosahatchee River Estuary

Alts 4R and 4R2 performed better than FWO, having a fewer number of times flow criteria were not met which would help to re-establish a salinity range favorable to SAV and provides minor beneficial effects. In comparison to FWO, the number of times high flow criteria (>2800 cfs [cubic feet per second]) were not met decreased from 81 for FWO to 70 for Alts 4R and 4R2. The number of times low flow criteria (<450 cfs) were not met decreased from 27 for FWO to 24 and 23 for Alts 4R and 4R2.

C.2.2.3.2.2 St. Lucie Estuary

Compared to FWO, Alts 4R and 4R2 had a fewer number of times flow criteria were not met, which provide minor beneficial effects and benefit oysters and SAV within the estuary and Indian River Lagoon. The number of times high flow criteria were not met (> 2000 cfs) decreased from 65 for FWO to 37 and 36 for Alts 4R and 4R2. The number of times low flow criteria (<350 cfs) were not met decreased from 92 for FWO to 90 for Alt 4R and 65 for Alt 4R2.

C.2.2.3.3 Everglades Agricultural Area

Negligible effects to vegetation within the EAA are anticipated as a result of implementation of Alts 4R and 4R2. As all of the property that will be used to construct the A-2 Flow Equalization Basin (FEB) is considered to be atypical jurisdictional wetlands based on hydric soils and hydrology; wetland vegetation is anticipated to return to the site once construction of the A-2 FEB is complete. During construction, temporary short-term adverse effects are expected to vegetation within the construction area, however, these are considered to be minor as the land was formerly used for agriculture.

C.2.2.3.4 Greater Everglades

Due to changes in the quantity, quality, distribution and timing of water entering the Greater Everglades ecosystem, effects on wetland hydrology and vegetation would potentially occur with implementation of Alts 4R and 4R2. The primary factors influencing the distribution of dominant freshwater wetland plant species of the Everglades are soil type, soil depth, nutrients and hydrological regime (FWS 1999). In the Greater Everglades, improved hydroperiods and sheetflow in WCA 2A, WCA 3A, WCA 3B, and Everglades National Park (ENP) result in reduced soil oxidation, promoting peat accretion necessary to rebuild the complex mosaic of habitats across the landscape providing a moderate beneficial effect. Alternatives 4R and 4R2 provide moderate improvements in hydroperiods in WCA 2A compared to FWO.

However, Alt 4R had a moderate adverse effect in WCA 2B by significantly decreasing stages compared to FWO, while Alt 4R2 had a minor to moderate adverse effect compared to FWO. In the L-28 Triangle, Alts 4R and 4R2 showed an improvement in hydroperiod over FWO. Slight differences in hydrologic performance among Alts 4R and 4R2 were found within northern WCA 3A, central WCA 3A, WCA 3B and southeastern ENP. Restoration of sheetflow and historic hydropatterns within WCA 2A, WCA 3 and ENP will result in beneficial shifts in vegetation communities, landscape patterns, and animal populations. Implementation of Alts 4R and 4R2 would provide greater project benefits to those areas located in WCA 2A, northern WCA 3A and ENP. Central and southern WCA 3A would remain largely unaffected by the project.

As a result of reduced freshwater inflow and drainage by the Miami Canal, northern WCA 3A is currently dominated largely by mono-specific sawgrass stands, with large areas of shrub and monotypic cattail (*Typha* spp.) stands and lacks the diversity of communities that exists in central and portions of southern WCA 3A. Alts 4R and 4R2 include features to distribute water through spreader canals in the L-4 across northern 3A and backfill portions of the Miami Canal north of Interstate 75, thereby increasing hydroperiods and depths within this area. Implementation of the CEPP is expected to rehydrate much of northern WCA 3A by providing a means for redistributing treated STA discharges from L-4 in a manner that promotes sheetflow and by removing the drainage effects associated with the Miami Canal, thereby providing moderate beneficial effects. Resumption of sheetflow and related patterns of hydroperiod and water depth will significantly help to restore and sustain the microtopography, directionality, and spatial extent of ridges and sloughs and improve the health of three islands in the ridge and slough landscape.

Alts 4R and 4R2 generally produced improved inundation patterns in northwestern WCA 3A, providing minor beneficial effects. Implementation of Alts 4R and 4R2 would achieve 77% of the target HUs for Zone 3A-NW and 70% of the target HUs for Zone 3A-MC. Alt 4R would achieve 75% of the target HUs for Zone 3A-NE. Alt 4R2 would achieve 74% (Refer to **Appendix G**). As compared to Alt 4R, Alt 4R2 produced slightly lower depths during average hydrologic conditions in northeastern WCA 3A. Observed depths for Alt 4R2 in northeastern WCA 3A may be more conducive to shorter hydroperiods sawgrass marshes relative to Alt 4R. Neither Alt 4R nor 4R2 would provide the necessary inundation pattern for slough vegetation restoration; however CEPP implementation of Alts 4R and 4R2 would act to rehydrate northern WCA 3A promoting peat accretion, reducing the potential for high intensity fires and promoting transition from upland to wetland vegetation.

Rehydration of previously dry areas within northern WCA 3A has the potential to temporarily mobilize nutrients within the water column; however, this is not expected to be a significant issue since portions of WCA 3A north of I-75 experience annual dryout and rehydration with no significant downstream impact. One notable concern would be the introduction of phosphorus into previously unimpacted areas (i.e. central and southern WCA 3A) potentially resulting in vegetation shifts, providing a minor adverse effect. Chaing et al. (2000) suggested that phosphorus loadings alter the Everglades plant communities through increased plant productivity, tissue phosphorus storage, soil phosphorus enrichment and shifts in plant species composition. Substantial vegetation changes may result from elevated phosphorus concentrations. Previous studies have shown that slough and sawgrass communities have been replaced by cattail-dominated communities (Davis et al. 1994; Rutchey and Vilchek 1994; Newman et al. 1998). However, Craft et al. (1995) and Chaing et al. (2000) observed no significant change in macrophyte species diversity or expansion of cattails in study plots receiving nutrient additions during the two years and four years, respectively, of their studies. Vegetation that can assimilate nutrients directly from the water column appears to be the most sensitive to nutrient

enrichment and include periphyton and floating-leaved plants, such as spatterdock and water lily (Chaing et al. 2000; Newman et al. 2004). The periphyton-*Utricularia* complex may be quite sensitive to increased phosphorus, as illustrated by the disappearance of this complex from enriched study plots after the third year (Chaing et al. 2000).

Many areas of WCA 3A, particularly within central WCA 3A still contain good quality wetland habitat consisting of a complex of tree islands, sawgrass marshes, wet prairies, and aquatic sloughs. Vegetation and patterning in the central portion of WCA 3A resembles pre-drainage conditions most closely and represents some of the best examples of remnant Everglades habitat in south Florida. As compared to Alt 4R, Alt 4R2 produced slightly higher depths during average hydrologic conditions in central WCA 3A. These areas remain largely unaffected by Alts 4R and 4R2. Increases in depth within central WCA 3A were not as significant as increases in observed depths in northern WCA 3A; however maintenance of existing conditions within this region of the project area is desirable as ridge and slough habitat is well conserved, providing a negligible effect.

In southern WCA 3A, high water levels during the wet season are important in maintaining quality wet prairie and emergent slough habitat (FWS 2010). However, prolonged high water levels (i.e. during both wet and dry season) and extended hydroperiods have resulted in vegetation shifts within southern WCA 3A, negatively impacting tree islands and fragmenting sawgrass ridges, resulting in the loss of historic landscape patterning. Neither Alts 4R, 4R2 nor the FWO would provide significant benefits to southern WCA 3A through reduction in high water levels or duration, therefore, significant shifts in vegetation are not anticipated within this region, providing a negligible effect.

Typical Everglades vegetation, including tree islands, wet prairies, sawgrass marshes, and aquatic sloughs also occur throughout WCA 3B. However, within WCA 3B, the ridge and slough landscape has been severely degraded by the virtual elimination of overland sheetflow due to the L-67 Canal and Levee system. WCA 3B experiences very little overland flow and has become primarily a rain-fed system predominated by shorter hydroperiod sawgrass marshes with relatively few sloughs or tree islands remaining. Loss of sheetflow to WCA 3B has also accelerated soil loss reducing elevations of the remaining tree islands in WCA 3B and making them vulnerable to high water stages.

Improved hydrologic conditions in comparison to FWO within WCA 3B are anticipated through increasing stages and resulting hydroperiods within the area, providing a minor beneficial effect. Increases in stages and hydroperiods would promote wetland vegetation transition, through contraction of sawgrass marshes and expansion of wet prairies, and in deeper regions, sloughs. Plant species diversity will likely increase in WCA 3B with species composition in wet parries determined largely by peat depth and substrate type (Powers 2005). Submerged aquatic plants are commonly associated with sloughs providing structure for growth of periphyton, the main source of primary production within the freshwater Everglades (Gunderson 1994; Powers 2005). As compared to Alt 4R, Alt 4R2 produced slightly higher depths during average hydrologic conditions in northern WCA 3B. Although Alts 4R and 4R2 did not meet the desired dry and wet season water depths for slough vegetation in WCA 3B, CEPP implementation would improve inundation patterns within WCA 3B and slightly improve conditions for slough vegetation relative to the FWO.

Alts 4R and 4R2 include conveyance features and levee removal within L-67A and C, thereby providing new point source discharges of water into WCA 3B and a minor adverse effect. However, it is anticipated that Broward County Water Preserve Areas (BCWPA) CERP Project would be constructed prior to CEPP implementation, thereby reducing discharges from S-9 into L-67A. Currently, Total phosphorous

(TP) within L-67A ranges between 10 and 20 ppt, depending upon the time of year. With completion of the BCWPA CERP Project, it is anticipated that TP within L-67A will be greatly reduced and therefore minimal effects to vegetation due to changes in water quality are anticipated within WCA 3B. Cattail expansion will be monitored as outlined within **Annex D**, **Project Monitoring and Adaptive Management Plan**. Tree islands contain extraordinarily high levels of TP in their soil suggesting that they may play a major role in the biogeochemical cycles of nutrients in the Everglades (Sah 2004; Troxler and Childers 2010; Troxler and Richards. 2009; Wetzel 2002; Wetzel et al. 2009, 2011). Wetzel et al. (2011) found that soil TP levels within WCA 3A and WCA 3B tree islands were approximately 4 times higher than the surrounding marsh TP levels. Tree islands within WCA 3B may help to capture and focus nutrients, assisting to minimize potential effects on sawgrass and wet prairie communities within this region (Wetzel et al. 2011).

Flows through SRS under current system compartmentalization and water management practices are greatly reduced when compared with pre-drainage conditions. The result has been lower wet season depths and more frequent and severe dry downs in sloughs and reduction in extent of shallow water edges. Over-drainage in the peripheral wetlands along the eastern flank of Northeast Shark River Slough (NESRS) has resulted in shifts in community composition, invasion by exotic woody species, and increased susceptibility to fire. Implementation of Alts 4R and 4R2 is expected to rehydrate much of NESRS by providing a means for redistributing flows from WCA 3B to ENP, providing minor beneficial effects. Resumption of sheetflow and related patterns of hydroperiod will significantly help to restore pre-drainage patterns of water depths and the complex mosaic of Everglades' vegetation communities.

As compared with the FWO, Alts 4R and 4R2 produced significantly higher depths and inundation durations in ENP (refer to **Appendix G**, **Figure G-38** and **Figure G-39**). Within northern ENP, performance of Alts 4R and 4R2 was similar with each alternative reducing the number of dry events within Shark River (SRS) and extending average hydroperiods by 35 to 90 days depending upon location. Reduction in number and duration of dry events and extended hydroperiods will reduce soil oxidation, decrease fire potential, promote peat accretion and aid in restoration of historic wetland vegetation communities, providing minor beneficial effects. Improved inundation patterns produced by Alts 4R and 4R2 in northern ENP resulted in better suitability for slough vegetation. Although none of the alternatives met the desired dry and wet season water depths for slough vegetation in northern ENP; Alts 4R and 4R2 would provide benefits as compared with the FWO by increasing water depths in both the wet and dry season within this region. As compared to Alt 4R, Alt 4R2 produced slightly lower depths during average hydrologic conditions in southeastern ENP and decreased overland flow through Taylor Slough. Areas within the eastern marl prairies along the boundary of ENP suffer from over-drainage and reduced water flow.

Alts 4R and 4R2 include increasing capacity at S-333 from 1350 cfs to 3000 cfs. With an increase in S-333 flow, there is a likelihood of increased total phosphorus load entering NESRS. Potential changes in water quality due to implementation of Alts 4R and 4R2 have the potential to have a minor adverse effect on vegetation within ENP. The Everglades, a phosphorus-limited system, historically received most inputs of phosphorus through rainfall, with average TP concentrations of less than 0.01 milligrams per liter (mg/L) (McCormick et al. 1996, Newman et al. 2004). However, more recently, areas within ENP, including NESRS, have been exposed to TP concentrations at or in excess of 0.10 mg/L (SFWMD 2010). These concentrations and any additional inputs resulting from implementation of any of the CEPP alternatives (refer to **Section 5.2.9, Water Quality** for details), have the potential to result in vegetation changes within NESRS. Vegetation that can assimilate nutrients directly from the water column appears to be the most sensitive to nutrient enrichment and include periphyton and floating-leaved plants, such as spatterdock and water lily (Chaing et al. 2000; Newman et al. 2004). Chaing et al,

2000 demonstrated that the periphyton-*Utricularia* complex may be quite sensitive to increased phosphorus, as illustrated by the disappearance of this complex from enriched study plots after the third year. Potential effects to vegetation and species community composition within NESRS and ENP cannot fully be determined at this time. Water quality within the CEPP action area will continue to be monitored, as described in **Annex D**, to determine any associated changes.

Non-native and invasive plant infestations in the action area may be exacerbated by soil disturbance, increased nutrients, and hydrological modification. Many non-native and invasive species are flourishing in a variety of habitats and are negatively affecting the ecology throughout the Everglades. Non-native and invasive plant species are most frequently encountered in disturbed areas and areas where water quality has been impacted by increased nutrient loads. Construction and hydrological modification under Alts 4R and 4R2 will likely influence the spread and establishment of invasive and native nuisance plant species within the CEPP action area, providing a minor adverse effect. Refer to **Section 5.2.17** and **Appendix C, Section C.2.2.18** for additional information.

The Everglades Landscape Vegetation Succession model (ELVeS) was employed to predict vegetation community change over time in response to changes in environmental conditions (South Florida Natural Resources Center 2013c). The model uses empirically-based probabilistic functions of vegetation community niche space and temporal lags to evaluate expected community response within the model's domain. For this CEPP evaluation, ELVeS was run with nine freshwater marsh/wet prairie communities: (1) open water, (2) open marsh, (3) floating emergent marsh, (4) sawgrass, (5) spikerush, (6) marl prairie, (7) cattail, (8) pineland, and (9) wet scrubland. Results of this analysis are illustrated in **Figure C.2.2-1**. **Figure C.2.2-1** displays the dominant vegetation communities selected by ELVeS at the end of the 41-year POR (2005). At the broad landscape scale there are few large community changes in most of CEPP regions. The largest change is in 3A-NW where increased water deliveries to northern WCA 3A result in a decreased wet scrubland community and subsequent increase in sawgrass. Effects of the Blue Shanty flowway in WCA 3B and NESRS (ENP-N) are evident in the replacement of sawgrass with floating emergent marsh and open marsh. A modest expansion of the marl prairie community occurs within the northwestern portion of ENP (ENP-N). Deeper water vegetation communities area expected to expand in WCA 3A along the L-67 and L-29 canals (South Florida Natural Resources Center 2013c). Differences between Alts 4R and 4R2 appear relatively negligible. **Figure C.2.2-2** presents the acreage change between the FWO and Alt 4R for each community type.

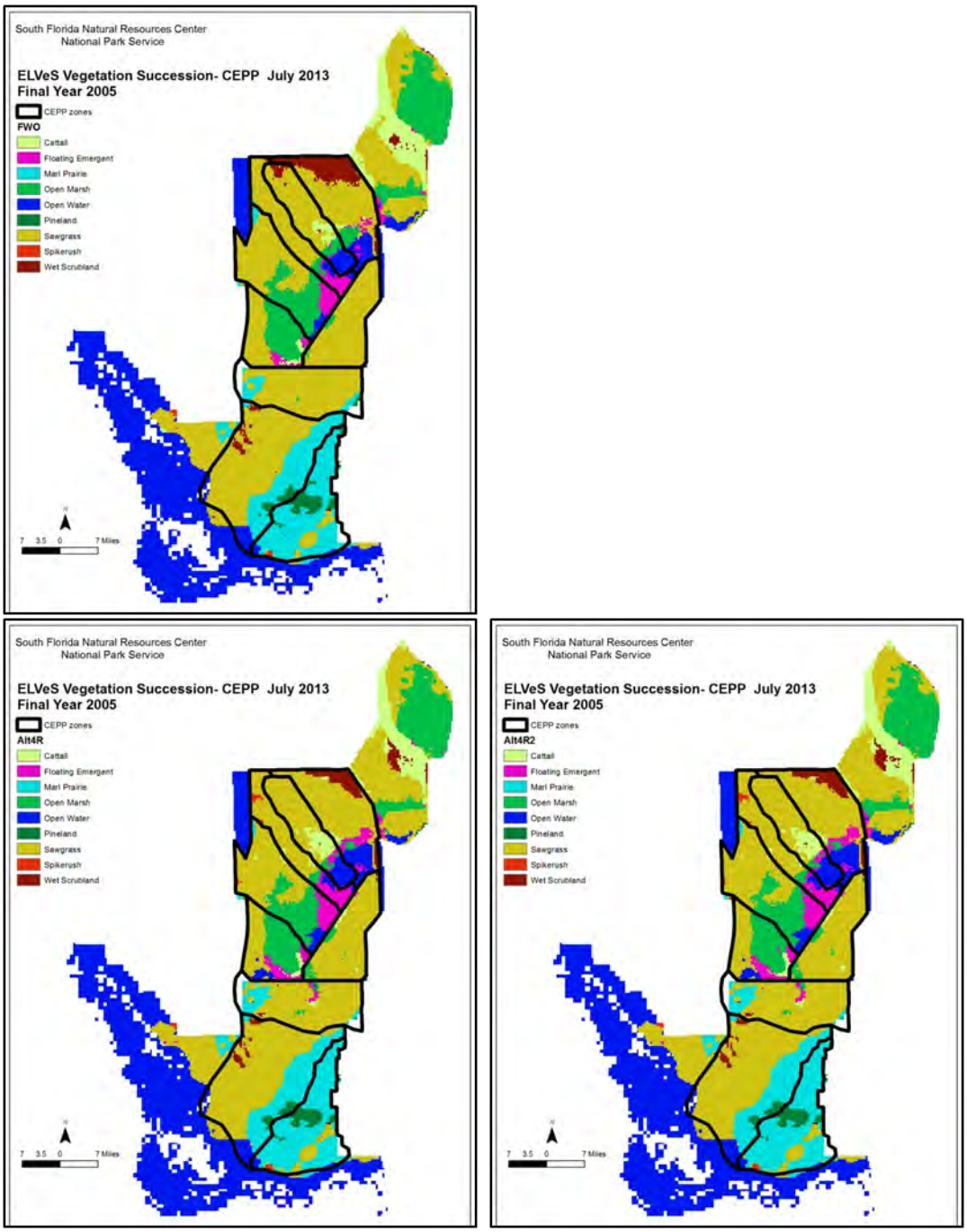


Figure C.2.2-1. Modeled dominant vegetation communities in 2005 as predicted by the Everglades Landscape Vegetation Succession model (ELVeS). The No Action Alternative (FWO) is depicted in the upper panel and Alternatives 4R and 4R2 in the lower panel. (South Florida Natural Resources Center 2013c).

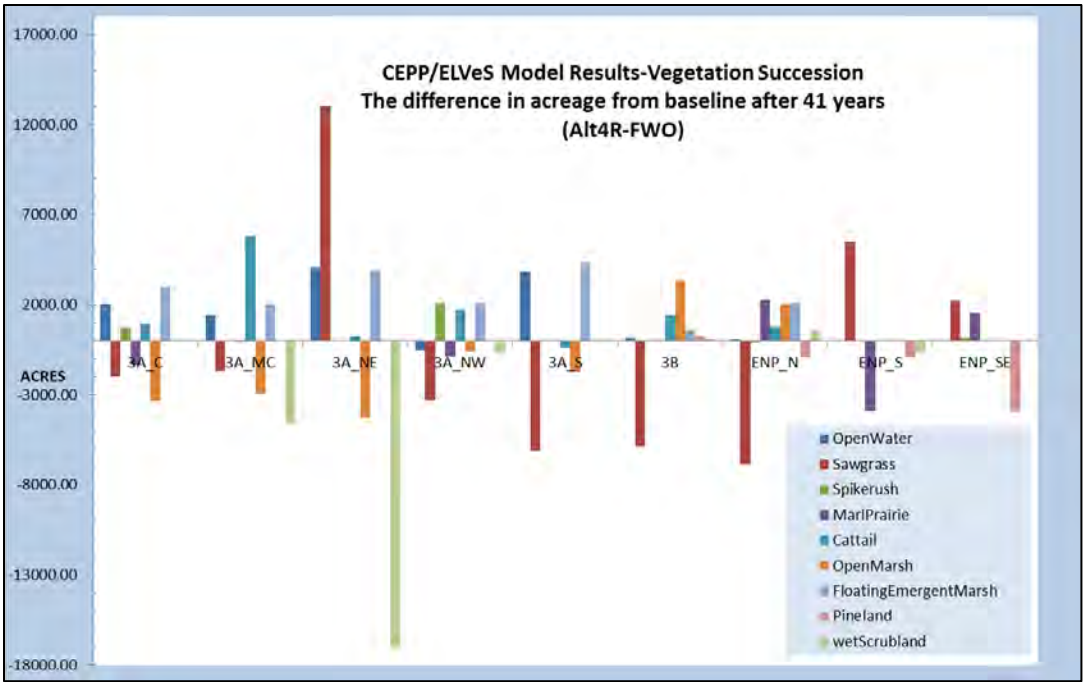


Figure C.2.2-2. Acreage differences (Alternative 4R – No Action Alternative [FWO] for each modeled vegetation community as predicted by Everglades Landscape Vegetation Succession model (ELVeS). (South Florida Natural Resources Center 2013c).

C.2.2.3.4.1 Slough/Open Water Marsh

Deep slough communities formerly occurred throughout the pre-drainage Ridge and Slough region of the Everglades (McVoy et al. 2011). Sloughs within the Greater Everglades have been degraded by compartmentalization resulting in reduced sheetflow, depths and inundation durations, altering vegetation community structure and resulting in expansion of wet prairie and sawgrass marsh communities. Overland sheetflow has been virtually eliminated from WCA 3B due to the L-67 Canal and Levee system, resulting loss of deep water sloughs and dominance of shorter hydroperiod dense sawgrass marsh. Vegetative trends within ENP have also included the conversion of slough/open-water marsh communities to shorter hydroperiod sawgrass marshes (Davis et al. 1994, Davis and Ogden 1997; Armentano et al. 2006). Alts 4R and 4R2 provide significant increases in sheetflow and hydroperiod. As a result of increased flows, depths and durations, it is expected that shorter hydroperiod sawgrass marshes will transition to wet prairie and slough/open water marsh communities providing minor beneficial effects. Shifts from one vegetation type to another may occur in a relatively short time frame (1 to 4 years) following hydrological alteration (Armentano et al. 2006; Zweig 2008; Zweig and Kitchens 2008; Sah et al. 2008). Although Alts 4R and 4R2 do not meet desired dry and wet season water depths for slough vegetation within WCA 3B and ENP; Alts 4R and 4R2 slightly improved conditions for slough vegetation by increasing water depths in both the wet and dry season within these regions.

C.2.2.3.4.2 Sawgrass Marsh

As a result of increased flows, depths and inundation durations, it is expected that shorter hydroperiod sawgrass marshes will transition to slough/open water marsh communities. Increased flow within northern WCA 3A and WCA 3B will aid to reduce dense sawgrass stands and help to promote a mosaic of wetland vegetation types within this area. As compared to Alt 4R, Alt 4R2 produced slightly lower depths during average hydrologic conditions in northeastern WCA 3A. Observed depths for Alt 4R2 in

northeastern WCA 3A may be more conducive to shorter hydroperiods sawgrass marshes, providing minor beneficial effects.

C.2.2.3.4.3 Wet Marl Prairies

Areas within the eastern marl prairies along the boundary of ENP suffer from over-drainage, reduced water flow, exotic tree invasion and frequent human-induced fires (Lockwood et al. 2003; Ross et al. 2006). To alleviate the perpetual drier conditions and its associated problems, increased water flows within this area are required. Alts 4R and 4R2 provide more water to SRS and the southern marl prairies providing minor beneficial effects. Increased hydroperiods within the eastern marl prairies may act to alleviate some of the problems associated with drier conditions and promote a shift in species community composition.

A HSI for marl prairie habitat was employed to predict potential effects of implementation of CEPP Alts 4R and 4R2. The HSI predicts hydrologic suitability of marl prairies based on Cape Sable Seaside Sparrow (CSSS) survey presence data and threshold ranges (Pearlstine et. al. 2013). The HSI measures marl prairie habitat suitability annually for four metrics: (1) average wet season water depths from June – October, (2) average dry season water depths from November – May, (3) discontinuous annual hydroperiods from May-April of the next year, and (4) maximum continuous dry days during the nesting season from March 1- July 15. Suitability for marl prairie habitat for Alts 4R and 4R2 trend similarly. Differences between alternatives within the project area are negligible.

Suitability for marl prairie habitat is decreased in the vicinity of CSSS subpopulations B, D, E, and F (CSSS-B, CSSS-D, CSSS-E, and CSSS-F) for Alts 4R and 4R2 relative to the FWO, having a major adverse effect (**Figure C.2.2-3**). Locations of CSSS subpopulations are depicted in (**Figure C.2.2-11**). Notable changes occur within the eastern marl prairies in the vicinity of CSSS-E, along the eastern edge of SRS (**Figure C.2.2-4**). This subpopulation shifts into wetter habitats with Alts 4R and 4R2. Increased hydroperiods within the eastern marl prairies may potentially result in a shift in vegetation. Ross et al. (2004) noted differences in species composition within wet prairies based upon hydroperiod. Shorter hydroperiod prairies were dominated by *Muhlenbergia*, *Schizachyrium* and *Paspalum*, while longer hydroperiod prairies consisted of *Cladium, Schoenus and Rhynchospora.* Compared to the FWO, differences in marl prairie habitat suitability within CSSS-B, CSSS-D, and CSSS-F for Alts 4R and 4R2 were minor.

Analyses of marl prairie habitat suitability with the northwestern marl prairies in the vicinity of CSSS-A reveal a reduction in this area for Alt 4R as compared with the FWO. Pollen data indicate that the marl prairies west of SRS are not a natural feature of the Everglades landscape but developed after twentieth century hydrologic modification of the system reduced flow to the region (Bernhardt and Willard 2006). Prior to the modifications, plant communities at the sites analyzed by Bernhardt and Willard (2006) in western SRS consisted of sawgrass marshes. The authors concluded that "the current spatial distribution and community composition of marl prairies are a response to water management and land cover changes of the twentieth century; and further sampling of modern marl prairie communities and adjacent communities is necessary to document the pre- and post-drainage distribution of marl prairie" (Bernhardt and Willard 2006). Compared to the FWO, negligible benefits occur within CSSS-A for Alt 4R2. Habitat suitability within central and southern CSSS-A (and flanking regions to the east) decline while habitat suitability in northern CSSS-A and regions northeast of CSSS-A slightly improve (**Figure C.2.2-4**). Alts 4R and 4R2 both provide negligible benefits within CSSS-C compared to the FWO.

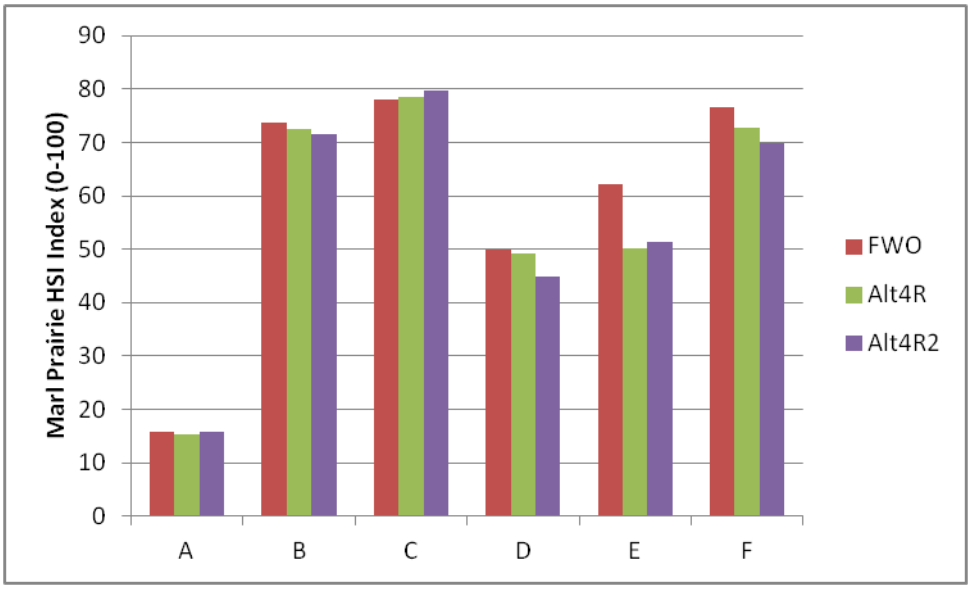


Figure C.2.2-3. Average marl prairie habitat suitability index scores (1965-2005) for the No Action Alternative and Alternatives 4R and 4R2 within CSSS subpopulations A-F.

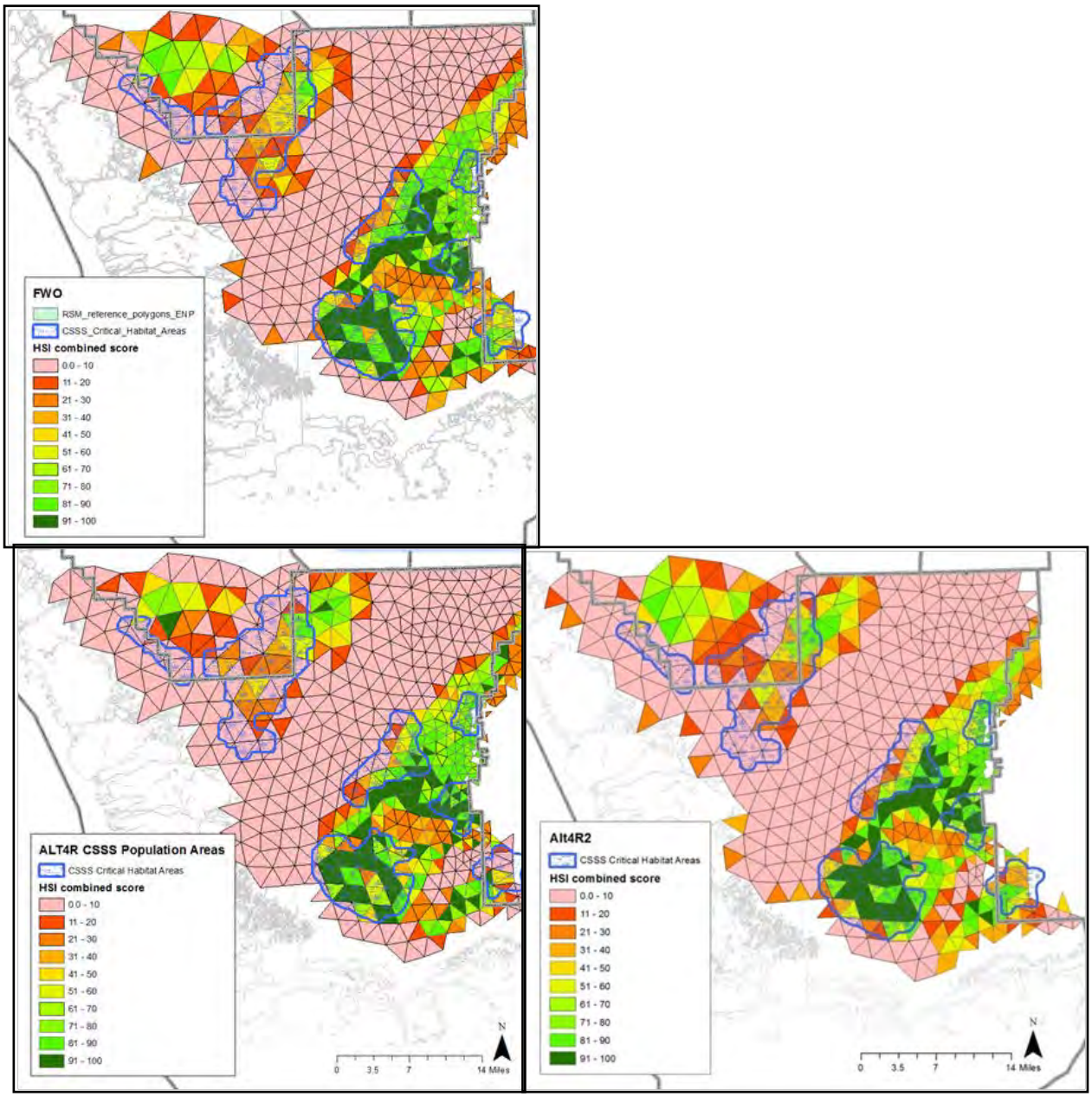


Figure C.2.2-4. Marl prairie habitat suitability for the combined marl prairie indicator scores at each RSM-GL cell for the No Action Alternative and Alternatives 4R and 4R2. Scores range from 0.0 (Not Suitable) to 100 (Most Suitable). CSSS subpopulations are outlined in blue.

C.2.2.3.4.4 Tree Islands

The hydrological and ecological responses of the Greater Everglades to the TSP are only slightly different from Alt 4R scenario upon which Alt 4R2 is based. These differences are easily seen when the figures below are compared to their counterparts in **Appendix C.2.1.3.4.4**. Starting in the Northeast section of WCA 3A where there is concern that hydrologic restoration might be stressful for the sawgrass plain and tree islands, the duration curve for ponding depths indicates a significant increase in hydroperiods and depths (**Figure C.2.2-5**). Alts 4R and 4R2 do not alter the extreme high ponding depths that can occur due to extreme meteorological events. Instead it prevents this region from being dry 40% of the time (it

will now be dry 15% of the time) and it adds, on average between 0.25 ft. and 0.65 ft. of ponding depth to the stage duration curve, providing minor beneficial effects. Since water depths on the marsh surface is predicted to be 1.0 ft or less, 80% of the time, this is not considered to be harmful to existing tree islands, Miami Canal islands that will be created, or ghost tree islands that have the potential to be restored by CEPP.

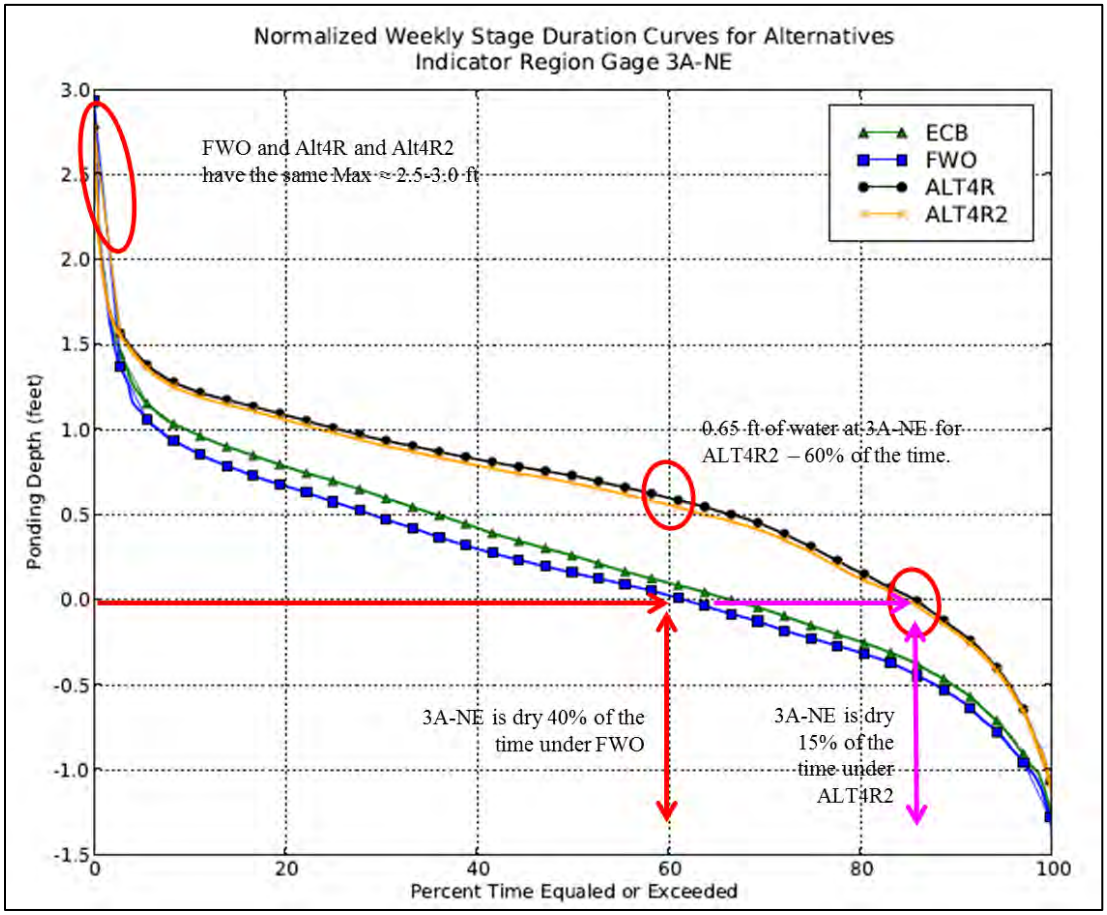


Figure C.2.2-5. The rehydration of Northeastern WCA 3A due to Alt 4R and Alt 4R2.

Moving down through WCA 3A, the central and southern regions are expected to respond similarly. As was seen for the Alts 1-4 evaluations in Southern WCA 3A (Indicator Region 124), Alt 4 managed to lower the ponding depths in comparison to the ECB and improve the ecological condition of trees islands in this region. However, Alts 4R and 4R2 only slightly improve hydrologic conditions for tree islands in comparison to FWO. This was due to the inclusion of the new ERTP schedule in FWO, and that ERTP effectively lowers the potential of flooding stress of trees on trees islands in the most southern reaches of WCA 3A.

Moving into WCA 3B (not including the Blue Shanty Flowway); Alts 4R and 4R2 make significant improvements to the hydroperiods in comparison to the FWO (**Figure C.2.2-6**). Unfortunately, Alts 4R and 4R2 do not do anything to reduce the extreme high ponding depths associated with the FWO. Instead, to prevent soil oxidation on tree islands and in sloughs, Alts 4R and 4R2 increase the

hydroperiod in WCA 3B by 10% by adding between 0.2 ft. and 0.5 ft. of ponding depths to the marsh when ponding depths drop below 1 ft, providing minor beneficial effects.

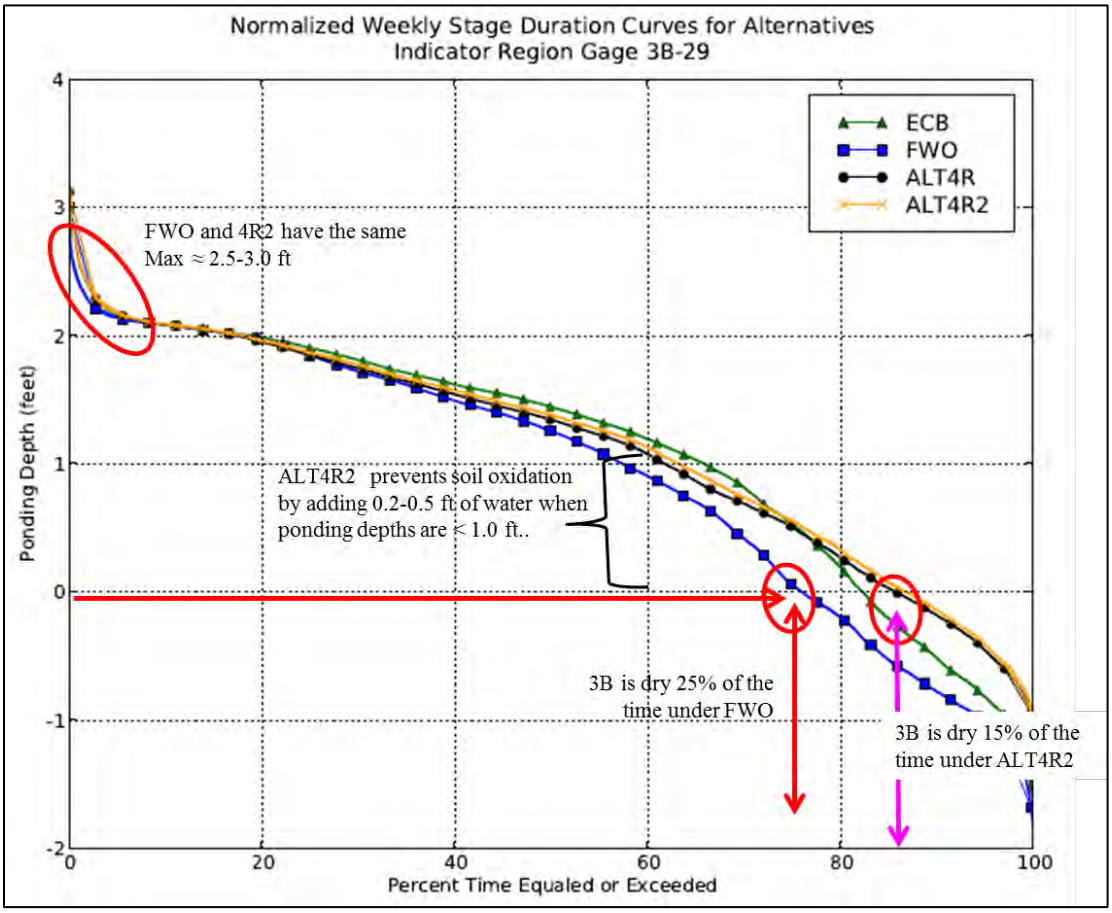


Figure C.2.2-6. The rehydration of WCA-3B due to Alts 4R and 4R2.

Shark River Slough (SRS)

Finally, looking at SRS where tree islands rise high above the surrounding marsh, their potential for flooding stress is practically non-existent. Instead, ENP is faced with a reduction in islands due to intensive fires that migrate across the marshes and burn tree island peat soils so that all that is left are rocky outcroppings. Here the objective of Alts 4R and 4R2 is to prevent extensive dry-downs and create extended hydroperiods. **Figure C.2.2-7** shows a FWO marsh surface hydrology that is shallow and for the most part, is less than 1.0 deep. For tree islands that are 1-2 ft higher than the marsh, this means that they are dry for most of the year. By adding 0.4 ft. of depth to the duration curve in SRS, Alts 4R and 4R2 decrease the probability of peat oxidation on these tree islands by increasing their hydroperiod by 30-40%.

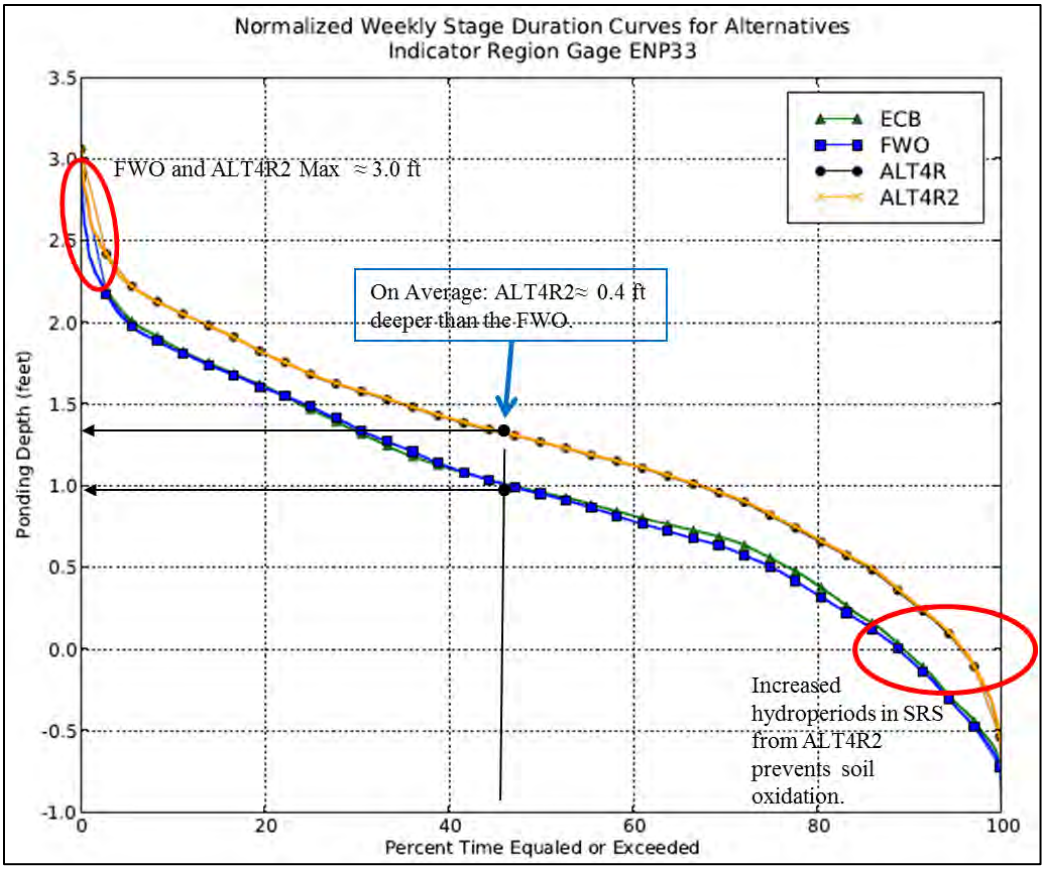


Figure C.2.2-7. Tree islands in SRS will significantly improve with Alts 4R and 4R2 in comparison to the FWO because this TSP adds about 0.4 ft. of ponding depths to the entire stage duration curve and because it increases the marsh hydroperiod by about 10%.

Changes in tree island vegetation are possible with Alt 4R2, however, tree island vegetation changes naturally over time and would continue to change under existing conditions or the TSP. Such changes are sometimes referred to as 'ecosystem succession' or 'forest dynamics', which are ecological terms that refer to plants colonizing an area or an island and completing their life cycle there while additional species of plants or the next generation of plants compete for space in the same area. This process is accelerated when some of the plants die or topple over, such as when wind storms topple trees which creates openings for seedlings and young plants to grow. Tree falls are a natural and important component of forest dynamics and can happen due to age, wind, trees growing in a site where they are ill-suited, and insect infestation. In the present day Everglades, canal construction and drainage have led to increased drought intensity and a resultant loss of peat soils. Reducing total water quantity stored by the ecosystem has lengthened the dry seasons and increased the frequency and duration of drydown events resulting in increased rates of organic soil loss. Peat loss can contribute to tree falls as a result of poor rooting conditions. It is possible that CEPP hydrology, which is expected to change flows and hydroperiods to be more like the pre-drainage Everglades and more like restoration conditions envisioned in CERP, will stress the root systems of plant species that are not well-suited to live in the restored conditions but are present currently due to drier post-drainage conditions. To address this possibility, CEPP aims for incremental hydrology targets to provide opportunities for the ecosystem, including plant and tree species, to transition to the restored conditions. Monitoring is described in the Adaptive Management and Monitoring Plan (**Annex D**) to check the survival and transition of plant species in key areas in the Everglades and report the results to decision makers.

It should be noted that south Florida's forest dynamics are driven significantly by hurricanes and wind storms. Damage to tree island species can be caused by hurricanes, depending on many factors: the location of tree islands in relation to a hurricane's center, sustained winds and wind gusts speed, soil conditions and types of vegetation. The intensity of a hurricane including duration and precipitation immediately prior to and during the event affect the stability of trees. If winds exceed the resistance of root/soil systems, trees uproot (Mitchell 2013). "In general, taller and larger trees are more susceptible to wind damage than shorter, smaller trees (Merry et al. 2011)." Also, tree species type affects vulnerability to damage (Barry et al., 1998). Therefore while CEPP hydrologic conditions may incrementally stress some plant species it is expected that the natural changes of forest dynamics, especially those associated with Florida's storms, would take place in the future with or without the TSP. In addition it is expected that the incremental restoration targets of CEPP and the monitoring feedback that will be provided by the Adaptive Management and Monitoring Plan (**Annex D)** will provide a double-check to ensure that vegetation is adapting to restoration conditions.

C.2.2.3.4.5 Rockland Pine Forest

Negligible effects are predicted within Rockland pine forest as a result of CEPP implementation.

C.2.2.3.4.6 Tropical Hardwood Hammock

Tropical hardwood hammocks on the Miami Rock Ridge have been affected by a lowered water table associated with the reduction of freshwater flow through the Everglades. Since Alts 4R and 4R2 provide increased flow through the Greater Everglades, it is anticipated that tropical hardwood hammocks would show a minor beneficial effect from CEPP implementation. As with other vegetative communities, Alts 4R and 4R2 would provide rehydration benefits to ENP as compared with the FWO.

C.2.2.3.5 Southern Coastal Systems

C.2.2.3.5.1 Mangroves

The estuarine communities of Florida Bay have been affected by upstream changes in freshwater flows through the Everglades. A reduction in freshwater inflows into Florida Bay and alterations of the normal salinity balance have affected mangrove community composition and may have contributed to a large-scale die-off of seagrass beds (FWS 1999). Mangrove communities occur within a range of salinities from 0 to 40 practical salinity units (psu).

Florida Bay experiences salinities in excess of 40 psu on a seasonal basis. As compared with FWO, Alts 4R and 4R2 provide increased freshwater flows to Florida Bay and the southwest coastal estuaries, thereby aiding to lower salinities levels within these areas to better encompass mangrove salinity tolerance range and providing minor beneficial effects. Alt 4R2 provides slightly improved salinity conditions in Florida Bay in comparison to Alt 4R.

In Biscayne Bay, Alt4R provided less water while Alt4R2 provided additional flows when compared to FWO. Alt4R flows to the coast are not evenly distributed showing positive benefits in the very northernmost reach of Biscayne Bay and negative effects from the mid-section of the northern portion to the south. Alt4R2 provides additional flows throughout the bay and is likely to provide a minor beneficial effect to the mangrove communities by providing additional flows to the coast, thereby lowering salinity levels and/or reducing the number of days salinities exceed 40 psu. Alt4R would likely result in a minor adverse effect to the mangrove communities by increasing the likely hood of maintaining salinity conditions in Biscayne Bay above the preferred salinity range of mangroves for

longer periods of time than FWO. Alternative 4R shows an unfavorable seasonal flow pattern with reductions in flows compared to FWO generally greater during the dry season. Alt4R2 shows slightly increased flows patterns for both seasons compared to FWO.

C.2.2.3.5.2 Seagrass Beds

Seagrasses within Florida Bay have long suffered from high salinities due to long-term reductions of freshwater flow. Seagrasses have an optimum salinity range of 24 to 35 psu, but can tolerate considerable short-term salinity fluctuations.

As compared with the FWO, Alts 4R and 4R2 provide increased freshwater flows to Florida Bay and the southwestern coastal estuaries, thereby aiding to lower salinities levels within these areas to better encompass seagrass salinity tolerance range and providing minor beneficial effects. Alt 4R2 provides slightly improved salinity conditions in Florida Bay in comparison to Alt 4R.

In Biscayne Bay, Alt4R provided less water while Alt4R2 provided additional flows when compared to FWO. Alt4R flows to the coast are not evenly distributed showing positive benefits in the very northernmost reach of Biscayne Bay and negative effects from the mid-section of the northern portion to the south. Alt4R2 provides additional flows throughout the bay and is likely to provide a benefit to the seagrass beds by providing additional flows to the coast, thereby lowering salinity levels and/or reducing the number of days salinities exceed 40 psu having a minor beneficial effect. Alt4R would likely result in a negative effect to the seagrass beds by increasing the likely hood of maintaining salinity conditions in Biscayne Bay above the preferred salinity range of seagrass for longer periods of time than FWO. Alternative 4R shows an unfavorable seasonal flow pattern with reductions in flows compared to FWO generally greater during the dry season. Alt4R2 shows slightly increased flows patterns for both seasons compared to FWO.

C.2.2.4 Threatened and Endangered Species

Regional Simulation Model – Glades Lower East Coast Service Area (RSM-GL) model results were used to compare performance of Alts 4R and 4R2 in relation to the ERTP PMs and ETs on species (discussed in Section 5 and C.2.1) the Corps has determined may be affected by the project. Microsoft Excel 2007 was used to analyze RSM results and create bar graphs to graphically compare Alts 4R, 4R2 and FWO. All calculations are based upon the RSM 41-year POR from 1965 through 2005. A detailed comparison between the Existing Conditions Baseline (2012), the FWO, and Alternative 4R2 (TSP) is contained within the Corps CEPP Biological Assessment, located in **Annex A**. A detailed discussion of species under the NMFS purview is contained within the Corps CERP Programmatic Biological Assessment prepared for NOAA NMFS, located in Annex A.

C.2.2.4.1 Everglade Snail Kite

Evaluation of potential effects to Everglade snail kites within the CEPP project area included adaptations of ERTP PMs, including depth and recession rate requirements for apple snails (FWS MSTS WCA 3 gages **Figure C.2.2-8**), along with the Apple Snail Population Model (SFNRC 2013b). The USACE believes the snail kite metrics (PM-B) are too restrictive, thus deferring to only the apple snail PM as an appropriate assessment that is based upon published literature (Darby 1998-2008).

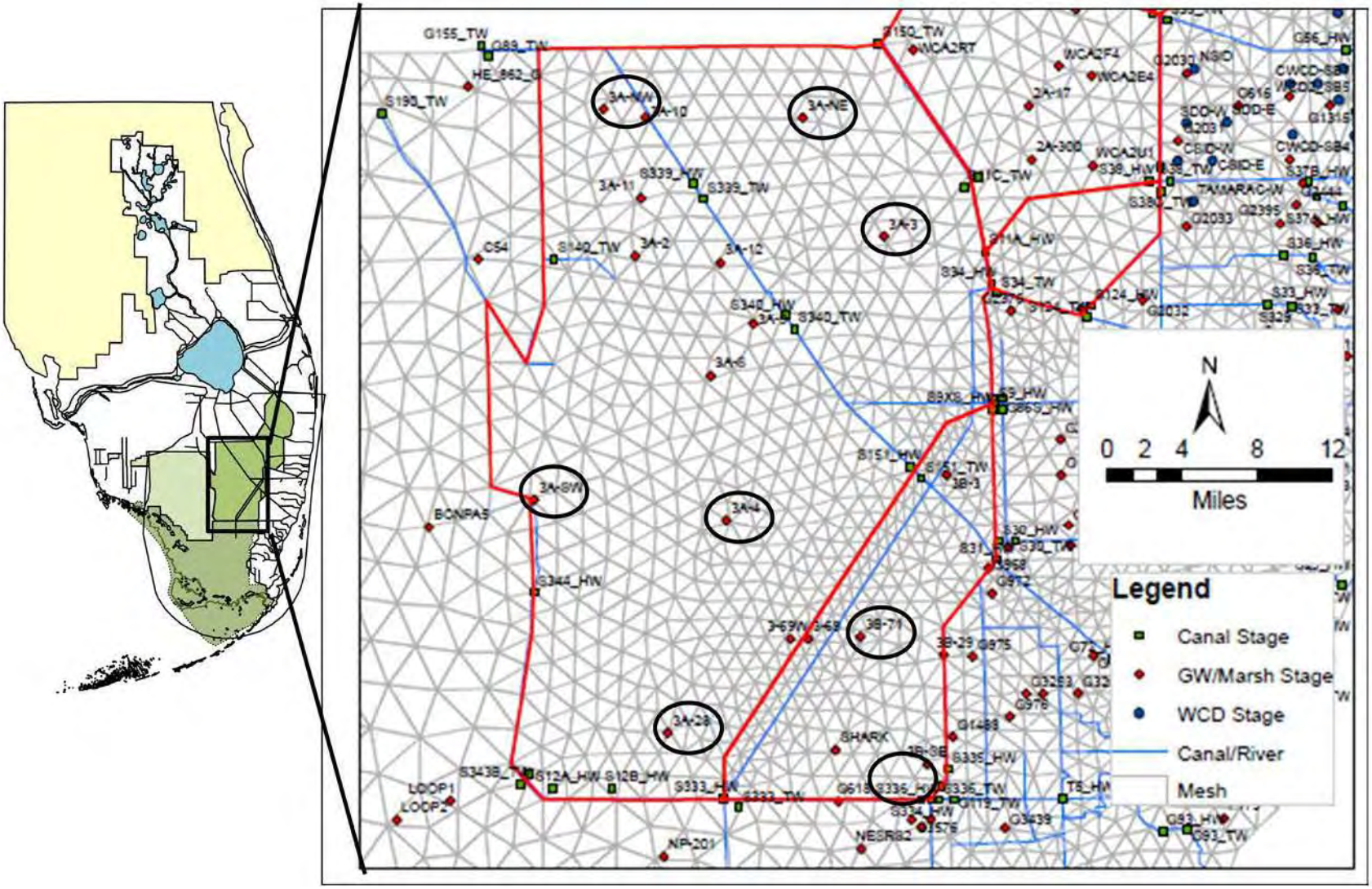


Figure C.2.2-8. WCA 3 Gage Locations for Snail Kite and Apple Snail Performance Measures

As compared to the FWO, rehydration and vegetation shifts within northern WCA 3A and increased hydroperiods within WCA 3B and ENP would increase suitable habitat for apple snails, thereby increasing the spatial extent of suitable foraging opportunities for snail kites, providing a moderate beneficial effect (**Table C.2.2-1**). Alternatives 4R and 4R2 substantially increased the number of years met over the FWO between May and June except at 3A-28. However, there was not much change between Alternatives 4R and 4R2 and FWO for the December 31 pre-breeding except at 3A-NW.

Table C.2.2-1. Number of years water depths at WCA 3 gages are within the FWS MSTS recommended apple snail depth ranges (PM C).

	31-Dec			May 1- June 1		
	ALT-4R	ALT-4R2	FWO	ALT-4R	ALT-4R2	FWO
Gage	3A-NE					
# years met	0	0	0	21	20	2
Gage	3A-NW					
# years met	17	16	0	17	19	4
Gage	3A-3					
# years met	10	10	11	21	20	7
Gage	3A-4					
# years met	24	22	22	23	23	18
Gage	3A-28					
# years met	4	4	5	17	15	19
Gage	3A-SW					
# years met	0	0	2	31	31	37
Gage	3B-71					
# years met	6	6	5	28	28	5
Gage	3BS1W1					
# years met	24	21	18	17	17	13
Total	**85**	**79**	**63**	**175**	**173**	**105**

An apple snail population model was developed by Phil Darby (University of West Florida), Don DeAngelis (USGS), and Stephanie Romañach (USGS) and is being used as an Ecological Planning Tool for the CEPP. The purpose of the model is to describe the dynamics of the apple snail population a function of hydrology and temperature. The numbers and size distribution of the snails are simulated and can be calculated for any day of a year with input data. Information regarding the size-structured population model was used to simulate the response of apple snails for Alt 4R with FWO and Alt 4R2 with FWO (**Figure C.2.2-9** and **Figure C.2.2-10**, respectively). Conditions are presented for a dry year for each model run (Alt 4R and FWO, and Alt 4R2 and FWO), because dry years are typically when restoration projects are likely to have the biggest impact, given that the system is largely rainfall driven in the wet season. Results are also shown for adult snails (> 20 mm) during the spring of a dry year, before that years' reproductive period. Adult snails during a given year are a product of egg production, and thus environmental conditions, from the previous year. End of spring results are shown as the population of snails of the size class consumed by the endangered Everglades snail kites. Based upon the results of this

analysis, Alt 4R and Alt 4R2 provide better conditions for apple snail populations as compared to the FWO, particularly in WCA 3A, WCA 3B, and ENP and provide a moderate beneficial effect.

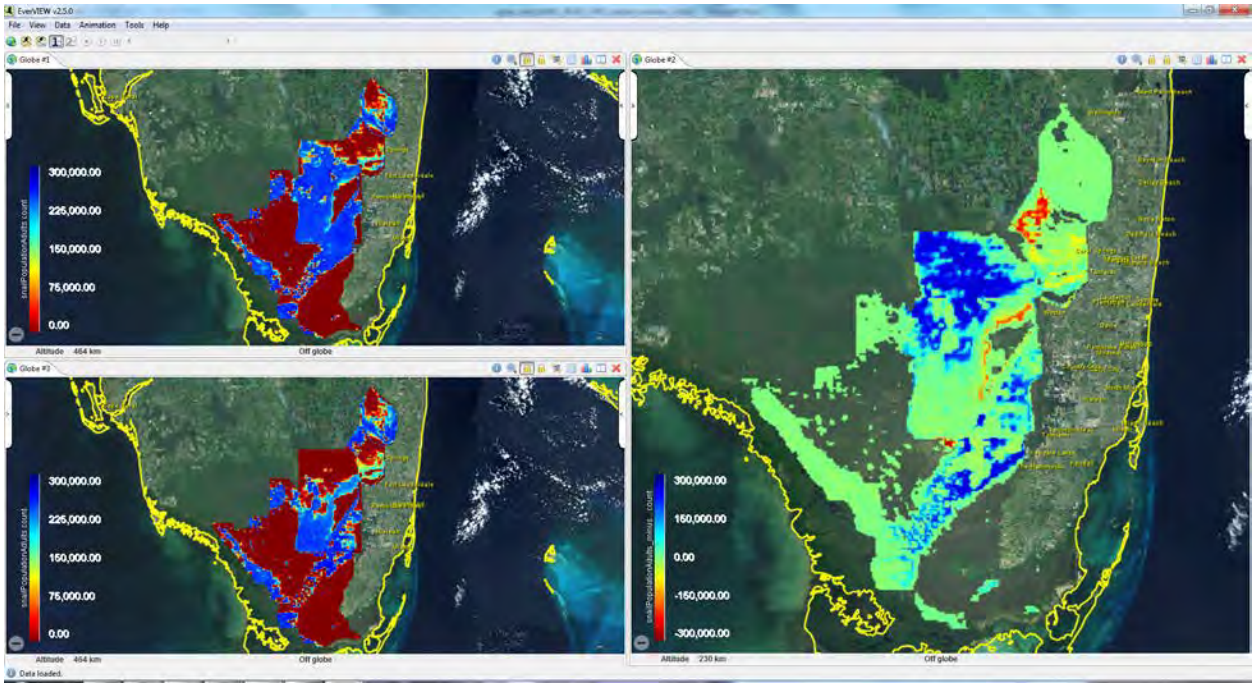


Figure C.2.2-9. Adult snail (> 20 mm) population size as a result of Alt 4R (top left) vs. FWO (bottom left), and a difference map (right map panel) of Alt4R minus FWO. (ENP 2013)

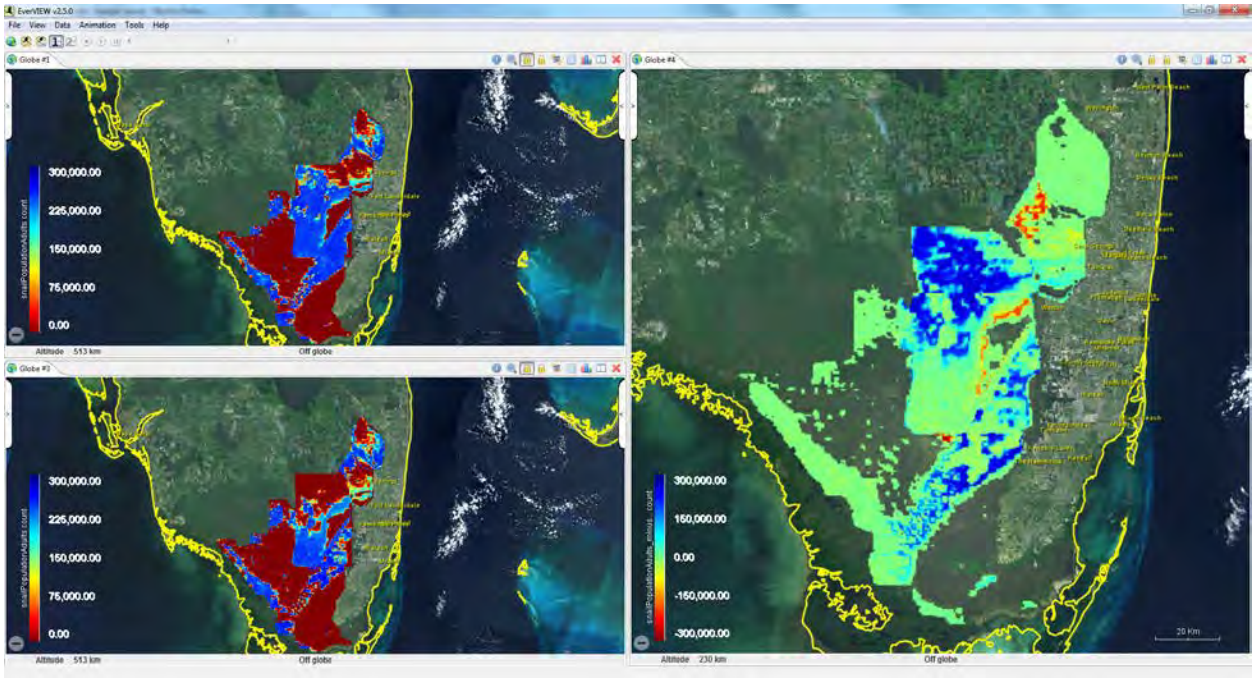


Figure C.2.2-10. Adult snail (> 20 mm) population size as a result of Alt 4R2 (top left) vs. FWO (bottom left), and a difference map (right map panel) of Alt4R2 minus FWO. (ENP 2013).

C.2.2.4.2 Cape Sable Seaside Sparrow

Presently, the known distribution of the CSSS is restricted to two areas of marl prairies east and west of SRS in the Everglades region (within ENP and BCNP) and the edge of Taylor Slough in the Southern Glades Wildlife and Environmental Area in Miami-Dade County. CSSS surveys resulted in a range map that divided the CSSS into six separate subpopulations, labeled as A through F (**Figure C.2.2-11**), with CSSS-A as the only subpopulation west of SRS (Curnutt et al. 1998).

Effects of Alternatives 4R and 4R2 on the CSSS are discussed below based on the appropriate PM and ET.

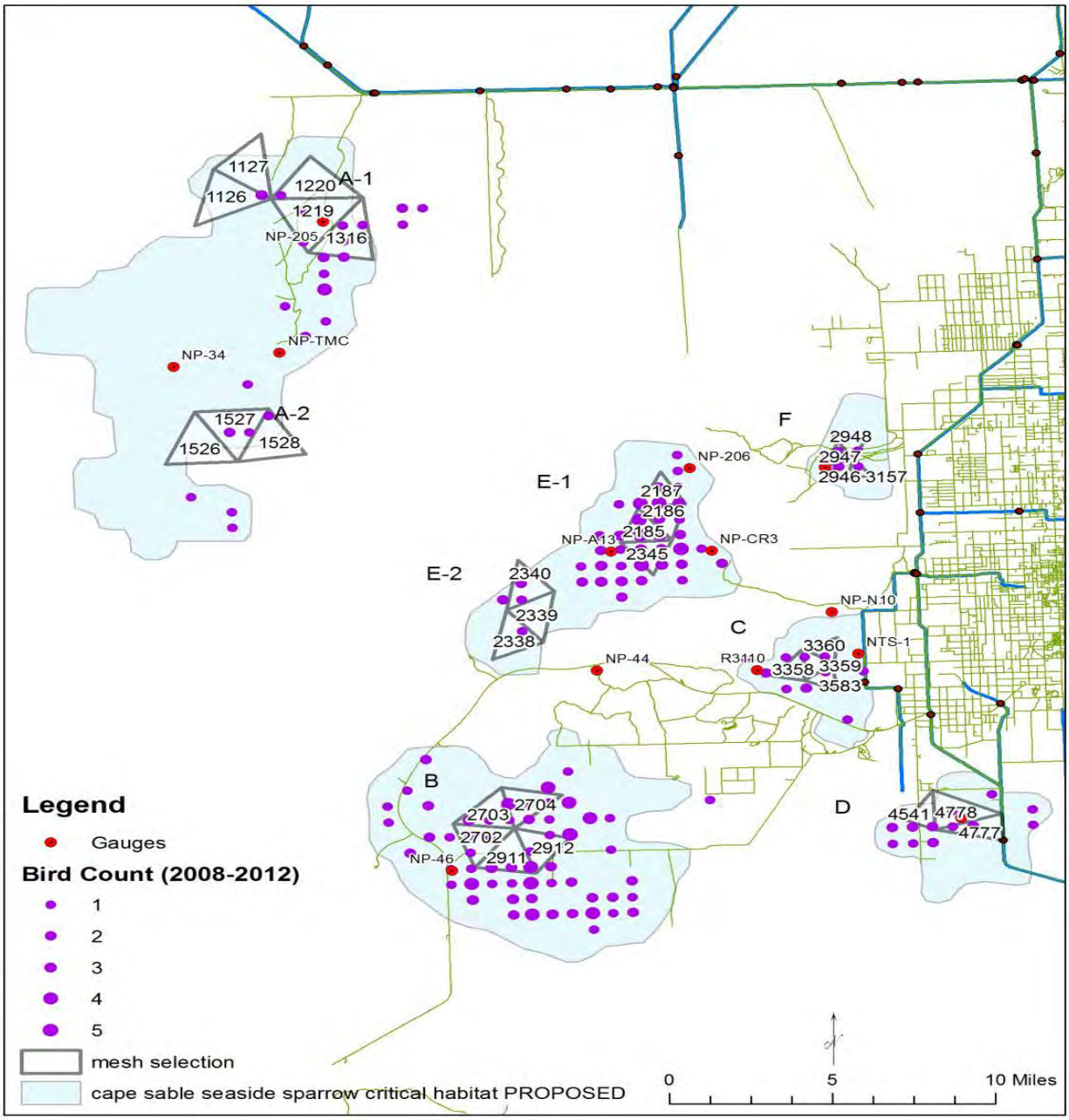


Figure C.2.2-11. Range of CSSS sub populations.

PM-A NP-205 (CSSS-A): Provide a minimum of 60 consecutive days at NP-205 below 6.0 feet, NGVD beginning no later than March 15.

Cape Sable seaside sparrows build nests low to the ground around 14-17 cm. Male CSSS call for mates and set up territories when water levels drop below ground surface. Breeding behavior can be interrupted when water levels rise above ground surface. That is why it is important to maintain water levels below the ground surface for at least 60 days during the nesting season from March 1 to July 15. In order to compare alternatives in relation to PM-A, the RSM-GL simulated NP-205 daily stage was utilized. From this data, the annual discontinuous hydroperiod (number of days inundated), was calculated and the number of consecutive dry days within the CSSS nesting window of March 1 through July 15 counted. **Table C.2.2-2** and **Figure C.2.2-12** compare Alternatives 4R and 4R2 with FWO for 60 consecutive dry days at NP-205 between March 1 and July 15. Alternatives 4R and 4R2 perform better than the FWO in the northern subpopulation A (22 years met compared to 20 in FWO) and show a minor beneficial effect. Alternatives 4R and 4R2 perform the same as the FWO in subpopulations B, C and F and show a negligible effect. Alternatives 4R and 4R2 perform worse than the FWO in the southern Sub population A (26 years met in Alt 4R and 25 years met in Alt 4R2 compared to 33 in the FWO), in subpopulation D (20 years met in Alts 4R and 4R2 compared to 22 in FWO) and subpopulation E (33 years met in Alts 4R and 4R2 compared to 36 in FWO) and show a minor adverse effect.

Table C.2.2-2. PM-A number of years there is a minimum of 60 consecutive days at NP-205 below 6.0 feet, NGVD beginning no later than March 15.

Subpopulation	Gage/Cell	Alt 4R	Alt 4R2	FWO
A	IR-A1	22	22	20
	IR-A2	26	25	33
	P34	29	29	29
	TMC	29	29	32
B	CY3	40	40	40
C	R3110	39	39	39
	E112	38	38	38
D	EVER4	20	20	22
E	NE of NPA13	33	33	36
F	NE of RG2	33	33	33

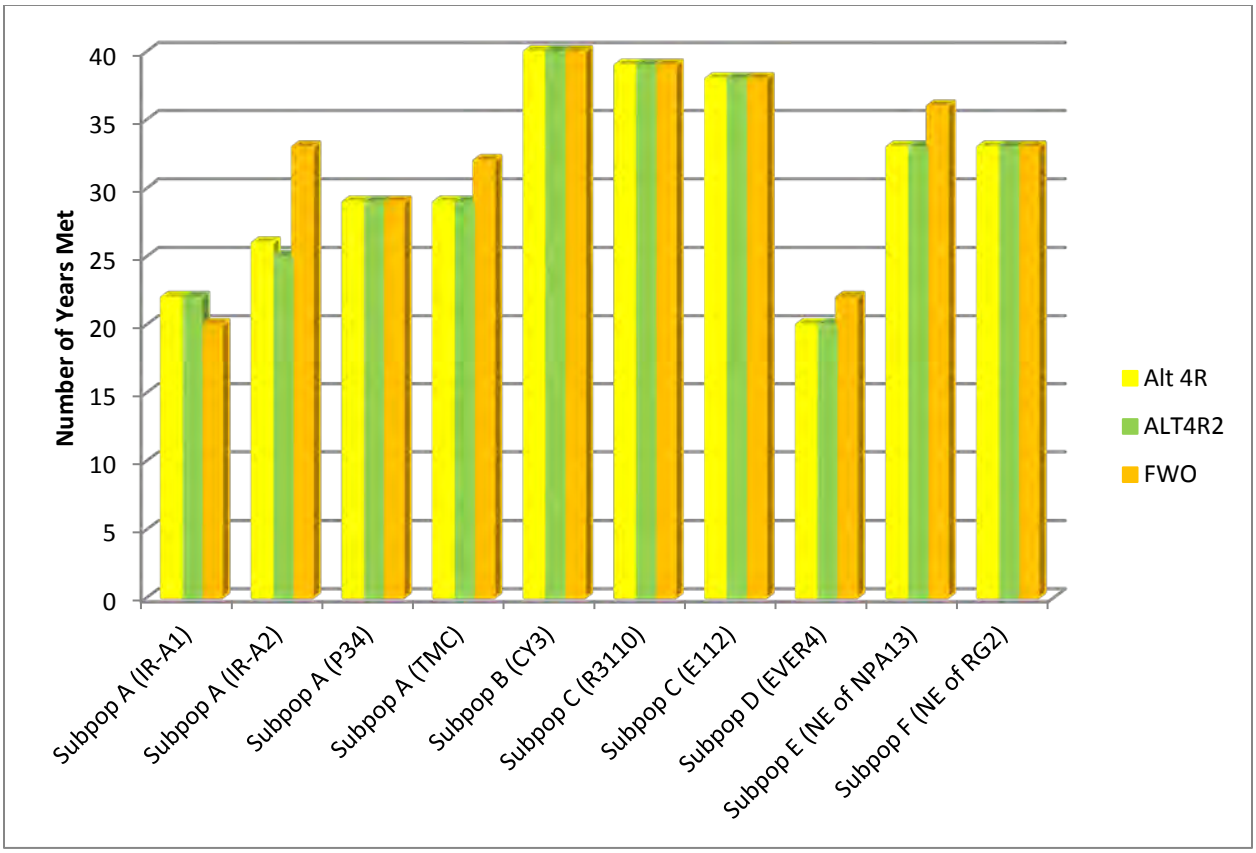


Figure C.2.2-12. PM-A: number of years a minimum of 60 consecutive days at NP-205 below 6.0 feet, NGVD beginning no later than March 15 is met out of the 40 year period of record.

Cape Sable seaside sparrows are largely sedentary, occupy the prairie habitats year-round and are completely dependent on the condition of the prairies. The CSSS have a short life expectancy of two to three years. This short life expectancy range identifies that for the population to sustain itself, there must not be three or more years in a row where water depths are not suitable for nesting. This means that there should not be three consecutive years in a row where the minimum of 60 consecutive dry days during the nesting season is not met. Additional analysis shows the number of consecutive dry days during the nesting season over the POR with the red line indicating 60 days (**Figure C.2.2-13** through **Figure C.2.2-19**). The target is 60 or more consecutive dry days during the nesting season (March 1-May 15) for Alts 4R, 4R2 and FWO and no more than two years in a row. The northern sub population A (A-1), sub population B and sub population C show very little difference between Alt 4R, 4R2 and FWO over the POR (**Figure C.2.2-13**, **Figure C.2.2-15** and **Figure C.2.2-16**). The southern sub population A (A-2) shows three times over the POR where Alts 4R and 4R2 are below the target of 60 consecutive dry days during the nesting season for three years in a row, whereas FWO does not go below the target for three consecutive years over the POR (**Figure C.2.2-14**). Sub population D shows three times over the POR where Alts 4R and 4R2 are below the target of 60 consecutive dry days during the nesting season for three years in a row, whereas FWO is below the target for three consecutive years one time over the POR (**Figure C.2.2-17**). In sub pop E, Alts 4R and 4R2 drop below the target of 60 consecutive dry days during the nesting season more times than the FWO, however neither the Alts nor FWO are below the target for three consecutive years over the POR (**Figure C.2.2-18**). In sub pop F, Alts 4R and 4R2 perform better than the FWO and do not go below the target of 60 consecutive dry days

during the nesting season for three years in a row, whereas FWO goes below the target range for three years in a row over the POR (**Figure C.2.2-19**).

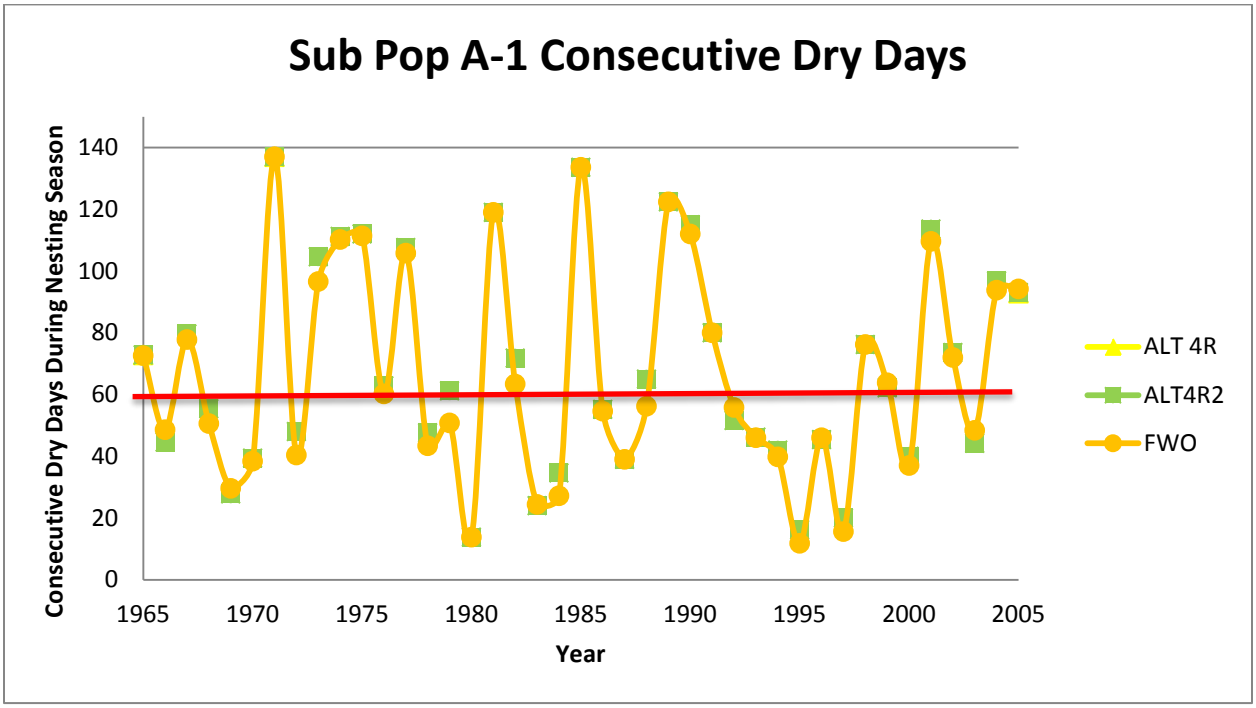


Figure C.2.2-13. Duration of consecutive dry days for the northern region of CSSS-A (IR-A1) between March 1 and July 15.

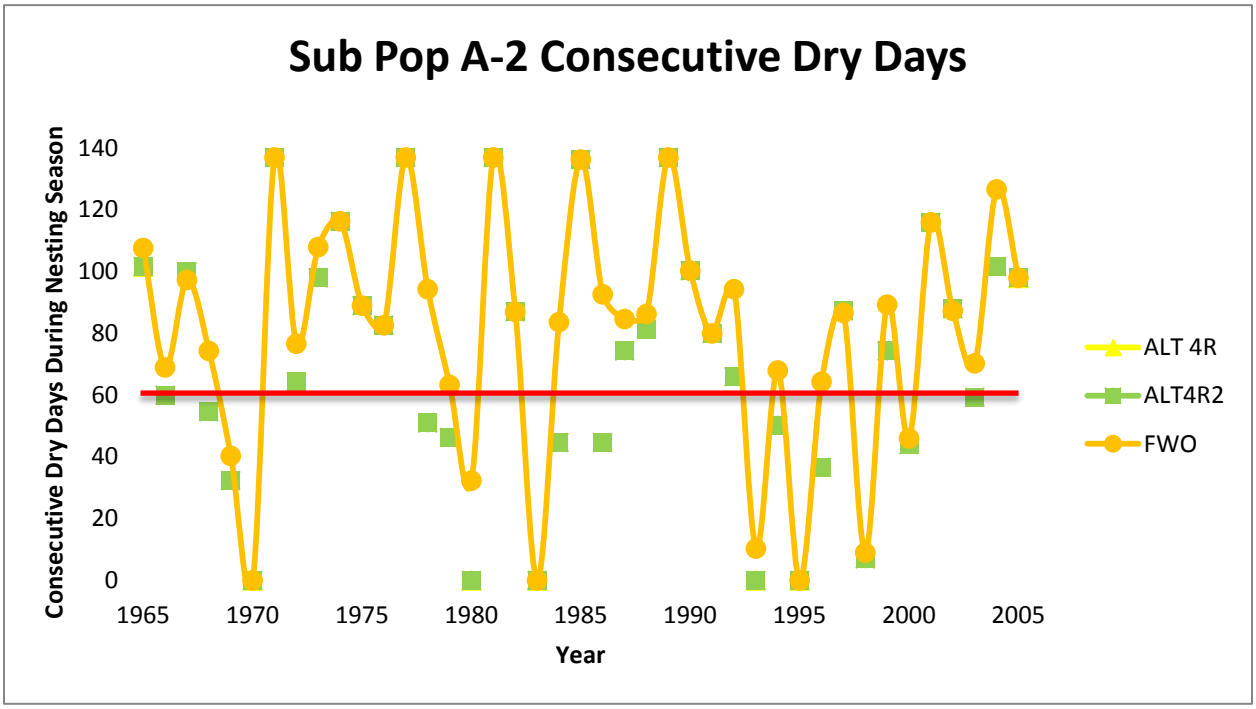


Figure C.2.2-14. Duration of consecutive dry days for the southern region of CSSS-A (IR-A2) between March 1 and July 15.

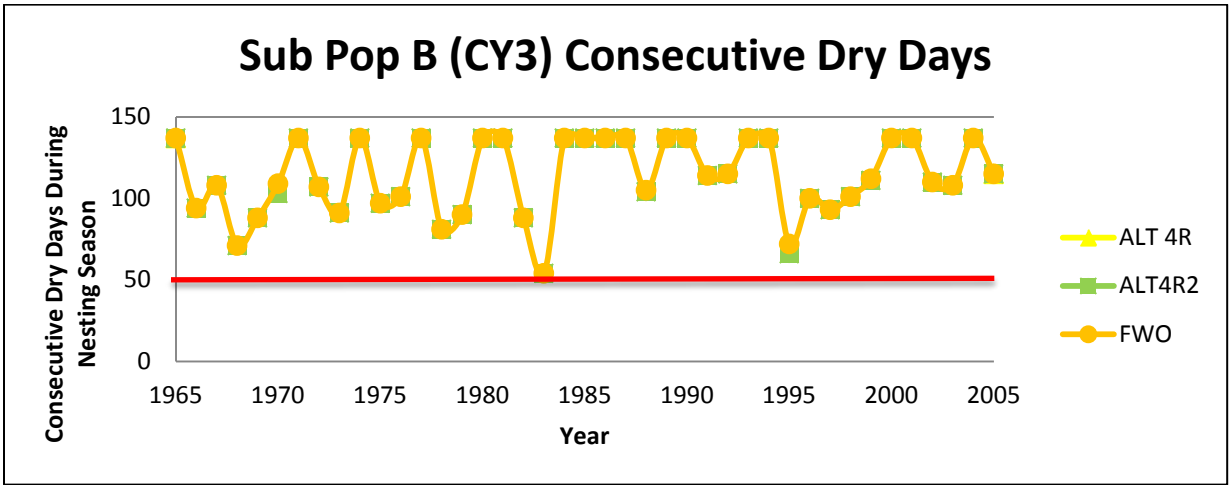


Figure C.2.2-15. Duration of consecutive dry days for CSSS-B (CY3) between March 1 and July 15.

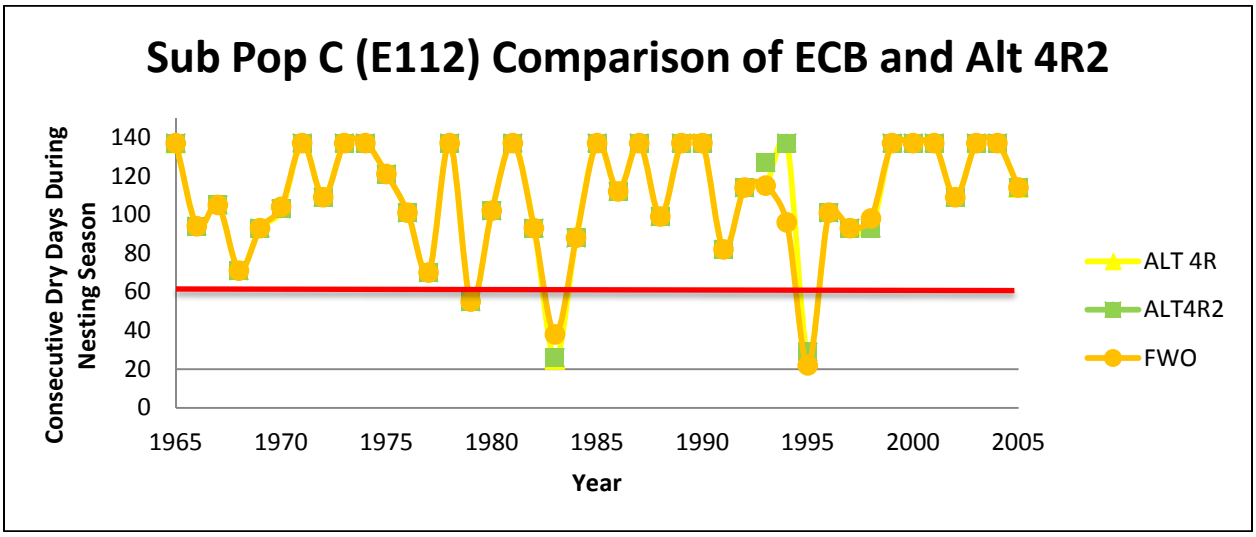


Figure C.2.2-16. Duration of consecutive dry days for CSSS-C (E112) between March 1 and July 15.

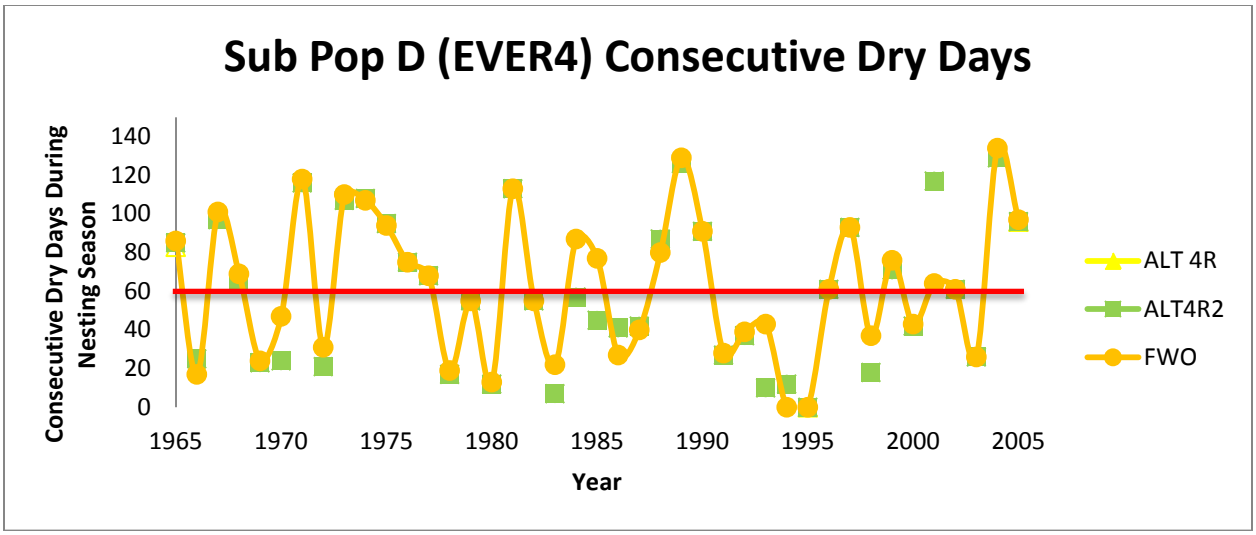


Figure C.2.2-17. Duration of consecutive dry days for CSSS-D (EVER4) between March 1 and July 15.

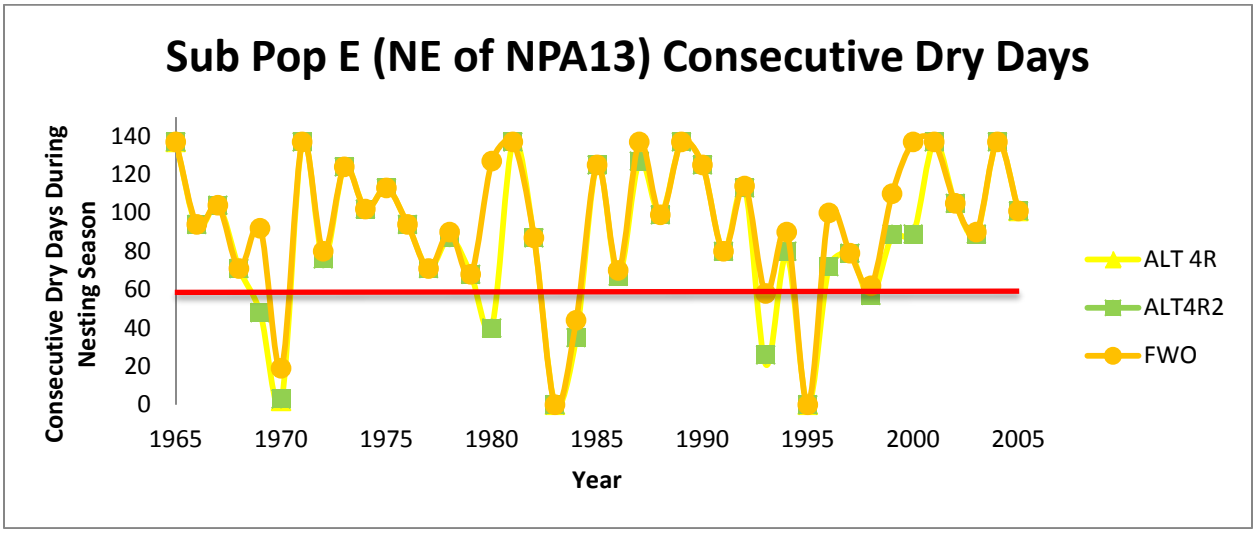


Figure C.2.2-18. Duration of consecutive dry days for CSSS-E (NE of NPA13) between March 1 and July 15.

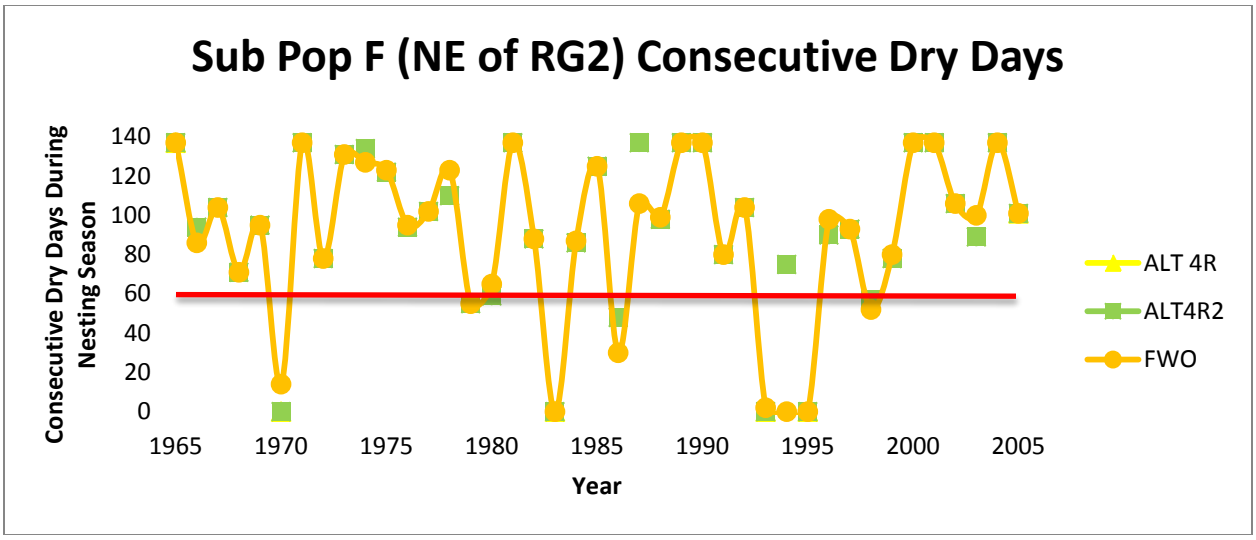


Figure C.2.2-19. Duration of consecutive dry days for CSSS-F (NE of RG2) between March 1 and July 15.

Further analysis of the PM-A data looked at the durations and timing of the total number of consecutive dry days during the nesting season for each year of the POR. Some of the consecutive day counts are close to 60, and may have been a day or a few days where the water level is just above the ground surface. In these cases, the cells were coded as yellow in that they may provide a suitable nesting season. Cells that are green met the 60 consecutive dry days and cells that are red did not meet the 60 consecutive dry days or even a total of 60 dry days during the nesting season. This analysis shows that for the northern CSSS sub population A (A-1), while there is still no difference between Alt 4R, Alt 4R2 and FWO, 1979 was a year in which there were 96 dry days for Alts 4R and 4R2 and 89 dry days for FWO that has the possibility of producing a successful nest (**Table C.2.2-3**). 1979 is also a year that is between years that did not reach 60 dry days during the nesting season, thus three consecutive years of nesting may not occur. 1984 is another year where Alts 4R and 4R2 do reach 60 dry days during the nesting season and in 2000, Alts 4R, 4R2 and FWO have a combined number of dry days greater than 60 during the nesting season. **Table C.2.2-3** shows that in the southern sub population A (A-2), while Alts 4R and 4R2 perform worse than FWO with more years and more consecutive years where there are less than 60 dry days during the nesting season, the breakdown of the days show that in 1979, there are 60 dry days during the nesting season as well as in 2000. **Table C.2.2-4** shows no difference between Alt 4R, Alt 4R2 and FWO in sub populations B and C, respectively. **Table C.2.2-5** shows that while Alts 4R and 4R2 perform slightly worse than FWO for CSSS sub population D, 1966 was a year in which there were 70 dry days for Alt 4R, 71 dry days for Alt 4R2 and only 48 dry days for FWO with Alts 4R and 4R2 having the possibility of producing a successful nest. A similar scenario was seen in 1986 where there were 67 dry days for Alt 4R, 68 dry days for Alt 4R2 and only 51 dry days for FWO. 1972, 1987, 1991, 1996 and 2000 were all years where Alts 4R, 4R2 and FWO have a combined number of dry days greater than 60 during the nesting season. **Table C.2.2-5** shows while that Alts 4R and 4R2 perform worse than FWO in the northern CSSS sub population E (E-1), there are a few years such as 1969, 1980 and 1984 where the alternatives do not meet the 60 consecutive dry day target, they do have at least 60 dry days during the nesting season and there are not three consecutive years where they do not reach 60 consecutive dry days during the nesting season. **Table C.2.2-6** shows while that Alts 4R and 4R2 perform worse than FWO in the southern CSSS sub population E (E-2), there are a few years such as 1972, 2000 and 2003 where the alternatives do not meet the 60 consecutive dry day target, but they do have at least 60 dry days during the nesting season. **Table C.2.2-6** shows that Alts 4R and 4R2 perform better than the FWO in CSSS sub population F and that there are a few years such as 1980 and 1986 where the alternatives do

not meet the 60 consecutive dry day target, but they do have at least 60 dry days during the nesting season.

Table C.2.2-3. Total number of consecutive dry days during March 1 – July 15 for the northern CSSS sub population A-1 (left) and the southern CSSS subpopulation A-2 (right). Cells that are green have 60 or greater dry days during the nesting season. Cells that are yellow do not have 60 or more consecutive dry days during the nesting season, but do have a total of 60 or more dry days during the nesting season. Cells that are red do not have 60 dry days during the nesting season.

Sub Pop A-1	Alt 4R	Alt 4R2	FWO
Year	# consecu-tive days	# consecutive days	# consecutive days
1965	69, 1, 17	69, 1, 17	69, 1, 17
1966	14, 41	14, 41	14, 41
1967	104	104	89
1968	79	80	3, 3, 63
1969	1, 6, 31, 16	1, 6, 31, 16	3, 28, 14
1970	47	47	46
1971	137	137	137
1972	14, 43	14, 43	8, 3, 35
1973	117	117	13, 94
1974	112	112	112
1975	112	112	112
1976	83, 4	83, 4	83, 2
1977	112, 22	112, 22	106, 22
1978	2, 55	2, 55	54
1979	52, 3, 9, 29, 3	52, 3, 9, 29, 3	51, 2, 8, 8, 6, 13, 1
1980	11	11	11
1981	135	135	135
1982	87	87	87
1983	31	31	31
1984	6, 9, 1, 47, 25	6, 9, 1, 47, 25	37, 22
1985	135, 1	135, 1	135
1986	1, 2, 1, 69	1, 2, 2, 70	1, 67
1987	14, 51	14, 51	15, 51
1988	86, 2	85, 2	12, 61, 1
1989	123, 11	123, 11	122, 9
1990	112, 1	112, 1	101, 10
1991	80	80	80
1992	102	102	93
1993	79	79	77
1994	54	54	2, 49
1995	13, 1, 4	13, 1, 3	5, 2, 1
1996	9, 72	9, 72	2, 1, 68
1997	23, 10, 4	23, 10, 4	13, 1
1998	3, 75	3, 75	3, 75
1999	62	62	63
2000	44, 58	44, 58	38, 43, 10
2001	113	113	112
2002	95	95	89
2003	61, 24	61, 24	61, 23
2004	121	122	12, 92
2005	98, 1	98, 1	98, 1

Sub Pop A-2	Alt 4R	Alt 4R2	FWO
Year	# consecutive days	# consecutive days	# consecutive days
1965	103	103	109
1966	63, 1, 2	63, 1, 2	70
1967	3, 100	3, 100	2, 96
1968	58	58	1, 73
1969	4, 44	4, 44	8, 46
1970	0	0	0
1971	137	137	137
1972	76	76	76
1973	119, 1	119, 1	120, 1
1974	117	117	117
1975	89	89	89
1976	83, 3	83, 3	83, 2
1977	137	137	137
1978	4, 53	3, 53	9, 97
1979	46, 1, 8, 5	46, 1, 8, 5	74, 8
1980	0	0	15, 21, 37, 5
1981	137	137	137
1982	87	87	87
1983	0	0	0
1984	73	73	93
1985	137	137	137
1986	57	57	103
1987	5, 82	5, 81	5, 82
1988	84	84	86
1989	137	137	137
1990	99, 4, 2	99, 4, 2	99, 4, 2
1991	80	80	80
1992	6, 69	5, 68	90
1993	0	0	12
1994	55, 3	52, 1	76, 1
1995	0	0	0
1996	3, 37, 1	3, 37, 1	65, 8
1997	13, 83	13, 83	13, 82
1998	6	5	8
1999	70	70	88
2000	22, 45, 9	22, 45, 9	32, 48, 10, 1
2001	116, 1	116, 1	116, 1
2002	90	89	88
2003	61, 24	61, 24	89
2004	118	118	127
2005	98	98	98

Table C.2.2-4. Total number of consecutive dry days during March 1 – July 15 for the CSSS sub population B (left) and sub population C (right). Cells that are green have 60 or greater dry days during the nesting season. Cells that are red do not have 60 dry days during the nesting season.

Sub Pop B	Alt 4R	Alt 4R2	FWO
Year	# consecutive days	# consecutive days	# consecutive days
1965	137	137	137
1966	94	94	94
1967	107	107	107
1968	71	71	71
1969	91	91	91
1970	111, 1	111, 1	113, 1
1971	137	137	137
1972	107	107	107
1973	121	121	121
1974	137	137	137
1975	97, 3, 4	97, 3, 4	107
1976	101	101	101
1977	137	137	137
1978	84	84	84
1979	137	137	137
1980	137	137	137
1981	137	137	137
1982	88	88	88
1983	53	53	53
1984	134	134	134
1985	137	137	137
1986	118, 17	118, 17	137
1987	137	137	137
1988	99, 2	99, 2	99, 2
1989	137	137	137
1990	137	137	137
1991	110	110	110
1992	115	115	115
1993	97, 18, 17	97, 18, 17	135
1994	137	137	137
1995	65	65	71
1996	100	100	100
1997	93	93	93
1998	101	101	102
1999	110	110	112
2000	137	137	137
2001	137	137	137
2002	109	109	109
2003	103, 4, 13	103, 4, 13	103, 4, 13
2004	137	137	137
2005	114, 1, 5	114, 1, 5	114, 1, 5

Sub Pop C	Alt 4R	Alt 4R2	FWO
Year	# consecutive days	# consecutive days	# consecutive days
1965	137	137	137
1966	94	94	94
1967	105	105	105
1968	71	71	71
1969	93	93	93
1970	83	84	86, 7, 2
1971	137	137	137
1972	109, 2	109, 3	109
1973	125, 3, 4	125, 3, 4	125, 3, 4
1974	126, 1	126, 1	125
1975	116	116	116
1976	94, 5	94, 5	94, 5
1977	70, 33, 26	70, 33, 26	70, 33, 27
1978	2, 5, 123	2, 5, 123	8, 124
1979	68, 56	68, 56	68, 55
1980	1, 135	1, 135	137
1981	137	137	137
1982	90, 24	90, 24	90, 24
1983	10, 1, 1, 1	11, 2, 4	32
1984	44, 77	44, 77	44, 77
1985	124, 4, 4	124, 4, 4	124, 9
1986	112, 1, 1, 6	112, 1, 1, 6	112, 4
1987	137	137	137
1988	99	99	99
1989	137	137	137
1990	137	137	123, 13
1991	82	82	82
1992	114	114	114
1993	92, 16, 2, 1	92, 1, 17, 7	92, 1, 17, 7
1994	1, 92, 30	1, 92, 1, 31	1, 93, 12, 12
1995	3, 12	5, 12	5, 2, 20
1996	86, 6	86, 6	86, 7
1997	82, 10	82, 10	82, 10
1998	81	82	92
1999	111, 7, 3	111, 7, 3	111, 7, 4
2000	137	137	137
2001	137	137	137
2002	106	106	106
2003	109, 3, 17	109, 3, 18	109, 4, 2, 18
2004	137	137	137
2005	101, 8	101, 8	101, 8

Table C.2.2-5. Total number of consecutive dry days during March 1 – July 15 for the CSSS sub population D (left) and southern sub population E (E-1, right). Cells that are green have 60 or greater dry days during the nesting season. Cells that are yellow do not have 60 or more consecutive dry days during the nesting season, but do have a total of 60 or more dry days during the nesting season. Cells that are red do not have 60 dry days during the nesting season.

Sub Pop D	Alt 4R	Alt 4R2	FWO
Year	# consecutive days	# consecutive days	# consecutive days
1965	111, 5, 14	111, 5, 14	111, 6, 18
1966	3, 24, 27, 16	3, 25, 27, 16	9, 25, 14
1967	102	102	102
1968	69	69	69
1969	26	27, 1	1, 1, 28, 1
1970	31	34	44
1971	118, 3, 2, 4	118, 4, 2, 4	119, 9, 7
1972	31, 3, 12, 16	31, 3, 12, 16	31, 3, 12, 17
1973	114	114	114
1974	123	123	110
1975	90, 21	90, 10, 10	90, 7, 2, 10
1976	75, 5, 2	75, 4, 2	75, 5, 2
1977	68, 1, 3, 8	68, 1, 3, 8	68, 1, 3, 8
1978	19	19	21, 1
1979	55	55	55
1980	16, 22, 1	17, 22, 1	20, 29, 6
1981	119	119	119
1982	54, 4	54, 4	54, 6
1983	0	0	14
1984	22, 63	22, 63	86
1985	72, 3, 38	72, 3, 38	117
1986	19, 48	20, 49	5, 46
1987	5, 4, 48, 51	5, 6, 49, 51	6, 13, 47, 47
1988	91	91	91
1989	126, 7	126, 7	137
1990	87, 29	87, 8, 20	87, 4, 16
1991	2, 45, 29	2, 45, 29	2, 44, 29
1992	19, 75	20, 75	22, 75
1993	19	22	2, 8, 31
1994	12, 4	13, 4	1, 9
1995	0	0	0
1996	45, 23	46, 23	2, 47, 23
1997	93	93	93
1998	14, 27, 3	15, 27, 4	31, 29, 5
1999	84	85	2, 104
2000	42, 54, 1	43, 54, 1	100, 2
2001	100, 29, 4	100, 29, 1	100, 29, 4
2002	89	90	91
2003	26, 18, 6, 1	26, 18, 6, 1	26, 19, 7, 5
2004	133	135	137
2005	101	101	101

Sub Pop E-1	Alt 4R	Alt 4R2	FWO
Year	# consecutive days	# consecutive days	# consecutive days
1965	137	137	137
1966	93	94	94
1967	104	104	104
1968	71	71	71
1969	14, 48, 11, 1	15, 48, 12, 1	92
1970	2	3	19
1971	137	137	137
1972	76, 1	76, 1	80, 4
1973	124	124	124
1974	102	102	102
1975	113, 1	113, 1	113, 1
1976	94	94	94
1977	71, 34, 2, 3, 6	71, 34, 2, 3, 6	71, 34, 3, 6, 6
1978	87	87	90
1979	68, 7	68, 5	68, 13, 3, 3, 1
1980	15, 30, 41, 4	14, 29, 40, 4	1, 127
1981	137	137	137
1982	87	87	87
1983	0	0	0
1984	32, 5, 35, 8, 4	32, 5, 35, 8, 2, 1	44, 38, 9, 7
1985	125	125	125
1986	25, 67	25, 67	26, 70
1987	5, 127	5, 127	137
1988	99	99	99
1989	137	137	137
1990	125, 1, 2, 1	125, 1, 1	125, 1, 1
1991	80	80	80
1992	113	113	114
1993	21	26	58, 15
1994	1, 78, 8, 8	80, 8, 8	90, 8, 9
1995	0	0	0
1996	1, 72, 10	2, 72, 10	100
1997	79	79	79, 1
1998	56	57	62
1999	88	89	110
2000	44, 89	44, 89	137
2001	137	137	137
2002	105	105	105
2003	89	89, 6	90, 9, 3
2004	137	137	137
2005	101	101	101

Table C.2.2-6. Total number of consecutive dry days during March 1 – July 15 for the southern CSSS sub population E (E-2, left) and sub population F (right). Cells that are green have 60 or greater dry days during the nesting season. Cells that are yellow do not have 60 or more consecutive dry days during the nesting season, but do have a total of 60 or more dry days during the nesting season. Cells that are red do not have 60 dry days during the nesting season.

Sub Pop E-2	Alt 4R	Alt 4R2	FWO
Year	# consecutive days	# consecutive days	# consecutive days
1965	137	137	137
1966	2, 70	3, 70	81
1967	104	104	104
1968	70	70	71
1969	2, 3, 29	2, 3, 1, 29	1, 7, 9, 32
1970	0	0	0
1971	137	137	137
1972	24, 1, 36	24, 1, 36	35, 1, 40
1973	3, 1, 75	3, 1, 75	4, 2, 78
1974	106	106	106
1975	90	90	90
1976	88	88	88
1977	71, 33, 2, 6, 6	71, 33, 2, 6, 6	71, 33, 2, 7, 6
1978	71	71	74
1979	51	51	55, 2, 1
1980	1, 18	18	24, 41, 2, 40, 5
1981	56, 123	2, 124	131
1982	87	87	87
1983	0	0	0
1984	12, 45	2, 9, 45	22, 58
1985	124	124	124
1986	25, 71	25, 71	103
1987	5, 98	5, 98	5, 103
1988	98	98	99
1989	137	137	137
1990	117	117	117
1991	80	80	80
1992	23, 72	23, 72	97
1993	17, 3	17, 3	64, 1, 1
1994	33, 5, 18	33, 5, 17	68
1995	0	0	0
1996	2, 13, 44	2, 13, 44	9, 72, 1
1997	79	79	79
1998	35	35	40
1999	83	84	100
2000	36, 42	36, 43	44, 46, 1, 2
2001	137	137	137
2002	90, 4	90, 4	91, 5
2003	16, 8, 21, 19	16, 8, 21, 19	26, 23, 19
2004	135	135	137
2005	98	98	98

Sub Pop F	Alt 4R	Alt 4R2	FWO
Year	# consecutive days	# consecutive days	# consecutive days
1965	137	137	137
1966	94	94	86
1967	104	104	104
1968	71	71	71
1969	95	95	95
1970	0	0	14
1971	137	137	137
1972	78	78	78
1973	131	131	131
1974	134, 2	134, 2	127, 5, 1
1975	122	122	123
1976	94	94	95, 1
1977	94, 7, 33	102, 33	102, 34
1978	9, 110	9, 110	123
1979	55	55	55, 1
1980	10, 57, 2	9, 59	1, 33, 2, 65
1981	137	137	137
1982	88	88	88
1983	0	0	0
1984	86	86	87
1985	125, 3	125, 3	125, 7
1986	25, 48	25, 48	24, 30, 2
1987	137	137	30, 106
1988	98	98	99
1989	137	137	137
1990	137	137	137
1991	80	80	80
1992	104	104	104
1993	0	0	2
1994	73, 4, 1, 25	75, 33	0
1995	0	0	0
1996	90	90	98
1997	93	93	93, 2
1998	55	57	52
1999	77, 8, 5	77, 8, 5	80, 8, 6
2000	137	137	137
2001	137	137	137
2002	106	106	106
2003	89	89	100
2004	137	137	137
2005	101	101	101

ET-1 (NP-205, CSSS-A): Strive to reach a water level of less than or equal to 7.0 feet, NGVD at NP-205 by December 31 for nesting season water levels to reach 6.0 feet, NGVD by mid-March.

As illustrated by **Figure C.2.2-20** ET-1 would have been achieved in 97 percent of years (39 of 40 years) in Alternatives 4R and 4R2 and the FWO.

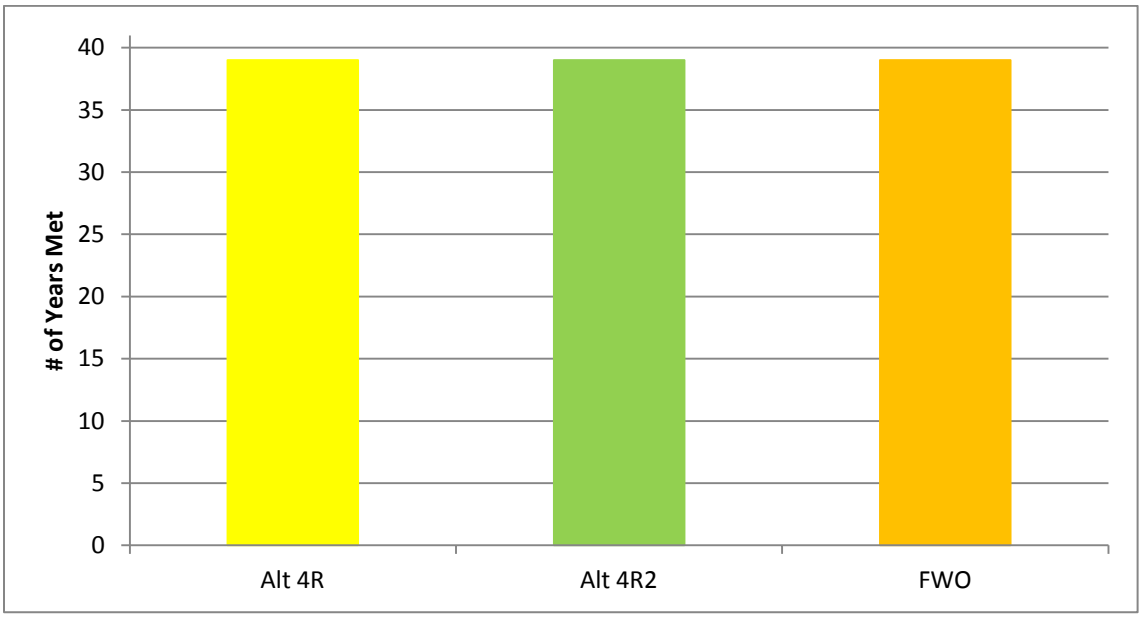


Figure C.2.2-20. ET-1 Number of years over the POR where water levels were at or below 7.0 ft at NP-205 by December 31 for nesting season water levels to reach 6.0 feet by mid-March for the four alternatives and the No Action Alternative (FWO).

ET-2 (CSSS): Strive to maintain a hydroperiod between 90 and 210 days (three to seven months) per year throughout sparrow habitat to maintain marl prairie vegetation.

To maintain suitable habitat for CSSS, the annual hydroperiod (i.e. time above ground surface during wet season) should be between 90 and 210 days. Sparrows prefer to nest in short-stature clumped grasses such as *Muhlenbergia*, *Schizachryium*, and *Schoenus.* Habitat can tolerate infrequent years of up to 240 days and below 90 days. In order to compare alternatives for hydroperiod throughout CSSS habitat, ETs were used. RSM-GL results for each CSSS subpopulation are depicted in **Table C.2.2-7** and **Figure C.2.2-21** through **Figure C.2.2-29**. **Table C.2.2-7** and **Figure C.2.2-21** compares Alternatives 4R and 4R2 to the FWO to maintain a hydroperiod between 90 and 210 days (three to seven months) per year throughout sparrow habitat to maintain marl prairie vegetation. Alternatives 4R and 4R2 performed better than the FWO in the Northern subpopulation A (10 years met compared to 6 in FWO; **Figure C.2.2-22**) and show a minor beneficial effect. Alternatives 4R and 4R2 perform slightly worse than the FWO for southern subpopulation A (8 years met compared to 9 in FWO; **Figure C.2.2-23**) and subpopulation B (24 years met compared to 25 in FWO; **Figure C.2.2-24**) and show a minor adverse effect. Alternatives 4R and 4R2 perform worse than the FWO for subpopulation C (16 years met for 4R and 15 years met for 4R2 compared to 19 for FWO; **Figure C.2.2-25**), subpopulation D (12 years met for 4R and 13 years met for 4R2 compared to 16 years for FWO; **Figure C.2.2-26**), northern subpopulation E (17 years met for 4R and 18 years met for 4R2 compared to 24 for FWO; **Figure C.2.2-27.**), southern subpopulation E (10 years compared to 12 years for FWO; **Figure C.2.2-28**) and subpopulation F (15 years met for 4R and 14 years met for 4R2 compared to 18 for FWO; **Figure C.2.2-29**) and show a major

adverse effect. **Figure C.2.2-30** through **Figure C.2.2-37** show the hydroperiod in each sub population and the target number of days within the hydroperiod. In looking at the amount of time the hydroperiod is in the target range of 90 – 210 days below 7.0 ft over the entire POR, **Figure C.2.2-30** shows that Alternatives 4R and 4R2 spend more time within the target range over the POR than FWO for sub population A-1, the northern sub population A population. In the southern portion of sub population A (A-2) FWO spends slightly more time within the target range than Alternatives 4R and 4 R2 (**Figure C.2.2-31**). In sub populations B and D there is no significant difference between Alternatives 4R, 4R2 and FWO with the amount of time over the POR that is spent within the target range (**Figure C.2.2-32** and **Figure C.2.2-34**). In sub populations C and E-2 (southern sub population E) Alternatives 4R and 4R2 had slightly less time in the target ranges than the FWO during the POR (**Figure C.2.2-33** and **Figure C.2.2-36**). Sub populations E-2 (southern sub population E) and F show the greatest difference between Alternatives 4R and 4R2 and FWO with Alts 4R and 4R2 spending a greater amount of the POR outside of the target range (**Figure C.2.2-35** and **Figure C.2.2-37**).

Table C.2.2-7. Number of years out of the period of record that the hydroperiod was between 90 and 210 days (three to seven months) each year throughout sparrow habitat in order to maintain marl prairie vegetation.

CSSS Subpopulation	Alt 4R	Alt 4R2	FWO
Northern A (A-1)	10	10	6
Southern A (A-2)	8	8	9
B	24	24	25
C	16	15	19
D	12	13	16
Northern E (E-1)	17	18	24
Southern E (E-2)	10	10	12
F	15	14	18

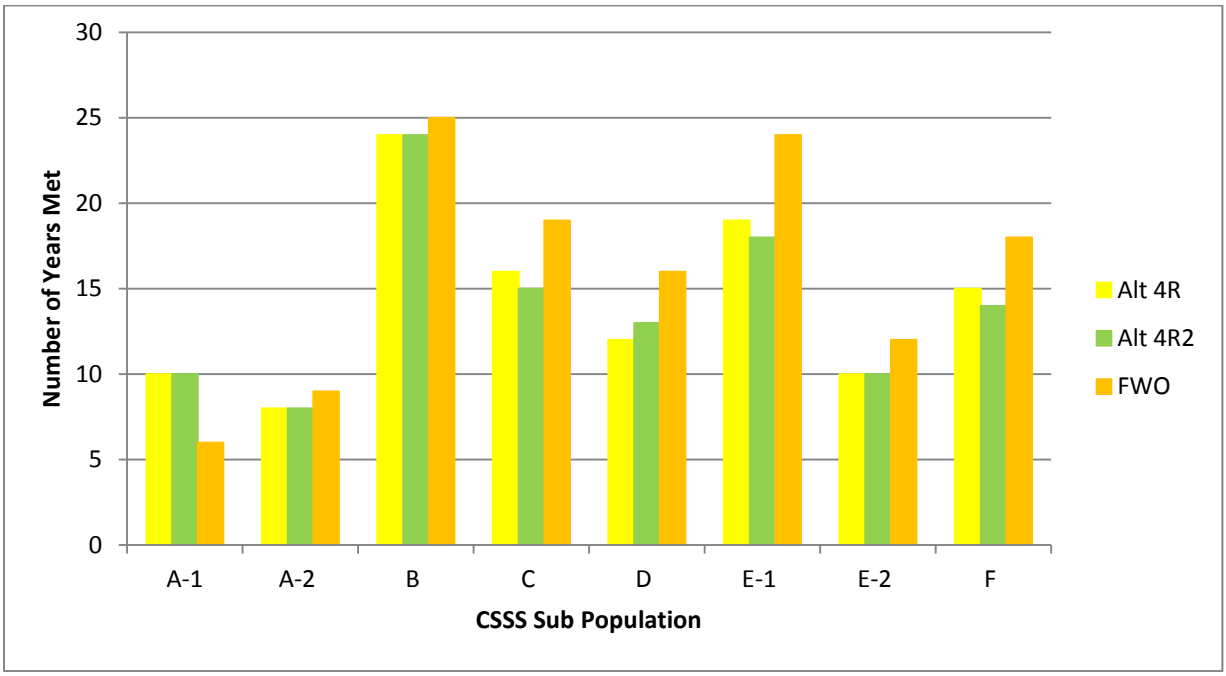


Figure C.2.2-21. Number of years out of the period of record that the hydroperiod was between 90 and 210 days (three to seven months) each year throughout sparrow habitat in order to maintain marl prairie vegetation.

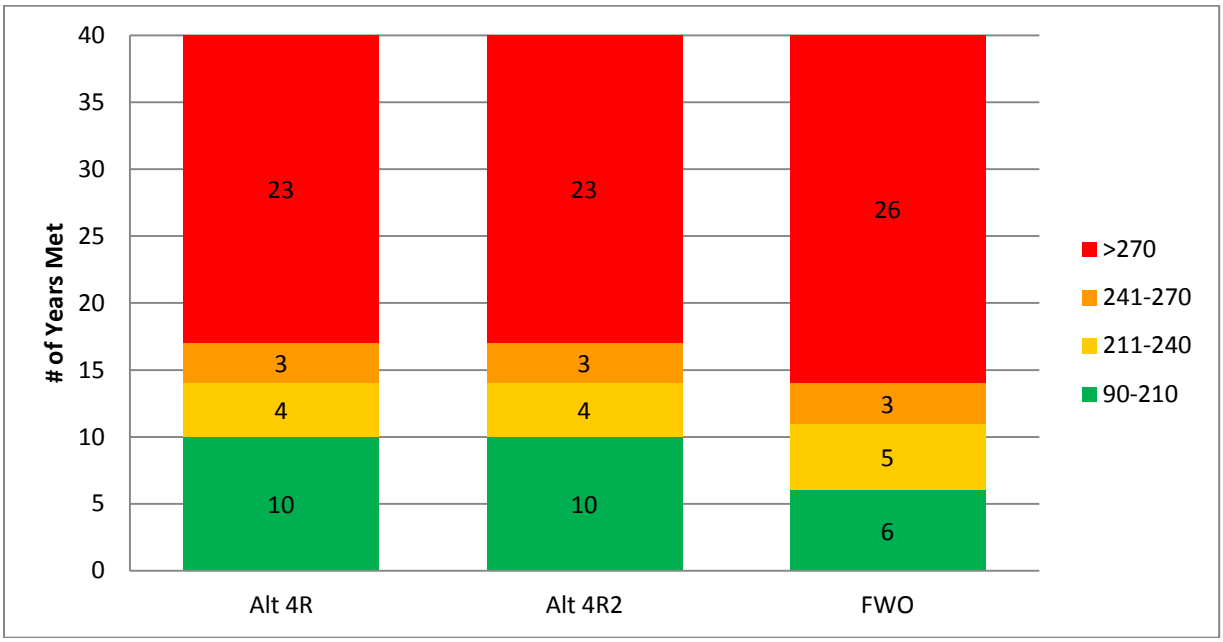


Figure C.2.2-22. Northern subpopulation A hydroperiod.

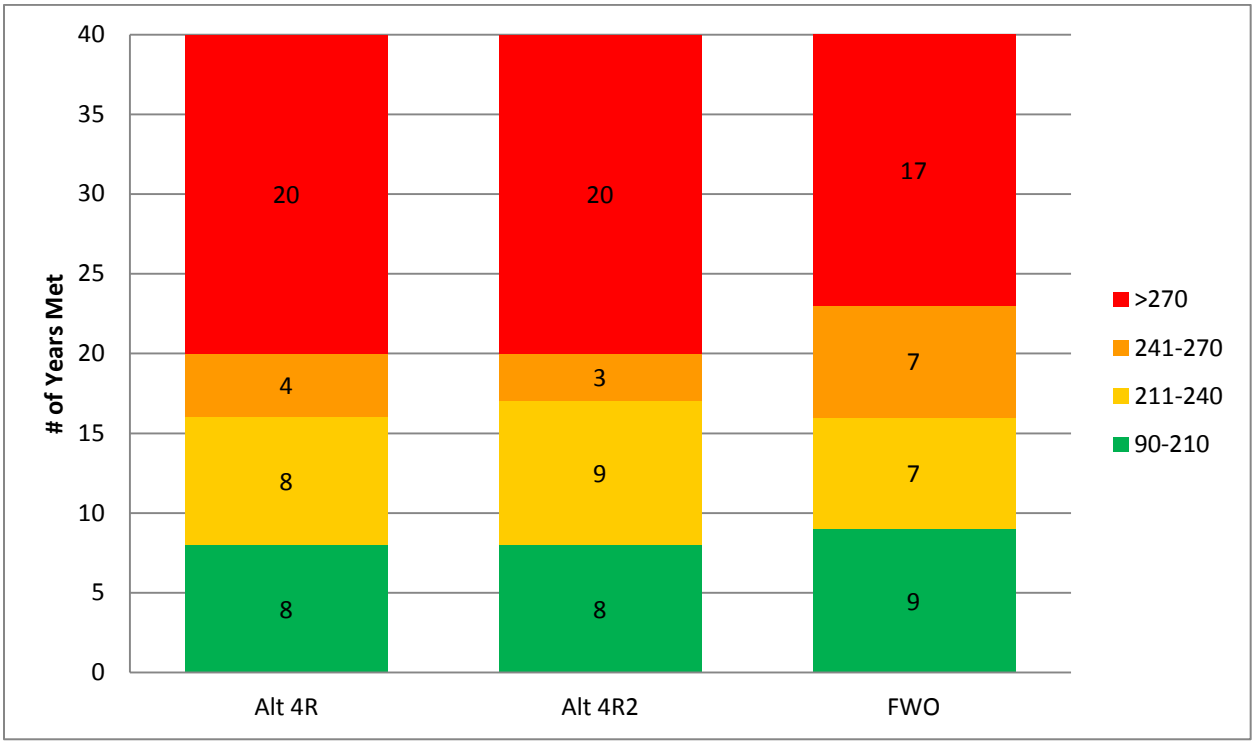


Figure C.2.2-23. Southern subpopulation A hydroperiod.

Figure C.2.2-24. Subpopulation B hydroperiod.

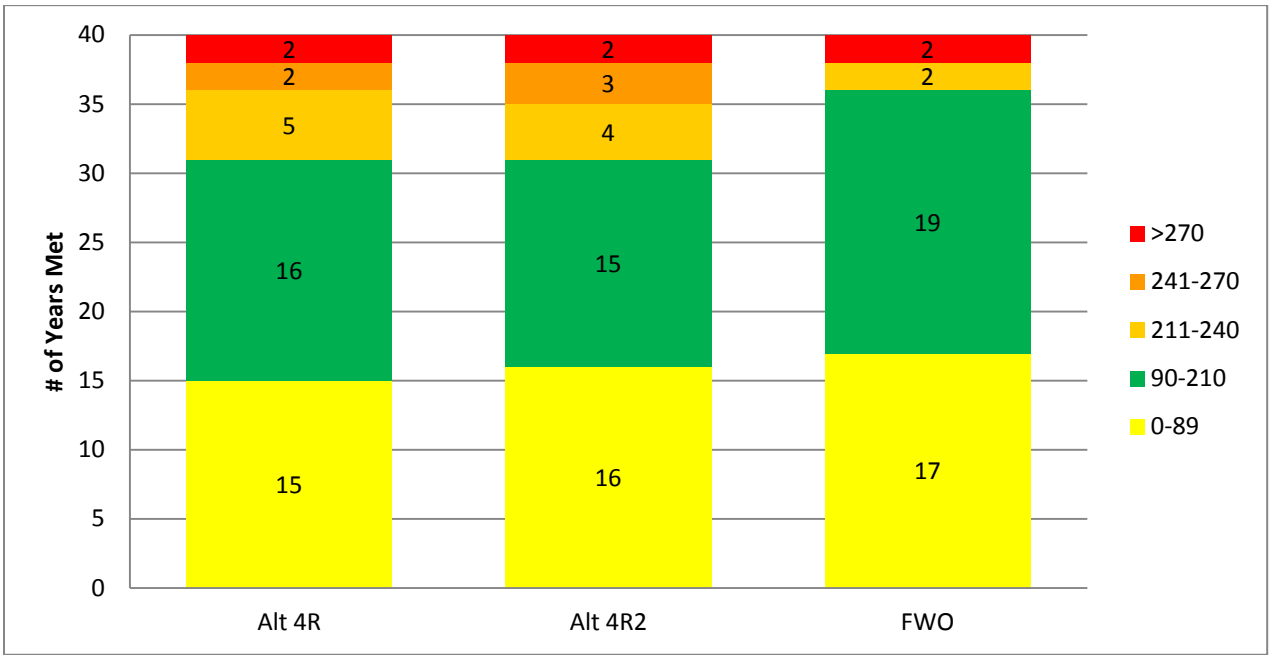


Figure C.2.2-25. Subpopulation C hydroperiod.

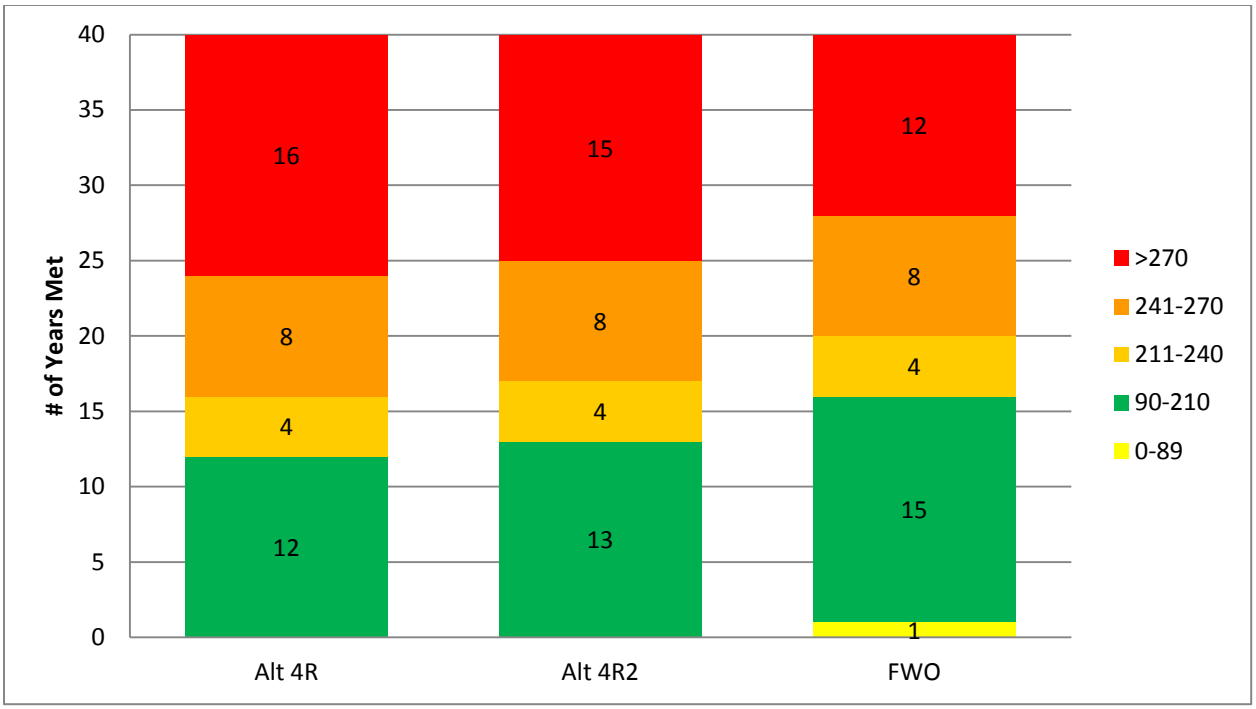


Figure C.2.2-26. Subpopulation D hydroperiod.

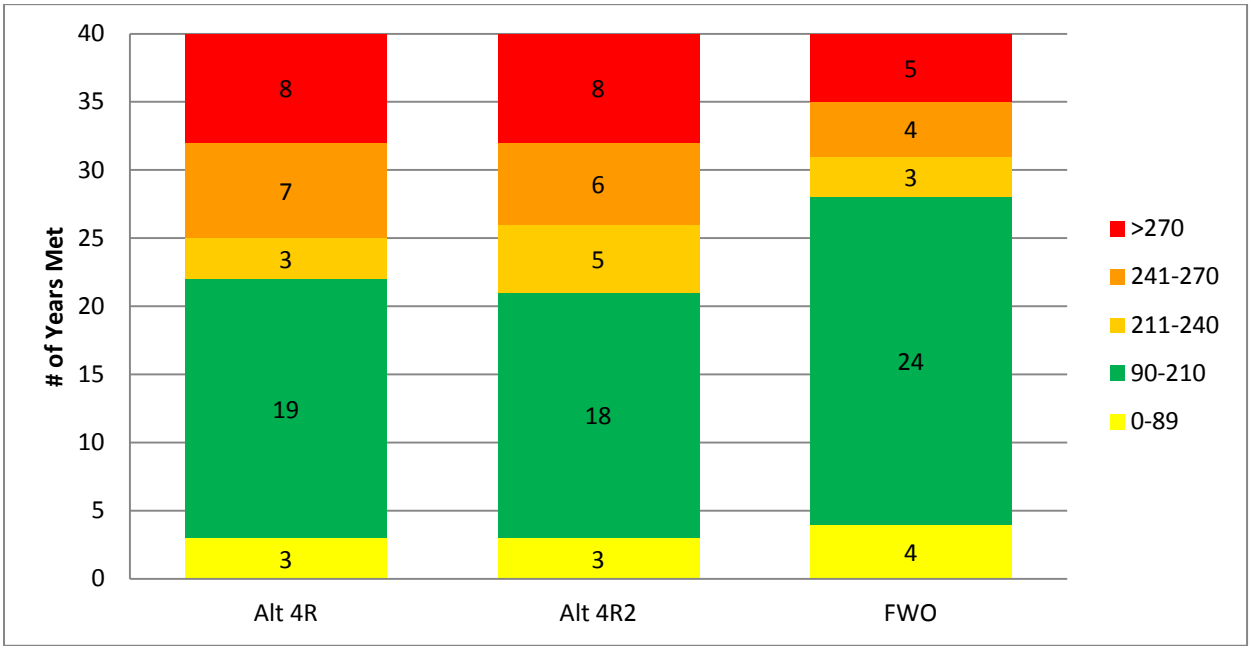


Figure C.2.2-27. Northern subpopulation E hydroperiod.

Figure C.2.2-28. Southern subpopulation E hydroperiod.

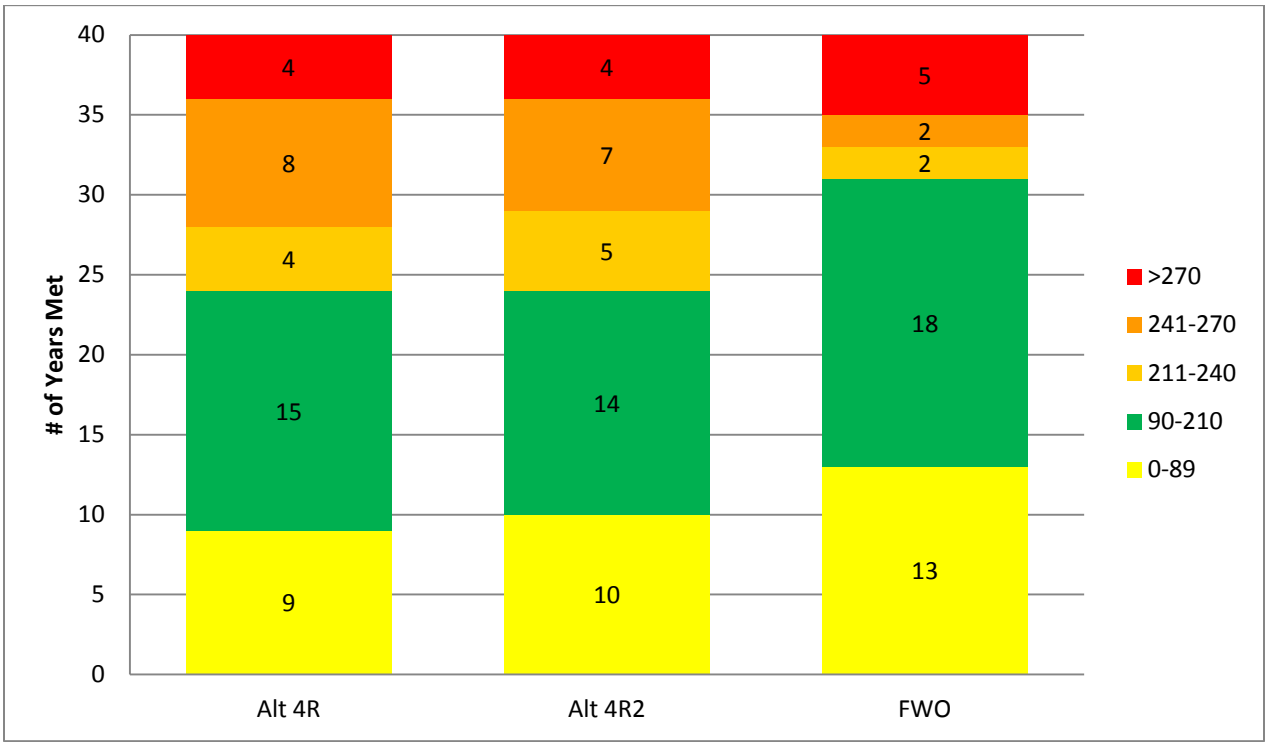


Figure C.2.2-29. Subpopulation F hydroperiod.

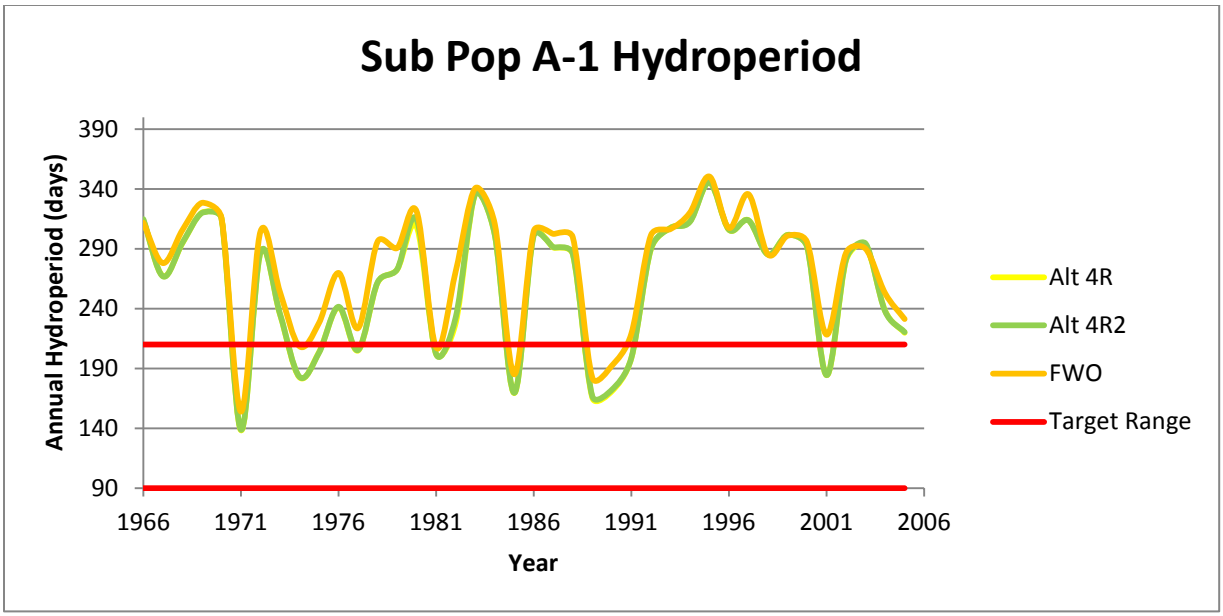


Figure C.2.2-30. Annual hydroperiod for the northern CSSS sub population A over the POR.

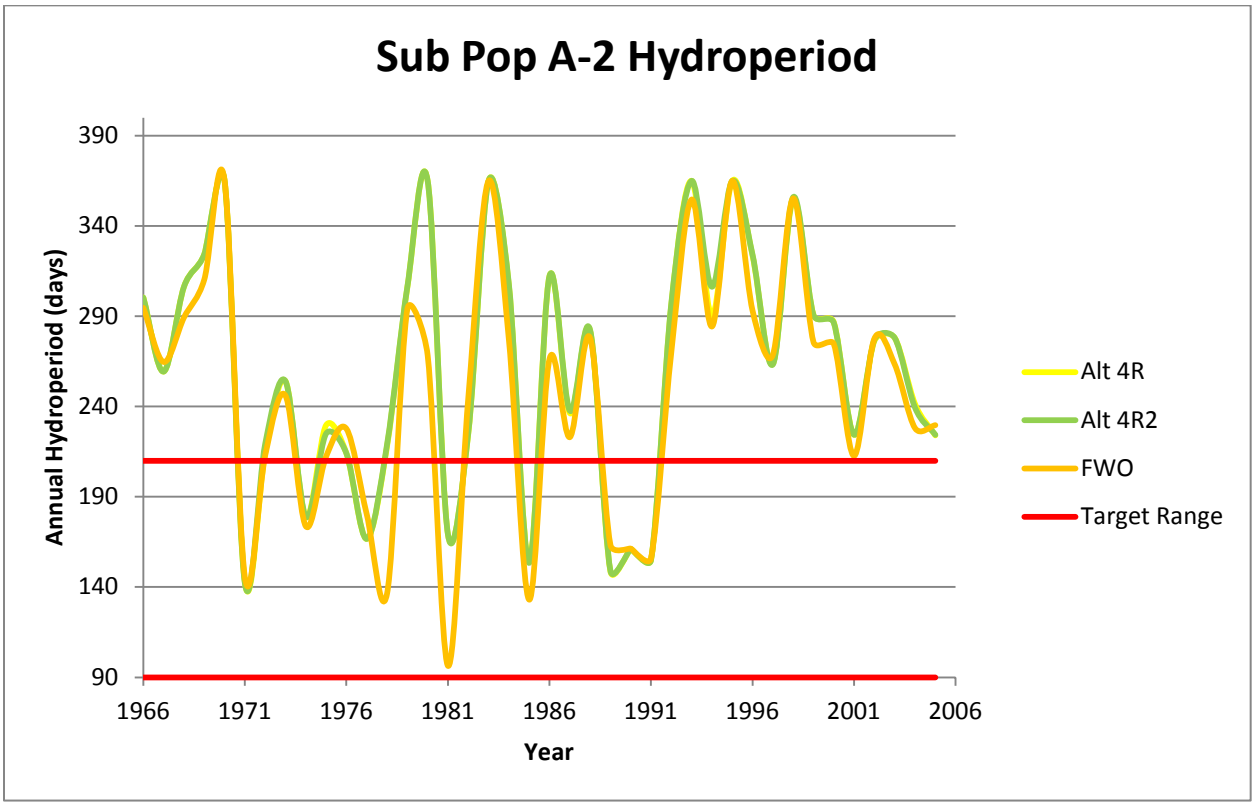


Figure C.2.2-31. Annual hydroperiod for the southern CSSS sub population A over the POR.

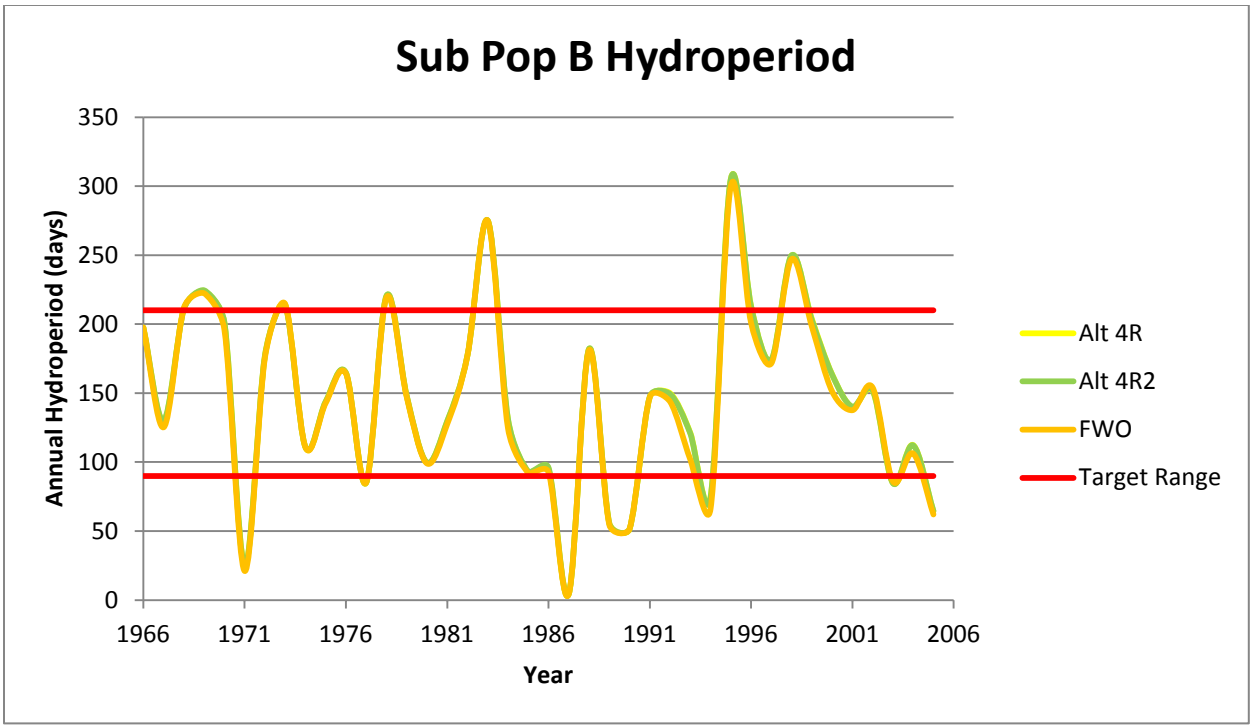


Figure C.2.2-32. Annual hydroperiod for the CSSS sub population B over the POR.

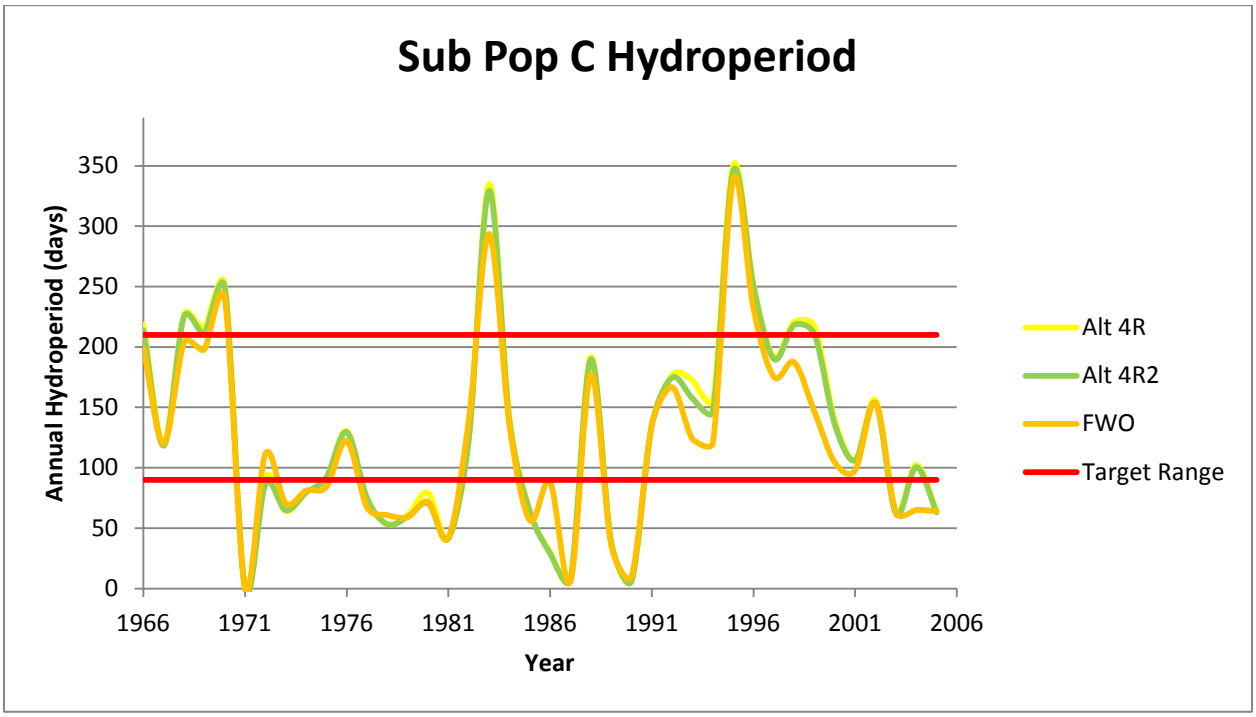


Figure C.2.2-33. Annual hydroperiod for the CSSS sub population C over the POR.

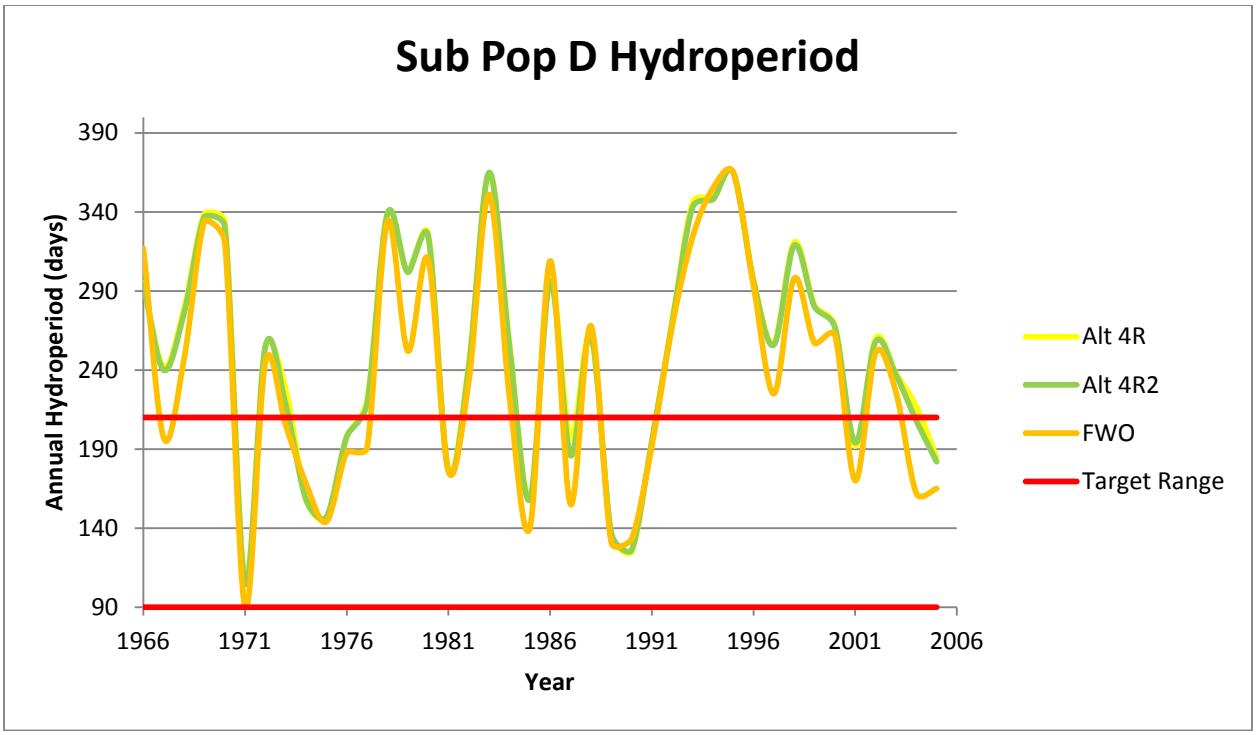


Figure C.2.2-34. Annual hydroperiod for the CSSS sub population D over the POR.

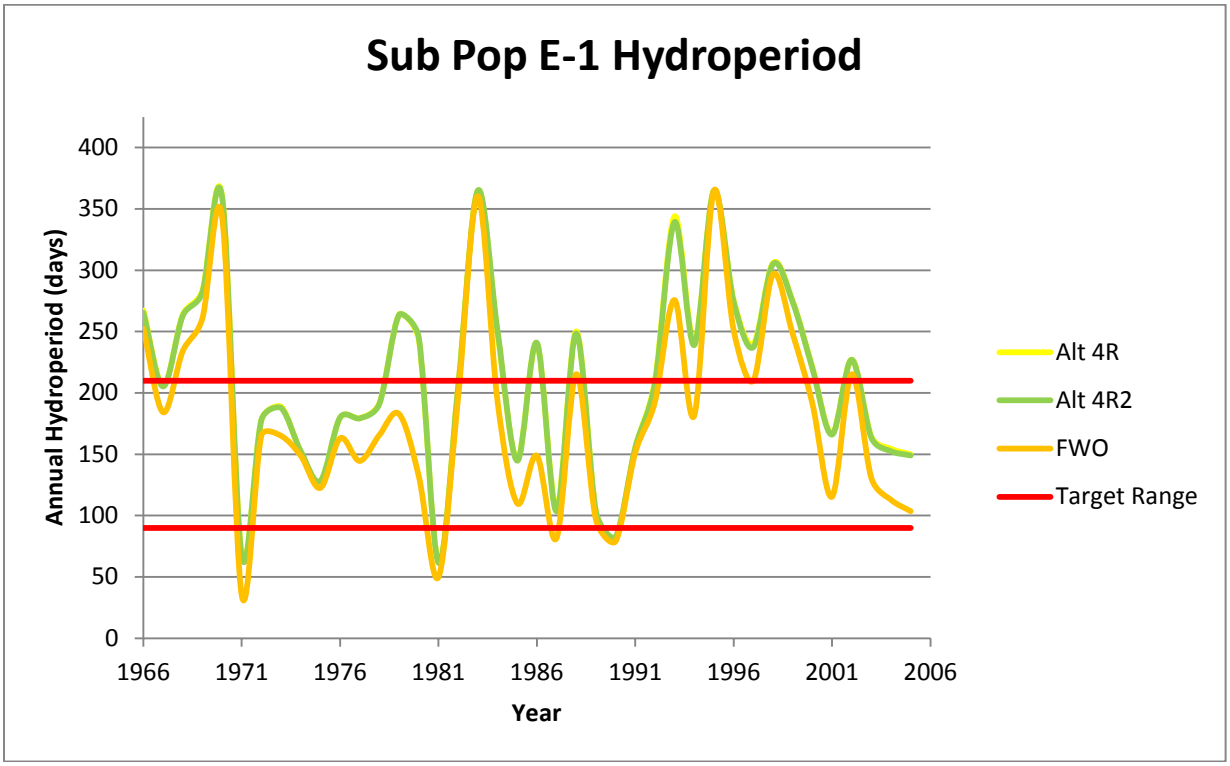


Figure C.2.2-35. Annual hydroperiod for the northern CSSS sub population E over the POR.

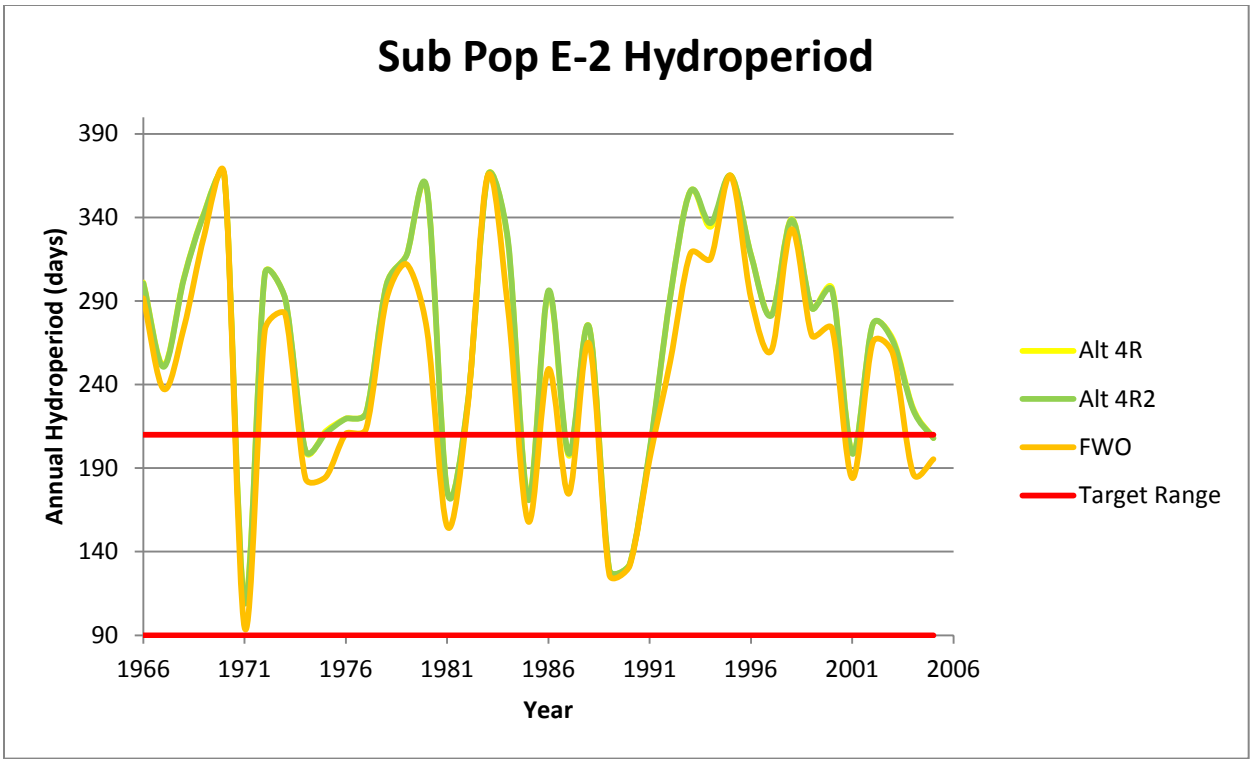


Figure C.2.2-36. Annual hydroperiod for the southern CSSS sub population E over the POR.

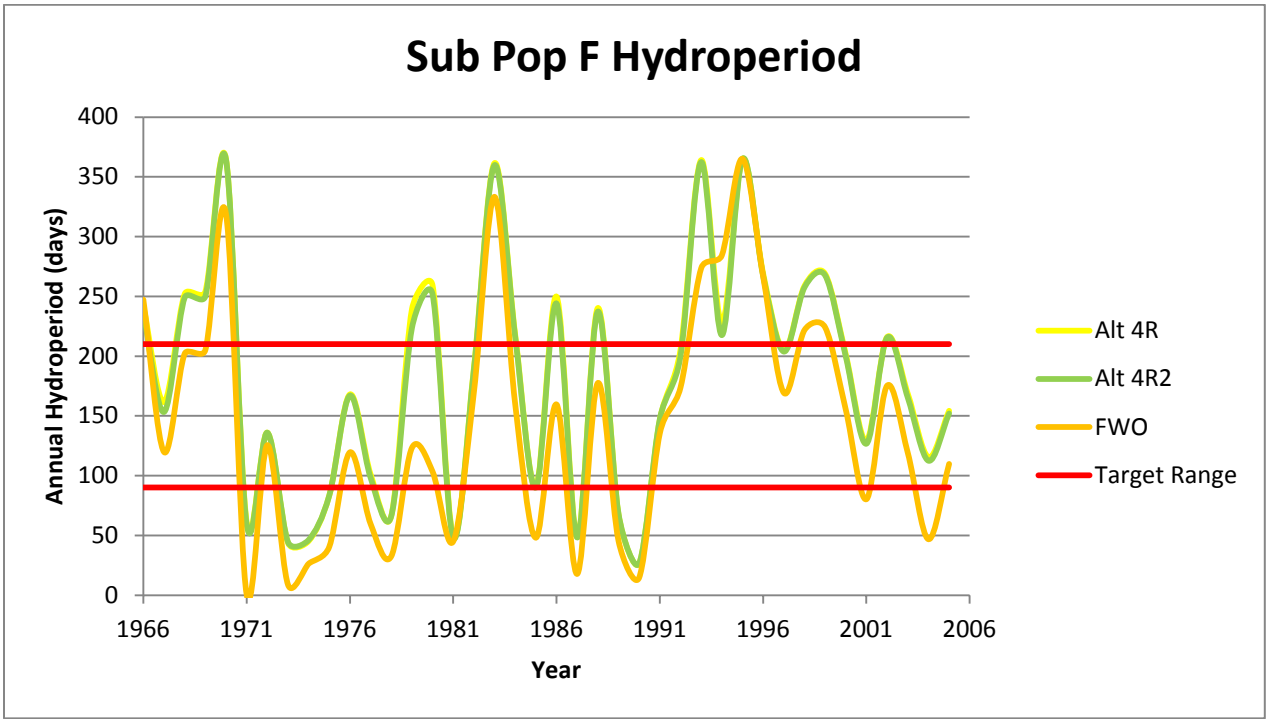


Figure C.2.2-37. Annual hydroperiod for the CSSS sub population F over the POR.

Implementation of Alts 4R and 4R2 has the potential to have a major adverse effect on hydroperiods within the marl prairies adjacent to SRS. Modeling indicates an increase in hydroperiod within CSSS-E

and southern portions of CSSS-A. However, hydroperiods within northern CSSS-A are slightly reduced as compared with FWO, providing slightly better, but overall, too wet conditions for marl prairie habitat and nesting CSSS. Minor habitat improvements were seen in CSSS-F.

C.2.2.4.3 Wood Stork

Wood storks rely upon short hydroperiod wetlands (i.e. marl prairies) for pre-breeding foraging. Short hydroperiod wetlands would help increase body condition and would allow for wood storks and other wading birds to initiate nesting earlier than they do now (November versus February). This will improve nesting success by reducing potential for nest abandonment, increasing juvenile survival by ensuring prey are available within CFA and allowing juveniles to fledge prior to end of dry season/start of wet season when food availability decreases around nests.

Several models of wading birds were used to assess potential affects to wading birds within the Greater Everglades as a result of implementation of CEPP Alt 4R including: 1) Wood Stork Foraging Probability Index model (SFNRC 2013a) 2) wading bird species distribution (Beerens 2013); and 3) wading bird nesting success (Beerens 2013). ERTP PMs are captured within the Beerens models.

A Wood Stork Foraging Probability Index model (ENP 2013) was used to assess potential affects to wading birds within the Greater Everglades as a result of CEPP implementation. An analysis of wood stork foraging potential was performed to predict improvements to foraging habitat with CEPP implementation (ENP 2013). The Wood Stork Foraging Probability Index (STORKI v. 1.0) was developed to provide rapid simulations of wood stork foraging conditions in response to modeled CERP scenarios (LoGalbo et al. 2012).

Figure C.2.2-38 and **Figure C.2.2-39** indicate that Alt 4R2 provides the greatest benefit within northeastern WCA 3, areas adjacent to the Miami Canal, and throughout ENP relative to the existing conditions. Wood stork foraging suitability notably improves with Alt 4R2 in northern WCA 3A (CEPP zones 3A-MC and 3A NE) and within southern ENP, providing a moderate beneficial effect. Less substantial benefits occur within NW WCA 3A (CEPP zone 3A-NW), and southeast Everglades National Park (CEPP zone ENP-S) relative to the FWO. Benefits generally result from the increased water deliveries to these regions which result in more suitable water depths for wood stork foraging as compared to the FWO. Substantial declines in stork foraging suitability occur within northern Everglades National Park (CEPP Zone ENP-N) with Alt 4R and Alt4R2 relative to future conditions without CEPP, providing moderate adverse effects. The effects of increasing flow deliveries to Everglades National Park through the Blue Shanty Flow-way results in downstream water depths in ENP-N substantially less suitable for wood stork foraging. Less substantial negative impacts to wood stork foraging also occur in central and southern WCA 3A central (CEPP Zones 3A-C and 3A-S) with Alt 4R and Alt4R2 as compared to the FWO.

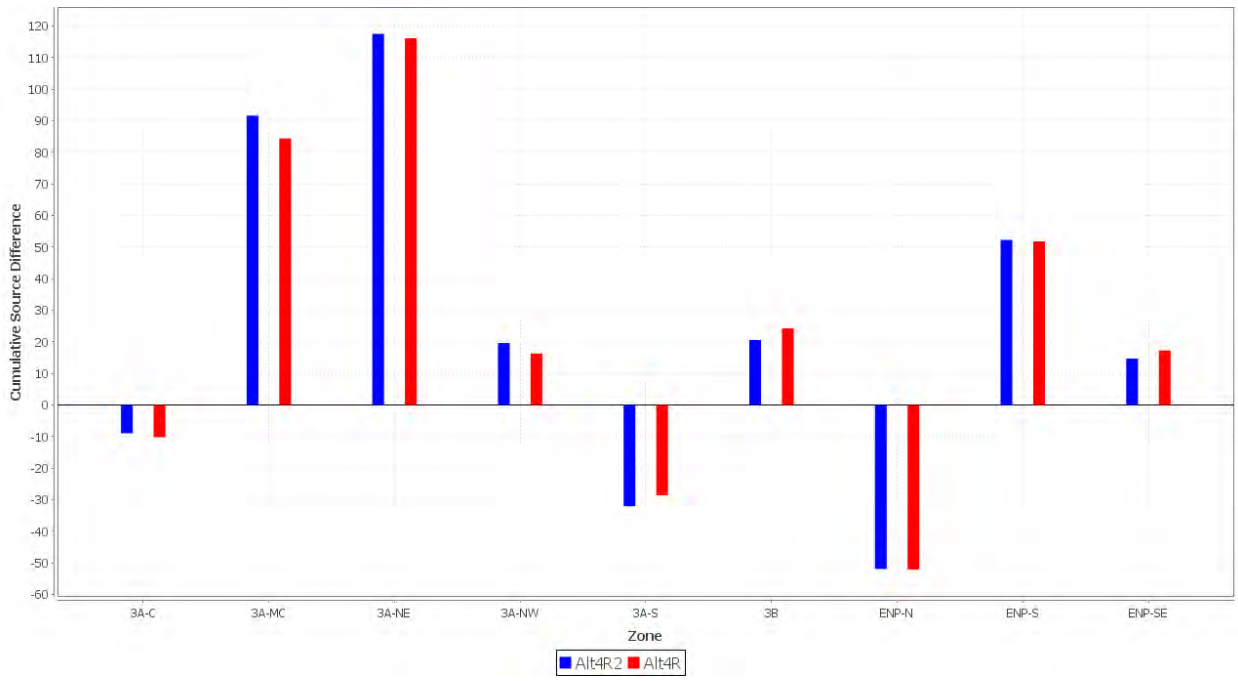
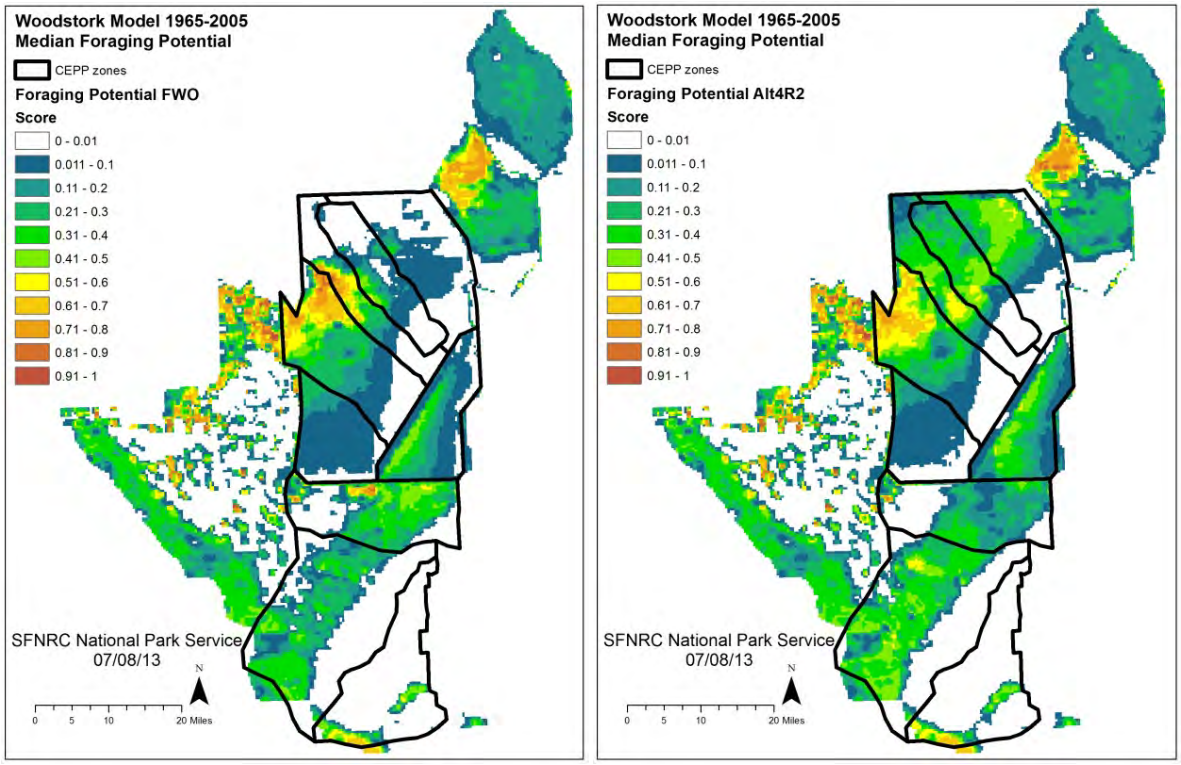


Figure C.2.2-38. Cumulative wood foraging suitability (1965-2005) lift from future without CEPP (FWO) for CEPP tentatively selected plan (ALT4R2) and CEPP alternative (Alt4R) within each CEPP zone. A maximum score of 1327 is possible if FWO has a suitability score of 0.0 every week and the alternative has a suitability score of 1.0 every week of the 41 year hydrologic model runs.



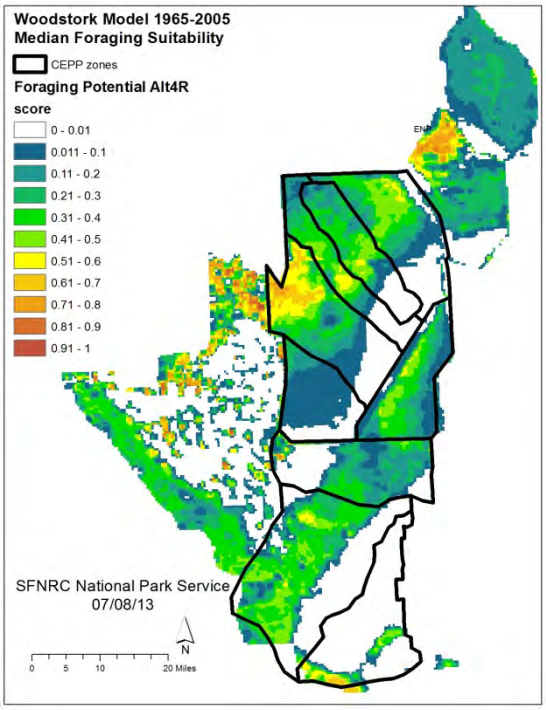


Figure C.2.2-39. Median wood stork foraging potential suitability scores for 1965-2005. Scores vary from 0.0 (not suitable) to 1.0 (optimal foraging). Existing conditions is shown in the left panel and Alt 4R2 in the right panel (SFNRC 2013a).

Wood stork species distribution was modeled by Beerens (2013) in support of the RECOVER Greater Everglades ecological evaluation. The objectives of the spatial foraging conditions model (SFC) are to determine the average hydrological and spatial characteristics of a cell that predict the species-specific *frequency* of cell use over the study period. Wood storks generally showed increased numbers in northern WCA 3A, WCA 3B, and southern ENP under Alt 4R and Alt 4R2 compared to the FWO (**FigureC.2.2-40** and **Figure C.2.2-41**).

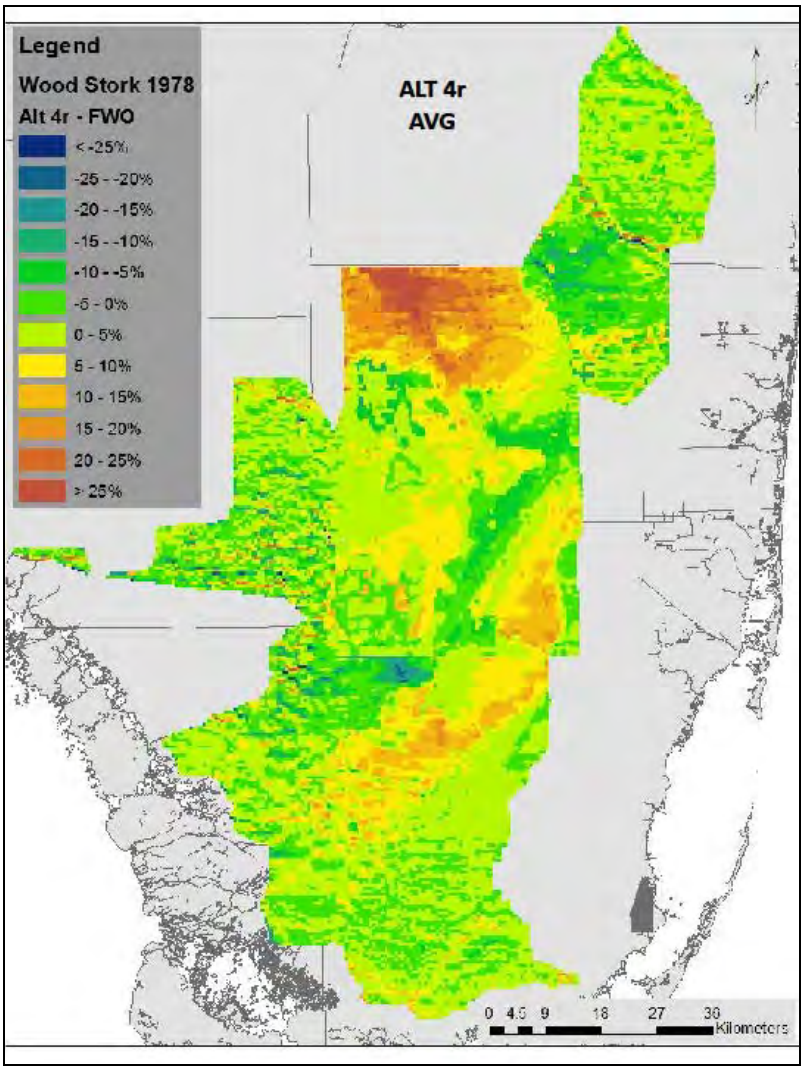


Figure C.2.2-40. CEPP RSM WADEM Spatial Foraging Conditions Model Output for Wood Stork for Alt 4r as compared with FWO for 1978, an average year. (Beerens 2013).

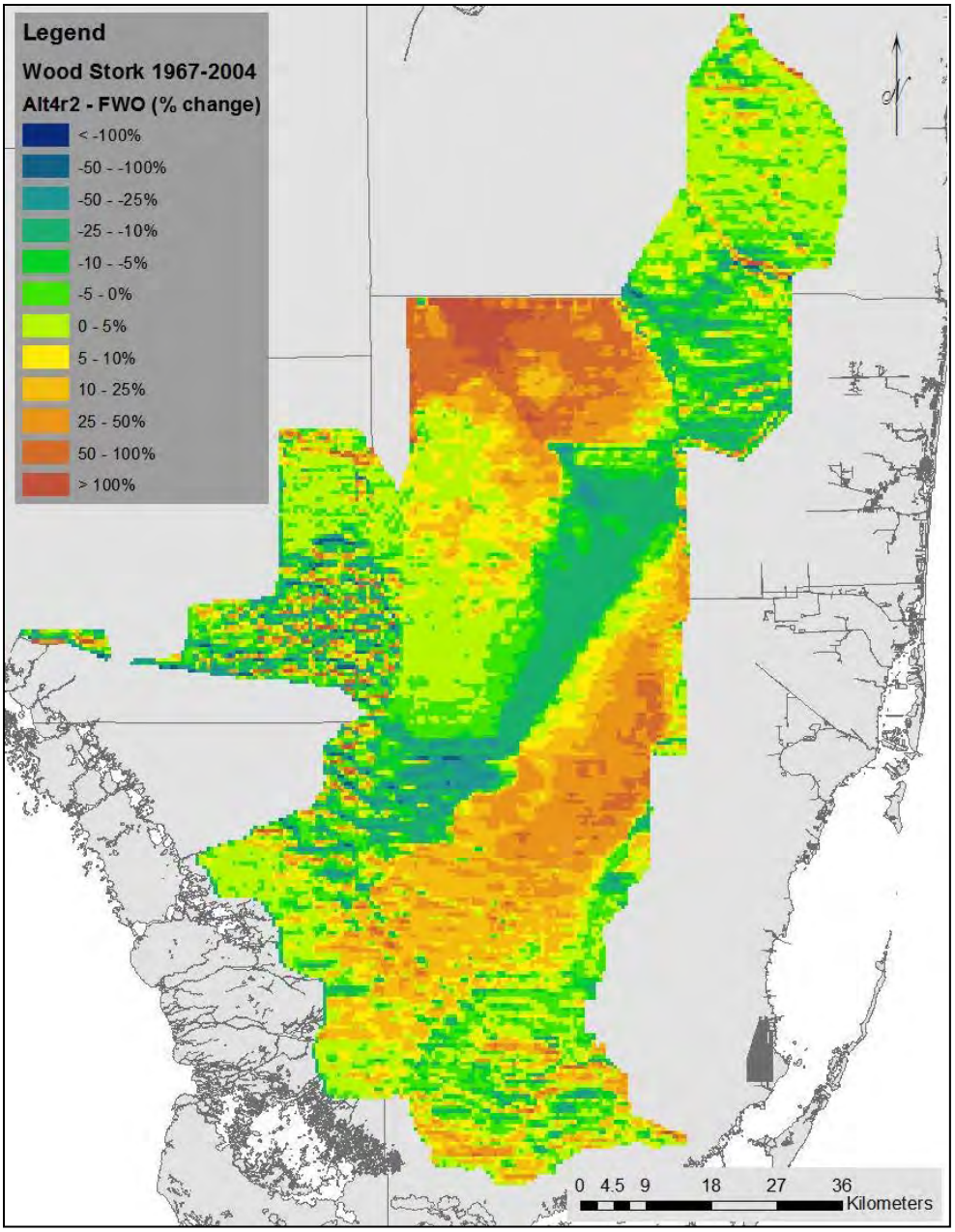


Figure C.2.2-41. The coloration in this map represents the mean percent change in wading bird cell use (Jan – May, 1967-2004) for Alt4R2 relative to Future Without (FWO).

Historically, the short hydroperiod wetlands within ENP have been important for wood stork foraging during the pre-breeding season with the storks shifting to longer hydroperiod wetlands as the dry season progresses. Hydrological patterns that produce a maximum number of patches with high prey availability (i.e. high water levels at the end of the wet season and low water levels at the end of the dry season) are necessary for high reproductive outputs (Gawlik 2002; Gawlik et al. 2004). Depending upon the elevation and microtopography throughout the WCAs and ENP, implementation of CEPP will produce a variety of wetland habitats that would support prey densities conducive to successful wading bird foraging and nesting.

Water depth and recession rate are the two most important hydrological variables for wood storks (Gawlik et al. 2004) and wading birds. In their analysis of habitat suitability, Gawlik et al. (2004) identified feeding sites where the weekly average water depths from November to April (pre-breeding and breeding season) were between 0.0 and 0.5 feet as the most suitable. Suitability drops to 0.0 when water depths are -0.3 feet below marsh surface or greater than 0.8 feet. Wood storks and other wading birds require recession condense their prey items into shallow pools for more effective foraging. It is recognized that areas of suitable foraging habitat will vary both within and between years due to microtopography, antecedent conditions, hydrological and meteorological conditions, and water management actions. It is anticipated that these provisions within CEPP will help to improve foraging conditions within WCA 3A and provide a direct benefit to the wood stork and other wading bird species.

Restoration of hydroperiods and hydropatterns closer to a pre-drainage condition (Pre-drainage conditions are defined as those conditions that occurred in the late 1800s, prior to the wide-scale drainage, urbanization, and compartmentalization of the Everglades.) is a focal Everglades restoration objective for the Comprehensive Everglades Restoration Plan (CERP). A related CERP restoration goal is to restore historic wading bird foraging and colonial nesting habitats in the mainland estuary zones of Everglades National Park (ENP). Therefore, the general transitioning of wood stork foraging habitat (under most climatic conditions) from Shark River Slough, which historically was a deep water white-water lily-dominated slough habitat, back into southern ENP, is considered a progressive step toward ecosystem restoration. It should be noted, however, that with Alt 4R and Alt 4R2, a levee will be constructed within WCA 3B that will result in permanent loss of wood stork foraging habitat as well as habitat connectivity. This impact is not assessed in the wood stork foraging probability index (SFNRC 2013c).

Hydrologic changes associated with implementation of the project are expected to alter and provide an overall net benefit for wood stork foraging suitability throughout WCA 3 and ENP. However, substantial declines in foraging suitability occur in northern ENP due to increased flow deliveries through the Blue Shanty flow way. Implementation of a coordinated adaptive management plan incorporating real-time ground monitoring will also benefit the species.

C.2.2.4.4 Eastern Indigo Snake

The Eastern indigo snake is the largest native non-venomous snake in North America. It is an isolated subspecies occurring in southeastern Georgia and throughout peninsular Florida. The Eastern indigo snake prefers drier habitats, but may be found in a variety of habitats from xeric sandhills, to cabbage palm hammocks, to hydric hardwood hammocks (Schaefer and Junkin 1990). Eastern indigo snakes need relatively large areas of undeveloped land to maintain their population. The main reason for its decline is habitat loss due to development. Further, as habitats become fragmented by roads, Eastern indigo snakes become increasingly vulnerable to highway mortality as they travel through their large territories (Schaefer and Junkin 1990).

In south Florida, the Eastern indigo snake is thought to be widely distributed. Given their preference for upland habitats (Steiner et al. 1983), Eastern indigo snakes are not commonly found in great numbers in the wetland complexes of the Everglades region, even though they are found in pinelands, tropical hardwood hammocks, and mangrove forests in extreme south Florida (Duellman and Schwartz 1958; Steiner et al. 1983). They prefer dry, well drained sandy soils, and commonly use burrows and other natural holes as dens. Steiner et al. (1983) also report that Eastern indigo snakes inhabit abandoned agricultural land and human-altered habitats in south Florida which would include levees within the Water Conservation Areas.

One of the CEPP project features to be constructed is the A-2 FEB. This would convert approximately 14,000 acres of former agricultural land to a wetland functioning area. The proposed A-2 FEB consists almost exclusively of drained marsh that has been converted to agriculture. Currently, the main crop is sugar cane, although rice has also been observed in some fields. A few areas have become overgrown with exotic Brazilian pepper, willow, dog fennel, and grasses including invasive exotic Napier grass. Only two soil types occur in the project area: Pahokee Muck and Lauderhill Muck (NRCS 2012). Both types consist of very poorly drained organic materials that commonly occur in broad freshwater marshes. These soil types indicate hydric soils/wetland areas, which was originally in place prior to human actions. One of the CEPP goals is to help restore lands back to a more natural condition, which in the FEB area, would be considered wetlands.

No natural standing water features are present in the A-2 FEB project area. Natural sloughs and channels are evident in aerial photographs from the 1940s as well as those taken as recently as 2012. These natural sloughs and channels are much drier due to drainage changes, but are the first areas to be inundated during rains. Man-made drainage features such as ditches and narrow canals traverse the A-2 FEB and are continually being modified and created in response to agricultural needs.

Since Eastern indigo snakes occur primarily in upland areas, their presence within the Greater Everglades portion of the project area is somewhat limited. The hydrologic effects of the proposed project are expected to benefit existing or historic wetlands. Once the Miami Canal is backfilled, created tree islands will be constructed, which would potentially provide habitat for the indigo snakes, perhaps offsetting the increased hydroperiods within WCA 3. In addition, improvements to mangrove communities adjacent to Florida Bay may also benefit Eastern indigo snakes within those areas. However, eastern indigo snakes have a high probability of occurrence within the proposed A-2 FEB site and as a result of construction of the A-2 FEB are likely to be displaced, thereby removing approximately 14,000 acres of potential habitat having a major adverse effect.

C.2.2.4.5 Florida Manatee

The federally endangered Florida manatee is a large, plant-eating aquatic mammal that can be found in the shallow coastal waters, rivers, and springs of Florida. Florida manatees live in freshwater, brackish, and marine habitats, and can move freely between salinity extremes. Florida manatees have been observed in conveyance canals within the action area, specifically in the lower C-111 Canal just downstream of S-197; and adjacent nearshore seagrass beds throughout Florida Bay including all waters of Card, Barnes, Blackwater, Little Blackwater, Manatee and Buttonwood sounds. The extensive acreages of seagrass beds in the bay provide important feeding areas for Florida manatees. Decreased salinities within the Northern Estuaries that reduce stress on SAV and promote increases in seagrass shoots have the potential to increase foraging opportunities for manatees in this region. Similarly, increased freshwater flows to Florida Bay and the southwestern coastal estuaries resulting in lowered salinity levels that better encompass seagrass salinity tolerance ranges would also increase foraging opportunities for manatees. Alternative 4R2 would provide benefits to Florida manatee as compared with the FWO, providing minor beneficial effects (refer to **Section C.2.1.3.5.2, Seagrass Beds** for further information).

Florida manatees also depend upon canals as a source of freshwater and resting sites. It is highly likely that Florida manatees also depend on the deep canals as a cold-weather refuge. The relatively deep waters of the canals respond more slowly to temperature fluctuations at the air/water interface than the shallow bay waters. Thus, the canal waters remain warmer than open bay waters during the

passage of winter cold fronts. **Figure C.2.2-42** illustrates canals that Florida manatees have access to within CEPP action area. All CEPP alternatives include backfilling of portions of the Miami Canal north of Interstate 75. Although **Figure C.2.2-42** shows that manatees can access portions of the Miami Canal, backfilling as described under CEPP is not likely to adversely affect manatees.

Alts 4R and 4R2 would provide increased flows to Florida Bay and the southwestern coastal estuaries, improving salinities, therefore benefitting Florida manatee as compared with the FWO and providing minor beneficial effects. Damaging flows to the Northern Estuaries related to pulse releases would be reduced, resulting in decreased sedimentation and silt, and increased light penetration, therefore providing better sea grass survival and minor beneficial effects. Alt 4R2 includes backfilling portions of the Miami Canal north of Interstate 75, which manatees do access; however, backfilling could benefit them with less likelihood of becoming stranded in the WCAs.

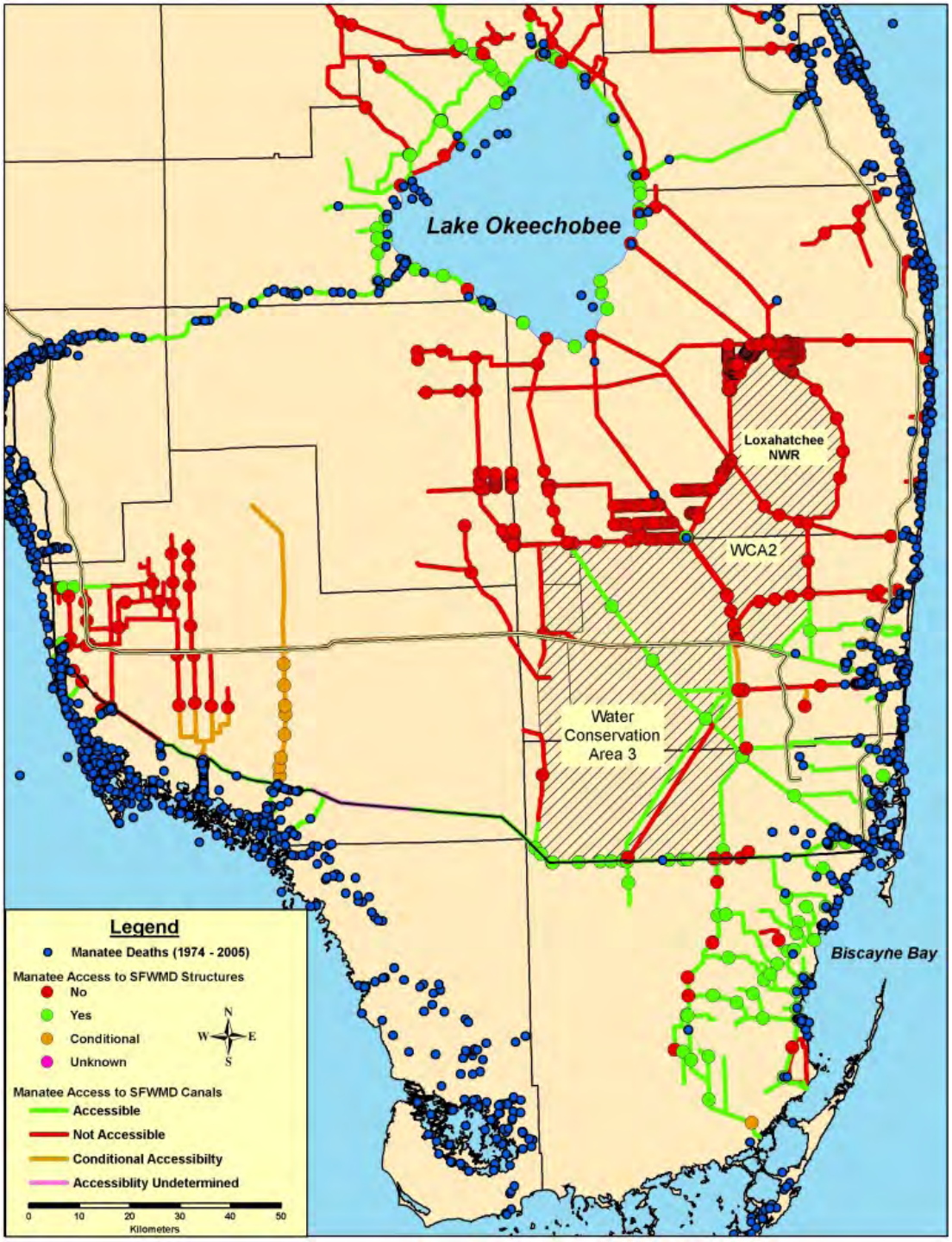


Figure C.2.2-42: Canals that Florida manatee have access to within CEPP action area.

C.2.2.4.6 Florida Panther

The federally endangered Florida panther (*Puma concolor cory)* was once the most widely distributed mammal (other than humans) in North and South America, but it is now virtually exterminated in the eastern United States. Habitat loss has driven the subspecies known as the Florida panther into a small area, where the few remaining animals are highly inbred, causing such genetic flaws as heart defects

and sterility. Recently, closely-related panthers from Texas were released in Florida and are successfully breeding with the Florida panthers. Increased genetic variation and protection of habitat may save the subspecies.

Florida panthers presently inhabit lands in the EAA and ENP adjacent to the Southern Glades, and radio tracking studies have shown that they venture into the Southern Glades on occasion during post-breeding dispersion. Reference is made to the revised Panther Key and Panther Focus Area Map (**Figure C.2.2-43**) for use in determining effects to the Florida panther. Construction of the 14,000 acre FEB within the A-2 parcel in EAA would result in conversion of upland habitat that could be potentially used by Florida panther to transverse the area to wetland habitat, thereby eliminating potential habitat within the panther secondary zone in this region. This would provide a minor adverse effect. In addition, since potentially suitable habitat occurs within the project area, increased water deliveries to ENP could affect Florida panther habitat. However, as lands within the CEPP project area become restored to their more historic natural values, the improved forage base would result in greater use by the Florida panther utilizing these areas, providing a minor beneficial long-term effect.

Today, the A-2 FEB contains agricultural fields planted in sugar cane and rice. Some areas are overgrown with Brazilian pepper, willow, and dog fennel; however, most fields are regularly tilled and disked to a standard depth. This tilling gives the fields a very uniform elevation, which makes observing any variations in the topography difficult. CEPP Alternatives 4R and 4R2 have the potential to affect both the Primary and Secondary Zones for Florida panther habitat.

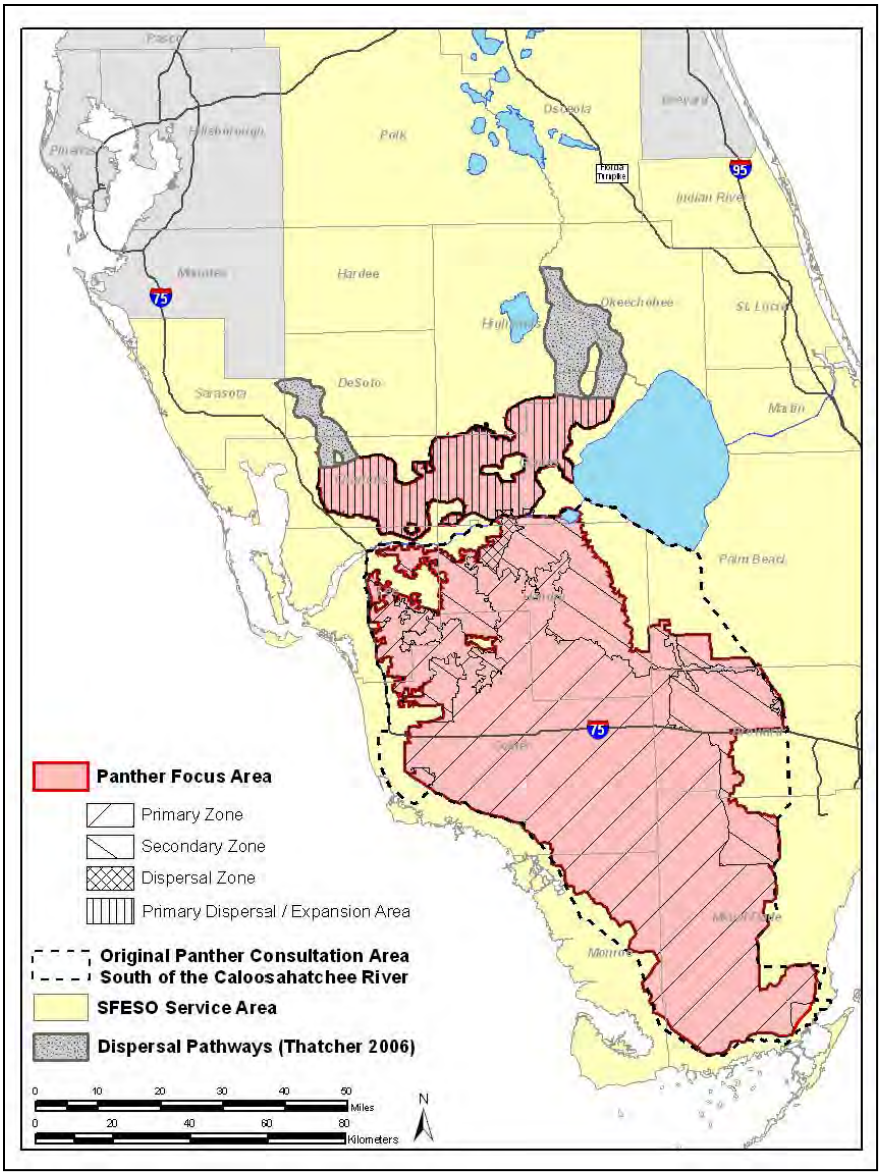


Figure C.2.2-43. Panther Focus Areas Map.

Since potentially suitable habitat occurs within the action area, increased water deliveries under all CEPP alternatives to ENP could affect Florida panther habitat. However, as lands within the study area become restored to their more historic natural values, the concomitant improved prey base would result in greater use by the Florida panther utilizing these areas.

C.2.2.4.7 American Alligator

A keystone species within the Everglades ecosystem, the American alligator (*Alligator mississippiensis*) is dependent on spatial and temporal patterns of water fluctuations that affect courtship and mating, nesting, and habitat use (Brandt and Mazzotti, 2000). Historically, American alligators were most abundant in the peripheral Everglades marshes and freshwater mangrove habitats, but are now most abundant in canals and the deeper slough habitats of the central Everglades. Water management practices including drainage of peripheral wetlands and increasing salinity in mangrove wetlands as a result of decreased freshwater flows has limited occurrence of American alligators in these habitats

(Craighead 1968, Kushlan 1990, Mazzotti and Brandt 1994). A HSI for alligators was employed to predict potential effects of implementation of CEPP Alts 4R and 4R2 (South Florida Natural Resources Center 2013c). The HSI measures habitat suitability annually for five components of alligator production: (1) land cover suitability, (2) breeding potential (female growth and survival from April 16 of the previous year - April 15 of the current year), (3) courtship and mating (April 16 – May 31), (4) nest building (June 15 – July 15), and egg incubation (nest flooding from July 01 – September 15).

Results indicate that implementation of Alts 4R and 4R2 would improve alligator habitat suitability as compared with the FWO and provide a minor beneficial effect. Alligator habitat suitability for Alts 4R and 4R2 trend similarly; differences between alternatives within the project area are negligible. The greatest increase in benefits is visible within northern WCA 3A (CEPP Zones 3A-MC, 3A-NE and 3A-NW) (**Figure C.2.2-44)** due to additional water deliveries within this region. Gains are smaller in central WCA 3A, WCA 3B and ENP north and south zones, though they appear to have an increased spatial extent of slightly improved potential habitat in Alts 4R and 4R2 **(Figure C.2.2-45).** Changes within southern WCA 3A and southeastern ENP are negligible (South Florida Natural Resources Center 2013c). Southern WCA 3A is the only region showing negative impacts to alligator production with Alt 4R (**Figure C.2.2-44**). In summary, increasing freshwater flow through the Greater Everglades into WCA 3 and ENP under CEPP will provide increased benefits to alligators within these habitats in comparison with the FWO. Major adverse effects to alligators that utilize the Miami Canal will occur due to backfilling of the Miami Canal. However, these effects are expected to be short-term as alligators will expand into other areas of suitable habitat created as a result of CEPP implementation.

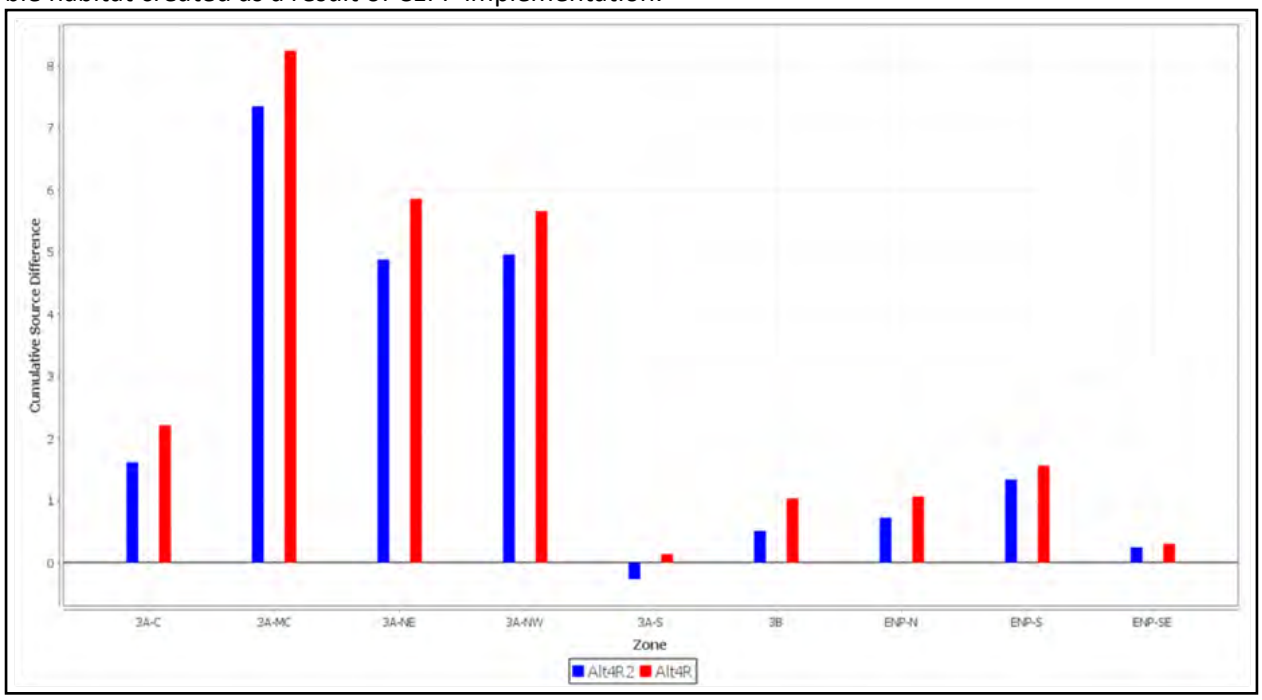


Figure C.2.2-44. Suitable alligator habitat cumulative (1965-2005) lift above the No Action Alternative (FWO) for Alts 4R and 4R2 within each CEPP zone. A maximum score of 41 is possible if FWO has a suitability score of 0.0 every year and the alternative has a suitability score of 1.0 every year. (South Florida Natural Resources Center 2013a).

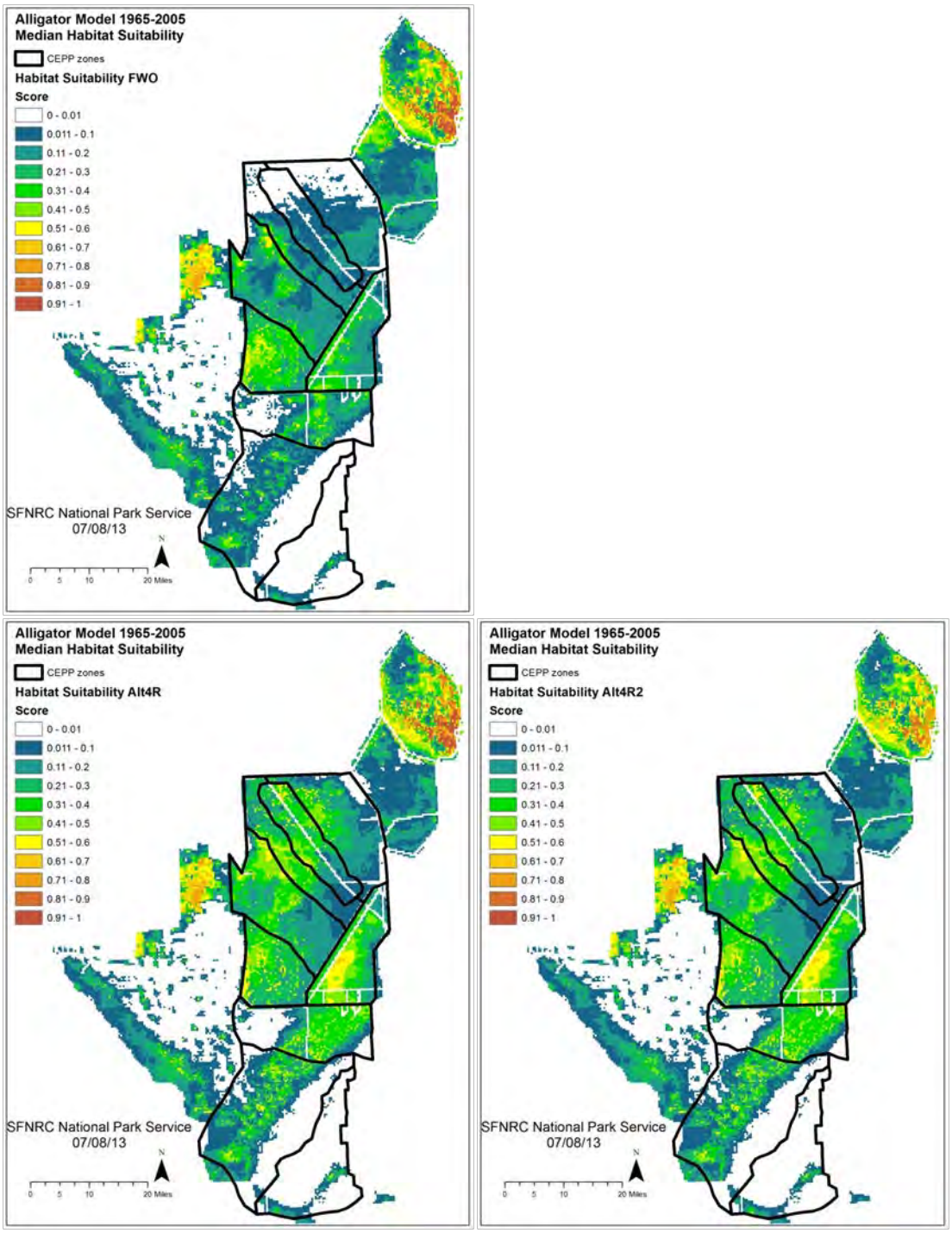


Figure C.2.2-45. Suitable alligator habitat cumulative (1965-2005) lift above the No Action Alternative (FWO) for Alts 4R and 4R2 within each water conservation area (WCA). (South Florida Natural Resources Center 2013a).

C.2.2.4.8 American Crocodile

A HSI for juvenile American crocodiles (*Crocodylus acutus*) was employed to predict potential effects of implementation of CEPP Alts 4R and 4R2. The crocodile growth and survival index used in this analysis is one of the components of a crocodile HSI that characterizes suitable habitat for crocodiles based on habitat, location of known nest sites, salinity, and prey biomass. The growth and survival index is

calculated for August through December, the period following hatching when hatchlings are most vulnerable to high salinities (Moler 1992; Mazzotti 1999; Mazzotti et al. 2007). For this analysis, data from salinity monitoring stations at Joe Bay, Trout Cove, Little Madeira Bay (the stations among the available stations closest to where the highest densities of crocodile nests are) and Long Sound, Little Blackwater Sound, Terrapin Bay and Garfield Bight (generally closer to shoreline stations in areas where crocodiles could occur) are used as input to HSI. Each day between August 1 through December 31 is assigned a score based on the following salinity ranges: salinity <20 practical salinity units (psu) was assigned the highest score of 1 because salinity in this range is considered most favorable for juvenile crocodile growth and survival (Moler 1992; Mazzotti 1999; Mazzotti et al. 2007); salinity ≥ 20 and <30 psu was assigned a score of 0.6; ≥30 and <40 psu was assigned a score of 0.3, and >40 psu a score of 0. Average yearly and an average overall score were calculated.

Results from applying the salinity data into the juvenile crocodile HSI is shown in **Figure C.2.2-46** (Brandt 2013)**.** The plot shows the lift (Alt 4R minus FWO and Alt 4R2 minus FWO) of an index of juvenile crocodile growth and survival at sites along the northern Florida Bay shoreline for all years of the model runs. Sites in the orange box historically have had the most crocodile nesting. Results of the juvenile crocodile HSI performance for an extremely dry (1989) year are shown in **Figure C.2.2-47**. As indicated by **Figure C.2.2-46** and **Figure C.2.2-47,** implementation of Alts 4R and 4R2 will directly benefit juvenile crocodiles within the CEPP action area, providing a minor beneficial effect.

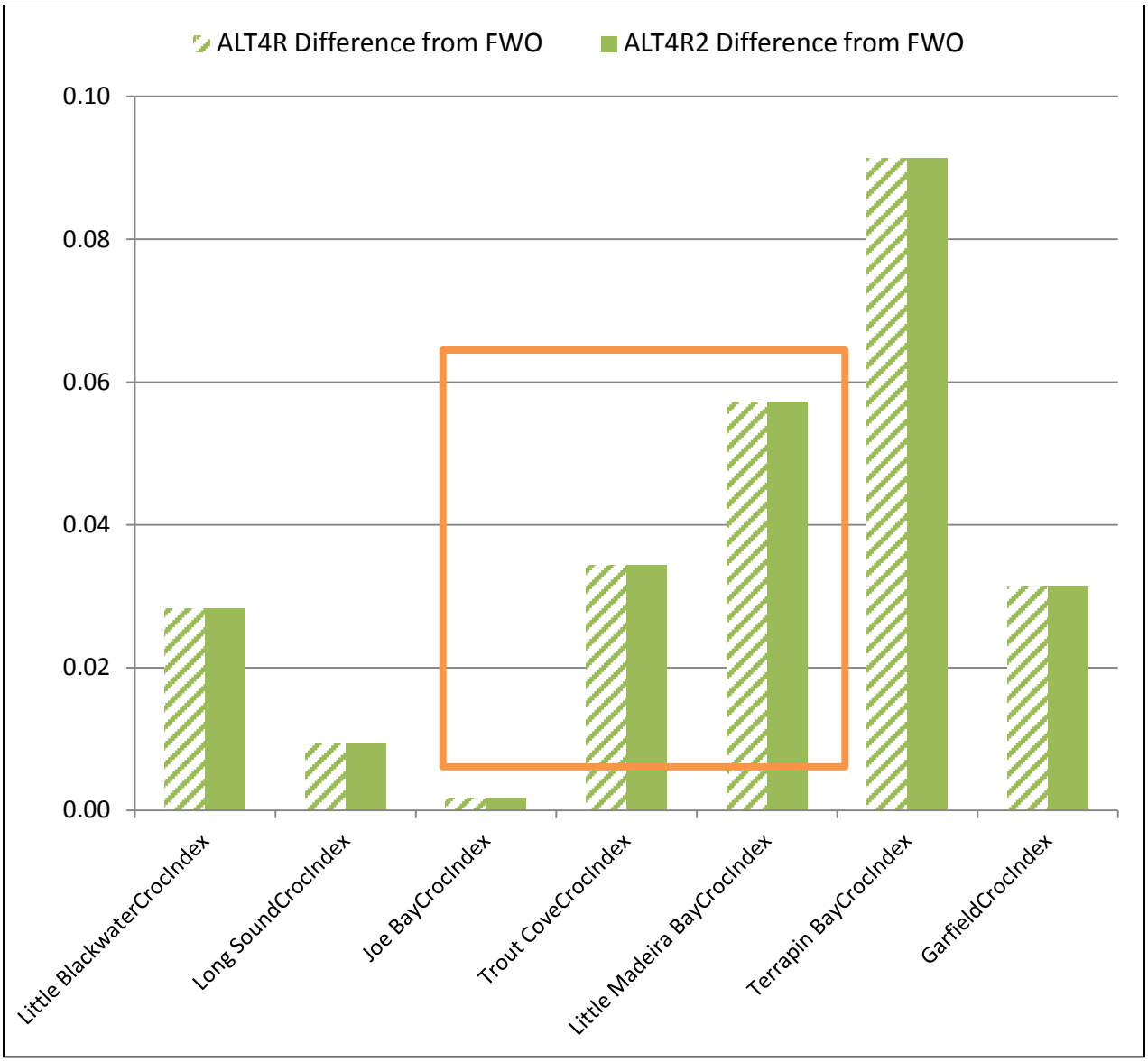


Figure C.2.2-46. Histogram showing the results of the juvenile crocodile HSI for 7 locations of known crocodile nesting areas across all years within Period of Record (1965-2005). Index values show lift provided by Alt 4R as compared with the No Action Alternative and Alt 4R2 as compared to the no action alternative. (Brandt 2013).

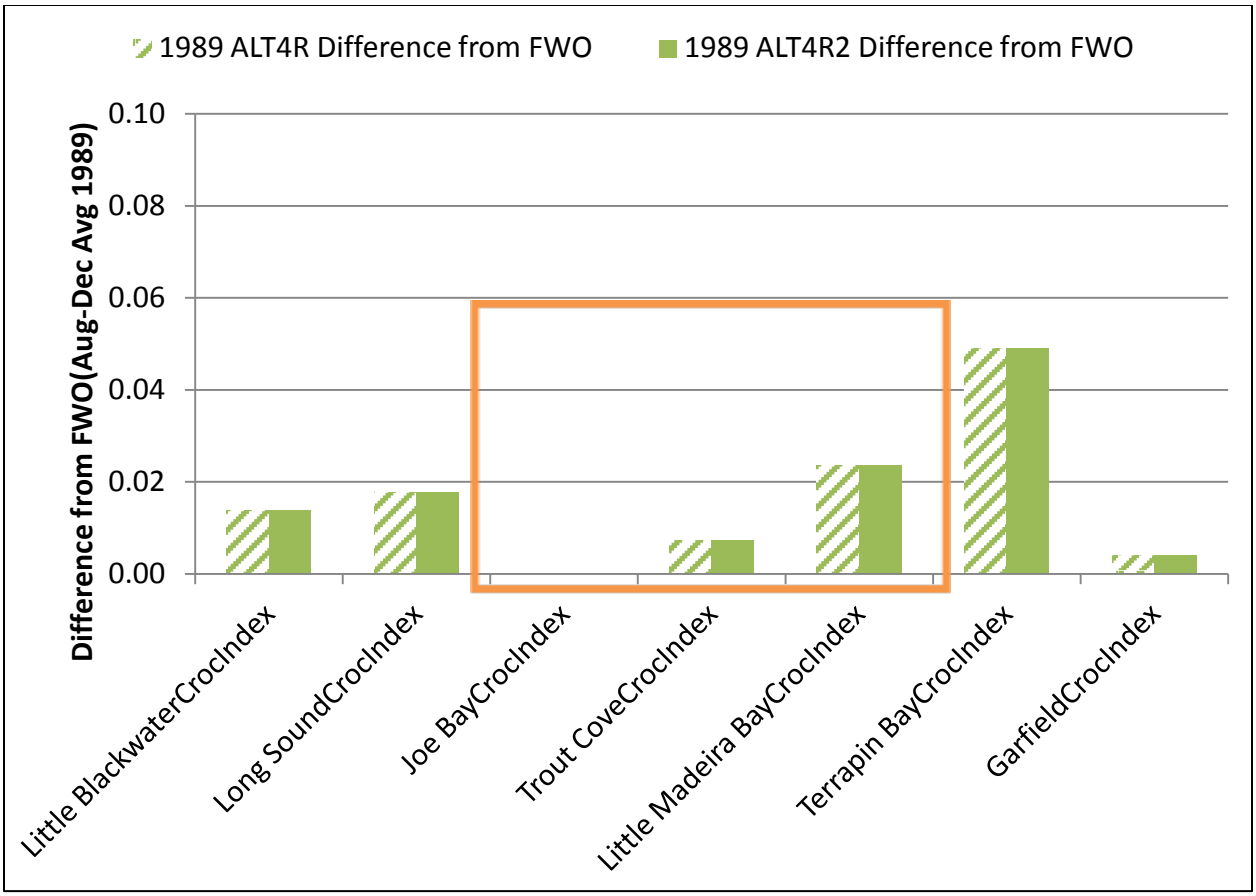


Figure C.2.2-47. Histogram showing the results of the juvenile crocodile HSI for 7 locations of known crocodile nesting areas for a very dry year (1989). Index values show lift provided by Alt 4R as compared with the FWO and Alt 4R2 as compared with FWO. (Brandt 2013).

C.2.2.4.9 Smalltooth Sawfish

Smalltooth sawfish (*Pristia pectinata*) have been reported in the Pacific and Atlantic Oceans, and the Gulf of Mexico; however, the United States population is found only in the Atlantic Ocean and Gulf of Mexico. Historically, the United States population was common throughout the Gulf of Mexico from Texas to Florida, and along the east coast from Florida to Cape Hatteras. The current range of this species includes peninsular Florida, with some regularity only in south Florida from Charlotte Harbor to Florida Bay. Juvenile sawfish use shallow habitats with a lot of vegetation, such as mangrove forests, as important nursery areas. Many such habitats have been modified or lost due to development of the coastal areas of Florida and other southeastern states. The loss of juvenile habitat likely contributed to the decline of this species.

Although the main Florida population resides in the Caloosahatchee River and adjacent Charlotte Harbor estuaries, smalltooth sawfish has the potential to be found in the southern estuaries where the juveniles could potentially occur and feed in red mangrove wetlands. By implementation of the proposed project, the smalltooth sawfish may show a minor beneficial effect from increased freshwater flows into the coastal wetlands adjoining Florida Bay, which would provide more natural and historic overland flows.

Discharging large volumes of freshwater from Lake Okeechobee to the Caloosahatchee River during the wet season significantly reduces salinities and increases nutrient loading; all of which has a profound adverse effect on estuarine flora and fauna. As a result, the smalltooth sawfish may show a minor beneficial effect from the project's ability to reduce excessive freshwater flows by improving the salinity regime throughout the Caloosahatchee estuary.

C.2.2.4.10 Green Sea Turtle

The green sea turtle weighs approximately 150 kilograms and lives in tropical and sub-tropical waters. Areas that are known as important feeding areas for the green turtles in Florida include the Indian River Lagoon, the Florida Keys, Florida Bay, Homosassa, Crystal River and Cedar Key. Green turtles occupy three habitat types: high energy oceanic beaches, convergence zones in the pelagic habitat, and benthic feeding grounds in the relatively shallow, protected waters. Females deposit eggs on high energy beaches, usually on islands, where a deep nest cavity can be dug above the high water line. Hatchlings leave the beach and move in the open ocean. Green sea turtles forage in pastures of seagrasses and/or algae, but small green turtles can also be found over coral reefs, worm reefs, and rocky bottoms.

Although green sea turtles are expected to be found foraging in nearshore seagrass habitats within Florida Bay, the increased freshwater flows associated with CEPP may alter seagrass species composition but should have a negligible effect on the overall biomass available for sea turtle feeding habits. Additionally, no green sea turtles would attempt to utilize areas for nesting purposes since there is no suitable habitat for nesting in the project area. With the expectation of improved nearshore habitat, no utilization of the project area for nesting purposes, and the implementation of agency approved Sea Turtle and Smalltooth Sawfish Construction Conditions, the Corps has determined green sea turtle may be affected, but is not likely to be adversely affected, by the proposed project.

C.2.2.4.11 Hawksbill Sea Turtle

The hawksbill sea turtle is a small to medium-sized marine turtle weighing up to 15 kilograms in the United States. The hawksbill lives in tropical and sub-tropical waters of the Atlantic, Pacific, and Indian Oceans. Areas that are known as important feeding areas for hawksbill turtles in Florida include the waters near the Florida Keys and on the reefs off Palm Beach County. Hawksbill turtles use different habitat types at different stages of their life cycle. Post hatchlings take shelter in weed lines that accumulate at convergence zones. Coral reefs are the foraging habitat of juveniles, sub-adults, and adults. They are also known to inhabit mangrove-fringed bays and estuaries, particularly along the eastern shore where coral reefs are absent. Hawksbills feed predominantly on sponges and nest on low and high energy beaches, frequently sharing 94 the high-energy beaches with green sea turtles. Nests are typically placed under vegetation.

Although hawksbill sea turtles are expected to be found foraging near hardbottom habitats within Florida Bay, the increased freshwater flows associated with CEPP may reduce nearshore salinity concentrations but should have a negligible effect on sponges or other food sources utilized by this species. Additionally, no hawksbill sea turtles would attempt to utilize areas for nesting purposes since there is no suitable habitat for nesting in the project area. With the expectation of improved nearshore habitat, no utilization of the project area for nesting purposes, and the implementation of agency approved Sea Turtle and Smalltooth Sawfish Construction Conditions, the Corps has determined hawksbill sea turtle may be affected, but is not likely to be adversely affected, by the proposed project.

C.2.2.4.12 Leatherback Sea Turtle

The leatherback sea turtle is the largest living turtle and weighs up to 700 kilograms. The leatherback lives in tropical and sub-tropical waters. Habitat requirements for juvenile and post-hatchling leatherbacks are virtually unknown. Nesting females prefer high-energy beaches with deep unobstructed access. Leatherbacks feed primarily on jellyfish.

Although leatherback turtles are expected to be found foraging in nearshore habitats within Florida Bay, the increased freshwater flows associated with the CEPP may reduce nearshore salinity concentrations but should have a negligible effect on jellyfishes or other food sources utilized by this species. Additionally, no leatherback sea turtles would attempt to utilize areas for nesting purposes since there is no suitable habitat for nesting in the project area. With the expectation of improved nearshore habitat, no utilization of the project area for nesting purposes, and the implementation of agency approved Sea Turtle and Smalltooth Sawfish Construction Conditions, the Corps has determined leatherback sea turtle may be affected, but would not likely be adversely affected, by the proposed project.

C.2.2.4.13 Kemp's Ridley Sea Turtle

The Kemp's ridley sea turtle is the smallest of all sea turtles and weighs up to 45 kilograms. This species is a shallow water benthic feeder consuming mainly algae and crabs. Juveniles grow rapidly. Juveniles and sub-adults have been found along the eastern seaboard of the United States and in the Gulf of Mexico. However, the major nesting beach for the Kemp's ridley sea turtle is on the northeastern coast of Mexico. This species occurs mainly in coastal areas of the Gulf of Mexico and in the northwestern Atlantic Ocean. The post-pelagic stages are commonly found dwelling over crab-rich sandy or muddy bottoms. Juveniles frequent bays, coastal lagoons, and river mouths. 95

Although Kemp's ridley sea turtles could be found foraging in nearshore habitats within Florida Bay, this species is not expected to be found within the direct area of influence associated with CEPP. Additionally, no Kemp's ridley sea turtles would attempt to utilize areas for nesting purposes since their main nesting location is on a single stretch of beach on the Gulf Coast of Mexico. With the expectation of improved nearshore habitat, no utilization of the project area for nesting purposes, and the implementation of agency approved Sea Turtle and Smalltooth Sawfish Construction Conditions, the Corps has determined Kemp's ridley sea turtle may be affected, but would not likely be adversely affected, by the proposed project.

C.2.2.4.14 Loggerhead Sea Turtle

Loggerhead sea turtles inhabit the continental shelves and estuarine environments along the margins of the Atlantic, Pacific, and Indian Oceans. Females select high energy beaches on barrier strands adjacent to continental land masses for nesting. Steeply sloped beaches with gradually sloped offshore approaches are favored. After leaving the beach, hatchlings swim directly offshore and eventually are found along drift lines. They migrate to the near-shore and estuarine waters along the continental margins and utilize those areas as the developmental habitat for the sub-adult stage. Loggerheads are predators of benthic invertebrates.

Although loggerhead sea turtles are expected to be found foraging in nearshore habitats within Florida Bay, the increased freshwater flows associated with CEPP may reduce nearshore salinity concentrations but should have a negligible effect on crustaceans, mollusks or other invertebrate food sources utilized by this species. Additionally, no loggerhead sea turtles would attempt to utilize areas for nesting purposes since there is no suitable habitat for nesting in the project area. With the expectation of improved nearshore habitat, no utilization of the project area for nesting purposes, and the

implementation of agency approved Sea Turtle and Smalltooth Sawfish Construction Conditions, the Corps has determined loggerhead sea turtle may be affected, but would not likely be adversely affected, by the proposed project.

C.2.2.4.15 State Listed Species

C.2.2.4.15.1 Florida Bonneted Bat

The Florida bonneted bat is Florida's largest bat, weighing approximately 1.1 to 2.0 ounces, with a 19 to 21 inch wingspan, and a body length of 5.1 to 6.5 inches. The species has dark brown fur and large broad ears that join together and slant forward over the eyes. Relatively little is known regarding the ecology and habitat requirements of this species (FWS 2009). In general, bats will forage over ponds, streams and wetlands and require roosting habitat for daytime roosting, protection from predators and rearing of young (Marks and Marks 2008). Florida bonneted bats roost in tree cavities, rocky outcrops and dead palm fronds. In residential communities, the bats roost in Spanish tile roofs, but have also been found in attics, rock or brick chimneys and fireplaces of old buildings (NatureServe 2009). Colonies are small, with the largest reported as just a few dozen individuals. The bat is a nocturnal insectivore and relies upon echolocation to navigate and detect prey. Females give birth to a single pup from June through September (Scott 2004); however limited data suggests that a female may undergo a second birthing season possibly in January or February (FWS 2009).

The Florida bonneted bat is Florida's only endemic bat and is listed by FWC as a state listed endangered species and is a candidate species for Federal listing under the ESA. The range of this species is limited to southern Florida, although this species was encountered in 2008 in two locations within the Kissimmee River Wildlife Management Area north of Lake Okeechobee. Records indicate that it was once common in the 1950s and early 1960s near Coral Gables and Miami (Belwood 1992). The Florida bonneted bat has only been documented in 12 locations within Florida, including areas within Coral Gables, Homestead, Naples, Everglades City and North Fort Myers. Seven of the locations are under public ownership with the Florida bonneted bat found in discrete and specific areas within BCNP, Fakahatchee Strand Preserve State Park, Kissimmee River Wildlife Management Area, Babcock Ranch and Fred C. Babcock and Cecil M. Webb Wildlife Management Area (FWS 2009). Loss of suitable habitat is believed to be the primary cause of population declines. Other perceived threats include pesticide and herbicide use, which decrease populations of insects, the bats primary prey. Given the documented location of the located bats outside of the project area and that increased hydroperiods and wetland area from CEPP implementation should provide for ideal habitat, the Corps determination is that the Florida bonneted bat would not be affected by CEPP.

C.2.2.4.16 State Threatened Species

C.2.2.4.16.1 Everglades Mink

The Everglades mink is an exceedingly rare, small, semi-aquatic mammal. The mink is medium to dark brown in color with dense, glossy, water repellant fur. Minks have a small head with beady black eyes and an elongated body with five partially-webbed toes. Males weigh 2 to 3.5 pounds and are typically two feet in length; females are smaller in size. Minks are nocturnal and generally solitary, except when raising young; three to six kits are born inside the den during the spring and are weaned at five to six weeks. Dens typically consist of a hollow log. Minks are carnivorous, primarily feeding on crayfish, fish, insects, small snakes, small mammals, and birds (Conservancy of Southwest Florida 2009).

The Everglades mink is listed by FWC as a state listed threatened species. Historically, the Everglades mink ranged into the northern Everglades, near the Lake Okeechobee region, but no sightings have been reported in the northern range in recent years. The range of the Everglades mink is currently limited to the shallow freshwater marshes and swamps of ENP, BCNP, and Fakahatchee Strand. Most of the recent sightings of the minks occurred in ENP, near Tamiami Trail (U.S. Highway 41) (Smith 1980).

Seasonal habitat use by the Everglades mink was documented by Humphrey and Zinn (1982) within a large wetland in south Florida (Big Cypress Swamp) using line transects of chalk-dusted trackboards and anal scent attractant. Results indicated a higher frequency of track station visits to marshes in autumn (late wet season) than in spring (late dry season). In the late dry season, most mink track station visits occurred in swamps, where aquatic habitat and high concentrations of prey (fishes) persisted, suggesting that disruptions in the timing and magnitude of water level fluctuations or hydroperiods may negatively impact the species.

The quality of the Everglades mink habitat has been degraded through development and the drainage of wetlands. Unnatural high water levels have also resulted in flooding of dens and an increase in road-related deaths. Suitable freshwater wetland habitat for the species exists within the project area. Evidence of direct impacts to the Everglades mink as a result of the existing operating regime (i.e. ERTP) is lacking, however the species is extremely rare and difficult to trap and/or monitor. IOP has resulted in lower average water levels and shorter periods of surface water inundation in the WCAs to the north of ENP (WCA 3A and WCA 3B), as well as in central and western SRS. Shorter hydroperiods potentially decrease the distribution and abundance of small fish species sensitive to hydrologic changes upon which the Everglades mink feeds. CEPP would increase hydroperiods within WCA 3 and ENP, therefore the Corps determined that CEPP may affect, but is not likely to adversely affect the Everglades mink.

C.2.2.4.16.2 Florida Black Bear

The Florida black bear is one of three subspecies of American black bear recognized in the southeastern United States. The bear is characterized by a highly arched forehead and long narrow braincase. Adult males normally weigh 250 to 450 pounds and females 125 to 250 pounds. Both sexes have soft, black hair, often with blonde chest markings, small round ears, short tails, stout curved claws, and large canine teeth (FWC 2003b). Females give birth every two years, breeding in June and July. Young are born in January and February; litter size is two to four cubs. Females generally first give birth at three to four years of age. Males generally live to be 8 to 12 years old and females 10 to 15 years (FWC 2003b).

Florida black bears may inhabit large tracts of forestland of any type. Habitat includes; pine flatwoods, hardwood swamp, cypress swamp, cabbage palm forest, sand pine scrub and mixed hardwood hammock. Home range sizes vary greatly among individuals, age classes, and populations, but average approximately 37 square kilometers for females and 161 square kilometers for males; individuals tend to be solitary (Maehr and Wooding 1992). Florida black bears are omnivorous, primarily feeding upon vegetation, nuts, berries, and insects. In Florida, black bears are dependent upon saw palmetto plants, black gum, and oak trees for a significant portion of their diet. The species may prey upon animals such as armadillos, deer fawns, and hogs, but overall, these food sources make up a small percentage of their diet (Maehr and Wooding 1992).

The Florida black bear is listed by FWC as a state listed threatened species. Historically, the subspecies ranged throughout the southeastern United States, inhabiting all of Florida, including the upper keys and portions of southern Georgia, Alabama, and Mississippi (FWC 2003b). This widespread distribution has been severely reduced; the range has now been restricted to eight locations within Florida

(Apalachicola, Big Cypress, Eglin, Ocala, Osceola, and St. Johns) and two remnant areas (Chassahowitzka and Glades/Highlands) (FWC 2003b). Unregulated hunting up to the mid 1900s has had the greatest impacts on population declines. More recently, development associated with Florida's growing population has led to an increase in the loss of forested lands and human-induced mortality. The annual number of recorded vehicle/bear collisions and reported human/bear conflicts (nuisance complaints) has risen substantially. CEPP is not expected to negatively affect forested areas, therefore the Corps determination is may affect, not likely to adversely affect the Florida black bear.

C.2.2.4.17 Shore Birds

C.2.2.4.17.1 Snowy Plover, Least Tern, Black Skimmer, and American Oystercatcher

Snowy plovers are small in size, weighing about two ounces, with a 13 inch wingspan, and a length of six to seven inches. Snowy plovers have inconspicuous plumage, with white undersides, pale-brown upperparts, a short black bill, and dark grey to blackish legs (Warriner et al. 1995). Least terns are slightly larger than both, with a wingspan of 20 inches and a length of nine inches. Least terns have a grayish-white body with yellow legs, a short notched tail, and a yellow bill unique among North American terns (Thompson et al. 1997).

The snowy plover and least tern are listed by FWC as state listed threatened species. Florida populations of snowy plovers are made up of both migrant and resident species. Breeding birds are discontinuously distributed along the Gulf coast from Marco Island north to Anclote Key and along the coast of the Florida Panhandle, where most Florida breeders now occur. In central and southern Florida, breeding occurs only in a few protected parks, such as Caladesi Island, Fort DeSo Park, and Cayo Costa and on isolated peninsulas (FWC 2003c). No breeding records exist from the Keys or Atlantic coast. The least tern is more widely distributed than the snowy plover; breeding populations are distributed along both the Gulf and Atlantic Coasts and the Florida Keys (FWC 2003c).

These shorebirds inhabit sparsely vegetated sandy beaches where they nest in shallow depressions on bare, open ground. They typically form loose colonies and require open dry sand near dunes for breeding; access to inner dunes is essential for brood protection (FWC 2003c). For the two species, females typically lay two to three eggs; eggs are incubated for less than 30 days. Nestlings fledge in approximately four weeks and the breeding season extends from March to September (FWC 2003c). Plovers feed on crustaceans, mollusks, marine worms, and insects, by directly capturing prey or by probing in the sand for food. Least terns forage over open water and primarily feed upon small fish and crustaceans.

The numbers and distribution of these shorebirds have steadily decreased due to loss and degradation of coastal habitats and breeding grounds. Continued development of beachfront property into residential, commercial, and recreational areas has led to population declines. Birds quickly abandon nesting attempts when they are disturbed by people. Conservation efforts include closing nesting beaches, monitoring nests, roping off or fencing in breeding sites, posting educational signs and banning pets and vehicle use. CEPP would not affect shorelines, therefore the project would have no effect on the snowy plover, least tern, black skimmer, or American oystercatcher.

C.2.2.4.18 State Listed Species of Special Concern

C.2.2.4.18.1 White Ibis

The white ibis is easily identified by its long red legs, all white plumage, red face, long de-curved red bill and black tipped wings. White ibises are medium-sized wading birds, weighing about two pounds, with a 36-inch wingspan, and a length of 24 inches. White ibises inhabit shallow coastal marshes, wetlands and mangrove swamps and feed on crayfish, crabs, insects, snakes, frogs, and fish (Kushlan and Bildstein 1992).

Nesting occurs in trees, shrubs, and grass clumps from ground level to a height of 50 feet. Nests are constructed of vegetation sticks, leaves, and/or roots. Females typically lay two to three eggs; eggs are incubated for 21 to 22 days. The young are able to leave the nest at 9 to 16 days of age. Nestlings are independent at 40 to 50 days of age. Breeding season extends from March to August (FWC 2003c). Ibises are known for frequent shifts in roost and colony sites.

The white ibis has been recorded to breed throughout the state of Florida; the center of breeding abundance occurs in the Everglades, with breeding populations extending into Florida Bay and the Keys (FWC 2003c). Aerial surveys have revealed 90 percent declines in south Florida breeding pairs since the 1940s and 20 to 50 percent declines statewide during the past decade. Because of this, the FWC listed the white ibis as a state listed species of special concern (FWC 2003c). Population declines of the species are attributed to loss and degradation of suitable habitat; however, large populations of white ibises remain. CEPP would increase hydroperiods, therefore increasing habitat for white ibis as well as increasing the forage base, showing a minor beneficial effect. Therefore the Corps determination is that CEPP may affect, but is not likely to adversely affect the white ibis.

C.2.2.4.18.2 Snowy Egret, Reddish Egret, Little Blue Heron, and Tricolored Heron

The snowy egret, reddish egret, little blue heron, and tricolored heron are listed by the FWC as a species of special concern. Snowy egrets are medium sized herons, with entirely white plumage, long slender black bills, long black legs, and bright yellow feet (Parsons and Masters 2000). The snowy egret breeds in Florida from January through August, breeding mostly in central and southern Florida in freshwater and saltwater marshes (FWC 2003c). The tricolored heron occupies similar habitats; breeding occurs in February through August (FWC 2003c). The tricolored heron is ornately colored; it is slate-blue on its head and upper body and has a purplish chest with white under parts and fore-neck (Frederick 1997).

The little blue heron is a smaller-sized heron, dark overall with yellow-green legs, and a blue bill with a black tip (Rodgers and Smith 1995). The little blue heron shows a preference for freshwater habitat; however, it also inhabits saltwater marshes. Little blue herons breed later than tricolored herons or snowy egrets; breeding occurs in April through September in Florida. The little blue heron is more widely distributed throughout the state in comparison to the tricolored herons or snowy egrets. Like the snowy egret, breeding populations are concentrated in central and southern Florida (FWC 2003c).

Reddish egrets have two color morphs; white and dark. Dark morphs have gray bodies with chestnut heads, blue legs and pink bills with black tips (Lowther and Paul 2002). The reddish egret is the rarest heron in Florida and is entirely restricted to the Florida coast with concentrations in Florida Bay and the Keys; two-thirds of the state's breeding population. The heron forages on shallow flats and sandbars for fish species, including killifish. In Florida Bay, reddish egrets nest from November through May (FWC 2003c).

Population declines of the species are attributed to loss and degradation of suitable habitat. Target nest numbers for snowy egrets and tricolored herons combined are 10,000 to 20,000 pairs. Nesting targets for the snowy egret and tricolored heron have not been met in the WCAs and ENP since the implementation of IOP in 2002. Nesting effort (number of nests) of these species from 2002 to 2008 is summarized as follows; 2000-2002: 8,614 pairs, 2001-2003: 8,088 pairs, 2002-2004: 8,079, 2003-2005: 4,085 pairs, 2004-2006: 6,410 pairs, 2005-2007: 4,400 pairs, 2006-2008 3,778 pairs(SFWMD 2009b). However, target numbers have not been met prior to the current operating regime; 1998-2000: 2,788 pairs, 1999-2001 4,270 pairs. Little blue heron censuses from aerial surveys are unreliable due to its dark plumage and tendency to nest in small, isolated colonies (FWC 2003c).

CEPP would not negatively affect these bird species. Improved hydroperiods in the WCAs and WNP, CEPP may have a minor beneficial effect, but is not likely to adversely affect the snowy egret, reddish egret, little blue heron, and tricolored Heron.

C.2.2.4.18.3 Limpkin

Limpkins are large (approximately 66 cm) brown to olive colored birds with a long, heavy down-curved yellow bill with a dark tip. Occurring from peninsular Florida and southern Mexico through the Caribbean and Central America to Northern Argentina, limpkins are listed as species of special concern in Florida. Limpkins inhabit freshwater marshes and swamps with tall reeds, as well as mangroves. They are largely nocturnal, but daytime activities have also been observed (Holyoak and Colston 2003).

Limpkins forage primarily in shallow water and on floating vegetation, such as water hyacinth and water lettuce. Similar to Everglade snail kite, this wading bird species feeds primarily on apple snails of the genus *Pomacea*. The availability of apple snails has a significant effect on the local distribution of the limpkin (Cottam 1936). Freshwater mussels and other species of snail are secondary food resources. Less important prey items include insects, frogs, lizards, crustaceans and worms, which may be important dietary components during periods of drought or flooding when birds may be forced to forage in suboptimal areas. Implementation of CEPP would increase hydroperiods, therefore increasing the forage base for the limpkin, providing minor beneficial effects. Therefore, the Corps determination is that CEPP may affect, but is not likely to adversely affect the limpkin.

C.2.2.4.18.4 Roseate Spoonbill

Roseate spoonbills have a pink body with a white neck and breast, pink wings with highlights of red and long reddish legs. Spoonbills have an unfeathered head which can be yellow or green. Roseate spoonbills are large wading birds, weighing about three pounds and have a 50-inch wingspan. Characteristic to the species is a long, spatulate bill. The spoonbill feeds by wading through shallow water, head down, probing the bottom by sweeping its long, spoon-shaped bill back and forth in the water. When prey is detected by touch, the bill snaps shut; small fish, crustaceans, and insects make up the bulk of the diet (Dumas 2000).

Spoonbills typically establish nests in Florida Bay between November 1 and December 15, with a mean nest initiation date of November 18. Females typically lay three eggs; eggs are incubated for about 21 days. After the young spoonbills hatch, chicks require a continuous supply of food for 42 days. Spoonbills primarily feed on wetland fishes. Foraging adult spoonbills require water levels at or below 13 centimeters within the coastal wetlands to forage efficiently and feed young (Lorenz et al. 2010). Nestlings fledge in approximately four weeks (FWC 2003c).

Thirty-nine of Florida Bay's keys have been used by roseate spoonbills as nesting colonies. These colonies have been divided into five distinct nesting regions based on the colonies primary foraging locations: northeast region, northwest region, central region, south region, and southwest region. The northeast and northwest colonies contain the largest nesting colonies and these birds principally use wetlands on the mainland as their primary foraging grounds (Lorenz et al. 2010). In addition to a large nesting population in Florida Bay, roseate spoonbills historically nested along the southwest coast of the Everglades in the SRS and Lostman's Slough estuaries. Although there has been some documentation of spoonbill nesting in this area, the numbers have been negligible (Lorenz et al. 2009).

The roseate spoonbill is state listed by the FWC as a species of special concern. In 1979, 1,258 roseate spoonbill nests were located in Florida Bay. More than half of these nests (688) were located in the northeast region (Lorenz et al. 2008). Drops in nests coincide with the completion of the South Dade Conveyance System (SDCS) in 1982, when water deliveries to Taylor Slough and northeastern Florida Bay changed dramatically. Since completion of the SDCS, spoonbill nesting effort has shifted to the northwest region of Florida Bay; nesting effort has been consistent since the early 1980s and the population remains stable with an average of 1.24 chicks produced per nest, per year (Lorenz et al. 2008). Prior to the construction of the SDCS, spoonbills in the northeast region of Florida Bay produced an average of 1.38 chicks per nest, per year. Following completion of the SDCS, spoonbill production dropped to 0.67 chicks per nest, per year (Lorenz et al. 2008). Wading bird studies suggest that a population that does not produce at least one chick per nest, on average, will decline. CEPP is expected to benefit wading bird populations with an increased forage base. Therefore, the Corps determination is that CEPP may provide minor beneficial effects, but is not likely to adversely affect the roseate spoonbill.

C.2.2.5 Wildlife

A comparison of the FWO and CEPP action alternatives Alt 4R and 4R2 and their potential effects on wildlife within the CEPP action area are summarized below. Effects to state and federally listed species are described in further detail in **Section C.2.2.4, Threatened and Endangered Species** and within **Annex A**. Changes in water quality also have the potential to affect prey forage base through altering of vegetation composition or structure. Water quality will continue to be monitored under CEPP; potential effects are largely uncertain at this time.

C.2.2.5.1 Invertebrates

Negligible effects to the invertebrate community within Lake Okeechobee or EAA are anticipated with CEPP implementation. Currently, many oyster beds are stressed and have been reduced or eliminated from their former areas by extreme salinity fluctuations, increased turbidity, sedimentation, dredging and damage from boats. Oyster beds have been stressed and occasionally all but eliminated by frequent freshwater releases from both the watershed and Lake Okeechobee. During dry times, oysters in the Caloosahatchee are also stressed by disease and increased predation due to higher salinities. As compared with the FWO, Alts 4R and 4R2 show a minor beneficial effect with performance improvement within the Northern Estuaries as indicated by fewer high volume flow months. Reductions in high volume discharges and salinity fluctuations would likely benefit oysters within the Northern Estuaries. Reduction in high flows and accompanying flow velocities would help lessen the current problem of flushing of oyster spat into outer areas of the Northern Estuaries that experience high salinities levels during the dry season resulting in increased predation and disease in the oyster population.

Within Florida Bay, a habitat suitability index model was employed to simulate growth, survival and potential harvest of a cohort of shrimp as a function of salinity and temperature (Browder et al. 1999;

2002). Comparisons of the percent increase in potential pink shrimp harvest in two representative Florida Bay basins over the 41-year POR for Alts 4R and 4R2 relative to the FWO are shown in **Figure C.2.2-48** and **Figure C.2.2-49**. Whipray Basin is located in north central Florida Bay and Johnson Key Basin is located in western Florida Bay. Alt 4R2 provides slight improvement relative to Alt 4R in both Whipray Basin and Johnson Key Basin and provides minor beneficial effects.

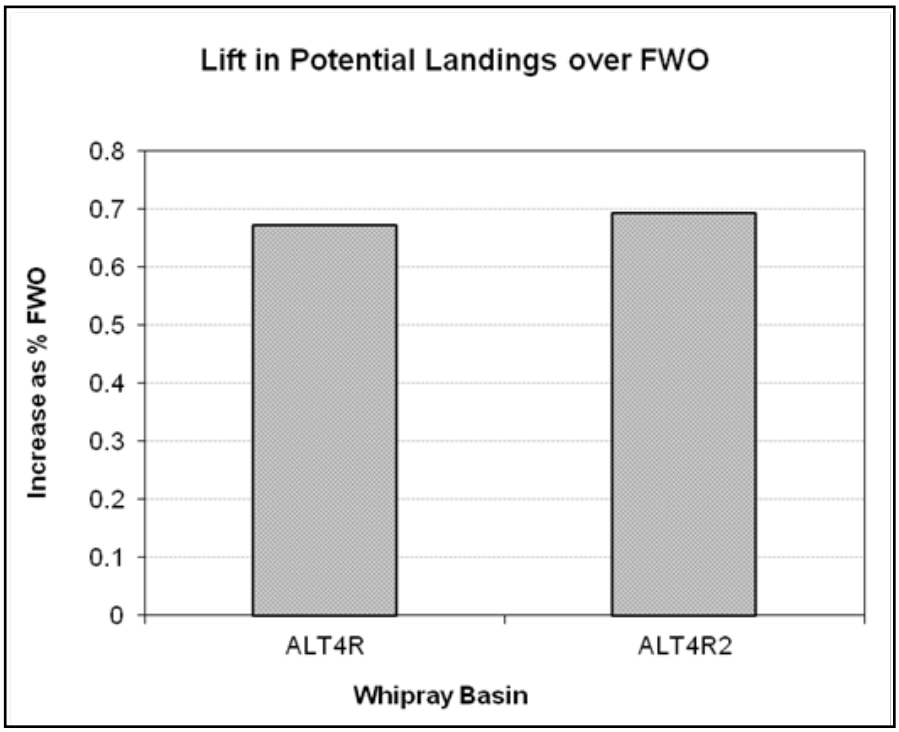


Figure C.2.2-48. Comparison of the percent increase in potential pink shrimp harvest in Whipray Basin for the 1965-2005 period of record for Alts 4R and 4R2 relative to the No Action Alternative (FWO). (Browder 2013).

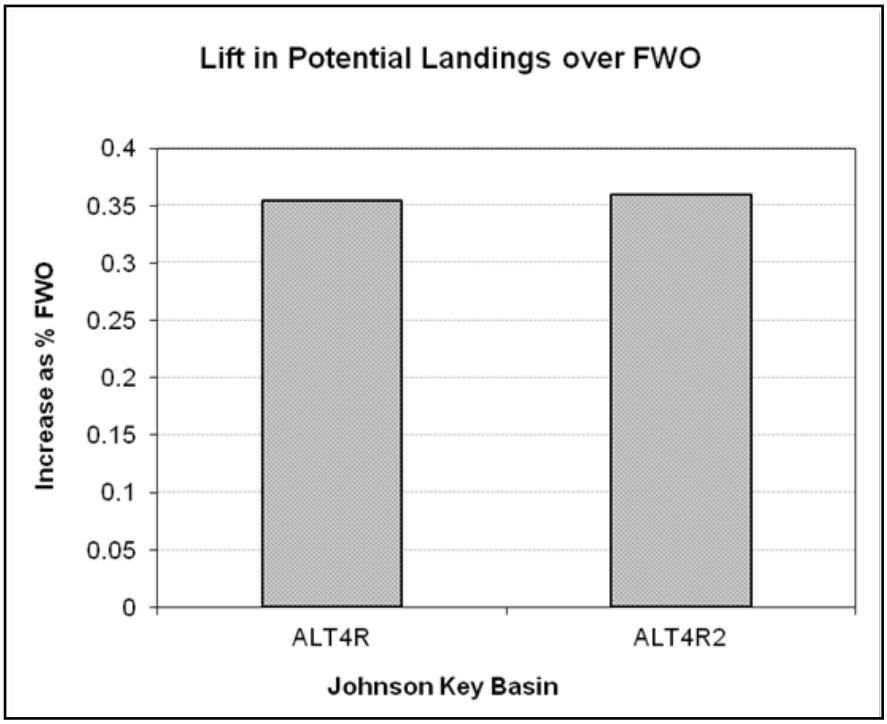


Figure C.2.2-49. Comparison of the percent increase in potential pink shrimp harvest in Johnson Key Basin for the 1965-2005 period of record for Alternatives 4R and 4R2 relative to the No Action Alternative (FWO). (Browder 2013).

In Biscayne Bay, Alt4R provided less water while Alt4R2 provided additional flows when compared to FWO. Alt4R flows to the coast are not evenly distributed showing positive benefits in the very northernmost reach of Biscayne Bay and minor adverse effects from the mid-section of the northern portion to the south. Alt4R2 provides additional flows throughout the bay and is likely to provide a minor beneficial effect to the invertebrate population by providing additional flows to the coast, thereby lowering salinity levels and/or reducing the number of days salinities exceed 40 psu. Alt4R would likely result in a negative effect to the invertebrate population by increasing the likely hood of maintaining salinity conditions in Biscayne Bay above the preferred salinity range of invertebrate population for longer periods of time than FWO. Alternative 4R shows an unfavorable seasonal flow pattern with reductions in flows compared to FWO generally greater during the dry season. Alt4R2 shows slightly increased flows patterns for both seasons compared to FWO.

Within the Greater Everglades aquatic invertebrates would rapidly colonize newly re-hydrated areas with implementation of Alts 4R and 4R2, showing a minor beneficial effect that directly benefits aquatic invertebrates within the action area. Increases in stages and hydroperiods within WCA 2, northern WCA 3A, WCA 3B and ENP would promote wetland vegetation transition through contraction of sawgrass marshes and expansion of wet prairies, and in deeper regions, sloughs. Submerged aquatic plants are commonly associated with sloughs providing structure for growth of periphyton, the main source of primary production within the freshwater Everglades (Gunderson 1994; Powers 2005).

Periphyton is a primary component of invertebrate diets, including apple snails. In addition to the potential for increased foraging opportunities, changes in vegetation resulting in expansion of wet prairie and increases in emergent vegetation would also provide habitat structure critical for apple snail

aerial respiration and egg deposition (Turner 1996; Darby et al. 1999). Apple snails tend to avoid areas where water depths are greater than 50 centimeters (Darby et al. 2002). Avoidance of deeper depths may be related to the type and density of vegetation in deeper water areas, food availability or energy requirements for aerial respiration (van der Walk et al. 1994; Turner 1996; Darby 1998; Darby et al. 2002). Water-lily sloughs support lower apple snail densities as compared with wet prairies (Karunaratne et al. 2006). Limited food quality and lack of emergent vegetation in sloughs may account for the lower densities. Research indicates that apple snails depend upon periphyton for food (Rich 1990; Browder et al. 1994; Sharfstein and Steinman 2001), which may be limited within deeper water environments. Karunaratne et al. (2006) observed little or no submerged macrophytes and epiphytic periphyton in the sloughs they studied in WCA 3A. In contrast, species commonly encountered within wet prairie habitat (e.g. *Eleocharis* spp., *Rhynchospora tracyi*, *Sagittaria* spp.), along with sawgrass that grows within the ecotones between the two vegetative communities, support abundant populations of epiphytic periphyton (Wetzel 1983; Browder et al. 1994; Karunaratne et al. 2006). A reduction in the number of available emergent stems for egg deposition would also contribute to the observed lower snail densities within sloughs. Drying events are needed to maintain the emergent plant species characteristic of typical apple snail (Wood and Tanner 1990; Davis et al. 1994). As shown by Darby et al. (2008), apple snails can survive these events and it is the timing and duration of the dry down event that are critical determinants of apple snail survival and recruitment. As compared with the FWO, Alts 4R and 4R2 provide increased opportunities for apple snails within northern WCA 3A; and appropriate conditions for increased apple snail populations in ENP and provide minor beneficial effects (see **Section C.2.2.4.1** for more information on apple snails).

Crayfish are important components within the Everglades food web, serving as primary dietary components of higher trophic level species including fish, amphibians, alligators, wading birds and mammals such as raccoons and river otters (Kushlan and Kushlan 1979). Crayfish are particularly important forage resource for nesting white ibis (*Eudocimus albus*), therefore the availability of crayfish is an important component for recovery of this species (Boyle et al. 2012; Dorn et al. 2011). Crayfish species composition and abundance within the Greater Everglades are linked to hydroperiod. Two species of freshwater crayfish are found within the Greater Everglades: Everglades crayfish (*Procambarus alleni*) and slough crayfish (*Procambarus fallax)*. *P. alleni* is commonly found in marshes that dry seasonally, generally with a hydroperiod of less than 10 months. When surface water recedes, *P. alleni* burrows to escape drying conditions. *P. fallax* is commonly found in perennially flooded habitats. Both species have been found co-occurring in areas with hydroperiods ranging between 9 and 11 months, as well as in sites that remained flooded during the dry season.

Increases in hydroperiod associated with implementation of Alts 4R and 4R2 would likely increase crayfish density within areas of northern WCA 3A, WCA 3B and ENP, particularly within the marl prairies providing a moderate beneficial effect. Research by Acosta (2001) revealed that environmental changes associated with shortened hydroperiod have affected growth, survival, dispersal and productivity within Everglades marl prairies and within the rocky glades. Results from this study indicate that crayfish productivity would increase substantially if hydroperiods within marl prairies wetlands were extended by 3 to 4 months. Although CEPP would not extend hydroperiods within marl prairies by this duration, Alts 4R and 4R2 would increase hydroperiods within this region resulting in increased *P. alleni* productivity.

P. alleni biomass also declines during periods of extended high water. During extended periods of inundation, populations of large predatory fish species may increase, thereby increasing predation pressure on crayfish populations (Kushlan and Kushlan 1979). Under CEPP, in areas in which

hydroperiods will be extended sufficiently to support increases in large predatory fish (refer to **Section C.2.2.5.2**, **Fish**), there will also likely be associated declines in *P. alleni* biomass.

Kushlan and Kushlan's (1979) notion that dry-downs promote crayfish abundance and recruitment by reducing predatory fish populations has recently received considerable empirical support for both crayfish species. Kellogg and Dorn (2012) demonstrated that just a few small sunfish (*Lepomis* spp.) can have dramatic effects on crayfish recruitment in experimental wetland mesocosms. Moreover, this was verified at the slough scale in an experimental drought study at LILA (SFER 2012), and at the scale of WCA 3A where crayfish densities were positively correlated with the length of the previous dry period (SFER 2012). Taken together, these results suggest aquatic predators control crayfish density and recruitment and dry disturbances, which temporarily reduce predatory fishes, release crayfish from top-down control. However, it should also be noted that deep water refuges (e.g. canals) buffering predatory fish populations against drying, and poor burrowing substrates for crayfish (i.e., shallow peat layers combined with long dry periods) can offset the positive effects of dry disturbances for crayfish population growth. Thus, while CEPP is likely to improve conditions for crayfish in areas that are currently too dry for crayfish production (sensu Acosta 2001), it is not entirely clear how additional water provided by Alts 4R and 4R2 will affect populations in areas that currently experience periodic dry downs and are relatively productive for crayfish.

C.2.2.5.2 Fish

Implementation of CEPP is expected to significantly improve conditions for fish species throughout much of the Greater Everglades and have a moderate beneficial effect. It is predicted that with implementation of Alts 4R and 4R2, that the largest percent gains in daily average fish density would occur within northern WCA 3A and NESRS due to rehydration. In these areas, fish densities often increased in excess of 20%, with extremes of over 50% (**Figure C.2.2-50**). Other areas within Shark River Slough are also expected to experience appreciable gains in fish density due to increased flows. It is also expected that regional percent changes in fish densities would be highest in SRS and the southern marl prairies (17-31%) for Alt 4R and that Taylor Slough and Florida Bay would also be expected to experience positive changes as compared with the FWO (Catano and Trexler 2013). Alt 4R predicted approximately 5% higher biomass than Alt 4R2 in SRS and the southern marl prairies. Decreases in fish density, or negligible changes (3%), were predicted for Alts 4R and 4R2 in WCA 2A and the area of WCA 3A along the L-67 A canal. Negligible differences between Alts 4R and 4R2 were predicted in most other regions.

Introduction or expansion of non-native fish species due to changes in water distribution and increased connectivity within WCA 3A, WCA 3B and ENP is likely to occur; however, the extent of invasion is uncertain at this time. In contrast to the FWO, new access points will be created under CEPP.

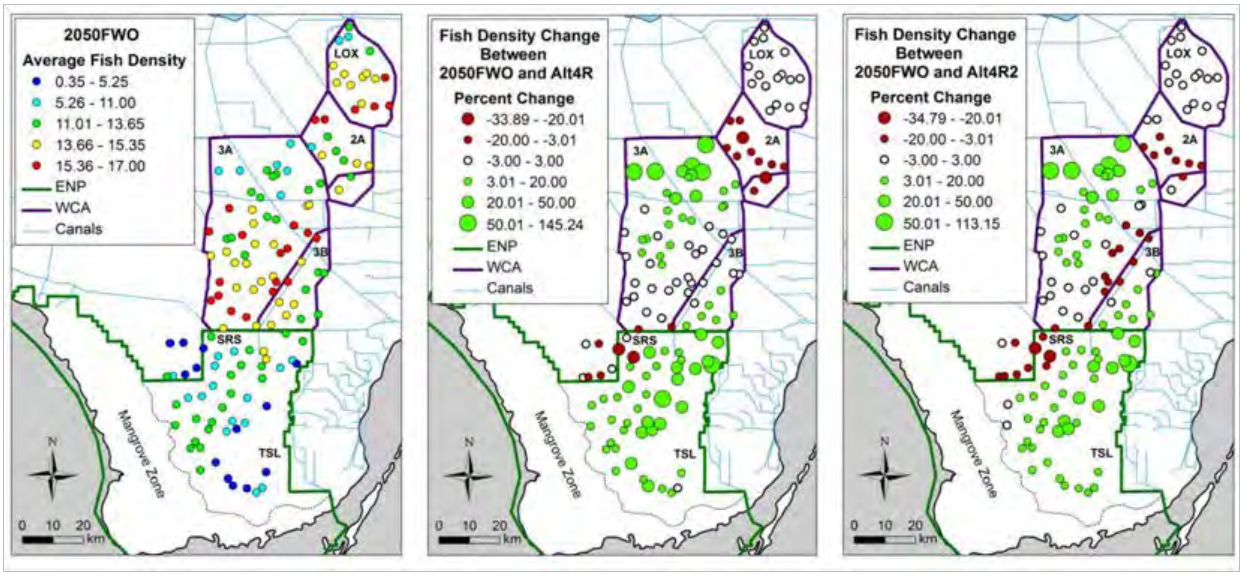


Figure C.2.2-50. Percent change in average daily fish density over the 41 year period of record (1965)2005 predicted by comparing the No Action Alternative to Alts 4R and 4R2. Bubble sizes are proportional to differences in density.

In Biscayne Bay, Alt4R provided less water while Alt4R2 provided additional flows when compared to FWO. Alt4R flows to the coast are not evenly distributed showing positive benefits in the very northernmost reach of Biscayne Bay and negative effects from the mid-section of the northern portion to the south. Alt4R2 provides additional flows throughout the bay and is likely to provide a benefit to the fish population by providing additional flows to the coast, thereby lowering salinity levels and/or reducing the number of days salinities exceed 40 psu, providing minor beneficial effects. Alt4R would likely result in a minor adverse effect to the fish population by increasing the likely hood of maintaining salinity conditions in Biscayne Bay above the preferred salinity range of fish population for longer periods of time than FWO. Alternative 4R shows an unfavorable seasonal flow pattern with reductions in flows compared to FWO generally greater during the dry season. Alt4R2 shows slightly increased flows patterns for both seasons compared to FWO.

C.2.2.5.3 Amphibians and Reptiles

Minor beneficial effects to amphibian and reptile communities are anticipated with CEPP implementation. Alts 4R and 4R2 showed improved conditions for amphibians within WCA 3 and ENP as compared with the FWO. Rehydration within previously dry areas within northern WCA 3A would increase spatial extent of suitable habitat for aquatic amphibian species in this area. Similarly, increased hydroperiods within ENP would also benefit aquatic amphibian species. As hydrology improves within WCA 3A, WCA 3B and ENP, it is expected that amphibian species richness will also change. However, declines in some amphibian species will be offset by favorable habitat conditions for other species. Increase in forage prey availability (i.e. crayfish and other invertebrates, fish) in areas rehydrated by CEPP implementation will also directly benefit amphibian and reptiles species.

Introduction or expansion of non-native amphibian species due to changes in water distribution and increased connectivity within WCA 3A, WCA 3B and ENP is likely to occur and have a minor adverse effect; however, the extent of invasion is uncertain at this time. In contrast to the FWO, new access points will be created under CEPP.

Submerged aquatic vegetation and algal communities are also common foraging areas for the green sea turtle. Decreased salinities within the Northern Estuaries that reduce stress on SAV and promote increases in seagrass shoots have the potential to increase foraging opportunities for green sea turtles in this region. Similarly, increased freshwater flows to Florida Bay and the southwestern coastal estuaries resulting in lowered salinity levels that better encompass seagrass salinity tolerance ranges would also increase foraging opportunities for green sea turtles. Alt 4R2 provided slightly improved salinity conditions in Florida Bay in comparison to Alt 4R. Implementation of Alts 4R and 4R2 would directly benefit foraging green sea turtles within the Northern and Southern Estuaries and provide a minor beneficial effect.

C.2.2.5.4 Birds

The freshwater wetlands of the Everglades are noted for their abundance and diversity of colonial wading birds. Nesting and foraging activities of resident bird species are anticipated show a moderate beneficial effect with the implementation of Alts 4R and 4R2. Impacts to the Cape Sable seaside sparrow, snail kite, and word stork are further discussed in **Section C.2.2.4, Threatened and Endangered Species** (see also **Annex A** for the BA). Changes in water quality also have the potential to affect birds through alteration of vegetation composition or structure or impacts to their forage base. Water quality will continue to be monitored under CEPP and potential effects are largely uncertain at this time.

As predicted by the Trophic Hypothesis (RECOVER 2004) an increase in density of small fishes will directly benefit higher trophic level predators such as wading birds. Therefore, it is predicted that Alts 4R and 4R2 that provide a moderate beneficial effect to small fishes as described in **Section C.2.2.5.2, Fish**, will also perform well overall for wading birds. Crayfish are a particularly important forage resource for nesting white ibis (*Eudocimus albus*). Appropriate foraging conditions and crayfish densities within core foraging areas of nesting wading birds colonies can reduce foraging flight distance. As indicated in **Section C.2.2.5.1, Invertebrates**, increases in hydroperiod associated with implementation of Alts 4R and 4R2 would likely increase crayfish density within northern WCA 3A, WCA 3B and ENP, particularly within the marl prairies.

The largest wading bird rookery within the Everglades ecosystem is Alley North. Under current and FWO conditions, a large dry area within northeastern WCA 3A creates a significant hazard for nesting birds due to egg predation by mammals. Alts 4R and 4R2 show significant hydrological improvement within northeastern WCA 3A, providing minor beneficial effects. As compared to Alt 4R, Alt 4R2 showed slightly lower depths during average hydrologic conditions in northeastern WCA 3A. Associated increased depths, hydroperiods and sheetflow decrease the potential for nest predation within Alley North.

C.2.2.5.5 Mammals

As compared with the FWO, potential minor beneficial effects to mammals within the CEPP action area are anticipated with Alts 4R and 4R2. Small mammals including raccoons and river otters would benefit from increased crayfish and small prey fish biomass in rehydrated areas within northern WCA 3A, WCA 3B and ENP as a result of Alts 4R and 4R2. Effects to state and federally listed species are described in further detail in **Section C.2.2.4, Threatened and Endangered Species** and within **Annex A**. Changes in water quality also have the potential to affect prey forage base through altering of vegetation composition or structure. Water quality will continue to be monitored under CEPP; potential effects are largely uncertain at this time.

CEPP implementation, however, may have a moderate adverse effect on mammals dependent upon upland habitat. As compared with the FWO, Alts 4R and 4R2 increased depths and resulting hydroperiods within northern WCA 3A. Due to increased water flow and changes in water distribution it is anticipated that overdrained areas in northern WCA 3A will be rehydrated, triggering a vegetation transition from upland to wetland habitat. Performance between Alts 4R and 4R2 was similar in northwestern WCA 3A; however Alt 4R2 showed slightly lower depths during average hydrologic conditions in northeastern WCA 3A. Although, mammals occurring within the action area are adapted to the naturally fluctuating water levels in the Everglades; there is an increased potential for this vegetation transition to have a moderate adverse effect on the mammals utilizing upland habitat. This is a particular concern for deer populations within northern WCA 3A that utilize tree islands. However, as discussed in **Section C.2.2.3.4.4, Tree Islands**, no adverse effects to tree islands within WCA 3A and ENP are anticipated to occur under any CEPP implementation; however slightly lower water depths under Alt 4R2 relative to Alt 4R may be more favorable to deer populations in northeastern WCA 3A. Deer populations that utilize the lower elevation tree islands within WCA 3B may suffer from habitat loss, having a moderate adverse effect. In addition, deer that utilize levees slated for removal (L-67A, L-29, L-67 Extension) also have the potential to show a moderate adverse effect. Loss of these levees may be offset by the construction of the Blue Shanty Levee in WCA 3B. Deer are highly mobile and will migrate to find suitable habitat. Negligible effects on mammals in the remainder of the CEPP action area are anticipated under Alts 4R and 4R2.

C.2.2.6 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act, 16USC 1801 et seq. Public Law 104-208 reflects the Secretary of Commerce and Fishery Management Council authority and responsibilities for the protection of essential fish habitat (EFH). Federal agencies that fund, permit, or carry out activities that may adversely impact EFH are required to consult with the National Marine Fisheries Service (NMFS) regarding the potential effects of their actions on EFH. In conformance with the 1996 amendment to the Act, the information provided in this Integrated Environmental Impact Statement (EIS) will comprise the required EFH assessment and has been coordinated with NMFS.

Consultation for CEPP was initiated on January 10, 2012 through a NEPA scoping letter. The NMFS has indicated that beneficial effects to fish resources and EFH may occur as a result of this project. The NMFS requested an evaluation of potential impacts to living marine resources, including mangroves, seagrasses, live bottom communities, and the marine/estuarine water column that may be impacted by activities or operations of the project alternatives.

Essential Fish Habitat in the Project Area:

The project area includes three distinct regional estuarine and nearshore coastal systems: The southern estuaries including Biscayne Bay and Florida Bay; and the northern estuaries including the Caloosahatchee River and the St. Lucie Estuary.

The southern estuaries comprise Biscayne National Park and a large portion of Everglades National Park, and are a shallow estuarine system (average depth less than 3 feet). Florida Bay is the main receiving water of the greater Everglades, heavily influenced by changes in timing, distribution, and quantity of freshwater flows into the southern estuaries. Lake Okeechobee discharges into the two northern estuaries. The St. Lucie Canal feeds into the St. Lucie Estuary, and the Caloosahatchee Canal/River feeds into the Caloosahatchee Estuary to the west.

<u>Biscayne Bay and Florida Bay</u>

The southern estuaries contain essential fish habitat for corals; coral reef and live bottom habitat; red drum (*Sciaenops ocellatus*); penaeid shrimps; spiny lobster (*Panulirus argus*); other coastal migratory pelagic species and the snapper-grouper complex. Species generally present in the southern estuaries region include brown shrimp (*Penaeus aztecus*), pink shrimp (*Penaeus duorarum*), white shrimp, spiny lobster, stone crab, gulf stone crab, red drum, Spanish mackerel, and gray snapper (*Lutjanus griseus*). Essential fish habitat in the southern estuaries is comprised of seagrasses, estuarine mangroves, intertidal flats, the estuarine water column, live/hard bottoms, and coral reefs.

Caloosahatchee River

The Caloosahatchee River estuary contains essential fish habitat for juvenile brown shrimp (*Penaeus aztecus*), juvenile gray snapper (*Lutjanus griseus*), juvenile pink shrimp (*Penaeus duorarum*), adult and juvenile red drum, (*Sciaenops ocellatus*), adult and juvenile Spanish mackerel (*Scomberomorus maculatus*), smalltooth sawfish (*Pristia pectinata*) and juvenile stone crab (*Menippe mercenaria*). Downstream habitats include oyster reefs and seagrass beds (submerged aquatic vegetation).

St. Lucie Estuary

The proposed project is within the jurisdiction of the South Atlantic Fishery Management Council (SAFMC) and is located in areas designated as EFH for wormrock, live bottom habitat, for the American oyster (*Crassostrea virginica*); pink shrimp (*Penaeus duorarum*); white shrimp (*Penaeus* sp.) and brown shrimp (*Penaeus aztecus*); Florida red drum (*Sciaenops ocellatus*); grouper (*Epinephelus* spp.); gray snapper (*Lutjanus griseus*); white grunt (*Haemulon plumieri*); red porgy (*Pagrus pagrus*); spiny lobster (*Panulirus argus*); and the snapper-grouper complex. In addition, the nearshore hardbottom habitat outside of the St. Lucie Estuary is designated as Essential Fish Habitat-Habitat Areas of Special Concern (EFH-HAPC) for the snapper-grouper complex.

Assessments of Effects on Essential Fish Habitat:

Southern Estuaries

Project construction activities should have no effect on the nearshore communities or essential fish habitat downstream of the project areas. However, this project is expected to have a minor beneficial indirect effect by increasing overland flow into the southern estuaries. The increased flow is anticipated to stabilize the water quality and salinities required to improve and sustain nearshore biological communities.

Seagrasses are expected to benefit from the re-direction and dispersion of fresh water across the wetland systems prior to entering the southern estuaries. Seagrass habitats are heavily utilized by both juvenile and adult fishes and invertebrates for feeding and shelter (SAFMC 1998). Species that depend on seagrass habitats include the penaeid pink and brown shrimp, and spiny lobster (SAFMC 1998). Seagrass performs as an important nursery habitat for red drum, snook (*Centropomus undecimalis*), bonefish (*Albula vulpes*), tarpon (*Megalops atlanticus*) and several species of snapper and grouper, and is critical to the health of Biscayne Bay, Florida Bay, and a number of commercial and recreational fisheries (SAFMC 1998).

The restored hydrology provided by this project would also increase the periodic inundation of the downstream mangrove wetlands. Mangrove wetlands depend on this periodic inundation; the lack of freshwater from upstream sources contributes to their degradation (SAFMC 1998). Mangrove habitats are important because they provide food and refuge to a large variety of species. These species include: spiny lobsters, pink shrimp, snook (*Centropomus undecimalis*), goliath grouper (*Epinephelus itajara*), tripletail (*Lobotes surinamensis*), leatherjack (*Oligoplites saurus*), gray snapper (*Lutjanus*

griseus), dog snapper (*L. jocu*), sailor's choice (*Haemulon parra*), bluestriped grunt (*H. sciurus*), sheepshead (*Archosargus probatocephalus*), black drum (*Pogonias cromis*) and red drum (SAFMC 1998).

The estuarine water column is typically characterized by four salinity categories: oligohaline (< 8 psu), mesohaline (8-18 psu), and polyhaline waters (18-30 psu) with some euhaline water (>30 psu) around inlets (SAFMC 1998). Saline boundaries in the estuarine water column are variable, but are generally maintained by sea water transported through inlets by tide and wind mixing with fresh water supplied by land runoff' (SAFMC 1998). This project will improve quantity, timing, and distribution of water delivered to Northern Biscayne Bay and Eastern Florida Bay, providing a minor beneficial effect. It is likely that this will result in an improvement to the salinity characteristics of the estuarine water column. This habitat is utilized by larvae of commercially important fishes for feeding, and is an important means of conveying organisms and nutrients from inland to offshore areas (SAFMC 1998).

This project is not expected to have an effect on coral reef or hard bottom communities in the southern estuaries. There are no coral reefs or hard bottom communities located within the proposed project site or the nearshore waters affected by the project. Corals found within Florida Bay and Biscayne Bay are outside the area of potential effect.

Northern Estuaries

Aquatic habitats within the Caloosahatchee Basin have been altered through the channelization of the river. Nevertheless, the basin continues to support fishery resources of some recreational and commercial importance. Seagrass communities within the Caloosahatchee estuary provide critical refugia for juvenile fishes such as redfish, grouper, snook, and spotted seatrout. The decline in juvenile abundance and distribution of these and other species, along with an overall decrease in species richness may be related to the loss of seagrass habitat and/or a result of alterations in the salinity regime and the timing of the freshwater discharges from the S-79 structure. Reports from Lee County biologists (e.g. J.N. Ding Darling National Wildlife Refuge, City of Sanibel, and the Sanibel Captiva Conservation Foundation), indicate seasonal seagrass die-offs (as observed under the present freshwater plume extending beyond the mouth of the lower estuary); and given the appropriate salinity conditions, seagrass growth and spatial expansion. However, while difficult to quantify the mortality and subsequent impacts to estuarine organisms including oysters and fishes, reductions and durations of high volume freshwater discharges into the Caloosahatchee River as a result of implementing CEPP will help maintain salinities in the preferred ranges for all estuarine biota.

Another primary goal of this project is to reduce high nutrient freshwater flows to the St. Lucie estuary. No direct impacts are anticipated, rather the restoration potential of seagrass beds, oyster reef, and the estuarine water column itself. Increases in seagrass and oyster reef would provide a large number of benefits to the essential fish habitat species. The proposed project significantly increases the acres of SAV, oyster, and healthy benthic habitat, providing a minor beneficial effect.

Conclusion:

Southern Estuaries

Previous water management operations have resulted in an inland migration of saline conditions in both groundwater and surface waters. This has caused the expansion of moderate to high salinity zones and has diminished the spatial extent of freshwater wetland habitats in the southern estuaries. Landward expansion of saltwater and mangrove wetlands, including low-productivity, sparsely vegetated dwarf mangrove communities typical of the hypersaline 'white zone' has also occurred in the southern estuaries.

The proposed project components would improve freshwater delivery to coastal wetlands and adjacent southern estuaries. Implementation of the project would redistribute flow to salt water wetlands and nearshore bay areas and result in favorable changes to salinity levels. These changes may affect essential fish habitat, although the impacts to the aquatic resources are anticipated to be beneficial.

Northern Estuaries

The Caloosahatchee and St. Lucie estuaries both receive excessive discharges from Lake Okeechobee as well as their local basins during wet years, and suffer from too little discharge on excessively dry years.

Restoration goals in the Caloosahatchee estuary include; re-establishment of a salinity range favorable to juvenile marine fish, shellfish, oysters and submerged aquatic vegetation (SAV), re-establishment of seasonally appropriate freshwater flows of favorable quality that maintain low salinities in the upper estuary and re-establishment of more stable salinities and ranges in the lower estuary. Restoration goals for the St. Lucie estuary include maintaining a salinity range favorable to fish, benthic invertebrates, oysters and SAV. This requires a reduction of high volume, long duration discharge events from Lake Okeechobee, the C-44, C-23 and C-24 watersheds.

In summary, CEPP may improve conditions for estuarine and marine resources throughout the Northern Estuaries by restoring more natural timing, volume, and duration of freshwater flows to the Caloosahatchee and St. Lucie estuaries. It has the potential to reduce excess nutrient loading and provide a more appropriate range of salinity conditions by reducing extreme salinity fluctuations and durations. The improvement of estuarine conditions will ultimately have a beneficial effect to essential fish habitat resources.

C.2.2.7 Hydrology

Hydrologic modeling simulations of the ECB and the FWO were developed with the RSM-BN and RSM-GL sub-regional modeling tools, to provide baseline conditions for plan formulation, the assessment of CEPP project benefits (comparisons against FWO), and the assessment of CEPP alternative performance for the level-of-service for flood protection and water supply (comparisons against ECB). The ECB was developed to represent the system-wide infrastructure and operations that were in place at the time CEPP plan formulation was initiated, approximately January 2012. The FWO for CEPP assumes the construction and implementation of currently authorized CERP and non-CERP projects, and other Federal, state or local projects constructed or approved under existing governmental authorities that occur in the CEPP study area. Selection of the TSP is conducted based on comparisons between the CEPP alternatives and the CEPP FWO. The reader should refer to Section 2 of the CEPP PIR main report and Appendix C.1 for additional documentation of the ECB and FWO conditions.

The portion of the Greater Everglades within the CEPP project area includes WCA 1, WCA 2A, WCA 2B, WCA 3A, WCA 3B, and ENP. This overview of CEPP hydrological conditions is intended to provide a general overview of regional hydrological changes for Alt 4R and the CEPP TSP (Alternative 4R2) compared to the CEPP FWO. RSM-BN and RSM-GL hydrologic modeling simulations for the CEPP final array of alternatives were developed starting from the FWO modeling simulation. Since all of the components north of the red line were the same for the initial CEPP final array of alternatives (Alts 1 through 4), a single RSM-BN simulation was originally completed for all of the CEPP components north of the red line. However, during the modeling effort for the Alt 4R and Alt 4R2, revised RSM-BN simulations were completed for these alternative simulations to address performance shortfalls observed with Alt 4 and Alt 4M, including to avoid potential impacts to water supply levels of service in

the Lake Okeechobee Service Area (LOSA) and the Lower East Coast (LEC) and to avoid increases in the number of low flow events to the St. Lucie Estuary. The revised RSM-BN simulations resulted in updated boundary conditions for the RSM-GL modeling of Alt 4R and Alt 4R2. Hydrologic performance within any specific spatial area is due to the combined effect of Alt 4R and Alt 4R2 components and operations identified throughout the project area. Deduction of cause-effect relationships between CEPP alternative components were conducted throughout the CEPP preliminary screening and alternative formulation effort (refer to **Sections 3** and **4** of the CEPP PIR/EIS main report). For a more detailed assessment, the reader should refer to the complete suite of RSM-GL modeling results. A map of the RSM-GL gage locations is provided in **Figure C.2.2-51**.

The ECB and FWO baseline condition assumptions, which were established early during the CEPP preliminary screening process (prior to February 2012), were not modified during the CEPP formulation process in order to maintain a consistent set of base conditions for screening and alternative evaluation purposes. Following identification of the recommended plan in June 2013, the base condition assumptions were subsequently revisited and updated to represent the most current information for the analysis of Savings Clause requirements and Project-Specific Assurances in Annex B. The revised 2012 Existing Condition Baseline (2012EC) updated the ECB to include implementation of ERTP operations for WCA-3A and the South Dade Conveyance system, in addition to minor localized corrections to improve RSM-GL representation of the S-9/S-9A operations and the L-28 weir (all other ECB assumptions remain unchanged; the complete assumptions tables for the ECB and 2012EC are provided in Annex A-2 of Appendix A). The revised Initial Operating Regime Baseline (IORBL1) updated the FWO to include final SFWMD proposed operational intent for the Restoration Strategies project, the 2.6 mile western Tamiami Trail bridge proposed with the initial increment of the DOI Tamiami Trail Next Steps Project (based on best available phased implementation information from DOI), operational updates to the CERP Indian River Lagoon South (IRLS) project (based on best available information from the IRLS project team), and operational refinements to the CERP Broward County Water Preserve Area project (to reduce excess discharges to tide via S-29, without the CERP Lake Belt reservoirs assumed in the CEPP FWO condition), in addition to the same minor localized corrections included with the 2012EC to improve RSM-GL representation of the S-9/S-9A operations and the L-28 weir (all other FWO assumptions remain unchanged; the complete assumptions tables for the FWO and IORBL1 are provided in Annex A-2 of Appendix A). Compared to the FWO baseline, the updated IORBL1 baseline indicates significant hydrologic differences with respect to the Saint Lucie Estuary, the L-28 Triangle, and Biscayne Bay, with other portions of the CEPP project area performing similar to the FWO; since the analysis contained in Annex B compares the recommended plan (ALT 4R2) to the IORBL1, a summary of these performance differences between the FWO and IORBL1 is provided in this section for the St. Lucie Estuary, the L-28 Triangle, and Biscayne Bay.

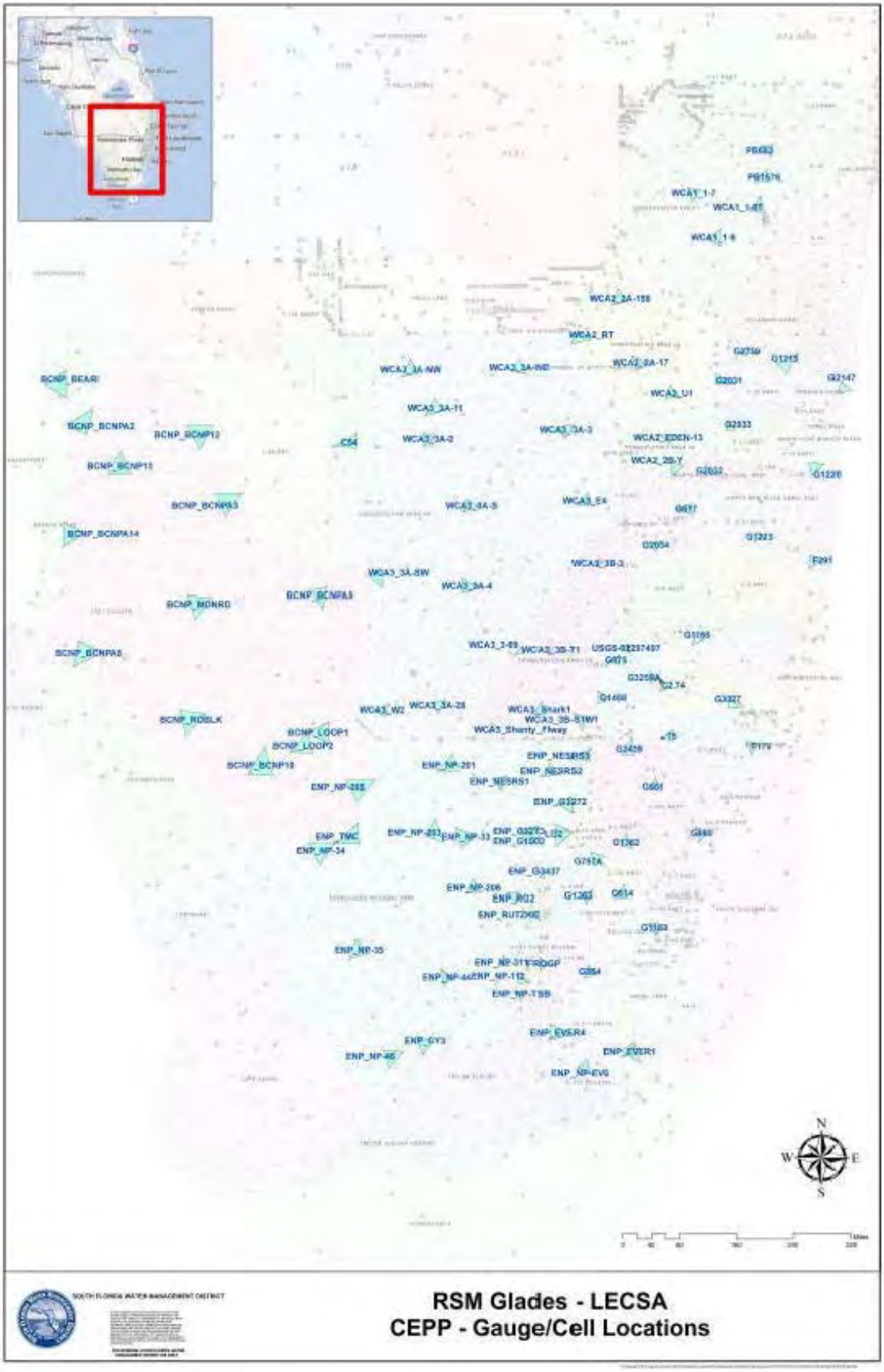


Figure C.2.2-51. **Map of RSM-GL monitoring gage locations.**

C.2.2.7.1 Lake Okeechobee and the Northern Estuaries

As a result of the CEPP preliminary screening process, operational changes were incorporated into the hydrologic modeling conducted for the CEPP alternatives, including the Alt 4R and the TSP Alt 4R2, in efforts to optimize CEPP system-wide performance within the assumed existing flexibility of the 2008 LORS. More specifically, the hydrologic modeling of the CEPP alternatives included proposed revisions to the 2008 LORS decision tree outcome maximum allowable discharges dependant on the following criteria: Lake Okeechobee inflow and climate forecasts (class limits were modified for tributary hydrologic conditions, seasonal climate outlook, and multi-seasonal climate outlook), stage level (regulation zone), and stage trends (receding or ascending). While some refinements were made within the operational flexibility available in the 2008 LORS, consistent with the original modeling intent, the final operational assumptions ultimately extended beyond this flexibility due to adjustments made to the tributary/climatological classifications. Minor modifications to the operational assumptions were included for Alt 4R and Alt 4R2, compared to Alts 1 through 4. For all CEPP alternatives, the LORS 2008 Regulation Schedule zones were unchanged. Additional information and documentation of these assumptions can be found in the Engineering Appendix of the CEPP PIR.

Compared to the FWO, Alt 4R2 Lake Okeechobee stages are increased by 0.25-0.50 feet for the upper 70% of the stage duration curve, excluding extreme wet hydrologic conditions (**Figure C.2.2-52**). Compared to the FWO, Alt 4R Lake Okeechobee stages are increased by 0.25-0.50 feet for the upper 60% of the stage duration curve, excluding extreme wet hydrologic conditions. Compared to Alt 4, Lake Okeechobee stages for Alt 4R and Alt 4R2 are slightly increased by less than 0.10 feet during the upper 40% of the stage duration curve. Peak lake stage increased from 17.50 feet NGVD in the FWO to 17.64 feet NGVD in Alt 4R and 17.66 feet NGVD for Alt 4R2. The number of days with stages above 16 feet NGVD is increased from 696 in the FWO to 1157 and 1162 in Alt 4R and Alt 4R2, respectively, during the 1965-2005 period of simulation.

For the Caloosahatchee Estuary, compared to the FWO, mean monthly flows above 2800 cfs and 4500 cfs are reduced by 11 months and 4 months, respectively for Alt 4R2 (14% and 12% reductions, respectively; **Figure C.2.2-53**). Mean monthly flows above 2800 cfs and 4500 cfs are reduced by 11 and 3 months, respectively for Alt 4R (14% and 9% reductions, respectively. Mean monthly flows less than 450 cfs are reduced by 4 months (15%) for Alt 4R2 and 3 months (11%) for Alt 4R (**Figure C.2.2-54**).

For the St. Lucie Estuary, compared to the FWO, mean monthly flows above 2000 cfs and 3000 cfs are reduced by 29 months and 7 months, respectively for Alt 4R2 (34% and 23% reductions, respectively; **Figure C.2.2-55**). Mean monthly flows above 2000 cfs and 3000 cfs are reduced by 27 months and 5 months, respectively for Alt 4R (32% and 16% reductions, respectively. Mean monthly flows less than 350 cfs are decreased by 27 months (29%) for Alt 4R2 and decreased by 2 months (2%) for Alt 4R (**Figure C.2.2-56**).

For the St. Lucie Estuary, compared to the IORBL1, mean monthly flows above 2000 cfs and 3000 cfs are reduced by 15 months and 5 months, respectively for Alt 4R2 (21% and 17% reductions, respectively). Compared to the IORBL1, mean monthly flows less than 350 cfs are increased by 12 months (23%) for Alt 4R2.

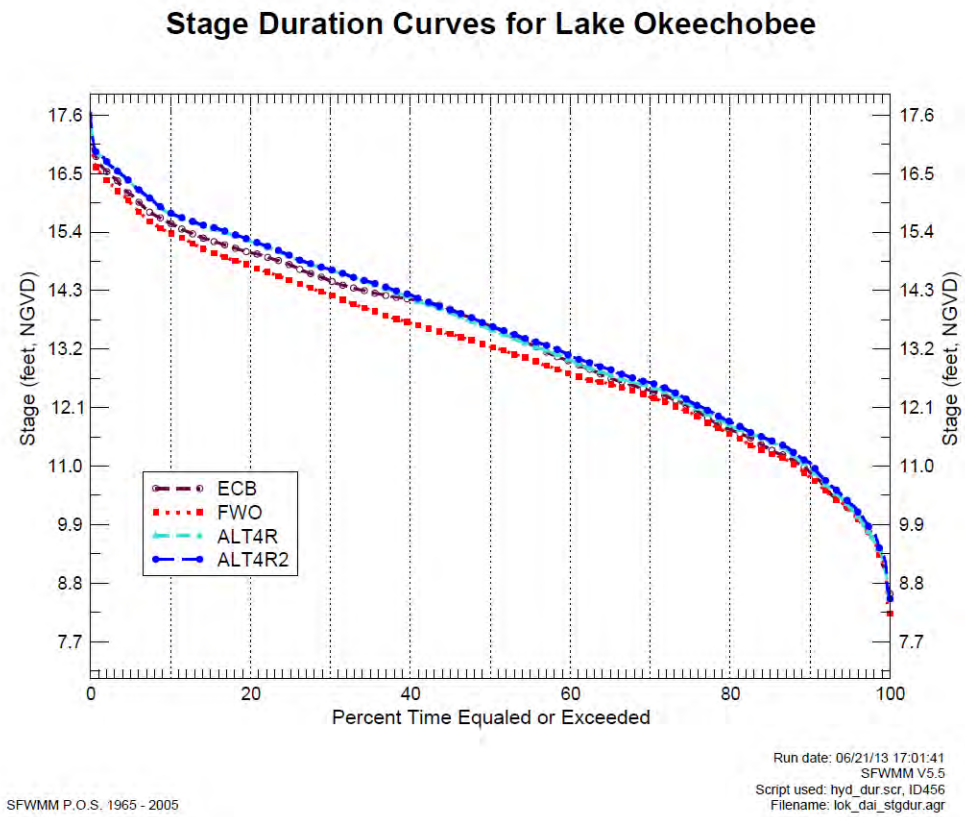


Figure C.2.2-52. Lake Okeechobee Stage Duration Curve for CEPP Alt 4R.

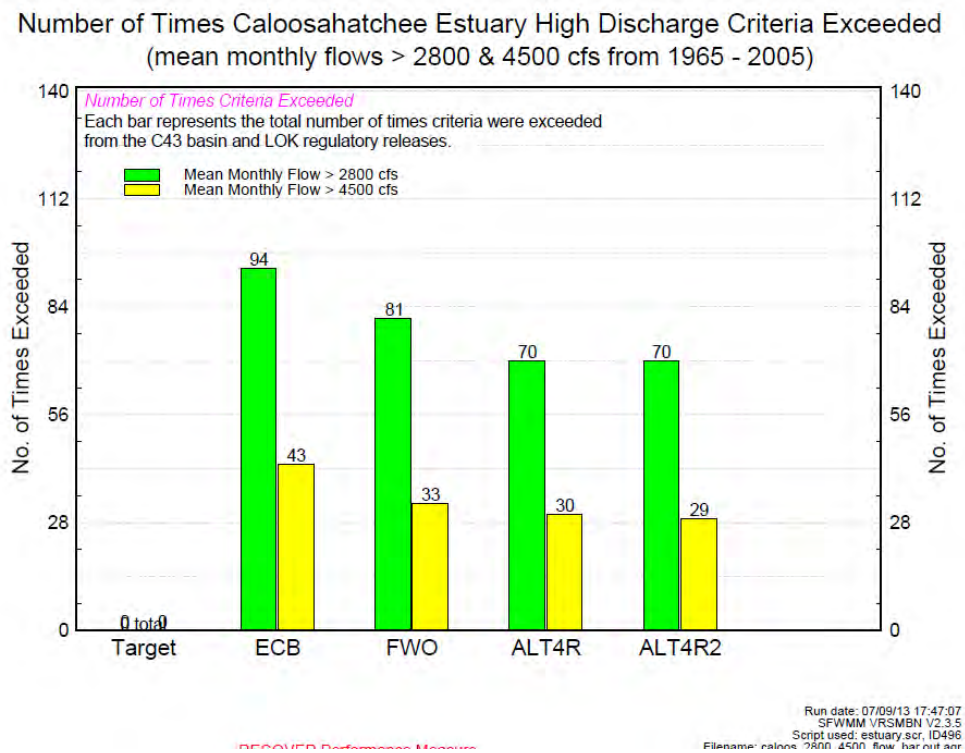


Figure C.2.2-53. Caloosahatchee Estuary High Discharge Frequency for CEPP Alt 4R.

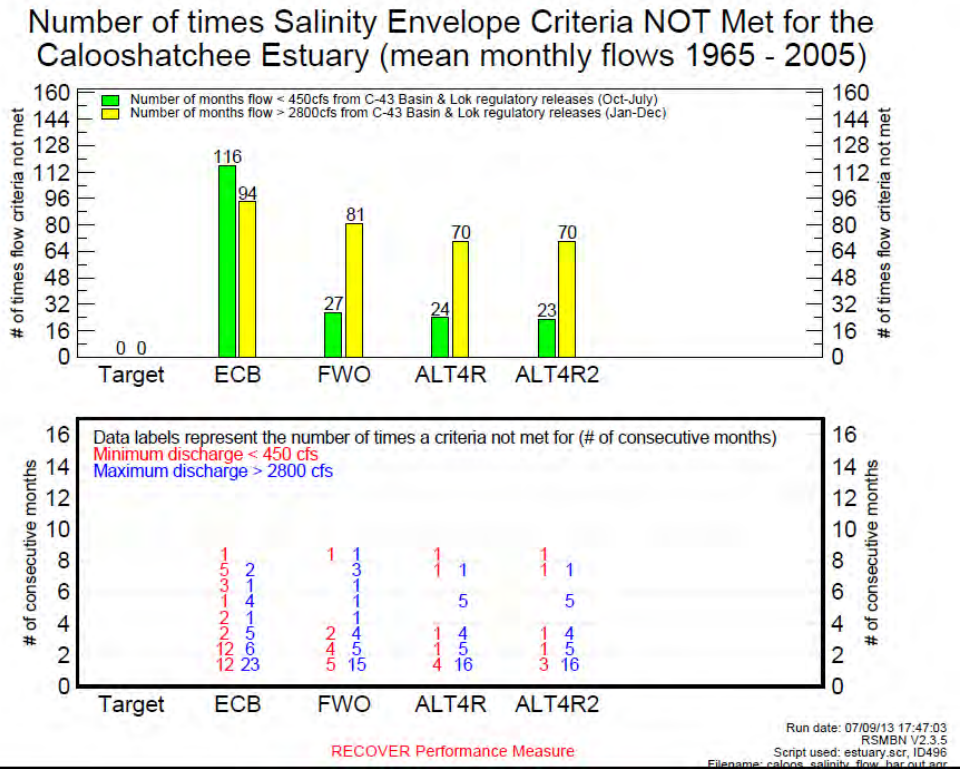


Figure C.2.2-54. Caloosahatchee Estuary Low Discharge Frequency for CEPP Alt 4R.

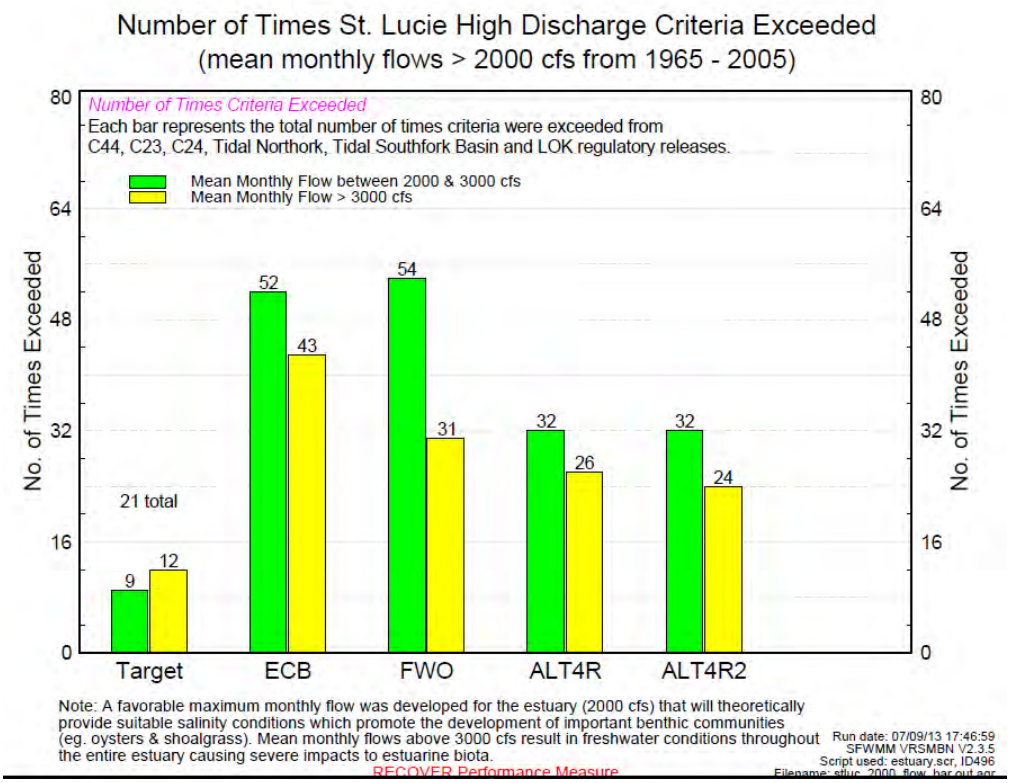


Figure C.2.2-55. St. Lucie Estuary High Discharge Frequency for CEPP Alternatives.

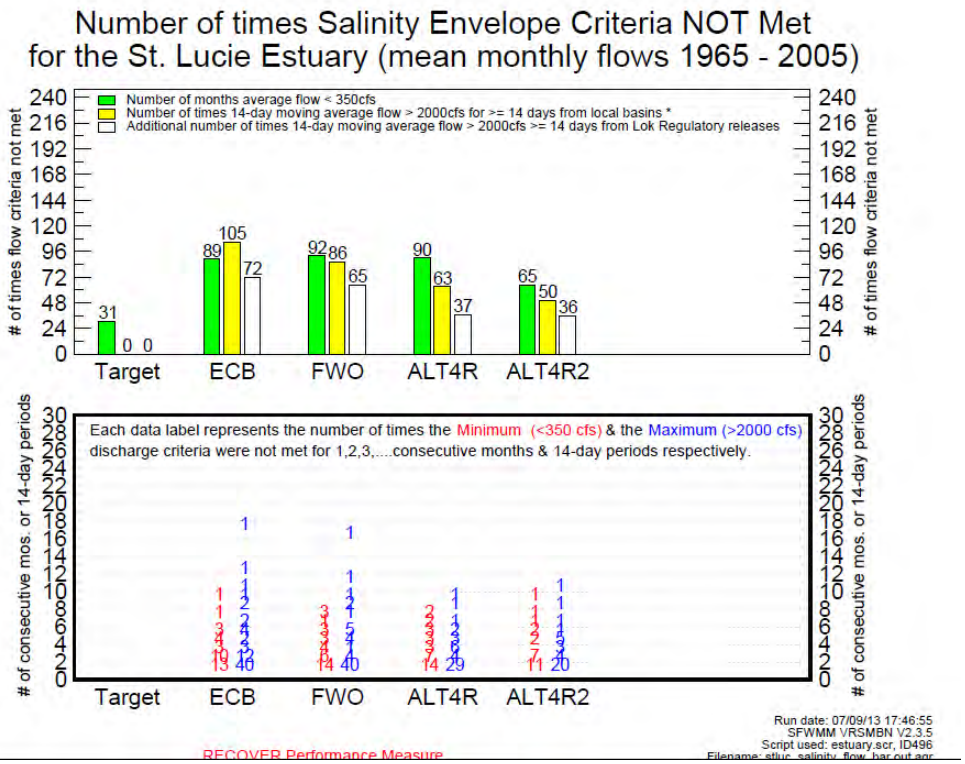


Figure C.2.2-56. St. Lucie Estuary Low Discharge Frequency for CEPP Baselines.

C.2.2.7.2 Everglades Agricultural Area

Minor changes to groundwater levels are expected adjacent to the proposed CEPP A-2 FEB (14,000 acres), compared to the FWO which includes the SFWMD Restoration Strategies A-1 FEB. The A-2 FEB design includes perimeter seepage collection canals and associated seepage pumps to limit potential impacts. Detailed CEPP assessments within the EAA are not available because the RSM-BN does not simulate groundwater within the EAA.

C.2.2.7.3 Water Conservation Area 1

Compared to the FWO, no significant changes to WCA 1 stages are indicated with Alt 4R or Alt 4R2. Average annual regulatory releases from WCA 1 to WCA 2A via the S10 structures are slightly reduced from 268,000 acre-feet (268 kAF) to approximately 266 kAF with Alt 4R and Alt 4R2.

C.2.2.7.4 Water Conservation Area 2A and 2B

Compared to the FWO, WCA 2A stages are moderately decreased by 0.1-0.3 feet under all hydrologic conditions for Alt 4R and Alt 4R2 (**Figure C.2.2-57**). Average annual inflows from STA 2 (including Compartment B) to WCA 2A are significantly decreased from 381 kAF to 230 kAF in Alt 4R (a 40% decrease) and 236 kAF in Alt 4R2 (a 38% decrease) with the assumed implementation of the L-6 diversion from WCA 2A to WCA 3A. The S-7 pump station also contributes inflows to WCA 2A; S-7 inflows are reduced from 77 kAF in the FWO to 29 kAF in Alt 4R and 68 kAF in Alt 4R2, due to operations to redirect a portion of STA-3/4 discharges away from WCA 2A to WCA 3A via the S-8 pump station. The L-6 diversion from WCA 2A to WCA 3A is utilized approximately 70 percent of the period of simulation under the TSP Alt 4R2 operations (reduced compared to Alt 4R), with the maximum diversion capacity of 500 cfs approximately 17 percent of the period of simulation. Average annual regulatory releases from

WCA 2A to WCA 3A via the S11s are significantly decreased from 460 kAF in the FWO to 290 kAF for Alt 4R and 323 kAF for Alt 4R2.

Compared to the FWO, Alt 4R stages within WCA 2B are significantly decreased by 0.25-0.50 feet under nearly all hydrologic conditions, excluding extreme wet conditions, for Alt 4R (**Figure C.2.2-58**). Stages are approximately equivalent to the ECB. Alt 4R2 operational adjustments to reduce the frequency and magnitude of the L-6 diversion operations resulted in increased stages within WCA 2B. Compared to the FWO, Alt 4R2 stages within WCA 2B are slightly decreased by less than 0.10 feet between the 20th and 60th percentiles of the stage duration curve and stages are decreased by 0.25 feet during the driest 20 percent of the stage duration curve. Changes within WCA 2B are directly related to the decreased stages within WCA 2A and decreased inflows from S-144, S-145, S-146, and seepage.

C.2.2.7.5 L-28 Triangle and Western L-28 Basin

Located to the west of northwestern WCA 3A, the areas immediately west of the L-28 Levee are affected by the increased stage levels in northwest WCA 3A through increased seepage westward across the L-28 Levee. South of the L-4 Levee and north of Interstate 75 (approximately 11 miles), the areas immediately west of the L-28 Levee include the Seminole Big Cypress Indian Reservation and the Miccosukee Indian Reservation. Compared to the FWO, Alt 4R and Alt 4R2 stages immediately west of the L-28 Levee are increased by 0.1-0.2 feet under wet to normal hydrologic conditions and increased by 0.2-0.3 feet under normal to dry hydrologic conditions, with no significant change indicated for extreme wet or dry conditions (**Figure C.2.2-59**). Stage increases are only observed for the RSM-GL cells located immediately west of the L-28 Levee, which correspond to approximately 1-2 miles west of L-28. Average annual hydroperiods for these cells are increased by 10 to 60 days with Alt 4R and Alt 4R2 for the 7-8 miles north of Interstate 75 (FWO hydroperiods range from 25-150 days), with no significant hydroperiod changed indicated for the 2-3 miles south of L-4 (FWO hydroperiods range from 0-15 days) .

The L-28 Triangle area is located entirely within the boundaries of the Miccosukee Federal Indian Reservation and encompasses 7830 acres of Tribal lands and approximately 230 acres of BCNP. The L-28 Triangle area is confined on north by Interstate 75, the west by L-28 Interceptor Canal (L-28I) and the BCNP, and the east by the L-28 Canal. Although Alt 4R and Alt 4R2 do not include modifications to the L-28 Levee or the adjacent canal, stages within the L-28 Triangle are significantly increased by 0.25-1.0 feet during normal to extreme wet hydrologic conditions, compared to the FWO. This anomalous stage increase is the result of a localized correction to improve RSM-GL representation of the L-28 weir, which was implemented for the updated ECB (2012EC) and the updated FWO (IORBL1), and retained (unchanged compared to the IORBL1) in Alt 4R and Alt 4R2. The ECB and FWO baseline conditions should not be compared to the Alt 4R and Alt 4R2 results. Alt 4R and Alt 4R2 results for the L-28 Triangle area can only be meaningfully compared to the 2012EC and IORBL1.

Although Alt 4R and Alt 4R2 do not include modifications to the L-28 Levee or the adjacent canal, stages within the L-28 Triangle are slightly increased by 0.1-0.2 feet during nearly all hydrologic conditions, due to groundwater interactions with the down-gradient western WCA 3A marsh (**Figure C.2.2-60**). Compared to the FWO, no stage increases are indicated during extreme wet hydrologic conditions.

C.2.2.7.6 Big Cypress National Preserve

Stages within the BCNP, west of WCA 3A and Western Shark River Slough (ENP), do not change significantly between the CEPP FWO, Alt 4R, and Alt 4R2.

C.2.2.7.7 Water Conservation Area 3A and 3B

The hydrologic effects of the CEPP alternatives include the combined effects from implementation of the A-2 FEB, the L-6 Diversion, the northern WCA 3A hydropattern restoration components along L-4, the Miami Canal backfill (north of Interstate 75), and the proposed new or expanded WCA 3A outlet structures along L-67A, along with the associated operations. Compared to the FWO, average annual combined structural inflows to WCA 3A from STA 3/4, STA 5/STA 6 (including Compartment C), and WCA 2A are significantly increased from 1,028 kAF to 1,258 kAF (a 22% increase) with Alt 4R2. Compared to the FWO, average annual combined structural inflows to WCA 3A from STA 3/4, STA 5/STA 6 (including Compartment C), and WCA 2A are significantly increased from 1,028 kAF to 1,266 kAF (a 23% increase) with Alt 4R. In order to avoid adverse increases to the frequency, duration, and peak stages of WCA 3A high water conditions with this net increase in WCA 3A inflows, average annual combined structural outflows from WCA 3A through S-151 (to WCA 3B), S-333 (to ENP NESRS), the S-12 structures (to ENP WSRS), and the S343/S344 culverts are also significantly increased from 1,190 kAF in the FWO to 1,427 kAF for Alt 4R2 and 1,423 kAF in Alt 4R (approximately 20% increases).

Since WCA 3A covers approximately 752 square miles, hydrologic differences between the CEPP FWO , Alt 4R, and Alt 4R2 are characterized at representative gages throughout WCA 3A.

Within northwest WCA 3A, compared to the FWO, stages are generally significantly increased by 0.6-0.8 feet for Alt 4R and Alt 4R2 (**Figure C.2.2-61**). Stages within northeast WCA 3A are generally significantly increased by 0.4-0.7 feet for Alt 4R and Alt 4R2, with no significant change during extreme wet conditions and a slight increase in stage for extreme dry conditions (**Figure C.2.2-62**); Alt 4R2 stages are slightly reduced, by less than 0.10 feet, compared to Alt 4R2 due to the reduced frequency and magnitude of L-6 diversion operations. Within east-central WCA 3A (3A-3), Alt 4R and Alt 4R2 stages are generally significantly increased by 0.2-0.5 feet, with no significant change during the wettest 20% of conditions (**Figure C.2.2-63**). Proceeding south within central WCA 3A (3A-4), Alt 4R and Alt 4R2 stages are generally increased by 0.1-0.2 feet during average to dry conditions, with a slight depth reduction during the wettest 10% of conditions and no significant change during extreme dry conditions (**Figure C.2.2-64**). Southern WCA 3A (3A-28) stages for Alt 4R and Alt 4R2 are decreased by 0.1-0.2 feet during the wettest 5% of conditions and slightly decreased during normal to dry conditions (**Figure C.2.2-65**).

The CEPP FWO includes the existing S-151 gated culvert as the sole structural inflow to WCA 3B (327 kAF average annual) and the existing S-355 A and B spillways as the only structural outflows from WCA 3B (<2 kAF average annual). Alt 4R and Alt 4R2 include three new inflow structures to WCA 3B along L-67A (in addition to increased capacity at S-333), resulting in an additional WCA 3B inflow design capacity of 1500 cfs. The WCA 3B outflow configuration for Alt 4R and Alt 4R2 includes the removal of the L-29 Levee within the Blue Shanty flowway. Water budget map with surface water flow vectors for Alt 4R and Alt 4R2, focusing primarily on the structure flows (kAF average annual) and locations (levee seepage flux along L-30 and L-29 is also indicated), are provided in **Figure C.2.2-66** and **Figure C.2.2-67**, similar to the graphics previously provided for Alts 1 through 4. Alt 4R and Alt 4R2, with the Blue Shanty flowway and L-29 Levee Gap, achieve significant north-to-south surface water flow directionality within WCA 3B only in the spatial footprint of the Blue Shanty flowway. Peak stages within central WCA 3B (Site 71) exceed 9.0 feet NGVD for only 15 days (0.10%) of the RSM-GL 1965-2005 period of simulation for both alternatives (compared to 9 days for Alt 4), and WCA 3B stages are above 8.0 feet NGVD for approximately 22-24% or the period of simulation (compared to 21% for Alt 4); Alt 4R2 stages at Site 71 are slightly higher than Alt 4R.

The WCA 3B hydrologic effects, resultant from the targeted increased inflows to eastern WCA 3B with Alt 4R and Alt 4R2, compared to Alt 4, are apparent. Compared to the FWO, Alt 4R and Alt 4R2 stages at WCA 3B Site 71 are increased under all hydrologic conditions (**Figure C.2.2-68**), including stage increases of 0.1 feet during the upper 20% of the stage duration curve (wet to extreme wet conditions), stage increases of 0.2-0.3 feet for normal to dry conditions, and a slight stage increase during extreme dry conditions. For Alt 4R and Alt 4R2, the stage duration curves for stages within the interior of the Blue Shanty flowway and the down-gradient L-29 Canal stages are shown in **Figure C.2.2-69** and **Figure C.2.2-70**. For Alt 4R2, the peak stage within the Blue Shanty flowway is 9.70 feet NGVD and stages exceed 8.0 feet NGVD for approximately 42% of the period of simulation. For Alt 4R, the peak stage within the Blue Shanty flowway is 9.74 feet NGVD and stages exceed 8.0 feet NGVD for approximately 45% of the period of simulation. The Alt 4R2 simulation included operational constraints for the inflow structures to the Blue Shanty flowway (S-345F and S-345G) to prevent L-29 Canal stages from exceeding 9.7 feet NGVD, the assumed design high water criteria for the DOI TTNS project.

C.2.2.7.8 Northeast Shark River Slough

Consistent with Alts 1 through 4, Alt 4R and Alt 4R2 assumes the L-29 Canal maximum operational limit at 9.7 feet NGVD (7.5 feet NGVD is used for the ECB and FWO) and removal of the G-3273 stage constraint (6.8 feet NGVD is used for the ECB and FWO). Total net structural inflows to NESRS (via the L-29 Canal; computed as the sum of S-333, S355A, S-355B, L-29SA, L-29PA, L-29PB, L29 Levee Gap, and S-356 minus S-334) are significantly increased to 761 kAF with Alt 4R and Alt 4R2, compared to the CEPP FWO (94 kAF average annual); L-29 inflows are slightly increased compared to Alt 4 (717 kAF).

Stage duration curves for the L-29 Canal are provided in **Figure C.2.2-71** and **Figure C.2.2-72** (upper 25% only) (note: for Alt 4R and Alt 4R2, L-29 Canal stages are indicated west of the proposed L-29 divide structure). For Alt 4R and Alt 4R2, peak stages in the L-29 Canal range are 9.59-9.60 feet NGVD west of the L-29 divide structure and 9.50-9.51 feet NGVD east of the L-29 divide structure (the FWO peak stage is 8.43 feet NGVD). Based on the assumed operational constraints, the CEPP FWO L-29 Canal stage exceeds the maximum operational limit of 7.5 feet NGVD approximately 6% of the 1965-2005 RSM-GL period of simulation (due to direct rainfall); by contrast, the 9.7 feet NGVD maximum operational limit prescribed for Alt 4R and Alt 4R2 is not constraining during any period within the period of simulation, and L-29 Canal stages exceed 8.5 feet NGVD during only approximately 11% of the period of simulation within the western L-29 Canal and approximately 5% within the eastern L-29 Canal segment in both alternatives.

Compared to the FWO, stages are significantly increased by 0.5-0.9 feet under all hydrologic conditions at NESRS-2 for Alts 4R and Alt 4R2 (**Figure C.2.2-73**). Similar trends are also observed further south at the NESRS-1 monitoring gage. Changes to the average annual overland flow to NESRS across RSM-GL transect 18 are shown in **Figure C.2.2-75**; a reference map for the RSM-GL transects (which are consistent with the SFWMM model transects, adjusted for the RSM grid resolution) is provided in **Figure C.2.2-74**.

C.2.2.7.9 Western Shark River Slough

WSRS, located to the west of L-67 Extension Levee and bounded on the north by Tamiami Trail, is primarily influenced by rainfall and water management operations at the S-12 structures (A, B, C and D). Under ERTP, the utilization of the S-12 structures and the seasonal sequential closure periods beginning from the west at S-12A (November 1 – July 14) and S-12B (January 1 – July 14), respectively, is meant to move water from WCA 3A into SRS while providing conditions for Cape Sable seaside sparrow Subpopulation-A (CSSS-A) nesting and breeding. Modification to the ERTP seasonal closure periods for

the S-12A and S-12B was not considered during CEPP preliminary screening and alternative formulation, based on USACE consideration of the USFWS Biological Opinion for ERTP.

Changes to the average annual overland flows to WSRS across RSM-GL transect 17 are shown in **Figure C.2.2-76**. Compared to the FWO, Alt 4R and Alt 4R2 stages within northwest ENP (NP-201) are generally significantly decreased by 0.1-0.3 feet under both wet and dry hydrologic conditions; stages are slightly increased or unchanged from the FWO for normal hydrologic conditions between approximately 35% and 55% on the stage duration curve (**Figure C.2.2-77**). To the south and west, the NP-205 monitoring gage (used as an indicator for CSSS-A hydrology) indicates a potentially significant stage decrease of 0.1-0.2 feet under all hydrologic conditions for all alternatives, including Alt 4R and Alt 4R2, compared to the FWO (**Figure C.2.2-78**). Stages further south within Central Shark River Slough (P-33) are generally significantly increases by 0.2-0.4 feet under all hydrologic conditions for Alt 4R and Alt 4R2 (**Figure C.2.2-79**). Stages within Central Shark River Slough demonstrate a combined hydrologic response to the hydrologic changes previously indicated for both NESRS and WSRS; the resultant combined average annual transect flows within Central Shark River Slough (Transect 27) are significantly increased from an average annual volume of 594 kAF with the FWO to 758 kAF for Alt 4R (28% increase) and 760 kAF for Alt 4R2 (28% increase) (**Figure C.2.2-80**).

C.2.2.7.10 Taylor Slough

Compared to the FWO, ENP stages along Taylor Slough (NP-TSB) are slightly decreased by approximately 0.1 feet during the wettest 20% of hydrologic conditions and slightly increased by 0.1-0.2 feet during normal to dry hydrologic conditions with Alt 4R and Alt 4R2 (**Figure C.2.2-81**). Consistent with Alt 4, Alt 4R and Alt 4R2 each include the Blue Shanty flowway and the L-29 divide structure to direct surface water flows further west within NESRS, as compared to Alts 1 through 3.

C.2.2.7.11 Lower East Coast Area

The LEC area is located to the east of the L-31N, L-31W, and C-111 canals. Under the FWO (ERTP), specified canal water levels/ranges are meant to provide flood protection, water supply, and prevention of saltwater intrusion for the LEC. For the CEPP final array of alternatives, including Alt 4R and Alt 4R2, the operations for the SDCS are changed from the FWO operations for G-211 and the coastal canals are utilized to convey seepage water to Biscayne Bay to offset for reduced flows caused by implementation of CEPP.

Observed stage changes within the LEC are separately discussed with the summary of flood control and water supply performance for the CEPP alternatives, included in **Section C.2.2.8**.

C.2.2.7.12 8.5 Square Mile Area

Consistent with Alts 1 through 4, Alt 4R and Alt 4R2 modify the FWO operations of the S-357 pump station, in an effort to increase discharges from the 8.5 SMA detention cell to the C-111 South Dade North Detention Area and reduce the reliance on the S-331 pump station in L-31N to provide flood mitigation for the 8.5 SMA protected area. Details of the S-357 operations are provided with the documentation of the modeling assumptions for the CEPP action alternatives, located in Annex A-2 of the Engineering Appendix (Appendix A). The protected portion of the 8.5 SMA is represented by three model grid cells in the RSM-GL (**Figure C.2.2-82**), and the resolution of the RSM-GL is extremely limiting for adequate representation of the 8.5 SMA project features. Prior to implementation of CEPP, further technical investigations will likely be needed for the 8.5 SMA operations, and additional hydrologic/hydraulic modeling with a higher resolution model may be required.

The 8.5 SMA detention cell weirs were lowered with Alt 4R and Alt 4R2 to allow overflow when depths exceeded 1.0 feet, which resulted in performance improvements within the southwestern portion of the 8.5 SMA protected area compared to Alts 1 through 4. RSM-GL modeling of Alt 4R and Alt 4R2 indicate that stages within the 8.5 SMA are lowered by approximately 0.25-0.50 feet during wet conditions for the three RSM-GL grid cells 2965 that represent the protected portion of the 8.5 SMA, compared to the FWO. Stages for the southwest portion of the 8.5 SMA protected area are indicated in **Figure C.2.2-83**.

C.2.2.7.13 Biscayne Bay

Combined total average annual surface water canal discharges to central and southern Biscayne Bay (S-336, S-338, S-194, S-196, S-197) are reduced by approximately 9 kAF for Alts 4R, compared to the FWO. Average annual surface water canal discharges to northern Biscayne Bay (S-29, S-28, S-27), which are affected by the assumed operations of the CERP BCWPA project, are slightly reduced by 2 kAF for Alt 4R, compared to the FWO. Modifications to the Alt 4 L-31N seepage cutoff wall and SDCS operations were specifically targeted to limit potential water supply reductions to Biscayne Bay (canal discharges to the central and southern Biscayne Bay were reduced by 37 kAF, and canal discharges to northern Biscayne Bay were reduced by 7 kAF for Alt 4). In response to potential Savings Clause concerns with this reduction to Biscayne Bay, Alt 4R2 operations were further adjusted to direct a larger quantity of the CEPP increased seepage from WCA 3B and NESRS to Biscayne Bay. Combined total average annual surface water canal discharges to central and southern Biscayne Bay (S-336, S-338, S-194, S-196, S-197) are increased by approximately 17 kAF for Alt 4R2, compared to the FWO. Average annual surface water canal discharges to northern Biscayne Bay (S-29, S-28, S-27), which are affected by the assumed operations of the CERP BCWPA project, are reduced by 46 kAF for Alt 4R2, compared to the FWO.

Combined total average annual surface water canal discharges to central and southern Biscayne Bay (S-336, S-338, S-194, S-196, S-197) are increased by approximately 15 kAF for Alt 4R2, compared to the IORBL1. Average annual surface water canal discharges to northern Biscayne Bay (S-29, S-28, S-27), which are affected by the assumed operations of the CERP BCWPA project, are reduced by 4 kAF for Alt 4R2, compared to the IORBL1.

C.2.2.7.14 Florida Bay

For Alt 4R and Alt 4R2, average annual surface water transect flows from southeastern ENP towards Florida Bay are increased by 2 kAF (7%) for Craighead Basin (RSM-GL Transect 23-A), increased by 8-10 kAF (11-14%) from Taylor Slough (Transect 23-B), and increased by 13-15 kAF (9-10%) for the Eastern Panhandle of ENP (Transect 23-C), resulting in a net increase of approximately 27 kAF for Alt 4R and 23 kAF for Alt 4R2, compared to the FWO. Alt 4R2 overland flows to Florida Bay are slightly reduced compared to Alt 4R for Transect 23-B and Transect 23-C. The salinity effects within Florida Bay from this overall increase and changed spatial distribution of flows were also evaluated by the CEPP ecological sub-team (with additional RECOVER support), and additional information for the changes observed between Alt 4R and Alt 4R2 compared to the FWO is discussed in **Appendix G, Environmental Benefits Model**.

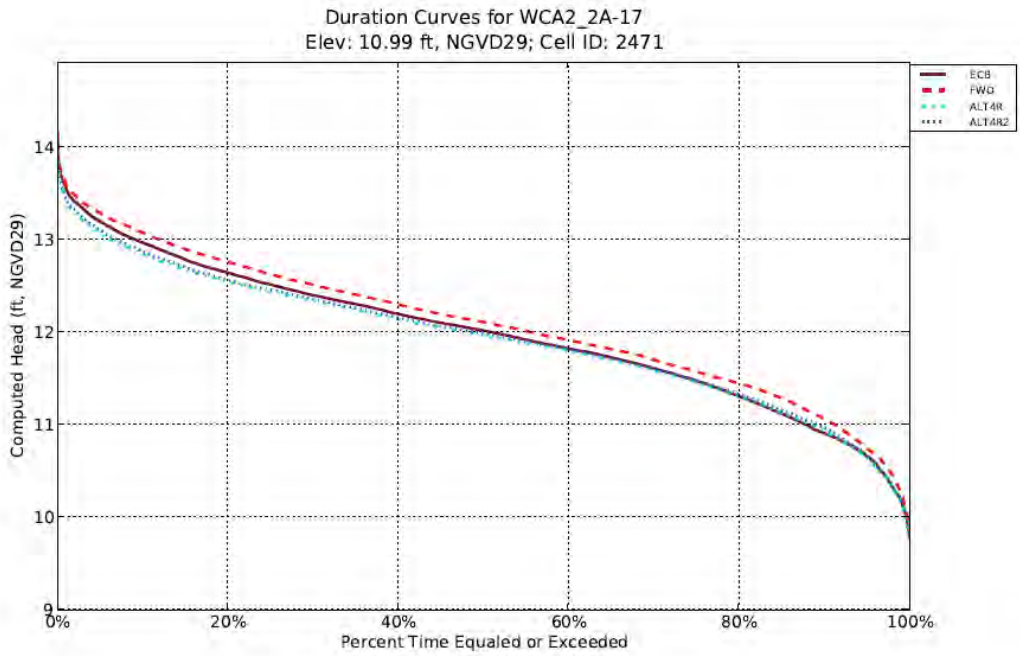


Figure C.2.2-57. Central WCA 2A Stage Duration Curve.

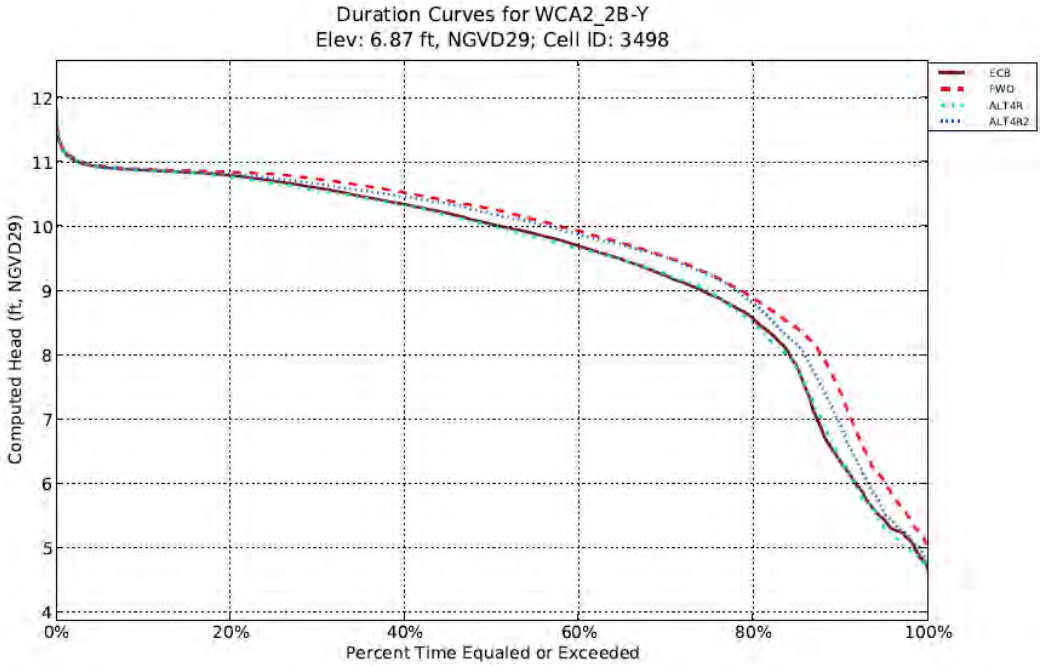


Figure C.2.2-58. Southern WCA 2B Stage Duration Curve.

Figure C.2.2-59. Western L-28 Basin Stage Duration Curve.

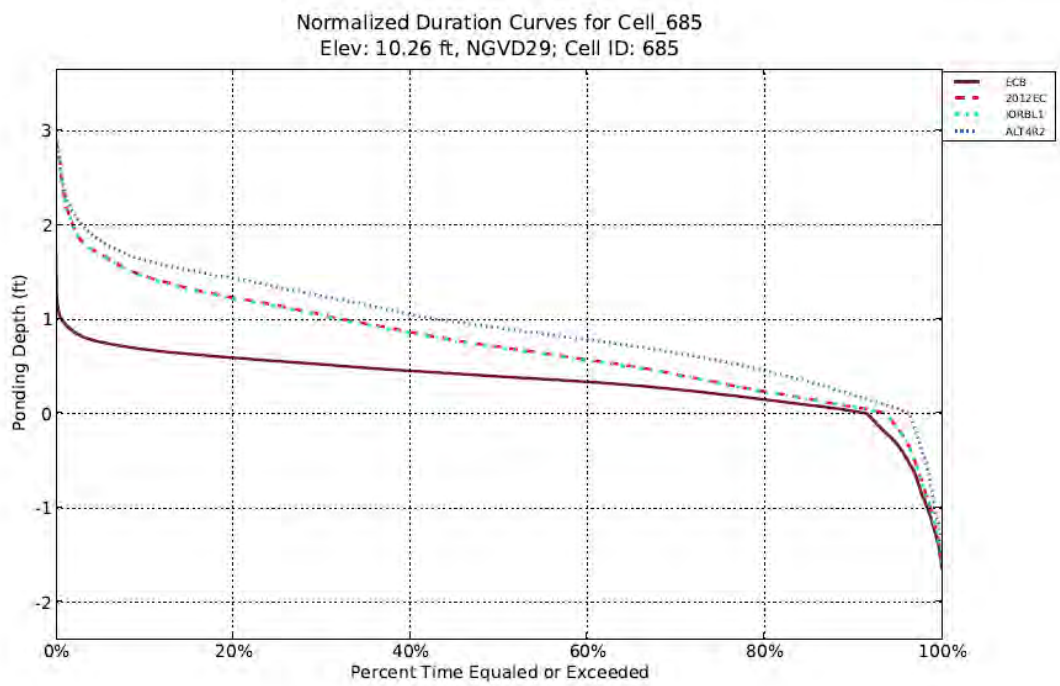


Figure C.2.2-60. L-28 Triangle Stage Duration Curve.

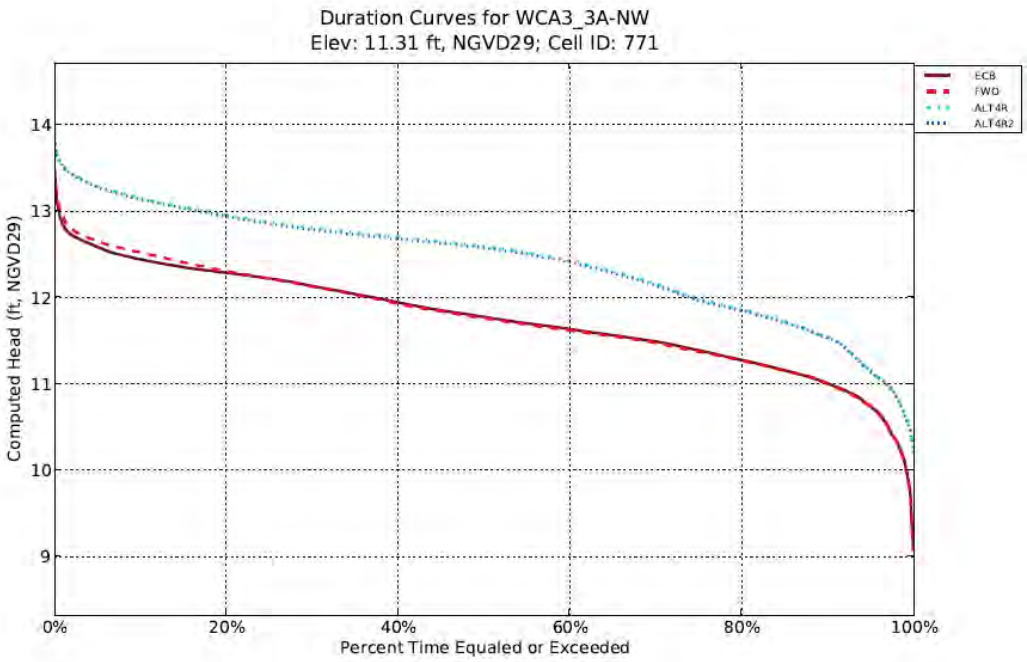


Figure C.2.2-61. Northwest WCA 3A Stage Duration Curve.

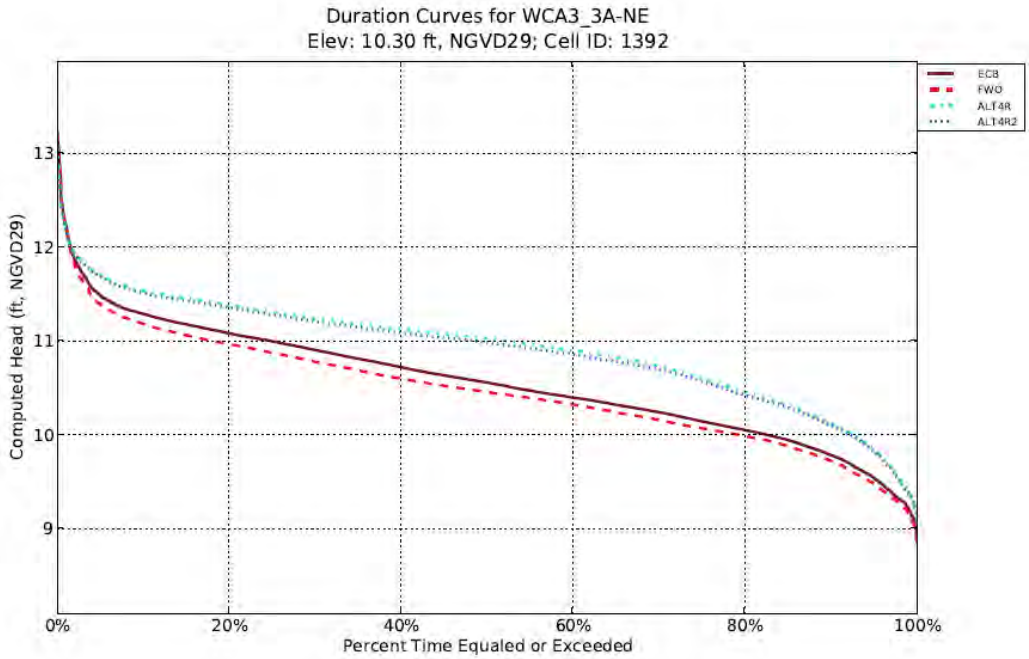


Figure C.2.2-62. Northeast WCA 3A Stage Duration Curve.

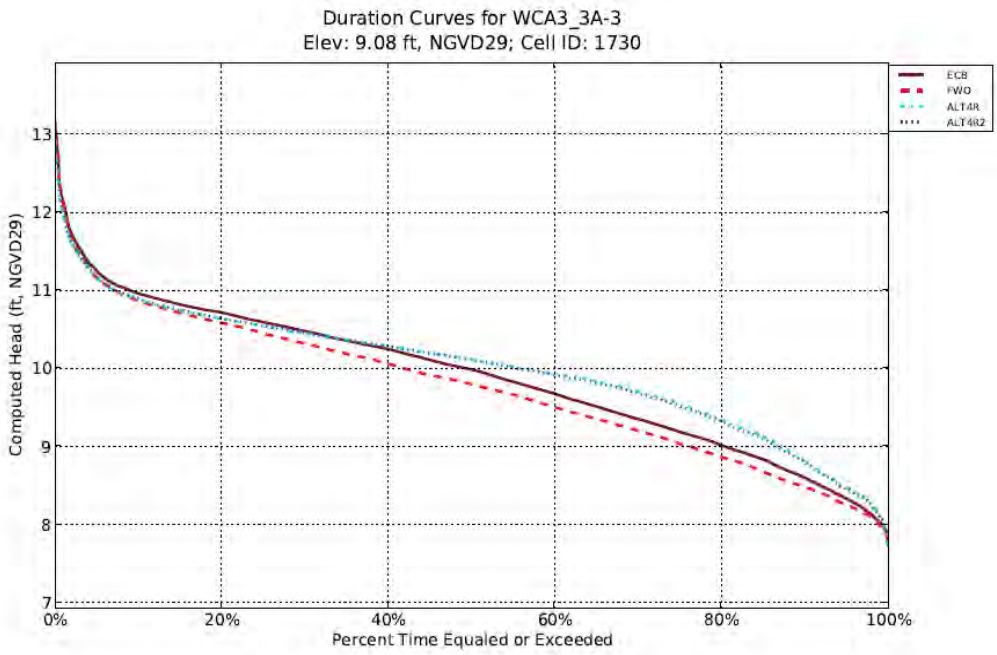


Figure C.2.2-63. East-Central WCA 3A Stage Duration Curve.

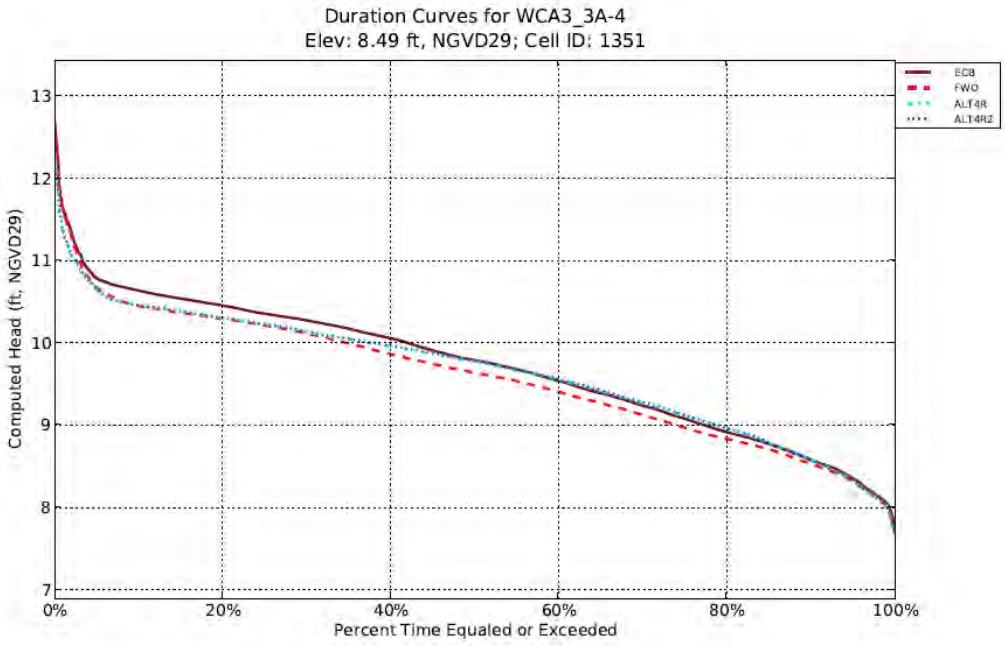


Figure C.2.2-64. Central WCA 3A Stage Duration Curve.

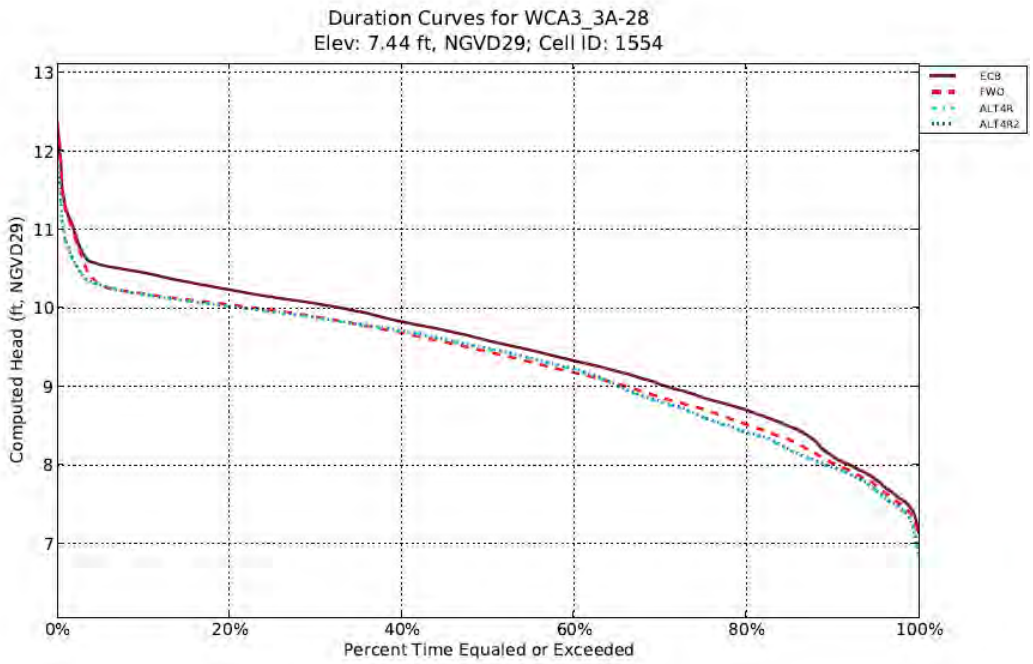


Figure C.2.2-65. South WCA 3A Stage Duration Curve

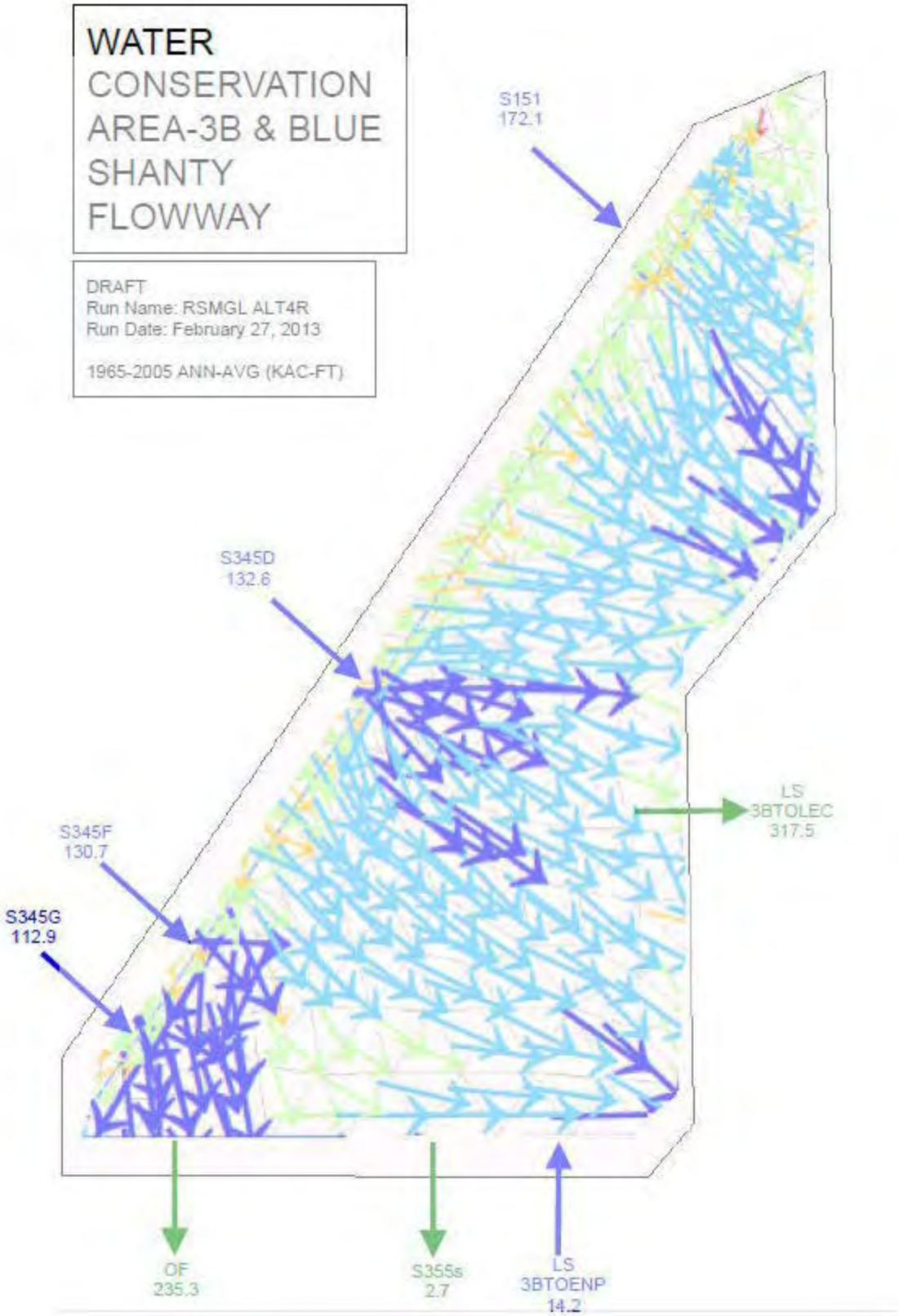


Figure C.2.2-66. WCA 3B Water Budget and Flow Vector Map for Alt 4R.

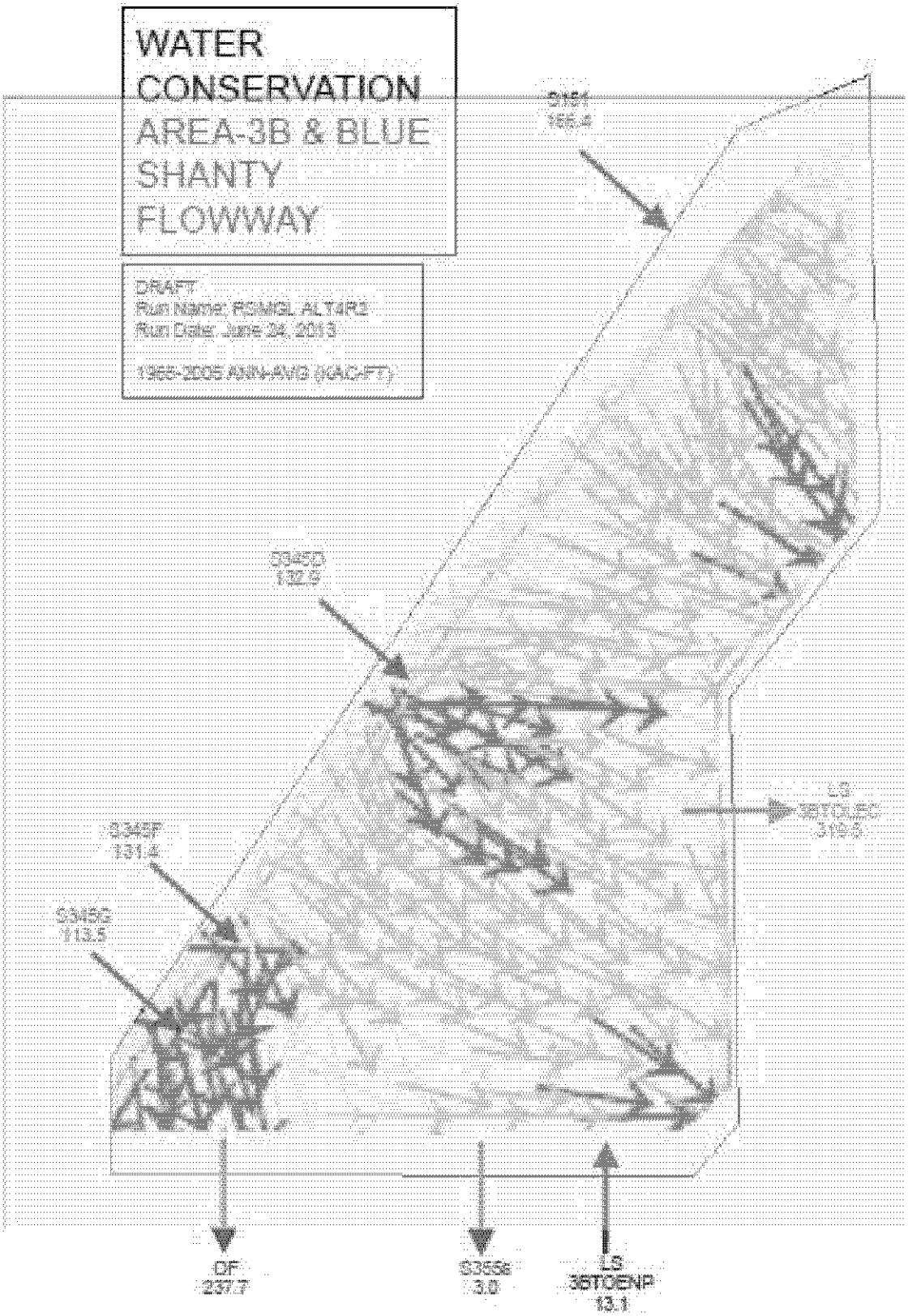


Figure C.2.2-67. WCA 3B Water Budget and Flow Vector Map for Alt 4R2

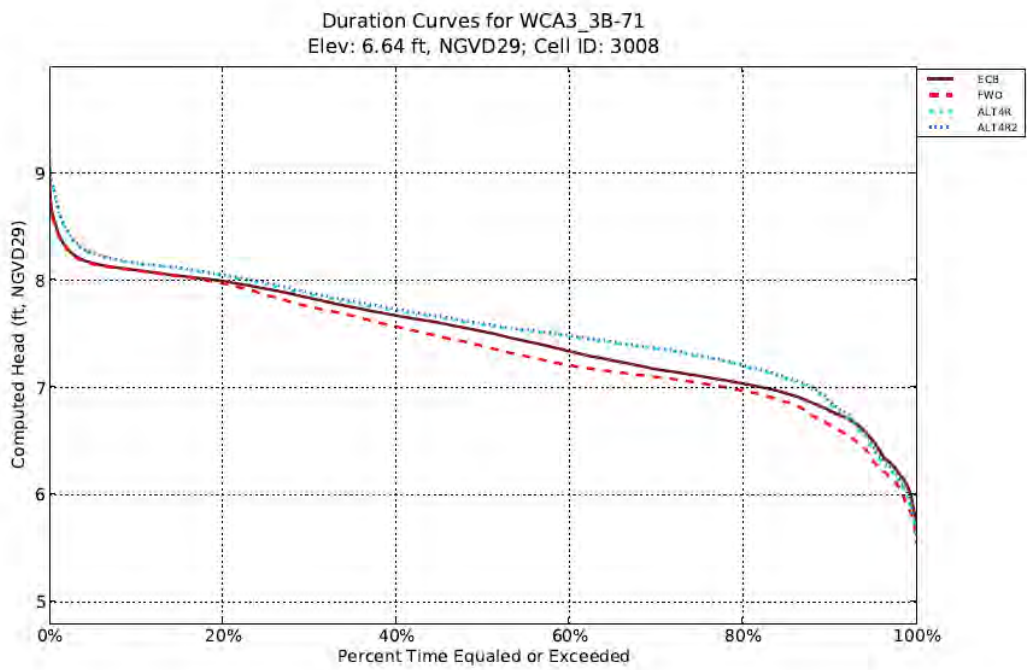


Figure C.2.2-68. Central WCA 3B Stage Duration Curve.

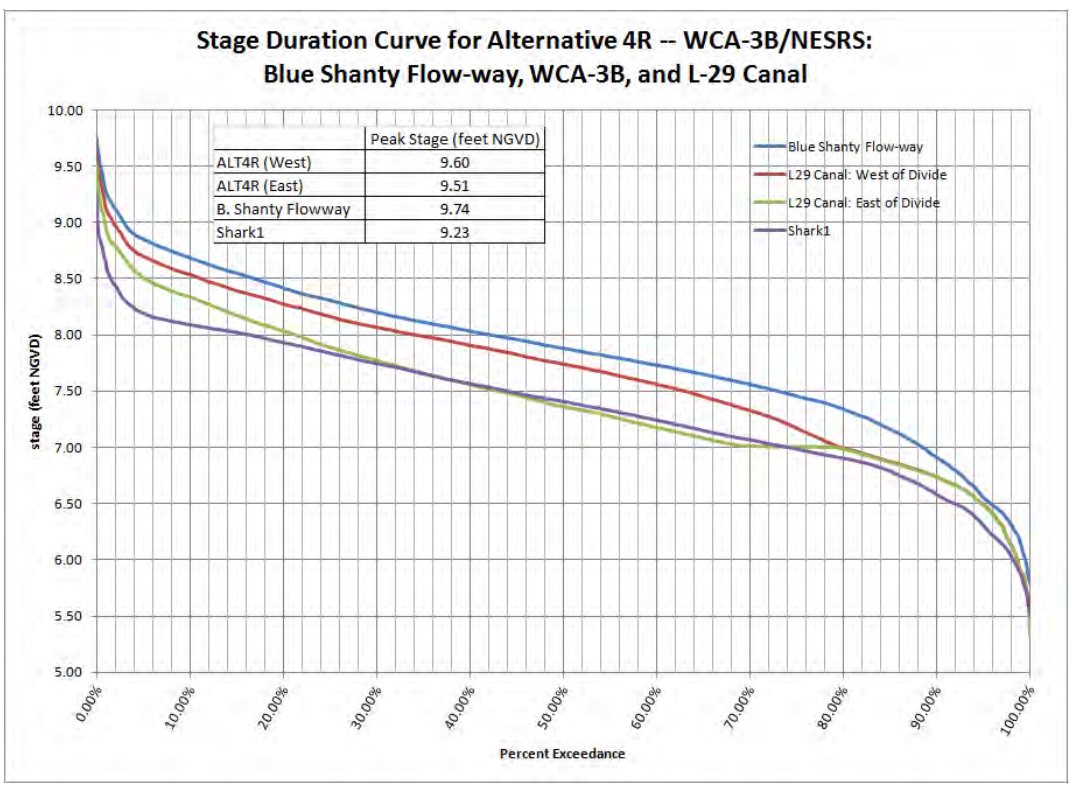


Figure C.2.2-69. WCA 3B Blue Shanty Flow-Way Stage Duration Curve (Alt 4R).

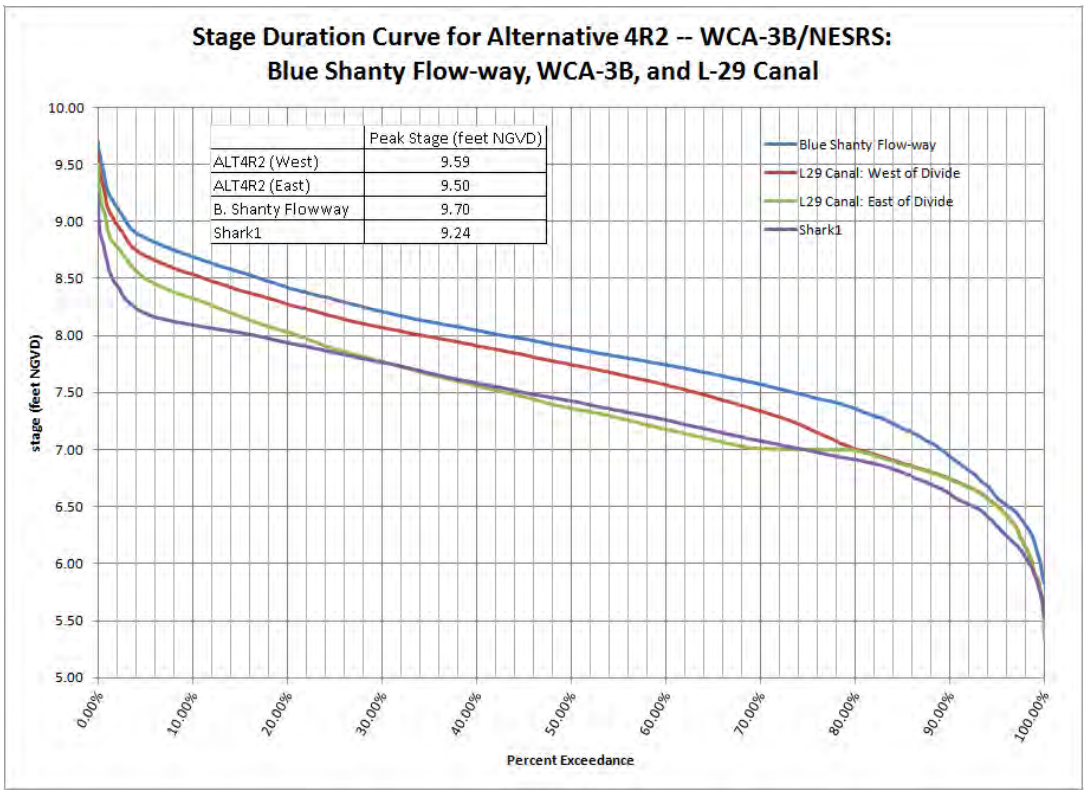


Figure C.2.2-70. WCA 3B Blue Shanty Flow-Way Stage Duration Curve (Alt 4R2).

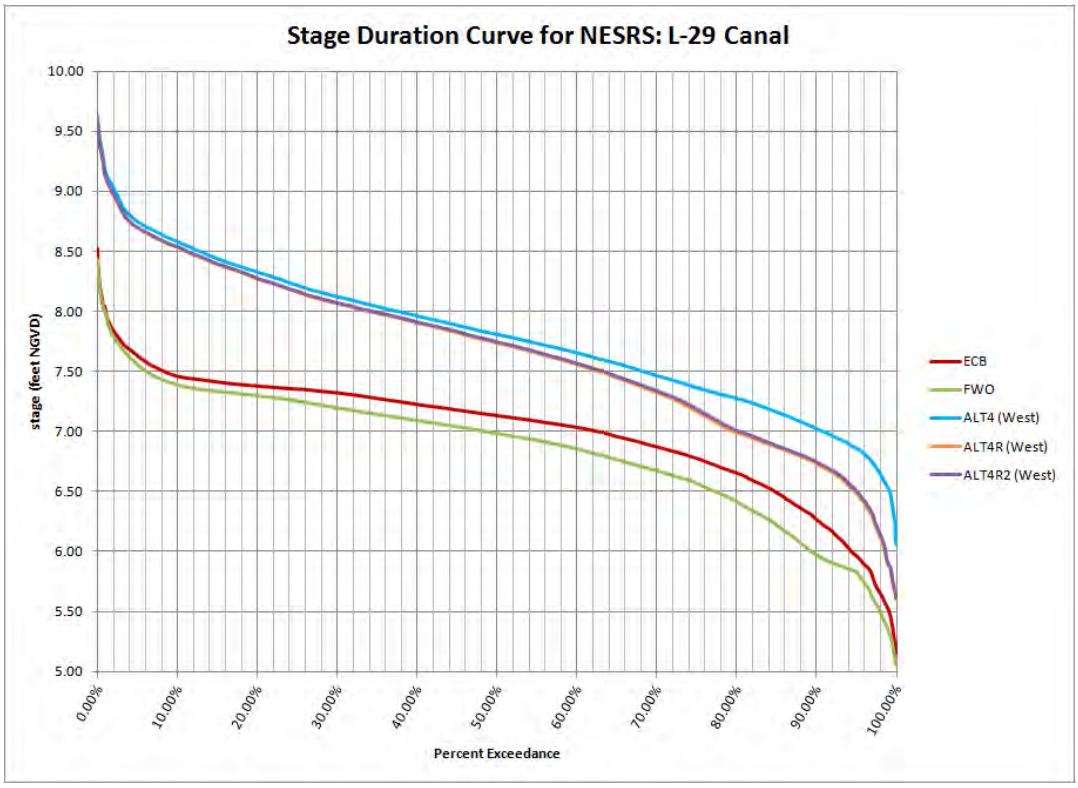


Figure C.2.2-71. L-29 Canal Stage Duration Curve.

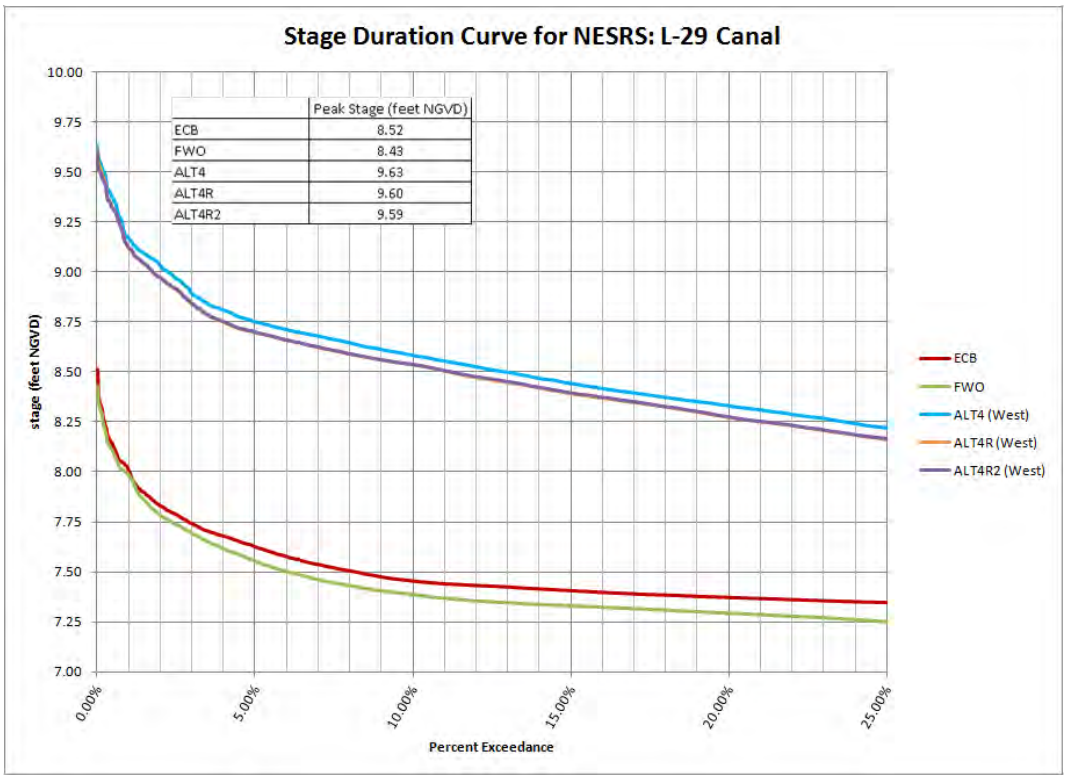


Figure C.2.2-72. L-29 Canal Stage Duration Curve (upper 25%).

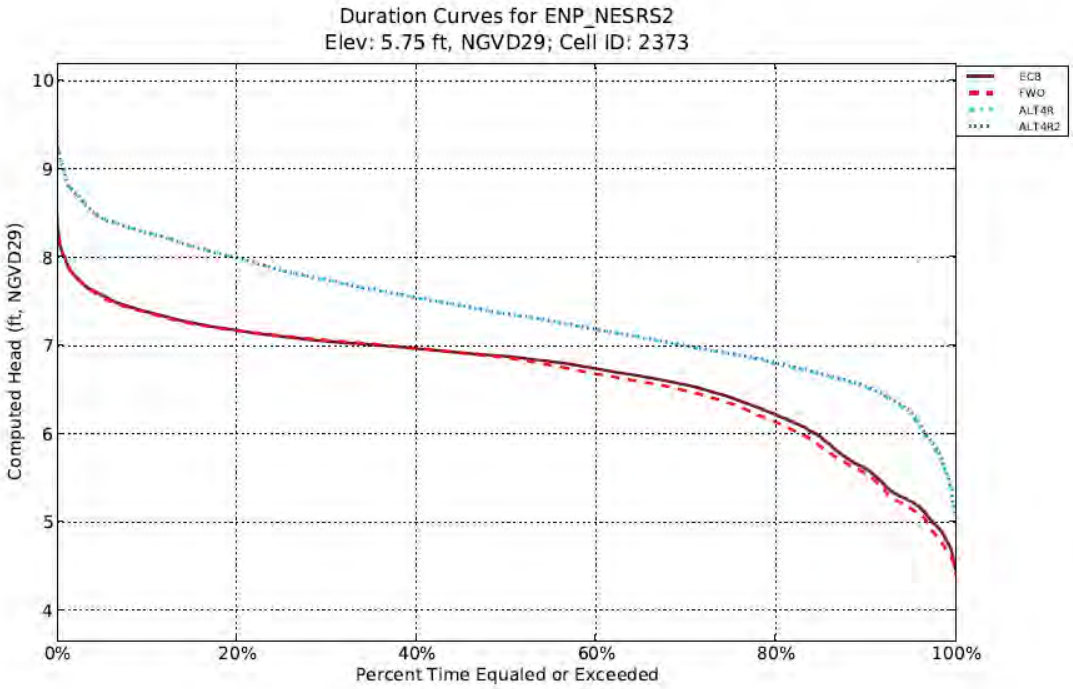


Figure C.2.2-73. Northeast ENP Stage Duration Curve.

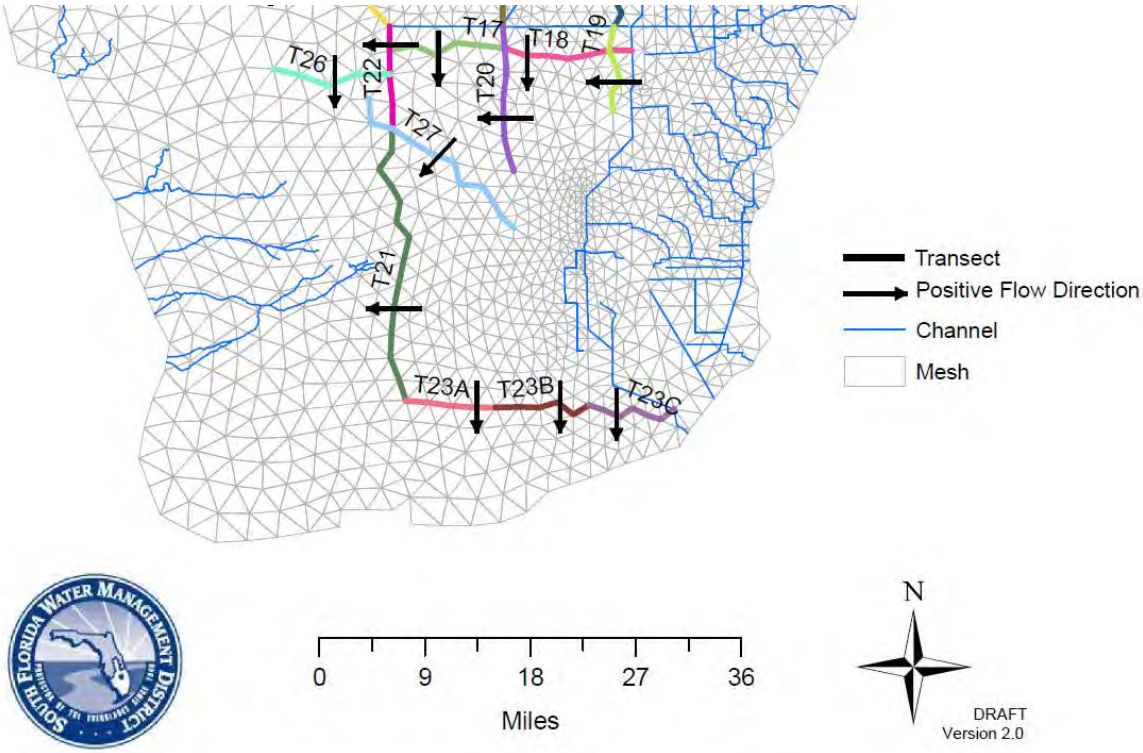


Figure C.2.2-74. RSM-GL Overland Flow Transects for ENP.

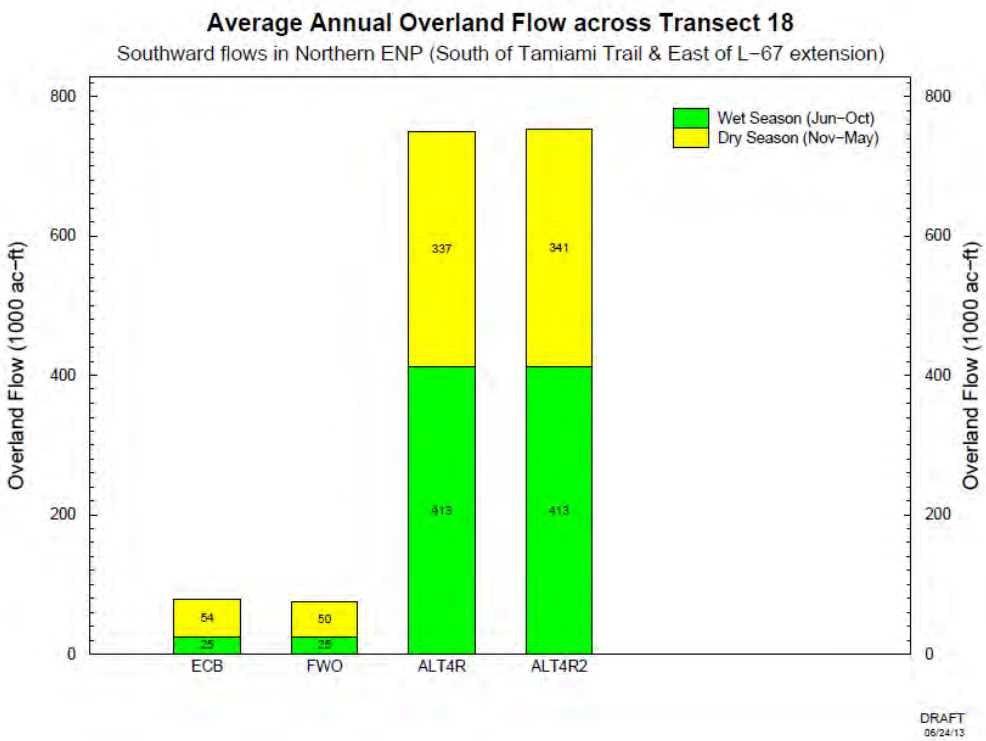


Figure C.2.2-75. Average Annual Overland Flow to NESRS.

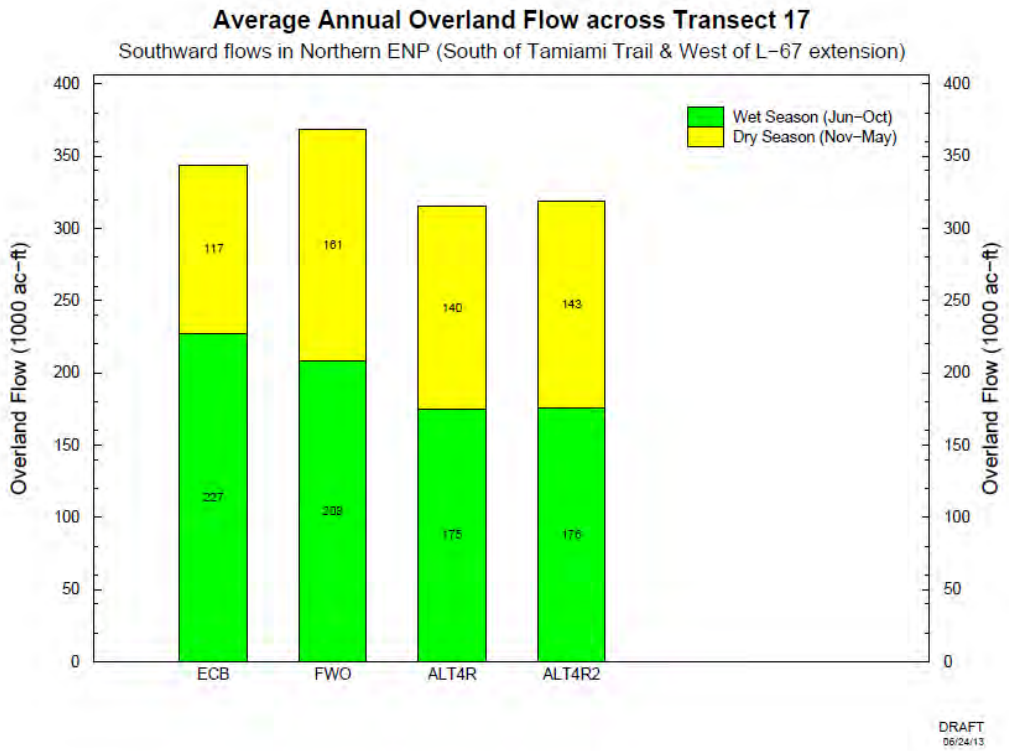


Figure C.2.2-76. Average Annual Overland Flow to WSRS.

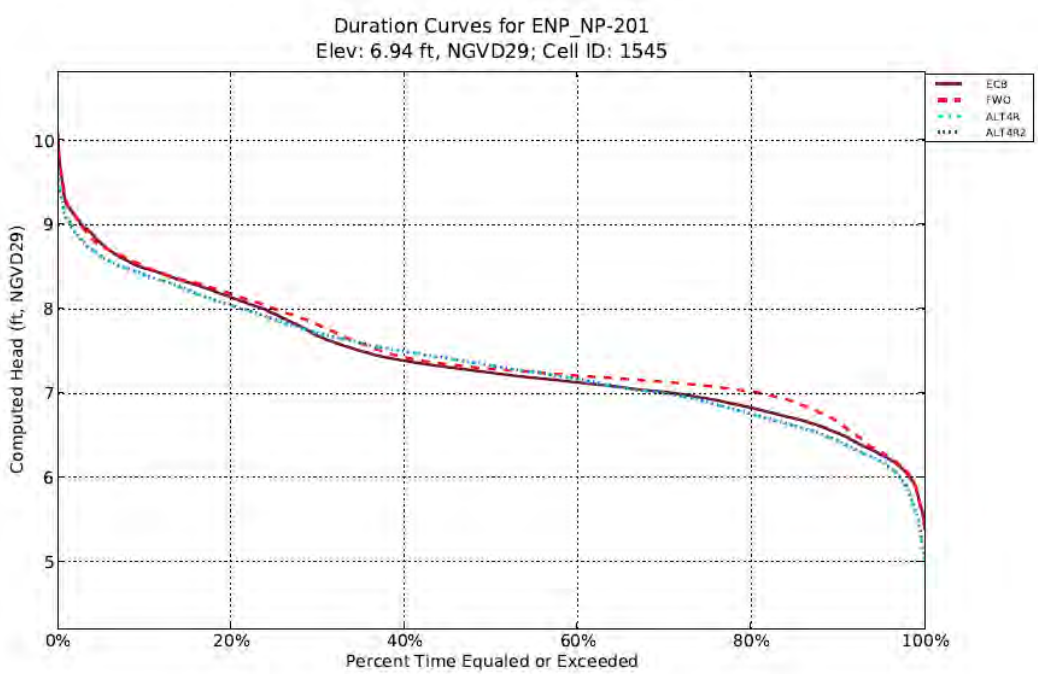


Figure C.2.2-77. Northwest ENP Stage Duration Curve (NP-201).

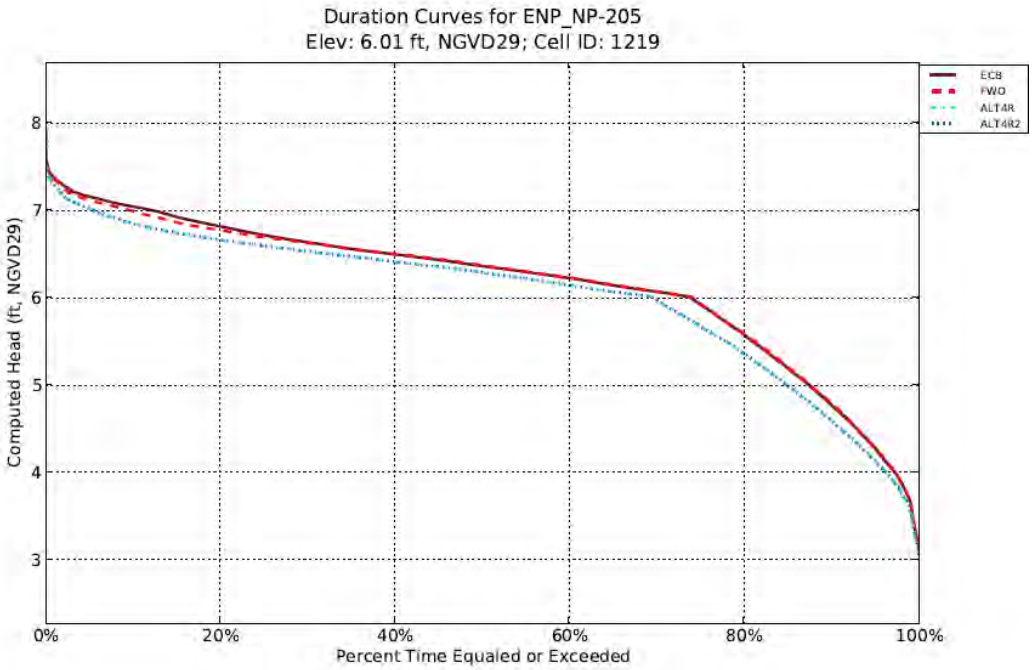


Figure C.2.2-78. Northwest ENP Stage Duration Curve (NP-205).

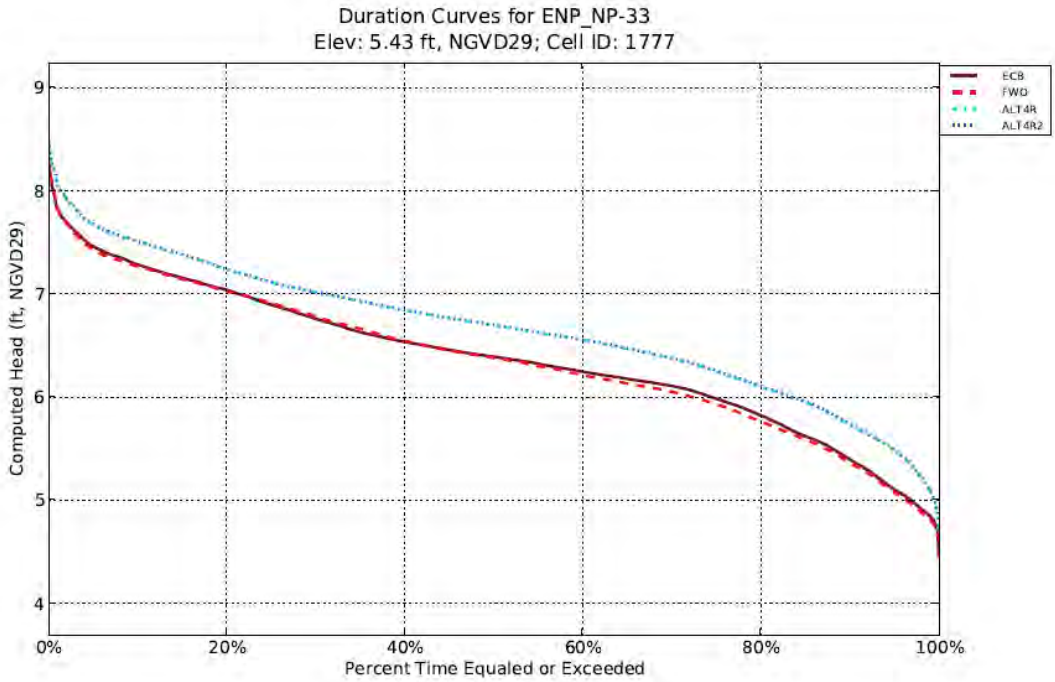


Figure C.2.2-79. Central ENP Stage Duration Curve.

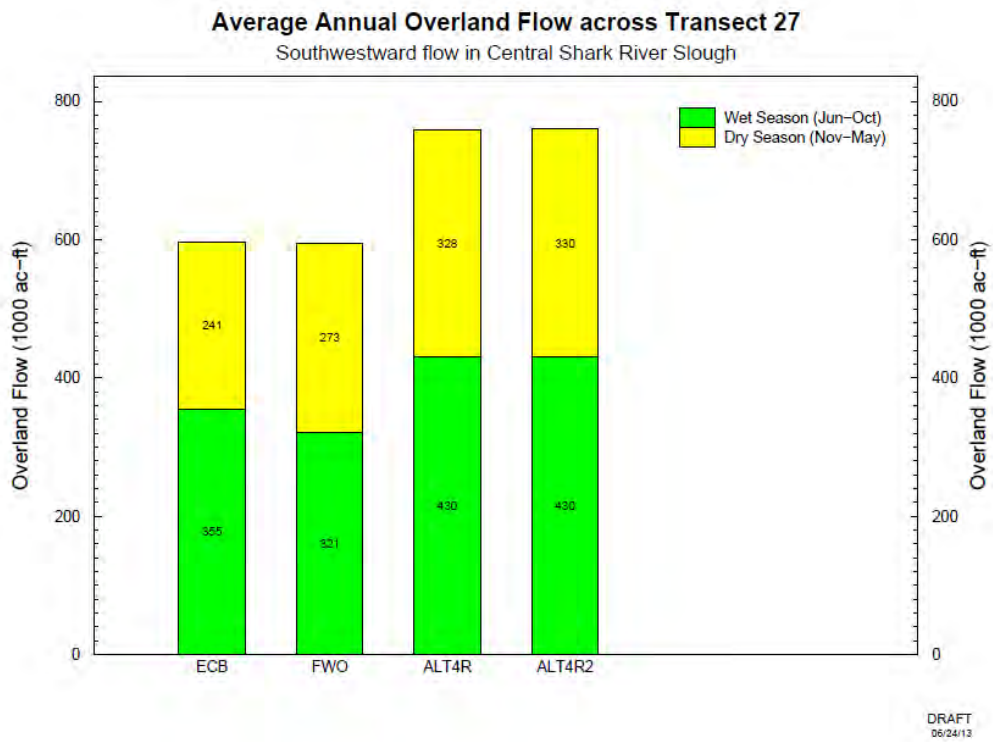


Figure C.2.2-80. Average Annual Overland Flow Transect for Central Shark River Slough.

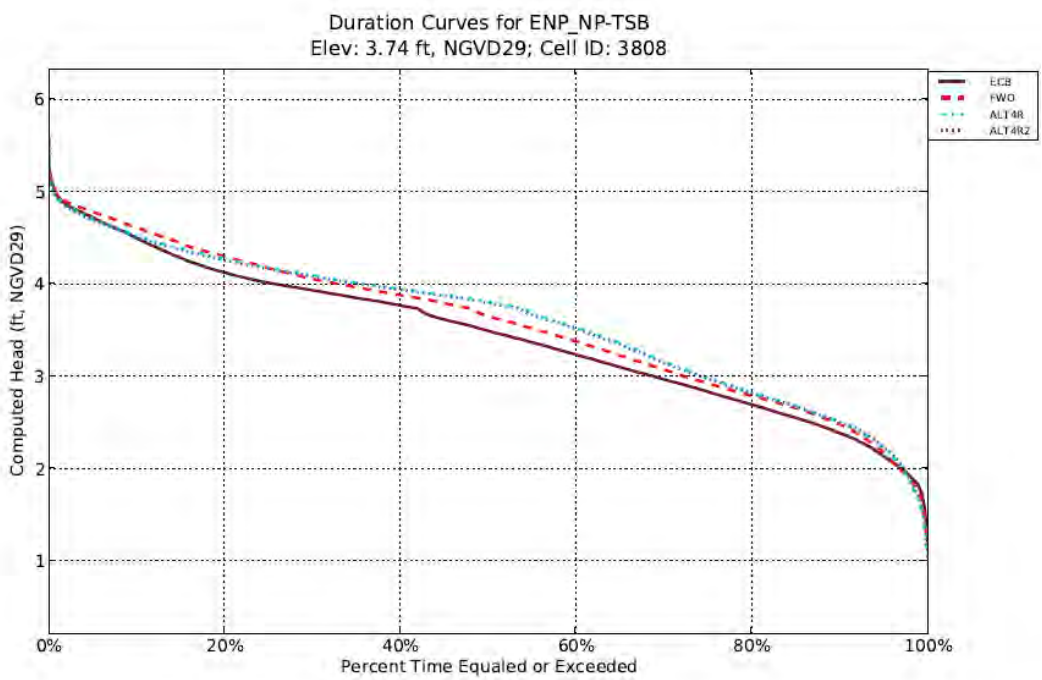


Figure C.2.2-81. ENP Taylor Slough Stage Duration Curve.

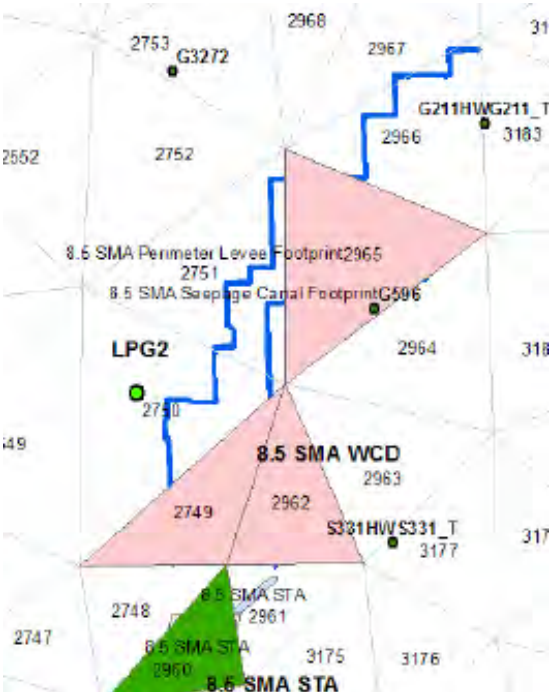


Figure C.2.2-82. RSM-GL grid cell representation of the 8.5 SMA

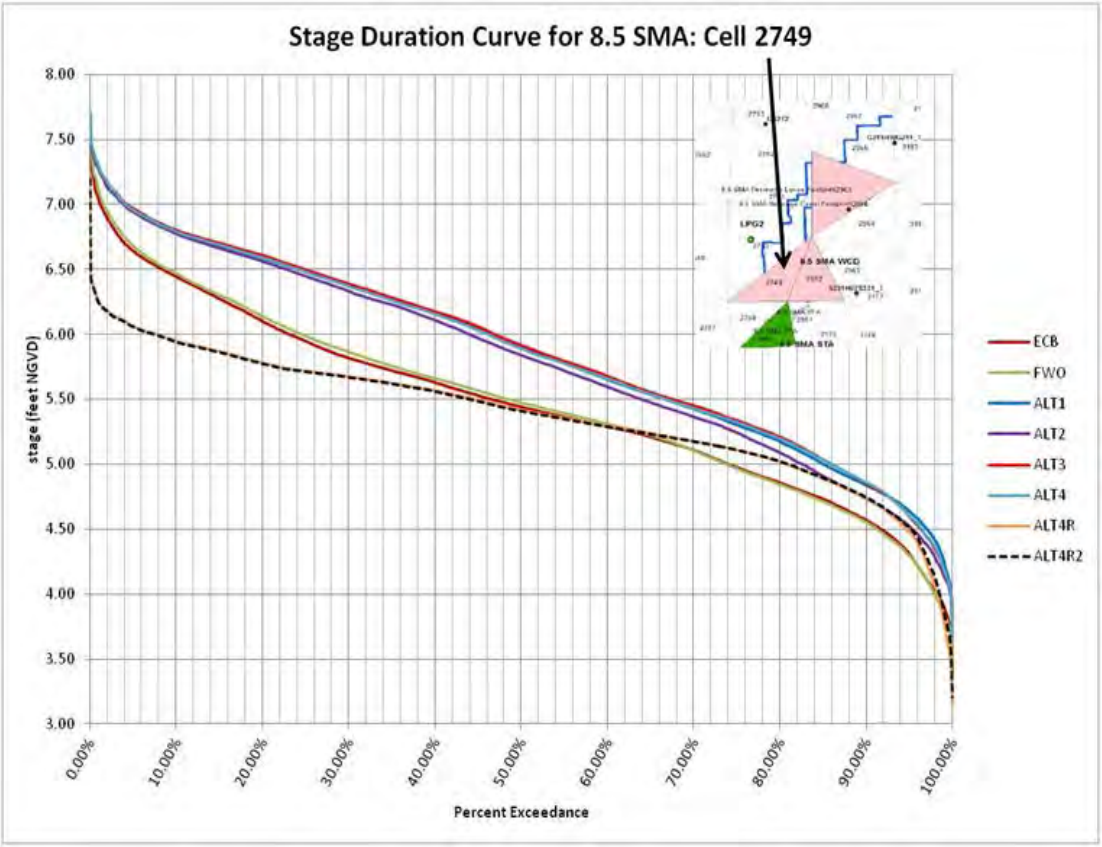


Figure C.2.2-83. Stage Duration Curve for Southwest 8.5 SMA.

C.2.2.8 Water Supply and Flood Control

Consistent with the Savings Clause requirements for CERP, each CERP project included in the CEPP FWO (Indian River Lagoon-South Project, Picayune Strand Restoration Project, Site 1 Impoundment Project, Biscayne Bay Coastal Wetlands Project, Broward County Water Preserve Areas Project, Caloosahatchee River (C-43) West Basin Storage Reservoir, C-111 Spreader Canal Western Project) must independently demonstrate in the respective PIRs that implementation of these CERP projects would not adversely impact the existing legal sources for water supply or the levels of service for flood protection. Operations protocols for the first and second generation CERP projects were modeled in the CEPP FWO consistent with the draft Project Operating Manuals, as documented in the respective PIRs. Operations and components of the previously listed CERP projects are retained Alt 4R and Alt 4R2, and the inclusion of the components is therefore implicit to the analyses within this section.

To address the Savings Clause requirements for CERP, the CEPP draft PIR/EIS includes a detailed and comprehensive analysis of potential effects of the CEPP TSP (Alt 4R2), where applicable, to existing legal sources for water supply and/or the levels of service for flood protection (refer to **Section 6** of the PIR main report for summary information and **Annex B** for the complete analysis). The general hydrologic overview of water supply and flood control performance of Alt 4R in this section is separate and distinct from the content of the TSP Savings Clause analysis contained in **Annex B**. Areas within the CEPP project area that are not specifically discussed in this section, such as the WCAs, may be presumed to have insignificant impacts to water supply or flood control.

C.2.2.8.1 Lake Okeechobee

Based on the modeling, compared to the FWO, the frequency of water restrictions enacted by the SFWMD Governing Board due to Lake Okeechobee falling below the Water Shortage Trigger line as defined by LOWSM is projected to slightly decrease for both Alt 4R and Alt 4R2: two fewer years with three or more months with restrictions for LECSA 1 (note: one additional year with restrictions, compared to the ECB); no change in the number of years with three or more months with restrictions for LECSA 2 (note: one fewer year with restrictions, compared to the ECB); and three fewer years with three or more months with restrictions for LECSA 3 (note: same number of years as the ECB).

As a result of the CEPP preliminary screening process, operational changes were incorporated into the hydrologic modeling conducted for the CEPP alternatives, including the Alt 4R and the TSP Alt 4R2, in efforts to optimize CEPP system-wide performance within the existing flexibility of the 2008 LORS. More specifically, the hydrologic modeling of the CEPP alternatives included proposed revisions to the 2008 LORS decision tree outcome maximum allowable discharges dependant on the following criteria: Lake Okeechobee inflow and climate forecasts (class limits were modified for tributary hydrologic conditions, seasonal climate outlook, and multi-seasonal climate outlook), stage level (regulation zone), and stage trends (receding or ascending). While some refinements were made within the operational flexibility available in the 2008 LORS, consistent with the original modeling intent, the final operational assumptions ultimately extended beyond this flexibility due to adjustments made to the tributary/climatological classifications. Minor modifications to the operational assumptions were included for Alt 4R and Alt 4R2, compared to Alts 1 through 4. For all CEPP alternatives, the LORS 2008 Regulation Schedule zones were unchanged. Additional information and documentation of these assumptions can be found in the Engineering Appendix **(Appendix A)** of the CEPP PIR.

Based on the modeling assumptions and the resulting moderate stage increases within Lake Okeechobee with Alt 4R and Alt 4R2, the average annual percentage of water supply demand not met is projected to decrease for the EAA and the remainder of the LOSA (**Figure C.2.2-84**). For the eight years

with the largest water supply cutbacks within the LOSA, the water supply cutback percentage with Alt 4R2 is reduced for seven of the eight years and increased for one of the eight years (1981), compared to the FWO (**Figure C.2.2-85**). For the eight years with the largest water supply cutbacks within the LOSA, the water supply cutback percentage with Alt 4R is reduced for six of the eight years and increased for two of the eight years (1981 and 1982), compared to the FWO.

Lake Okeechobee stage duration curves for the RSM-BN model representation of the CEPP ECB (LORS 2008), CEPP FWO (LORS 2008, plus additional CERP and non-CERP projects), and CEPP Alts 1 through 4R2 (LORS 2008, additional CERP and non-CERP projects, and prescribed operational flexibility) are shown in **Figure C.2.2-86**. A single RSM-BN simulation was originally completed for all of the CEPP components north of the red line for the final array of Alts 1 through 4, although separate RSM-BN simulations were later completed for both Alt 4R and Alt 4R2 to improve water supply performance within the LOSA with the TSP plan. Compared to the FWO, Alt 4R2 Lake Okeechobee stages are increased by 0.25-0.50 feet for the upper 70% of the stage duration curve, excluding extreme wet hydrologic conditions. Compared to the FWO, Alt 4R Lake Okeechobee stages are increased by 0.25-0.50 feet for the upper 60% of the stage duration curve, excluding extreme wet hydrologic conditions. Compared to Alt 4, Lake Okeechobee stages for Alt 4R and Alt 4R2 are slightly increased by less than 0.10 feet during the upper 40% of the stage duration curve. Peak lake stage increased from 17.50 feet NGVD in the FWO to 17.64 feet NGVD in Alt 4R and 17.66 feet NGVD for Alt 4R2.

The baselines, Alt 4R and the TSP Alt 4R2 all show simulated stages above 17.25 feet NGVD: 18 days for the ECB; 9 days for the FWO; 29 days for Alt 4R; and 29 days for Alt 4R2 (note: 14,975 days in the RSM-BN 41-year period of simulation). The USACE LORS 2008 Environmental Impact Statement (EIS) assessment recognized that minimizing the frequency of exceedance of the 17.25 feet elevation offers additional protection for public safety and the HHD, for the condition prior to completion of the current approved and planned HHD remediation measures, and this criterion was evaluated as a LORS project performance measure. Significant increases in the frequency, duration, and magnitude of Lake Okeechobee peak stages do not result from the assumed modified Lake Okeechobee operations with the CEPP alternatives (including Alt 4R and Alt 4R2), despite the assumed completion of HHD remediation measures, because the adverse ecological effects associated with increased lake stages and the associated increases in high volume releases to the estuaries were effectively balanced during the CEPP preliminary screening (for additional discussion of screening metrics, refer to **Section 3** of the PIR main report). Extreme high lake stages have also been documented to adversely impact the plant and animal communities, through processes which include the following: physical uprooting of emergent and submerged plants; reduced light levels in the water column due to increased suspended sediment; and littoral zone exposure to increased nutrient levels from the water column. The number of days with stages above 16 feet NGVD is increased from 696 in the FWO to 1157 in Alt 4R and 1162 in Alt 4R2 during the 1965-2005 period of simulation.

Following completion of the HHD remediation of Reaches 1, 2, and 3, the degree to which higher maximum lake stages and increased frequency and duration of high lake stages would be accepted, if at all, will be contingent on the conclusions identified in the USACE 2014 Dam Safety Modification Report (DSMR) for the Herbert Hoover Dike (HHD). Any changes to the Lake Okeechobee Regulation Schedule would be analyzed and coordinated with the public through the NEPA process.

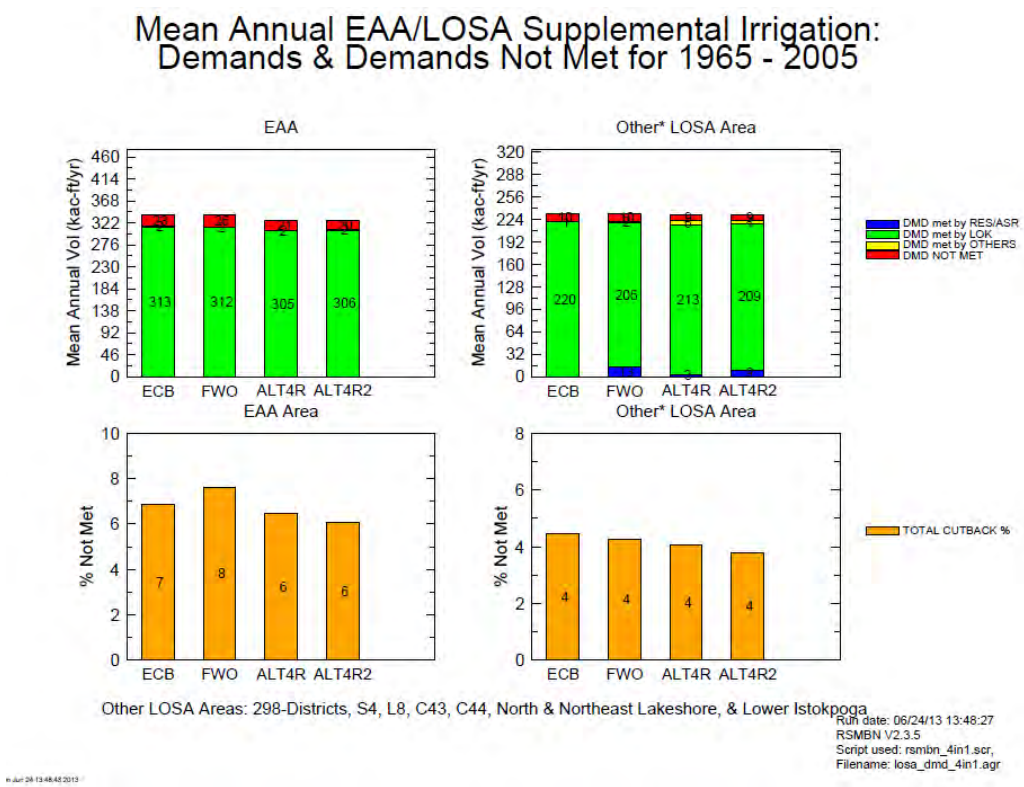


Figure C.2.2-84. EAA and LOSA Water Supply Performance.

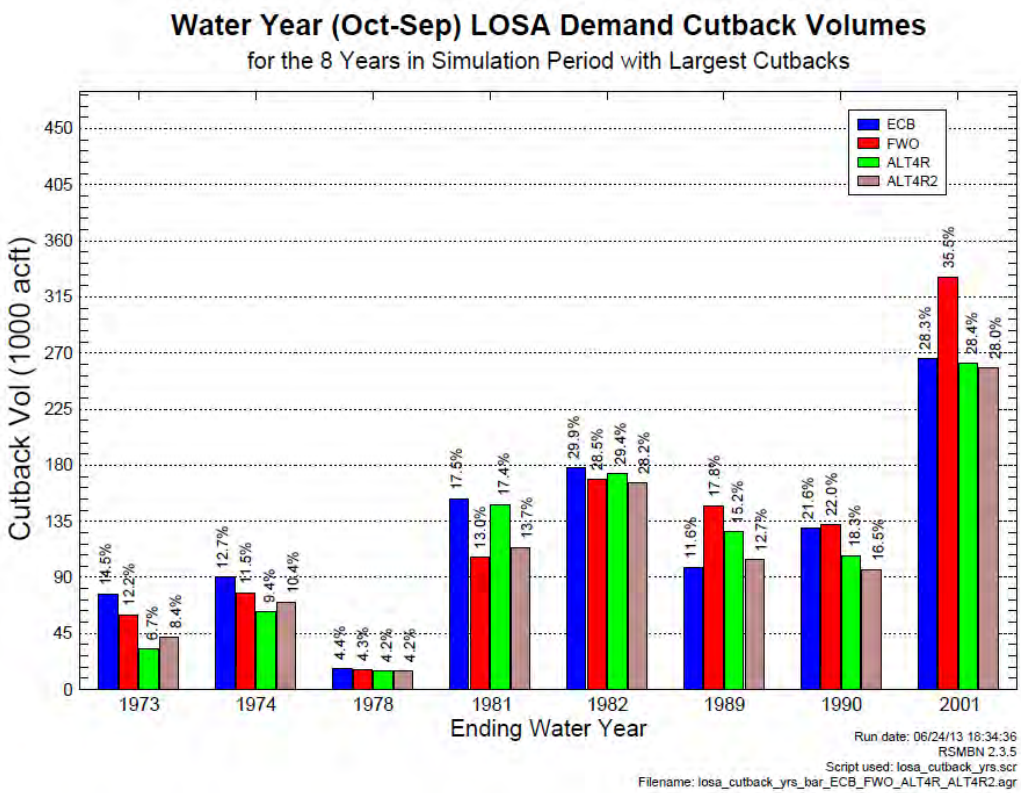


Figure C.2.2-85. LOSA Water Supply Performance for the Eight Largest Cutback Years.

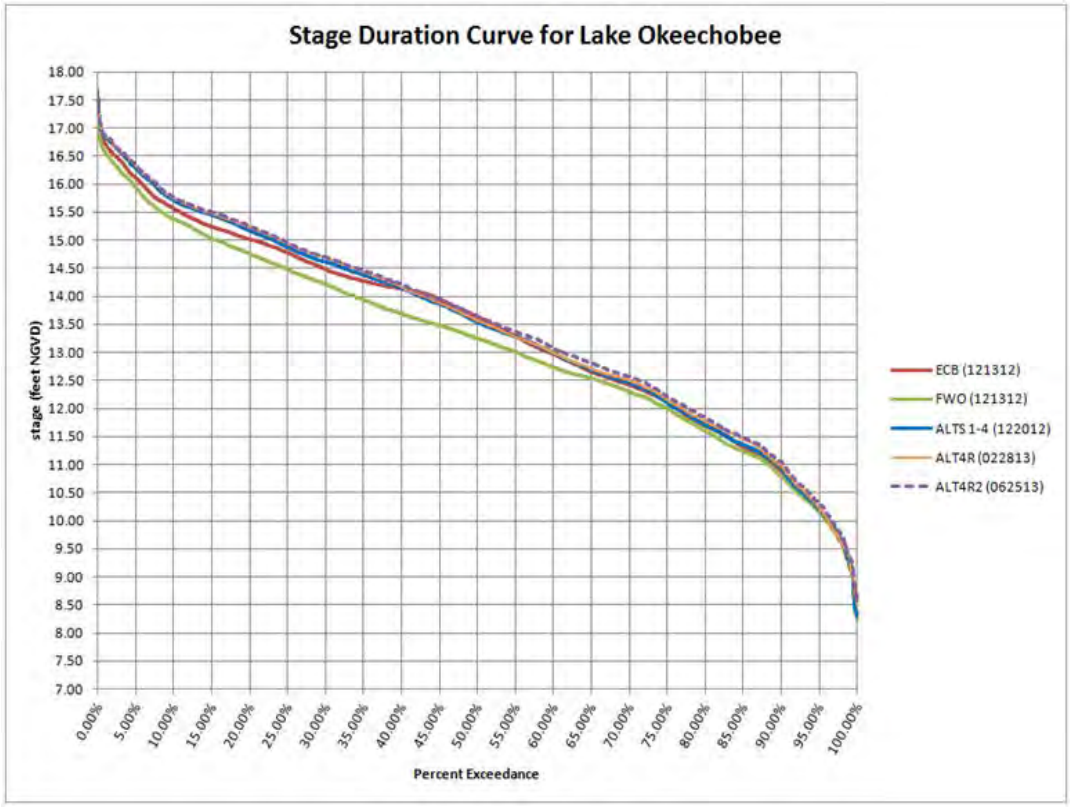


Figure C.2.2-86. Lake Okeechobee stage duration curves.

C.2.2.8.2 Seminole Tribe of Florida

Based on the CEPP alternative modeling assumptions regarding Lake Okeechobee operational flexibility and the resulting general moderate stage increases within Lake Okeechobee, the percentage of water supply demand not met for the Brighton Reservation is shown to slightly decrease by 0.5% for Alt 4R and by 0.8% for Alt 4R2 compared to the FWO (**Figure C.2.2-87**) (note: demand not met is also 0.3-0.6% lower than the ECB). The percentage of water supply demand not met for the Big Cypress Reservation is shown to be slightly reduced by 0.2% for Alt 4R and 0.4% for Alt 4R2 (**Figure C.2.2-88**) (note: demand not met is also 1.0-1.2% lower than the ECB). The Seminole Tribe has surface water entitlement rights pursuant to the 1987 Water Rights Compact and subsequent entitlement provisions executed between the Seminole Tribe of Florida, the State of Florida, and the SFWMD. Impacts are not expected for Alt 4R or Alt 4R2 based on the hydrologic modeling.

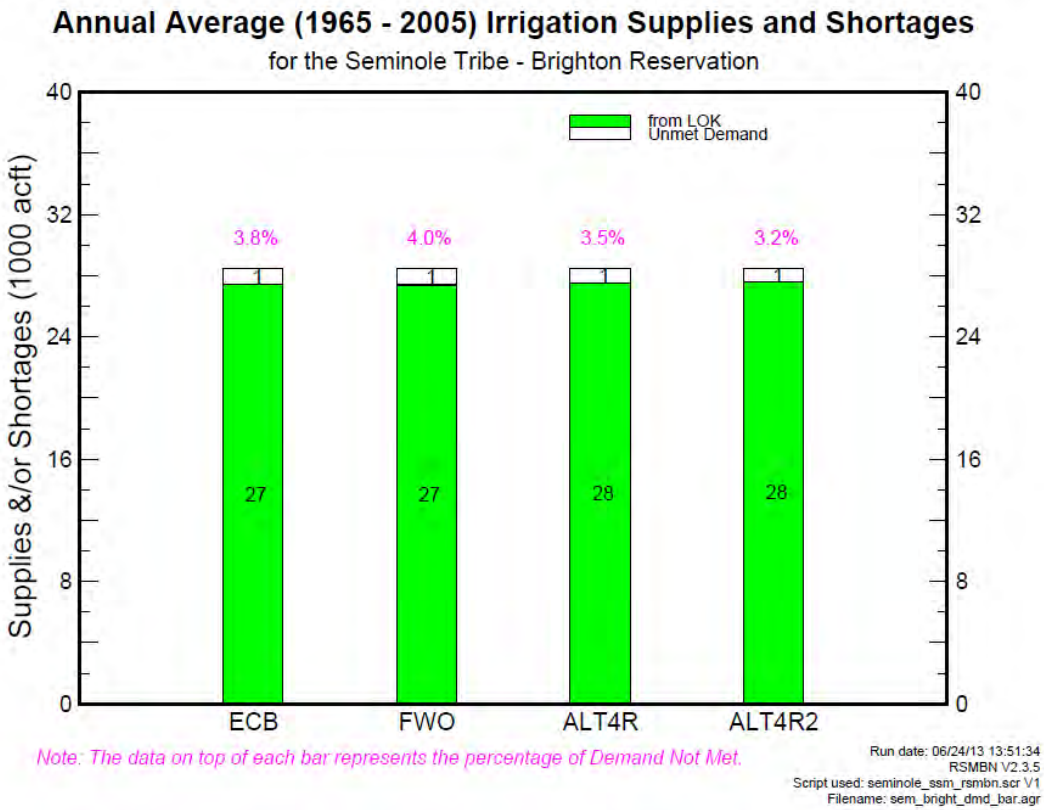


Figure C.2.2-87. Water Supply Demand for Seminole Tribe Brighton Reservation.

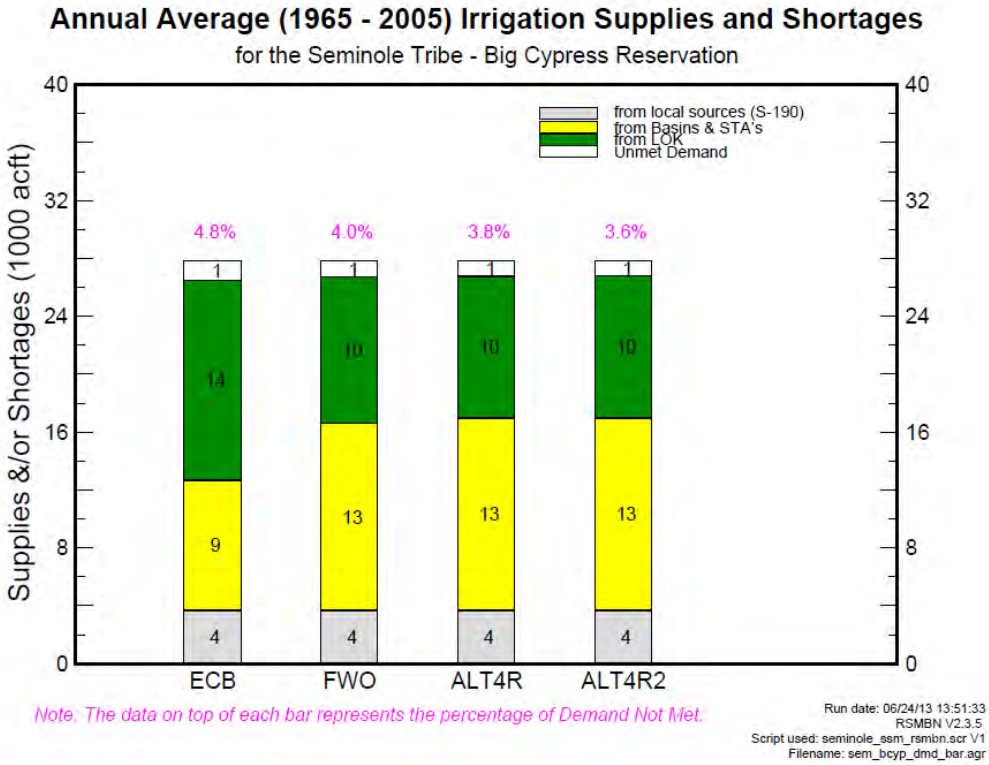


Figure C.2.2-88. Water Supply Demand for Seminole Tribe Big Cypress Reservation.

C.2.2.8.3 Lower East Coast Service Areas

Based on the alternative modeling, compared to the FWO, the frequency of water restrictions enacted by the SFWMD Governing Board due to Lake Okeechobee falling below the Water Shortage Trigger line as defined by LOWSM is projected to slightly decrease for both Alt 4R and Alt 4R2: two fewer years with three or more months with restrictions for LECSA 1 (note: one additional year with restrictions, compared to the ECB); no change in the number of years with three or more months with restrictions for LECSA 2 (note: one fewer year with restrictions, compared to the ECB); and three fewer years with three or more months with restrictions for LECSA 3 (note: same number of years as the ECB). For the LECSA, additional water has been made available with Alt 4R2 in the regional system and has been quantified for LECSA 2 and LECSA 3. An increased demand of 12 million gallons per day (MGD) in LECSA 2 and 5 MGD in LECSA 3 was included in Alt4R2 above the demands in the FWO baseline; the public water supply demands assumed for the FWO are also equivalent to the demands assumed for the ECB and 2012EC existing condition baselines. This increase in demands for other water related needs was able to be provided without adversely affecting the benefits accrued in the natural system.

Alternative 4R and Alt 4R2 modeling also indicate no significant reductions to regional groundwater stages during dry conditions (assumed as a surrogate for water supply conditions for this discussion) for most portions within the LECSA, as compared to the FWO condition. No significant changes were indicated within LECSA 1, LECSA 2, and most of LECSA 3 that were prevalent through normal to dry hydrologic conditions. For Alt 4R, some reduced stages were indicated during the driest 5-10% of hydrologic conditions for areas east of WCA 2A and WCA 2B (monitoring gages G2031, G2033, and G2032) and during the driest 5% of hydrologic conditions for areas east of L-31N and south of the 8.5 SMA (monitoring gages G1362, G1363, G614, and G757A). The modified L-6 diversion operations applied for Alt 4R2 resulted in increased dry period stages within WCA 2B, and Alt 4R2 does not indicate reduced stages for areas east of WCA 2A and WCA 2B (monitoring gages G2031, G2033, and G2032) that were affected with Alt 4R. Alt 4R2 continues to indicate reduced stages during the driest 5% of hydrologic conditions for areas east of L-31N and south of the 8.5 SMA (monitoring gages G1362, G1363, G614, and G757A). In general, lowered regional groundwater stages during dry conditions that were apparent for the FWO when compared to the ECB are not further exacerbated by Alt 4R or Alt 4R2.

For Alt 4R and Alt 4R2, compared to the FWO, L-30 Canal stages (north of S-335) are generally increased by 0.1-0.6 feet for normal to extreme dry conditions (**Figure C.2.2-89**); L-30 Canal stages also show an increase of 0.2-0.4 feet compared to the ECB for the driest 20% of hydrologic conditions. L-30 Canal stages are highly correlated to hydrologic conditions within central and eastern WCA 3B. L-31N Canal stages (north of G-211) are increased by 0.1-0.2 during dry conditions for Alt 4R and Alt 4R2, with no significant change compared to the ECB and FWO during normal hydrologic conditions (**Figure C.2.2-90**). No significant stage reductions within the C-111 Canal (between S-176 and S-18C) are indicated during normal to dry hydrologic conditions that would affect water supply deliveries, and both Alt 4R and Alt 4R2 performance indicates a 0.1-0.2 feet stage increase during normal hydrologic conditions compared to both ECB and FWO (**Figure C.2.2-91**).

The Alt 4R and Alt 4R2 modeling indicates no significant increases to regional groundwater stages during wet conditions which would impact the levels of service for flood control within the LECSA, as compared to the FWO condition. No significant changes were indicated within LECSA 1, LECSA 2, and significant reductions were observed for portions of LECSA 3. For Alt 4R2, LEC monitoring gauge stages immediately east of the Pennsuco wetlands (east of WCA 3B), specifically G3259A (**Figure C.2.2-92**), USGS-02297497, and C2_74, indicate a minor increase to stages in the wettest 10% of the stage duration

curve, with stage increases of less than 0.20 feet; however, in all cases, Alt 4R2 stages are the same or lower than the ECB base condition for the wettest 10% of the stage duration curve. The L-30 Canal stages (north of S-335) for Alt 4R and Alt 4R2 indicate a moderate reduction of 0.1-0.2 feet to flood control stages within the wettest 10% of hydrologic conditions, with no significant change observed for the upper 1% of the stage duration curve (**Figure C.2.2-89**). The L-31N Canal stages (north of G-211) indicate a significant (up to 1.0 feet) reduction to flood control stages within the wettest 5% of hydrologic conditions for Alt 4R and Alt 4R2 (**Figure C.2.2-90**). C-111 Canal stages between S-176 and S-18C indicate no significant change for the upper 10% of the stage duration curve compared to the FWO, with a small stage reduction of 0.1 feet observed compared to the ECB (**Figure C.2.2-91**).

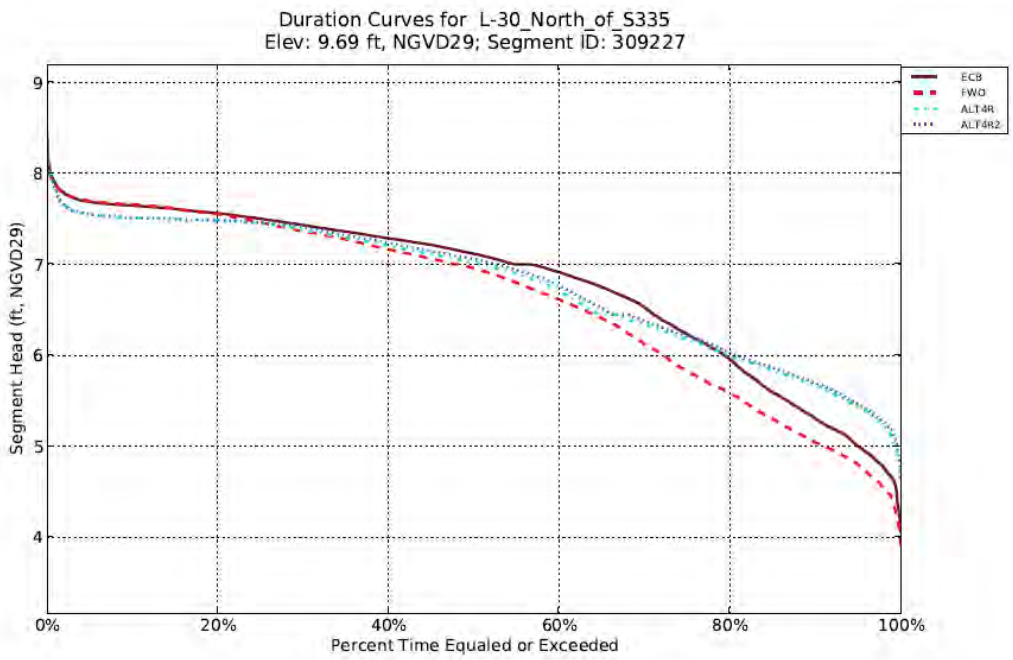


Figure C.2.2-89. Stage Duration Curve for L-30 Canal in LECSA 3.

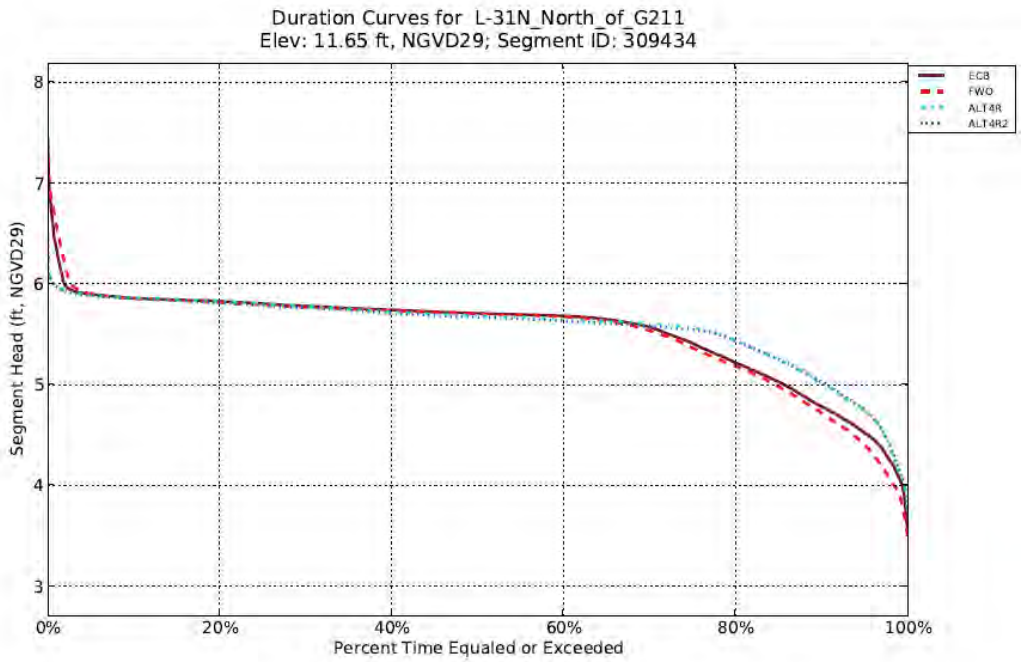


Figure C.2.2-90. Stage Duration Curve for L-31N Canal in LECSA 3.

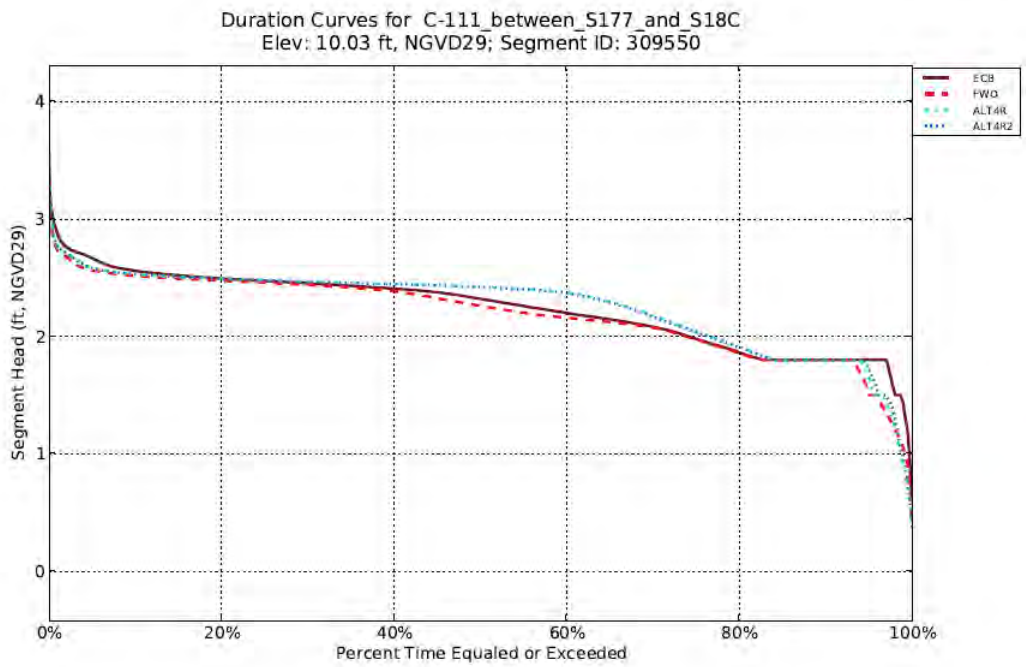


Figure C.2.2-91. Stage Duration Curve for C-111 Canal in LECSA 3.

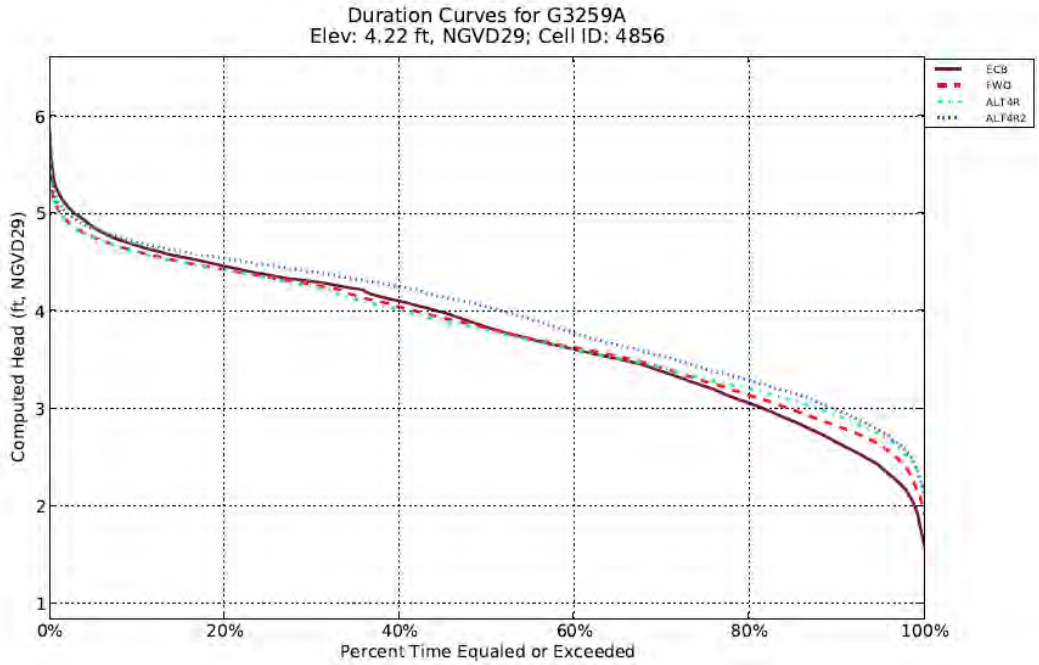


Figure C.2.2-92. Stage Duration Curve for G-3259A in LECSA 3.

C.2.2.9 Water Quality

Water quality impacts from Alt 4R and Alt 4R2 are considered to be nearly identical given that these alternatives have identical project features and nearly identical operating criteria. Discussion of the water quality impacts of Alt 4R apply equally to Alt 4R2.

C.2.2.9.1 Lake Okeechobee

Relative to the FWO project, Alt 4R will likely result in some improvement in Lake water quality as a result of reduced extreme lake stage events. However, the expected improvement will likely not be very significant since nutrient loading conditions are not expected to differ between FWO and Alt 4R. Methyl-mercury bioaccumulation potential in the lake is not expected to change. As discussed in the existing conditions section for Lake Okeechobee, there is an existing TMDL for phosphorus. This TMDL requires a reduction in annual phosphorus loading from more than 500 metric tons per year to 140 metric tons per year. The average annual S-308 backflow quantity into the lake under the ECB condition is 95 kac-ft/yr which results in approximately 13 metric tons of phosphorus load per year. The S-308 backflow phosphorus load to the under the FWO condition is estimated to be 1.9 metric tons per year which is in line with the USEPA's 2008 TMDL allocation (USEPA-Region 4, 2008) of 2.6 metric tons per year. ALT4R will increase the S-308 backflow into the lake to 95 kac-ft/yr. This will result in an estimated 4.6 metric tons of phosphorus per year which is higher than the TMDL allocation for the S-308 structure. The increase of 2 metric tons per year amounts to less than 1.5 percent of the phosphorus TMDL target of 140 metric tons/yr. In terms of the existing phosphorus loading at 380 metric tons/yr, it is less than 1 percent. Though the CEPP does increase TP loading from the S-308 basin which is contrary to the requirements of the TMDL, the amount is relatively small in relation to the total loading TMDL and it is likely that this additional load can be addressed through reductions in loads attributed to other sources.

C.2.2.9.2 Northern Estuaries

Caloosahatchee: Improved salinity conditions within this estuary as a result of a reduction in the number of high flow events and a reduction in the number of extreme low flow events as characterized by flows through the S-79 structure. Nutrient and dissolved oxygen conditions should improve slightly during the wet season within the estuary given the reduction in high flow events. The frequency of dry season algal events within the upper estuary may change as a result of increased dry season flows through the S-79 structure during the late spring.

St. Lucie Estuary: Improved salinity conditions within this estuary as a result of a reduction in the number of high flow as characterized by flows through the S-80 structure. Nutrient and dissolved oxygen conditions should improve during the wet season within the estuary given the reduction in high flow events. The number of months of flow less than 300 cfs decreases so there may be some change in the frequency of algal blooms during the later part of the dry season.

C.2.2.9.3 EAA

With-Project Alternatives vs. FWO

Alternative 4R includes the A-2 FEB integrated into the A-1 FEB along with additional Lake Okeechobee water distributed south of the EAA. Dynamic Model for Stormwater Treatment Areas (DMSTA) water quality modeling indicates that the with-project alternatives will meet the 2012 Water Quality-based Effluent Limits (QBEL). The risk that the QBEL will not be met under with-project conditions is similar to the risk for the FWO condition.

C.2.2.9.4 Greater Everglades

WCA 1, WCA 2

Water quality conditions for WCA 1 are not expected to be significantly changed by Alt 4R since it does not include features that influence flows and treatment within the eastern flow path. Nutrient and sulfate loading conditions in WCA 2 should improve somewhat given the reduction in hydrologic load sent to this water conservation area. Reduced nutrient and sulfate loading should somewhat alter the locations where mercury methylation is problematic within WCA 2.

C.2.2.9.5 WCA 3A

Phosphorus loading into the northern portion of WCA 3A is expected to increase by about 10 percent relative to the FWO condition as a direct result of the increase in hydrologic loading; however, relative to the existing condition, phosphorus loads from Alt 4R will be reduced by approximately 25 percent. Phosphorus concentrations in water discharged into WCA3A are expected to be lower by approximately 1/3rd relative to existing conditions. Sulfate concentrations into the northern portion of WCA 3A are expected to decrease with Alt 4R as a result of the additional dilution of EAA runoff with Lake Okeechobee discharges which have sulfate concentrations roughly half that of the EAA runoff. The total load of sulfate into WCA3A is expected to increase from 5 to 10 percent over FWO.

Figure C.2.2-93 shows the average annual flow across three transects in WCA 3A. A comparison of total flow to the surface water flow for these three transects shows that surface water flows dominate the flow. Increased nutrient uptake in the northern portion of WCA 3A will likely result in reduced TP concentrations at the southern end of this WCA as compared with the FWO condition which has significant canal flows that provide little in the way of nutrient uptake. It is likely that northern portions of the WCA 3A marsh that are adjacent and south of the L-4, and L-5 canals will experience higher TP loads as compared to the FWO. This will cause the conversion of some areas of native vegetation to less

desirable cattail. A detailed discussion of CEPP impacts to phosphorus loads and concentrations in WCA 3A is provided in **Annex F**.

The methylmercury cycle is very complex with many factors affecting bioaccumulation in fish. Changes in hydrology can impact the formation of methylmercury. For instance, Alt 4R will reduce dryout/rewetting cycles in northern WCA 3A which will reduce sulfate and Hg remobilization due to soil oxidation. Project related changes to the timing, distribution, and loading of sulfate in WCA 3A will likely alter the locations where methylated mercury is found at high concentrations in the water column. This is illustrated in **Figure C.2.2-94** from the 2013 SFER report which shows the impact to mosquitofish mercury body burden of reducing by 50 to 100 percent the agriculturally sourced sulfate discharged into the Everglades Protection Area. This figure shows that significant decreases in sulfate loading would both increase and decrease mosquitofish mercury concentrations in WCA 3A primarily because the existing sulfate concentrations are near the optimum for maximizing methylmercury production. A 100 percent reduction in agricultural sulfate loading is projected to result in an overall reduction in average water column sulfate concentrations within the Everglades Protection Area from 2.4 mg/L to 0.78 mg/L; however, the average mosquitofish mercury concentration is estimated to be reduced from 85.7 ng/g to 80.0 ng/g which is a relatively insignificant change in proportion to the reduction in sulfate. Though these projections are for decreases in sulfate rather than increased sulfate loading, they are indicative of the relative insensitivity of mosquitofish methylmercury bioaccumulation to relatively small changes (<10 percent increase) in sulfate loading as contemplated with Alt 4R.

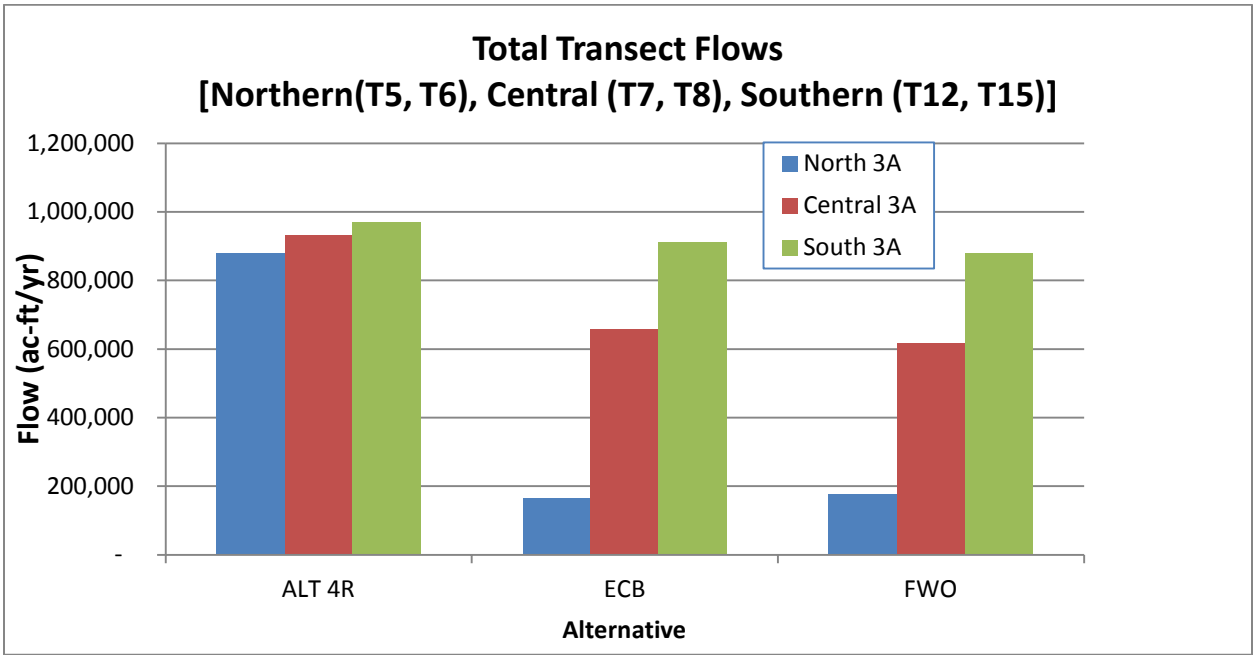


Figure C.2.2-93. Average Annual Surface and Groundwater Transect Flows for WCA 3A.

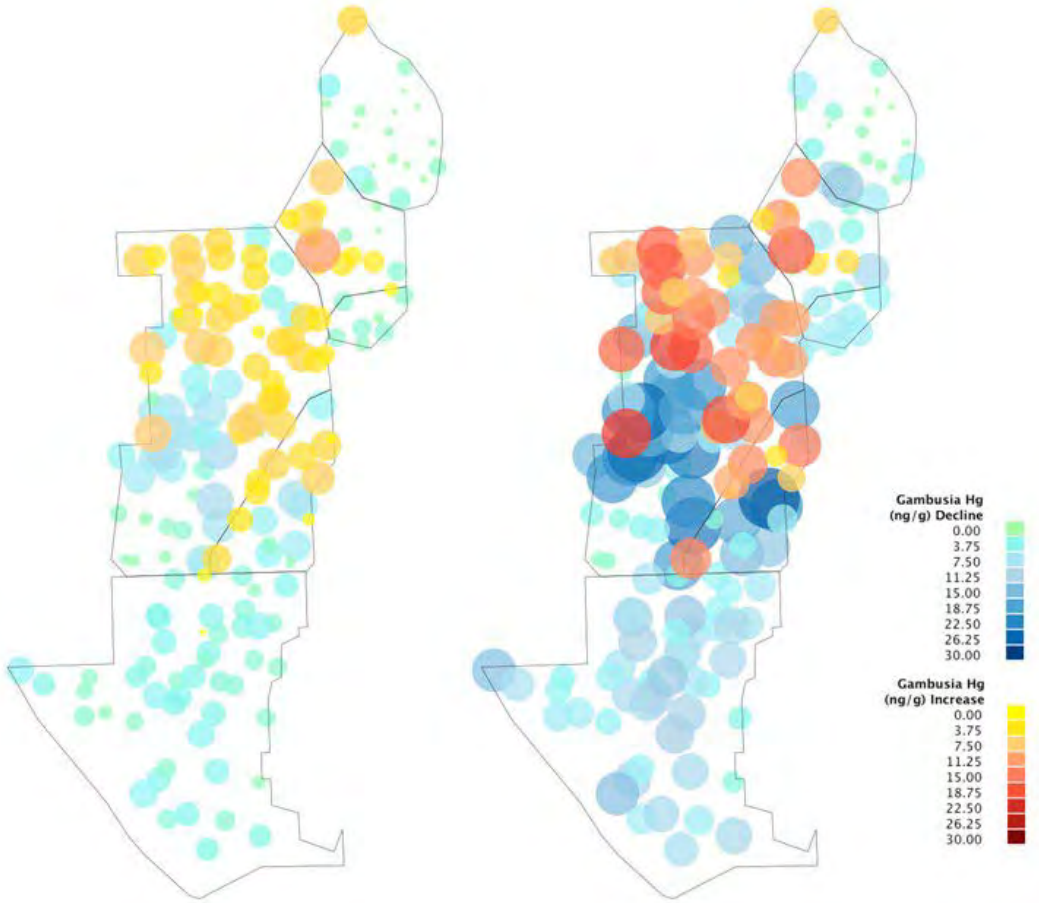


Figure C.2.2-94. Predicted changes in *Gambusia* Hg concentrations in response to 50 and 100 percent reductions in excess (non-marine) sulfate exported from the EAA (left and right, respectively) using R-EMAP Cycles 6 and 7 data. (from SFWMD, 2012).

C.2.2.9.6 WCA 3B

Additional water flow into WCA 3B will result from the breaches of the L-67A and L-67C levees. Relative to the FWO condition, flows through these breaches will be composed of more water that passes through the northern WCA 3A marsh and less water from the Miami Canal and the S-9 basin since these flows are reduced by approximately 50% at S-151 and 9% from S-9/S-9A pumps. Increased hydration of WCA 3B will reduce the risk for severe drydown and thus reduce fire risk relative to FWO. Water quality degradation such as the release of Total Phosphorous (TP) into the water column and increased methyl mercury (MeHg) in the water column associated with fire events and their aftermath will be reduced. Additional flow into WCA 3B will increase nutrient loads relative to the FWO condition. **Annex F** includes a detailed discussion of the impact of CEPP on phosphorus within WCA 3B.

Like WCA 3A, sulfate loads are likely to increase in WCA 3B due to increased flows into this area relative to the FWO condition. The reduction in dryout/rewetting cycles within this area should reduce soil oxidation and the resulting recycling of sulfate and mercury back into the water column. The effects of additional sulfate on water column methylmercury concentrations and total mercury body burden in fish and birds in WCA 3B cannot be predicted with certainty. In light of this uncertainty, there is no reason to predict that the CEPP project will result in bioaccumulation that exceeds historic mercury concentration maximums unless atmospheric mercury deposition increases over present rates. The

recent downward trends in measured water and tissue mercury concentrations in this area are encouraging.

C.2.2.9.7 Everglades National Park

C.2.2.9.7.1 Shark River Slough

Alternative 4R vs. FWO

Water entering Shark River Slough (SRS) from WCA 3 is likely to have lower concentrations of TP as compared with the FWO condition due to the backfilling of the Miami Canal which will result in more water passing through the marsh areas and less water flowing directly from upstream canal sources. A detailed discussion of the effect of the CEPP project on total phosphorus concentrations in ENP is provided in **Annex F**.

Fish mercury concentrations within ENP have not decreased as much as that observed in WCA 3. The reasons for continued higher concentrations of bioaccumulated mercury in ENP fish are not well understood at this time. The range of sulfate concentrations that maximize methylmercury formation in ENP is significantly lower than optimal sulfate concentration ranges for the water conservation areas. Thus, smaller changes to sulfate concentrations in ENP may result in greater changes to mercury methylation and bioaccumulation than would occur in the water conservation areas.

Sulfate loading into ENP under the Alt 4R2 condition is likely to decrease somewhat relative to the FWO condition primarily because most of the flows into northern ENP will have been routed through the WCA 3 marsh which is likely to remove more sulfate than the additional sulfate provided by the increased flow from Alt 4R. The additional flow will increase stages within Shark River Slough by an average of 0.5 ft which should significantly reduce areas that are subject to dry out and rewetting. Reduced dry out and rewetting will reduce the recycling of sulfate and mercury that exacerbates mercury bioaccumulation. The effects of Alt 4R on formation and bioaccumulation of methylmercury cannot be predicted with certainty since the mechanisms that affect mercury methylation rates in ENP are not fully understood at this time. However, if sulfate loads do not increase with Alt 4R and the additional flow reduces dry out/rewetting cycles, it is likely that future with-project mercury methylation conditions will not exceed the peak concentrations observed in ENP in 1999 unless atmospheric deposition of mercury increases in the future. Continued monitoring and scientific investigation of mercury within the Everglades Protection Area will provide more certainty regarding potential project impacts well before the additional flows from Alt 4R2 are realized.

C.2.2.10 Air Quality

Direct emissions from the proposed construction of the CEPP project features would be confined to exhaust emissions of labor transport equipment, and construction equipment (dump trucks, excavators, graders, bulldozers, etc.). Clean Air Act pollutants considered in this air quality assessment are SO_x; volatile organic compounds (VOCs); nitrogen oxides (NOx), CO, PM10, and PM2.5. Green house gas emissions are also considered. Volatile organic compounds, sulfer oxides, and nitrogen oxides are important since they are precursors to ozone generation. These criteria pollutants are generated by the construction and operational activities associated with the proposed alternatives.

Pursuant to the General Conformity Rule, of the Federal Clean Air Act (CAA) as promulgated by the U.S. Environmental Protection Agency (EPA), a federal agency must make a General Conformity Determination for all federal actions in non-attainment or maintenance areas where the total of direct and indirect emissions of a non-attainment pollutant or its precursors exceeds levels established by the regulations. Since Palm Beach, Broward, and Miami-Dade Counties are considered by EPA to be in

attainment for all criteria pollutants, the proposed TSP for CEPP is exempt from CAA Conformity Determination requirements. The criteria pollutants, including ozone, are estimated herein for planning purposes only.

C.2.2.10.1 Emission Sources

The emission rate factors shown in **Table C.2.2-8** for equipment such as excavators, dozers, dump trucks, and the associated support equipment, were derived from a USEPA non-road engine emissions modeling report USEPA, 2002). The number, type, and duration of use for each piece of equipment were estimated using preliminary earth moving volumes estimated for each of the project features.

Table C.2.2-8. Emission Rate Factors for Construction Equipment Likely to Be Used to Construct CEPP ALT4R Project Features.

Equipment	HP	Load Factor	Emission Factors in g/bhp-hr					
			CO	VOC	Nox	Sox	PM10	PM2.5
Tractor with bush hog	108	0.21	4.07	1.19	7.16	0.007	0.654	0.582
Dozer	140	0.58	2.19	0.59	6.15	0.006	0.229	0.204
Off Road Dump Truck	300	0.57	1.82	0.57	5.55	0.006	0.295	0.263
Road Grader	165	0.59	2.19	0.59	6.15	0.006	0.229	0.204
Roller	106	0.43	4.08	1.32	7.76	0.007	0.686	0.611
Scraper	250	0.7	2.45	1.32	7.76	0.007	0.686	0.611
Trac-hoe	270	0.59	2.19	0.59	6.15	0.006	0.229	0.204

C.2.2.10.2 Emission Calculations

Project related air pollution emissions were estimated for each of the constructed features included in the selected plan (Alt 4R2) these estimates are considered to be applicable to the other with-project alternatives. The construction effort for each project feature was derived from very rough estimates of the volume of earth material moved for each features, the likely construction methodology, and the estimated drive distance between material excavation and material placement. To account for emissions from activities not directly associated with earth moving, the estimates were increased by 20 percent. The duration of construction for each project feature was determined using the probable maximum annual expenditure and the estimated construction cost of the feature. For instance, if the feature is estimated to cost $400 million and the probable maximum annual construction budget is $100 million per year, the duration of construction for that feature was estimated to take four years. Since the sequencing of activities required to build an individual project feature is not available in the planning phase, all construction tasks were spread out over the entire duration of construction of the feature. Emission rates, reported in tons of pollutant emitted per year of operation (tons/year) for each engine were calculated for each of the six criteria air pollutants: CO, NOx, PM2.5, PM10, SOx, and VOCs. The emission rates were derived from the formula:

Emission Rate (tons/yr) = Engine Horsepower × *Engine Load Factor* × *Emission Factor* × duration of operation over the year

Green house gas emissions (carbon dioxide) were estimated based upon the diesel fuel consumption for each feature.

C.2.2.10.3 With Project Construction Emissions

The criteria air pollutants emissions shown in **Table C.2.2-9** are the estimated total of direct and indirect emissions that would occur during the construction of the CEPP project features. The project features included are:

L-5: L-5 Canal Capacity Expansion
MCB: Miami Canal Backfill
BSL: Blue Shanty Flow-way Levee
DGRD: Degrade of the L-67E, L-67A, L-67C, L-29 levee
A2: A-2 FEB
SB: L-29N Seepage Barrier

The emissions from the construction of pump stations and flow control structures are accounted for in the 20 percent contingency factor applied to the total loads.

Table C.2.2-9. Estimated Air Pollutant Emissions from the Construction of ALT4R.

Feature Construction		Regulated Air Pollutants						Green House Gas Emissions	
	Year	CO	VOC	Nox	Sox	PM10	PM2.5	Fuel Burnt	CO2
		Mton/yr	Mton/yr	Mton/yr	Mton/yr	Mton/yr	Mton/yr	gallons/yr	Mtons/yr
L-5	1	27.8	8.3	82.5	0.1	4.0	3.5	453,333	4,565
L-5	2	27.8	8.3	82.5	0.1	4.0	3.5	453,333	4,565
MCB	3	23.9	7.2	71.2	0.1	3.5	3.1	465,000	4,683
MCB	4	23.9	7.2	71.2	0.1	3.5	3.1	465,000	4,683
MCB	5	23.9	7.2	71.2	0.1	3.5	3.1	465,000	4,683
MCB	6	23.9	7.2	71.2	0.1	3.5	3.1	465,000	4,683
BSL	7	12.0	4.3	34.2	0.0	2.0	1.8	212,654	2,141
DGRD	8	7.8	2.1	21.8	0.0	0.8	0.7	162,000	1,631
DGRD	9	7.8	2.1	21.8	0.0	0.8	0.7	162,000	1,631
DGRD	10	7.8	2.1	21.8	0.0	0.8	0.7	162,000	1,631
DGRD	11	7.8	2.1	21.8	0.0	0.8	0.7	162,000	1,631
DGRD	12	7.8	2.1	21.8	0.0	0.8	0.7	162,000	1,631
A2	13	15.4	5.4	43.3	0.0	2.5	2.2	309,421	3,116
A2	14	15.4	5.4	43.3	0.0	2.5	2.2	309,421	3,116
A2+SB	15	17.7	6.1	50.2	0.0	2.8	2.5	353,421	3,559
A2+SB	16	17.7	6.1	50.2	0.0	2.8	2.5	353,421	3,559
Totals		**268**	**83**	**780**	**1**	**38**	**34**	**5,115,006**	**51,508**

C.2.2.10.4 With Project Operational Emissions

Operational emissions estimates are assumed to be generated primarily from the pumps moving water into the A-2 FEB and from the enlarged S-356 pump station (**Table C.2.2-10**). The pump stations feeding the A-2 FEB is the S-370 and the S372 pumps. The NOx and SOx loads are taken from Golder Associates,

2010. The other pollutants loads were estimated from the Golder Associates NOx emissions. The A-2 FEB emissions and the ratio of A-2 FEB flows to S-356 flows were used to estimate the S-356 emissions. Emissions associated with employee transportation and maintenance of ALT4R features are not presented here because they should be minor in comparison to the emissions from the major pump stations. Emissions associated with the Alt 4R will result in minor, localized, temporary increases in concentrations of NO_2, SO_2, CO, VOC, and PM. Since the project is located in an attainment area, there is no requirement to prepare a conformity determination. Nonetheless, estimates were tallied to determine the level of emissions that would occur due to the proposed actions. On an annual basis, the project would result in nitrous oxide emissions exceeding the General Conformity threshold (100 tons/year) during operations. However, as stated earlier since Broward County is in an attainment area, there is no CAA requirement to meet this threshold or to mitigate for exceedance of it.

Rehydration of peat soils in the portion of WCA 3A north of Alligator Alley (approximately 70,000 hectares) is expected to stop the oxidation of peat soils by 2025 which releases between 3.71 and 9.2 tons of $C0_2$ per hectare per year. By 2065, rehydration should result in peat accretion which is estimated to capture approximate 3.7 tons of $C0_2$ per hectare per year (Richardson et. al., 2013). Peat accretion after 2065 will result in the sequestration of approximately 260,000 metric tons of $C0_2$ per year.

Table C.2.2-10. Air Quality Emissions for Major Project Features of ALT4R During Operations.

Project Feature	Annual Emission Loads (Mton/yr)						Fuel Burnt	CO2
	CO	VOC	Nox	Sox	PM10	PM2.5	gallons/yr	Mtons/yr
A2 Inflow Pumping (G372, G370)	84	25	250	5	12	11	50,000	500
S356 Pump	28	8	83	2	4	4	17,000	170
Peat Accretion after year 2065*								(-260,000)

***Estimate of C02 sequestration from peat accretion is based on methodology found in Richardson et al, 2013.**

C.2.2.10.5 Without Project Air Emissions

The largest contributor of air emissions under the without project condition is the continued use of the 14,000 acre A-2 FEB lands for sugar cultivation. Sugarcane field burning is estimated to contribute 20 percent of the VOC, 48 percent of the PM2.5, 22 percent of the CO, and 11 percent of the NOx annual loads in Palm Beach County (Hall et. al 2010). **Table C.2.2-11** shows a rough estimate of the air emissions from sugar cane cultivation on the 14,400 acres A-2 FEB. Emissions for sugarcane cultivation were estimated using average heavy equipment emissions factors and an estimate of 16 gallons of diesel per acres of cultivation. Cane field burning factors were taken from Hall, et al (2010). Continued oxidation of peat soils will result in the release of as much as 51,500 tons of C02 from the A-2 FEB lands and 1,600,000 tons of C02 from northern WCA 3A.

Table C.2.2-11. Estimated Air Emissions From Continued Sugarcane Operations on A-2 FEB Lands and From Peat Loss in WCA-3A (North of Alligator Alley).

Activity	Annual Emission Loads (Mton/yr)						Fuel Burnt	CO2
	CO	VOC	Nox	Sox	PM10	PM2.5	gallons/yr	Mtons/yr

Sugar Cane Cultivation	10	3.5	20	.02	1.8	1.65	225000	2,250
Cane Field Burning	9	6				0.7		450
Peat Loss on A-2 Lands *								21,000 to 52,000
Peat Loss in WCA-3A (North of Alligator Alley) *								650,000 to 1,600,000

* Estimate of C02 Emissions from peat loss is based on methodology found in Richardson et. al 2013.

The total increases in air pollutants are relatively minor in relation to the existing point and nonpoint and mobile source emissions in Palm Beach, Broward, and Miami-Dade Counties. Impacts from project related emissions during construction and during the operational phase of CEPP would not significantly impact air quality within the airshed. Short-term loadings of internal-combustion engine exhaust gasses are expected to be negligible and not pose a threat to workers or local populations. The G-370 and G-372 pumps presently have air quality emissions permits. These permits may need modification to account for the additional operations and emissions. An air quality permit will be obtained prior to the construction of the S-356 pump station. Because the project is located within a designated attainment area, EPA's general conformity rule to implement Section 176 (c) of the Clean Air Act does not apply, and a conformity statement should not be required. Over the long-term, rehydration of peat soils in WCA 3A will capture many more tons of C02 than that emitted during construction or as a result of pump operations.

C.2.2.11 Hazardous, Toxic and Radioactive Waste

The FWO and with-project alternative conditions will have similar hazardous, toxic and radioactive waste (HTRW) conditions in the future with the exception of the lands used for the A-2 FEB. Under the FWO condition, the A-2 FEB lands will likely continue to be farmed which will result in the additional application of agricultural pesticides in the cultivated portions of this property and the inadvertent release of petroleum and pesticides in operation and maintenance areas. During the construction of project features, is possible that undiscovered HTRW contamination will be found. Per EC 1165-2-132, the non-federal sponsor will be required to remediate these sites at their sole expense. There is also the potential for HTRW release associated with the operation of project pump stations; however, with modern facilities and best management practices, this presents a minor risk to the environment.

C.2.2.11.1 Residual Agricultural Chemicals

The USACE HTRW policy (ER 1165-2-132) directs that Construction of Civil Works projects in HTRW-contaminated areas should be avoided where practicable. In September 2011, the ASA(CW) provided an exception to this HTRW policy for CERP Projects (Memorandum for Deputy Commanding General for Civil and Emergency Operations, Subject: Comprehensive Everglades Restoration Plan (CERP) – Residual Agricultural Chemicals, Dated September 14, 2011). A copy of this policy is included in **Appendix C.4.** If specific criteria are met, this policy memorandum allows residual agrichemicals to remain on project lands and allows the USACE or SFWMD to integrate response actions directly into the construction plan. At the request of the SFWMD, this section of the PIR has been included in the CEPP PIR to comply with the ASA(CW) policy. A copy of the letter from the SFWMD requesting application of the policy is included in **Annex H** along with HTRW reports, sampling protocol, and correspondence**.**

The FDEP and USFWS have reviewed the sampling performed to date on the A-2 FEB land and preliminarily indicated that the soils do not require any remedial action in order to protect USFWS trust species. The FDEP and USFWS is recommending that additional sampling of water quality, periphyton and apple snails be conducted in lieu of requiring soil remediation since they believe that the risks to trust species are minimal. Development of an agrochemical best management practices (BMP) plan for the interim use of the property was also recommended. It is possible that in the future, some impacted soils may be identified for removal or isolation or the USACE may come in contract with these soils during construction. For these reasons, the SFWMD has requested that the CERP Residual Agricultural Chemical policy be applied to this project.

This section of the PIR partially fulfills the requirements established in the aforementioned policy for the A-2 FEB portion of the CEPP. Pursuant to paragraph 4 of the policy and prior to beginning construction, the Jacksonville District will obtain written documentation of regulatory approval(s) for all response actions from SFWMD, and enter into an agreement with the SFWMD wherein the USACE accepts and expends funds, contributed by the SFWMD, for performance of the approved response action(s).

As part of the land acquisition process and in coordination with the Florida Department of Environmental Protection (FDEP) Bureau of Waste Cleanup and USFWS Contaminants Section, SFWMD assessed the A-2 FEB site in a series of Phase I/II Environmental Site Assessments (ESA) and Ecological Risk Assessments (ERA). The SFWMD performed point source remediation and completed multiple corrective actions in accordance with FDEP regulations. A Summary of the completed corrective actions performed by the SFWMD is included in the audit reports included in **Annex H**. The only chemicals of concern remaining on the A-2 FEB site are residual agricultural chemicals.

As required, the following is a discussion of each of the Policy Memorandum's requirements and conditions for only the constituents remaining on the A-2 FEB site. Documentation of full compliance with the CERP Ag-Chem policy requirements will be provided prior to construction on the A-2 FEB lands that have impacted soils.

a. Residual Agricultural Chemicals

1) Determination that lands were formerly cultivated soils. At the time of acquisition, the 14,408-acre site was in active sugar cane and rice cultivation. The historical research included in the Phase I/II ESA indicated that prior to converting the land to agricultural production around the 1950s, the land was undeveloped lowlands.

2) The nature and extent of residual agricultural chemicals within the cultivated area of the A-2 FEB lands was investigated by conducting soil sampling at 30 randomly selected 50-acre grids located within the 14,400 acre site. The 50-acre grid soil samples were analyzed for organochlorine pesticides (OCPs) by EPA method 8081, organophosphorus pesticides plus atrazine by EPA Method 8141, chlorinated herbicides by EPA Method 8151, and total organic carbon (TOC), and RCRA 8 metals plus copper by EPA method 6010/7471. This list includes a total of 88 distinct analytes. **Table C.2.2-12** is a summary of the detected analytes found on the property. **Table C.2.2-12** lists all of the residual agricultural chemicals with the maximum concentration remaining on the A-2 FEB site as well as the applicable regulatory criteria for each detected chemical. Arsenic was detected in all samples at concentrations above the residential direct exposure criteria. Given that the project lands will be inundated, exceedance of residential exposure criteria does not pose a risk to human health. Atrazine was detected above the groundwater leachate limit on approximately 23 percent of the tested grid cells. Since atrazine is a modern, low-persistence herbicide this exceedance is

classified as temporary and is expected to naturally attenuate once active sugar cane cultivation ceases.

Copper was detected on approximately 30 percent of the tested grids at concentrations that exceed the USFWS interim criteria of 85 mg/kg for copper in inundated soils/sediments. The estimated 95% Upper Confidence Limit concentration for A-2 FEB residual soil copper is estimated to be 81 mg/Kg which is slightly lower than the USFWS interim criterion. The 85 mg/kg criterion which is intended to protect the endangered Everglades snail kite, was established based upon sandy soil conditions associated with citrus cultivation. Relevant scientific literature reviewed as part of the Screening Level Ecological Risk Assessment (SLERA) performed on behalf of the SFWMD (PSI, 2013) indicate that the bioavailability of copper to ecological receptors is likely to be significantly lower in organic muck soils found within the A-2 FEB lands than it is for sandy citrus soils. Given that most of the samples exceeding 85 mg/Kg copper were in the 85 to 95 mg/ range and that the organic soil would make copper less available, PSI, the SFWMD contractor determined that the copper concentrations in the highly organic soils would not present a significant risk to the snail kite. The USFWS agreed with this assessment. Dieldrin, a legacy organo-chlorine pesticide was detected in 10 percent of the grid samples at concentrations that exceed the groundwater leachability criteria and the Sediment Quality Assessment Guideline Threshold Effect concentration (SQAG-TEC). Subsequent Synthetic Precipitation Leaching Procedure (SPLP) testing was conducted for the two (2) samples with the highest dieldrin concentrations. SPLP results indicated that dieldrin was not detected in either sample above the laboratory minimum detection limit (MDL); however, the MDL in this case was above the applicable surface water criteria. This is not uncommon since surface water criteria for organic chemicals are based on derived toxicity estimates and are not set with consideration for achievable laboratory detection limits. In this case, surface water flows and rainfall are expected to dilute the dieldrin from the sediments sufficiently such that surface water quality criteria will be met. After reviewing the analytical data, the USFWS and FDEP concurred that the detected concentrations of copper and other contaminants are unlikely to pose risk to trust resources or otherwise require remedial actions. The USFWS and FDEP agreed with the SFWMD's recommendation that sampling for detected pesticides and metals be performed during start up of the A-2 FEB. Copies of the USFWS and FDEP correspondence are found in **Annex H.**

Table C.2.2-12. Residual Agricultural Chemicals Detected on A-2 FEB Lands During January 2013 Sampling of Cultivated Lands (PSI, 2013).

				Regulatory Limits (mg/Kg)				
Parameter	CAS #'s[1]	CERCLA[2] Regulated (Y/N)	Range[3] Observed (mg/Kg)	EPA Regulatory Limits[4] (mg/Kg)	SCTL-CDE[5]	SCTL-RDE[6]	SQAG-PEC[7]	SQAG-TEC[8]
Arsenic	7440-38-2	Y	3.1-6.8	1.6	12	2.1	33	9.8
Barium	7440-39-3	Y	69-110	190,000	130,000	120	60	20
Cadmium	7440-43-9	Y	<0.1 - 0.18	800	1,700	82	5.0	1.0
Chromium	7440-47-3	Y	5.6-28	NG	470	210	110	43
Copper	7440-50-8	Y	53-110	41,000	89,000	150	150	32/85[9]
Lead	7439-92-1	Y	4.7-8.4	800	1,400	400	130	36
Mercury	7439-97-6	Y	0.077-0.15	43	17	3	1.1	0.18
Selenium	7782-49-2	Y	<0.58 - 3.7	5,100	11,000	440	N/A	4.2[10]
Silver	7440-22-4	Y	<0.3 - 0.64	5,100	8,200	410	2.2	1.0
2,4-D	94-75-7	N	<0.057-0.94	7700	13,000	770	***	***
Atrazine	1912-24-9	N	<0.025 - 3.5	7.5	19	4	NG	0.0003
Metribuzin	21087-64-9	N	<0.018 - 1.7	15,000	290	54	***	***
Phorate	298-02-2	N	<0.0036 - 0.12	120	320	16	***	***
Dieldrin	60-57-1	Y	<0.00099 - 0.0051	0.11	0.3	0.06	0.062	0.0019

Notes:
mg/Kg - milligrams per Kilogram
NG - No guideline
- Site concentrations for carcinogenic polycyclic aromatic hydrocarbons must be converted to Benzo(a)pyrene equivalents before comparison with the appropriate direct exposure SCTL for Benzo(a)pyrene using the approach described in the February 2005 'Final Technical Report: Development of Cleanup Target Levels (CTLs) for Chapter 62-777, F.A.C.'
[1]CAS Registry Number (CAS#'s) - unique numeric identifier which designates one substance and has no chemical significance
[2]40 Code of Federal Regulations (CFR) 302.4, Designation of Hazardous Substances - Comprehensive Environmental Response, Compensation, Liability Act
[3]Range of chemical concentrations observed in all the samples collected within the Agricultural Areas only.
[4]USEPA - Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites - Industrial Soil
[5]Chapter 62-777, FAC, Table 2 - Technical Background Document, SCTLs, Direct Exposure - Commercial / Industrial
[6]Chapter 62-777, FAC, Table 2 - Technical Background Document, SCTLs, Direct Exposure - Residential
[7]Development and Evaluation of Sediment Quality Assessment Guidelines, Volumes 1-4 (MacDonald, 2000), Sediment Quality Assessment Guidelines-Probable Effects Concentration
[8]Development and Evaluation of Sediment Quality Assessment Guidelines, Volumes 1-4 (MacDonald, 2000), Sediment Quality Assessment Guidelines-Threshold Effects Concentration
9USFWS Interim Screening Level for Everglades Snail Kite
10No SQAG criteria have been developed for selenium. An Action Level of 4.2 mg/kg was negotiated with USFWS on the C9/C11 project for Selenium in organic soils.

3) <u>Determination that agricultural chemicals were commercially available products, lawfully applied for their intended purpose, not spilled, and did not result from waste management.</u>

Phase I/II ESA were conducted on the site using an environmental protocol approved by SFWMD, FWS and FDEP-Bureau of Waste Cleanup. (Copies of summary environmental audit report and the environmental protocol are included in **Annex H**.) These Phase I/II audits document long-term sugar cane farming activities that began in the 1960's. **Table C.2.2-12** lists the chemical compounds found on the project lands that exceed regulatory limits or guidelines. These compounds are either active ingredients found in commercially available products registered under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) (7 U.S.C. 136a) or they are micro-nutrients that are added to increase the fertility of muck soils utilized to grow sugar cane (Rice, et al, 2010).

Copper was found in 30 percent of the soil samples above 85 mg/kg. The average copper soil concentration was 76.8 mg/kg. The minimum concentration was 53 mg/kg and the maximum copper concentration was 110 mg/kg. The average concentration was compared to potential residual concentrations that result from long-term application at recommended rates. If one assumes 40 years of copper application at a rate of 2 lb/acre/year (Rice, 2010), and a background of 30 mg/Kg, the potential average concentration of copper distributed in the top 1 ft of soil would be approximately 90 mg/Kg. That the measured average is somewhat lower can be accounted for by losses to deeper soils or use of less copper in some areas. For comparison, copper concentrations

on industrial National Priority List sites where spills or disposal have occurred are typically are in the 1,000s of mg/Kg.

Arsenic has a long and continued history of use in agriculture. It is likely that the reported arsenic concentrations found on the A-2 FEB land (average of 4.5 mg/kg) are the result of a combination of background arsenic (0.8 to 3.7 mg/Kg, per Chen 2001) and arsenic added during agricultural operations.

Lead was found at concentrations above the residential exposure limit (RDLE); however, since the A-2 FEB land will be inundated this particular criteria is not relevant.

Elevated selenium concentrations have been found on previously farmed land in Miami-Dade and Broward counties. Residual selenium concentrations in farm soils in South Florida are attributed to trace selenium contained within fertilizers applied to farms to enhance fertility.

Dieldrin and Atrazine are pesticides and herbicides that are or were registered under FIFRA. Their presence on the A-2 FEB lands is not unusual for farmed soils in the EAA.

The exceedances for barium, cadmium, chromium, mercury, and silver were of the SQAG limits which are guidelines but not promulgated standards. Several pesticides were detected (2,4, D , metribuzin, and phorate; however, the concentrations were below applicable standards and no SQAG limits exist for these contaminants.

Given the information presented here and other site evidence, there is no indication that the concentrations found on the A-2 FEB cultivated lands are indicative of a spill, deliberate on-site disposal or some other non-farming activity. A reasonable conclusion regarding the source of these residual soil contaminants is that they are the result of routine application of chemicals to the fields during routine farming operations.

4) Availability of Alternative Lands (why avoidance of land was not practicable). Much of the land in south Florida that is not currently residential, commercial, or industrial was once used for agriculture, even including some areas that now comprise the Everglades National Park. There are few open areas that were not used for agriculture. The lands for the A-2 FEB components were required to be located in the EAA Miami Canal Sub-basin with access to the Miami Canal on approximately 10,000 to 14,000 acres of land. There are several possible sites. The existing land use for these sites was predominantly sugar cane, turf grass, other agriculture or wetlands. Other than using other agricultural lands in the sub-basin, the A-2 FEB facility could be sited in wetlands. Siting storage facilities on wetlands obviously involves adverse impact to wetland habitat. In terms of the potential for presence of problematic concentrations of residual agricultural chemicals, sugar cane lands are considered to be lower risk than turf grass, citrus, or truck crop lands since persistent organo-chlorine pesticides were generally not applied at high rates during sugar cane cultivation.

5) Project Purpose (conversion from agricultural production to an aquatic restoration purpose). The project purpose for the A-2 FEB is capture and store releases from Lake Okeechobee and then distribute the water to STA3/4 and Compartment B of STA2 for treatment prior to releasing this water into northern WCA 3A. The project will inundate the land with water for an extended period of time in order to meet federal project goals. This purpose is achieved with a 14,000 acre (wetted area) reservoir which will be inundated with up to 4 feet of water. Therefore, these components

require the land conversion from agricultural production to aquatic restoration which inundates the land with water in order to meet the Federal project goals.

b. Regulatory Coordination

The SFWMD has conducted several Phase I/II site assessments prior to and since acquiring the A-2 FEB lands in 1999. A discussion of the findings of these investigations and coordination of remedial activities with FDEP in included in the Summary Environmental Report, PSI, Inc, August 21, 2012 which is in **Annex H**. In January of 2013, the SFWMD conducted additional sampling of cultivated areas on the A-2 FEB lands. The USFWS and FDEP have preliminarily determined that the residual agricultural chemicals found on the A-2 FEB lands do not present a risk to protected resources. Based on the results of the 2013 soil testing, the USFWS and FDEP are recommending that during the initial operations of the FEB, the SFWMD perform testing of water for several contaminants (2,4, D, atrazine, metribuzin, phorate, dieldrin, chromium, mercury, selenium, copper) as well as testing of periphyton and apple snails for copper.

The FDEP also reviewed the 2013 soil sampling results and recommended the development of a soil management plan to address the fate of arsenic impacted soils during construction as well as the same start-up operations sampling program as provided by the USFWS. The FDEP and the USFWS both recommended that agrochemical best management practices be instituted during the continued cultivation of the lands.

The USFWS and FDEP review letters did not identify threshold concentrations or the potential consequences of detecting elevated concentrations of copper in water, periphyton, or apple snails during initial operations monitoring. The USFWS and FDEP provided the same comments on the A-1 FEB which has similar levels of copper in the cultivated soil. To better define threshold copper concentrations, the SFWMD has jointly sponsored several studies which are currently underway to evaluate copper bioaccumulation, toxicity, desorption, and other important parameters that significantly impact the potential risks associated with exposure of the Everglades snail kite, and other species to copper in sediments. The SFWMD believes that they will be in a better position to discuss threshold concentrations with the USFWS and FDEP after completion of these studies within the next 12-18 months, and prior to the A-1 FEB construction. The risk that threshold copper concentrations detected in the A-2 FEB during start-up operations will result in a post-construction remedial action requirements is minimal given completion of ongoing copper bioaccumulation studies and because the operation of the A-1 FEB will precede the A-2 FEB design/construction by several years.

The A-2 lands will remain in agricultural production for several years until the A-2 project feature is set for construction at which time the agricultural leases will be terminated. Once farming has ceased on the project lands, an Exit Assessment will be performed to determine the presence of any new potential sources of HTRW since the completion of the previous Phase II ESA, and to verify the concentration of contaminants in the cultivated areas at selected locations. The results of these audits will be provided to the FDEP and USFWS for their review, comment, and concurrence regarding the need for remedial actions.

c. Soils Removed

Testing and Investigations Performed. The environmental site assessments for the A-2 FEB site generally followed the FDEP and FWS established protocols in terms of procedures with the exception that 10 percent of the 50-acre grids were sampled rather than the normal 30 to 50 percent of the grids. The lower sampling rate was acceptable to the USFWS because of the prior land use which was limited to sugar cane cultivation in the cultivated areas and because the sampling results showed similar concentrations of detected analytes rather than widespread differences between sampled grids. The testing and investigations performed during the Phase I/II concluded that the remaining residual agricultural chemicals on the A-2 FEB site are either not "listed" hazardous wastes or are at concentrations reflecting lawful application for its intended purpose, and was not the result of a spill or waste management.

Hazardous Waste Characteristics. Per Subpart C (40 CFR 261.20 et seq.) the four RCRA characteristics of hazardous waste are: ignitability, corrosivity, reactivity, and toxicity. Ignitable wastes readily catch fire, sustain combustion, and when ignited, burn so vigorously and persistently that it creates a hazard. Corrosive wastes are a liquid and are acidic or alkaline wastes that readily corrode or dissolve flesh, metal, or other materials. Reactive wastes are unstable, readily explode or undergo violent reactions.

None of the soils tested in 2013 on the A-2 FEB site exhibit any of these hazardous waste characteristics. Per **Table C.2.2-12**, the concentrations of the remaining residual agricultural chemicals are not sufficient to render the soils ignitable or reactive. FDEP-Bureau of Waste Cleanup required no special handling of similarly impacted soils at other CERP project sites. Also, cultivation of crops in these and similar soils in the region is not known to result in soil combustion or explosion. Similarly, no corrosive materials are known to be present. To be corrosive, materials must be in a liquid state. Soils on the site are solids. Therefore, testing for these three characteristics (ignitability, corrosivity, and reactivity) is not necessary.

The fourth characteristic is toxicity. Toxic wastes leach toxic compounds or elements into underlying soils or groundwater supplies. For a toxic constituent in 40 CFR 261, Subpart C, demonstration of the RCRA toxicity characteristics can be determined by utilizing the Toxicity Characteristics Leachate Procedure (TCLP) test or by analyzing for total constituent concentration and applying the "Rule of 20" to infer whether the RCRA Toxicity Characteristics regulatory limits would be exceeded. The "Rule of 20" allows a toxicity determination to be made by comparing the total concentration analysis (dry weight) to the TCLP regulatory concentration (wet weight). The rule is used by multiplying the RCRA TCLP limit (mg/l) by 20 and then comparing this value to the measured total constituent concentration (mg/kg). If the measured total constituent concentration value is less than the TCLP concentration multiplied by 20, the material does not exhibit RCRA characteristics based on toxicity as determined by analytical procedures. Additionally, if the constituent is not listed in Table 1 of Subpart C, the material is not a RCRA characteristic waste based on toxicity.

Table C.2.2-13 summarizes the results of the "Rule of 20" for the residual agricultural chemicals on the A-2 FEB site. Based on the "Rule of 20" none of the remaining soils containing residual agricultural chemicals on the A-2 FEB site exceed the RCRA characteristic toxicity levels. Based on the information provided by the SFWMD, the USACE concurs that none of the remaining soils on site will need to be removed from the A-2 FEB site by SFWMD prior to the start of construction based on the criteria in the Policy Memorandum (Soils Removed). Should soils containing residual agricultural chemicals be found to contain contamination that rises to a RCRA level before, during

or after construction, the NFS shall remove, properly dispose, and manage such soils at 100% NFS cost and USACE shall not conduct such work. As discussed in previous sections, after agricultural operations have ceased on the lands, subsequent testing will be performed and the results subjected to the RCRA hazardous waste determination to ascertain compliance with the USACE Policy for Agricultural Chemicals on CERP lands

Table C.2.2-13. "Rule of 20" Test for Residual Soil Contaminants Found on A-2 FEB Lands.

Agricultural Chemicals on site	Maximum Concentration (mg/kg)	RCRA TCLP Concentration (mg/l)	RCRA TCLP Concentration multiplied by 20 (mg/kg)	Is Max Concentration Less than TCLP times 20?
Arsenic	6.8	1.0	20.0	Yes
Atrazine	0.0035	Not Listed	Not Applicable	Not Applicable
Barium	110	100	2000	Yes
Cadmium	0.18	1.0	20	Yes
Chromium	28	5.0	100	Yes
Copper	110	Not Listed	Not Applicable	Not Applicable
Dieldrin	0.0045	Not Listed	Not Applicable	Not Applicable
Mercury	0.15	.2	4.0	Yes
Metribuzin	1.7	Not Listed	Not Applicable	Not Applicable
Phorate	0.12	Not Listed	Not Applicable	Not Applicable
Selenium	3	1	20	Yes
Silver	0.64	5.0	100	Yes
2,4-D	3	10	200	Yes

d. Cost Comparison for Soils Containing Residual Agricultural Chemicals Remaining on Project Lands

The FDEP and USFWS have preliminarily determined that the residual agricultural chemicals found on the A-2 FEB lands do not present a risk to protected resources. At this time, the FDEP and USFWS are recommending that the SFWMD perform testing of water, periphyton algae, and apple snails for copper during the initial operations period for the FEB. Given that the USFWS has not identified soils requiring removal, no costs can be identified at this time. If the USFWS determines in the future that some A-2 FEB project soils have to be removed or isolated, a cost comparison will be prepared.

e. Cost Comparison for USACE Acting as the Construction Agency and Performing the Response Action for the NFS

If the FDEP and/or USFWS determine in the future that some A-2 FEB project soils have to be removed or isolated, this cost comparison will be prepared as part of complying with the CERP Agricultural-Chemical Policy.

Cost effective analyses for determining if it is cost effective for the USACE to perform the non-RCRA response actions for the SFWMD will be prepared for the A-2 FEB if and when sufficient information

is available. The assumptions used to develop the costs for the construction scenario, where the USACE does not touch impacted soil, will likely be: 1) the SFWMD performs all earth moving construction activities that involve excavating impacted soils, stockpiling impacted soils, blending impacted soils, and placing blended materials; 2) the USACE performs construction actions such as pump foundation excavation of clean limerock, pump station construction, culvert installation, and earth moving construction in areas where impacted soils have either been removed or are covered with a minimum of 6 inches of clean fill; 3) splitting the work between the two agencies does not result in additional costs associated with actual construction activities, i.e., no additional material handling occurs; and 4) the additional cost of having two construction agencies and two contracts, results in an increase in the total amount required for design/engineering and contract supervision/administration. This assessment will be prepared and submitted to HQUSACE for concurrence prior to construction by USACE.

f. Engineering and Other Risks

1) Engineering Risk. The USACE will address risks during design and construction of the project components by: 1) Regulatory review of plans and specifications by the FDEP which is the delegated RCRA authority in Florida; 2) Review of environmental audits and environmental risk assessments prepared for and by the USFWS for potential impacts to Threatened and Endangered Species; 3) Incorporation of appropriate safety and handling specifications into the project bid documents; 4) Review of plans and specifications by the USACE Environmental and Munitions Center for Expertise (EM CX) prior to contract advertisement; 5) Conducting appropriate supervision and oversight of construction; 6) Conducting confirmation sampling after feature construction, and 7) SFWMD's obtaining final approval of construction actions by FDEP. These safeguards further reduce the risk of future releases or exposure and are consistent with USACE construction standards and requirements.

2) Other Risk. Once constructed, it is possible that man-made actions might disturb the soils containing residual agricultural chemicals if such material is placed within the project features or otherwise remains on the project site. To limit this risk, land use restriction covenants may be incorporated into the property deeds where required by FDEP. The SFWMD shall ensure that land use restrictions if any will not reduce ecosystem restoration benefits, hinder O&M, or interfere with the Project's proper function. Once an approved soil management plan is available, CESAJ environmental specialists and the EMCX (Environmental and Munitions Center of Expertise) will review the plan to determine other risks if any. The results of the CESAJ and EMCX review will be provided to HQUSACE for concurrence.

3) Final Risk Determination. The USACE and SFWMD will prepare a final determination report for the A-2 FEB to confirm that the overall project risk from impacted soils is low and acceptable. The final determination report will be submitted to HQUSACE prior to construction. For each construction contract managed by the USACE, the SFWMD will be responsible for providing full funding to the USACE prior to contract advertisement for the identified contract specific cost of addressing residual agricultural chemicals.

g. NFS Responsibility:

The NFS is 100% responsible for the cost of actions taken due to the presence of residual agricultural chemicals, at no expense to the Federal Government. Any future costs associated with the presence of residual agricultural chemicals at the Federal project site are a 100% NFS cost and responsibility. The costs for characterization of the project lands in preparation for conducting a re-

sponse action for the residual agricultural chemicals and removal of soils that are hazardous waste shall be included as 100% NFS responsibility. The Jacksonville District shall not conduct actions to address residual agricultural chemicals for the SFWMD during the operation and maintenance, repair, replacement and rehabilitation (OMRR&R) phase of the project.

C.2.2.12 Noise

Features of Alts 4R and 4R2 are the same. There would be minor and short term increases in noise during construction of Alts 4R and 4R2. Alts 4R and 4R2 propose additional pump stations which would result in long-term, localized increases in noise. Alts 4R and 4R2 each add the fewest number of pump stations (two) over the other action alternatives, having the least effect on noise.

C.2.2.13 Aesthetics

Features of Alts 4R and 4R2 are the same. During construction of all features there would be a temporary short-term adverse impacts to aesthetic values in the construction areas. Alternatives 4R and 4R2 show a significant increase in aesthetic value over the FWO due to restoration of hydropatterns and sheetflow throughout the project area and provide minor beneficial effect. The restoration of sheetflow provides additional habitat for native plants and animals and opportunities for wildlife viewing.

There would be negligible effects due to Alts 4R and 4R2 in Lake Okeechobee. In the Northern Estuaries, Alts 4R and 4R2 increased the aesthetic value due to decreased high flow events, providing minor beneficial effects. Reductions in high volume discharges to the estuaries would result in lower suspended solids, increased water clarity and the correct salinity envelope that maintain healthy SAV beds. These benefits could also lead to an increase in wildlife viewing opportunities (Orth et al., 2006). Within the EAA, the existing aesthetic character of the A-2 footprint is similar to the EAA as a whole; the landscape is flat and has a predominantly uniform and organized appearance. Wetland vegetation is anticipated to colonize the proposed A-2 FEB increasing wildlife utilization and opportunities for wildlife viewing within the area in Alts 4R and 4R2, thus providing minor beneficial effects. In the southern estuaries Alts 4R and 4R2 increase the aesthetic value due to an increase in native plants and animals due to increased flows in Florida Bay providing increase in potential wildlife viewing as well as providing a potential for the reduction in red tide occurrences.

Within the Greater Everglades, Alts 4R and 4R2 have a greater potential effect on aesthetics compared with FWO due to the construction of a new levee (Blue Shanty Levee). There would be temporary, short-term, localized adverse effects to aesthetics during construction of the proposed features. Alternatives 4R and 4R2 show a minor beneficial effect in aesthetic value over the FWO due to restoration of hydropatterns and sheetflow throughout the project area. The restoration of sheetflow provides additional habitat for native plants and animals and increased opportunities for wildlife viewing. Restoration of flows within Florida Bay and the southwestern coastal estuaries that reduce extreme salinity ranges improves habitat within these regions, increase potential opportunities for wildlife viewing. Alternatives 4R and 4R2 include backfilling the Miami Canal from 1.5 miles south of S-8 down to Interstate 75, thereby improving aesthetics due to removal of this unnatural landscape feature, providing long-term minor beneficial effects.

The complete degradation of the L-67 Extension levee provides a long-term minor beneficial effect in aesthetics due to the restoration of sheetflow increased native plants and animals and viewing potential. The construction of the Blue Shanty Levee (~8 mile levee) in WCA 3B has a minor adverse effect on aesthetic value due to the addition of a levee within a wetland, however, it creates a flowway

to the west that provides wildlife viewing opportunities and water flowing under Tamiami Trail. The seepage barrier in Alts 4R and 4R2 provides a moderate negative effect to the aesthetics.

C.2.2.14 Socioeconomics

Effects are provided in the main report in **Section 5.2.15**.

C.2.2.15 Recreation

In Lake Okeechobee and the Northern Estuaries, FWO and Alts 4R and 4R2 have a negligible effect on current recreation opportunities. Alternatives 4R and 4R2 may provide enhanced fishing opportunities due to better salinity conditions in the Caloosahatchee and St. Lucie Estuaries. In the Everglades Agricultural Area (EAA), currently no recreation exists on the project site so Alts 4R and 4R2 would be positive for public access meeting the identified needs according to Florida's Statewide Comprehensive Outdoor Recreation Plan (SCORP) compared to FWO.

In the Greater Everglades, in the FWO condition recreational fishing would be affected little if at all. Hiking, biking and camping will not be affected directly. In the FWO any changes in recreation would be due to degraded quality of wetlands and the aesthetic values that could decrease as wildlife viewing and nature study would be degraded. Alternative 4R and 4R2 effects to recreation will be negative or positive depending on the activity and location. The Blue Shanty Levee will bisect L-67C. Recreational fishing by prop boat to the northern end of L67C canal would continue to be available from a new public boat ramp located in the northern end of L67C at the S151, providing minor beneficial effect. Also at the S151 a new public boat ramp will allow access into the northern 5 miles of the Miami Canal south of S151 not previously served by a public boat ramp. Bank fishing opportunities could have a minor beneficial effect by the addition of access points around proposed structures. Furbearer hunting (deer, hog, rabbit, etc.) could have a major adverse effect in the short term by increased hydration in areas that have been dryer. In the long term if not better hydration peat loss to oxidation and fire would degrade current habitat further. Waterfowl hunting should improve with better hydration throughout the greater everglades during the early part of the dry season. Bird watching should improve with increased hydration of the Greater Everglades as well. Improved access and designation of blue and greenway trails will be positive. In the Southern Estuaries there is no effect on recreation with the FWO. For Alts 4R and 4R2 access to the Southern Estuaries would not change based on CEPP, however, impacts to existing quality of recreation can be impacted negatively or positively depending on location and changes to fish habitat as identified above for the Greater Everglades, however additional flows to Florida Bay are expected to provide enhanced fishing opportunities, providing a minor beneficial effect. A Recreation Plan is included in **Appendix F**.

C.2.2.16 Land Use

C.2.2.16.1 Wetlands and Uplands

Much of the future development within the study area is expected to occur on lands that were formerly in agricultural use. **Table C.2.2-14** summarizes the impacts to wetlands and uplands for Alts 4R and 4R2. Features of Alts 4R and 4R2 are the same. Alternatives 4R and 4R2 each show a major beneficial effect with an increase of 625 acres of wetland/upland habitat over the FWO. While there are some minor adverse effects due to the construction of some features, most notably the Blue Shanty Levee in WCA 3B, the construction of other features, the degradation of levees and the backfilling of canals reconnects and adds wetland acreage and provides the needed topography for sheetflow to restore the natural system. Alternatives 4R and 4R2 each shift approximately 13,800 acres of agricultural land use with wetland soils to a higher quality wetland with the construction of the A-2 FEB. The A-2 FEB would alter the land use from agriculture to an FEB that includes wetland habitat. The degradation of the L-4 levee adds

approximately 35 acres for each Alt due to the degradation of that levee and the reconnection of the wetlands in northwestern WCA 3A. The backfilling of the Miami Canal would provide an additional 417 acres of wetlands for each Alt. The backfilling of the Miami Canal would restore the wetland habitat and reestablish sheetflow in northern WCA 3. Spoil mounds on both sides of the Miami Canal from S-8 to S-339 would be removed and 22 spoil mounds (the highest priority/highest functioning Florida Fish and Wildlife Conservation Commission (FWC) enhanced spoil mounds) would be maintained for each Alt while the others would be removed. In addition to the removal of the selected spoil mounds in order to promote sheetflow across the backfilled Miami Canal, additional mounds (1.5 feet above the marsh surface) would be created every mile for each Alt from S-8 to Interstate 75 to prevent hydraulic channelizing and flow and provide upland animal habitat. This would provide an additional 45 acres of upland habitat for each Alternative. This additional upland habitat provides refuge for fur-bearing mammals during periods of high water and a minor beneficial effect. These mounds also align with the historic ridge habitat and there is the possibility that the placement of the mounds would help reestablish the ridge and slough pattern in WCA 3A.

In southern WCA 3A and WCA 3B several features increase wetland habitat while other features remove/impact wetland habitat while connecting WCA 3A to WCA 3B and ENP. The proposed L-67A culverts would have a minor adverse effect to the wetland of 4.5 acres/gated culvert for each Alt. Alternatives 4R and 4R.2 each have 3 culverts, thus a loss of 13.5 acres for each Alt. However, the culverts are critical to connecting WCA 3A and WCA 3B and in conjunction with the gated culverts in L-67A levee, there are 6,000 foot gaps in the L-67C levee that would increase wetland habitat. Each 6,000 foot gap would provide an additional 9 acres of wetland habitat; therefore Alts 4R and 4R2 would each provide 9 additional acres of wetlands. Alternatives 4R and 4R2 each have only one 6,000 foot gap because the other 2 gated culverts are included in the Blue Shanty flowway discussed below. The degradation of approximately 8 miles of the L-67C in Alts 4R and 4R2 provide 64 acres of additional wetlands for each Alt. The degradation of the L-29 levee provides an additional 46 acres of wetlands for each Alt (approximately 4.3 miles of degradation per Alt). The construction of the Blue Shanty Levee to create the flow way between WCA 3B and ENP removes 84 acres of wetlands in WCA 3B for each Alt (approximately 6.25 mile levee per Alt). In ENP, the backfill of the entire L-67 Extension canal provides an additional 104 acres of wetlands for each Alt.

Table C.2.2-14. Wetland and upland impact of the project area.

Project Feature	FWO Acres of Wetland Gain (Loss)	Alt 4R Acres of Wetland Gain (Loss) over FWO	Alt 4R2 Acres of Wetland Gain (Loss) over FWO
L-4 Degrade	0	35	35
Miami Canal Backfill	0	417	417
Miami Canal Spoil Mounds	0	45	45
L-67A Culverts	0	(13.5)	(13.5)
L-67C Gaps	0	9	9
L-67C Flow Way Degrade	0	64	64
L-29 Degrade	0	46	46
Blue Shanty Levee	0	(113)	(113)

Project Feature	FWO Acres of Wetland Gain (Loss)	Alt 4R Acres of Wetland Gain (Loss) over FWO	Alt 4R2 Acres of Wetland Gain (Loss) over FWO
L-67 Extension Backfill	0	104	104
Old Tamiami Trail Road Degrade	0	31	31
Total Net Change	**0**	**625**	**625**

C.2.2.16.2 Agriculture

The entire CEPP project area consists of lands currently under public ownership. 14,000 acres in the proposed A-2 FEB footprint are currently in production for sugar cane. Alternatives 4R and 4R2 would convert 14,000 acres of agricultural lands to wetlands due to the construction of the proposed A-2 FEB. As described in **Section 5.2.1.7**, Hydrology, negligible changes were noted for water stages within the SDCS; therefore no indirect effects to agriculture within this region are anticipated. Coordination with the United States Department of Agriculture (USDA) and National Resources Conservation Service (NRCS) to meet the requirements of the Farmland Protection Policy Act, is ongoing. When detailed design information that locates each of the plan components is completed, it can then be determined how many acres of unique farmland would be affected by the Project. (Refer to **Appendix C.4.12**).

C.2.2.17 Cultural Resources

The Everglades and associated ecosystems are a nationally significant resource and have been severely impacted by human activities for over a hundred years. A review of the Florida State Master Site Files (FMSF) indicate that there are 23,499 recorded cultural resource sites and resource groups within the CEPP study area that have a survey determination and/or State of Florida Historic Preservation Office (SHPO) evaluation of other than ineligible for listing with the National Register of Historic Places (NRHP).

Consultation in conjunction with the National Historic Preservation Act (NHPA) was initiated with the Seminole Tribe of Florida's Tribal Historic Preservation Office (THPO), the Miccosukee Tribe of Indians of Florida's NAGPRA Representative, the SHPO, Everglades National Park, Chief of Cultural Resources (ENP) and Florida Bureau of Archaeological Research, it was determined that additional surveys were needed to identify cultural resources within specific areas of potential effect (**Appendix C.5**). It was also decided that as the CEPP project progressed, additional surveys may be needed, specifically during the detailed design phase for construction, when feature designs were finalized and construction staging areas were determined. It was understood that Section 106 Compliance with the NHPA would not be completed during the current feasibility phase of the project, however would be complete prior to construction.

Area of Potential Effect

The area of potential effect (APE) for cultural resources differs greatly from the overall CEPP study area. For this project, the APE for cultural resources include the EAA A-2 footprint, portions of the L-6 levee and associated borrow canal, the L-5 canal, the S-8 Pump Station Complex, portions of the L-4 levee and associated canal, the L-28 Triangle, portions of the Big Cypress Seminole Reservation immediately west of L-28 and north of I-75, portions of the Miami Canal, WCA 3A and 3B, L-67A and L67C levee, portions of the L-29 levee, the L-67 Ext levee and associated canal, portions of the Old Tamiami Trail, and portions of the L-31N levee, and Everglades National Park (see **Table C-1.8** in **Appendix C.1.16**).

Comparison of Proposed Alternatives and FWO

Impacts to cultural resources vary by individual components within Alts 4R and 4R2. Therefore, impact evaluations were based on a review of the individual components of each Alt to determine if actions would potentially result in impacts to significant cultural resources (which include sites eligible or potentially eligible for NRHP listing), described below. Throughout the development and selection of the components, mitigation measures that would eliminate or lessen adverse cultural resource effects were utilized.

The following significance thresholds have been used in determining whether components proposed for each Alt would result in a significant impact to cultural resources. The use of the term cultural resources includes historic properties eligible or potentially eligible for NRHP listing and culturally significant sites. A cultural resource impact is considered significant if implementation of a component of an Alt would result in any of the following when compared to FWO:

- Result in a change in the significance or eligibility for NRHP, including but not limited to any contributing elements, of a historic resource
- Result in an adverse change in the significance or eligibility for NRHP of a historic resource
- Disturb any human remains, including but not limited to those outside of formal cemeteries
- Disturb memorials determined to hold public significance regardless of age
- Result in adverse changes to sites identified through consultation with the Seminole Tribe of Florida and/or the Miccosukee Tribe of Indians of Florida as having cultural significance.

For each component discussion, the environmental effect is determined when compared to future without conditions.

*Consultation is currently ongoing with regards to the determination of effects and potential mitigation of effects listed below, and therefore should be considered preliminary. While the effects associated with each Alt have been preliminarily considered for this feasibility study, a final determination of effects as required under Section 106 of the NHPA will not be determined until the project is authorized and subsequent project design phase begins. Project schedule (**Section 6.7 and 6.11.2.3**) allows for each suite of features will be consulted on as they arise. This will ensure that the most up to date information will be considered in the determination of effect. Also, based on final designs or modifications, additional work may be required for compliance with the NHPA.*

C.2.2.17.1 Draft Preliminary Operations Manual (DPOM)

This component of CEPP involves the development of a draft preliminary operation plan for each component or feature of the project. More information about the draft preliminary operation plan is recorded in **Section 6.6.5**. It should be noted that currently there are approximately 350 significant or NRHP eligible cultural resource sites, including five districts and one World Heritage site (ENP) recorded within the APE for CEPP. Effects: For this component of CEPP, there are many uncertainties similar to those described in the ERTP EIS. The uncertainty centers around what effects fluctuating water would have on subsurface cultural material, which is being addressed by ongoing investigations for ERTP. Another uncertainty is the velocity that water will be flowing from the L-4 Spreader feature and from within the Blue Shanty flowway. Water velocity can cause erosional effects and is considered an adverse long term effect to archeological sites. Once a determination of effects of fluctuating water on cultural resources has been identified for ERTP and the project enters into the design phase, Section 106 consultation for the CEPP DPOM should continue. Mitigation of Effects: Unknown at this time.

North of Redline

C.2.2.17.2 Lake Okeechobee

There are no changes from the FWO for this component of Alts 4R and 4R2. Effects: There would be no effect to cultural resources.

C.2.2.17.3 Northern Estuaries

This component of Alts 4R and 4R2 proposes to redirect a percentage of water currently flowing from Lake Okeechobee into the eastern and western northern estuaries, south into the Miami Canal and the North New River Canal. Effects: This decrease of freshwater into the estuaries would have no effect to cultural resources.

C.2.2.17.4 EAA A-2 FEB

The EAA A-2 FEB consists of a perimeter levee to confine the water, potential grading within the interior of the FEB footprint, improvements to existing agriculture canals, and improvements to existing and/or constructing new structures or features. A cultural resource Phase I Survey of this project component was conducted specifically for CEPP in 2013 to identify and assess cultural resources within the FEB footprint. As a result, four historic sites were identified, two of which are considered significant (8PB16039, 8PB16040) under NEPA. Effects: Effects to sites 8PB16039 and 8PB16040 for Alts 4R and 4R2 are considered long-term. Mitigation of Effects: Due to the lack of knowledge of prehistoric occupation sites within the area, Phase III Investigations are recommended for 8PB16039, which would result in a no effect determination. Site 8PB16040 contains human remains and is therefore a culturally significant resource. Mitigation of effects are unknown at this time and will be determined through consultation once the project is implemented.

A new structure (S-623) associated with the operation of A-2 FEB would potentially be constructed along the NRHP eligible Miami Canal (8PB13369). Effects: There would be no effect to cultural resources for Alts 1 through 4. The proposed new structure would not alter either directly or indirectly the characteristics which make the Miami Canal (8PB13369) significant.

Existing structures G-373, G-372 and G-372HL are associated with the operations of STA 3/4 and date to the 1990's, and are therefore not significant. Effects: There would be no effect to significant cultural resources for Alts 4R and 4R2.

South of the Redline

C.2.2.17.5 L-4 Levee and Canal

This component involves degrading the western 2.9 miles of the southern L-4 levee, resulting in the creation of a water spreader feature at the northwestern most boundary of WCA 3A. A pump station near the western terminus of the L-4 degrade would also be constructed. Exact placement of the pump station has not been determined. Effects: There would be no effect to cultural resources for Alts 4R or 4R2 in the degrading of the southern L-4 levee, nor for the placement of the proposed L-4 Pump Station, regardless of placement location.

C.2.2.17.6 S-8 Complex

This component of Alt 4R and 4R2 involves modifications to the S-8 Pump Station and potentially other structures within the S-8 Complex to permit flows to the west. The S-8 Complex consists of G-357, G-404, the L-5-1 bridge, the S-8 Crane System, and the S-8 Pump Station, all of which are considered significant or NRHP eligible are an integral part of the Miami Canal FMSF # 8BD4840 (see C.2.1.1.9 below). Effects: For Alts 4R and 4R2, changes to any features within the S-8 Complex (listed above)

would be considered long-term adverse effects. Mitigation of Effects: If effects to any component of the S-8 Complex are unavoidable, a qualified architectural historian should conduct a Historic American Engineering Record (HAER) and/or Historic American Buildings Survey (HABS). This documentation packet will then be entered into the Library of Congress as well as Florida Master Site Files. These measures would reduce the effects determination to no effect.

C.2.2.17.7 L-5 Levee and Canal

This component involves improvements to accommodate L-6 and STA 3/4 conveyances, by deepening the L-5 borrow canal and the placement of a gravity pump. The L-5 levee and associated borrow canal are depicted on historic aerial photographs (Armando Ramirez, personal communication), however during the 2011 survey of the L-5 levee and canal (FMSF # pending) the levee and associated canal were determined not eligible for NRHP listing. The L-5-1 bridge that joins the L-5 north levee to the L-5 south levee is potentially eligible for NRHP listing as part of the Miami Canal FMSF # 8BD4840 and is considered significant. Effects: There will be no effects to historic properties for this component of Alts 4R and 4R2. Currently there is no plan to remove the bridge or alter the L-5 levee or canal in a way that would cause adverse effect to the property.

C.2.2.17.8 L-6 Levee and Canal

This component involves deepening and/or widening the L-6 borrow canal, replacement or redesign of the G-336G culverts and removal of the L-6 canal plug. The G-336G and the L-6 canal plug were originally constructed in association with WCA2 operations and are not historic. The L-6 borrow canal appears on historic aerial photographs (Armando Ramirez, personal communication 2013) and therefore would require additional work to determine significance or NRHP eligibility. Effects: Effects to historic properties for this component of the Alts are unknown. Cultural resource investigations would be needed to assess significance of the L-6 levee and associated borrow canal. Mitigation of Effect: If determined a significant historic property, it is recommended that a Level I Historic American Engineering Record (HAER) document is written and submitted to the Library of Congress and the Florida State Archives. This action would reduce the effects of the proposed action to no effect.

C.2.2.17.9 Miami Canal (8BR4840/8DA6525)

To improve sheet flow throughout WCA 3A, a portion of the Miami Canal (8BR6525) would be backfilled using spoil material originally excavated during the construction and maintenance of the canal and dredged material from the L-5 modifications. The Miami Canal and associated features/structures have been investigated during seven separate surveys (FMSF Survey # 5844, 14404, 17583, 19090, 19276, and 2 surveys with FMSF Survey # pending). As a result, it has been determined that the Miami Canal and specific features/structures associated with the canal are eligible for the National Register of Historic Places (NRHP) and are therefore considered significant. Effects: Effects to historic properties for Alts 4R and 4R2. Through consultation with the Tribes (**Appendix C.5**), it has been determined that the spoil mounds associated with the Miami Canal do not contain culturally significant sites (i.e., culturally significant flora and/or other culturally sensitive uses), therefore a determination of no effect to culturally significant sites is listed for the use of the spoil material. Mitigation of Effects: It is recommended that a Level I or II Historic American Engineering Record (HAER) document is written and submitted to the Library of Congress and the Florida State Archives. This would reduce the effects of the proposed action to no effect.

Greenline/Blueline

C.2.2.17.10 L-67A Levee and Canal

This component involves the placement of gated structure(s) within the L-67A levee and the removal of spoil material deposited during the original construction or maintenance of the L-67A borrow canal and will span approximately 0.5-miles on each side of the structure(s).

Three cultural resource surveys are listed with the State for WCA 3A, one conducted via aerial photographs (FMSF Survey # 602), a Phase I Survey conducted in 2011 (FMSF Survey # pending) and a Phase I Sample Survey and Phase II Excavation conducted in 2012 specifically for CEPP (FMSF Survey # pending). During the 2011 survey, the L-67A levee and associated canal was assessed and determined to be not significant. Results of the 2012 cultural resources survey conducted specifically for CEPP included testing portions of tree islands impacted by the original levee/borrow canal construction. In some cases this involved portions of tree islands with recorded sites that were identified during Survey # 602 using aerial photography. These sites have not been field verified. Only areas of potential effect for sites recorded during Survey # 602 were investigated for CEPP. It also should be noted that existing As-Built Plans for the L-67A and C show that the area immediately underneath the existing levee, and areas between the levee and borrow canal were degraded prior to construction. During the CEPP specific 2012 Survey (FMSF Survey # pending), no significant cultural resources were identified.

Two culturally significant sites actively used by the Miccosukee Tribe of Indians of Florida are located on two of the spoil mounds west of the borrow canal. Effects: Potential effects to the culturally significant sites for Alts 4R and 4R2 are considered potentially long-term adverse effects. Mitigation of Effects: Effects to the culturally significant sites could be mitigated down to a determination of no effect by avoiding the spoil mounds associated with the sites during the design-build phase of CEPP. Also, to avoid potential inadvertent discoveries, it is recommended that should spoil mounds be removed within the historic footprint of tree islands, that degrading be terminated at tree island grade, not marsh grade. Previous research conducted by the Corps' archaeologist has shown that compacted spoil material can extend well below tree island grade. Additionally, a professional archaeologist should monitor construction activity within historic tree island footprints to ensure that any discovery is recorded and assessed for significance.

C.2.2.17.11 L-67C Levee and Canal

This project component involves degrading approximately 8-miles of the L-67C levee to promote sheet-flow into the Blue Shanty flowway, constructing one gated structure north of the newly constructed 8.5-mile levee, and removing 6,000-ft of the L-67C levee in association with the new structure.

Three cultural resource surveys are listed with the State for WCA 3A, one conducted via aerial photographs (FMSF Survey # 602), a Phase I Survey conducted in 2011 (FMSF Survey # pending) and a Phase I Sample Survey and Phase II Excavation conducted in 2012 specifically for CEPP (FMSF Survey # pending). For tree islands impacted by the original levee/borrow canal construction, only areas of potential effect were investigated. In some cases this involved portions of tree islands with recorded sites that were identified during Survey # 602 using aerial photography. These sites have not been field verified. Only areas of potential effect for sites recorded during Survey # 602 were investigated for CEPP. It also should be noted that existing As-Built Plans for the L-67 A and C show that the area immediately underneath the existing levee, and areas between the levee and borrow canal were degraded prior to construction. During the CEPP specific 2012 Survey, no significant cultural resources were identified within the APE for this feature. It was also determine that the L-67C was not historically significant. Effects: For this component of Alt 4Rs and 4R2, there would be no effect on cultural

resources. Mitigation of Effects: To avoid potential inadvertent discoveries, it is recommended that should spoil mounds be removed within the historic footprint of tree islands, that degrading be terminated at tree island grade, not marsh grade. Previous research conducted by Corps archaeologist has shown that compacted spoil material can extend well below tree island grade. Additionally, a professional archaeologist should monitor construction activity to ensure that any discovery is recorded and assessed for significance.

C.2.2.17.12 L-29 Levee

This component involves degrading of approximately 4.3-miles of the L-29 Levee in the Blue Shanty flow way and the placement of a divide structure at the terminus of the western Tamiami Trail bridge. The original construction of the L-29 impacted two large tree islands. Through consultation with the Cultural Resource Representative to the Miccosukee Tribe of Indians of Florida, these islands have been identified as being culturally significant. Multiple surveys have been conducted to identify cultural resources within WCA 3A and 3B, one conducted via aerial photographs (FMSF Survey # 602), Survey # 17032, Survey # 283, a Phase I Survey conducted in 2011 (FMSF Survey # pending), and a Phase I and Phase II Survey conducted in 2012 specifically for CEPP (FMSF Survey # pending). With information gathered from these surveys and others in similar environments, it is highly probably that historic sites will also be located on these islands.

The ValuJet Flight 592 Crash Memorial is also located along the L-29 levee. Although the Memorial is not historic, it is frequently visited by those directly or indirectly affected by the accident. Therefore, the Memorial is considered culturally significant and should be preserved in place. If preservation is not viable, consultation with all family members of the victims, and local residents should occur prior to completion of the design-build phase.

Two significant traditional cultural properties, Airboat Association of Florida and Coopertown, associated with the modern Gladesmen culture group, and one Miccosukee Tribe of Indians of Florida residential camp (Osceola Camp) are located south of the L-29 levee and therefore are within the area of potential effect of the levee removal. There is also one Miccosukee Tribe of Indians of Florida residential camp (Tigertail Camp) located atop the L-29 levee. These properties are considered significant.

Effects: Alternative 4R and 4R2 could potentially have long-term adverse effects to two sites deemed culturally significant to members of the Miccosukee Tribe. These sites were originally impacted by the levee and borrow canal construction. Based on previous research, it is highly probable that these two tree islands contain historic resources of unknown significance. Cultural resource investigations on these islands would require further consultation prior to fieldwork. Based on preliminary design plans for Alts 4R and 4R2, there would be no effect to the Valujet Flight 592 Crash Memorial, or the Tiger Tail Camp. Mitigation of Effects: Avoid placing structures within known culturally significant sites, significant historic properties, currently occupied camps could downgrade the determination to no effect. Potential adverse effects to potential historic properties impacted by the original levee construction could be mitigated down to a determination of no effect by avoiding tree islands and/or by limiting the depth of levee removal to not exceed tree island grade.

C.2.2.17.13 S-333 Modifications

This component of Alt 4R and 4R2 involves constructing an additional structure to increase the S-333 capacity. The new structure would be located just north of the S-333. Exact placement of the structure is unknown.

There are no known high probability areas for archaeological sites located within the area of potential effect. The ValuJet Flight 592 Crash Memorial is also located along the L-29 levee just east of the S-333 structure. Although the Memorial is not historic, it is frequently visited by those directly or indirectly affected by the accident. Therefore, the Memorial is considered culturally significant and should be preserved in place. If preservation is not viable, consultation with all family members of the victims, and local residents should occur prior to completion of the design and build phase. Effects: Based on preliminary design plans for Alts 4R and 4R2, there would be no effect to the Valujet Flight 592 Crash Memorial.

C.2.2.17.14 L-67D Levee and Flow way within WCA 3B (Blue Shanty)

This component involves constructing a levee within WCA 3B to connect the L-67A levee with the L-29 levee, thereby creating a flow-way for water to pass from WCA 3A into Shark River Slough. Working closely with project engineers, areas of concern have been identified in an effort to avoid significant cultural resources or areas of high probability (i.e. tree islands impacted by the canal/levee construction and areas currently in use by the Miccosukee Tribe of Indians of Florida) within the footprint of the proposed levee. Based on the multiple surveys conducted within the similar environmental areas (FMSF # 602, 286, 1616, 17032, 18093, 1615, 904, 1009, 1014, 1187, 1307, 6968, 7667, and the CEPP specific 2012 Survey (FMSF # pending) and in conjunction with consultation with the Tribes, there is a high probability for significant cultural resources to be located within the flow way. Also, modeling results indicate that water depth could exceed current stages to the point that it could prove detrimental to lower elevated tree islands within the flow way that have not undergone a Phase I Survey. The exact footprint of this feature is unknown at this time. Effects: Effects to cultural resources for Alts 4R and 4R2 are unknown. Once the footprint of the L-67D levee and the APE for the flow way is determined, and prior to completion of the design and build phase, an integrated Phase I and Phase II Survey would be conducted to identify and assess significant cultural resources that may be located on high probability areas (tree islands) within the proposed flow way. Mitigation of Effects: Unknown at this time. It is recommended that the levee avoid impacting tree islands.

C.2.2.17.15 Old Tamiami Trail (8DA6453/8DA6510)

This component involves the removal of approximately 6-miles of the original Tamiami Trail from the L-67 Extension west to Shark Valley Loop Road. The original Tamiami Trail is located within Everglades National Park (ENP). The Tamiami Trail and associated features/structures have been reported and evaluated during four separate surveys (FMSF Survey #6687, 12129, 17445, and 18181). As a result, it has been determined that the original Tamiami Trail and specific features/structures associated with the roadway are significant and therefore are eligible for the National Register of Historic Places (NRHP).
Effects: There would be long-term adverse effects to the Tamiami Trial (8DA6453) and associated features. Mitigation of Effects: Portions of 8DA6453 has previously been impacted by the construction of the 1-mile Tamiami Trail Bridge. Impacts to the site were mitigated with an Memorandum of Agreement (MOA) signed by ENP, USACE, and SHPO. Through consultation with ENP, it is probable that the current projects impacts to the original Tamiami Trail could be included in the current mitigation plan. This would reduce the effects to no effect. Further consultation is needed.

C.2.2.17.16 L-67 Extension Levee Removal

This component involves the backfilling of the L-67 Extension borrow canal using associated levee material. This component is located within ENP, a recorded World Heritage site. In January 2013, USACE and ENP employees conducted a Phase I Survey (FMSF # pending) of potential high probability areas impacted by the original construction of the L-67 Extension levee and associated borrow canal.

The L-67 Extension levee and associated borrow canal, and associated features S-347, and S-346 are not significant or NRHP eligible properties (FMSF site # pending). No significant cultural resource sites were located. Effects: There would be no effect to cultural resources for Alts 4R and 4R2. However, to avoid potential inadvertent discoveries, it is recommended that should levee material be removed within the historic footprint of tree islands, that degrading be terminated at tree island grade, not marsh grade. Previous research has shown that compacted spoil material can extend well below tree island grade. Additionally, a professional archaeologist should monitor construction activity within historic tree island footprints to ensure that any discovery is recorded.

Yellowline

C.2.2.17.17 L-31N Seepage Barrier / L-31N Pump Station(s)

This component involves the construction of a seepage barrier within the existing L-31N levee and/or the construction of pumps. Three surveys have been conducted along the L-31N Levee (FMSF # 11698, 16709, 18093), which resulted in the identification of one site recommended as potentially eligible for the National Register. The U.S. Army Corps concurs with this recommendation and considers 8BD2104 as eligible for NRHP listing. Effects: There could potentially be long-term adverse effects to the Levee Cut Site (8BD2104) dependent upon pump location. Mitigation of Effects: Consideration should be given to the placements of these pump stations or structures. If placement avoids direct or indirect impact to site 8DA2104, then a no effect determination would be made. The effect determination for 8DA2104 should be revisited once feature specific plans and specification for the project are developed.

C.2.2.17.18 S-356 Relocation

This component involves changes to the S-356 Pump Station. Based on examination of historic aerial photographs, the original construction of the pump station did not impact any tree islands within the construction footprint. As previously stated, based on previous research, tree islands are considered high probability for cultural resource locations. Effects: The S-356 Pump Station is not a historic structure, nor did original construction impact areas of high probability areas. Therefore, there would be no effect to cultural resources for this component of Alt 4R and 4R2.

C.2.2.17.19 G-211 Operational Refinements

This component involves the utilization of current coastal infrastructure (canals and associated features) to convey seepage south. Effects: There would be no effect to significant cultural resources.

C.2.2.18 Invasive and Native Nuisance Species

Alternatives 4R and 4R2 have the potential and likelihood for establishment and spread of non-native invasive and native nuisance species. Proposed restoration activities may affect ecosystem drivers that directly or indirectly influence the invasiveness of non-native species. These factors may affect invasive species positively or negatively, depending on the unique characteristics of individual species and the environmental conditions for a given biological invasion (Doren et al. 2009). For example, shortened surface water drawdowns may reduce the recolonization rates of melaleuca in sawgrass marsh while increasing habitat suitability for Old World climbing fern on tree islands. Many of the areas where features are proposed are currently inhabited by non-native invasive and native nuisance species. Construction of the proposed features has the potential to spread the existing non-native invasive and native nuisance species on site as well as introduce new invasive species via contaminated equipment. Disturbed areas resulting from construction are likely to become established with non-native invasive and native nuisance species. New flows created by operations of the proposed features may serve as vectors to spread invasive and native nuisance species into new areas. The large number of existing and potential invasive plant and animal species and the often incomplete knowledge of invasive mechanisms

for each species create moderate to high uncertainty in this evaluation. Long-term monitoring in an adaptive management framework is critical to ensure efficient management of the most threatening non-native invasive species in the restoration footprint.

C.2.2.18.1 Lake Okeechobee and the Northern Estuaries

Alternatives 4R and 4R2 would reduce freshwater flows from Lake Okeechobee to the Caloosahatchee and St. Lucie estuaries, allowing for slightly higher salinity levels in the estuaries. The reduced freshwater outflows are not expected to have an impact on non-native invasive or native nuisance species. Existing invasive species under active management are expected to persist at baseline levels if current funding levels are sustained (e.g., melaleuca). Existing species not under active management or which are ineffectively controlled are expected to increase in abundance and spatial extent (tropical American water grass). New invasions of non-native plant and animal species are expected but estimates of species number and severity of impacts are conjectural.

C.2.2.18.2 A-2 Flow Equalization Basin

There are invasive and native nuisance species to consider with the proposed FEB A-2. Species of concern include Brazilian pepper, torpedo grass, tropical American watergrass, water hyacinth, water lettuce, and hydrilla. The proposed A-2 FEB lands currently are agricultural lands. Brazilian pepper exists along the agricultural canals. Once the proposed A-2 FEB is operational, the water levels are likely to inhibit growth and recruitment of Brazilian pepper. All upland sites (e.g., levees) are expected to experience colonization of Brazilian pepper, torpedo grass, paragrass, and other invasive species common in ruderal sites. The proposed four-mile spreader canal would require continual maintenance of floating, emergent and potentially submersed plant species in order to maintain the function of the canal. It is expected that increased sedimentation immediately downstream of the spreader would result in succession to large stands of Carolina willow and cattail and this area may require maintenance to achieve target flow rates. In addition, the seepage canal would require continual maintenance to control both non-native invasive and native nuisance species. Due to eutrophic conditions and variable hydroperiods, many invasive species would aggressively invade and are likely to be costly and difficult to control. Therefore, control efforts focused at maintaining the primary functions of the proposed A-2 FEB (e.g., conveyance capacity) are preferred over aggressive eradication efforts typically applied to natural areas. Invasive/nuisance species in this category include, but are not limited to torpedo grass, hydrilla, water hyacinth, and water lettuce. In all alternatives, these species have the potential to interfere with surface water conveyance immediately upstream of water control structures. There are many species that could establish both in FEBs and WCAs. Establishment of these species in the proposed A-2 FEB could be part of an invasion pathway to natural areas downstream (i.e. WCA 3A/3B, ENP). For this reason, diligent monitoring and rapid response control measures for these species would need to be carried out during construction and operations phases. Examples of such species include tropical American watergrass, Wright's nutrush, West Indian marshgrass, Nile monitor, and bullseye snakehead.

There are two recreational access points proposed to the proposed A-2 FEB. Access points provide opportunity for the introduction of invasive species. Boats and trailers can serve as a vector for new species introductions.

C.2.2.18.3 Diversion of L-6 Flows and L-5 Improvements

Deepening of the L-5 has the potential to reduce productivity of various species of SAV (including hydrilla), but would not eliminate suitable habitat for their establishment and growth (Langeland 1996).

Alternatives 4R and 4R2 may improve habitat for non-native tropical fish species which utilize deep water zones to avoid cold temperature events (Trexler et al. 2000).

C.2.2.18.4 L-4 / L-5 – Spreader Canal and Levee Degradation

Northwest WCA 3A has dried out significantly since the area was compartmentalized. The vegetation has shifted from ridge and slough to woody shrubs and small trees including Carolina willow, wax myrtle, Brazilian pepper, and melaleuca. The flows provided by the spreader canal into northwest WCA 3A are expected to increase wet season stages and decrease duration of surface water draw downs in the northern portions of WCA 3A. This may reduce recruitment rates of some invasive or nuisance species, such as Carolina willow and Brazilian pepper, and may facilitate expansion of other invasive or nuisance species, such as cattail and paragrass. The proposed spreader canal would require continual maintenance of floating, emergent, and, potentially, submersed plant species in order to maintain the function of the canal. It is expected that increased sedimentation immediately downstream of the spreader would result in succession to stands of Carolina willow and cattail and this area may require maintenance to achieve target flow rates. Similar areas in ENP are also invaded by Brazilian pepper and Old World climbing fern. The remaining portions of the levee would offer suitable habitat for Burmese pythons. Invasive species could be introduced into northern WCA 3A with the new flows from the spreader canal. The degraded levee area may be invaded by non-native invasive and native nuisance obligate wetland plant species.

Model output for WCA 3A suggests substantial decreases in dry out periods in the northern reaches of WCA 3A. This is likely to reduce the rate of spread for certain species, especially Brazilian pepper, Australian pine, torpedo grass, and Napier grass. Melaleuca recruitment would also continue but at a reduced rate. Other species more suited to longer periods of inundation may find conditions more favorable for establishment and spread. These include but are not limited to Old World climbing fern, Island apple snail, West Indian marsh grass, paragrass, and potentially Peruvian primrose willow. Diligent monitoring and control efforts would be recommended to minimize establishment of new plant species in these areas.

Continued maintenance of the remaining portions of the L-4 levee is assumed. If regular mowing is not carried out, this segment of levee would become invaded by a number of invasive plants and animals, such as Brazilian pepper, Napier grass, bishopwood, cogongrass, Burmese pythons, feral hogs, and Nile monitors.

C.2.2.18.5 Miami Canal Backfill – S-8 to I-75

Backfilled portions of the Miami Canal may be invaded by non-native invasive and native nuisance wetland plant species. Invasion by paragrass, torpedograss, and cattail is expected if backfill operations result in elevated nutrient availability. Spoil mounds along the Miami Canal in WCA 3A currently supports high densities of Brazilian pepper and other invasive plants. Degradation of these spoil deposits would result in the removal of approximately 200 acres of Brazilian pepper. This would reduce an important seed source and lower bird dispersal to nearby tree islands. While there is uncertainty about the impacts of non-native fish species on native fauna (Trexler et al. 2000), backfilling the canal would reduce available deep water habitat for non-native fish species and could reduce further expansion.

Preserved planted tree islands and the proposed spoil island creation efforts would experience immediate and long-term susceptibility for biological invasion. Elevated nutrient regimes on the new islands would promote invasion of numerous invasive species, including Brazilian pepper, napier grass,

climbing cassia, Peruvian primrose willow, and torpedograss. These elevated areas are also expected to provide excellent habitat for Burmese pythons and Nile monitors.

C.2.2.18.6 L-28 Levee Degradation / Backfill

Continued maintenance of the remaining portions of the L-28 levee is assumed. If regular O&M vegetation management is not carried out, fallow segments of levees are likely to be invaded by a number of invasive plants and animals, such as Brazilian pepper, Napier grass, bishopwood, cogongrass, Burmese pythons, feral hogs, and Nile monitors. Backfilled portions and the degraded levee area may be invaded by non-native invasive and native nuisance wetland plant species.

C.2.2.18.7 Increase Capacity of S-333

The additional flows from increasing the capacity of S-333 are expected to have a minimal effect on invasive species populations. Existing invasive species under active management are expected to persist at baseline levels if current funding levels are sustained (e.g., water hyacinth). Existing species not under active management, or which are ineffectively controlled, are expected to increase in abundance and spatial extent (e.g., roundleaf toothcup). New invasions of non-native plant and animal species are expected but estimates of species numbers and severity of impacts are conjectural.

C.2.2.18.8 L-67A Gated Structures / Spoil Removal

The proposed gated structures on the L-67A have the potential to spread cattail, torpedograss, and non-native fish species downstream of the structure and into the gap between L-67A and L-67C. Cattail and torpedo grass are also expected to colonize spoil removal areas. It is expected that non-native fish species would establish at the outflow, where water levels are deeper. Existing non-native fish species could move from the canal into the gap, but they are not expected to maintain substantial populations in the marsh due to seasonal drawdowns. Many non-native fish are documented to move from canals to the marsh during the wet season, but do not venture too far from the canal and return to the canal as water levels recede (Trexler 2000). There is a potential for invasion by new aquatic species capable of tolerating seasonal drawdowns but the number of species and severity is conjectural.

C.2.2.18.9 L-67C Levee Degradation

The proposed gaps would provide a pathway for aquatic species currently present in the L-67C canal to spread into WCA 3B. Existing invasive species under active management in WCA 3B are expected to persist at baseline levels if current funding levels are sustained (e.g., melaleuca). Existing species not under active management or which are ineffectively controlled are expected to increase in abundance and spatial extent (Old World climbing fern). New invasions of non-native plant and animal species are expected but estimates of species numbers and severity of impacts are conjectural. The proposed 6,000-foot gaps in the L-67C levee would provide an open pathway for cattail spread into WCA 3B. The extent of spread is uncertain.

C.2.2.18.10 Outflow structures out of WCA 3B

Agricultural canals in WCA 3B currently release water into the L-29. There is potential for new non-native invasive species to be transferred from WCA 3A or L-67A through the new culverts and levee degrade area into WCA 3B, L-29, and eventually into ENP.

C.2.2.18.11 Build North-South Levee in WCA 3B

The construction of a north-south levee in WCA 3B would cause significant disturbance within the construction footprint and adjacent marsh. Regular maintenance would be required to ensure non-native invasive plant species do not establish along the levee. Cattail is likely to establish along the

entire eastern side of the levee. Existing invasive species in the affected area that are under active management should persist at baseline levels if current funding levels are sustained (e.g., melaleuca). Existing species not under active management or which are ineffectively controlled are expected to increase in abundance and spatial extent. New invasions of non-native plant and animal species are expected but number of species and severity of impacts are undetermined.

C.2.2.18.12 L-67 Extension – Levee Degradation / Backfill

The L-67 Extension canal and levee system extends south into ENP. This area is now invaded by numerous non-native invasive plants and also serves as habitat for Burmese pythons and feral hogs. Removal of the L-67 Extension levee would remove suitable habitat for Brazilian pepper, napier grass, climbing cassia, torpedo grass, guava, and Australian pine. Removal of the L-67 Extension levee would also reduce habitat for the Burmese python, feral hogs, and potentially, the Argentine black and white tegu. Island apple snails may find the degradation footprint as suitable habitat if final grade is lower than the surrounding marsh.

C.2.2.18.13 L-29 Levee Degradation

Degradation of the L-29 levee would open surface water connectivity between the L-29 canal and WCA 3B (Blue Shanty flowway). This is likely to promote the expansion of several invasive species currently limited to the L-29 canal, particularly roundleaf toothcup, island apple snail, and numerous non-native fish species. There is uncertainty whether these species would be able to persist far from the canal since many are unable to tolerate conditions during dry season drawdowns.

C.2.2.18.14 Divide Structure on L-29

This feature is expected to have minimal effect on invasive species. Maintenance of submersed and floating vegetation would be required to ensure operational functionality of the structure.

C.2.2.18.15 Increase S-356 Capacity to 1,000 cfs

The additional flows from increasing the capacity of the S-356 structure may slightly reduce recruitment rates of melaleuca and other invasive plants in northern portions of ENP.

C.2.2.18.16 Remove ~6 Miles of the Old Tamiami Trail roadway from L-67Extension to Tram Road

This area is now heavily invaded by numerous invasive plants and also serves as habitat for Burmese pythons and feral hogs. Alternatives 4R and 4R2 would remove suitable habitat for Brazilian pepper, napier grass, climbing cassia, torpedo grass, guava, and Australian pine. Removal of the old roadway would also reduce habitat for the Burmese python, feral hogs, and potentially, the Argentine black and white tegu. Island apple snails would continue to thrive in the adjacent canal and may spread further south as a result of removing the old road.

C.2.2.18.17 G-211 Operational Modifications / Coastal Canals Conveyance

This feature is expected to have minimal effects on non-native invasive and native nuisance species. Existing invasive species under active management are expected to persist at baseline levels if current funding levels are sustained (e.g., hygrophila). Existing species not under active management or which are ineffectively controlled are expected to increase in abundance and spatial extent (roundleaf toothcup). New invasions of non-native plant and animal species are expected but number of species and severity of impacts are undetermined.

C.2.2.18.18 Penetrating Seepage Barrier

The depth and duration of surface water drawdowns in northeastern ENP are expected to decrease with Alternatives 4R and 4R2. These changes in hydroperiods are expected to reduce recruitment rates of Australian pine, Brazilian pepper, and to a lesser extent, melaleuca. These changes may improve conditions for other invasive plant species such as tropical American water grass, West Indian marsh grass, and roundleaf toothcup.

C.2.2.19 Cumulative Effects

Cumulative effects are defined in 40 CFR 1508.7 as those effects that result from:

> *the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

Cumulative effects for the proposed action were assessed in accordance with guidance provided by the President's Council on Environmental Quality (CEQ). The primary goal of cumulative effects analysis is to determine the magnitude and significance of the environmental consequences of the proposed action in the context of the cumulative effects of other past, present, and future actions. The following summarizes past, present, and projected USACE efforts that cumulatively affect the regional environment of south Florida (**Table C.2.2-15**). In addition, there are efforts underway by other Federal, State, and local agencies, as well as non-governmental organizations, that are too numerous to mention, that are all working towards similar restoration goals. **Table C.2.2-16** shows the net cumulative effects of the various resources which are directly or indirectly impacted. CEPP is expected to contribute to a net beneficial cumulative impact on the regional ecosystem.

C.2.2.20 Past, Present, and Reasonably Foreseeable Actions Affecting Resources within the Project Area

Prior to drainage and compartmentalization, the Everglades were a shallow wetland conveying water from Lake Okeechobee to the southern coast of Florida. The Everglades Drainage District, encompassing 7,150 square miles, was created in 1907 by Florida Governor Napoleon Bonaparte Broward for the purpose of drainage and reclamation of the Everglades (Light and Dineen 1994). In the early 1900s, the Everglades Drainage District constructed several canals that impacted Lake Okeechobee and the Greater Everglades. By 1917, the West Palm Beach, Hillsboro, North New River and Miami Canals had been constructed (Allison et al., 1948). By 1931, the outlet from Lake Okeechobee to the Caloosahatchee River was improved, and the completion of the St. Lucie Canal east to the Atlantic Ocean provided another way of controlling lake levels. The Bolles and Cross canals became connectors to the four major canals south of Lake Okeechobee bringing the total miles of canal excavated to 440 (Light and Dineen 1994). The Everglades Drainage District also constructed 47 miles of levees around the southern rim of Lake Okeechobee during this time (Allison et al., 1948). Within a similar time frame (1915-1928) the construction of Tamiami Trail was completed which linked Miami with Naples on the west coast. Hurricanes in 1926 and 1928 shifted attention from Everglades drainage to controlling flooding around Lake Okeechobee. In 1930, the USACE became a major participant with the state (i.e., Okeechobee Flood Control District) in controlling flooding around Lake Okeechobee. Florida agreed to share a portion of the costs to increase discharges from the lake, improve canal works, and reconstruct and enlarge the levees around it (Light and Dineen 1994). The effect of levees on the agricultural area south of Lake Okeechobee was dramatic and sugarcane production was doubled in 10 years between 1931 and 1941. Drainage of the Everglades and the linkage of the east and west coast, promoted urban growth in south Florida

and the population escalated from 22,961 in 1900 to 228,454 by 1930 (Dietrich 1978). During the 1930s and into the 1940s, construction was abandoned and maintenance ceased on Everglades Drainage District works (Light and Dineen 1994).

Although modifications to Lake Okeechobee and the Everglades began in the early 1900s, the greatest influence on the alteration of flow was the Central and Southern (C&SF) Flood Control project, which was originally authorized by Congress in 1948. The C&SF Flood Control project was designed to lower water levels east of the eastern protective levee by 4 to 5 feet (Light and Dineen 1994). Increased flood protection coupled with lowering of the water table east of the levee had a dramatic effect on urbanization and development and acted as a catalyst for a population explosion in south Florida. Between 1952 and 1954 the eastern perimeter levee along the WCAs was constructed from Palm Beach to Dade County in order to stop sheet flow from the Everglades toward the urbanizing eastern coastal areas (Light and Dineen 1994). Between 1954 and 1959 additional levees (L-1, L-2, L-3, L-4, L-5, L-6, and L-7) were constructed to partition the EAA from the remainder of the Everglades and the old Everglades Drainage District Canals (West Palm Beach, Hillsboro, North New River, and Miami) were deepened within the EAA to provide better flood conveyance from the agricultural area into the WCAs (Light and Dineen 1994).

Between 1960 to 1963 substantial portions of the C&SF Flood Control project were completed. Construction of the levees surrounding WCA 3 was completed by 1963 with the L-67A levee dividing WCA 3 into two compartments, WCA 3A and WCA 3B (Light and Dineen 1994). The L-67A levee (completed 1962) and the parallel L-67C levee (completed 1966) were originally constructed for several reasons, including as a step-down system to reduce seepage to the east to allow for urban and agricultural developments in Miami-Dade County, and to increase storage of water in WCA 3A to provide water supply to an expanding urban population to the east. S-151 and S-31 were also constructed during this time period. These two structures improved the discharge capacity of the Miami Canal to coastal communities (Cooper and Roy, 1991), further exacerbating the unnatural drainage of northern WCA 3A. In an attempt to remedy excessive drainage caused by the Miami Canal, two structures, S-339 and S-340, were built across the Miami Canal in 1980 to block water from flowing directly down the canal, except at times of extreme high water or when increased conveyance capacity is needed to deliver water for the ENP and/or the LEC. Upstream from each structure, water was expected to flow laterally from the canal into the marsh through 100-foot gaps that had been left at 500-foot intervals along the Miami Canal sidecast spoil material. In combination with the northern levees of WCA 3A (L-4 and L-5), the Miami Canal has substantially impacted historical sheetflow and natural wetland hydroperiods. As a result, during wet periods, the natural capability of WCA 3A to store water is lost and the Miami Canal effectively over-drains the area. These hydrologic changes have increased the frequency of severe peat fires and have also resulted in the loss of ridge and slough topography that was once characteristic of the area. Northern WCA 3A has become largely dominated by sawgrass, cattail and scattered shrubs and lacks the structural diversity of plant communities seen in central and western WCA 3A.

Completion of the L-29 levee in 1962 led to ponding in the southern portions of WCA 3A. Exacerbating this problem were the major canal systems (i.e. Miami Canal, L-67A) which accelerate the flow of water from north to south within WCA 3A, drying the north while further ponding the south (Zaffke 1983), especially along the L-67A and L-29. As a result of this ponding, extended hydroperiods and increased water depths led to changes in vegetation communities in which wet prairies were displaced by aquatic slough communities (Zaffke 1983, Tanner et al. 1987). In addition, many tree islands within southern WCA 3A were lost due to increased water depths (Craighead 1971), with many of the remaining islands showing signs of stress. Wood and Tanner (1990) documented the trend in southern WCA 3A toward deep water lily dominated sloughs due to impoundment within the southern end of WCA 3A.

Four control structures located along the L-29 were constructed between 1960 and 1963 (S-12A, S-12B, S-12C, and S-12 D). These structures were used to regulate discharge from WCA 3A to the western part of Shark River Slough (Light and Dineen 1994). Construction of the L-67 Extension levee, extending 8 miles south of Tamiami Trail, was completed in 1967 in order to facilitate water delivery from WCA 3A to ENP. Completion of the L-67A and L-67C canal and levee system intercepted water that would otherwise flow to WCA 3B. With its impoundment, WCA 3B became isolated from the rest of the Everglades with inflows and outflows limited to rainfall and levee seepage. Within WCA 3B, the ridge and slough landscape has become severely compromised by the virtual elimination of overland sheetflow and has largely turned into a sawgrass monoculture where relatively few sloughs or tree islands remain. Loss of sheetflow to WCA 3B has also accelerated soil loss reducing elevations of the remaining tree islands in WCA 3B, making them vulnerable to high water stages. With the construction of WCA 3A, WCA 3B and the L-67 Extension Levee, flows to ENP became subject to water supply deficits during the dry season and excesses during the wet season, resulting in a decline in ecological quality.

Among the first Congressional actions to offset adverse impacts to ENP by improving the supply and distribution of water, the Flood Control Act of 1968 provided for modifications to the C&SF Project through the implementation of the ENP South Dade Conveyance System (SDCS). Additional Congressional actions ensued, including the ENP Protection and Expansion Act of 1989, which expanded ENP to incorporate NESRS and the East Everglades into the Park's boundary for protection and restoration of the natural hydrologic conditions within ENP. This Act also provided authorization for development of the Modified Water Deliveries (MWD) to ENP project. The goal of the MWD Project was to improve water deliveries into ENP and, to the extent practicable, take steps to restore the natural hydrologic conditions within ENP. The Water Resources Development Act (WRDA) of 2000 established CERP to provide for the restoration, protection and preservation of the water resources of central and southern Florida, including the Everglades and Florida Bay (USACE 1999).

CERP contains 68 components that include approximately 217,000 acres of new reservoirs and wetlands-based water treatment areas. A number of operational components have also been identified in CERP and will, in most cases, occur in conjunction with related construction features. The operational features in CERP include: a modified Lake Okeechobee regulation schedule; environmental water supply deliveries to the Caloosahatchee and St. Lucie Estuaries; modifications to the regulation schedules for WCAs 2A, 2B, 3A, 3B, and the current rainfall delivery formula for ENP to implement rain-driven operations; modified Holey Land Wildlife Management Area Operation Plan; Modified Rotenberger Wildlife Management Area Operations Plan; a modification for coastal well field operations in the Lower East Coast (LEC); LEC utility water conservation; and operational modifications to the southern portion of L-31 and C-111.

CERP projects would increase the supply of freshwater for the Everglades and south Florida ecosystem. Large areas within the study area would be used to increase water storage resulting from CERP Projects for the overall gain and long term benefit of the regional system. These project features would provide important storage functions and are essential to the overall restoration of the freshwater marshes and the estuaries of the greater Everglades ecosystem. Project components in the area, especially storage, seepage control, and redirection of point source canal flows to overland flow will act to restore more natural freshwater flows to the northern and southern estuaries, reduce seepage losses from the Everglades, improve recharge of the Biscayne aquifer, and should result in other beneficial environmental effects.

Construction has begun on the first generation of CERP project modifications already authorized by Congress. These include the Indian River Lagoon-South Project, the Picayune Strand Restoration Project, and the Site 1 Impoundment Project. The second generation of CERP projects for Congressional authorization includes the Biscayne Bay Coastal Wetlands Project, Broward County Water Preserve Areas Project, the Caloosahatchee River (C-43) West Basin Storage Reservoir, and the C-111 Spreader Canal Western Project. These projects will result in significant environmental benefits to the CERP project area, improving the quantity, quality, timing and delivery of water to the natural system. Further information on the above mentioned CERP projects assumed to be in the future without project conditions are provided in **Section 2** (**Existing and Future Without Project Conditions**) and **Appendix C.1** (**Existing and Future Without Project Conditions**).

Non-CERP projects assumed to be in the future without project condition for CEPP, which incorporate similar restoration goals of improving flow and water quality to the Everglades, include the DOI Tamiami Trail Modifications Next Steps (TTMNS) Project and the Restoration Strategies Regional Water Quality Preliminary Plan (SFWMD 2012). The DOI through the National Park Service (NPS) and ENP completed a study to evaluate the feasibility of additional Tamiami Trail bridge length, beyond that to be constructed pursuant to the MWD Project, to restore more natural water flow to ENP and Florida Bay and for the purpose of restoring habitat within the ENP. The TTMNS project was authorized by Congress in the Consolidated Appropriations Act, 2012. The Restoration Strategies Regional Water Quality Preliminary Plan describes resulting projects developed to address water quality concerns associated with existing flows to the Everglades Protection Area (EPA) to achieve water quality standards established for the Everglades. The SFWMD is implementing a technical plan to complete six projects that will create more than 6,500 acres of new STAs and 110,000 acre feet of additional water storage through construction of FEBs.

The C&SF Flood Control project has numerous water management structures consisting of culverts, spillways, and pump stations that have specified operating criteria for managing or regulating water levels for Congressionally-authorized project purposes. Regulation schedules have been, and will continue to be, designed to balance multiple, and often competing, project purposes and objectives. Managing for better performance of one objective often lessens the effectiveness of performance of competing objectives. For example, for Lake Okeechobee, higher regulation schedules tend to benefit water supply, but may increase the risk to public health and safety, and can harm the ecology of the lake. By contrast, lower lake schedules may produce lake levels more desirable for the lake ecology and improved flood protection, but reduce water supply potential.

Since April 2008, Lake Okeechobee has been operated in accordance with the 2008 Lake Okeechobee Regulation Schedule (2008 LORS). Prior to the 2008 LORS, Lake Okeechobee operations were managed under the "Water Supply and Environment (WSE) Regulation Schedule" since July 2000. The 2008 LORS operational study was initiated to address high lake levels, high estuarine discharges, estuary ecosystem conditions, and lake ecology conditions that occurred during the 2003 to 2005 time period. The study considered the back-to-back historically significant 2004 and 2005 hurricane seasons' effects on the recognized structural integrity issues of HHD along with effects to other project purposes. The 2008 LORS was identified to be effective at decreasing the risk to public health and safety, reducing the number of high-volume discharges to the estuaries, and providing critical flexibility to perform water management operations. When it was approved, LORS 2008 was identified as an interim schedule. The USACE expected to operate under the interim schedule until the earlier of (1) implementation of a new Lake Okeechobee schedule as a component of the system-wide operations to accommodate early CERP projects (Band 1 projects) or (2) completion of the modifications to HHD.

In addition to CERP and non-CERP projects previously specified, the CEPP future without project condition includes implementation of the Everglades Restoration Transition Plan (ERTP) for WCA 3A, ENP, and the SDCS, which replaced the Interim Operational Plan (IOP) for Protection of the Cape Sable Seaside Sparrow (CSSS). From July 2002 through October 2012, WCA 3A was regulated according to a seasonally varying 8.75 to 10.75 feet, NGVD regulation schedule and the Rainfall Plan (initiated in 1985), as per IOP. The primary objective in implementing IOP was to adhere to a 1999 FWS Jeopardy Opinion to reduce damaging high water levels within CSSS habitat west of SRS (i.e. CSSS-A). The purpose of IOP was to provide an improved opportunity for CSSS nesting by maintaining water levels below ground level for a minimum of 60 consecutive days between March 1 and July 15, corresponding to the CSSS breeding season. In addition, a secondary purpose of IOP was to allow CSSS habitat to recover from prolonged flooding during the mid-1990s. The ERTP superseded the IOP in October 2012 and is intended to define water management operating criteria for the C&SF project features and constructed features of the MWD and Canal-111 South Dade Projects (C-111 SD) until a Combined Operational Plan (COP) is implemented following completion of the MWD and C-111SD projects. ERTP objectives include improving conditions in WCA 3A for the endangered Everglade snail kite, wood stork and wading bird species while maintaining protection for the endangered Cape Sable seaside sparrow (CSSS) and Congressionally-authorized purposes of the C&SF Flood Control project.

Table C.2.2-15. Past, Present, and Reasonably Foreseeable Actions and Plans Affecting the Action Area.

	Past Actions/Authorized Plans	Current Actions and Operating Plans	Reasonably Foreseeable Future Actions and Plans
Status of Non-CERP Projects	- C&SF Project (1948) - ENP Protection and Expansion Act (1989) - Modified Water Deliveries (MWD) General Design Memorandum (GDM) and Final Environmental Impact Statement (1992)	- MWD 8.5 Square Mile Area General Reevaluation Report (2000) - MWD Tamiami Trail Modifications Limited Reevaluation Report (2008) - MWD 8.5 Square Mile Area Interim Operating Criteria Environmental Assessment (2011) - C&SF C-51 West End Flood Control Project - Kissimmee River Restoration - Seepage Barrier near the L-31 N Levee (Miami-Dade Limestone Products Association)	- Tamiami Trail Modifications Next Steps (TTMNS) Project - SFWMD Restoration Strategies Project MWD Closeout -- C-11 South Dade Project (Contracts 8 and 9)
Operations Plan for Lake Okeechobee, WCA 3A, ENP and the South Dade Conveyance System	- Water Supply and Environment (WSE) Lake Okeechobee Regulation Schedule (2000) - Interim Operational Plan* (IOP) 2002 to Present	- Lake Okeechobee Regulation Schedule (LORS 2008) - SFWMD LEC Regional Water Supply Plan - Everglades Restoration Transition Plan (ERTP) October 2012 to present*	- LORS 2008 to be replaced by revised Lake Okeechobee Regulation Schedule - SFWMD periodically revises the LEC Regional Water Supply Interim Plan - ERTP to be replaced by Combined Operational Plan to be completed to include MWD and C-111 components.
CERP Projects		Awaiting Authorization by Congress: - Biscayne Bay Coastal Wetlands Project - Broward County Water Preserve Areas Project - Caloosahatchee River (C-43) West Basin Storage Reservoir - C-111 Spreader Canal Western Project. Congressional Authorization Received and Construction in Progress: - Indian River Lagoon-South Project - Picayune Strand Restoration Project - Site 1 Impoundment Project	- Future CERP Projects

***** The 2006 IOP for Protection of the CSSS was the governing regulation schedule for the project area at the start of the CEPP planning process. In addition, existing hydrologic conditions within the project area are a result of IOP operations from 2002 to 2012. Therefore, for planning purposes, the existing

condition includes IOP as the operational plan. The current approved operational plan for southern WCA 3A, ENP, and the SDCS as of October 2012 is known as the ERTP. For planning purposes, the CEPP FWO project condition includes ERTP as the operational plan.

Table C.2.2-16. Summary of Cumulative Effects.

Hydrology	
Past Actions	Flood and water control projects have greatly altered the natural hydrology.
Present Actions	Federal and state agencies are coordinating on and implementing projects to improve hydrology.
Proposed Action	Reductions in high discharge events from Lake Okeechobee to the Northern Estuaries. Significant beneficial hydrologic effects are anticipated within the Greater Everglades through restoration of sheetflow and rehydration of previously drained areas. Improved hydrologic conditions will result from increasing depths and extending hydroperiods in WCA 3A, WCA 3B, and ENP.
Future Actions	Additional CERP projects propose to restore hydrology to more natural conditions.
Cumulative Effect	Although it is unlikely that natural hydrologic conditions would be fully restored to pre-drainage conditions, improved hydrology would occur. CERP is expected to improve the quantity, quality, timing and distribution of freshwater flow.
Threatened and Endangered Species	
Past Actions	Water management practices and urbanization have resulted in the degradation of existing habitat function and direct habitat loss leading to negative population trends of threatened and endangered species.
Present Actions	Ongoing efforts have been made by Federal and state agencies to implement projects to improve hydrology within the project area. Ongoing projects have been implemented to maintain CSSS populations. The FWS recovery plan is used as a management tool.
Proposed Action	No effect on Audubon's Crested Caracara. May affect the eastern indigo snake, Florida panther, wood stork, Everglade snail kite, Everglade snail kite critical habitat, Florida manatee, Florida manatee critical habitat, crocodile, crocodile critical habitat, CSSS, and CSSS critical habitat.
Future Actions	Ongoing projects would be implemented to maintain threatened and endangered species within the project area. ERTP implementation represents a paradigm shift from single species to multi-species management. ERTP includes performance measures specifically directed at managing water levels and releases for the protection of multiple species and their habitats within the project area.
Cumulative Effect	Habitat improvement, monitoring and management of threatened and endangered species are anticipated to allow populations to be maintained. Improvement of degraded populations is expected to be facilitated by the restoration and enhancement of suitable habitat through efforts to restore more natural hydrologic conditions within the project area.
Fish and Wildlife Resources	
Past Actions	Water management practices have resulted in aquatic vegetation community changes and a resultant disruption of aquatic productivity and function that has had repercussions through the food web, including effects on wading birds, large predatory fishes, reptiles and mammals.
Present Actions	Ongoing efforts have been made by Federal and state agencies to implement projects to improve hydrology within the project area to restore habitat conditions for fish and wildlife resources.
Proposed Action	Negligible effects to fish and wildlife resources within Lake Okeechobee, and the EAA. Reductions in the number of high discharge events to the Northern Estuaries are anticipated to improve suitable habitat for key indicator species such as oysters. Significant beneficial effects are anticipated within the Greater Everglades. Rehydration within previously dry areas of WCA 3A, 3B, and ENP would increase the spatial extent of suitable habitat. Increases in forage prey availability (crayfish, other invertebrates, and fish) would directly benefit amphibian, reptile, small mammal, and wading bird species. Nesting and foraging activities of resident bird

	species are anticipated to be significantly improved. Increased freshwater flows to Florida Bay would aid in improving suitable habitat for pink shrimp, juvenile spotted seatrout, sea turtles, manatee and crocodiles among other species.
Future Actions	Some level of improvement to fish and wildlife resources is expected to occur as a result of implementation of projects with the capability of improving the timing, quantity, quality and distribution of freshwater flow to the study area. Hydrologic restoration planned as part of CERP would further improve fish and wildlife habitat.
Cumulative Effect	Habitat improvement efforts are anticipated to benefit fish and wildlife resources.
Vegetation and Wetlands	
Past Actions	Drainage of Florida's interior wetlands, conversion of wetlands to agriculture, and urban development has reduced the spatial extent and quality of wetland resources.
Present Actions	Efforts are being taken by state and Federal regulatory agencies to reduce wetland losses.
Proposed Action	Negligible effects to vegetation within Lake Okeechobee and the EAA are anticipated. Reductions in the number of high discharge events to the Northern Estuaries are anticipated to improve conditions for seagrass beds. Significant beneficial effects are anticipated within the Greater Everglades. Improved hydroperiods and sheetflow within WCA 3A, 3B and ENP would result in reduced soil oxidation, promoting peat accretion necessary to rebuild the complex mosaic of habitats across the landscape. Increased freshwater flows to Florida Bay would aid to lower salinity levels, benefiting mangrove communities and seagrass beds.
Future Actions	Some level of improvement to vegetative communities is expected to occur as a result of implementation of projects with the capability of improving the timing, quantity, quality and distribution of freshwater flow to the study area. More natural hydrology as part of the CERP would assist in restoring natural plant communities.
Cumulative Effect	While the spatial extent of natural plant communities would not be restored to historic proportions, the quality of vegetative communities would be improved.
Cultural Resources	
Past Actions	Flood and water control projects, conversion of wetlands into agriculture and urban development have had adverse unmitigated effects to cultural resources either directly or indirectly.
Present Actions	Ongoing efforts have been made by Federal and state agencies to implement projects to improve hydrology within the project area, thereby stabilizing the tree islands which are known to have a high potential for cultural resources.
Proposed Action	While effects of the proposed action have been evaluated, a final determination of effects on cultural resources is not complete. Consultation with stakeholders, including the State Historic Preservation Office, Advisory Council on Historic Preservation, Seminole Tribe of Florida and the Miccosukee Tribe of Indians of Florida is currently ongoing.
Future Actions	Continued improvement to hydroperiods and sheetflow within WCA 3A, 3B and ENP could reduce soil oxidation, which could stabilize the environment, and this in turn could stabilize tree islands containing cultural resources. Investigations mandated in the Programmatic Agreement for ERTP are in the process of being completed and will determine the effects of fluctuating water on subsurface historic properties.
Cumulative Effect	Cumulative effects to historic properties and culturally significant sites will potentially be long-term adverse effects. Mitigation measures for effects to historic properties could potentially reduce the cumulative effect to minor long-term adverse effects. Mitigation measures for culturally significant sites is unknown.

Water Quality	
Past Actions	Water quality has been degraded from urban, suburban, commercial, industrial, recreational and agricultural development.
Present Actions	Efforts to improve water quality from agricultural areas are ongoing. Federal and state projects can temporarily elevate localized levels of suspended solids and turbidity.
Proposed Action	Implementation of the project is not expected to significantly affect the water quality of Lake Okeechobee or the Northern Estuaries. Changes in the quantity, timing, and distribution of flows within WCA 3A and WCA 3B may result in temporary increases in phosphorus concentrations at some TP Rule monitoring stations; however, this should not significantly affect TP Rule compliance. Over the long-term, distributing the flow over the northern WCA-3A marsh, reducing short-circuiting down the canals, adding more flow from the lake that is treated to the WQBEL, should result in improved water quality within WCA 3 and a reduction in flow weighted mean total phosphorous concentration entering the Park. Southern Estuaries salinity conditions are expected to be improved by the project.
Future Actions	Actions by the State of Florida's Restoration Strategies will decrease pollutant concentration and loadings to the project area. If authorized in the next Water Resources Development Act (WRDA), the Broward County WPA Project, (report approved in 2007) would reduce storm runoff deliveries to WCA 3 and improve water quality coming across Tamiami Trail.
Cumulative Effect	While anthropogenic effects on water quality are unlikely to be eliminated, water quality is expected to slowly improve over existing and recent past conditions.

Water Supply/Flood Control	
Past Actions	Water supply and flood control for agricultural and urban users has benefited from construction and operation of the C&SF project.
Present Actions	Availability of water from Lake Okeechobee for agricultural users were recently diminished through implementation of LORS 2008. Availability of water for urban and agricultural users were recently diminished through implementation of ERTP. The SFWMD has implemented Restricted Allocation Area Rules to cap users dependent on water supplies from Lake Okeechobee and the regional system (the Everglades).
Proposed Action	Implementation of ALT 4R2 would likely have no effect on water supplies to agricultural users dependent on Lake Okeechobee. A portion of the urban users, namely LECSA 2 and 3, future supplies would increase slightly.
Future Actions	Future supplies would not change in the future unless additional CERP storage or hydrologic improvements to the Everglades are implemented and increase water availability.
Cumulative Effect	While effects on water supplies are unlikely to improve, water supplies available for agricultural and urban users are expected to remain stable until additional storage mechanisms are implemented.

C.2.2.21 References

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APPENDIX C.3

PERTINENT CORRESPONDENCE INFORMATION

C.3.1 National Environmental Policy Act (NEPA) Scoping
C.3.2 Agency Coordination and Public Involvement
C.3.3 Draft Project Implementation Report (PIR) and Environmental Impact Statement (EIS) Notice of Availability

Appendix C.3.1 NEPA Scoping

NEPA Scoping Letters

Notice of Intent

NEPA Scoping Comment Response Matrix

NEPA Comments

C.3.1 NEPA Scoping

A NEPA scoping letter dated November 23, 2011 was mailed to stakeholders soliciting comments for this action. The scoping letter was used to invite comments from Federal, State, and local agencies, affected Indian Tribes, and other interested private organizations and individuals. Comments were accepted through January 20, 2011. Public scoping meetings were held December 14, 2011 in Plantation, Florida and December 15, 2011 in Clewiston Florida. A Notice of Intent (NOI) to prepare the Environmental Impact Statement (EIS) for the CEPP was published in the Federal Register (76 FR Volume 75539) December 2, 2011.

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

NOV 23 2011

TO WHOM IT MAY CONCERN:

The Jacksonville District, U.S. Army Corps of Engineers (Corps) is beginning preparation of a National Environmental Policy Act assessment for the Central Everglades Planning Project. The goal of the Central Everglades Planning Project is to develop an integrated, comprehensive technical plan, including the first increment of project features to be recommended for authorization, for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem.

The Everglades ecosystem encompasses a system of diverse wetland landscapes that are hydrologically and ecologically connected across more than 200 miles from north to south and across 18,000 square miles of southern Florida. In 2000, the U.S. Congress authorized the Federal government, in partnership with the State of Florida, to embark upon a multi-decade, multi-billion dollar Comprehensive Everglades Restoration Plan (CERP) to further protect and restore the remaining Everglades ecosystem while providing for other water-related needs of the region. CERP involves modification of the existing network of drainage canals and levees that make up the Central and Southern Florida Flood Control Project to restore the south Florida ecosystem.

Construction has begun on the first generation of CERP project modifications already authorized by Congress. These include the Picayune Strand Restoration, the Indian River Lagoon South and Site 1 Impoundment projects. Project Implementation Reports have been completed, or are nearing completion, for the second generation of CERP projects for Congressional authorization, including Biscayne Bay Coastal Wetlands-Phase 1, the Broward County Water Preserve Areas, the Caloosahatchee River (C-43) West Basin Storage Reservoir, and the C-111 Spreader Canal Western Project. All of these CERP projects utilize lands that were acquired by the State and Federal government to meet CERP goals of increasing the extent of wetlands, reducing damaging freshwater discharges to the coastal estuaries, and reducing seepage losses from the natural system. These projects contribute significant ecological benefits to the system and the specific regional habitats in which they are located. These initial CERP projects were intended to provide initial and immediate ecological benefits and set the conditions along the margins of the system that help ensure increased water flows to the interior of the system will not cause adverse effects.

The next step for implementation of CERP is to redirect water that is currently discharged to the east and west coast estuaries from Lake Okeechobee and restore water flow to the south, allowing for restoration of natural habitat conditions and water flow in the central Everglades and re-connecting the ecosystem from Lake Okeechobee to Everglades National Park and Florida Bay. The Central Everglades Planning Project (Figure 1) will develop the initial increment of the project features that provide for storage, treatment and conveyance south of Lake Okeechobee, removal of canals and levees within Water Conservation Area 3 and seepage management features to retain water within the natural system. The CERP Projects identified to accomplish this include the Everglades Agricultural Storage Reservoirs, Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement, Everglades National Park Seepage Management, and Everglades Rain-Driven Operations. These projects make up the heart of CERP aimed at restoring more natural quantity, quality, timing and distribution of water flows to the remaining portions of the river of grass. An integrated study effort on these projects is needed to set the direction for the next decade of CERP implementation.

The Corps will hold a Public Workshop December 14 from 6:30 to 9:00 p.m. at the Sheraton Suites Plantation, Plantation I/II Room, 311 North University Drive, Plantation, Florida and December 15, 2011 from 6:30 to 9:00 p.m. at the John Boy Auditorium, 1200 South W.C. Owen Avenue, Clewiston, Florida. The formal portion of the workshop will begin at 7:30 p.m. The Central Everglades Planning Project team will be available prior to and after the formal presentation to provide information and answer questions about the projects and development of a proposed plan. Interested attendees can call 904-232-1613 for Spanish translation or other special services.

We invite the participation of Federal and State agencies, Native American Tribes, local agencies, interested parties and individuals in providing comments and identifying any issues or concerns. Please share this notice with any interested party. Please send any comments you may have to the attention of Gina Paduano Ralph, Ph.D. (904-232-2336) at the letter head address or email gina.p.ralph@usace.army.mil no later than 30 days from the date of this letter. All individuals providing comments will be included in future mailings. Others may be added to the mailing list by making a written request (postcard) to the same address or by email.

Sincerely,

Stuart J. Appelbaum
Chief, Planning and Policy Division

Enclosure

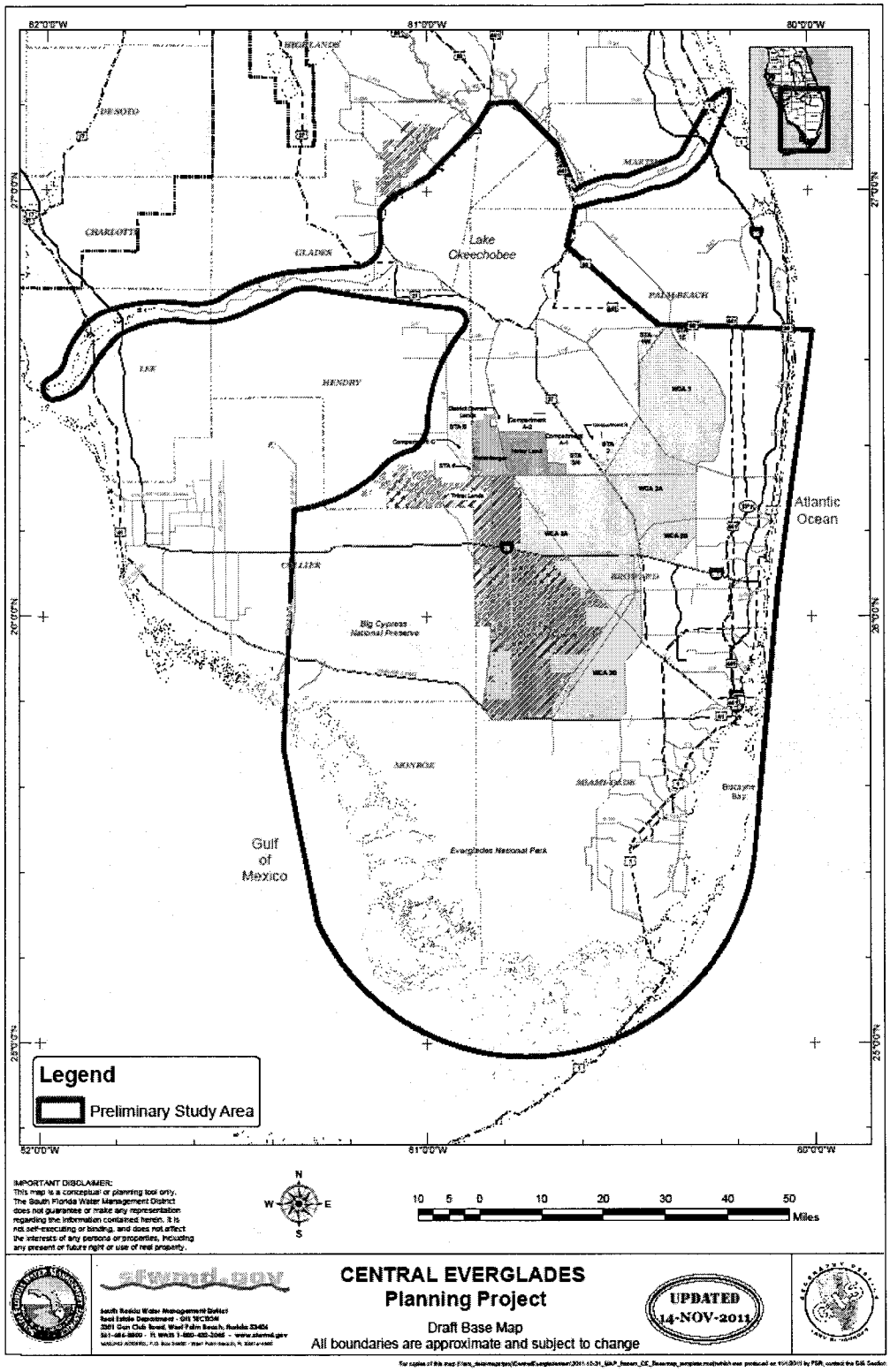

Figure 1. Central Everglades Planning Project Preliminary Study Area.

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

DEC 0 7 2011

Planning and Policy Division
Environmental Branch

Honorable Colley Billie
Chairman, Miccosukee Tribe of Indians of Florida
Post Office Box 440021, Tamiami Station
Miami, Florida 33144

Dear Chairman Billie:

The Jacksonville District, U.S. Army Corps of Engineers (Corps) is beginning preparation of a National Environmental Policy Act assessment for the Central Everglades Planning Project. The goal of the Central Everglades Planning Project would be to develop an integrated, comprehensive technical plan for the first increment of project features to be recommended for authorization for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem. The Corps respectfully requests to meet with you and your staff routinely throughout this planning process to ensure any issues or concerns the Tribe may have are identified and we receive your input regarding the development of this plan. Additionally, the Corps would also like to invite you or your designated staff to participate on the Project Delivery Team that will be conducting the technical analyses and evaluations in support of plan development and selection. I, along with select staff, would be pleased to meet with you to discuss Central Everglades Planning Project.

The Everglades ecosystem encompasses a system of diverse wetland landscapes that are hydrologically and ecologically connected across more than 200 miles from north to south and across 18,000 square miles of southern Florida. In 2000, the U.S. Congress authorized the Federal government, in partnership with the State of Florida, to embark upon a multi-decade, multi-billion dollar Comprehensive Everglades Restoration Plan (CERP) to further protect and restore the remaining Everglades ecosystem while providing for other water-related needs of the region. CERP involves modification of the existing network of drainage canals and levees that make up the Central and Southern Florida Flood Control Project.

Since 2000, much progress has been made. Construction has begun on the first generation of CERP project modifications already authorized by Congress. These include the Picayune Strand Restoration, the Indian River Lagoon South and Site 1 Impoundment projects. Project Implementation Reports have been completed, or are nearing completion, for the second generation of CERP projects for Congressional authorization, including Biscayne Bay Coastal Wetlands – Phase 1, the Broward County Water Preserve Areas, the Caloosahatchee River (C-43) West Basin Storage Reservoir, and the C-111 Spreader Canal Western Project. All of these CERP projects utilize lands that were acquired by the State and Federal government to meet CERP goals of increasing the extent of wetlands, reducing damaging freshwater discharges to the coastal estuaries, and reducing seepage losses from the natural system. These projects contribute significant ecological benefits to the system and the specific regional habitats in which they are located. These initial CERP projects were intended to provide initial and immediate ecological benefits and set the conditions along the margins of the system that help ensure increased water flows to the interior of the system will not cause adverse effects.

The next step for implementation of CERP is to redirect water that is currently discharged to the east and west coast estuaries from Lake Okeechobee and restore water flow to the south, allowing for restoration of natural habitat conditions and water flow in the central Everglades and re-connecting the ecosystem from Lake Okeechobee to Everglades National Park and Florida Bay. The Central Everglades Planning Project (Figure 1) will develop the initial increment of project features that provide for storage, treatment and conveyance south of Lake Okeechobee, removal of canals and levees within Water Conservation Area 3, and seepage management features to retain water within the natural system. The CERP projects identified to accomplish this include the Everglades Agricultural Storage Reservoirs, Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement, Everglades National Park (ENP) Seepage Management, and Everglades Rain-Driven Operations. These projects make up the heart of CERP aimed at restoring more natural quantity, quality, timing and distribution of water flows to the remaining portions of the river of grass. An integrated study effort on these projects is needed to set the direction for continued CERP implementation.

The Corps will also hold a Public Workshop December 14 from 6:30 to 9:00 p.m. at the Sheraton Suites Plantation, Plantation I/II Room, 311 North University Drive, Plantation, Florida and December 15, 2011 from 6:30 to 9:00 p.m. at the John Boy Auditorium, 1200 South W.C. Owen Avenue, Clewiston, Florida. The formal portion of the workshop will begin at 7:00 p.m. The CES team will be available prior to and after the formal presentation to provide information and answer questions about the projects and development of a proposed plan. Interested attendees can call 904-232-1613 for any special services.

We look forward to the opportunity to meet with you. Please contact Kim Taplin 561-801-0285 at your earliest convenience to schedule.

Sincerely,

Alfred A. Pantano, Jr.
Colonel, U.S. Army
District Commander
12/07/11

Enclosure

Copy Furnished:

Bernie Roman, Miccosukee Tribal Attorney; PO Box 440021 Tamiami Station; Miami, Florida 33144
Fred Dayhoff, Section 106 and NAGPRA Consultant; PO Box 440021 Tamiami Station; Miami, Florida 33144
James Erskine, Water Resources Director; PO Box 440021 Tamiami Station; Miami, Florida 33144
Rory Feeney, Miccosukee Wildlife Director; PO Box 440021 Tamiami Station; Miami, Florida 33144
Terry Rice, Colonel (Ret'd), PhD, PE; Miccosukee Everglades Consultant; 6526 S Kanner Highway, PMB 316; Stuart, Florida 34997

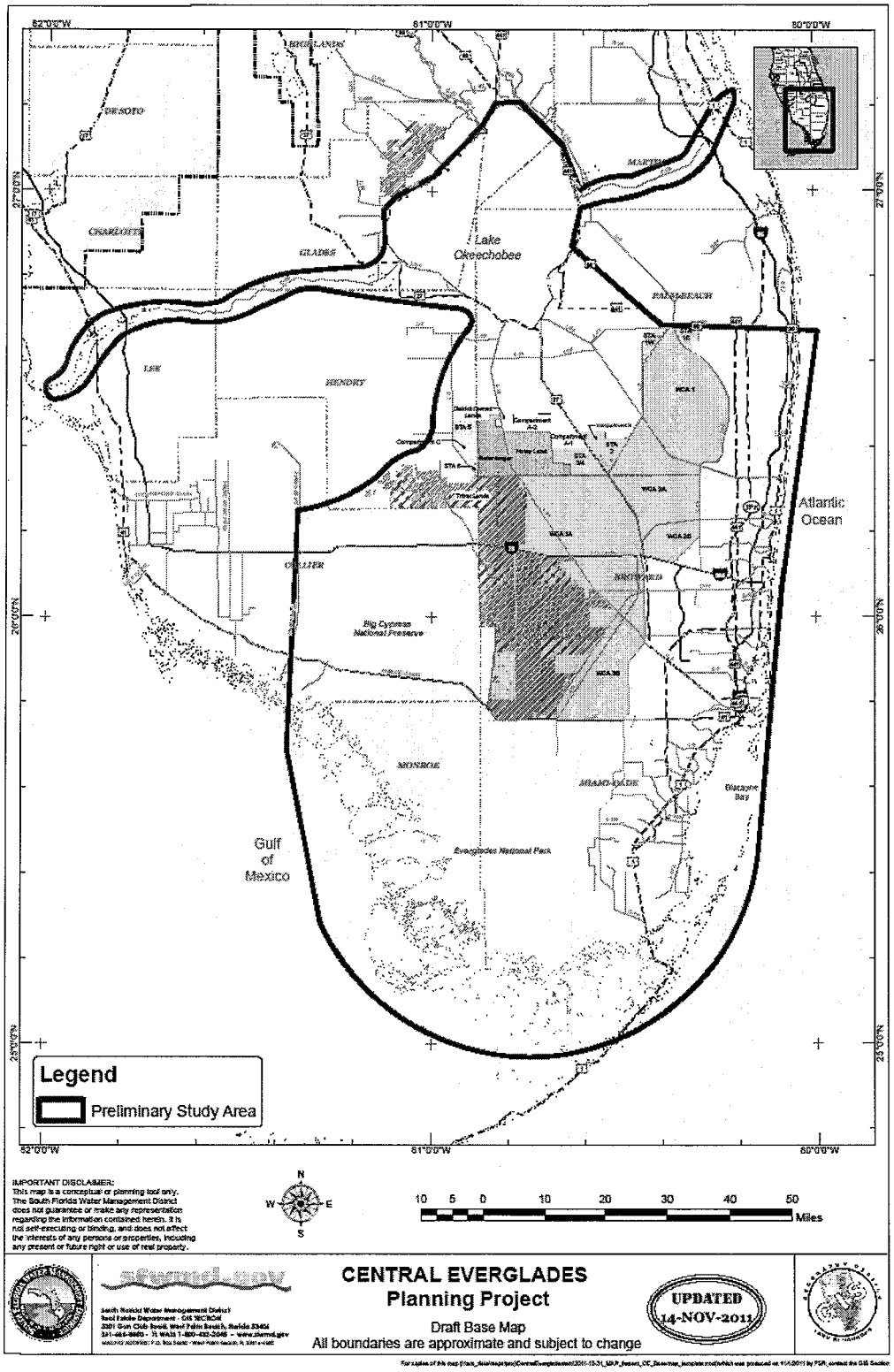

Figure 1. Central Everglades Planning Project Preliminary Study Area.

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

DEC 0 7 2011

Planning and Policy Division
Environmental Branch

Honorable James Billie
Chairman, Seminole Tribe of Florida
6300 Stirling Boulevard
Hollywood, Florida 33024

Dear Chairman Billie:

The Jacksonville District, U.S. Army Corps of Engineers (Corps) is beginning preparation of a National Environmental Policy Act assessment for the Central Everglades Planning Project. The goal of the Central Everglades Planning Project would be to develop an integrated, comprehensive technical plan for the first increment of project features to be recommended for authorization for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem. The Corps respectfully requests to meet with you and your staff routinely throughout the planning process to ensure any issues or concerns the Tribe may have are identified and we receive your input regarding development of this plan. Additionally, the Corps would also like to invite you or your designated staff to participate on the Project Delivery Team that will be conducting the technical analyses and evaluations in support of plan development and selection. I, along with select staff, would be pleased to meet with you to discuss the Central Everglades Planning Project.

The Everglades ecosystem encompasses a system of diverse wetland landscapes that are hydrologically and ecologically connected across more than 200 miles from north to south and across 18,000 square miles of southern Florida. In 2000, the U.S. Congress authorized the Federal government, in partnership with the State of Florida, to embark upon a multi-decade, multi-billion dollar Comprehensive Everglades Restoration Plan (CERP) to further protect and restore the remaining Everglades ecosystem while providing for other water-related needs of the region. CERP involves modification of the existing network of drainage canals and levees that make up the Central and Southern Florida Flood Control Project.

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We look forward to the opportunity to meet with you. Please contact Kim Taplin 561-801-0285 at your earliest convenience to schedule.

Sincerely,

Alfred A. Pantano, Jr.
Colonel, U.S. Army
District Commander
12/27/11

Enclosure

Copy Furnished:

Craig Tepper, Director of Water Resource Management, Seminole Tribe of Florida, 6300 Stirling Road, Hollywood, Florida 33024
Jim Shore, General Counsel, Seminole Tribe of Florida, 6300 Stirling Road, Hollywood, Florida 33024
Willard Steele, Seminole Tribe of Florida, Tribal Historic Preservation Officer, 30290 Josie Billie Highway, PMP 1004, Clewiston, Florida 33440

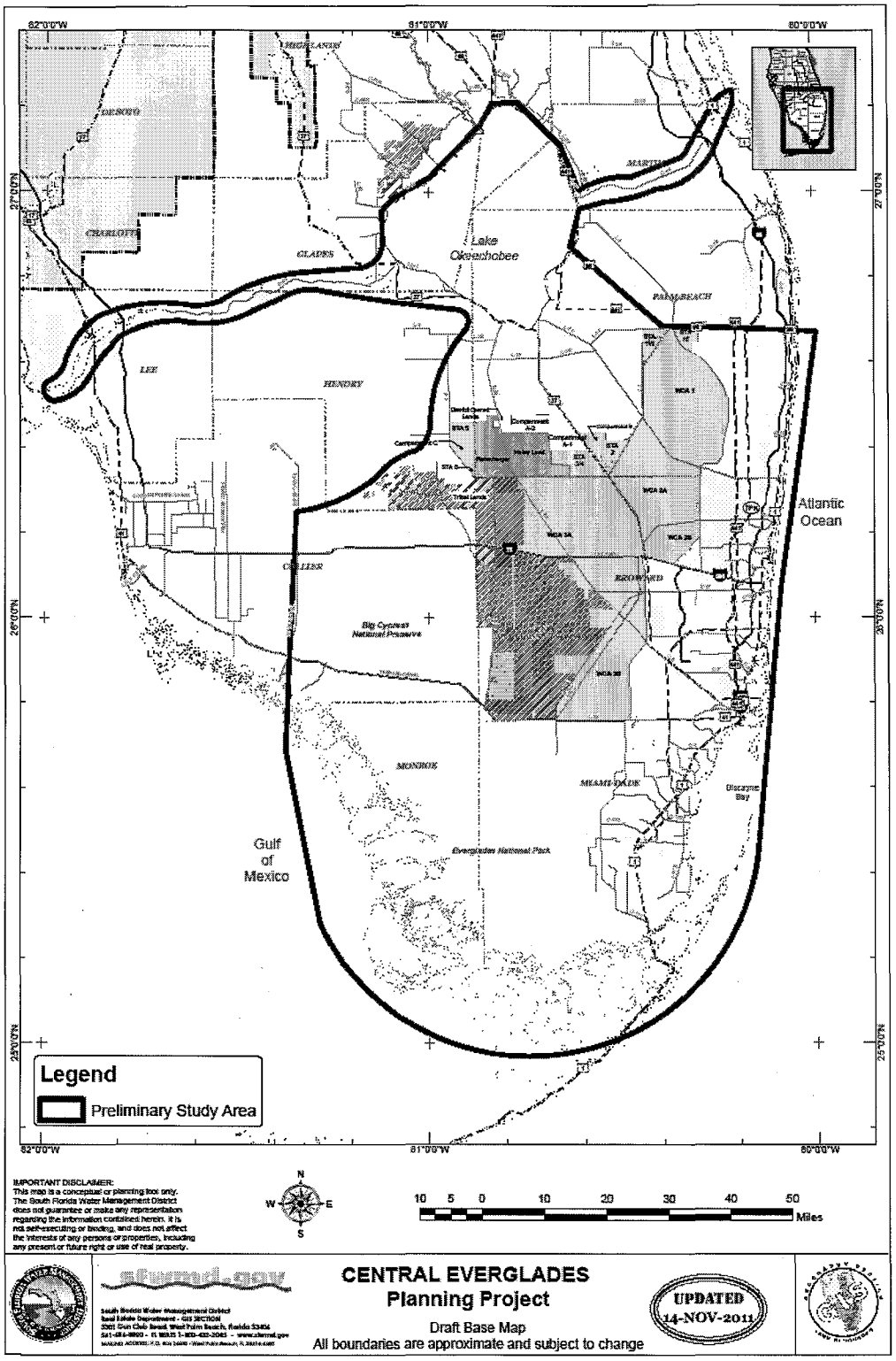

Figure 1. Central Everglades Planning Project Preliminary Study Area.

Dated: November 29, 2011.

Morgan F. Park,

Alternate OSD Federal Register Liaison Officer.

[FR Doc. 2011–30986 Filed 12–1–11; 8:45 am]

BILLING CODE 5001–06–P

DEPARTMENT OF DEFENSE

Department of the Army, Corps of Engineers

Intent To Prepare an Environmental Impact Statement for the Central Everglades Planning Project, Okeechobee, Glades, Martin, Palm Beach, Broward, Miami-Dade and Monroe Counties, FL

AGENCY: Department of the Army, U.S. Army Corps of Engineers, DOD.

ACTION: Notice of intent.

SUMMARY: The Everglades ecosystem encompasses a system of diverse wetland landscapes that are hydrologically and ecologically connected across more than 200 miles from north to south and across 18,000 square miles of southern Florida. In 2000, the U.S. Congress authorized the Federal government, in partnership with the State of Florida, to embark upon a multi-decade, multi-billion dollar Comprehensive Everglades Restoration Plan (CERP) to further protect and restore the remaining Everglades ecosystem while providing for other water-related needs of the region. CERP involves modification of the existing network of drainage canals and levees that make up the Central and Southern Florida Flood Control Project.

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ADDRESSES: U.S. Army Corps of Engineers, Planning Division, Environmental Branch, P.O. Box 4970, Jacksonville, FL 32232–0019.

FOR FURTHER INFORMATION CONTACT: Dr. Gina Ralph at (904) 232–2336 or email at *Gina.P.Ralph@usace.army.mil.*

SUPPLEMENTARY INFORMATION:

a. The goal of the Central Everglades Planning Project effort would be to develop an integrated, comprehensive technical plan, including the first increment of projects, for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem.

b. A scoping letter will be used to invite comments from Federal, State, and local agencies, affected Indian Tribes, and other interested private organizations and individuals.

c. A scoping meeting will be held December 14, 2011 from 6:30 to 9 p.m. at the Sheraton Suites Plantation, Plantation I/II Room, 311 North University Drive, Plantation, Florida and December 15, 2011 from 6:30 to 9 p.m. at the John Boy Auditorium, 1200 South W.C. Owen Avenue, Clewiston, FL. Assistance for individuals with special needs or language translation will be available as needed by calling (904) 232–1613.

d. All alternative plans will be reviewed under provisions of appropriate laws and regulations, including the Endangered Species Act, Fish and Wildlife Coordination Act, Clean Water Act, and Farmland Protection Policy Act.

e. The Draft Environmental Impact Assessment is expected to be available for public review in the 1st quarter of 2013.

Brenda S. Bowen,

Army Federal Register Liaison Officer.

[FR Doc. 2011–31010 Filed 12–1–11; 8:45 am]

BILLING CODE 3720–58–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

Combined Notice of Filings #1

Take notice that the Commission received the following electric corporate filings:

Docket Numbers: EC12–38–000.

Applicants: TPW Petersburg, LLC, Gestamp Eolica S.L.

Description: Application of TPW Petersburg, LLC and Gestamp Eolica S.L. for Authorization Pursuant to Section 203 of the Federal Power Act and Request for Confidential Treatment, Expedited Consideration and Waivers.

Filed Date: 11/21/11.

Accession Number: 20111121–5279.

Comments Due: 5 p.m. ET 12/12/11.

Take notice that the Commission received the following electric rate filings:

Docket Numbers: ER11–4674–001.

Applicants: Midwest Independent Transmission System Operator, Inc.

Description: Vectren-IMPA FCA Amendment to be effective 9/29/2011.

Filed Date: 11/21/11.

Accession Number: 20111121–5193.

Comments Due: 5 p.m. ET 12/12/11.

Docket Numbers: ER12–351–001.

Applicants: Midwest Independent Transmission System Operator, Inc.

Description: 11–21–11 MRES Attachment O, GG, and MM Amendment to be effective 1/1/2012.

Filed Date: 11/21/11.

Accession Number: 20111121–5234.

C.3.1 NEPA Scoping Comment Response Matrix

Table C.3-1. CEPP NEPA Scoping Comment Response Matrix

LETTER	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
FEDERAL		
UNITED STATES FISH AND WILDLIFE SERVICE (FWS)		
FWS-1	While the Service [FWS] fully supports this effort and approach, it is necessary to point out that there are many restoration opportunities within the Central Everglades that would not be captured by simply undertaking the three specific projects suggested: EAA [Everglades Agricultural Area] storage component, DECOMP [WCA-3 Decompartmentalization and Sheetflow Enhancement] of PIR1 [Project Implementation Report] Project; and ESM [Everglades Seepage Management] Project. ▪ Primarily, the reconnection of WCA-3B [Water Conservation Area 3B] as a flow-through system connecting WCA-3A to ENP [Everglades National Park] is the most critical part of Everglades restoration remaining to be planned. The Service suggests, and will provide alternative scenarios, that this critical element be made a core component of CEPP. ▪ Additional opportunities that should be included in CEPP are the relaxation of the G-3273 constraint, integration of the S-356 pump station to control seepage in the L-30 and L-31N canals, and expansion of the S-333 structure to allow greater flow out of the ponded areas in WCA-3A into Northeast Shark River Slough [NESRS]. ▪ Also, if the Combined Operational Plan is going to be delayed or absorbed into CEPP then an operational plan that utilizes the newly constructed 1-mile bridge should be incorporated. ▪ Other opportunities include defining environmental water regulation	The Corps supports reconnecting WCA-3B as a functioning component of the Everglades ecosystem. Alternatives to accomplish this will be evaluated within CEPP. The CEPP alternatives will include operational changes to the L-29 canal stages, along with opportunities for delivering additional water to Everglades National Park (ENP). All Modified Water Deliveries (MWD) to ENP Project components currently constructed or under construction will be included within CEPP planning process. Under a separate effort, the Corps plans to move forward with a field test for relaxation of the G-3273 restraint, with a goal of increasing and/or removing the G-3273 stage constraint to increase water deliveries from WCA-3A to ENP through Northeast Shark River Slough (NESRS) for the benefit of natural resources. This test will include use of the S-356 pump station. Also under a separate effort, the Corps will formulate an operational plan that utilizes the newly constructed 1-mile bridge. Rain driven operations will also be examined as part of CEPP in order to improve water deliveries into the Everglades Protection Area and ENP to restore more natural hydrologic conditions. Due to high rates of seepage, a regulation schedule is currently not utilized for WCA-3B, as it is an impounded area whose water management function is to reduce seepage from WCA-3A to the east.

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	schedules for WCAs 2 and 3B and refining the schedule for 3A.	Operational criteria for WCA-3B will be reviewed within CEPP. A revised regulation schedule for WCA-2 will not be included in CEPP.
FWS-2	…as quickly as possible, determine the size and type of available storage and treatment areas in the EAA to help guide the team in formulating downstream project features. There is a considerable speculation as to the amount of water that the project will deliver south which is entirely predicated on the amount of storage and treatment available in the EAA. The Corps should notify the Service regarding the best time to provide important information regarding the design and detailed operations of stormwater treatment areas and storage reservoirs and their effects on listed species, migratory birds, and other wildlife resources.	The Corps concurs with this statement and is currently developing management measures and screening criteria to determine the size and type of storage and treatment features within the EAA. The Corps will continue to coordinate with FWS throughout CEPP process.
FWS-3	The Service does not feel that a completed seepage management project, without the delivery of additional water for the environment, constitutes a valid restoration project.	The formulation of CEPP components will incorporate a "systems thinking approach" to ensure compatibility with the Comprehensive Everglades Restoration Plan (CERP) and any potential future updates to restoration goals and targets. This will also highlight the interdependency of CERP components targeting restoration in the Central Everglades study area. A holistic system is any set (or grouping) of interdependent or temporally interacting parts. These parts are generally systems themselves and are composed of other parts (i.e. management measures and components). Systems thinking emphasizes the linkages and interactions between the parts that compose the entirety of a complex system. A common way to understand a complex system is to evaluate the system by analyzing the parts composing that system. Yet, focusing solely on management measures or

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		components in isolation could potentially lead to a disconnection between the function of the management measures and components and the functionality of the entire system. Systems thinking incorporates the examination of measures by themselves (similar to traditional Project Implementation Reports) and the synthesis of these parts. The CEPP plan formulation strategy will emphasize the interdependency of the components and articulate the strategy for maximizing their compatibility into a system, while incorporating design that is flexible and amenable to change.
FWS-4	A project feature that should not be considered during the CEPP is further modification of the S-12 structures closure regime for protection of the Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*). Once the Everglades Restoration Transition Plan (ERTP) is authorized (Record of Decision scheduled late February 2012) the S-12 closure regime will be relaxed due to the addition of year-round operational capability at S-12C. With the additional "untested" risk to the Cape Sable seaside sparrow subpopulation A and its habitat from ERTP operations, the Service strongly recommends that restoration become more focused on shifting flow eastward towards the original flow path of WCA 3B to NESRS. No further management changes to the S-12s should be considered until more flow has been restored into northeastern ENP.	As part of the Corps plan formulation and National Environmental Policy Act (NEPA) assessment process, system-wide benefits and impacts of each alternative will be analyzed and compared in order to select a recommended plan.
FWS-5	An area of concern regarding the expedited process is how PDT [Project Delivery Team] meetings are being conducted. As we approach the 3-month mark there have only been two PDT meetings. These were conducted as short (~3 hour) meetings prior to public workshops. Dialogue among PDT members and between the team and project management regarding critical	The initial phase of the process was focused on scoping. This is essentially development of the scope of the effort and development of the Project Management Plan (PMP). The PMP is the document of activities and funding required to conduct the study and is developed primarily between the Corps and the Non-Federal sponsor, SFWMD.

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	project planning elements was restricted. Draft language, such as project objectives, on which the PDT members were asked to comment, was not shared prior to the meeting. The Service suggests that the Corps and SFWMD [South Florida Water Management District] convene a PDT meeting in the style previously used during CERP to discuss critical project elements as soon as possible.	During this phase we conducted two PDT meetings and two NEPA public workshops to gather input about the study scope. Now that the Corps has received approval to enter into the execution phase, the PDT will meet regularly to discuss all aspects of the study during the process. Due to the expedited schedule, the Corps does not anticipate having read-aheads prior to PDT meetings. However, all materials will be made available to participants after the meetings.
FWS-6	The Service encourages the Corps and SFWMD to seek out and use available ecological planning tools to help to ensure that evaluations include both hydrologic and ecologic information. Consideration should be given to ecological planning tools in Florida Bay and Biscayne Bay as well as Greater Everglades.	The Corps concurs with this statement and has requested for full participation from our DOI partners with respect to utilization of current DOI ecological planning tools for assistance in determining potential ecological impacts of the CEPP alternatives. Ecological planning tools currently under consideration include the Cape Sable Seaside Sparrow Model, the Everglades Landscape Vegetation Succession Model (ELVes), the Apple Snail Population Model, and Prey Based Freshwater Fish Density Model. In order to be included within CEPP, however, all planning tools will need to undergo the appropriate level of Corps review and certification process.
FWS-7	The Service recommends that development of an adaptive management plan occur in conjunction with the CEPP planning process.	The Corps concurs with this statement and in accordance with the 2011 CERP Adaptive Management Integration Guide; an adaptive management plan will be developed and included in CEPP Project Implementation Report (PIR) and Environmental Impact Statement (EIS).
FWS-8	The Corps and SFWMD project managers should refine the scope and study area to more precisely fit the first increment of the CEPP as soon as possible. This will allow the team to refine the objectives and identify PMs [Performance Measures] and model applications that will be useful in determining project benefits.	The study area for CEPP encompasses the Northern Estuaries (St. Lucie River and Indian River Lagoon and the Caloosahatchee River and Estuary), Lake Okeechobee, a portion of the EAA, the Water Conservation Areas, ENP, the Southern Estuaries (Florida Bay and Biscayne Bay), and the Lower

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		East Coast (LEC). As CEPP plan formulation progresses, refinements to the original scope and study area as stated in the Corps NEPA scoping letter dated November 23, 2011 are anticipated.
FWS-9	Specific comments on the draft project objectives are as follows: ▪ "Reduce water loss out of the natural system..." We assume that this is referring to seepage loss since the Seepage Management project was identified as a core component of CEPP but it is not clear. It may refer to the loss of freshwater to tide. The seepage component is not primarily for wildlife benefit but for flood protection and the objective should reflect this. Please clarify this objective. ▪ "Restore more natural water level responses to rainfall predicted by project modeling..." This needs to be reworded or better explained. Does this imply that the model predicts rainfall? We assume the desire is to have the system respond more naturally to rainfall patterns. ▪ "Increase oyster habitat and seagrass populations in the Northern Estuaries by reducing salinity fluctuations from freshwater regulatory pulse discharges." There is a misconception contained within this objective that by reducing salinity fluctuations you increase oyster and seagrass habitats. This is not the case as additional management actions are needed for this to occur. The Service also suggests this objective be reworded to include the restoration of the overall ecological function of the estuaries as measured by oyster and sea-grass populations. Detailed questions regarding this objective are as follow: • What is meant by	The project objectives have been revised since the NEPA scoping letter was mailed in November 2011. ▪ The reduce water loss in the quoted text refers to seepage losses, not discharges to the northern estuaries. However, another objective of CEPP is to reduce damaging discharges to the Northern Estuaries. ▪ The phrase "predicted by rainfall" was removed from the objective. The desire is for the system to respond more naturally to rainfall patterns. ▪ The objective has been revised to "Reduce high volume discharges from Lake Okeechobee to improve the quality of oyster and SAV [submerged aquatic vegetation] habitat in the northern estuaries." The team has not fully established methods to analyze changes to the northern estuaries, beyond using the RECOVER performance measures that assesses salinity envelopes in the St. Lucie and Caloosahatchee estuaries based on discharges from Lake Okeechobee. The CEPP team intends to work with agency biologists and RECOVER to identify performance metrics to address these types of questions.

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	seagrass population, species composition, density, acreage increase, etc? • Is Vallisneria included under seagrass since it is an important component of the Caloosahatchee River restoration? • Which Northern Estuaries will the CEPP improve (St. Lucie, Caloosahatchee, etc.)? • Will muck removal in estuaries or addition of artificial substrates (oyster cultch) be included in the Management Measures as part of the CEPP to claim maximum ecological benefits for Northern Estuaries oyster and seagrass health and abundance?	
FWS-10	Concerns we have at this point are whether the RECOVER approved and vetted PMs previously used in CERP can be modified to use RSM [Regional Simulation Model] output.	The majority of the CEPP identified RECOVER approved PMs have already been utilized with RSM output during the CERP DECOMP Phase 1 project. Any RECOVER approved PMs identified for use by CEPP that do not currently work with RSM output will be modified by the CEPP team and verification testing demonstrating reasonable outcomes (e.g. compared to South Florida Water Management Model outputs) will be available for review.
FWS-11	Also of concern is how output from the additional ecological tools will be used to formulate alternatives to optimize benefits for natural resources throughout the system. The Service recommends that conclusions and recommendations drawn from these specialized tools be considered between alternative runs to make the next iteration more beneficial for natural resources.	The Corps has requested full participation from our DOI partners with respect to utilization of current DOI ecological planning tools for assistance in determining potential ecological impacts and refining CEPP alternatives. In order to be included within CEPP, however, all planning tools will need to undergo the appropriate level of Corps review and certification process.

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FWS-12	There are some concerns with using the RESOPS model in conjunction with the Regional Simulation Model — Glades Lower Ease Coast Service Area (RSM-Glades LECSA) model. RSM-Glades LECSA is a daily time-step model that will be using output from RESOPS which utilizes a monthly time-step. This will automatically create inherent errors in the model results.	The RESOPS model will only be utilized during screening model application to CEPP. All final array alternatives will be run with the RSM Basins and RSM Glades LESCA models, both of which are daily time-step models capable of exchanging boundary conditions at a consistent temporal scale. The modeling tools for CEPP will be used for relative comparison. Extensive numerical analysis to reduce qualitative or quantitative uncertainties will not be conducted. Levels and degrees of uncertainties are recognizably inherent to the planning process. Some uncertainty will be addressed in cost contingencies which will help to account for uncertainty in the modeling tools and the expedited planning process.
FWS-13	A similar concern exists for the RSM Glades-LECSA model which simulates hydrology within 1-square mile grid cells without providing individual gauge data. Since the Corps and SFWMD water management sections base their management actions on individual gauge data as the Service bases its nondiscretionary terms and conditions on gauge data, a cross-walk between simulated hydrology across a large area to that at specific gauges will be needed. The hydrologic effects of the proposed action at key gauge sites identified by the Service during this and previous consultations should be provided.	While the RSM is a regional scale hydrologic model and results should be interpreted as such, the model does generate information for gauge locations and this information will be used in CEPP. Through review of RSM calibration results, it is possible to identify differences in the modeled representation of gauges of interest and the observed field responses.
FWS-14	L-29 levee concerns have presented a human health and safety constraint in WCA-3A, thus a levee assessment with flood event modeling will likely become necessary especially since more water is predicted to move south though the system into WCA-3A.	Based on the results of a preliminary Phase 1 review and analysis, as documented in the December 2011 ERTP Final EIS, the Corps determined the current configuration of WCA-3A would result in a predicted increase in the Standard Protective Flood (SPF) stage for WCA-3A of between 1.3 and 1.4 feet, due primarily to a reduced outlet capacity from the S-12s

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		compared to design assumptions. This significant change to the original design assumptions, with the additional diminished extent of emergent vegetation within WCA-3A, led the Corps to identify WCA-3A high water stages as a potential cause for concern. Although the preliminary analysis does not provide a quantifiable risk assessment, the hydrologic insights gained from the analysis made it prudent for the Corps to recommend the lowering Zone A of the WCA-3A Regulation Schedule as an interim risk reduction measure. The ERTP analysis did not identify a human health and safety constraint in WCA-3A. CEPP would conduct preliminary levee safety screening by looking at stages based on the Period of Record (POR) output from RSM; this screening level assessment would be contained in the CEPP PIR, consistent with the POR-based Savings Clause assessment of levels of service for flood protection within the LEC. Design Storm/SPF analyses (levee design criteria) would be conducted, if warranted, during the preconstruction engineering design (PED) phase of CEPP. Appropriate resources, scope and analysis tools have not been identified at this time. Once the existing conditions baseline and Future Without (FWO) modeling is done, CEPP team should know the levee safety screening baseline conditions for WCA-3A, WCA-3B, and ENP. If water levels within the natural areas increase under CEPP during POR high water events, further evaluation of potential effects on the levee design criteria in the affected areas would likely be needed (depending on the upstream storage components and WCA-3B conveyance, water levels in WCA-3A may not increase) in PED.

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		During PED, the Corps would look at options to maintain benefits and not increase levee modification costs (i.e. levee redesign, construction or mitigation).
FWS-15	The planning team should evaluate available tools and information that can be used to assess future impacts of climate change including sea level rise and changes in urbanization (which may affect water supply).	A sea level rise evaluation will be conducted on the tentatively selected plan (TSP), using a static scenario based geographic conformations system (GIS) sea level rise mapping effort similar to previous CERP PIRs. The future conditions for the CEPP planning effort holds consumptive use (i.e. water supply) fixed at current levels due to state-rulemaking.
TRIBAL		
MICCOSUKEE TRIBE (M-TRIBE)		
M-TRIBE-1	**EIS [Environmental Impact Statement] Required:** CEPP formulation and implementation will have a "significant impact on the human environment." Therefore, the document that is required to be prepared by the Corps under the National Environmental Policy Act ("NEPA") must be an Environmental Impact Statement ("EIS") rather than an Environmental Assessment ("EA").	An EIS will be prepared for CEPP in accordance with NEPA.
M-TRIBE-2	**All Applicable Law Must be Followed.**	As with all Corps' projects, CEPP will be planned and implemented in accordance with all applicable laws.
M-TRIBE-3	**ERTP [Everglades Restoration Transition Plan], Not IOP [Interim Operational Plan for protection of the Cape Sable Seaside Sparrow], Should be the Base Condition:** The Corps concluded in the Final Environmental Impact Statement (FEIS) on the Everglades Restoration Transition Plan that "IOP is no longer a viable option" for water management within WCA-3A and the South Dade Conveyance System." ERTP FEIS at xiii. The Corps argued when it stopped using the Test 7 operational plan as a base condition in the EIS process that it could no longer be used because it was contrary to the ESA [Endangered Species	The CEPP existing condition has been defined as conditions existing as of January 27, 2011. As the Record of Decision for ERTP is not expected until June 2012, 2006 IOP will serve as the CEPP existing conditions. Upon ERTP Record of Decision, ERTP will serve as the future without project condition.

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	Act]. Similarly here, the Corps cannot rely on IOP as the base condition for CEPP in the NEPA process, because it is not viable. In addition, the ERTP should be replacing IOP in the very near future and prior to any NEPA document being produced.	
M-TRIBE-4	**Ensure No Adverse Impacts to the Miccosukee Tribe Culture and Cultural Resources: The Corps must perform a comprehensive review of all potential adverse impacts of all proposed actions under the CEPP on the Miccosukee Tribe's Culture and Cultural Resources in the action area, which includes WCA-3 and the Park [Everglades National Park, ENP], and ensure that any adverse impacts are eliminated prior to implementation of the selected alternative. Certainly, the assurance of the "health and safety" of the Tribe must be paramount.**	The Corps is currently in consultation with both Tribes and State Historic Preservation Office to develop methods to perform any inventories required under NEPA and Section 106 and an initial review of potential impacts to cultural resources. The Corps considers public health and safety as its highest priority, and WCA-3A will continue to be managed by the Corps in accordance with this priority.
M-TRIBE-5	**Must Produce Benefits for Tribal Lands in WCA 3A:** The CEPP process should incorporate a revised WCA-3A regulation schedule targeted at the restoration of the entire central Everglades that incorporates a multispecies management approach building upon what was achieved with the ERTP and hopefully will be achieved under COP [Combined Operational Plan].	Modifications to the WCA-3A Regulation Schedule, including rain-driven operations, will be examined as part of CEPP in order to improve water deliveries into the Everglades Protection Area and ENP and to restore more natural hydrologic conditions. The CEPP will include a multispecies approach to water management.
M-TRIBE-6	**CEPP Must Decrease WCA 3A Flooding: CEPP must reduce damaging high water levels in WCA 3A even more than the proposed ERTP and the anticipated COP. So-called "new science," which in many cases is old science that has been discarded, must not be misused as an excuse to drown the Tribal Everglades to provide more water to the Park downstream.**	Restoration of more natural water flows, water levels and habitat conditions within WCA-3A is an important focus of CEPP. One objective of CEPP is to restore seasonal hydroperiods and freshwater distribution to support a natural mosaic of wetland and upland habitat in the Everglades system. Tree islands support a diverse array of upland (land-requiring) species and are an important focus of Everglades restoration. By restoring appropriate hydrologic conditions, tree islands and other short hydroperiod environments (e.g. marl prairie) will be restored and thereby provide suitable habitat for both wetland and upland species.

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M-TRIBE-7	**<u>Health and Safety Must Be a Priority:</u> any CEPP water management actions that may impact water levels in WCA-3 must account for specific flood stage of the L-29 levee system as detailed in the US Army Corps of Engineers 2011 General Design Memorandum for WCA-3A. Finally, any safety studies that have been, or are being, conducted on the L-31 levee and the Lake Okeechobee dike must also be taken into account. Health and safety of the Miccosukee Tribe, and the public, must be the top priority in the CEPP process.**	The Corps considers public health and safety as its highest priority. The CEPP would conduct preliminary levee safety screening by looking at stages based on the POR output from RSM; this screening level assessment would be contained in the CEPP PIR, consistent with the POR-based Savings Clause assessment of levels of service for flood protection within the LEC. Design Storm/SPF analyses (levee design criteria) would be conducted, if warranted, during the PED phase of CEPP. Appropriate resources, scope, and analysis tools have not been identified at the current time. Once existing conditions baseline and FWO modeling is done, CEPP team should know the levee safety screening baseline conditions for WCA-3A, WCA-3B, and ENP. If water levels within the natural areas increase under CEPP during POR high water events, further evaluation of potential effects on the levee design criteria in the affected areas would likely be needed (depending on the upstream storage components and WCA-3B conveyance, water levels in WCA-3A may not increase) in PED. During PED, the Corps would look at options to maintain benefits and not increase levee modification costs (i.e. levee redesign, construction or mitigation).
M-TRIBE-8	**<u>CEPP Must Incorporate Storage As a Priority:</u>** Incorporating storage facilities must be a central component of the CEPP and should be scheduled for construction and implementation early in the sequencing process. **Constructing storage at the soonest must be a priority if CEPP is to succeed.**	The Corps concurs with this statement and is currently developing management measures and screening criteria to determine the size and type of storage and treatment features within the EAA.
M-TRIBE-9	**<u>Rehydrate Only with Clean Water to Protect Northern WCA-3A and WCA-3B:</u> In general, CEPP should never permit rehydration with dirty water and should always strive for natural flows and levels**	The Corps concurs that water that does not meet water quality standards should be avoided to the maximum extent practicable for rehydration of unnaturally dried out areas. As part of

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	to the greatest extent practicable.	the Corps plan formulation and NEPA assessment process, system-wide benefits and impacts of each alternative will be analyzed and compared in order to select a recommended plan.
M-TRIBE-10	**CEPP Must Incorporate Solutions to Stop Western Basins Pollution:** Recent data from the 2011 South Florida Environmental Report shows that the combined discharge from the S-140 and S-190 water control structures comprised nearly 30% of the total phosphorus load discharged to WCA-3A. The Central Everglades Planning Process is the time to initiate the long overdue planning process for the CERP [Comprehensive Everglades Restoration Plan] Big Cypress- L-28 Interceptor Modifications and provide a solution for the devastating discharges from the L-28 Interceptor Canal and the S-140 water control structure.	The CEPP Project Team will coordinate with the implementing agencies on efforts to improve water quality in the Western Basins and the Seminole Tribes' Water Conservation Plan (Critical Project).
M-TRIBE-11	**No More Dirty Water, No Rehydration with Dirty Water, & No Use of WCAs As *De Facto* STAs [stormwater treatment areas]: ...the Tribe does and will not support a CEPP that 1) increases the amount of dirty water brought into the Everglades Protection Area, or 2) restores flows to the Everglades Protection Area with dirty water, until the restoration water meets the 10 ppb P [phosphorus] criterion mandated by the Clean Water Act. Even more, Tribal land will not be utilized as an STA. The 10 ppb P criterion must be a major performance measure in CEPP and water quality must be thoroughly analyzed and evaluated in the CEPP process.**	The CEPP will formulate appropriate water quality treatment facilities needed to ensure any new water moving into the everglades will meet the required 10 parts per billion (ppb) long-term geometric mean.
M-TRIBE-12	**No Trade-Offs Permitted:** ..."trade-offs between water quality and water quantity" which opens the door wide for those who would destroy one part of the Everglades for the benefit of another. At the heart of this is the utilization of vast areas of the Everglades (both WCAs and Tribal Land) as *de facto* STAs in the restoration process. The Tribe is concerned that under the guise	As part of the Corps plan formulation and NEPA assessment process, system-wide benefits and impacts of each alternative will be analyzed and compared in order to select a recommended plan.

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	of "new science" some will attempt to use the CEPP process to seek a plan that forces large volumes of water through some areas, like WCA-3A, for the possible benefit of some areas, like the Park to the south. **CEPP must endorse as a guiding principle that no area of the Everglades will be destroyed/sacrificed for the benefit of another area of the Everglades by planned CERP projects, or for that matter, any proposed project.**	
M-TRIBE-13	**CEPP Must Not Delay Already Delayed MWD [Modified Water Deliveries to Everglades National Park] Project Components:** The Tribe is concerned that some will attempt to delay important aspects of this project by incorporating them into the CEPP, which may never be authorized. The Tribe will be opposed to any attempt to do so. **Completion and implementation of the MWD Project must be a pre-condition to the CEPP and a "without project condition" under NEPA.**	For planning purposes, the MWD project will be assumed to be complete based upon those features already completed and those features currently under construction. This planning assumption is predicated upon the Corps, in consultation with DOI, first making a determination that the expected benefits for the MWD project have been achieved.
M-TRIBE-14	**Decompartmentalization of WCA-3:** plans for the Decompartmentalization [DECOMP] of WCA-3 should incorporate more than the hydrologic modification features proposed for north of I-75 by the DECOMP PDT [Project Delivery Team]. When incorporating the Decompartmentalization of WCA-3 into the CEPP all of the canals in the L-28 system should be considered for removal in addition to the entire Miami canal and L-67 canal system to truly provide restoration of the "Central Everglades." As the Decompartmentalization of WCA 3 progresses, careful and consistent consultation with the Tribe should take place to ensure that the cultural meeting places of the Miccosukee people and Tribal camps are not adversely affected.	The CEPP will build upon DECOMP project components and will examine an array of management measures for decompartmentalization of WCA-3A.
M-TRIBE-15	**Analyze Expanding the Capacity of S-333:** All water that the Park desires for rehydration of Northeast Shark River Slough cannot flow through WCA-3B without causing significant irreversible destruction. As much water as is naturally	The Corps supports reconnecting WCA-3B as a functioning component of the Everglades ecosystem. Opportunities for increased conveyance into WCA-3B and NESRS will be explored under CEPP.

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	possible should be funneled through WCA-3B, and, if more is available to satisfy the desires of the Park, than it should be provided via S-333, at least until the CERP eastern rehydration projects are completed. In order to provide this additional water, the capacity of S-333 should be increased. It is only prudent to finally increase the size of S-333 in order to ensure the Park can receive higher volumes of water at a faster rate that it claims it needs.	
M-TRIBE-16	**8.5 Square Mile Area [SMA] Must Be Protected:** The Corps must ensure the people of the 8.5 SMA are afforded the protection they are authorized, and must not let another 8.5 SMA debate paralyze the restoration process and stop the CEPP from being implemented.	The Corps concurs with this statement. Flood mitigation will be provided to the 8.5 SMA in accordance with the 2000 MWD 8.5 SMA Record-of-Decision (ROD).
M-TRIBE-17	**CEPP Transitional Plan is Essential:** There remain several components of both the MWD and C-111 projects that must be formulated, designed and constructed. These components will not all be completed at the same time; it will take years for all to be completed. Similarly, the components of the different projects that will constitute the CEPP to deliver what the Corps refer to as "incremental" restoration will also come on line at different times. Thus, the **CEPP should contain a transitional plan that implements beneficial operational changes once each new component of the Pre-CERP and CERP projects is completed.**	Once the TSP is selected, the PDT will develop an implementation plan. The implementation plan for the CEPP TSP will recognize that time will be required to receive funds and complete construction of CEPP features. The implementation plan will consider whether certain features could be "partially operated" to achieve benefits while the remaining CEPP features are still under construction.
M-TRIBE-18	**No Operation of the S-356 Pump Station:** The Miccosukee Tribe will not support the operation of the S-356 pump station as a component of CEPP. There are three primary reasons: 1) water quality issues exist which have not been adequately addressed…2) the net result of the use of S-356 is pumping water in a circle…and 3) most important to the Tribe, the pumping into the L-29 Canal from S-356 reduces the flow through S-333 into the L-29, and, thus results in higher water in WCA-3A and	The S-356 pump station is an authorized and constructed feature of the MWD project, designed to mitigate for the additional seepage from ENP/WCA-3B caused by implementation of MWD. S-356 provides a means of controlling additional inflows to L-31 borrow canal caused by the increased seepage into the canal resulting from MWD implementation.

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	Tribal land. This latter consequence of S-356 utilization results in adverse impacts to Tribal lands in WCA-3A and the endangered snail kite and its critical habitat. **The S-356 pump station has no redeeming value at this point, and probably never will, and it certainly should be eliminated from consideration in the formulation of CEPP.**	The CEPP will also focus on additional management measures to control seepage within the project area.
M-TRIBE-19	**Address Seepage Control As A Critical Requirement:** Seepage out of Northeast Shark River Slough in ENP remains a huge impediment to restoration. Simply and directly stated, the restoration of ENP and the entire Everglades cannot be achieved until the seepage between S-335 and G-211 is adequately managed. **CEPP must recognize this debilitating seepage limitation and be formulated to appropriately account for it.**	Seepage management is a primary CEPP focus.
M-TRIBE-21	**1-Mile Eastern Bridge Should Be Plugged:** …given the facts that additional flows into Northeast Shark River Slough are severely limited by seepage into the L-31 Canal, and that the 1-Mile Eastern Bridge that is now being constructed will concentrate current and additional flows on the eastern side of the Park, it is clear that the bridge should not be utilized until the seepage challenge is met. **The opening under the ridge should either 1) remain blocked by leaving the existing Tamiami Trail in place, or 2) be blocked by fill, sheet pile, or some other technique, until the seepage challenge is appropriately met, thus forcing more of the flow to the west in Shark River Slough where seepage is much less of an issue.**	The Corps concurs that seepage management concerns will need to be further evaluated and addressed as necessary prior to raising the L-29 operational limit to 8.5 feet NGVD following completion of the Tamiami Trail modifications. The S-356 pump station is an authorized and constructed feature of the MWD project, designed to mitigate for the additional seepage from ENP/WCA-3B caused by implementation of MWD. S-356 provides a means of controlling additional inflows to L-31 borrow canal caused by the increased seepage into the canal resulting from MWD implementation.
M-TRIBE-22	**Reduce/Eliminate the "Big Red Arrow":** The "Big Red Arrow", i.e. the arrow depicted on water budget schematics depicting the huge amounts of water forced south out of the L-31N Canal into the area of Homestead and vicinity since the enlargement of the L-31N in the early 1980s, must be reduced to the maximum extent practicable. If not, beyond the level	The Corps concurs that CEPP has the potential to exacerbate the inter-basin transfer of water from the ENP NESRS basin to both the adjacent Miami-Dade area and the C-111 basin, consistent with insights from prior CSOP stakeholder input and CSOP alternative evaluations. As part of the Corps plan formulation and NEPA assessment

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	of protection authorized by Congress, and clearly CEPP has the potential to exacerbate this already bad situation, the people of south Miami-Dade will continue to be flooded. Therefore, CEPP should have as a primary goal the elimination of the "Big Red Arrow".	process, system-wide benefits and impacts of each alternative will be analyzed and compared in order to select a recommended plan. In order to respond to these known issues, the CEPP development will include evaluation of IOP/ERTP Column 2 operations (regulatory transfer from WCA-3A to C-111 detention areas) and Lower East Coast canal stages, NESRS inflow constraints, S-356 and other seepage management operations, G-211 flood control operations, 8.5 SMA flood mitigation operations, and C-111 detention area operations.
M-TRIBE-23	**Maintain the G-3273 Trigger Gage:** Uncontrolled, high volumes of seepage into the L-31N Canal can cause and has exacerbated flooding in the built portion of Miami-Dade County, which includes Miccosukee property. Seepage also causes the "Big Red Arrow", which specifically leads to increased flooding in southern Miami-Dade. Historically, this seepage has been somewhat managed by discontinuing the controllable inflow of water into Northeast Shark River Slough when the G-3273 gauge rises 6.8 feet NVGD [National Geodetic Vertical Datum]. **Until seepage, and, thus, unacceptable flooding, are adequately addressed, there is little reason to believe that G-3273 trigger well is not going to remain a critical part of the water management system under CEPP.**	As part of the CEPP plan formulation process, seepage management measures and operations will be considered in order to meet the project objectives. It is the intent that once seepage issues are addressed that constraints such as the G-3273 trigger stage can be reduced and/or eliminated in order to allow increased flows to NESRS via S-333 and from WCA-3B via the S-355s. Under a separate effort, the Corps plans to move forward with a field test for relaxation of the G-3273 restraint, with a goal of increasing and/or removing the G-3273 stage constraint to increase water deliveries from WCA-3A to ENP through Northeast Shark River Slough (NESRS) for the benefit of natural resources.
M-TRIBE-24	**<u>Clear Downstream of the Culverts to Increase Flows:</u>** …new and independent scientific/engineering findings [Dr. David A. Chin, PE, January 2010] provide great hope for major, quick improvements in the condition of the Everglades at a very reasonable cost. Dr. Chin's work convinced the Superintendent of ENP to conduct an actual Pilot Swale Project to evaluate Dr. Chin's findings in the field; although this pilot project was supposed to be implemented by October of 2010, it	The Corps concurs with the importance of increased flow through existing culverts as practicable as well as other measures to increase the flow out of WCA-3A.

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	appears that the work has been delayed. **Given that the evidence and possibilities are so compelling, and the deteriorating state of the Everglades so dire, the Corps should move forward with full scale swale projects immediately, and analyze the increased flow capabilities of swales as a component of the CEPP EIS.**	
M-TRIBE-25	**Clear Downstream of the S-12s & Implement Other Measures Needed to Increase Flows:** As outlined within the USACE EN-W Position Statement on WCA-3A Regulation Schedule Modifications, 9 September 2010 and within the March 4, 2011 [Everglades Restoration Transition Plan] ERTP Draft [Environmental Impact Statement] EIS, Corps reiterated the importance of clearing the downstream blockages of the S-12 structures, as well as other measures to increase the flow out of WCA-3A. **Additional measures that need to be addressed in the CEPP EIS include: 1) clearing downstream of the S-12 structures, 2) removing as much as possible of Old Tamiami Trail, and 3) further degrading the L-28 levee. These and other measures that might help need to be planned and analyses in the CEPP EIS and implemented at the soonest.**	The Corps concurs with the importance of increased flow through existing culverts as practicable as well as other measures to increase the flow out of WCA-3A.
M-TRIBE-26	**Impact on Endangered Species Must be Assessed-Multi-Species Approach Is Essential: The ERTP model for multi-species management must be a guiding principle of CEPP.**	Concur; the Corps strongly endorses implementation of a multi-species approach to restoration and water management operations.
M-TRIBE-27	**Restoration West of Shark River Slough Must Begin:** The [U.S. Fish and Wildlife Service] FWS has officially decided, and a Federal Judge upheld the FWS decision, that at some point this area will be restored and be wetter. The Tribe, for the sake of its land and culture in particular, and Everglades restoration in general, implores the Corps to begin the of western Shark River Slough via both the COP and CEPP.	The Corps acknowledges the work of Bernhardt and Willard (2006) concluding that the western marl prairie was wetter and historically; in addition, the Corps also acknowledges that modeling has shown that this area will be wetter with CERP implementation; however, the Corps has limited flexibility in removing the S-12A and S-12B gate closures due to the status of the endangered Cape Sable seaside sparrow (CSSS) and its protection under the Endangered Species Act (ESA). This same

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		issue was brought before the 2007 Avian Ecology Workshop when it was suggested that CSSS emergency management measures cease and regulatory releases be allowed through the S-12 structures during the CSSS nesting season. This panel concluded: "Given the extensive previous work on the water level requirements of the sparrow, the panel concludes that without mitigation this action in isolation is likely to result in extirpation of subpopulation A and is unclear as to what extent it will benefit or otherwise impact the other subpopulations or other endangered species. However, because of the interconnected structure of the subpopulations (see below) there may be unintended consequences for the other subpopulations. Ultimately, if any action is expected to have a negative overall effect on the sparrow, its justification as a conservation measure would require a clear demonstration that there would be positive effects on other elements of the Everglades ecosystem." (Sustainable Ecosystems Institute, 2007)
M-TRIBE-28	**Decisive Action Required:** The Colonel must make a final decision for COP based on the best information available in spite of the misguided demands that some may have. No more "kicking the can down the road." Another dead end excursion is not an option for the dying Everglades. Bold, decisive action that results in actual restoration is essential for success.	The Corps intends to make a decision once the hydrological and ecological analyses have been completed and the NEPA document has been coordinated with the public.
STATE		
FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES (FDACS)		
FDACS-1	First, the process for developing the CEPP must clearly recognize the interim status of the current Lake Okeechobee Regulation Schedule; it would be inappropriate to assume that LORS08 [2008 Lake	The future without project condition includes the assumption that the Herbert Hoover Dike (HHD) rehabilitation would be complete. However, the Dam Safety Modification

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	Okeechobee Regulation Schedule] schedule for either the With- or Without-Project scenarios. Planned repairs to the Herbert Hoover Dike should increase storage in the Lake, and the planning process should consider the availability of that additional storage in its analysis of project alternatives. Any additional demands on the Lake must be carefully evaluated in light of existing demands of both water users and the environment, as well as future demands from other CERP components (e.g., the C-43 Reservoir) that rely upon Lake water.	Report is not scheduled for completion until 2015. As such, the analyses of the reduction in risk to be achieved by the rehabilitation have not been assessed. It is recognized that the LORS is an interim schedule and that it is anticipated that the Lake Okeechobee regulation schedule will be re-evaluated once rehabilitation has achieved a sufficient level of risk reduction. Any details regarding modifications to the Lake Okeechobee regulation schedule in the future are currently unknown. In the absence of having a revised schedule to include in the future without project condition, the LORS 08 schedule will be used. The CEPP study will not be the mechanism for changing LORS. Any change in the schedule will be the subject of a separate NEPA process at a later date. Evaluations of alternative plans for CEPP will consider use of the flexibility within LORS to support achievement of benefits and minimization of undesirable impacts.
FDACS-2	Second, the planning process must realistically deal with water quality considerations. The Comprehensive Everglades Restoration Plan (CERP) is built upon assumptions regarding water quality that we cannot continue to accept because water quality constraints can prevent the movement of additional water through the central part of the system. The in-lake phosphorus concentration for Lake Okeechobee is one such constraint, even if one assumes that the total maximum daily load (TMDL) for phosphorus will be met in the foreseeable future. Issues related to the Stormwater Treatment Areas (STAs) must also be addressed. Without resolving the legal and technical uncertainties characterizing the STAs as currently operated, it is hard to envision how additional water made available by the CEPP can be moved southward.	Adequate treatment facilities necessary to achieve the 10 ppb long-term geometric mean for new water delivered to the natural system will be considered in the planning and formulation of CEPP alternatives. The condition of the water in the lake as it exists today will be identified and adequate treatment facilities will be included in alternative plans based upon the current quality of lake water.

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FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP)		
FDEP-1	The Department [FDEP] believes that addressing water quality is one of the most critical components of this planning effort. The State of Florida is committed to addressing water quality with regard to the existing flows to the Everglades Protection Area consistent with the requirements of the state's phosphorus criterion. The Department requests that the Corps include, as part of the future without-project condition, the assumption that existing volumes of water will be treated to meet the objectives of the phosphorus criterion prior to discharge to the Everglades Protection Area.	The Corps concurs with these statements.
FDEP-2	With regards to this particular item [Risk Register], the Department recommends that the Corps maintain and provide a list of identified risks to the commenting agencies for their use in early issue resolution.	The risk register is a tool being used in the Pilot Planning Program as a means to identify, discuss and document issues early in the process. A risk register was developed by the study team to identify significant risks attributed to the shortened study period and to project success.
FDEP-3	… the Department requests that the Corps use the existing quality of water flowing from Lake Okeechobee, and the delta between existing flows and future with project flows, through the central flow path as a basis for planning additional treatment, storage or other features identified as part of the expedited planning process. As with the treatment of existing flows, the Corps should assume that any new water flowing to the Everglades Protection Area will be required to be treated to levels consistent with the phosphorus criterion.	The Corps concurs with these statements.
FDEP-4	The Department suggests that the Corps work closely with the local sponsor to establish expectations regarding cost sharing on all new components, or modifications to existing components, that ultimately result from the expedited planning process. In particular, cost sharing expectations for water quality projects	New water is potentially available to be used for CERP purposes. The CEPP planning process will determine what water is available and what should be used for CERP purposes. Cost sharing recommendations will be in accordance with applicable law and policy.

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	need to be identified and resolved early on in the planning process.	
FDEP-5	The Department requests that the Corps focus its planning efforts for storage and treatment projects on lands already owned by the District.	The alternatives analyses will follow NEPA requirements. Through the planning process, the Corps will draw conclusions with regard to the use of lands already acquired for restoration purposes. The Corps understands that the state supports efforts sited on available lands and that the state considers those to be preferable for economic and other reasons.
FDEP-6	The Department suggests that an evaluation of the implementation schedule for second generation CERP projects that may influence the CEPP should be carefully considered as part of the expedited planning process.	The Corps concurs with this statement and these second generation CERP components will be considered in CEPP planning process as part of the implementation plan.
FDEP-7	Any future with-project condition scenario that includes features originally identified under the MWD project should be identified as being the sole responsibility of the federal government, with the exception of cost-share commitments made between the SFWMD and the Corps for operations.	For planning purposes, the MWD project will be assumed to be complete based upon those features already completed and those features currently under construction. This planning assumption is predicated upon the Corps, in consultation with DOI, first making a determination that the expected benefits for the MWD project have been achieved.
SOUTH FLORIDA WATER MANAGEMENT DISTRICT (SFWMD)		
SFWMD-1	**Water Quality Requirements, Assumptions and Cost-Share:** *Future Without Project Condition – Existing Water Flows to the Everglades Protection Area:* For the purposes of the Central Everglades Planning Project, the District can only support the Corps' assuming for the "Future Without Project Condition" that the District will treat current annual flows of approximately 850,000 acre-feet of water to a flow-weighted mean for total phosphorus of 13 parts per billion (ppb). All facilities needed to treat existing inflows, as proposed by the State of Florida in response to the U.S. Environmental Protection Agency's Amended	Existing sources and quantities of water to the natural system will be identified. All water (existing and new water) directed to the natural system will meet applicable water quality standards (i.e. 10 ppb long-term geometric mean).

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	Determination, would be non-federally funded.	
SFWMD-2	**Water Quality Requirements, Assumptions and Cost-Share:** *Future With Project Condition – New Water Flows Identified by the Central Everglades Planning Project to the Everglades Protection Area:* As part of its assumptions for the Central Everglades Planning Project, the Corps should use the existing quality of water flowing from Lake Okeechobee through the central flow path as a basis for planning additional treatment facilities. Consistent with the treatment of existing flows, the Corps should also assume that new water flowing to the Everglades Protection Area will be treated to 13 ppb total phosphorus.	Existing sources and quantities of water to the natural system will be identified. All water (existing and new water) directed to the natural system will meet applicable water quality standards (i.e. 10 ppb long-term geometric mean). New water is potentially available to be used for CERP purposes. The CEPP planning process will determine what water is available and what should be used for CERP purposes. The condition of the water in Lake Okeechobee will be considered and adequate treatment facilities will be included in alternative plans based upon the quality of lake water as it exists today. Cost sharing will be in accordance with applicable law and policy.
SFWMD-3	**Use of Existing District-Owned Lands:** To implement the initial increment of restoration for the central Everglades in an expeditious, cost-effective and commonsense manner, formulation of Central Everglades Planning Project features should be undertaken utilizing the lands already acquired by the District	Please refer to FDEP-5 response.
SFWMD-4	**Inclusion of Specific Modified Water Deliveries to Everglades National Park Project** **Features:** The District can support inclusion of these features in the "Future With Project Condition" only if the Corps identifies in the Central Everglades Project Implementation Report and Environmental Impact Statement that construction and operation of these features will be cost-shared in accordance with the terms and conditions of the Project Cooperation Agreement between the District and the Department of the Army to Improve Water Deliveries to Everglades National Park dated September 24, 1994 and its subsequent amendments.	For planning purposes, the MWD project will be assumed to be complete based upon those features already completed and those features currently under construction. This planning assumption is predicated upon the Corps, in consultation with DOI, first making a determination that the expected benefits for the MWD project have been achieved.

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	The District cannot agree to cost-share construction and operation of these features under the CERP authority, Section 601(e) of the Water Resources Development Act of 2000.	
LOCAL		
LEE COUNTY (LC)		
LC-1	Central to a healthy ecosystem in Lee County is the protection and restoration of the Caloosahatchee River and Estuary, and the beneficial management of Lake Okeechobee. Specifically, the reduction of high volume discharges from Lake Okeechobee to improve water quality of oyster and submerged aquatic vegetation in the Caloosahatchee River and Estuary is an objective long sought by Lee County.	Concur; the Corps has included the following objective into CEPP: "Reduce high volume discharges from Lake Okeechobee to improve the quality of oyster and SAV habitat in the northern estuaries."
MIAMI-DADE COUNTY (MDC)		
MDC-1	The "fast-tracked" CEPP represents an opportunity to link together water quality, storage, conveyance and seepage management components, to more holistically reverse ongoing decline in the Everglades system and demonstrate benefits, as compared to the standard compartmentalized and cumbersome planning process.	Concur, the Jacksonville District is excited that CEPP has been selected as a pilot project for the Corps expedited Planning Process Pilot Program. The pilot program focuses the detail on the key drivers of the decisions that are to be made and reduces unnecessary detail that results in a longer process and one that may not deliver a better solution.
MDC-2	…it is important that the scope of plan formulation in CEPP be comprehensive, both in geographic scale and in addressing the three principal interests of Miami-Dade County in an integrated fashion: local and system wide ecological benefits, water supply, and seepage management.	Prior planning efforts and the development of scientific goals and targets for CERP have led to a determination that some components are in fact interdependent features that necessitate formulation from a systems approach. Recently authorized CERP projects are "perimeter" projects that generally do not greatly depend upon or influence other CERP projects. However, the components in the Central Everglades are hydraulically connected from Lake Okeechobee to Florida Bay, and are reliant on one another for both inflows and outflows. These interdependencies require system plan formulation and analysis in order to

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		optimize structural and operational components, rather than formulating separable components that may not be compatible when looking at the cumulative impacts.
MDC-3	… the scope of CEPP formulation should address: Water quality, ecological and hydrological benefits, including effects on plant community, habitat structure, and listed species and other wildlife in Florida and Biscayne Bays, as well as within WCA3a and b, and ENP.	The Corps concurs with this statement. As part of the NEPA analysis, a full assessment of potential effects on water quality, listed species and other wildlife and their habitat within CEPP project area will be conducted. Impacts in one area may be offset by habitat improvements in other areas of the system. Modeling and ecological planning tools will be utilized to perform these assessments.
MDC-4	… the scope of CEPP formulation should address: Water quality and quantity with respect to Miami-Dade public wellfields, including surface groundwater interactions and saltwater intrusion, particularly during dry season or in prolonged drought, and in view of sea level rise projections.	In accordance with Section 601(h)(5) of the Water Resources Development Act (WRDA) 2000, CEPP will avoid any elimination or transfer of any existing legal sources of water beyond those existing in December 2000. Similar to previous CERP projects, a sea level rise evaluation will be conducted on the tentatively selected plan using a static scenario based GIS sea level rise mapping effort.
MDC-5	… the scope of CEPP formulation should address: Flood protection under various canal stages and high water conditions, including operational criteria and modeling of distribution of peak stages and flows at critical gauges (such as S-357, S-338, S-196, S-194, S-380, C6-Palm, S-26 and T5) and at reference residential and agriculture lands.	In accordance with Section 601(h)(5) of the WRDA 2000, CEPP will avoid any impact to levels of service for flood protection beyond that existing in December 2000.
MDC-6	Early public presentations about CEPP by USACE and SFWMD staff suggest that modeling tools for plan formulation will not address flood protection, water quality, wellfields, or Florida Bay and Biscayne Bay in detail or with defined "performance measures". This approach represents a serious concern to Miami-Dade. However, we believe that unnecessary delays and costs, caused by repeated modeling efforts,	The majority of the CEPP identified RECOVER approved PMs will be utilized with RSM output including performance measures for Florida Bay, Biscayne Bay and water supply for other water related needs. While the RSM is a regional scale model and results should be interpreted as such, the model does generate information for gauge locations and canals and this

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	revisions of alternatives, or challenges can be avoided by including all of the above issues from the outset in developing and evaluating a suite of restoration alternatives. This can be addressed in part through appropriate inclusion of sub-regional or local hydrologic dynamic models, particularly in areas where seepage management features are contemplated, and through extension of evaluation transects or targets to coastal transition zones and lands to the east of the L-30/31 boundary.	information will be used in CEPP. Through review of RSM calibration results, it is possible to identify differences in the modeled representation of gauges and canals of interest and the observed field responses. This will be helpful when evaluating changes in flood protection.
MDC-7	…evaluation models should also be capable of addressing consensus sea level rise projections.	Similar to previous CERP projects, a sea level rise evaluation will be conducted on the tentatively selected plan using a static scenario based GIS sea level rise mapping effort.
MDC-8	It is also strongly recommended that CEPP build upon modeling tools, as wells as evaluation factors, including surrogates for water quality and hydrologic targets for tree islands and protected species, that have been developed or extensively reviewed by earlier Project Development Teams working on DECOMP [Decompartmentilization and Sheet Flow Enhancement], ERTP [Everglades Restoration Transition Plan], C-111 [Canal 111 Spreader Canal], and BBCW [Biscayne Bay Coastal Wetlands]..	The CEPP will incorporate and build upon lessons learned for these previous projects.
MDC-9	Miami-Dade County also recommends that the scope of benefits and cost analyses in CEPP include non-traditional approaches, such as valuation of ecosystem "services" that may derive from restoration, such as savings on costs of flood protection or drinking water treatment, and economic benefits of recreational or aesthetic values of natural habitats, fish and wildlife.	CEPP will develop a methodology to capture the existing and future without project condition ecosystem services values for potentially impacted ecosystem service sectors in WCA-3A, WCA-3B and ENP. The marginal change in ecosystem services will then be evaluated for the recommended plan. The Ecosystem Services report will be provided separate from the Draft PIR/EIS after it has been through a review process.
MDC-10	…we request that one or more CEPP public meetings or workshops directed at local stakeholders and their concerns be held in Miami-Dade and recommend that similar	The Corps will hold future public NEPA meetings throughout the study area to gather stakeholder input.

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	regional meetings be held in other local jurisdictions south of Lake Okeechobee.	
PRIVATE		
ARTHUR R. MARSHALL FOUNDATION & FLORIDA ENVIRONMNETAL INSTITUTE (MARSHALL)		
MARSHALL-1	Scoping should include more focus on CERP Table 5-1 Goals & Objections (pointing out what was now on the Conference Room Table). It seems like such focus would go a long way in meeting Susan Markley's concerns, also Laura Brant's concern about ecological considerations. Table 5-1 is still not in any of the written material / presentations other than what has been put on the conference table.	Table 5-1 of the Central and Southern Florida Project (C&SF) Restudy, lists two general goals for the south Florida ecosystem: enhance ecologic values, and enhance economic values and social well being. The goal of the CEPP is to improve the quantity, quality, timing and distribution of water in the Northern Estuaries, Water Conservation Area 3, and Everglades National Park in order to restore the hydrology, habitat and functions of the natural system. The CEPP team finds the project level goals and objectives to be consistent with the goals and objectives presented in Table 5-1 of the C&SF Restudy. The Corps will provide the PDT the crosswalk between CERP Goals and Objectives and the CEPP project objectives to provide additional clarity and include this information in the PIR.
MARSHALL-2	The top level performance measure being considered by the CEPP scoping process per Table 5-1 objective 1 ought to be total increase in acres, of increase in total spatial extent of natural area. This would allow engagement of the Costanza Synthesis.	A methodology will be developed to quantify the acreage of ecosystem benefits produced as a result of implementation of the tentatively selected plan. This methodology will utilize habitat unit (HU) scores produced from Habitat Suitability Indices (HIS) corresponding to each project performance measure. The project team is not planning on formulating to maximize ecosystem services, but is planning on putting together a work plan to capture resulting ecosystem service lift from TSP. The Ecosystem Services report will be provided separate from the Draft PIR/EIS after it has been through the review process.
MARSHALL-3	Before the presentations, I was going to ask	As the planning effort for the CEPP

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	how or what habitat units are assigned to various biomes [Stormwater Treatment areas; Ridge & Slough landscapes, flow-way for sheetflow; forested wetlands; reservoirs, etc.]. After the HU presentation, I think I am starting to get it. [More on this in next comments below].	continues, a methodology will be developed to calculate HU values for the study area. The HU are used as the basis to compare alternatives and identify a selected plan for ecosystem restoration projects. Typically, PM scores are aggregated and average to produce a habitat quality index. The PM scores are obtained from a hydrologic model and are indicators of conditions in the natural system that have been determined to be characteristic of a healthy restored ecosystem. The PMs scores cover all regions of the study area. The HIS is then multiplied by acreage to generate a HU for each alternative. Where necessary, additional tools or metrics may be utilized to supplement HU scores and assist in plan comparison.
MARSHALL-4	There is a lot of fuzziness about the CEPP boundaries (physical and fiscal). A regional CEM might sort out some of the fuzziness by establishing CEPP geographic boundary limits [consistent where CEPP construction costs will be incurred], while considering cause-effect upstream/down stream relationships [i.e., considering connectivity where all things are connected].	The study area for the CEPP encompasses the Northern Estuaries (St. Lucie River and Indian River Lagoon and the Caloosahatchee River and Estuary), Lake Okeechobee, a portion of EAA, the Water Conservation Areas, ENP, the Southern Estuaries (Florida Bay and Biscayne Bay), and LEC. Both structural and non-structural features or activities that address one or more planning objectives will be formulated for the study area. The PDT will utilize PMs to evaluate alternative plans. These PMs were developed from the Lake Okeechobee, Northern Estuaries and Greater Everglades Ridge and Slough Conceptual Ecological Models (CEM) which identify the major anthropogenic drivers and stressors on natural systems, the ecological effects of these stressors, and the best biological attributes or indicators of these ecological responses.
MARSHALL-5	Weighting methods are most times argumentative. The HU weighting scheme may prove difficult to explain to the public [and decision makers]. While the HU	The methodology recently developed for DECOMP PIR 1 to quantify ecosystem benefits weighted project performance measures relative to their

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	approach may justify alternative selection [as stated earlier], it does not monetize the ecological benefits such that the benefits can be compared to costs [as the means to get to return on investment] for decision makers. On Fred Sklar's comment: That the Everglades is more complex, is an indication that a better approach to Synthesis is needed, understandable by OMB, Congress, and the public, and especially the National Research Council CERP Peer Review Panel.	importance in achieving the project objectives. This methodology may be used and/or adapted for the CEPP, however it is not anticipated that the same approach to weighting project performance measures will be used. Cost Effectiveness and Incremental Cost Analyses (CEICA) will be used to determine the most cost effective plan.
AUDUBON OF FLORIDA/AUDUBON SOCIETY OF THE EVERGLADES/CLEAN WATER ACTION/DING DARLING WILDLIFE SOCIETY/EVERGLADES FOUNDATION/FLORIDA WILDIFE FEDERATION/FLORIDA OCEANOGRAPHIC SOCIETY/LEAGUE OF WOMEN VOTERS OF FLORIDA/NATIONAL PARKS CONSERVATION ASSOCIATION/NATURAL RESOURCES DEFENSE COUNCIL/SIERRA CLUB/SOUTH FLORIDA AUDUBON SOCIETY/TROPICAL AUDUBON SOCIETY (NGOs)		
NGOs-1	First, the CEPP must decompartmentalize a significant majority of Water Conservation Area (WCA) 3, improve the quality of water headed south, and help resolve seepage management issues to the east.	The goal of the CEPP is to improve the quantity, quality, timing and distribution of water in the Northern Estuaries, WCA-3, and ENP in order to restore the hydrology, habitat and functions of the natural system. In order to accomplish this goal, CEPP will examine potential components within the EAA, WCA-3 and ENP. The formulation of CEPP components will incorporate a "systems thinking approach" to ensure compatibility with CERP and any potential future updates to restoration goals and targets. Prior planning efforts and the development of scientific goals and targets for CERP have led to a determination that some components are in fact interdependent features that necessitate formulation from a systems approach. These interdependencies require system plan formulation and analysis in order to optimize structural and operational components, rather than formulating separable components that may not be compatible when looking at the cumulative impacts.
NGOs-2	… to help expedite current planning efforts, the CEPP should build on data and tools developed in previous Decomp Project De-	The CEPP will build upon modeling and ecological evaluation tools utilized in previous CERP projects, including

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	livery Team (PDT) efforts. Incorporating previous planning efforts will allow CEPP to move forward at a speed needed to provide a PIR by 2013. In particular, the CEPP should: ▪ Incorporate the findings of the Decomp Physical Model as they become available in the next 18 months. ▪ Explore including the Decomp hydropattern restoration feature (i.e. spreader canals) along the northern border of WCA 3A. ▪ Consider innovative partial backfill and plugging opportunities of the L-67A and L-67C canals that could provide increased access and continued fishing opportunities, while at the same time ensuring the canals do not interfere with sheetflow in ways that have adverse ecological consequences, or result in adverse water quality impacts. ▪ Assess options to degrade, including by partially backfilling or plugging, the Miami Canal in order to allow water into WCA 3B. ▪ Analyze options to degrade the L-29 levee, including by way of new outlets and culverts. ▪ Explore phasing alternatives for planned additional elevation and bridging of Tamiami Trail, using information from the Department of Interior's November 2010 Tamiami Trail Modifications: Next Steps Final Environmental Impact Statement. ▪ Evaluate the use of available levee material to recreate tree islands.	DECOMP PIR 1 in order to examine an array of management measures for decompartmentalization of WCA-3A and to meet other CEPP objectives.
NGOs-3	CEPP must evaluate implementing increased storage, treatment and conveyance in the Everglades Agricultural Area (EAA). Specifically, we urge Corps to include the following in its CEPP scoping: ▪ An evaluation of (1) the use of the	The Corps concurs with this statement and is currently developing management measures and screening criteria to determine the size and type of storage and treatment features within the EAA.

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	lands known as the A1 and A2 parcels, which were purchased by the federal government pursuant to the Talisman Land Acquisitions Grant Agreement, as storm water treatment areas (STAs) and (2) the potential replacement acreage of any acres used for STAs with lands or other options (as required under the grant agreement) that would enable increased water flows to the central Everglades and ENP including Florida Bay. ▪ An estimation of storage needed to enable increased water flows to the central Everglades and ENP including Florida Bay and a discussion of options to provide needed additional storage.	
NGOs-4	In order to manage increased flows, it will be necessary to include improved seepage management. Specifically, we urge the Corps to: ▪ Evaluate the miners' proposed L-31N seepage pilot project, designed to resolve significant seepage out of ENP. ▪ Evaluate whether additional seepage components are needed to resolve seepage out of the central Everglades and ENP.	The Corps concurs with this statement and is currently developing management measures and screening criteria to address seepage management concerns.
NGOs-5	… we recommend that the CEPP assess the operational changes occurring or being considered as part of the Everglades Restoration Transition Plan and the Combined Operations Plan. In particular, the CEPP should: ▪ Consider opening the S-151 structure to allow additional flow into WCA 3B. ▪ Consider raising L-29 levels during short-term high-water emergencies. ▪ Evaluate the need for more appro-	Please refer to FWS-1 response.

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	priate water levels in WCA 3A, 3B, and ENP, as opposed to stair-step levels now often found moving among the areas and damaging the ecosystem.	
NGOs-6	While the CEPP cannot take on the challenges posed by the many related projects that are in operation or in planning stages, it should review the status and operations of projects such as the 8.5 Square Mile Area and C-111 Western and South Dade projects and highlight needed adjustments to ensure that they meet their stated goals and achieve ecological objectives.	The Corps concurs with this statement and will review as appropriate the status and operations of previous CERP and non-CERP projects.
DADE COUNTY FULLTRACK CONSERVATION CLUB (DCFCC)		
DCFCC-1	We want to make sure that the recreational aspect of the area remains and that recreational opportunities are not lost as a result of the project, particularly within northern WCA-3A.	Recreation will be considered as part of CEPP. A recreational sub-team has been formed to explore potential impacts on recreational opportunities as well as the potential for new recreational access. The CEPP will also continue to be discussed at future Water Resources Advisory Commission Recreation meetings to engage stakeholders.
EVERGLADES COALITION (EVCO)		
EVCO-1	Resolution Supporting Central Everglades Planning Project	The Corps appreciates the Everglades Coalition's endorsement of this project.
SUGAR CANE GROWERS COOPERATIVE OF FLORIDA (SUGAR)		
SUGAR-1	While we support your efforts to streamline the process to produce a Project Implementation Report (PIR), the desire for expeditious completion of a PIR must not outweigh the necessity for careful, comprehensive evaluation of alternatives, uninhibited by arbitrary or unrealistic constraints and assumptions.	A comprehensive evaluation of alternatives will be conducted for the CEPP; the Jacksonville District is excited that CEPP has been selected as a pilot project for the Corps expedited Planning Process Pilot Program. The pilot program focuses the detail on the key drivers of the decisions that are to be made and reduces unnecessary detail that results in a longer process and one that may not deliver a better solution.
SUGAR-2	The planning scope must recognize that the present Lake Okeechobee Regulation Schedule is an interim one necessitated by concerns with levee integrity. Additional water storage in the Lake should therefore	Raising water levels within Lake Okeechobee would require substantial modifications to HHD. The Corps is currently conducting a project to strengthen and secure the existing

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	be evaluated as part of the project's alternatives analyses.	dike, and any increase in water levels would require a commensurate increase in the dike dimensions for human health and safety concerns. As stated in the 2008 LORS EIS, the Lake Okeechobee Regulation Schedule is interim and LORS will be revisited upon completion of HHD modifications. Higher water levels within Lake Okeechobee would also cause significant impacts to the littoral zone. The lake's natural resources are dependent on the littoral zone since it provides nursery areas, spawning areas, foraging areas, and roosting areas required for the completion of life cycles. The frequency and duration of inundation of the lake littoral zone would increase with higher lake levels under a revised regulation schedule. High lake stages result in loss of beneficial littoral zone plant communities in favor of introduced exotics (e.g., torpedo grass) as well as impacts to wading birds and other water-dependent wildlife.
SUGAR-3	While CERP used the Run 25 Lake Schedule, the WSE [Water Supply and Environment] Schedule was approved concurrent with CERP and should be used as the with-out project condition for the CEPP.	The Corps respectfully disagrees with the statement and intends to utilize LORS2008 as the existing and FWO condition. The Corps may undertake sensitivity analyses of the TSP in comparison to WSE to ascertain potential improvements to the plan under a revised Lake Schedule scenario. However, any analyses conducted during the study will not predetermine a change to the lake schedule that will be undertaken as a result of completion of necessary HHD rehab efforts or updates to System Operations Manual as a result of additional CERP project implementation.
SUGAR-4	Assumptions concerning water quality must be based in reality. To assume Lake Okeechobee water meets the TDML [Total	The CEPP planning process will determine what water is available and what should be used for CERP

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	Daily Mean Limit] for the lake, without any project features on the horizon to accomplish that, seems foolhardy. The TMDL is designed to meet a much reduced load target for phosphorus flowing into Lake Okeechobee, not an in-lake concentration.	purposes. The condition of the water in lake as it exists today will be identified and adequate treatment facilities will be included in alternative plans based upon the quality of lake water as it exists today.
SUGAR-5	Assuming that the without-project condition Stormwater Treatment Areas are meeting some un-defined target that's tied up in two federal court cases, and the new water made available by CEPP will meet that same unknown target is inappropriate. The CEPP should integrate water quality and water quantity planning to ensure the most effective use of available land resources and achieve the best balance among the four aspects of water flow essential to restoration-quantity, quality, timing and distribution. In evaluating the cost-effectiveness of various alternatives tradeoffs will be necessary, and the federal agencies must be prepared to make them.	The Corps concurs with the statement that integration of water quality and water quantity is a necessity for CEPP planning, and therefore is currently developing management measures and screening criteria to determine the size and type of storage and treatment features within the EAA.
SUGAR-6	In considering increased storage, the examination of alternatives must be comprehensive. The Aquifer Storage and Recovery Projects (ASR) as envisioned by CERP have a compelling advantage over surface storage in avoiding loss of water due to evapotranspiration as well as having minimal land requirements.	Preliminary results from the ASR Pilot Study that is currently being finalized seem to indicate that ASR may be feasible in regards to possible toxicology issues, groundwater migration, etc. ASR will be evaluated as a management measure for the proposed project and will be considered for incorporation into alternatives during plan formulation.
SUGAR-7	Another alternative for providing increased water storage that must be addressed is increased use of Lake Okeechobee for storage beyond that provided historically.	Please refer to SUGAR-2 response.
SUGAR-8	…it is essential that the scope of the CEPP track very closely with the conceptual plans covered by Congress. With respect to the EAA, the actual footprint of the project in the final CERP document matches well with the land now owned by the District [SFWMD], and limiting the planning scope to that property meets the stated intent for the CEPP. Going beyond that footprint	Please refer to FDEP-5 response.

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	would trigger the need for a CERP Update as specified in the Programmatic Regulations and should not be part of this plan.	
SUGAR-9	…the scale of the Everglades flow values now being discussed in some circles is well beyond anything contemplated in WRDA [Water Resources Development Act] 2000 and would clearly require a formal CERP update. The Central Everglades Plan must stay close to the flow volumes expected with the plan approval in WRDA 2000.	It is highly unlikely that CEPP volumes exceed the flows projected from CERP. It is much more likely that subsequent restoration efforts will be required to achieve the scale of water envisioned in CERP. Each PIR updates CERP.
SUGAR-10	… we remind the Corps that the savings clause imposes a constraint on plans based on conditions prevailing at the time of the enactment of WRDA 2000 and is an accounting calculation separate from the projections based on the present prevailing situation and the future most-likely without project condition.	Correct, the savings clause analysis is performed subsequent to initial plan formulation efforts and TSP selection. Specifically, an analysis of the elimination or transfer existing legal sources and levels of flood protection by TSP is performed before the plan can be recommended.
SUGAR-11	…the CEPP must include options that evaluate returning sheet flow to the Holey Land and Rotenberger proprieties adjacent to WCA-3A. To continue to isolate those areas will require additional engineering features to flow water around, rather than through, those areas, and severely limit the restoration of Everglades sheet flow over a large portion of the historic Everglades.	The Corps will consider information from previous studies undertaken by the SFWMD to consider this option and determine if applicable for inclusion in the CEPP
FLORIDA FARM BUREAU FEDERATION (FFBF)		
FFBF-1	The intended purpose of the Comprehensive Everglades Protection Plan (CERP) within WRDA 2000 is the restoration and protection of the remaining Everglades while continuing to meet the water consumption needs of permitted users. The stated scope of the CEPP is very vague in how the goal will be accomplished. The vagueness along with the expedited CORP [Corps] schedule provides concern that the proper assurances will be in place to minimize impact to landowners in the region south of Lake Okeechobee.	The savings clause analysis is performed subsequent to initial plan formulation efforts and TSP selection. Specifically, an analysis of the elimination or transfer existing legal sources and levels of flood protection by TSP is performed before the plan can be recommended.
FFBF-2	Key to movement of additional water south is additional water storage. Thus far, the CORPS operation of the current Lake	The Corps concurs with this statement and is currently developing management measures and screening

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	Okeechobee Regulation Schedule has not allowed the flexibility to increase water storage for proper timing of additional flows to the south. Without a noted change in operation, the CEPP must denote additional storage to create the proper timing needed to redirect water south.	criteria to determine the size and type of storage and treatment features within the EAA.
FFBF-3	Water quality has been an impediment to moving water into Everglades National Park and the current water conditions in Lake Okeechobee must be considered within the scoping process.	Concur; the CEPP planning process will determine what water is available and what should be used for CERP purposes. The condition of the water in lake as it exists today will be identified and adequate treatment facilities will be included in alternative plans based upon the quality of lake water as it exists today.
FFBF-4	Past single species management of Endangered Species such as the Cape Sable Seaside Sparrow must be addressed within the scoping process of the CEPP. Creating the mechanism to move water south only to have it blocked from entering the Everglades National Park will result in ultimate failure and the potential to flood lands in the EAA.	CEPP will include a multispecies approach to water management.
FLORIDA WILDIFE FEDERATION (FWF)		
FWF-1	As a member of the Everglades Coalition, we embrace the Coalition's recitation of necessary projects and request that special attention be paid to dealing with seepage management issues.	The Corps is currently developing management measures and screening criteria to address seepage management concerns.
FWF-2	In addition, we believe that the COE [Corps] should include in the scope of the CEPP a goal of delivering its recommendations in time to be incorporated into the federal-budget cycle commencing in January 2014.	The CEPP has been selected as a pilot project for the Corps expedited Planning Process Pilot Program. A Chief's Report to be submitted for Congressional authorization is anticipated to be complete by August 2013.
FWF-3	In addition the Federation urges the COE to include in its design studies and make recommendations about maintaining freshwater-fishing habitat in Water Conservation Area 3B, the L-67 canals and L-29 (Tamiami Trail) canal and public access. We ask that this planning include consideration of creating depressions	The Corps supports reconnecting WCA-3B as a functioning component of the Everglades ecosystem. Alternatives to accomplish this will be evaluated within CEPP. As part of the Corps plan formulation and NEPA assessment process, system-

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	similar to alligator holes, slopes to establish "littoral zones" around borrow pits/canals, and the use of fill to stabilize, re-generate or create tree islands mimicking the Everglades' natural ridge and slough landscape. As the COE is aware, over the years water has tended "to pond" in WCA 3B. This has resulted in establishing a thriving bass fishery that South Florida sportsmen have come to prize. The proximity to urban South Florida, which otherwise offers limited freshwater recreational fishing opportunities, enhances its recreational value. At this point we believe that fishery enhances the area for wading birds and wildlife and can be incorporated into proposed projects without harm to restoration goals.	wide benefits and impacts (including impacts to recreation and wildlife) of each alternative will be analyzed and compared in order to select a recommended plan.
THE INSTITUTE FOR ENVIRONMENTAL MONITORING (IEM)		
IEM-1	The federal register notice and online Central Everglades Planning Project (CEPP) documents do not provide specific information about how best available science will be incorporated into decision making or into the hydrologic scenario generation/evaluation process.	There are several ways that up-to-date science will be included in the planning, formulation, implementation, and continued adaptive management of CEPP, including but not limited to: 1) agency scientists including several members of the RECOVER science group were integral in setting goals, objectives, constraints, and PMs for CEPP; 2) PMs and modeling tools have been developed using the best available science; 3) model parameter settings are determined based on best available science to constantly improve the accuracy of model output for viewing alternative plans for CEPP; 4) several ecological planning tools developed by agency scientists may be used to view potential impacts of CEPP alternatives on species; 5) the Eco-subteam may develop qualitative ratings of CEPP alternative plans that will include current scientific understanding of the Everglades ecosystem; and 6) the Adaptive Management and Monitoring plan for CEPP will include monitoring to continually improve the scientific

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		understanding of the ecosystem and the effects of CEPP on it, as well as informing future decisions with the best scientific understanding of the ecosystem.
IEM-2	The Corp's Planning Process Transformation Pilot Program, upon which the CEPP EIS is based, appears to be an experimental and untested paradigm. We question the choice of the Everglades - a complex and highly degraded ecosystem - as a testing ground for this planning paradigm, given the potentially non-reversible nature of unsound decisions that could result from this process.	The Corps has continually heard from stakeholders that its planning process is overly detailed, expensive and that it takes too long; the amount of time and data being invested in studies are not leading to a better product or decision. As a result, the Corps is considering looking at ways to transform the planning process and fortunately, CEPP has been selected as a pilot project for this program. The pilot program focuses the detail on the key drivers of the decisions that are to be made and reduces unnecessary detail that results in a longer process and one that may not deliver a better solution.
IEM-3	CEPP scenario hydrology will apparently be generated by the South Florida Regional Simulation Model (RSM). CEPP documents provide insufficient detail about RSM calibration data, scenario generation, incorporation of biotic models in the evaluation process, and continued monitoring of key ecosystem components to provide assurances that science will continue to have an appropriate role in decision-making.	RSM calibration information will be made available through the CERP Data Access Storage and Retrieval (DASR) site or upon written request for those without DASR access. CEPP continues to provide information on plan formulation strategy and scenario generation through regular PDT meetings. The CEPP updates are also provided to stakeholders through the South Florida Ecosystem Task Force Working Group Sponsored Workshops, Water Resources Advisory Commission and SFWMD Governing Board meetings. The identified RECOVER PMS will be generated from the RSM to evaluate alternative plans. To make the correlation between hydrologic output and ecosystem functions, the project team will utilize PMs developed from the Lake Okeechobee, Northern Estuaries and Greater Everglades Ridge and Slough CEM. These CEM have been extensively peer reviewed and provide the framework for the

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		planning and assessment of CERP and are used to identify the major anthropogenic drivers and stressors on natural systems, the ecological effects of these stressors, and the best biological attributes or indicators of these ecological responses.
IEM-4	The documents do not discuss a mechanism for how biotic assessments are to be carried out, how alternative planning is to be developed based upon these assessments, nor how scientific input from the expansive collection of biotic system models developed as part of CERP are to be supported and incorporated in the EIS.	Wildlife species in CEPP area will be considered in several ways during the planning of CEPP. Examples include: current scientific understanding of species needs were strongly considered for the development of performance measures that will be used by CEPP, and agency-developed ecological planning tools will be used to view potential impacts of CEPP alternatives on species, the Eco-subteam may develop qualitative ratings of CEPP alternative plans that will include species considerations, and the Adaptive Management and Monitoring plan for CEPP will include monitoring of the biotic system that is appropriate for showing effects of CEPP over time.
IEM-5	We are particularly concerned that monitoring has been discontinued or reduced for key components of the Everglades biota (including white-tailed deer and the Florida panther in Everglades National Park) despite the fact that there is still insufficient understanding of these species responses to accurately project the impacts of hydrologic changes on their populations. For those species still being monitored, no central data repository has been established, although such a repository was a major element in CERP planning to provide for continued incorporation of best available science into models.	White-tailed deer and Florida panther are not monitored in the ecosystem-wide CERP monitoring program (“Monitoring and Assessment Plan or MAP) but may be monitored by individual restoration projects within CERP. For example, CERP’s Picayune Strand restoration project includes monitoring for Florida panther and white-tail deer. The interagency CEPP team will consider the interest in white-tailed deer, panther, and other key biota during the development of CEPP’s monitoring program. Repository for monitoring data: The CERP Integrated Database (CID) has been developed to house, or connect to, all hydrologic and ecologic monitoring data for CERP that cannot be housed in the SFWMD's DBHydro

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		database. Information in CID is accessed through the user interface named "EverGlades Restoration data Extraction Tool" (EGRET). EGRET is a GIS mapping application that shows CERP monitoring project locations and provides access to associated data. EGRET allows for data queries by spatial parameters or type of data. Project abstracts and data tables can be viewed within the application, or be exported to .csv files for further use. Access to EGRET is only available to the CERP partner agencies through the CERPZone. All RECOVER partnering agencies and CERP Projects are in the process of adding data into the database as resources become available.
IEM-6	Shortening the time period for management decision-making for CEPP relative to the CERP process makes the transparent incorporation of best available science and continued monitoring to assess biotic impacts all the more urgent.	The Corps concurs with this statement.
FLORIDA CRYSTALS CORPORATION (CRYSTALS)		
CRYSTALS-1	<u>Scoping is Premature in the Absence of a Specific Proposal:</u> To date, the Corps has not proposed any specific plan for the CEPP. While these comments are meant to provide constructive, meaningful input into the CEPP, in light of the lack of a specific project at this point, we reserve the right to supplement these scoping comments in the future.	The Corps respectfully requests your continued participation and feedback throughout the CEPP planning process.
CRYSTALS-2	<u>The Corps Should Clarify Which CERP Projects Are Part of the CEPP:</u> It is important that The Corps clearly define which projects from the 1999 Approved Plan are included in the CEPP. Moreover, the Project Implementation Report will have to demonstrate that the CEPP design is "consistent with the [1999 Approved] Plan," 33§CFR 385.26(a)(3)(i), and "[i]nclude a discussion of any significant	The scope of the CEPP will include increments of the following components that were part of the Yellow Book Plan: ▪ Everglades Agricultural Storage Reservoirs (G)Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement (AA, QQ and SS)

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	changes in cost or scope of the project from that presented in the "Final Integrated Feasibility Report and Programmatic Environmental Impact Statement,' dated April 1, 1999," id. -(a)(3)(xiii).	▪ Dade-Broward Levee/Pennsuco Wetlands (BB) ▪ Bird Drive Recharge Area (U) ▪ L-31N Improvements for Seepage Management and S-356 Structures (V and FF) ▪ Everglades Rain-Driven Operations (H)
CRYSTALS-3	<u>The Corps Should Limit the CEPP to the Scope Approved by Congress in WRDA 2000:</u> It would be inappropriate for the Corps to design a project that would significantly depart from the 1999 Approved Plan in the Project Implementation Report for the CEPP. In the particular case of the Everglades Agricultural Storage Reservoirs (G)' project, it would be improper for the agency in the CEPP to develop a proposal, and analyze alternatives to such a proposal, that would call for significantly larger land footprints in the EAA.	The purpose of the CEPP is to improve the quantity, quality, timing and distribution of water flows to the central Everglades (WCA 3 and ENP). Utilizing the Incremental Adaptive Restoration (IAR) approach recommended by the National Research Council (NRC) and new science and technological information gained to date, the CEPP will be composed of increments of project components that were identified in the CERP Comprehensive Review Study (Yellow Book), reducing the risks and uncertainties associated with project planning and implementation. The term "increment" is used to underscore that this study will formulate an initial portion of individual CERP components. It is envisioned that later studies will further refine this "increment" and develop subsequent CERP components to achieve the level of restoration envisioned for CERP. This study approach is consistent with the recommendations from the NRC to utilize IAR to both achieve timely, meaningful benefits of CERP and to lessen the continuing decline of the Everglades ecosystem. Prior planning efforts and the development of scientific goals and targets for the CERP have led to a determination that some components are in fact interdependent features that necessitate formulation from a systems approach. Recently

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		authorized CERP projects are "perimeter" projects that generally do not greatly depend upon or influence other CERP projects. However, the components in the Central Everglades are hydraulically connected from Lake Okeechobee to Florida Bay, and are reliant on one another for both inflows and outflows. These interdependencies require system plan formulation and analysis in order to optimize structural and operational components, rather than formulating separable components that may not be compatible when looking at the cumulative impacts.
CRYSTALS-4	Congress Approved a Specific Plan in WRDA 2000, and the Corps Lacks Authority to Go Beyond That Plan:	Please refer to CRYSTALS-2 and CRYSTALS-3 responses.
CRYSTALS-5	The Corps Cannot Prepare a Project Implementation Report If There Will Be Significant Changes to the CERP Projects:	Please refer to CRYSTALS-2 and CRYSTALS-3 responses.
CRYSTALS-6	Significant Changes to CERP Projects in the CEPP Will Require Additional Programmatic NEPA Compliance:	Please refer to CRYSTALS-2 and CRYSTALS-3 responses. An integrated PIR/EIS will be prepared for CEPP.
CRYSTALS-7	Proposed Planning Constraints and Performance Measures Should Be Revised: A. Lake Okeechobee Water Storage and Operations It would be inappropriate for the CEPP to make LORS 2008 a planning constraint for the CEPP. First, it would be inconsistent with the 1999 Approved Plan. Second, using LORS 2008 as a planning constraint for the CEPP would be inconsistent with the regulation schedule itself. Third, making LORS 2008 a planning constraint would violate Savings Clause of WRDA 2000. The only valid approach for the CEPP would be to allow for changes in the Lake Okeechobee Regulation Schedule as	Please refer to FDACS-1 response.

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	necessary to achieve project objectives. To summarize, the Without-Project Condition must assume either the WSE or Run 25 regulation schedules are in effect, while the With-project Condition can utilize the WSE schedule, or a proposed new schedule recommended by the CEPP.	
CRYSTALS-8	Proposed Planning Constraints and Performance Measures Should Be Revised: B. Water Quality The role of water quality standards in the CEPP needs to be reconsidered. The CEPP plans also need to be developed based upon the actual quality of water in Lake Okeechobee.	The CEPP planning process will determine what water is available and what should be used for CERP purposes. The condition of the water in lake as it exists today will be identified and adequate treatment facilities will be included in alternative plans based upon the quality of lake water as it exists today.
CRYSTALS-9	Proposed Planning Constraints and Performance Measures Should Be Revised: C. Water Supply Assuring adequate water supply for existing and future uses should be a planning constraint for the CEPP. There should also be a performance measure that evaluates the extent to which the CEPP alternatives increase water supplies for users other than the natural system.	Planning constraints protecting existing sources of water, consistent with federal and state law, have been included in CEPP. In addition, a new goal and objective has been added to CEPP to address water supply for other water related needs. Specifically the new goal reads, "Enhance Economic Values and Social Well Being", while the objective is to "Increase availability of fresh water (agriculture/municipal/industrial)". Corresponding PMs to evaluate the ability to meet existing and future uses will be applied during plan formulation.
CRYSTALS-10	Proposed Planning Constraints and Performance Measures Should Be Revised: D. Flood Protection A planning constraint for flood protection therefore would be appropriate for the CEPP. The CEPP should include as a performance measure the degree to which proposals improve flood protection.	Planning constraints protecting existing levels of flood protection, consistent with federal and state law, have been included in CEPP. Key metrics will be evaluated during plan formulation to identify potential changes, improvements or declines in flood protection. A more thorough analysis will be performed on TSP.
CRYSTALS-11	Proposed Planning Constraints and Performance Measures Should Be Revised: E. Economic and Social Disruption	The Corps agrees that economic and social disruption should be a consideration during the planning process and feature siting analysis, and

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	Consistent with the Reconnaissance Report, the CEPP should include minimization of economic and social disruption as a planning constraint, using the proxy of reduced agricultural production and property removed from the tax rolls.	any impacts to agricultural production and tax rolls will be identified.
CRYSTALS-12	Alternatives: ..the Corps should consider opportunities for additional water storage in Lake Okeechobee.	Please refer SUGAR-2 response.
CRYSTALS-13	Alternatives: …the Corps should consider restoration/rehydration of the Holey Land and Rotenberger Wildlife management Areas. These lands are publicly-owned by the State of Florida and are perfectly positioned to store and release water needed for the restoration of WCA-3A and Everglades National Park. At a minimum, the CEPP should consider restoring sheetflow to those areas, since they are located immediately north of WCA 3A.	Please refer to SUGAR-11 response.
CRYSTALS-14	Alternatives: …to the extent that the CEPP concludes that Lake Okeechobee water will need to be treated before delivery to the WCAs, the CEPP should consider a wide variety of alternative ways to treat that water. For each alternative treatment option, analyses should evaluate the effectiveness of each treatment option in reaching target phosphorus levels, the true long-term cost of each option, and the resulting effects on the Northern Estuaries associated with greater and lesser flows from the lake associated with the effectiveness of different options.	The CEPP planning process will determine what water is available and what should be used for CERP purposes for the next increment of restoration. The condition of the water in lake as it exists today will be identified and adequate treatment facilities will be included in alternative plans based upon the quality of lake water as it exists today.
PRIVATE CITIZENS		
CITIZEN-1; Comment 1	No future bridging projects on ModWaters should be done without emergency pull-off lanes for U.S. 41 motorists within a construction zone.	Comment forwarded to Modified Water Deliveries project managers.
CITIZEN-1; Comment 2	One thing that is worrisome is the expedited process and reducing the level of detail, I don't agree with that.	The Corps has continually heard from stakeholders that its planning process is overly detailed, expensive and that it

LETTER	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
		takes too long; the amount of time and data being invested in studies are not leading to a better product or decision. As a result, the Corps is considering looking at ways to transform the planning process and fortunately, CEPP has been selected as a pilot project for this program. The pilot program focuses the detail on the key drivers of the decisions that are to be made and reduces unnecessary detail that results in a longer process and one that may not deliver a better solution.
CITIZEN-2	THERE IS ONE EVERGLADES. THATS IT! We believe a few very important points are vital to the glades health. #1, The Urban Development Boundary Dade Co. must remain where it is. #2, The dike around the Lake will NOT break free as proposed by people. A waste of money to repair. It isn't the ocean, and even a severe 'cane won't provide waves like it would in an ocean! New Orleans simply caused this panic! The rim canal would barely be affected. It's a ridiculous notion! I bring this up because of the wasteful funds it could use up. #3, we don't want TOO much water where there shouldn't be much and vice versa! land animals need dry land! #4, the "glades people" although very important, may have to adapt IF this affects them negatively! A few people, although very important, sometimes have to sacrifice livelihood for the greater good of something greater...THE GLADES AND EARTH'S FUTURE! #5, I'm hoping, having worked there, that Arch Creek, one of only a few natural rivers left, and of extreme historical significance, can once again flow! Its stagnant still, last I heard, and this should be of utmost importance- to let it flow again...it's a polluted mess! It would bring a lot of happiness and add a little touch of personality to the CERP program! How will the Cape Sable Sparrow fare?	1. This is outside the Corps' authority. 2. The primary compilation of information and documentation of the condition of the dike was prepared in the 2000 HHD Major Rehabilitation Report. The original plan for Reach 1 rehabilitation was developed before Hurricane Katrina's devastating impact on levees in New Orleans in August 2005. Even though construction had begun on Reach 1, it was determined lessons learned in Katrina's aftermath should be used to ensure that the HHD would continue to protect lakeside communities. In 2006 and 2007 Independent Technical Review (ITR) panels were convened to review the structural integrity of the HHD and aid in developing a long-term solution for rehabilitation. The findings of the ITR panels confirmed the Corps' earlier findings that the HHD is in need of rehabilitation. 3. The impoundment of the natural system and construction of drainage and conveyance has disrupted the annual pattern of rising and falling water depths in the remaining wetlands. Hydropatterns have been disrupted causing the erosion of valuable tree islands and the once uniform system is now too wet in some areas and too dry in others. One

LETTER	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
		objective of the CEPP is to restore seasonal hydroperiods and freshwater distribution to support a natural mosaic of wetland and upland habitat in the Everglades system. 4. Traditional cultural practices, cultural resources and recreation will all be considered during CEPP planning process. 5. Although listed on the National Register of Historic Places, Arch Creek is outside the CEPP project area and area of potential effects for cultural resources. 6. A thorough evaluation of endangered species needs, impacts and benefits will be conducted under CEPP.
CITIZEN-3	We welcome the Corps and other agencies' push to "move water South" at long last, having studied the issues since the early 1980s. I note that SFRestore's "New" science "discovery" repeats what the Corps has known at least since its independent scientist panel published the Reconnaissance Report in 1994. CERP Table 5-1 "Goals and Objectives" applies just as much today as it did when adopted in 1999 and should be followed. That seems to be the major flaw in the current CEPP: not restoring the natural flow instead of relying on new engineered "plumbing" projects. Without restoring the pond apple forest and the sawgrass sheet flow through the "River of Grass", we'll never achieve cleaning enough nutrients out of the water as it moves South to make it suitable for re-charging the Everglades.	The goals and objectives developed for the CEPP are fully consistent with those that were developed for the CERP. In regards to the restoration of the natural, or rather historical flow of the Everglades and system attributes, Section 385.8(c) of the Programmatic Regulations states that: "The restored South Florida ecosystem will be significantly healthier than the current system; however it will not completely replicate the undisturbed South Florida ecosystem and some areas may more closely replicate the undisturbed ecosystem than others." Although the CEPP is intended to restore, preserve, and protect the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection, it is accepted that a fully restored south Florida ecosystem may not completely resemble the historical Everglades as a whole. Restoration of a pond apple forest and sawgrass plain is outside of the scope of planning for the next increment of the CERP features under consideration. Due

LETTER	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
		consideration will be given to compatibility of CEPP features to future increments of these CERP components.
CITIZEN-4	I'm concerned that the Environmental Justice issues may not be adequately included in the plans for each project. With this in mind: What efforts are planned for the evaluation and management of the Environmental Justice issues for each project? How are the low income and minority communities impacted by each project being considered and compensated?	Environmental Justice will be assessed as part of NEPA process. The Corps plans to utilize the CERP Ethnographic Study to identify and address potential adverse impacts to minority and low income populations. Each CEPP alternative will be designed and analyzed to consider the plan that best meets the overall project objectives while identifying and addressing any disproportionate adverse impacts.
CITIZEN-5; Comment 1	As the only family thus recognized with a designation as a TCP [Traditional Cultural Property] by the CERP project by the Army Corps, we are truly concerned for the health of our Everglades, the River of Grass. All flora and fauna, likewise our family and our eight children depend on the health of this precious ecosystem. We've done our best to maintain and improve the health of our resources. The changes to be imposed around my family's dwelling are of great concern, especially for the next generation of the Gladesmen. We need to know that our traditional cultural ways of life will continue so as to be the bearers of a culture not to be forgotten by the wayside of progress in the name of restoration. The children of the Everglades rely on our decisions today for their cultural rights of tomorrow.	Impacts to historic sites and traditional cultural properties and practices will be assessed as part of NEPA and the National Historic Preservation Act process. Each CEPP alternative will be designed and analyzed to consider the plan that best meets the overall project objectives while minimizing adverse impacts.
CITIZEN-5; Comment 2	With reference to the hydroperiods, the definitions you guys are going by, I'd like to know whether they're based on historic data or if they're based on current flow chart data and whether or not if they're for primarily, basically municipal demand?	Hydroperiods throughout the majority of the Everglades are based upon historical data of predrainage conditions except in areas where deviations have been deemed ecologically beneficial (Loxahatchee Wildlife Refuge, marl marshes and Corbett Wildlife Management Area) and are not based upon municipal

LETTER	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
		demand. Hydroperiod targets differ throughout the Everglades landscape based upon the ecological community to be restored. For example, a wet prairie will have a shorter hydroperiod requirement than an aquatic slough.
CITIZEN-5; Comment 3	With reference to the surface water, what depths of the surface water are you talking about holding within the conservation areas and for what durations of time? It says on one of your boards that it's in order to diminish the damage to tree islands and reduce fire frequencies. Fires are cleansing for the Everglades. They remove invasive exotics and give the natural flora a chance to re-procreate. So how do you plan to mitigate seasonal sheetflow and what is the maximum depth of surface water going to be?	The project will not attempt to maintain a specific depth throughout the water conservation areas. Water depths within the water conservation areas will vary according to ground surface elevation, time of year, and location within the system. For example, average water depths within water lily-dominated slough communities should be between 2 to 3 feet during the wet season (June-October) and approximately 1.5 to 3 feet during the dry season (November-May). Similarly, hydroperiods will also vary according to the ecological community to be restored. For example, accretion of peat soils typical of ridge and slough landscape requires prolonged flooding, characterized by 10 to 12 month annual hydroperiods; while muhly grass-dominated marl prairies are characterized by a hydroperiod of 3 to 5 months. Water depths will also vary by season and year based upon hydro-meteorological and climatological conditions. The impoundment of the natural system and construction of drainage and conveyance has disrupted the annual pattern of rising and falling water depths in the remaining wetlands. Hydropatterns have been disrupted causing the erosion of valuable tree islands and the once uniform system is now too wet in some areas and too dry in others. Prolonged hydroperiods and water depths, particularly within southern WCA-3A, have led to degradation of tree islands and shifts in plant communities from

LETTER	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
		wet prairies to open water sloughs. Shortened hydroperiods, particularly within northern WCA-3A, have directly affected plant communities by enabling invasion of nuisance native (e.g. willow) and exotic (e.g. melaleuca, Brazilian pepper) plant species and altering plant community species composition. Restoration is focused instead on reducing the frequency of peat fires, which can cause long-term destruction of the important ridge-slough pattern. Exacerbated by prolonged dry seasons due to shortened hydroperiods, fires that are too frequent or severe can further alter plant communities, lead to loss of peat soils and native hardwood species and can promote the spread of exotics (e.g. Melaleuca releases seeds as a result of fire).
CITIZEN-5; Comment 4	How do you define wildlife utilization? One of your charts out there mentions that a lot of the study is based on wildlife utilization. I don't understand the definition or how you guys define wildlife utilization.	Wildlife utilization is defined as the use of the landscape by wildlife species. It is another way of asking: Is the habitat suitability of the Everglades for a diverse population of wading birds, mammals, fish, amphibians, etc. improving? One objective of the Central Everglades Planning Project is to reduce water loss out of the natural system to promote appropriate dry season recession rates for wildlife utilization. For example, wading birds, including the endangered wood stork, nest during the dry season and rely upon a seasonal pattern of drying wetlands to concentrate prey items. By reducing water loss out of the natural system and promoting appropriate dry season recession rates, areas of appropriate water depths for feeding would be available and wildlife utilization would be expected to increase.
CITIZEN-5; Comment 5	It makes mention of increases in productivity in the north estuaries, both of the oyster beds and the sea grass. I was wondering, are there considerations in	The restoration goal is to re-establish salinity regimes suitable for the maintenance of healthy, naturally-diverse and well-balanced estuarine

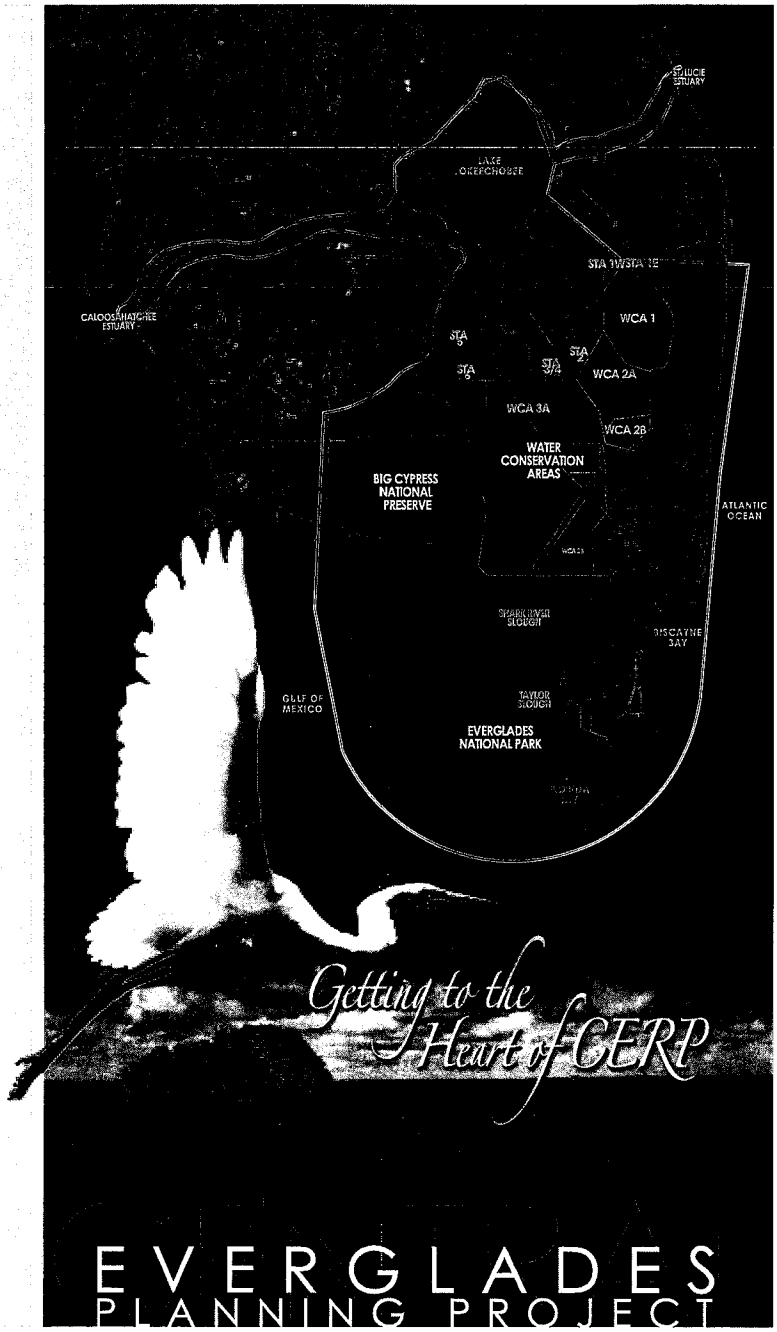
LETTER	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
	place for the bordering reefs and the other marine habitats in the scope of these projects because the bordering reefs and the other marine wildlife beyond the oyster beds and the sea grass are much -- equally, if not much more vital, to the overall ecosystem. That's the final piece of the ecosystem the Everglades touches.	ecosystems. Accomplishing restoration will require reducing canal discharges (including regulatory releases from Lake Okeechobee) and insuring sufficient dry-season flows necessary to avoid ecologically damaging high and low salinity extremes. Oysters, sea grasses, bordering reefs and other marine habitats will all directly benefit from restoration of appropriate salinity regimes.
CITIZEN-5; Comment 6	I'd like to know what the timeline is for this significant increase in aquatic food chain. Also, why is there no mention of the animal population increase of land-requiring animals, such as mammals, deer, panthers, foxes, things of that nature? It all makes reference to aquatic animal life. It makes no mention whatsoever of animals that require dry land.	One objective of CEPP is to restore seasonal hydroperiods and freshwater distribution to support a natural mosaic of wetland and upland habitat in the Everglades system. Tree islands support a diverse array of upland (land-requiring) species and are an important focus of Everglades restoration. By restoring appropriate hydrologic conditions, tree islands and other short hydroperiod environments (e.g. marl prairie) will be restored and thereby provide suitable habitat for both wetland and upland species. Within the project area, there are over 50 Federally-listed threatened and endangered species, including Florida panther, eastern indigo snake; Audubon's crested caracara and Everglade snail kite. These species depend upon both wetland and upland habitat and their needs will be incorporated into the Central Everglades Planning Project. The aquatic food web is mentioned because fish, amphibians and other aquatic species serve as essential prey resources for many larger predators such as those mentioned within the ecosystem. The timeline for the CEPP is to have a recommended plan for Congressional approval by August 2013. Implementation of the plan will then be dependent upon Congressional

LETTER	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
		authorization and funding. The timeline for actual increase in the food chain as a function of restoration (if that is what you were asking) will be estimated for each simulated/modeled alternative plan from a suite of environmental PMs.
CITIZEN-5; Comment 7	I'm all for the increase of water quality. But at what cost economically and environmentally?	Water quality must meet all applicable state and federal water quality standards prior to its discharge from EAA into the Water Conservation Areas and ENP.
CITIZEN-6; Comment 1	I do have a lot of concerns here in the name of restoration we could destroy the whole thing, and I know at one point there was a lot of concern about the amount of water that people were going to put out there, and the Everglades, it's not only how much water you put out there, but it's how long you hold the water.	The project will not attempt to maintain a specific depth throughout the water conservation areas. Water depths within the water conservation areas will vary according to ground surface elevation, time of year, and location within the system. Similarly, hydroperiods will also vary according to the ecological community to be restored.
CITIZEN-6; Comment 2	Concerned with putting a discharge canal on the south side of the L-5 levy. That would impact hundreds if not thousands of acres and cut off recreational access to the area.	The CEPP planning process is in the initial stages of plan formulation. At this point in the process, specific management measures or project features have not been developed. Recreation is one component that will considered as part of CEPP. A recreational sub-team has been formed to explore potential impacts on recreational opportunities as well as the potential for new recreational access. A recreational plan will be developed as part of CEPP to mitigate some potential impacts. CEPP will also continue to be discussed at future Water Resources Advisory Commission Recreation meetings to engage stakeholders.
CITIZEN-6; Comment 3	Concerned with filling of Miami River and loss of natural tree species that have been planted along the banks and loss of wildlife that depends upon it.	The CEPP planning process is in the initial stages of plan formulation. At this point in the process, specific management measures or project features have not been developed.

LETTER	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
CITIZEN-6; Comment 4	We’re not here to work against this project, but to work with you to make sure it’s implemented properly.	The Corps appreciates and welcomes your participation in CEPP planning process.
CITIZEN-6; Comment 5	The Everglades is not meant to be a reservoir. I was involved in the Everglades Agricultural Reservoir on that project, and I know there was litigation over it to stop the project. We're all for that project. We're for the STA's. That puts more tools in your box, so you can, you know, put the water into the area more naturally, and we're all for those projects.	The goal of the CEPP is to improve the quantity, quality, timing and distribution of water in the Northern Estuaries, Water Conservation Area 3, and ENP in order to restore the hydrology, habitat and functions of the natural system.
CITIZEN-6; Comment 6	We've lost probably 60 percent of our tree islands due to either too much water or too little water. So it's important to get the hydrology right. We've seen too much water; you kill off all the fur-bearing animals. You kill off all the hardwood trees. We've seen that happen firsthand. Too little water, we have these muck fires, and then everything burns down to the cap rock, and it's really a sad thing to see.	Please refer to Corps Response to CITIZEN- 5, Comment 6.
CITIZEN-6; Comment 7	Concern with loss of public recreational abilities.	Recreation is one component that will considered as part of CEPP. A recreational sub-team has been formed to explore potential impacts on recreational opportunities as well as the potential for new recreational access. A recreational plan will be developed as part of CEPP to mitigate some potential impacts. The CEPP will also continue to be discussed at future Water Resources Advisory Commission Recreation meetings to engage stakeholders.
CITIZEN-7	We're very concerned about the bridging and would like to know what level of bridging we're going to have. It appears to be from the comments of some of the people here that there's a lot of concern about the flooding and the fact that water is backing up, and of course the solution to that is the bridging so that water can flow into Everglades National Park rather than backing up on Tamiami Trail. So we think	The Corps will assume for FWO condition that the Tamiami Trail Next Steps Project, which includes an additional 5.5 miles of bridging along Tamiami Trail, will be completed. As part of the CEPP alternatives analysis, some increment of bridging (in addition to the 1-mile bridge currently under construction) will be included.

LETTER	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
	it's very important that this process include successful bridging so that we can get water moving south. We can do everything up north, but, if we can't get the water past Tamiami Trail, it's not going to do Everglades National Park any good.	
CITIZEN-8	We have a lot of confidence that two years is adequate time to get something good going and build it and when we get these systems running we can fine tune them and add on later, but let's make some progress.	Concur, the Corps is excited that CEPP has been selected as a pilot project for the Corps expedited Planning Process Pilot Program. The pilot program focuses the detail on the key drivers of the decisions that are to be made and reduces unnecessary detail that results in a longer process and one that may not deliver a better solution.
CITIZEN-9	Hendry-Glades Audubon favors projects that can be developed and managed effectively to improve water quality and supply while meeting the diverse needs of wildlife, ecosystems, private land owners and the public interest.	Concur, the Corps looks forward to Audubon's participation throughout CEPP planning process.
CITIZEN-10	Here are some options that should be considered within the CEPP PIR to partially substitute for or complement other proposed options: 1. In-ground Storage Reservoirs in lieu of above ground reservoirs 2. Deep In-ground cells within any reservoirs (above or below ground) for chemical water treatment (perhaps with alum) and sequestration of removed Phosphorus in deepest parts of the cell 3. ASR wells to store water when there is excess water in the EAA and reservoirs and/or Lake Okeechobee are at or near capacity (having good connections to use Lake Okeechobee water would be important). 4. Deep (boulder zone) disposal wells to remove water that cannot be stored and treated (e.g. brackish water in new in-ground reservoir cells and excess water	The CEPP planning process is in the initial stages of plan formulation. At this point in the process, specific management measures or project features have not been developed. The Corps appreciates and welcomes your participation in CEPP planning process.

LETTER	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
	imported from Lake Okeechobee during periods of regulatory discharge) (having good connections to use Lake Okeechobee water would be important). 5. Facilities to move and discharge water along the northern and western boundaries of Water Conservation Area 3. The first 4 options are less land intensive than the options of above-ground reservoirs and STAs. They may well be cost-competitive. They are also less likely to engender conflicts between their planned uses and environmental values. The fifth option is necessary to distribute water to rehydrate WCA 3 and establish proper flows to achieve restoration.	



COMMENTS/ QUESTIONS

EVENT: Central Everglades Planning Project Workshop

DATE: December 14-15, 2011

COMMENTS/QUESTIONS

Addition to verbal comments-
No future bridging projects on Modi Waters should be done without Emergency Pull-Off Lanes for US 41 motorists within a construction zone.

REPRESENTING (Check one)

___ ELECTED OFFICIAL
___ TRIBAL
___ CONGRESSIONAL
___ FEDERAL AGENCY
___ STATE LEGISLATURE
___ STATE AGENCY
___ LOCAL GOVERNMENT
___ ENVIRONMENTAL
___ AGRICULTURE
___ GROUP
___ SELF
___ MEDIA
___ OTHER

DO YOU WISH TO HAVE YOUR NAME INCLUDED ON THE MAILING LIST FOR FUTURE INFORMATION? ___ YES ___ NO

NAME AND TITLE (PLEASE PRINT) Frank Denninger

[redacted]

MAILING ADDRESS [redacted]

CITY [redacted] STATE ZIP CODE

PHONE NUMBER [redacted]

EMAIL ADD[redacted]

PRIVACY ACT STATEMENT

AUTHORITY: 42 USC 4321, 4331-4335

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CESAD FORM 935, OCT 98

-----Original Message-----
From: [redacted]
Sent: Tuesday, December 20, 2011 10:27 AM
To: [redacted] cerpprojectsprogram@evergladesplan.org
Cc: [redacted]
Subject: Re: [cerpprojectsprogram] Public scoping meetings for Central Everglades Planning Project (CEPP) in Plantation Dec. 14 and Clewiston Dec. 15

I was unable to participate in the Public Scoping Meetings. Howevr, I'm concerned that the Environmental Justice issues may not be adequately included in the plans for each project. With this in mind:

What efforts are planned for the evaluation and management of the Environmental Justice issues for each project? How are the low income and minority communities impacted by each project being considered and compensated?
C. R. Lee

Ralph, Gina P SAJ

From: martha musgrove [redacted]
Sent: Friday, January 20, 2012 9:49 PM
To: CEPPComments, SAJ
Cc: Manley Fuller
Subject: comments re CEPP scoping

Jan. 20, 2012

Att: Dr. Gina Padua Ralph

Re: Scope of the Central Everglades Project

The Florida Wildlife Federation supports the announced Corps of Engineers' expedited process to develop a suite of projects to increase the volume and flow of freshwater, which meets established water quality standards of 10 ppb phosphorus, into Everglades National Park. The Federation fully supports restoration of the Everglades, including the Everglades National Park and the Water Conservation Areas.

As a member of the Everglades Coalition, we embrace the Coalition's recitation of necessary projects and request that special attention be paid to dealing with seepage management issues. In addition, we believe that the COE should include in the scope of the CEPP a goal of delivering its recommendations in time to be incorporated into the federal-budget cycle commencing in January 2014.

In addition the Federation urges the COE to include in its design studies and make recommendations about maintaining freshwater-fishing habitat in Water Conservation Area 3B, the L-67 canals and L-29 (Tamiami Trail) canal and public access. We ask that this planning include consideration of creating depressions similar to alligator holes, slopes to establish "littoral zones" around borrow pits/canals, and the use of fill to stabilize, re-generate or create tree islands mimicking the Everglades' natural ridge and slough landscape. As the COE is aware, over the years water has tended "to pond" in WCA 3B. This has resulted in establishing a thriving bass fishery that South Florida sportsmen have come to prize. The proximity to urban South Florida, which otherwise offers limited freshwater recreational fishing opportunities, enhances its recreational value. At this point we believe that fishery enhances the area for wading birds and wildlife and can be incorporated into proposed projects without harm to restoration goals.

Manley Fuller, president

Florida Wildlife Federation

PO Box 6870

Tallahassee, FL 32314

850-656–7113

wildfed@gmail.com

sent by:
Ms. Martha Musgrove
Director, Florida Wildlife Federation
[redacted]

Ralph, Gina P SAJ

From: Shinn, Charles [Charles.Shinn@ffbf.org]
Sent: Wednesday, January 18, 2012 11:14 AM
To: CEPPComments, SAJ
Cc: [redacted]
Subject: Central Everglades Planning Project Public Comments on behalf of Florida Farm Bureau Federation

Attn: Dr. Gina Paduano Ralph

U.S. Army Corps of Engineers

Florida Farm Bureau Federation (FFBF) is the Sunshine State's largest general interest agricultural organization with more than 140,000 member-families representing farmers throughout Florida on various issues that may impact farming operations. We have numerous farmers in Central and South Florida that potentially may be impacted by the Central Everglades Planning Project (CEPP), therefore please accept the following comments on behalf of our farmer members.

We depend on the Central & South Florida Flood Control Project and the associated partners for water supply as well as flood protection as noted in the Water Resources Development Act of 2000 (WRDA 2000). The intended purpose of the Comprehensive Everglades Protection Plan (CERP) within WRDA 2000 is the restoration and protection of the remaining Everglades while continuing to meet the water consumption needs of permitted users. The stated scope of the CEPP is very vague in how the goal will be accomplished. The vagueness along with the expedited CORP schedule provides concern that the proper assurances will be in place to minimize impact to landowners in the region south of Lake Okeechobee.

Key to movement of additional water south is additional water storage. Thus far, the CORPS operation of the current Lake Okeechobee Regulation Schedule has not allowed the flexibility to increase water storage for proper timing of additional flows to the south. Without a noted change in operation, the CEPP must denote additional storage to create the proper timing needed to redirect water south.

Water quality has been an impediment to moving water into Everglades National Park and the current water conditions in Lake Okeechobee must be considered within the scoping process. It has been said that even if no additional loading is introduced to the lake, it will take a period of 50+ years for the lake to meet Federal standards. Ignoring the current condition of the lake will result in ultimate failure of any plan. Additionally, Federal Judge court orders must be considered and addressed.

Past single species management of Endangered Species such as the Cape Sable Seaside Sparrow must be addressed within the scoping process of the CEPP. Creating the mechanism to move water south only to have it blocked from entering the Everglades National Park will result in ultimate failure and the potential to flood lands in the EAA.

Florida Farmers are at their core environmentalists and the success of any farming operation depends on a healthy adjoining ecosystem. We fully support the concept of moving additional water south instead of releasing it to tide from via C-43 and C-44 thus harming fragile estuaries. The realities of the current conditions (quality/quantity/timing/distribution) must be fully addressed and vetted in any comprehensive plan such as CEPP. We look forward to working with the CORPS and other interested parties to develop a plan that will accomplish these goals.

Sincerely,

Charles Shinn

Assistant Director of Government & Community Affairs

Florida Farm Bureau Federation

P.O. Box 147030

Gainesville, Florida 32614

(772) 778-0932 office

(352) 538-0853 cell

charles.shinn@ffbf.org <mailto:charles.shinn@ffbf.org>

“The Voice of Florida Agriculture”

Florida Crystals Corporation
One North Clematis Street
Suite 200
West Palm Beach, FL 33401

William F. Tarr
Vice President
P: 561-366-5157
F: 561-651-1280

January 20, 2012

VIA E-MAIL AND U.S. MAIL

Dr. Gina Padua Ralph
U.S. Army Corps of Engineers
Planning Division
P.O. Box 4970
Jacksonville, Florida 32232-0019

Re: Scoping Comments on the Central Everglades Planning Project

Dear Dr. Ralph:

Please accept this letter and its attachment as our initial comments on the proposed Central Everglades Planning Project (CEPP) as presented in the scoping announcement in the Federal Register and the presentations given at public scoping meetings.

Florida Crystals and its affiliates, including Okeelanta Corporation and New Hope Sugar Company, have consistently supported restoration of the South Florida ecosystem, along with protection of economic and social interests in the region. We own a large amount of farmland, employ many people in the Everglades Agricultural Area (EAA), and are significant contributors to the economy of South Florida. A significant number of our products are certified organic, we produce the first sugar certified as "CarbonFree" by Carbonfund.org, and we operate the United States' largest biomass power plant. We have been active participants in farm-level Best Management Practices that have reduced phosphorus in stormwater runoff from the EAA by over 50 percent.

We applaud the premise of the CEPP, as we understand it, to bring important restoration projects on-line sooner, and sincerely hope that the process evolves into a project we can actively support. At this time, however, we are not sure what the CEPP is expected to accomplish and how it will affect the interests of Agriculture. In that respect, we feel that the scoping initiative

may be premature because the agencies have not yet proposed a plan with enough detail on which Florida Crystals can fully comment. Nevertheless, enclosed for your review is a series of detailed comments based on what we have seen so far.

Please do not interpret these comments to mean that we do not support the CEPP. We are hopeful that it can be a significant step forward, and we intend to stay engaged in the process to promote both Everglades restoration and to protect Agriculture.

Thank you for considering these comments. With kind regards, I am,

Yours truly,

William F. Tarr
Vice President
Florida Crystals Corporation

/jcd
Enclosure
Copy w/ encl. via e-mail to:
Mr. Joe Collins, SFWMD, Chair
Mr. Kevin Powers, SFWMD, Vice Chair
Ms. Sandy Batchelor, SFWMD Board Member
Mr. Daniel DeLisi, SFWMD Board Member
Mr. James J. Moran, SFWMD Board Member
Mr. Daniel O'Keefe, SFWMD Board Member
Mr. Juan M. Portuondo, SFWMD Board Member
Mr. Timothy Sargent, SFWMD Board Member
Mr. Glenn J. Waldman, SFWMD Board Member
Ms. Melissa Meeker, SFWMD
Mr. Matt Morrison, SFWMD
Mr. Tom Teets, SFWMD
Ms. Kimberly Taplin, USACE
Mr. Steven Kopecky, USACE
Mr. Dennis Duke, Interior
Mr. Tom MacVicar
Mr. Neal McAliley
Mr. Galen Miller

Florida Crystals Corporation's Detailed Comments on the CEPP (based on public scoping materials available to date)

January 20, 2012

1. Scoping is Premature in the Absence of a Specific Proposal

As an initial matter, it is premature to request scoping comments in the absence of a specific proposal by the U.S. Army Corps of Engineers (Corps) for the CEPP.

Scoping is required when an agency initiates preparation of an Environmental Impact Statement (EIS) pursuant the National Environmental Policy Act (NEPA). 40 CFR § 1502.4(d). Any NEPA process inherently begins with a proposal. *United States v. SFWMD,* 28 F.3d 1563, 1573 (11th Cir. 1994) ("It would be premature and serve no useful purpose to now require preparation of an EIS when no specific federal action has been proposed. ... NEPA does not require evaluation of hypothetical proposals, impacts and alternatives concerning a nonexistent federal proposal."); 40 CFR § 1502.4(a), -(d) ("Agencies shall make sure the proposal which is the subject of an Environmental Impact Statement is properly defined."). The purpose of scoping is to seek input from the public about what the agency should study with regard to that proposal. 40 CFR § 1501.7 ("There shall be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues *related to the proposed action.* This process shall be termed scoping.") (emphasis added); CEQ, Draft Guidance on Improving the Process for Preparing Efficient and Timely Environmental Reviews under NEPA, 76 Fed. Reg. 77492, 77496 (Dec. 13, 2011) ("In scoping, the lead agency determines the issues its EA or EIS will address and identifies the significant issues *related to the proposed action* that will be considered in the analysis.") (emphasis added).

To date, the Corps has not proposed any specific plan for the CEPP. Instead, the Corps has stated that it intends to use the CEPP process to *develop* a proposal. USACE, Notice of Intent to Prepare EIS on CEPP, 76 Fed. Reg. 75539 (Dec. 2, 2011) ("The goal of the CEPP would be to *develop* an integrated, comprehensive technical plan..."). This is reflected in the changing name for the CEPP: originally, it was referred to in public announcements as the "Central Everglades Study," then it was called the "Central Everglades Planning Process," and now it is referred to as the "Central Everglades Planning Project." Despite the current label of the CEPP as a "project," the Corps has not yet proposed any specific project.

Conducting scoping now is inconsistent with NEPA and the Programmatic Regulations for the Comprehensive Everglades Restoration Plan (CERP). The government-wide regulations governing NEPA contemplate scoping *after* a proposal has been announced. *See* 40 CFR § 1501.7. The Corps' NEPA regulations call for the scoping notice itself to describe both the specific proposal and reasonable alternatives. 33 CFR Part 230, App. C. The CERP Programmatic Regulations also require the Corps to involve public "in such a way to ensure meaningful consultation." 33 CFR § 385.10(d). Since the Corps has not identified any specific proposal for the CEPP, members of the public cannot provide meaningful input regarding the environmental issues raised by, and alternatives to, the nonexistent proposal. While the Corps

wants to pursue an accelerated schedule for the CEPP, the Corps has also stated that it will follow all laws and regulations pertaining to other CERP projects.

While these comments are meant to provide constructive, meaningful input into the CEPP, in light of the lack of a specific project at this point, we reserve the right to supplement these scoping comments in the future.

2. The Corps Should Clarify Which CERP Projects Are Part of the CEPP

The Corps needs to clarify which CERP projects are going to be considered part of the CEPP. The CERP approved by Congress in the Water Resources Development Act of 2000 (WRDA 2000) consisted of 68 specific projects, which together were designed to help benefit the South Florida ecosystem while providing for the other water-related needs of the region. 67 Fed. Reg. 50540 (Aug. 2, 2002). Congress directed the Corps to prepare a Project Implementation Report (PIR) for each individual project to be authorized. WRDA 2000, § 601(b)(2)(D)(i), -(d), -(h)(4)(A)(i). The purpose of a Project Implementation Report is to "bridge[] the gap between the conceptual level of detail contained in the [the 1999 Final Integrated Feasibility Study and Programmatic EIS (1999 Approved Plan)] and the detailed design necessary to prepare plans and specifications required to proceed to construction." 33 CFR § 385.26(a)(1). The starting point for any Project Implementation Report therefore must be to identify the projects from the 1999 Approved Plan which will be addressed in the report.

It is not clear at this point which projects from the 1999 Approved Plan are being included in the CEPP. The announced purpose of the CEPP is to design the individual projects for the Central Everglades. The December 2, 2011 notice in the Federal Register states that "[t]he CERP projects identified to accomplish [the agency's objectives] *include* the Everglades Agricultural Storage Reservoirs, Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement, Everglades National Park (ENP) Seepage Management, and Everglades Rain-Driven Operations." 76 Fed. Reg. 75539 (Dec. 2, 2011) (emphasis added). The December 2, 2011 notice states that these projects are only the

> "*initial increment of project features* that provide for storage, treatment, and conveyance south of Lake Okeechobee, removal of canals and levees within Water Conservation Area 3 and seepage management features to maintain water within the natural system." 76 Fed. Reg. 75539 (Dec. 2, 2011) (emphasis added).

Based on the Corps' description of potential CEPP features at initial public meetings, it appears that the CEPP may include even more projects identified in the 1999 Approved Plan. Potentially, all (or parts) of the following individual projects might fit within the general description CEPP provided to date:

- "Everglades Agricultural Storage Reservoirs (G)," 1999 Approved Plan, section 9.1.5 (identified in the Dec. 2, 2011 Federal Register notice)
- "Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement (AA, QQ and SS)," 1999 Approved Plan, section 9.1.7.2 (identified in the Dec. 2, 2011 Federal Register notice),

- "L-31N Improvements for Seepage Management and S-356 Structures (V and FF)" (later renamed, at least in some places, "ENP Seepage Management"), 1999 Approved Plan, section 9.1.8.21 (identified in the Dec. 2, 2011 Federal Register notice),
- "Everglades Rain Driven Operations (H)," 1999 Approved Plan, section 9.2.4.1 (identified in the Dec. 2, 2011 Federal Register notice)
- "Flows to Northwest and Central Water Conservation Area 3A (II and RR)", 1999 Approved Plan, section 9.1.7.1,
- "Water Conservation Areas 3A and 3B Levee Seepage Management (Q)", 1999 Approved Plan, section 9.1.8.13,
- "Lake Okeechobee Regulation Schedule (F)", 1999 Approved Plan, section 9.2.1.1,
- "Modified Holey Land Wildlife Management Area Operation Plan (DD)", 1999 Approved Plan, section 9.2.4.2,
- "Modified Rotenberger Wildlife Management Area Operation Plan (EE)", 1999 Approved Plan, section 9.2.4.3,

It is important that the Corps clearly define which projects from the 1999 Approved Plan are included in the CEPP. The public needs to know how much of the overall CERP is being packaged into the CEPP, if for no other reason than to enable them to provide meaningful comment. Moreover, the Project Implementation Report will have to demonstrate that the CEPP design is "consistent with the [1999 Approved] Plan," 33 CFR § 385.26(a)(3)(i), and "[i]nclude a discussion of any significant changes in cost or scope of the project from that presented in the 'Final Integrated Feasibility Report and Programmatic Environmental Impact Statement,' dated April 1, 1999," *id.* –(a)(3)(xiii). The sooner the agency identifies the specific CERP projects included in the CEPP, the better the public will be able to provide meaningful input.

3. The Corps Should Limit the CEPP to the Scope Approved by Congress in WRDA 2000

The 1999 Approved Plan presented to Congress specifically described the projects included in the plan, and the CEPP should only consider projects consistent with that plan. Agricultural interests in EAA supported approval of the CERP by Congress and the Florida Legislature based, in part, on the expectation that the agencies had identified a limited and reasonable amount of farm land to be sacrificed for water management purposes. The South Florida Water Management District currently owns the land in the EAA identified for CERP in the 1999 Approved Plan. This means that the Corps can implement the CEPP in the EAA consistent with the 1999 Approved Plan, using land the government already owns. For planning purposes, this would make the EAA portion of the CEPP manageable and more realistic and appears to be the Corps' plan, based on statements in early scoping meetings that it will "focus on lands purchased for CERP." Agency CEPP Powerpoint Presentation, p. 31 (Dec. 16, 2011).

It would be inappropriate for the Corps to design a project that would significantly depart from the 1999 Approved Plan in the Project Implementation Report for the CEPP. In the particular case of the "Everglades Agricultural Storage Reservoirs (G)" project, it would be improper for the agency in the CEPP to develop a proposal, and analyze alternatives to such a proposal, that would call for significantly larger land footprints in the EAA.

A. Congress Approved a Specific Plan in WRDA 2000, and the Corps Lacks Authority to Go Beyond That Plan

The Corps lacks authority to depart from the 1999 Approved Plan in development of the CEPP. In WRDA 2000, Congress approved the specific plan contained in the Final Integrated Feasibility Report and Programmatic Environmental Impact Statement, dated April 1, 1999. WRDA 2000, § 601(b)(1)(A) ("Except as modified by this section, the Plan is approved as a framework for modifications and operational changes to the Central and Southern Florida Project..."); *id.* § 601(a)(4) ("The term 'Plan' means the Comprehensive Everglades Restoration Plan contained in the 'Final Integrated Feasibility Report and Programmatic Environmental Impact Statement,' April 1, 1999, as modified by this section."). Congress affirmatively directed the Corps to implement that specific plan (with some modifications). WRDA 2000, § 601(b)(2)(A)(i) ("The Secretary shall carry out the projects included in the Plan in accordance with paragraphs (B), (C), (D), and (E)."). Congress also made a point of *not* approving a portion of the plan that was developed late in the process, and specifically indicated that water generated by that portion of the plan was *not* "water included in the Plan." WRDA 2000, § 601(g). While the Corps indicated in the 1999 Approved Plan that it would continue to refine and optimize the CERP based on new information and changed circumstances, *see, e.g.,* 1999 Approved Plan at 10-19 ("The purpose of the Project Implementation Report is to affirm, reformulate or modify a component, or group of components, in the recommended Comprehensive Plan."), it never told Congress that it would seek to significantly change the overall plan through individual project authorizations. In accordance with WRDA 2000, the Corps therefore needs to limit the scope of the CEPP to the approximate parameters of the projects approved by Congress in WRDA 2000.

B. The Corps Cannot Prepare a Project Implementation Report If There Will Be Significant Changes to the CERP Projects

The CEPP cannot consider significant changes to the 1999 Approved Plan in the context of a Project Implementation Report. In its December 2, 2011 public notice, the agency indicated that it will prepare a Project Implementation Report for the CEPP. Project Implementation Reports take the preliminary parameters of the projects contained in the 1999 Approved Plan and fill in the details. Programmatic Regulations, Six Program-Wide Guidance Memoranda, at 1-B-1 (July 2007) ("CERP Guidance Memoranda") ("Each component or project of the Plan has previously been formulated to a certain level and the component or project has been developed to accomplish specific CERP goals. As such, formulation in the PIR always begins with the formulations already completed in developing the plan."). Congress specifically directed that such reports must be consistent with the Plan. WRDA 2000, § 601(h)(4)(A)(iii)(I) ("A project implementation report shall ... be consistent with the Plan..."); *see also* 33 CFR § 385.6.

Although a Project Implementation Report may consider "minor adjustments in the Plan," a significant change in the plan would require preparation of a Comprehensive Plan Modification Report. 33 CFR § 385.32(c); CERP Guidance Memoranda, at 1-4 ("Minor adjustments to the Plan may therefore be accomplished through PIRs."). To date, the Corps has not identified a need for a significant change to the CERP which could be the basis of a Comprehensive Plan Modification Report. The Programmatic Regulations require the Corps to have prepared Periodic CERP Updates in 2004 and again in 2009, which could have been the basis for "modifying the design or operational plan for a project of the Plan not yet

implemented" or preparing a Comprehensive Plan Modification Report. 33 CFR § 385.31(c), -(d)(1)(ii), -(d)(2). Since the Corps has never prepared such a Periodic CERP Update there would be no basis to make significant departures from the 1999 Approved Plan in the detailed design of projects in the CEPP.

For the CEPP, this means that the Project Implementation Report should be limited to proposals and alternatives that would optimize the projects identified in the 1999 Approved Plan, making only limited adjustments. To take one project, the "Everglades Agricultural Storage Reservoirs (G)" was to be used for storage of local runoff and Lake releases to be delivered to the Water Conservation Areas at a total price of approximately $436,648 million (in 1999 dollars and cost of construction). The EAA features are at the heart of the CERP, and at the time the 1999 Plan was issued, the land needed for that project already had been acquired by government agencies. Developing the CEPP consistent with those parameters would be appropriate for a Project Implementation Report. The agency could also analyze different ways of using the available land that would balance deliveries to agricultural users and the WCAs, and that would meet the requirements of the Savings Clause of WRDA 2000 concerning the transfer of existing sources of water supply and levels of flood protection.

C. Significant Changes to CERP Projects in the CEPP Will Require Additional Programmatic NEPA Compliance

If the CEPP exceeds the scope of the 1999 Approved Plan, it will trigger the need for a new Programmatic EIS for the CERP. The 1999 Approved Plan was prepared with a Programmatic EIS, in part so that subsequent NEPA documents prepared for individual CERP components could tier-off of the original Programmatic EIS. 33 CFR § 385.26(d)(1). To the extent that the Corps makes significant changes to the 1999 Approved Plan in the CEPP, then it will need to prepare a new Supplemental Programmatic EIS for the overall CERP. If the agency wants to move expeditiously with the CEPP, then it should avoid making significant changes to the 1999 Approved Plan.

4. Proposed Planning Constraints and Performance Measures Should Be Revised

A. Lake Okeechobee Water Storage and Operations

The Corps must change its planning constraints related to operations of water control structures around Lake Okeechobee. In initial public meetings on the CEPP, the Corps has identified as a planning constraint "Lake Okeechobee Regulation Schedule – LORS 2008." *E.g.,* Agency CEPP Powerpoint Presentation, at 29 (Dec. 16, 2011). The agency apparently will assume that LORS 2008 will be in effect until at least 2050, because it is identified as part of the "Future Without Project Condition – 2050." *See, e.g., id.* at 33.

It would be inappropriate for the CEPP to make LORS 2008 a planning constraint for the CEPP. First, it would be inconsistent with the 1999 Approved Plan. The 1999 Approved Plan assumed that a former lake regulation schedule, Run 25 Lake Schedule, was the CERP 2050 Without-Project condition. This was the basis of the Corps' analysis of the overall benefits of the CERP compared to the status quo. If the Corps now treats LORS 2008 as the "Without-Project Condition," it would change every benefit analysis that was performed for the CERP and

clearly require a CERP Update or Comprehensive Plan Modification Report as envisioned in the Programmatic Regulations. At most, it might be appropriate to utilize the former WSE Schedule as the Without-Project Condition since it was developed concurrent with the 1999 Approved Plan, but in no case can the LORS 2008 schedule be used for that condition.

Second, using LORS 2008 as a planning constraint for the CEPP would be inconsistent with the regulation schedule itself. When the Corps adopted LORS 2008, the agency acknowledged that "Lake Okeechobee is a multi-purpose project with often competing project purposes....The recommended plan attempts to balance these project purposes, but public health and safety, related to concerns with HHD structural integrity were a dominant factor in the plan formulation." LORS 2008 ROD, at 2. The ROD further stated that it would only be an interim schedule for the Lake. LORS 2008 ROD, at 6 ("The final SEIS also explains that the recommended plan will be an interim schedule, and a new study will begin immediately following completion of this Lake Okeechobee Regulation Schedule Study which will take into consideration upcoming Comprehensive Everglades Restoration Plan (CERP) projects. ... The recommended plan identifies an interim solution..."). By making that "interim schedule" a planning constraint in the CEPP, the Corps effectively would convert it to a permanent regulation schedule. That would lock-in for purposes of the CEPP analysis a performance for the Lake that was never intended to be in place in the future when the CEPP projects will be in operation.

Third, making LORS 2008 a planning constraint would violate Savings Clause of WRDA 2000. The Savings Clause of WRDA 2000 provides, in part, that "[u]ntil a new source of water supply of comparable quantity and quality as that available on the date of enactment of this Act is available to replace the water to be lost as a result of implementation of the Plan, the Secretary and the non-federal sponsor shall not eliminate or transfer existing legal sources of water, including those for an agricultural or urban water supply." WRDA 2000, § 601(h)(5). "Existing legal source" means the "quantity and quality of water available within a basin ... used for a water supply, which is legally protected..., as of December 11, 2000, for ... [a]n agricultural or urban water supply." CERP Guidance Memoranda, at 3-3. The Programmatic Regulations provide that the Corps "shall determine if implementation of the project will cause an elimination or transfer of existing legal sources of water by comparing the availability of water with the recommended project with the pre-CERP baseline developed in accordance with § 385.35(a) [through guidance]." 33 CFR § 385.36. This determination should be done through "a preliminary screening analysis" at the start of the process. CERP Guidance Memoranda, at 3-1. The Pre-CERP Baseline developed under the Programmatic Regulations "is a description of assumed hydrologic conditions on the date of enactment of WRDA 2000 (December 11, 2000)," which for Lake Okeechobee was the "Lake Okeechobee Regulation Schedule WSE according to WSE decision trees." Programmatic Regulations, Pre-CERP Baseline Memorandum, at 8, 14 (April 2005). "Although regional models and model versions may change over time, the assumptions that define the Pre-CERP Baseline will not be changed." CERP Guidance Memoranda, at 3-6. Since the LORS 2008 regulation schedule was adopted in 2008, it is not part of the Pre-CERP Baseline. The apparent decision in the CEPP to make the "interim" LORS 2008 regulation schedule permanent, by treating it as the Without-Project Condition, will effect a permanent loss of water supply for agriculture (and other users). WRDA 2000 prohibits such a transfer of water supply until alternative water is made available, and the CEPP therefore cannot treat the LORS 2008 as an unchangeable constraint.

The only valid approach for the CEPP would be to allow for changes in the Lake Okeechobee Regulation Schedule as necessary to achieve project objectives. That would be consistent with the agency's initial outline of measures to be considered in the CEPP, which include "operational changes." It would also allow the agency to avoid transferring existing legal sources of water away from agricultural users in the EAA, by adjusting the lake schedule as appropriate to avoid adverse impacts to agricultural users. To summarize, the Without-Project Condition must assume either the WSE or Run 25 regulation schedules are in effect, while the With-Project Condition can utilize the WSE schedule, or a proposed new schedule recommended by the CEPP.

B. Water Quality

The role of water quality standards in the CEPP needs to be reconsidered. In initial public meetings on the CEPP, the Corps has identified as a planning constraint "Meet Applicable Water Quality Standards." *E.g.,* Agency CEPP Powerpoint Presentation, p. 29 (Dec. 16, 2011). This formulation of the planning constraint is quite vague, in that it does not identify which standards need to be met at what locations. To the extent that the Corps means that water from Lake Okeechobee delivered to the WCA's should meet applicable phosphorus effluent limitations for discharges from Stormwater Treatment Areas, those effluent limitations have not yet been fully determined. To the contrary, the precise effluent limitations for Stormwater Treatment Area discharges, and how those effluent limitations would be measured, is the subject of ongoing litigation which may not be fully decided for years. The CEPP therefore is being tied to a planning constraint which is undefined. Furthermore, the potential projects that may be required to meet the limitations resulting from the litigation may be incompatible with the plan recommended by the CEPP, and the South Florida Water Management District may not have the financial resources to satisfy both courts and participate in the CEPP.

The CEPP plans also need to be developed based on the actual quality of water in Lake Okeechobee. We have heard that some in the federal government are considering an assumption that the Lake water phosphorus concentration is at 44 parts per billion. According to recent data from the South Florida Water Management District, average phosphorus concentration within the Lake ranges from 100 to 200 ppb. The quality of water in Lake Okeechobee is not the responsibility of the EAA, because virtually all of the water entering the Lake comes from other basins. The CEPP should include in its analysis a defensible Lake Okeechobee phosphorus concentration based on reasonably foreseeable phosphorus levels over the course of the study period, not an assumption based on a goal where there is no expectation of that goal being met.

C. Water Supply

Assuring adequate water supply for existing and future uses should be a planning constraint for the CEPP. This has always been a planning constraint for CERP-related processes. It was a planning constraint to minimize loss of service for water supply in the C&SF Project Reconnaissance Report (Nov. 1994) (p. 200-201). The Governor's Commission for Sustainable South Florida, which Congress directed the Corps to consider in development of the CERP, made a planning objective of "ensur[ing] adequate water supply and flood protection for … agricultural needs." 1999 Approved Plan, at 6-4. In WRDA 2000, Congress included the Savings Clause which prohibits the elimination or transfer of an existing legal source of water

for agricultural or urban water supply until replacement water is available that is of comparable quantity and quality. WRDA 2000, § 601(h)(4)(A). For plan development purposes, the CEPP therefore should include a constraint that it will assure adequate water supplies for existing and future uses.

There also should be a performance measure that evaluates the extent to which the CEPP alternatives increase water supplies for users other than the natural system. When the 1999 Approved Plan was developed, many agricultural and urban water users supported the plan because the analyses showed that it would develop additional water for new human uses. *See, e.g.,* CERP Guidance Memoranda, at 3-2 ("It is anticipated that if more water is made available for the natural system in South Florida through implementation of the Plan, more water should also be available for other existing and future uses."). When the Florida Legislature approved the CERP in 2000, it expressly stated that one of the Plan's purposes was "the enhancement of water supplies." § 373.470(3)(b)(2), Fla. Stat. The project "Everglades Agricultural Storage Reservoirs (G)," for instance, in part was designed to provide water for agricultural uses in the EAA. *See* 1999 Approved Plan, at 6-14 to 6-15, 9-9 to 9-10. The Corps' presentation at the initial CEPP scoping meetings mentioned the Savings Clause for existing uses, but did not mention that water for new uses was to be provided by other elements of the CERP that could be affected by this project. The CEPP should consider this issue, and include the development of additional water supplies as a performance measure.

D. Flood Protection

The CEPP also should embrace the same purposes as the Everglades Agricultural Storage Reservoirs in CERP which included "increasing flood protection in the Everglades Agricultural Area." (1999 Approved Plan, at 9-9) In the WRDA 2000 Savings Clause, Congress directed that "[i]mplementation of the Plan shall not reduce levels of service for flood protection that are in existence on the date of enactment of this Act, and in accordance with applicable law." WRDA 2000, § 601(h)(4)(B). A planning constraint for flood protection therefore would be appropriate for the CEPP. Moreover, like water supply, one of the authorized features of the 1999 Approved Plan was improved levels of service for flood protection. (1999 Approved Plan, at 9-9) The CEPP should include as a performance measure the degree to which proposals improve flood protection.

E. Economic and Social Disruption

There should be an additional planning constraint that the agencies minimize regional economic and social disruption. This, too, has long been a planning goal of the Corps' South Florida ecosystem restoration planning. It was a planning constraint for the C&SF Project Reconnaissance Report (Nov. 1994) (p. 201). The Reconnaissance Report acknowledged that "reduced agricultural production" was a "negative impact," and "a proxy of acres of land removed from production, and similarly from county tax rolls, was used to measure the potential economic and social disruption" (p. 201). The 1999 Approved Plan identified as one of the "Planning Goals and Objectives" "Enhance Economic Values and Social Well Being." 1999 Approved Plan, at 5-24. Consistent with the Reconnaissance Report, the CEPP should include minimization of economic and social disruption as a planning constraint, using the proxy of reduced agricultural production and property removed from tax rolls.

5. Alternatives

As indicated above, it is very difficult for the public to identify alternatives for analysis in the absence of a specific proposal from the Corps. However, there are at least three types of alternatives that the agency should consider as it develops the CEPP.

First, the Corps should consider opportunities for additional water storage in Lake Okeechobee. The Lake was used to store significantly more water before implementation of LORS 2008. The only significant water storage that will be available in the CEPP timeframe will be provided by the Lake. To the extent that storage there is limited by condition of the Herbert Hoover Dike, the Corps could consider supplementing the dike rehabilitation funds as part of the funding appropriated for the CEPP, since many of the benefits to be derived from the CEPP will be dependent on storage capacity in Lake Okeechobee above what can be provided under the LORS 2008 schedule. This would be consistent with some of the "fundamental general concepts" of the Governor's Commission for Sustainable South Florida, which set a planning objective that "[t]he burden and responsibility of water storage should be shared across the system." 1999 Approved Plan, at 6-5.

Second, the CEPP should consider restoration/rehydration of the Holey Land and Rotenberger Wildlife Management Areas. These lands are publicly-owned by the State of Florida and are perfectly positioned to store and release water needed for the restoration of WCA-3A and Everglades National Park. The Rotenberger Wildlife Management Area is 28,760 acres, and Holey Land Wildlife Management Area is 35,350 acres. At a minimum, the CEPP should consider restoring sheetflow to those areas, since they are located immediately north of WCA 3A. There are two projects in the 1999 Approved Plan which seek to accomplish just that. These areas potentially could more than double the total acreage available to the government for water deliveries from Lake Okeechobee to the Everglades and the CEPP should consider how best to address those areas as it considers alternative measures for the Central Everglades.

Third, to the extent that the CEPP concludes that Lake Okeechobee water will need to be treated before delivery to the WCAs, the CEPP should consider a wide variety of alternative ways to treat that water. Potential options could include stormwater treatment areas, chemical treatment, and potential methodologies to deal with phosphorus within the Lake. For each alternative treatment option, analyses should evaluate the effectiveness of each treatment option in reaching target phosphorus levels, the true long-term cost of each option, and the resulting effects on the Northern Estuaries associated with greater and lesser flows from the lake associated with the effectiveness of different options.

* * *

We look forward to providing additional comments as the CEPP moves forward and the agencies develop a specific proposal for public review.

Everglades Coalition

1000 Friends of Florida
Arthur R. Marshall Foundation
Audubon of Florida
Audubon Society of the Everglades
Audubon of Southwest Florida
Caloosahatchee River Citizens Association/ Riverwatch
Clean Water Action
Clean Water Network
Collier County Audubon Society
Conservancy of Southwest Florida
Defenders of Wildlife
Ding Darling Wildlife Society
Earthjustice
Environment Florida
The Environmental Coalition
Everglades Coordinating Council
Everglades Foundation
Everglades Law Center
Florida Conservation Alliance
Florida Defenders of the Environment
Florida Keys Environmental Fund
Florida Native Plant Society
Florida Oceanographic Society
Florida Wildlife Federation
Friends of the Arthur R. Marshall Loxahatchee Wildlife Refuge
Friends of the Everglades
Hendry Glades Audubon Society
Izaak Walton League Florida Division
Izaak Walton League Florida Keys Chapter
Izaak Walton League Mangrove Chapter
Izaak Walton League of America
Last Stand
League of Women Voters of Florida
Loxahatchee River Coalition
Martin County Conservation Alliance
National Audubon Society
National Parks Conservation Association
National Wildlife Federation
National Wildlife Refuge Association
Natural Resources Defense Council
The Ocean Conservancy
The Pegasus Foundation
Sanibel-Captiva Conservation Foundation
Save It Now, Glades!
Sierra Club
Sierra Club Broward Group
Sierra Club Calusa Group
Sierra Club Central Florida Group
Sierra Club Florida Chapter
Sierra Club Loxahatchee Group
Sierra Club Miami Group
The Snook and Gamefish Foundation
South Florida Audubon Society
Tropical Audubon Society
The Urban Environment League
World Wildlife Fund

January 20, 2012

Attn: Gina Paduano Ralph, Ph.D
Department of the Army
Planning and Policy Division
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Dear Dr. Ralph:

Please see the attached Resolution Supporting Central Everglades Planning Project for inclusion in scoping. We look forward to working with you on this endeavor. Please contact us with any questions or comments.

Sincerely,

Julie Hill-Gabriel
State Co-Chair
305-371-6399 x136
Jhill-gabriel@audubon.org

Dawn Shirreffs
National Co-Chair
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Sierra Club Calusa Group
Sierra Club Central Florida Group
Sierra Club Florida Chapter
Sierra Club Loxahatchee Group
Sierra Club Miami Group
The Snook and Gamefish Foundation
South Florida Audubon Society
Tropical Audubon Society
The Urban Environment League
World Wildlife Fund

RESOLUTION SUPPORTING CENTRAL EVERGLADES PLANNING PROJECT

WHEREAS, the Everglades Coalition is committed to protecting lands critical to the future of Florida's environment, drinking water, economy, recreation, and quality of life; and

WHEREAS, the Everglades ecosystem has continued to decline in the face of restoration delays and an expedited solution is needed to increase the quality, quantity, timing and distribution of freshwater flows into the central Everglades, Everglades National Park and Florida and Biscayne Bay; and

WHEREAS, increased deliveries of water south of Lake Okeechobee will reduce damaging discharges to the Caloosahatchee and St. Lucie estuaries; and

WHEREAS, the goal of the Central Everglades Planning Project (CEPP) is to significantly reduce planning times and deliver a finalized plan, for a suite of restoration projects in the central Everglades within 18 months,

WHEREAS, the ecological goals and objectives of the Comprehensive Everglades Restoration Plan (CERP) include increasing the total spatial extent of natural area, improving habitat and functional quality, and improving native plant & animal species abundance & diversity:

THEREFORE BE IT RESOLVED that the Everglades Coalition supports the completion of a project implementation report (PIR) through the CEPP using CERP adaptive management protocols by May 2013 that addresses key obstacles for restoring freshwater flows and implements meaningful ecological and economic benefits toward restoring America's Everglades.

Approved January 5, 2012.

Julie Hill-Gabriel
State Co-Chair
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Dawn Shirreffs
National Co-Chair
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Streamlining Central Everglades Project Planning (CEPP) using CERP Adaptive Management Protocols

Executive Summary: Streamline CEPP using CERP ***Adaptive Management Integrated Guide*** protocols by:

- Incorporating a CEPP Conceptual Ecological Model (CEM) to arrive at restoration valuation measures
- Focusing on CERP 1999 Table 5-1 Goals & Objectives as the basis for top level valuation measures
- Valuing ecosystem services based on measured increases in total special extent per CERP Objective 1

Assumption: CEPP Time-lines & public support mandate streamlining by synthesis all can understand.

PROGRESS: Adding CEPP to CERP using CERP Adaptive Management Protocols resulting in CERP(+).

- Central Everglades Project Planning (CEPP) Positives:
  - The Project Delivery Team (PDT) Goes in the direction of CERP(+)
  - Federal Register/CEPP Workshops wording has this restoring flow, etc.:
    - Details at www.sfrestore.org;
    - See Federal Register handout (Attachment 1, A-1, next page)
  - Noted in Nov 30 CEPP Workshop: CEPP Federal agencies are considering ecosystem services valuation (ESV) for decision-support, per the July, 2011 White House Report – *Sustaining Natural Capital: Protecting Society & The Economy*
- Streamline the process using the CEPP evaluation tool box with 3 E-Z evaluation tool box additions per the CERP 2011 ***Adaptive Management Integration Guide*** protocols (See protocols in Attachment 2):
  1. CEPP Conceptual Ecological Model (CEM) (See Attachment 3 case for a CEPP CEM)
     a. A CEPP CEM is required by Activity 4 and lead-in to other required PDT activities;
     b. Note: Measures posted in Nov 30 CEPP Workshop were borrowed from other CEM's, but other regions do not include historical *attributes* of a pond apple forest, sawgrass plains, and 40 mi+ wide expanse of sheet flow; the *drivers* and *stressors* are also different.
  2. CERP 1999 Table 5-1 Goals & Objectives (see attachment 4 and "posting on the wall");
     a. Establish measures based on CERP Table 5-1 Total system goals and objectives per CEM process, e.g., what is the increase in total spatial extent of natural area in acres?
  3. Add Ecosystem Services Valuation Approach & Methodology to the evaluation tool box
     a. Calculate ESV of alternatives based on dollars per acre per year using Costanza Synthesis dollar values per acre, number of acres of increased spatial extent, and CERP life-cycle, e.g. economic and ecologic value for an alternative configuration looks something like:
     b. ESV = Costanza Synthesis Biome type value per acre per year x 100,000 acres x 40 years
        ESV ~ $10,000 x 100,000 acres x 40 years
     c. Compare benefits calculated by ESV to costs for a B:C ratio that provides return on investment (ROI) decision-support for decision makers.
     d. NOTES, especially for those critical of the benefits transfer approach based on the Costanza Synthesis, the most widely referenced peer-reviewed paper on ESV:
        i. Alternative approaches to a more ESV localized analysis are data and modeling intensive, and likely not achievable in a streamlined CEPP set time-frame
        ii. Literature that documents localized ESV modeling approaches appear to borrow data from other regions with even more benefits transfer than occurs using the Costanza Synthesis
        iii. CONCLUSION: The a.b.c. approach above has the distinct result of ***quicker, cheaper, better*** analysis of alternative and falls into the category of *close enough for government work*
        iv. Also goes in the direction of the White House Report recommending the feds apply ESV in projects like CERP as a means to get to return on investment for astute decision-support.

- POSSIBLE SUPPORT by up-start orgs in the news in November, 2011, and presently: Public Comment Request to Everglades Legislative Caucus; Member request to Florida Conservation Coalition (FCC): Push Streamlined CEPP
- Everglades Coalition Conference, ESV Breakout Session, Jan 7 (Push Streamlined CEPP using ESV)
- Apply ESV to Proposed Everglades Headwaters National Wildlife Refuge (Push Costanza Synthesis)
- Summer Intern Program Recruiting begins at EvCo Conference; project assignment = ESV Theme applied to CEPP

Dated: November 29, 2011.

Morgan F. Park,

Alternate OSD Federal Register Liaison Officer.

[FR Doc. 2011–30986 Filed 12–1–11; 8:45 am]

BILLING CODE 5001–06–P

DEPARTMENT OF DEFENSE

Department of the Army, Corps of Engineers

Intent To Prepare an Environmental Impact Statement for the Central Everglades Planning Project, Okeechobee, Glades, Martin, Palm Beach, Broward, Miami-Dade and Monroe Counties, FL

AGENCY: Department of the Army, U.S. Army Corps of Engineers, DOD.

ACTION: Notice of intent.

SUMMARY: The Everglades ecosystem encompasses a system of diverse wetland landscapes that are hydrologically and ecologically connected across more than 200 miles from north to south and across 18,000 square miles of southern Florida. In 2000, the U.S. Congress authorized the Federal government, in partnership with the State of Florida, to embark upon a multi-decade, multi-billion dollar Comprehensive Everglades Restoration Plan (CERP) to further protect and restore the remaining Everglades ecosystem while providing for other water-related needs of the region. CERP involves modification of the existing network of drainage canals and levees that make up the Central and Southern Florida Flood Control Project.

Since 2000, much progress has been made. Construction has begun on the first generation of CERP project modifications already authorized by Congress. These include the Picayune Strand Restoration, the Indian River Lagoon South and Site 1 Impoundment projects. Project Implementation Reports have been completed, or are nearing completion, for the second generation of CERP projects for Congressional authorization, including Biscayne Bay Coastal Wetlands—Phase 1, the Broward County Water Preserve Areas, the Caloosahatchee River (C–43) West Basin Storage Reservoir, and the C–111 Spreader Canal Western Project. All of these CERP projects utilize lands that were acquired by the State and Federal government to meet CERP goals of increasing the extent of wetlands, reducing damaging freshwater discharges to the coastal estuaries, and reducing seepage losses from the natural system. These projects contribute significant ecological benefits to the system and the specific regional habitats in which they are located. These initial CERP projects were intended to provide initial and immediate ecological benefits and set the conditions along the margins of the system that help ensure increased water flows to the interior of the system will not cause adverse effects.

The next step for implementation of CERP is to redirect water that is currently discharged to the east and west coast estuaries from Lake Okeechobee and restore water flow to the south, allowing for restoration of natural habitat conditions and water flow in the central Everglades and re-connecting the ecosystem from Lake Okeechobee to Everglades National Park and Florida Bay. The Central Everglades Planning Project will develop the initial increment of project features that provide for storage, treatment and conveyance south of Lake Okeechobee, removal of canals and levees within Water Conservation Area 3 and seepage management features to retain water within the natural system. The CERP projects identified to accomplish this include the Everglades Agricultural Storage Reservoirs, Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement, Everglades National Park (ENP) Seepage Management, and Everglades Rain-Driven Operations. These projects make up the heart of CERP aimed at restoring more natural quantity, quality, timing and distribution of water flows to the remaining portions of the river of grass. An integrated study effort on these projects is needed to set the direction for the next decade of CERP implementation.

ADDRESSES: U.S. Army Corps of Engineers, Planning Division, Environmental Branch, P.O. Box 4970, Jacksonville, FL 32232–0019.

FOR FURTHER INFORMATION CONTACT: Dr. Gina Ralph at (904) 232–2336 or email at *Gina.P.Ralph@usace.army.mil.*

SUPPLEMENTARY INFORMATION:

a. The goal of the Central Everglades Planning Project effort would be to develop an integrated, comprehensive technical plan, including the first increment of projects, for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem.

b. A scoping letter will be used to invite comments from Federal, State, and local agencies, affected Indian Tribes, and other interested private organizations and individuals.

c. A scoping meeting will be held December 14, 2011 from 6:30 to 9 p.m. at the Sheraton Suites Plantation, Plantation I/II Room, 311 North University Drive, Plantation, Florida and December 15, 2011 from 6:30 to 9 p.m. at the John Boy Auditorium, 1200 South W.C. Owen Avenue, Clewiston, FL. Assistance for individuals with special needs or language translation will be available as needed by calling (904) 232–1613.

d. All alternative plans will be reviewed under provisions of appropriate laws and regulations, including the Endangered Species Act, Fish and Wildlife Coordination Act, Clean Water Act, and Farmland Protection Policy Act.

e. The Draft Environmental Impact Assessment is expected to be available for public review in the 1st quarter of 2013.

Brenda S. Bowen,

Army Federal Register Liaison Officer.

[FR Doc. 2011–31010 Filed 12–1–11; 8:45 am]

BILLING CODE 3720–58–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

Combined Notice of Filings #1

Take notice that the Commission received the following electric corporate filings:

Docket Numbers: EC12–38–000.

Applicants: TPW Petersburg, LLC, Gestamp Eolica S.L.

Description: Application of TPW Petersburg, LLC and Gestamp Eolica S.L. for Authorization Pursuant to Section 203 of the Federal Power Act and Request for Confidential Treatment, Expedited Consideration and Waivers.

Filed Date: 11/21/11.

Accession Number: 20111121–5279.

Comments Due: 5 p.m. ET 12/12/11.

Take notice that the Commission received the following electric rate filings:

Docket Numbers: ER11–4674–001.

Applicants: Midwest Independent Transmission System Operator, Inc.

Description: Vectren-IMPA FCA Amendment to be effective 9/29/2011.

Filed Date: 11/21/11.

Accession Number: 20111121–5193.

Comments Due: 5 p.m. ET 12/12/11.

Docket Numbers: ER12–351–001.

Applicants: Midwest Independent Transmission System Operator, Inc.

Description: 11–21–11 MRES Attachment O, GG, and MM Amendment to be effective 1/1/2012.

Filed Date: 11/21/11.

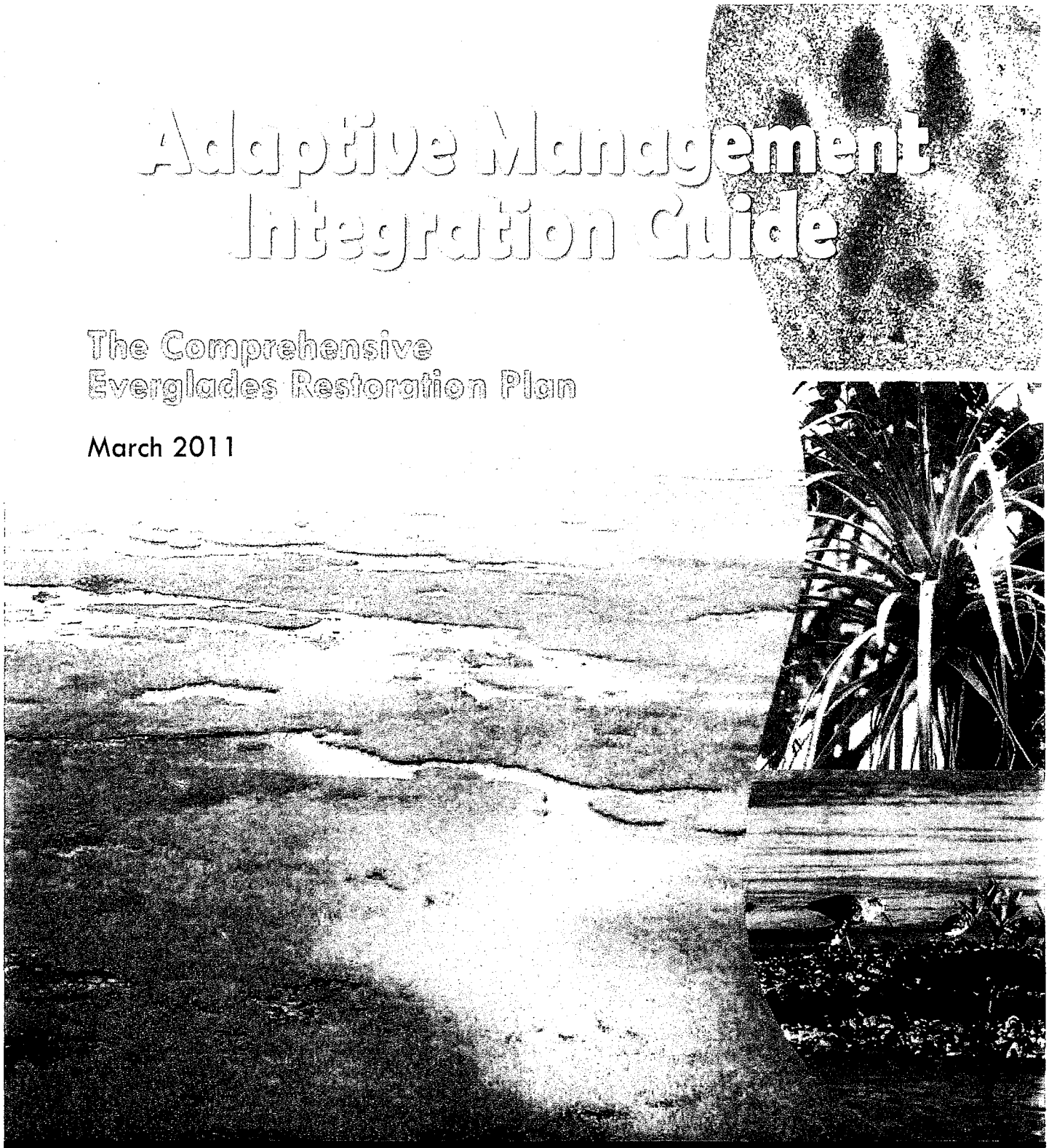
Accession Number: 20111121–5234.

A-1

Adaptive Management Integration Guide

The Comprehensive Everglades Restoration Plan

March 2011



the journey to restore
America's Everglades

A-2

STREAMLINING CENTRAL EVERGLADES PLANNING

Adaptive Management Activity	Inputs CEPP	Outputs CEPP	Decision Maker(s) & How Decisions are Made
Activity 4 – Apply Conceptual Ecological Models, and Develop Hypotheses and Performance Measures	MAP CEMs and hypothesis clusters RECOVER System-wide performance measures and targets including interim goal and targets	RECOVER and PDT: Use CEMs and hypotheses, identify evaluation methods (model tools and performance measures), refine targets ECOSYSTEM SERVICES VALUATION? (ESV)	Program – RECOVER approves CEMs, system-wide hypotheses and performance measures. Project – Hypotheses, models and performance measures approved by DCT.
Activity 5 – Integrate Adaptive Management Principles into Alternative Plan Development and Implementation	Yellow Book and project goals and objectives Uncertainties Hypotheses Performance measures: PER CERP TABLE 5-1 ↓ ESV ↓ BENEFITS ↓ BENEFIT: COST ROI	PDT: project designs to test hypotheses; performance measures to evaluate benefits; develop adaptive management plans that include potential management options matrix and costs; develop project operating manuals. USACE and SFWMD led interagency program teams: develop Comprehensive Plan Modification Report, System Operating Manual, and sequencing plan.	Program – USACE and SFWMD approve Comprehensive Plan Modification Report, Sequencing Plan, System operating manual Project – selected plan and adaptive management plan approved by DCT, JPRB, and USACE & SFWMD
Activity 6 – Monitoring	Management options matrix Performance measures and targets (BENEFITS?) Interim goals/targets CERP TABLE 5-1 GOALS/OBJECTIVES	RECOVER: Update and refine Monitoring and Assessment Plan, identify thresholds and timing (decision criteria) for reporting. PDT: Develop project-level monitoring plan, and identify costs, thresholds, and timing (decision criteria) for reporting.	Program – RECOVER approve MAP changes Project – Project-level monitoring plan and costs approval at DCT, JPRB, USACE & SFWMD

Additional Inputs not limited to these:
To PBCC & WRAC Mar 30, 06; To USACE, 3 Apr
To River of Grass Workshop & SCG, 2009
To GEER Conf '06, '08, '10 as Top 10 need
To SCG, 15, Sept 2010; To UF IFAS , Sept, 2010;
Back to WRAC, Oct 7, 2010; Gov Board, Oct 14, 2010

Environmental Action Committee => Central Everglades Project Planning (CEPP) Stakeholders

June 12, 2002 => Jul, 2010 (GEER) => SCG/WG, Sept 15, 2010=> Oct 7, 2010 => WRAC => Dec 16, CEPP Proj Dev Team
Repeat of an earlier EAC Recommendation, recycled, still a CERP(+)Science Need/gap, now a CEPP Need/Gap!

RECOMMENDED: That a Central Everglades Project Planning (CEPP) Conceptual Ecological Model (CEM) be established as part of the Comprehensive Everglades Restoration Plan (CERP) collection of CEM's:

WHEREAS, The CEMs have been declared the basis for CERP science, identifying stressors, drivers, attributes, cause and effect relationships, gaps in knowledge, and a means to establish CERP needs & requirements;

WHEREAS, CEMs exist for all other major regions of the Greater Everglades Ecosystem to be restored;

WHEREAS, The Central Everglades is part of the South Florida Ecosystem to be restored, and includes Lake Okeechobee, the Loxahatchee River Watershed, the Lake Worth Lagoon Watershed as well as the St Lucie and Indian River Lagoon Watershed, and the historic "River of Grass" that includes the sawgrass plains;

WHEREAS, The Central Everglades Watershed estuaries and the historic "river of grass" need to be given integrated consideration in CERP RECOVER Monitoring and Assessment Plan (MAP) proceedings;

WHEREAS, Without a Central Everglades Watershed CEM – drivers, stressors, and attributes (past, present, and future) will be overlooked; cause and effect relationships with respect to various components will be overlooked as if components, such as the pond apple swamp and sawgrass plains did not exist, and that the absence thereof is having serious negative impacts on CERP Implementation, including the River of Grass workshops per the attached impact analysis; and whereas a CEM serves as a historical reality check.

WHEREAS, Some of the attributes here included a massive pond apple forest south of the lake, which acted as a filter forest as noted in the 2010 Biennial Report; and this is a part of an integrated ecosystem in need of being addressed in the River of Grass (ROG) Workshops.

WHEREAS, The hydrologic continuum must be considered in the Central Everglades Watershed, along with the interdependence among biologic forms on the hydrologic continuum, same as the rest of the South Florida Ecosystem, in terms of habitat and function objectives of CERP Table 5-1 objectives; and;

WHEREAS, Consideration of a Conceptual Ecological Model (CEM) is Activity 4 is a PDT requirement of project development, per the CERP Adaptive Management Integration Guide, pages 13, 14, 16 and D-10.

WHEREAS, It is axiomatic that not addressing what's missing holds no possibility of restoration at all!

SO NOW BE IT HEREBY RECOMMENDED by Stakeholders, that a Central Everglades Planning Project CEM be formulated to provide an integrated approach to restoration of the Central Everglades Watershed Region as well as the integration of this region into the rest of the South Florida Everglades Ecosystem.

Respectfully resubmitted on behalf of Stakeholder Groups including the Arthur R. Marshall Foundation/FEI Science & Technology Committee, and the River of Grass Estuary/Everglades Restoration (ROGER) Group,

John Arthur Marshall

Attachment: Impact Assessment

Additional Inputs not limited to these:
To PBCC & WRAC Mar 30, 06; To USACE, 3 Apr
To River of Grass Workshop & SCG, 2009
To GEER Conf '06, '08, '10 as Top 10 need
To SCG, 15, Sept 2010; To UF IFAS , Sept, 2010;
Back to WRAC, Oct 7, 2010; Gov Board, Oct 14, 2010

MISSING IN ACTION: Central Everglades Planning Project (CEPP) Conceptual Ecological Model (CEM)

IMPACT ASSESSMENT of NO CEPP CEM in the PDT Planning Process

ASSUMPTION: Strategy for the future of the Central Everglades is being generated absent a CEPP CEM.

- Absence of CEPP CEM means environmental impacts of development will be handled out of context of total ecosystem consideration, and the PB County Commission is likely to continue to ignore CERP/CEPP needs & requirements.
- How can the future of the Central Everglades Watershed and a CERP configuration to restore same be fully considered without a CEPP CEM that considers what's missing (attributes) and the need to overcome stressors?

Restoration of Florida's Ancient Forests that previously existed as an *attribute* is not a visible consideration in CERP/CEPP

- Habitat & functional value of 1000's of acres of custard apple south of Lake OK, should be a part of CEPP
- Central Everglades Watershed had more forested wetland acreage than any other region in CERP
- Restoration of forested wetlands meets all CERP Table 5-1 Goals & Objectives, as proposed in ROG Workshop.

Estuary Attributes cannot be fully considered without a CEPP CEM

- Lake Worth Lagoon, Indian River Lagoon, Loxahatchee River being considered as separate watersheds v. interdependent subsystems of the Central Everglades region, i.e., Central Everglades Watershed.

Increasing spatial extent of natural area per CERP Table 5-1, and the ecosystem service value, is not being fully considered.

- Total increase of natural area resulting from CEPP ought to be the primary performance measure, and primary benefit.
- Without a CEM footprint, decreased spatial extent is a possibility due to development pressures
- RECOVER Job 1, Per Monitoring & Assessment Plan, is to measure to what extent CERP Goals & Objectives are met!
- CERP Table 5-1 Goals and Objectives need more consideration

Solution to *Dynamic Storage and Sheet Flow* per CERP Section 2.3.1 has not been fully considered, because lack of sheet flow was not been fully identified as a Central Everglades Watershed stressor, including potential flood control in extreme events, owing to lack of a CEPP CEM

- NAS CROGEE discussion indicated that restoration of flow need can be summarized as a "no-brainer"
- *Dynamic Storage & Sheet Flow* remains the fundamental characteristic of the Everglades, thus it remains the major requirement to achieve Everglades Restoration and flood control, per ROG Workshop objectives.
- Fundamental Flaw in CERP implementation: RECOVER MAP is not fully CERP requirements driven
- Object of CEPP CEM is to identify ecologic and economic needs & requirements for CERP(+)
- CERP Table 5-1 Goals and Objectives need more consideration as the central organizing theme.

SB626 Phosphorous Standard Regression and statements that on 10% of Everglades is impacted does not take the Central Everglades into consideration, i.e., total system view integrated approach remains absent, in absence of CEPP CEM.

- CERP Premise is that Ecosystem should be managed as a whole, i.e., as a watershed.
- Loxahatchee River is > 50% impacted; Watershed maps of the region are inconsistent
- CERP Implementation continues to be managed on the component level, with a bottom up approach.
- TOP-DOWN approach needed, using CERP Table 5-1 goals & objectives as central organizing theme; top-level measures resulting from the CEM ought to start here, but both the CEM and Table 5-1 are missing from the tool box.
- Economic benefits of a restored missing link River of Grass also need consideration as a performance measure

CEPP Stressors and missing attributes must be compensated for, but in absence of CEPP CEM are not fully considered:

- Soil Subsidence; Soil accretion and sustainable agriculture; Development pressures; heavy contaminant sources
- Need for *Dynamic Storage & Sheet Flow* (CERP 2.3.1) to fully restore the system (The *Marshall Plan*, again)

CONCLUSION: In CEPP PDT "***Ecological Evaluation Tools Under Consideration***" – tool box should include:

- CERP TABLE 5-1 Goals & Objectives
- CEPP Conceptual Ecological Model

IMPACT OF NOT INCLUDING THE ABOVE: "C" in CERP is less than 80% comprehensive

CERP TABLE 5-1

[What should be the Central Organizing Theme, Annotated]

GOALS & OBJECTIVES FOR THE C&SF RESTUDY

***[The $20[1] billion dollar+ CERP Promise* (1999)] !**

Is Everglades Restoration headed in this direction? [2]

GOAL 1: Enhance Ecological Values[3];

OBJECTIVES[4]:

- **Increase total spatial extent of natural areas [1.1] ⇔ FLOW**
- **Improve habitat and functional quality [1.2] ⇔ FLOW**
- **Improve native plant & animal species abundance & diversity [1.3][5]**

GOAL 2: Enhance Economic Values & Social Well-Being;

OBJECTIVES:

- **Increase availability of fresh water (agriculture, municipal and industrial) [2.1] [6] ⇔ [(FLOW + WQ) V. (ASR – WQ)]**
- **Reduce flood damages (agricultural and urban) [2.2][7] ⇔ ditto[8]**
- **Provide recreational, navigation opportunities [2.3]**
- **Protect cultural, archeological resources & values [2.4]**

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[1] Does not include O&M costs, including heavy use of fossil fuel. CERP implementation needs to be energy efficient.

[2] From Conceptual Everglades Restoration Plan, CERP SECTION 5.5, page 5-21, "Yellow Book", also "Overview", April, 1999, Page 15 = ***THE PROMISE*!**, per the NEPA/WRDA process; a major deficiency of implementation is that these goals lack full attention. These Goals & Objectives should be the central organizing theme; the absence of same begets more process; process subsumes focus; the result is that confusion and more process is the central organizing theme.

[3] Define Ecosystem Services Value in economic terms, to show total system benefits, relative to cost, for B:C analysis!

[4] Essentially a reiteration of 1993 Science Subgroup Report/1994 USACE Reconnaissance Study plan objectives. (Plan 6)

[5] ***WHERE ARE THE TREES IN CERP?*** Everglades Consolidated Report Peer Review 2003: Forested wetland pilot program needed to calculate P reduction! Consideration for carbon sequestration is not in the current focus.

[6] Objective 2.1 for the environment, implied, is to be covered in programmatic regulations; well, not exactly; Aquifer Storage & Recovery (ASR) does not do much for water quality (WQ), and is being viewed as hi-cost, hi-risk technology.

[7] Ditto, "shared adversity" applies, Tradeoff = buy land with ASR $$$ for "shared prosperity" The Governor's missing link initiative goes in this direction, but, there is no visible B/C analysis of alternatives per CERP Section 7.5.3 yet either!

[8] Bottom Line: BUY LAND & ***GO WITH THE FLOW per the Marshall Plan (1981) to restore the missing link and revitalize the river of grass…!*** For optimum water quantity & quality solutions. The Central Everglades Planning Project (CEPP) appears to be the answer we have been waiting for if executed & measured according to Table 5-1 Objectives.

-----Original Message-----
[redacted]
Sent: Thursday, January 12, 2012 12:03 PM
[redacted]
Subject: Public Comment on Today's CEPP Presentation to the Gov Board

Dear Gov Board members, et al;

As a response to the discussion on Central Everglades Planning Project (CEPP) which I viewed on Webcast, on behalf of the Arthur R. Marshall Foundation, the following comments.

For the ArtMarshall.org this is one of the most important CERP thrusts since CERP 1999. There has been a long standing CERP deficiency of lack of connectivity between Lake O and WCA-3. We call the addition of CEPP, CERP(+).

In previous workshops, the CEPP has been briefed appropriately as an adaptive management "re-adjustment" project based on new information (a wetter Everglades, than was considered in CERP 1999).

The re-connection of Lake O and WCA-3 with a flow-way of some sort is the key to the Art Marshall vision of restoring sheet-flow from the Kissimmee Basin to FL Bay to the extent feasible. We call my late Uncle's vision FULL DECOMP. This also traces back to Plan 6 in the 1994 USACE Recon study, and the 1993 Science Subgroup report.

A CEPP approach also provides much fuller relief of the estuaries, and a possible spill way for heavy storm events, i.e., flood control, a major objective of CERP Table 5-1, discussed in the attached power point.

Using the adaptive management approach as described in the SFWMD 2011 Adaptive Management Integration Guide, we see an opportunity to streamline the CEPP process. We have mentioned this approach in all PDT meetings and workshops thus far. More attention and compliance with the AM protocols are needed in the scoping process and beyond, as amplified in the attached.

As mentioned by one of the commentors, we also see CEPP as an extension of the River of Grass workshops, regarding the need to come up with a configuration to flow clean water south.

We also made a power point presentation on streamline CERP at the recent Everglades Coalition Conference. The presentation is attached for additional consideration.

As mentioned by other EvCo members, we look forward to further participation in the CEPP process, with the same message in the attached.

We very much appreciate the "enhanced public inclusion" in the CEPP process.

Thanks for your consideration, and a read of this comment, which is about three minutes worth, less the attachment.

For the Art Marshall approach, Semper Fi!

John Arthur Marshall, Chairman of the Board, Chair, Science & Technology Committee, Arthur R. Marshall Foundation & Florida Environmental Institute, Inc.
A Hands-on grassroots.org (www.ArtMarshall.org <http://www.artmarshall.org/>) Declaring 2012 the Year of "It's my Everglades, too"

NOTE THE DATES - Busy Start of 2012: Happy New Year Jan 5-8, Everglades Coalition Conference; Jan 7 Breakout Session Jan 13, Science Coordination Group meeting, SFWMD Jan 17-18, Water Supply Summit, Tallahassee Jan 18, Marshall Foundation Canoe River of Grass Expedition begins at the Arthur R. Marshall Lox National Wildlife Refuge Jan 20, Final Comments on Central Everglades Project Scoping process due Jan 25-26, Central Everglades Project Planning Meeting & Workshop, SFWMD Feb 4, Spruce-up At the Arthur R. Marshall Refuge in Prep for Everglade Day Feb 11, Everglades Day at the Arthur R. Marshall Refuge

EVERGLADES RESTORATION: Our Passion! Our Mission! Our Legacy!

1028 N Federal Hwy, Lake Worth, Fl 33460
Phone: 561-233-9004; Fax: 561-233-9989

Classification: UNCLASSIFIED
Caveats: NONE

Sustaining Natural Capital: Protecting Society & the Environment

January 17, 2012

John Arthur Marshall, Arthur R. Marshall Foundation

Presentation to the Everglades Legislative Caucus

Demonstration of an approach & methodology

for

Streamlining Central Everglades Project Planning

based on

Ecosystem Services Value of a Restored River of Grass

What's this all about?

- Problem: Insufficient consideration of economic value of natural capital resources for decision-support requiring trade-offs
- Solution: Calculate the total economic value of natural capital for project decision-makers
  - Use to Streamline Central Everglades Planning Project (CEPP) as a demonstration
  - Legislate State requirements along lines of federal recommendations and peer-reviewed approach

Streamlining CEPP using three essential evaluation tools per PDT* AM protocols

- CEPP Conceptual Ecological Model (CEM)
- CERP Table 5-1 Yellow Book Goals & Objectives
- Ecosystem Services Valuation (ESV) using the Costanza, et al, Synthesis.

*REFERENCE: CERP 2011 ***Adaptive Management Integrated Guide*** protocols (p. 13, 14, 16, D-10) for the Project Delivery Team (PDT); see:

http://www.evergladesplan.org/pm/pm_docs/adaptive_mgmt/062811_am_guide_final.pdf

D-10* AM Activity 4, 5 in Project Development

- Activity 4 requirement: Develop a CEPP CEM
- Establish CEPP valuation measures based on CEM Drivers, Stressors, and Attributes, and
- Activity 5 requirement:
  - *Pursue CERP Table 5-1 goals & objectives* , emphasizing ecological goals, especially first stated objective: *Increase total spatial extent of natural area* (acres)
  - Compare Ecosystem Service Benefits and Costs

CERP Table 5-1 Goals & Objectives

Goal: Enhance Ecologic Values; Objectives:

- **Increase the total spatial extent of natural areas**
- Improve habitat (biomes) and functional quality
- Improve native plant & animal species abundance & diversity

Goal: Enhance Economic Values And Social Well Being

- Increase availability of fresh water (ag/municipal & industrial
- Reduce flood damages (agricultural/urban)
- Provide recreational and navigation opportunities
- Protect cultural and archeological resources and values

CEPP process
<u>Boundaries</u>

Presently Defined as a Wish Bone to connect the head bone with the foot bone via the back bone

Adaptive Management Activity 5 Requirements: Consider Benefits and Costs

Apply Costanza $ynthesis values to get Benefits

- Calculate Ecosystem Service Value (benefits) in terms of $$$ per acre per year based on:
  - Costanza value of $/acre/yr (benefits transfer)
  - Total spatial extent of natural area added (acres)
  - 40 year CERP life-cycle (conservative)
- Notional example ($40 billion in benefits based on avg value)

  ESV = $10,000/Acre/yr x 100,000 acres x 40 yrs = $40 Billion
- Compare Benefits to Cost (B:C) for return on investment decision-support; 6:1 is conservative

ESV Demonstration by 2010 Summer Interns

- The Colorful Slides are theirs
- Also presented previously
  - Poster paper at the 2010 GEER Conference
  - Presentation at the 2011 & 2012 EvCo Conference
  - Presentation to FGCU Sustainability class
- Here it comes again with credible ”peer review” as the means to streamline the CEPP Process with $ynthesis that all can understand

Everglades Coalition Conference, January 7, 2011; Weston, FL

- The Honorable Rock Salt, Deputy Assistant Secretary of the Army (Civil Works):
  - *From what I have seen in my travels, your 2010 Interns came up with the best illustration of how Ecosystem Services Valuation [ESV] should be applied of any I have seen.*
    - *Secretary Salt has attended and spoken at A Conference on Ecosystem Services (ACES) in 2008 and 2010, and is on the White House Committee inducting an ESV approach as a matter of national policy.*

Valuing Ecosystem Services of a Restored "River of Grass"

GEER 2010: *Ecosystem Services Valuation as a Method to Guide Future Planning, Policy, and Science*

WRAC Meeting: July 8, 2010

Arthur R. Marshall Foundation Summer Interns:
Angelique Giraud, Ed Pritchard, Dylan Scott, Adrienne Smith, Jim Wally

The Honorable Rock Salt gives the 2010 Summer Intern Team a thumb's up on their ESV "How-to-do-it" Demonstration Project!

Introduction

- Valuing ecosystem services = ESV is an aid to environmental decision-making
- Six configurations are from ROG stakeholders
- Analysis uses Costanza, et al, synthesis of planetary ecosystem services value with benefits in terms of $$$ per acre per year
- Benefit-to-cost (B:C) ratios are indicators of optimum value

Features	Annual Value ac ($ $ac^{-1}yr^{-1}$)
STA	$8,643
Deep Water Reservoir	$6,590
Flow-Way	$10,499
Forested Wetland	$11,470

Table 3. The annual economic value of features in $ $ac^{-1}yr^{-1}$.

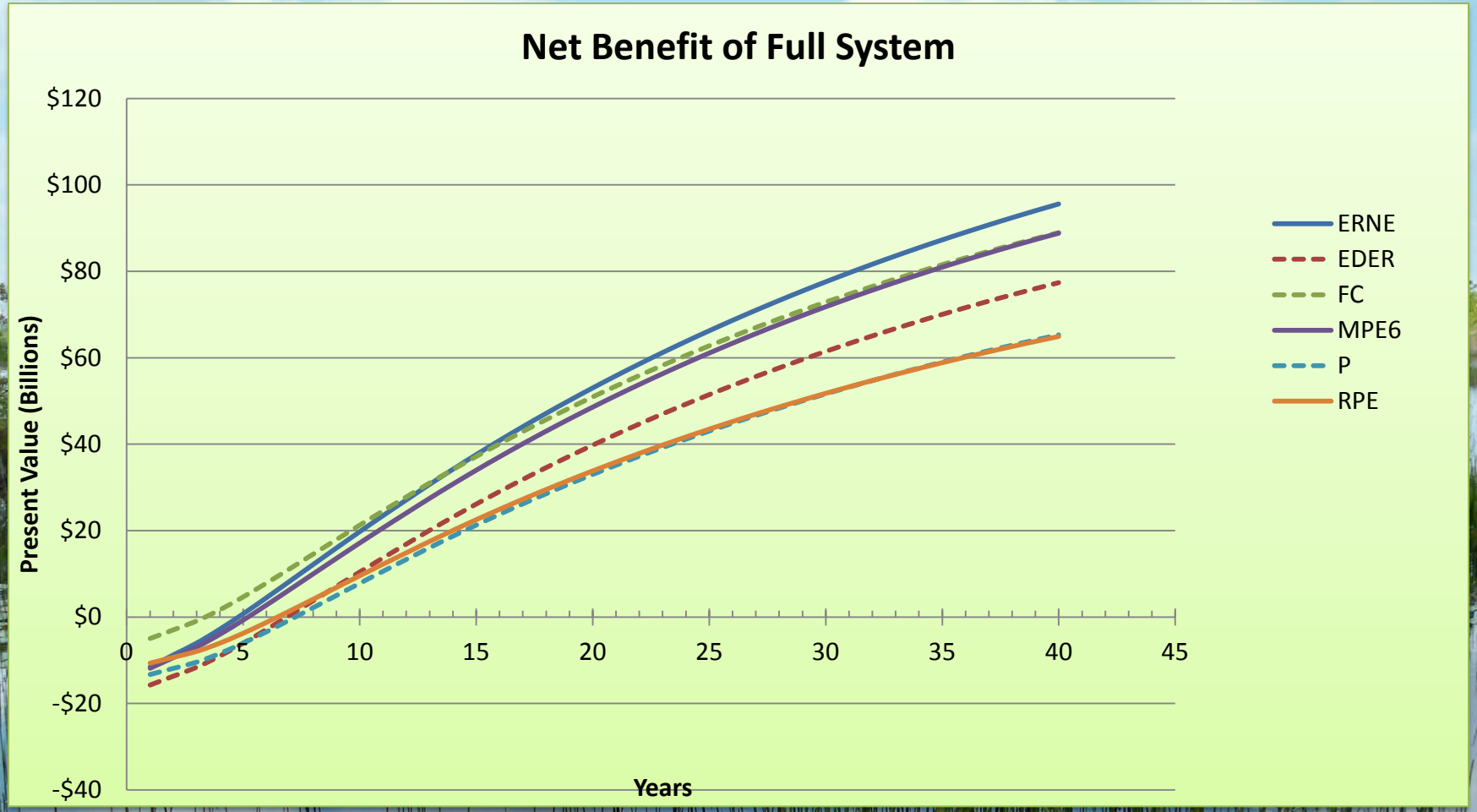


Figure 3. Net benefit of "river of grass" including benefits to estuaries. The Everglades River of Grass Northern Expansion (ERNE) configuration provides the estuaries with the greatest ecosystem benefit. EDER=ERDC

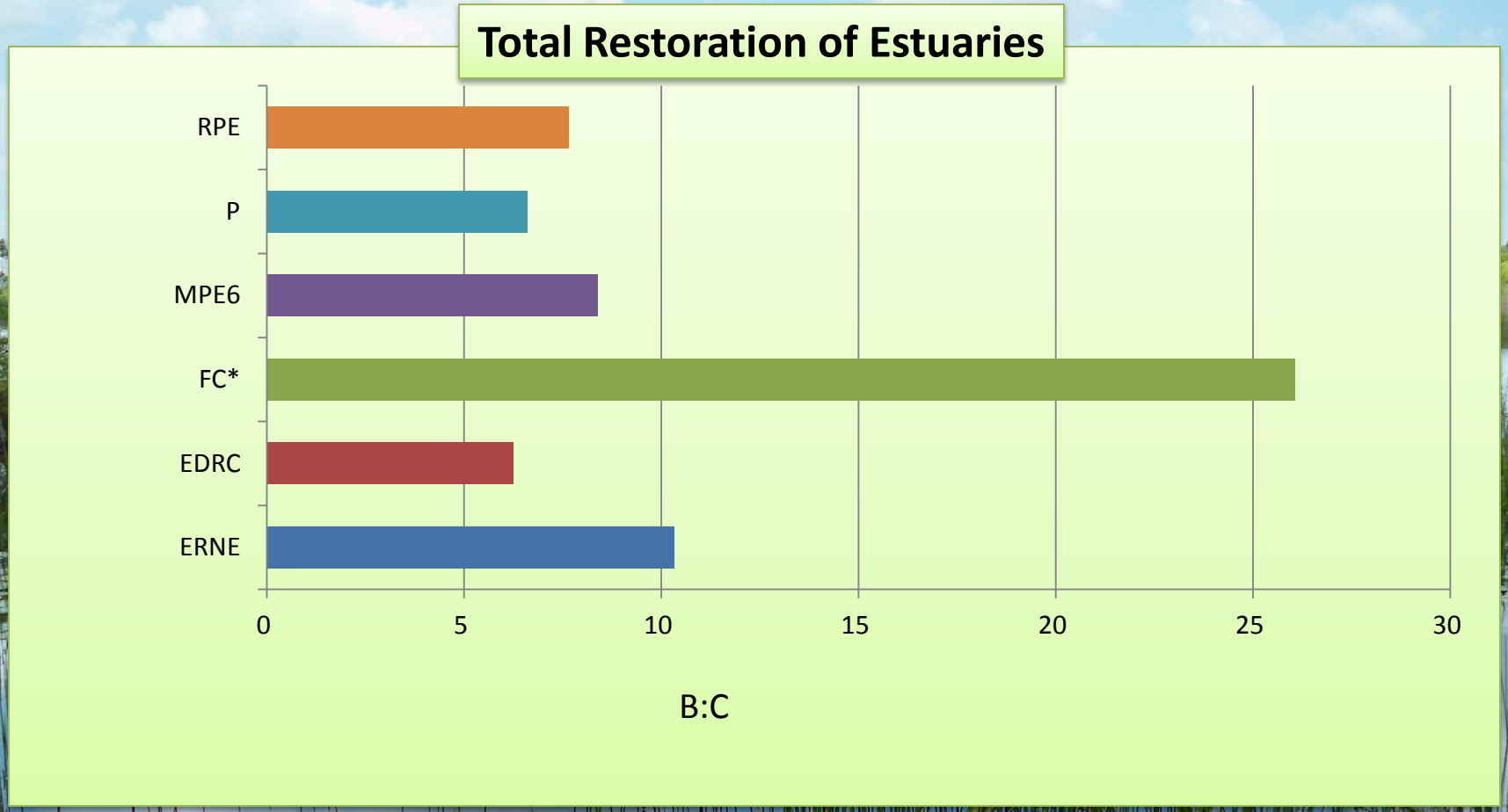


Figure 4. The benefit-to-cost ratio of configurations for the total restoration of affected estuaries. *Florida Crystals (FC) has the highest B:C ratio due to the absence of a deep water reservoir, resulting in a low capital and O&M cost.

Benefits Transfer Pro's and Con's

- First the bad news: BT is controversial because not every biome (ecosystem) type is the same, locally. Alternative analysis is data and modeling intensive incurring significant time and costs; may result in more BT than using the Costanza Synthesis
- Now the good news: BT using the Costanza Synthesis can be done in weeks v. years; meets ***quicker, better, cheaper*** method needed for a streamlined approach, close enough for Govt Work, perfect being the enemy of good enough.

Final Points

- Numerous NGO studies and robust B:C ratios > 6:1 indicate viability of Ecosystem Services Valuation for better decision-support, understandable by Office of Management & Budget, Congress and the Public
- When ecosystem services are not given a dollar value, the default value is zero (NRC 2005);
  - Does this place policy of *no net loss of wetlands* at risk?
- CEPP implementers should adopt the ESV approach and make the Everglades restoration Total Economic Value calculation an example to follow.
  - **Take-Home Assignment: Pester CERP *principals* to do so!**

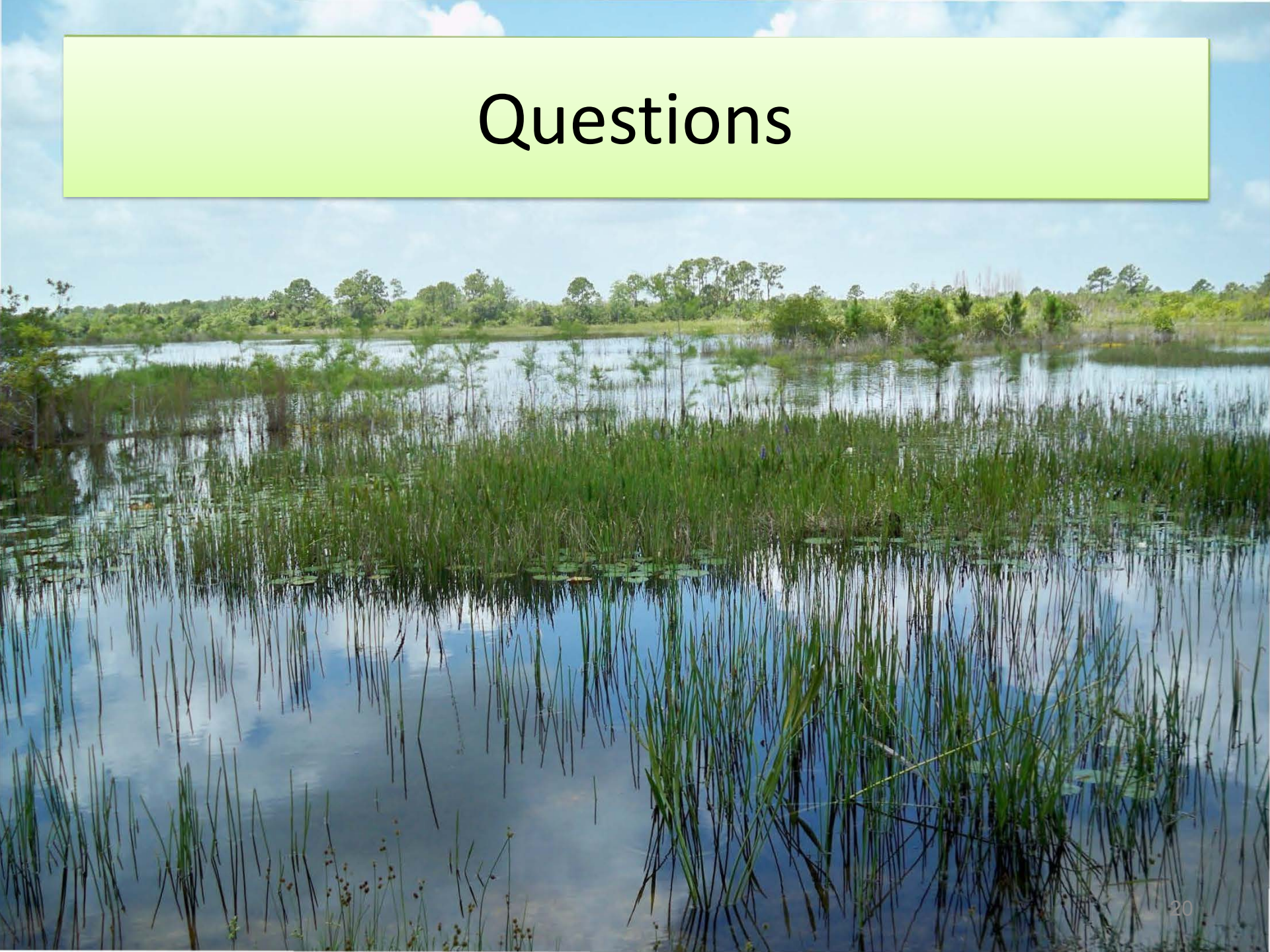
On Benefit:Cost Ratios

- A notional average is a conservative B:C = 6:1
- When the Ecosystem is given back to nature to the max, Florida Crystals Corp has calculated that the B:C approaches 26:1
- In calculating the ESV of the EH NWR, based on maximum preservation at minimum cost, B:C ratios may approach 100:1.
  - Literature confirms; See Wakefield on Costanza: http://www.uvm.edu/research/?Page=news&storyID=1153&category=uvmresearch

PRIMARY REFERENCES

- White House Report, July, 2011: Sustaining Natural Capitol – Protecting Society and the Economy http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_sustaining_environmental_capital_report.pdf
- Costanza, et al, Report on value of the planet's 18 biomes; Google ***Nature 387***, or http://www.uvm.edu/giee/publications/Nature_Paper.pdf
- Valuing Ecosystem Services – *Towards Better Environmental Decision-making*, NRC 2005; See http://www.nap.edu/catalog.php?record_id=11139
- For Additional information and more references:
  - Go to www.ArtMarshall.org; Contact JAMinfo@AOL.com
  - See: http://www.palmbeachpost.com/opinion/letters/return-on-saving-everglades-90-billion-883668.html?cxtype=ynews_rss

Questions



Gators are an Indicator Species!

Go Gators!

Ralph, Gina P SAJ

From: [redacted]
Sent: Friday, January 20, 2012 12:03 PM
To: [redacted]
Cc: [redacted]
Subject: Public Comments on Central Everglades Planning Project (CEPP) Scoping
Attachments: StreamliningCEPP-ELC-17 Jan.ppt

Dear CEPP Project Delivery Team, et al;

On behalf of the Arthur R. Marshall Foundation and Florida Environmental Institute, we are most pleased to participate in CEPP enhanced public involvement by submitting the following comments on the CEPP scoping process.

The following five points are essentially the same points we made at the PDT webinar, Dec 22, 2011. These comments appear to remain applicable, given the Science Coordination Group (SCG) meeting Jan 13, 2012, regarding CEPP Agenda item comments. The attached power point program encapsulates comments we made at the SCG meeting, and relates to the five comments that follow.

1. Scoping should include more focus on CERP Table 5-1 Goals & Objections (pointing out what was now on the Conference Room Table). It seems like such focus would go a long way in meeting Susan Markley's concerns, also Laura Brant's concern about ecological considerations. Table 5-1 is still not in any of the written material / presentations other than what has been put on the conference table.

2. The top level performance measure being considered by the CEPP scoping process per Table 5-1 objective 1 ought to be total increase in acres, of increase in total spatial extent of natural area. This would allow engagement of the Costanza Synthesis.

3. Before the presentations, I was going to ask how or what habitat units are assigned to various biomes [Stormwater Treatment areas; Ridge & Slough landscapes, flow-way for sheetflow; forested wetlands; reservoirs, etc.]. After the HU presentation, I think I am starting to get it. [More on this in next comments below].

4. There is a lot of fuzziness about the CEPP boundaries (physical and fiscal). A regional CEM might sort out some of the fuzziness by establishing CEPP geographic boundary limits [consistent where CEPP construction costs will be incurred], while considering cause-effect

upstream/down stream relationships [i.e., considering connectivity where all things are connected].

5. Weighting methods are most times argumentative. The HU weighting scheme may prove difficult to explain to the public [and decision makers]. While the HU approach may justify alternative selection [as stated earlier], it does not monetize the ecological benefits such that the benefits can be compared to costs [as the means to get to return on investment] for decision makers. On Fred Sklar's comment: That the Everglades is more complex, is an indication that a better approach to Synthesis is needed, understandable by OMB, Congress, and the public, and especially the National Research Council CERP Peer Review Panel.

Regarding using an ESV approach, SFWMD economist Ian Miller has been looking at the ESV Approach, per a brief to our Summer Interns. Given that the HU approach includes acreage we will have our 2012 Summer Interns make another pass as demonstrating the ESV approach, same as the analysis we did for the ROG workshops.

P.S. We plan on presenting our CEPP Streamlining approach at the Everglades Coalition Conference, and have submitted an abstract to present the same approach at the GEER/INTERCOL Conference in June.

As noted above, we presented our Streamlining CEPP approach as a power point program in the Everglades Coalition Conference Breakout session titled: Sustaining Natural Capital Protecting Society and the Economy. At the invitation of the Florida Everglades Legislative Caucus (ELC), we also presented essentially the same program, to the first ELC meeting in Tallahassee, Jan 17, 2012. The Streamlining CEPP power point is attached as amplification of the Arthur R. Marshall Foundation position on Streamlining CERP/CEPP using adaptive management protocols as defined in the 2011 Adaptive Management Integration Guide.

Thanks for your consideration. We look forward to continued discussion at future CEPP PDT meetings and workshops.

Finally, as a matter of considerable public interest in CEPP and enhanced publc involvement policy, we requested that the National Research Council CERP Peer Review Panel webcast their Jan 26, 2012 open meeting regarding CEPP presentations and considerations. Apparently this is beyond current NRC logistics, but would be much appreciated in the future, for meetings at remote locations, as is done by the SFWMD.

Respectfully Submitted,

John Arthur Marshall, Chairman of the Board, Chair, Science & Technology Committee, Arthur R. Marshall Foundation & Florida Environmental Institute, Inc.

A Hands-on grassroots.org (www.ArtMarshall.org <http://www.artmarshall.org/>) Declaring 2012 the Year of "It's my Everglades, too"

NOTE THE DATES OF BREAKING EVENTS;
Jan 5-8, Everglades Coalition Conference; Jan 7 Breakout Session Jan 13, Science Coordination Group meeting, SFWMD Jan 17, Everglades Legislative Caucus meeting, Capital, State of Florida Jan 17-18, Everglades Foundation Water Supply Summit, Tallahassee (Very Well done!)

Jan 18, Marshall Foundation Canoe River of Grass Expedition begins at the Arthur R. Marshall Lox National Wildlife Refuge; tune in at 8 AM Jan 20, 23 and 10AM Jan 24 for finale, at <http://breeze.palmbeach.k12.fl.us/riverofgrass2012/>
http://breeze.palmbeach.k12.fl.us/riverofgrass2012/

Jan 20, Final Comments on Central Everglades Project Scoping process due Jan 25, Central Everglades Project Planning Meeting & Workshop, SFWMD webcast Jan 26, National Research Council Peer Review Panel to review CEPP process, Wash, DC Jan 31, Central Everglades Project Planing Meeting & Workshop, Local Govt, SFWMD Feb 4, Spruce-up At the Arthur R. Marshall Refuge in Prep for Everglade Day Feb 11, Everglades Day at the Arthur R. Marshall Refuge

EVERGLADES RESTORATION: Our Passion! Our Mission! Our Legacy!

1028 N Federal Hwy, Lake Worth, Fl 33460
Phone: 561-233-9004; Fax: 561-233-9989

Ralph, Gina P SAJ

From: mike xxxxxxxxx[redacted]
Sent: Thursday, December 15, 2011 7:32 PM
To: CEPPComments, SAJ
Subject: Suggestions

Hello,

I attended the meeting last nite in Plantation and found it very positive and informative. Id like to add a few comments and suggestions.

Im a native Miamian and my dad as well. He was born in Miami in 1940. He can remember when the Miami River had rapids and 27th Ave was the last paved road to the west. He also remembers fishing in the glades and knows very well he had fished in spots that no one had ever stepped foot at before. He was a boy scout and as a kid would camp behing Long Pine Key campground in Everglades National Park. He grew up poor and became an AC repairman. He loved the outdoors and is one of the best self made south florida naturalists I know. He was also a vice president of the Tropical Audubon Society in the late 70s. WE LOVE THE ENVIRONMENT and nature in general. We dont hunt but we do fish and are active birders. My parent owned cheap property in the Big Cypress years ago (for pennies) and had to sell it to the oil companies about 20 yrs ago.

I went to FIU and received an Environmental Studies degree. I became a naturalist for Dade County Parks and currently work for the City of Ft Lauderdale. My family thinks that protecting the one and only glades for generations to come, after having lost a majority of it already, is the most important thing Florida can do. The Army Corps has already crippled the glades and they owe it to us to repair what they can. Over population has cleared almost all the pinelands and tainted our waters with mercury (why we stopped fishing in the glades 25 yrs ago). The water situation has caused havoc with the wood storks in Corkscrew and caused mercury levels in panthers and gators to be over the top.

THERE IS ONE EVERGLADES. THATS IT! We believe a few very important points are vital to the glades health. #1,The Urban Development Boundary Dade Co. must remain where it is.#2, The dike around the Lake will NOT break free as proposed by people. A waste of money to repair. It isnt the ocean, and even a severe 'cane wont provide waves like it would in an ocean! New Orleans simply caused this panic! The rim canal would barely be affected. Its a ridiculous notion! I bring this up because of the wasteful funds it could use up.#3, we dont want TOO much water where there shouldnt be much and vice versa! land animals need dry land! #4, the "glades people" although very important, may have to adapt IF this affects them negatively! A few people, although very important, sometimes hve to sacrifice livelihood for the greater good of something greater...THE GLADES AND EARTH'S FUTURE! #5, Im hoping, having worked there, that Arch Creek, one of only a few natural rivers left, and of extreme historical significance, can once again flow! Its stagnant still, last I heard, and this should be of utmost importance- to let it flow again...its a polluted mess! It would bring a lot of happiness and add a little touch of personality to the CERP program!

Thanks! I wrote this in a hurry but I hope our points have been made and will be taken into consideration. We generally support what the Sierra Club, Audubon, and Friends of the Everglades support.

We need to speak for the things that can speak for themselves and this is one of those cases! ONE EVERGLADES...ITS OUR WATCH. DO IT RIGHT!

I once met Marjorie Stoneman Douglas...I hope if shes looking down that shes proud of me for sticking up for her (and our native indian's) baby!

Sincerely,

Michael Pafford

Ralph, Gina P SAJ

From: mike xxxxxxxxx[redacted]
Sent: Monday, December 19, 2011 7:50 AM
To: CEPPComments, SAJ
Subject: Glades plans

One more thing: how will the Cape Sable Sparrow fare?
Thanks again,
Mike

Miccosukee Tribe of Indians
of Florida

Business Council Members
Colley Billie, Chairman

Jasper Nelson, Ass't. Chairman
Jerry L. Cypress, Treasurer

Andrew Bert Sr., Secretary
William M. Osceola, Lawmaker

January 20, 2012

Colonel Alfred Pantano (Alfred.A.Pantano@usace.army.mil)
United States Army Corps of Engineers
701 San Marco Blvd.
The Prudential Building
Jacksonville, Florida 32207-8175

Via E-Mail and Express Mail

Re: Comments by the Miccosukee Tribe of Indians of Florida on the NEPA Scoping for the Central Everglades Planning Project (CEPP)

Attention: Dr. Gina Paduano Ralph at CEPPComments@usace.army.mil

Dear Colonel Pantano:

Enclosed, please find the official comments of the Miccosukee Tribe of Indians of Florida in response to your request regarding scoping for the Central Everglades Planning Project (CEPP) under the National Environmental Policy Act (NEPA).

For over 13 years, allegedly to protect the Cape Sable seaside sparrow, discriminatory water management actions have flooded and degraded hundreds of thousands of acres of Tribal Everglades in Water Conservation Area 3A that are vital to the culture and way of life of the Tribe. The high water levels caused by these actions also posed a threat to the health and safety of the Miccosukee community and brought the Snail Kite to the verge of extinction. Sadly, a vast area of the Everglades, which the government promised to preserve in a natural state *in perpetuity* for the Tribe, has been severely degraded.

Based upon our experts' review of the Corps' selected plan for the Everglades Restoration Transition Plan (ERTP) as presented in your recently released Final Environmental Impact Statement dated March 4, 2011, the Tribe is cautiously optimistic that the ERTP should begin to alleviate some of the harm in Water Conservation Area 3A caused by more than a decade of discriminatory water management actions. In addition, the Corps has an opportunity under the Combined Operational Plan for the Modified Water Deliveries and C-111 projects to move Everglades Restoration even further ahead. While this plan has yet to be developed, a water management plan that moves us farther toward

P.O. Box 440021, Tamiami Station, Miami, Florida 33144, (305) 223-8380, fax (305) 223-1011
Constitution Approved by the Secretary of the Interior, January 11, 1962

restoration would make significant strides in protecting the Miccosukee culture and cultural resources once implemented.

Now, the Corps is proposing the Central Everglades Planning Project to develop a plan for a suite of projects in the Central Everglades to prepare for Congressional authorization as Comprehensive Everglades Restoration Plan (CERP). As you know, the Tribe has long raised concerns that vital restoration projects were being delayed and that the Central Everglades was being left out of the CERP process. Therefore, the Tribe is pleased to see an emphasis on projects for the central Everglades, which is the Tribe's traditional homeland. The Tribe, which has participated in more than twenty years of restoration planning, is concerned that to date no CERP projects that would benefit the Central Everglades, including Tribal lands, have been built. The Tribe is hopeful that the CEPP process will not turn into yet another planning process that produces no restoration results. In addition, care must be taken to ensure that projects are designed and implemented in such a way that they follow all applicable law. Finally, any so-called "new science" must not be used to attempt to justify sacrificing the Tribal Everglades in WCA-3A for the Park downstream. Thus, we believe it is very important that you sincerely consider, and adequately address, during your NEPA process, all the issues and concerns that have been identified by our experts if you are to actually achieve success.

As always, the Tribe expects that all agencies not only comply with all federal environmental statutes, but also with their Trust Responsibility to the Miccosukee people.

Finally, the Tribe hopes that the plan that is devised will treat all parts of the Everglades, and all species, equally and will only deliver water that is clean. Only by protecting all parts of the Everglades equally, and delivering clean water, will the goal of Everglades Restoration be achieved.

Sincerely,

Colley Billie
Chairman

MEMORANDUM

TO: Chairman Colley Billie
Miccosukee Tribe of Indians of Florida

FROM: Mr. James Erskine, Acting Miccosukee Water Resources Director; Mr. Rory Feeney, Miccosukee Wildlife Director; Col. (Ret'd) Terry L. Rice, PhD, PE; Ms. Joette Lorion, Environmental Consultant

DATE: January 13, 2012

SUBJECT: Identification of Issues and Concerns to Be Addressed in the Central Everglades Planning Project ("CEPP") National Environmental Policy Act ("NEPA") Document Proposed by the US Army Corps of Engineers.

The following memorandum includes our expert analyses of the issues and concerns that the Army Corps of Engineers ("Corps") should address in the National Environmental Policy Act ("NEPA") document that the Corps plans to prepare related to the Central Everglades Planning Project ("CEPP"). The Notice of Intent to prepare an Environmental Impact Statement ("EIS") for CEPP was issued in the Federal Register on December 2, 2011. A Public Notice sent by the Corps stated that: "Public comments on the Central Everglades Planning Project are being accepted through January 20, 2012. Thus, we recommend that this memorandum be submitted to the U.S. Army Corps of Engineers on or before January 20, 2012, as the Miccosukee Tribe's issues and concerns.

Background: Beginning as early as the 1880s, humans began modifying the natural hydrology of South Florida and the Everglades. Over the years, anthropogenic changes have, among other things, removed areas from the natural system, caused some areas to flood while others are dried out, and, in general, stopped the natural flow of water through the Greater Everglades Ecosystem.

Finally in 1989, the U.S. Congress directed the U.S. Army Corps of Engineers to begin the restoration of flows through the Everglades "to the extent practicable" in Public Law 101-229, the Everglades National Park Protection and Expansion Act, which authorized the Modified Water Deliveries ("MWD") project. The February 1991 Environmental Impact Statement ("EIS") on the MWD project stated that the Everglades National Park Protection and Expansion Act authorized construction of the project based on "the environmental benefits to be derived by the Everglades ecosystem in general and by the park in the particular." EIS at 3. The 1992 Final EIS promised that the project would benefit approximately 100,000 acres of wetlands in NESR, 600,000 acres of wetlands in WCA-3, and 200,000 acres within the Shark River Slough Basin of the Park. FEIS at EIS-32. The expectation of Congress was that this project would be completed

by approximately 1997. Despite a Government Accountability Office ("GAO") Report and Congressional hearings on the delay of the MWD project, it is now 2013 and the Corps is still years away from total completion given the original scope of the project.

On a parallel track with the MWD project, the Corps agreed to modify C-111 South Dade components of the Central and South Florida project ("C&SF") in order to restore flows through Taylor Slough, which eventually enter Florida Bay. As with the MWD project, the C-111 modifications have been in the works for over two decades without being completed. The completion of both the MWD and C-111 projects, and an operational plan to implement them, are extremely important to the Miccosukee Tribe. This is primarily because they will permit increased water to move south through the historic flow path of the Everglades, thus relieving Tribal land in WCA 3A north of Tamiami Trail from unnatural inundation and ongoing, irreversible destruction.

While these two projects were being planned and implemented at a snail's pace, the Fish and Wildlife Service ("FWS") declared jeopardy on the Cape Sable seaside sparrow ("the Sparrow") in 1997 under the provisions of the Endangered Species Act ("ESA"). The draconian and discriminatory water management changes, which the Corps made at the behest of the FWS, further exacerbated the flooding of Tribal land. The Corps began with emergency deviations in December 1997, and followed these with the Interim Structural and Operational Plan ("ISOP") in 1999, and the Interim Operational Plan ("IOP") in 2002; each made the flooding of Tribal land progressively worse. As preposterous as it sounds, all of these operational plans moved the Everglades further away from the restoration and have not helped the "Sparrow."

In 2003, the Corps began planning operational rules for the day that the MWD and C-111 projects would be completed. This effort was dubbed the Combined Structural and Operational Plan ("CSOP"). Tribal representatives participated in more than 22 meetings of a CSOP advisory team formed by the Task Force under the mistaken assumption that all the interests actually supported the goal of finally operating these projects in a manner that would begin the restoration process. After four years of intensive work on the part of many, to include the Tribe's representatives, and a consensus agreement on the part of a large majority of participants, the Corps abandoned the CSOP effort. ENP, with the support of their environmental allies, refused to support the plan for clearly unjustifiable reasons, including that the proposed Alternative 5R would allegedly harm the western "Sparrow" subpopulation A. As discussed herein, this issue is both a red herring and contrary to Everglades restoration.

In reality, the CSOP hydrologic modeling had revealed the obvious: The implementation of the MWD project and more natural flows would make the "Sparrow" habitat south of the Miccosukee Reserved Area ("MRA"), which has been unnaturally dried out since 1997, much wetter. This revelation was in diametric opposition to the FWS demands to artificially dry this area out over the past 13 years. The dilemma that the Tribe had realized and expounded for years, was now front and center; water managers could either continue to 1) unnaturally dry out the western side of the Park or 2) restore the area … not both.

During this same period, the FWS was responding to a lawsuit which required the Service to consider this area for designation as "critical habitat" under the provisions of the ESA. If this area was in fact designated "critical habitat," then it would have to be unnaturally dried out forever, and Everglades restoration would be permanently blocked. Based primarily on the Tribe's technical and scientific arguments, along with the Corps' modeling, the FWS rejected the establishment of this area as "critical habitat." The FWS was challenged in Federal Court, but, again, due to the Tribe's support in that case, the Judge upheld the FWS decision to not establish "critical habitat" and to permit Everglades restoration to move forward. The only question that remains now is when does the Corps start allowing more flows into this area, including through the S-12 gates under the contemplated Combined Operational Plan ("COP"), and eventually CERP, so that restoration can in fact commence both north and south of Tamiami Trail?

In 2010, after 13 years of discriminatory water management actions, purportedly for the "Sparrow," the Corps finally listened to two major points the Miccosukee Tribe had been making for years regarding these operations: 1) WCA 3A was being severely impacted by IOP and the previous "Sparrow" operations, as evidenced by the destruction that had been experienced, which is highlighted by the continuing loss of tree islands, the plummeting of the snail kite population from over 3,500 birds in 2000 to less than 700 in 2008, and the conversion of Everglades marsh habitat into a shallow lake, and 2) by far the most important, the "health and safety" of the Miccosukee Tribe was being threatened by operating WCA 3A at water levels well above its design specifications. This recognition by the Corps stemmed from the Tribe's Equal Protection lawsuit in which Tribal members and representatives, to include Chairman Colley Billie, gave testimony and resulted in the Corps' development of the Everglades Restoration Transition Plan ("ERTP"). As a result, the Corps issued a Final Environmental Impact Statement ("FEIS") in December of 2011, which proposed major changes to address the "health and safety" of the Tribe and the high water in WCA 3A. If the ERTP is finally implemented as proposed in the FEIS, the Tribe may finally be provided some relief from the damaging, discriminatory water management actions that have been going on for over 13 years.

In June 22, 2011, while the ERTP was in process, the Tribe provided NEPA scoping comments on the Combined Operational Plan ("COP"), which is the new acronym that replaced CSOP for the (CSOP operational plan that will be implemented once the construction of the MWD and C-111 projects is completed, which was once called CSOP. The COP will replace the ERTP when completed. If the Issues/Concerns that were provided to the Corps by the Tribe are adequately addressed, the COP has the potential of providing even more benefits for the Everglades and Tribe than the proposed ERTP promises to accomplish. However, since the COP has yet to be developed, and structures still need to be constructed, that remains to be seen.

In October 2011, with some CERP projects having been abandoned and others seriously delayed, the Corps and other announced yet another new planning effort to push forward certain central Everglades components of CERP. Yet another acronym was created and the Central Everglades Planning Project (CEPP) was announced with great fanfare. To date, the details of CEPP are

limited to power points, "fact" sheets, letters and a Federal Register Notice. The Federal Register Notice states that the goal of the CEPP effort is "to develop an integrated, comprehensive technical plan, including the first increment of projects, for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem." It identifies the CERP components that are included as the following projects: Everglades Agricultural Area Storage Reservoirs; Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement; Everglades National Park Seepage Management; and Everglades Rain Driven Operations. According to a Corps fact sheet, "The goal of the Central Everglades Planning Project is to deliver within two years a finalized plan, known as a Project Implementation Report, for a suite of restoration projects in the central Everglades to prepare for Congressional authorization as part of the Comprehensive Everglades Restoration Plan (CERP)." It is difficult to discern from the scanty information whether CEPP will be just another endless planning effort or projects will actually be built.

The statement in the Federal Register Notice that, "Since 2000 much progress has been made," is highly misleading. Nothing could be farther from the reality of missed deadlines and abandoned projects. The Tribe has been contending for almost a decade that projects were being seriously delayed, and that the "heart of the Everglades," including Tribal Everglades, was being left out of CERP. Even the Committee on Independent Scientific Review of everglades Progress (CISRERP) echoed the Tribe's concerns. In its 2006 Biennial Review, CISRERP found that important projects necessary to re-establish sheet flow in the Everglades are, ***"far behind the original schedule."*** It further recognized that, ***"anticipated restoration progress in the Water Conservation Areas and Everglades National Park appears to be lagging behind the production of natural system benefits in other parts of the Everglades."*** The 2008 Biennial Review warned that, ***"Ongoing delay to South Florida ecosystem restoration not only has postponed improvements to the hydrological condition but also has allowed ecological decline to continue."*** The Review concluded that, ***"It's too early to evaluate the response of the ecosystem to CERP Projects because none have been implemented."*** It is disingenuous based on reality for the Corps to attempt to fool the public into thinking that "much progress has been made" or that it is expediting projects that have been seriously delayed.

While the Tribe is pleased to see after all these years that there is finally a focus on creating a plan to move projects for the Central Everglades forward, it remains to be seen whether CEPP will be yet another new acronym for yet another endless planning effort or whether projects to restore the Central Everglades will actually be built. The Tribe, whose entire culture and way of life depends on a healthy Everglades ecosystem has long sought for its traditional homeland to be restored. Yet, the Tribe cannot help but have any optimism that it might have tempered by the many plans that it has worked on for so many years, only to see them cast aside when politics intervened. In the Tribe's experience, it remains to be seen whether projects necessary to restore the "heart of the Everglades" will ever be authorized and implemented. Moreover, depending on how the plan is designed, and implemented, the CEPP could either benefit or harm Tribal lands and interests in the Everglades, especially since the State failed to meet the December 31, 2006

deadline to meet water quality standards in the Everglades Protection Area. Thus, the following comments are provided in response to a Public Notice by the Corps requesting scoping comments and must be addressed in the CEPP NEPA process.

Miccosukee Tribe Issues/Concerns
That Must Be Addressed in the NEPA Process Include:

- **An EIS Is Required:** The CEPP formulation and implementation will have "*a significant impact on the human environment.*" Therefore, **the document that is required to be prepared by the Corps under the National Environmental Policy Act ("NEPA") must be an Environmental Impact Statement ("EIS").**

- **All Applicable Law Must be Followed:** While the Tribe is not opposed to the significantly delayed CERP process becoming more efficient, it is opposed to any streamlining that comes at the expense of compliance with all applicable laws. As always, the Tribe expects the Corps to comply with the National Environmental Policy Act ("NEPA"), the Endangered Species Act ("ESA"), the Federal Advisory Committee Act ("FACA"), the Clean Water Act, the U.S. Constitution, the Corps' Trust responsibility to the Tribe, and all other applicable laws.

- **ERTP, Not IOP, Should Be the Base Condition:** The Corps concluded in the Final Environmental Impact Statement (FEIS) on the Everglades Restoration Transition Plan ("ERTP") that, due to safety and endangered species concerns, that "IOP is no longer a viable option" for water management within WCA-3A and the South Dade Conveyance System." ERTP FEIS at xiii. The Corps argued when it stopped using the Test 7 operational plan as a base condition in the EIS process that it could no longer be used because it was contrary to the ESA. Similarly here, the Corps cannot rely on IOP as the base condition for CEPP in the NEPA process, because it is not viable. In addition, the ERTP should be replacing IOP in the very near future and prior to any NEPA document being produced.

- **Ensure No Adverse Impacts to Miccosukee Tribe Culture & Cultural Resources:** Corps' analysis and planning often do not adequately take into consideration the impacts of Corps project operations on the Miccosukee Tribe's Culture and Cultural Resources, before most projects/actions are authorized for implementation. **The Corps must perform a comprehensive review of all potential adverse impacts of all proposed actions under the CEPP on the Miccosukee Tribe's Culture and Cultural Resources in the action area, which includes WCA-3 and the Park, and ensure that any adverse impacts are eliminated prior to implementation of the selected alternative. Certainly, the assurance of the "health and safety" of the Tribe must be paramount.**

- **Must Produce Benefits for Tribal Lands in WCA 3A:** The CEPP process should incorporate a revised WCA-3A regulation schedule targeted at the restoration of the entire central Everglades that incorporates a multispecies management approach building upon what was achieved with the ERTP and hopefully will be achieved under COP. Any regulation scheduled developed in the CEPP process must provide restoration of the Tribal Everglades in

WCA-3A, as well as the Park. The Corps must be careful during the NEPA process not to succumb to unreasonable demands by the Park, or any other interests, to provide more water than the CEPP can reasonably deliver without sacrificing other areas of the Everglades, such as the Tribal Everglades in WCA-3A. **The pursuit of the unnecessary, unreasonable, and impossible often prevents the achievable.** The Tribal Everglades must benefit from CEPP.

- **CEPP Must Decrease WCA 3A Flooding:** WCA-3A water levels must become more natural as defined by the Natural Systems Model ("NSM") and the CERP documented -1 foot below to +2.5 feet above ground envelope to protect the few remaining tree islands. According to the December 2011 FEIS on the ERTP, for WCA-3, the result of lowering Zone A and extensions of Zones E1 and D can be seen in the modeling for the southern areas of WCA 3, such as Indicator Region 124, Figure A-H-7 and Figure A-H-8. FEIS at 4-36. The FEIS explains that the stages show a significant reduction (by as much as 0.2 or 0.3 feet) from about the highest 5 percent to about the 50% of the time range. *Id.* The results of lowering the zones under the ERTP Alternative 9E1 can be seen in Figure A-H-10 for the southern areas of WCA 3A. The number of high weeks (392) under the current condition (IOP) was reduced to 252 weeks under Run 9E1. *Id.* According to the FEIS, this equated to a 36 per cent reduction in exceedance of the high water stage criterion with no increase of low water events. *Id.* The modeling also shows that the numbers of weeks of sustained high water above 2.5 ft. in Indicator Region 14 has been reduced from 412 weeks under IOP to 260 weeks under ERTP 9E1. *See* FEIS at B-1-99. The Corps concluded: "The alternative that best met the ERTP objectives of improving conditions within WCA 3A for the snail kite, wood stork and other wildlife species, while maintaining protection for the CSSS and meeting Congressionally-authorized C&SF Project purposes, became the ERTP." FEIS at 2-31. Alternative 9E1 is the recommended plan. FEIS at *xiii.* ***CEPP* must reduce damaging high water levels in WCA 3A even more than the proposed ERTP and the anticipated COP. So-called "new science," which in many cases is old science that has been discarded, must not be misused as an excuse to drown the Tribal Everglades to provide more water to the Park downstream.**

Health And Safety Must Be a Priority: The Corps' recent FEIS for the ERTP quotes a letter of Miccosukee Tribal Chairman Colley Billie which states: ***"For far too many years, as a direct result of discriminatory water management actions, hundreds of thousands of acres of Tribal everglades in Water Conservation Area 3A have been flooded and degraded ... It has threatened the health and safety of the Miccosukee community."*** FEIS at 4-89. In 2008, the Tribe filed an Equal Protection lawsuit, pending in the Eleventh Circuit Court of Appeals, that detailed the threats that these discriminatory water management actions posed to the Tribal Everglades in WCA-3A, and to the health and safety of the Miccosukee people. In July 2010, the USACE Water Resources Engineering Branch (EN-W) conducted a review of the original General Design Memorandum for WCA-3A. *See* ERTP FEIS at 1-19; *see* Memo of Sean Smith as Exhibit A. Based upon the results of this review, the Corps concluded that a rigorous evaluation of the Standard Project Flood conditions within WCA-3A should be conducted. *Id.* As a result of the Corps' Phase I analysis of high water events, the Corps discovered that "based on

current system conditions as simulated in the water budget spreadsheet, the current configuration of WCA-3A would result in an increase in the SPF stage for WCA-3A of between 1.3 and 1.4 feet compared to the WCA-3A design assumptions." *Id.* Through this analysis, the Corps also discovered the blindingly obvious: "that peak SPF stage is increased over the original design due to the reduction in outlet capacity from WCA-3A through the S-12s." *Id.* The Corps recognized that the "Discharge through the S-12 structures is essential for managing the WCA-3A SPF peak stage." FEIS at A-5-33. The FEIS concluded that: "Leaving IOP in place is not an acceptable option due to the snail kite habitat issues and L-29 levee high stage concerns." FEIS at G-1-10. In light of this safety analysis, the FEIS concluded that it is "prudent for the USACE to recommend the lowering of Zone A of the WCA-3A Regulation Schedule as a risk reduction measure." FEIS at 1-20. The FEIS further concluded that the 1960 WCA-3A 9.5 to 10.5 feet, NGVD Regulation Schedule is a "required component for the interim water management criteria for WCA-3A Zone A under ERTP, necessary to mitigate for the observed effects of the discharge limitations of the S-12 spillways." *Id.* In light of these findings, **any CEPP water management actions that may impact water levels in WCA-3 must account for the specific flood stage of the L-29 levee system as detailed in the US Army Corps of Engineers 2011 General Design Memorandum for WCA-3A.** (see Exhibit A attached). This is vital to protecting the Miccosukee community located downstream of the L-29 levee. Finally, any safety studies that have been, or are being, conducted on the L-31 levee and the Lake Okeechobee dike must also be taken into account. **Health and safety of the Miccosukee Tribe, and the public, must be the top priority in the CEPP process.**

- **CEPP Must Incorporate Storage As a Priority:** As with water quality treatment, storage must also be incorporated. The nutrient enriched flows that are discharged from Lake Okeechobee could easily overload the current stormwater treatment system, and impact the Everglades wetlands. Incorporating storage facilities must be a central component of the CEPP and should be scheduled for construction and implementation early in the sequencing process. It is a tragedy that the Everglades Agricultural Area ("EAA") Reservoir Phase 1, one of the first CERP projects, was abandoned after many months of construction and an expenditure of more than $250 million dollars. If the EAA Reservoir Phase 1 had not been abandoned, both it and the Bolles and Cross Canal Projects, could have been completed by December 2009. Additionally, although the EPA Amended Determination stated that a Flow Equalization Basin ("FEB") built on this site could meet the Water Quality Based Effluent Limit in WCA-3 by 2013, no action has been taken to build an FEB on this site that was paid for by federal tax dollars. **Constructing storage at the soonest must be a priority if CEPP is too succeed.**

- **Rehydrate Only With Clean Water to Protect Northern WCA-3A and WCA-3B:** Flows into the dry areas of northern WCA-3A and through WCA-3B should be restored to the greatest extent practicable toward achieving historical flows and levels and only if the water is clean. Dirty water, *i.e.* water containing concentrations of phosphorus greater than 10 ppb should never be utilized for rehydration of unnaturally dried out areas. **In general, CEPP should never**

permit rehydration with dirty water and should always strive for natural flows and levels to the greatest extent practicable.

- **<u>CEPP Must Incorporate Solutions to Stop Western Basins Pollution</u>:** Any project truly geared at delivering more water clean water to the *"Central Everglades"* must incorporate solutions for the western basins. Discharges through the S-140 and the S-190 water control structures continually deliver phosphorus laden waters onto Tribal lands and into WCA-3A. Recent data from the 2011 South Florida Environmental Report shows that the combined discharge from the S-140 and S-190 water control structures comprised nearly 30% of the total phosphorus load discharged to WCA-3A. The S140 water control structure discharged 9.2 metric tons of phosphorus with a FWMC of 55 ppb directly onto Tribal lands and into WCA-3A. This was the single largest structure discharge into WCA-3A in 2010. The S-190 water control structure discharged 7.6 metric tons of phosphorus with a FWMC of 73 ppb directly into the L-28 Interceptor canal, which terminates on Tribal lands in WCA 3A (2011 SFER Appendix 3A-5). The SFWMD inflow station at the terminal end of the L-28 Interceptor canal had a discharge geometric mean phosphorus concentration of 65.2 ppb in WY 2010 (SFER 2011; Appendix 3-4).

The combined impacts and phosphorus load from these discharges has had a devastating effect on Tribal lands and WCA-3A. The Central Everglades Planning Process provides an invaluable opportunity to develop and implement solutions that will cooperatively benefit Tribal lands and the water conservation area. These solutions were outlined in the Comprehensive Everglades Restoration Plan (CERP) and in the Big Cypress - L-28 Interceptor Modifications Project description which calls for canal modifications and water quality treatment for these basins:

> *Big Cypress - L-28 Interceptor Modifications Project (www.evergladesplan.org)*
>
> *Modification of levees and canals, water control structures, pumps, and stormwater treatment areas (with a total storage capacity of 7,600 acre-feet) will re-establish sheetflow from the West Feeder Canal across the Big Cypress Reservation and into the Big Cypress National Preserve, maintain flood protection on Seminole Tribal lands, and ensure that inflows to the North and West Feeder Canals meet applicable water quality standards. Upstream flows entering the West and North Feeder Canals will be routed through two stormwater treatment areas to be located at the upstream ends of the canals. Sheetflow will be re-established south of the West Feeder Canal consistent with the Seminole Tribe's Conceptual Water Conservation System master plan.*

The Central Everglades Planning Process is the time to initiate the long overdue planning process for the CERP Big Cypress - L-28 Interceptor Modifications and provide a solution for the devastating discharges from the L-28 Interceptor Canal and the S-140 water control structure..

- **<u>No More Dirty Water, No Rehydration with Dirty Water, & No Use of WCAs As *De Facto* STAs</u>:** Unlike a lake or a stream in which pollutant discharges undergo relatively quick

and complete mixing, the Everglades is being eaten away by P pollution like a cancer. Cancer starts at a point and eventually spreads throughout the body unless stopped. Like a cancer, phosphorus pollution eats away from the points it enters the Glades, and continuously spreads further and further into unimpacted areas. It will eventually destroy the vast majority of what's left, if not the entire Everglades, unless it is stopped.

If damage occurred until the cause of the damage was stopped, and was then reversed in approximately the same time it took to cause that damage, this damage would be considered reparable, or reversible. This is not what occurs in the Everglades. Recreating tree islands and extracting high concentration of phosphorus from the soil may never be achieved by nature except in geological timeframes; and extirpated species will never be replaced. Even if humans could reverse the damage in a shorter time, which at present they cannot, it would certainly be cost prohibitive, and require many, many years to complete. Whether these restorations can be achieved is unknown, and, if they could, the time to achieve them is centuries, millennia, or longer. Even in the best case scenario, this damage is, for all intents and purposes, irreparable. It only makes sense that stopping this irreparable damage is the prudent first step to restoration, and, in the minds of many, including the Miccosukee Tribe, the mandatory first step.

It should be clear to all that restoration of the Everglades has not begun, as the Everglades continues today to be irreversibly destroyed. Restoration can only begin once the irreversible damage is stopped, and that day is, at best, far in the future.

The water quality issue was supposed to have been resolved by December 31, 2006 when the State, now under an Order of the Court, was supposed to have achieved inflows into the Everglades that ensured the Water Quality Standard was being met. The State's meeting this deadline in a timely fashion was a base assumption of the CERP Restudy, and the success of CERP, in accordance with the projected schedule, depended on it. However, this has yet to be achieved, and under the current best case scenario, may not be achieved until 2020. There is a possibility under the EPA Amended Determination that the Water Quality Based Effluent Limitation ("WQBEL") for WCA could be met by 2013 if a Flow Equalization Basin ("FEB") on the Talisman land was constructed, but no such reservoir is even being planned let alone being constructed. Moreover, as all who work on Everglades restoration know, the best case scenario is rarely, if ever, realized.

In addition, CISRERP has invited an analysis of "trade-offs between water quality and quantity," which opens the door wide for those who would destroy one part of the Everglades for the benefit of another. At the heart of this is the utilization of vast areas of the Everglades (both WCAs and Tribal Land) as *de facto* STAs. To permit the State to utilize Tribal Land as STAs in order to achieve 10 ppb P in the Park is diametrically opposed to actually restoring the Everglades, contrary to the Consent Decree and the Clean Water Act, and anathema to the Miccosukee Tribe. The Tribe will not permit Tribal land to be utilized as an STA.

Therefore, the Tribe does and will not support a CEPP that 1) increases the amount of dirty water brought into the Everglades Protection Area, or 2) restores flows to the

Everglades Protection Area with dirty water, until the restoration water meets the 10 ppb P criterion mandated by the Clean Water Act. Even more, Tribal land will not be utilized as an STA. The 10 ppb P criterion must be a major performance measure in CEPP and water quality must be thoroughly analyzed and evaluated in the CEPP process.

- **No More Dirty Water - Water Quality Must Be Met:** The Federal Register defines the primary objective of the CEPP as follows: "*The next step for the implementation of CERP is to redirect water that is currently discharged to the east and west coast estuaries from Lake Okeechobee and restore flow to the South...*" The CEPP process cannot attempt to restore more water into the central Everglades from the north, *i.e.* from the Everglades Agricultural Area ("EAA") and Lake Okeechobee until the State meets water quality standards in the water being delivered to the Everglades Protection Area. The State of Florida failed to meet the December 31, 2006 deadline, as recognized by Judge Gold, to ensure that waters discharged to the Everglades Protection Area meets water quality standards, including a numeric criterion of 10 ppb Phosphorus ("P"). Thus, waters discharged from Lake Okeechobee are laden with pollution. The most recent data for the 2011 South Florida Environmental Report shows that the open water Lake total phosphorus concentrations were 118 ppb for WY2010 and had a five year average of 172 ppb (2011 SFER; Table 10-12). To accomplish the stated goal of redirecting Lake Okeechobee flows south, while maintaining the water quality standards as a constraint, as presented and discussed at the Water Resources Advisory Commission (WRAC) on Thursday, January 6, 2012, treatment must incorporated. Without the appropriate treatment, redirected flows from Lake Okeechobee will greatly increase the nutrient loads to the water conservation areas, causing further degradation of Tribal lands within the Everglades ecosystem." **Once flow at natural rates, levels, and quality is "practicable," then, and only then, should more water be brought into the Everglades; given the current rate of progress, this is many years into the future, if ever.**

- **No Trade-Offs Permitted:** One hears discussions at times about trade-offs" in Everglades restoration. Although not clearly nor precisely framed, CISRERP has invited an analysis of "trade-offs between water quality and quantity," which opens the door wide for those who would destroy one part of the Everglades for the benefit of another. At the heart of this is the utilization of vast areas of the Everglades (both WCAs and Tribal Land) as *de facto* STAs in the restoration process. The Tribe is concerned that under the guise of "new science" some will attempt to use the CEPP process to seek a plan that forces large volumes of water through some areas, like WCA-3A, for the possible benefit of other areas, like the Park to the south. These are not new arguments, but old ones previously rejected and now being recirculated. There was much discussion during the Restudy process about how too much water could devastate the last vast expanse of sawgrass left in existence in WCA-3A. It was decided that all areas of the Everglades were to be restored. The Tribe is deeply concerned by the so-called "new science" that some are using to support sending greater volumes of water through the Everglades than was envisioned by CERP. It should be noted that much of the modeling on this new science that was done did not take into account any constraints for water supply, flood control, or the fact that half of the

Everglades is gone. The Tribe will resist any effort to drown the Tribal Everglades for the alleged benefit of the Park downstream. As discussed in the section on endangered species, Tribal lands and the endangered snail kite have suffered from the high water effects of discriminatory water management. The Miccosukee Tribe never endorsed "trade-offs", which is essentially *"Animal Farm"* equality for the Everglades, or the use of Tribal land as a *de facto* STA. Using the Tribe's Everglades in WCA-3A as a *de facto* STA to clean the water before it gets to the Park is also specifically prohibited by the Consent Decree (Judge Moreno's Court). **CEPP must endorse as a guiding principle that no area of the Everglades will be destroyed/sacrificed for the benefit of another are of the Everglades by planned CERP projects, or for that matter, any proposed project.**

- **CEPP Must Not Delay Already Delayed MWD Project Components:** According to the Congressional Research Service ("CRS") Report to Congress dated March 17, 2005, ***"Mod Waters was originally estimated to be completed by 1997, yet some now argue it is unclear when or even whether the project will be completed."*** Another study on the delay of the Modified Water Deliveries Project ("MWD Project") conducted by the Inspector General of the Department of the Interior dated March 2006, discusses the cost of delay: ***"The Corps estimates that damage to tree islands resulting from the current high water levels could be as much as 246 acres per year and the cost to restore the islands ranges from $12.3 million to $123 million per year."*** The CRS Report further stated that: "***Section 601(b)(2)(D)(iv) of WRDA 2000 provides that Mod Water must be completed before appropriations can be made to construct other restoration projects in the east Everglades."*** Moreover, the 2006 Biennial Review by CISRERP warned that: "***Since the Mod Waters Project is an assumed precursor for the WCA-3A Decomprtmentalization and Sheetflow Enhancement part 1 (Decomp) project, further delays in the project's completion may ultimately delay funding appropriations for Decomp.***" The committee recommended that: ***"Mod Waters should be completed without further delay."*** In its 2008 Biennial Review CISRERP warned, "***If this relatively modest restoration project cannot proceed and provide some restoration benefits, the outlook for CERP is dismal.***" The CEPP must not be used as an excuse to bypass Congressional intent or to delay the construction of vital MWD Project components, which have already been seriously delayed. The Tribe is concerned that some will attempt to delay important aspects of this project by incorporating them into the CEPP, which may never be authorized. The Tribe will be opposed to any attempt to do so. **Completion and implementation of the MWD Project must be a pre-condition to the CEPP and a "without project condition" under NEPA.**

- **Decompartmentalization of WCA-3:** The Tribe agrees with the CISRERP that, if MWD does not get completed, the outlook for CERP is dismal and, unfortunately, the MWD Project is still far from completion. The CERP Decompartmentalization Project is also well behind the scheduled January 2010 completion date for construction of certain components contained in Section 10 of the Yellow Book. The Tribe cannot help but wonder if this new planning effort, with a new acronym, was devised to obfuscate this important fact. However, in the event that the

CEPP planning effort actually moves forward, plans for the Decompartmentalization of WCA-3 should incorporate more than the hydrologic modification features proposed for north of I-75 by the DECOMP PDT Team. When incorporating the Decompartmentalization of WCA-3 into the CEPP all of the canals in the L-28 system should be considered for removal in addition to the entire Maimi canal and L-67 canal system to truly provide restoration of the "Central Everglades." As the Decompartmentalization of WCA 3 progresses, careful and consistent consultation with the Tribe should take place to ensure that the cultural meeting places of the Miccosukee people and Tribal camps are not adversely impacted.

- **Analyze Expanding the Capacity of S-333:** All water that the Park desires for rehydration of Northeast Shark River Slough cannot flow through WCA-3B without causing significant irreversible destruction. As much water as is naturally possible should be funneled through WCA-3B, and, if more is available to satisfy the desires of the Park, then it should be provided via S-333, at least until the CERP eastern rehydration projects are completed. In order to provide this additional water, the CEPP should look at increasing the capacity of S-333. During the development of "Sparrow" deviations in the late 1990s, it was decided to increase the S-333 capacity from 1,350 cfs to 2,000 cfs, as documented in the 2002 IOP Final EIS, but this was never accomplished. The tentatively selected plan for COP also included the same increase in capacity for the S-333 structure, but COP was abandoned. **It is only prudent to finally analyze increasing the size of S-333 in order to ensure the Park can receive the higher volumes of water at a faster rate that it claims it needs.**

- **8.5 Square Mile Area Must Be Protected:** After years of debate, a project to protect the people of the 8.5 Square Mile Area ("8.5 SMA") from project induced flooding was authorized by Congress and constructed by the Corps of Engineers. There still are many associated with the Park that would like to see the remaining homes removed; under the mandate of Congress, this is not going to happen. **The Corps must ensure the people of the 8.5 SMA are afforded the protection they are authorized, and must not let another 8.5 SMA debate paralyze the restoration process and stop the CEPP from being implemented.**

- **CEPP Transitional Plan Is Essential:** There remain several components of both the MWD and C-111 projects that must be formulated, designed, and constructed. These components will not be all completed at the same time; it will take years for all to be completed. Similarly, the components of the different projects that will constitute the CEPP to deliver what the Corps refers to as "incremental" restoration will also come on line at different times. Thus, the **CEPP should contain a transitional plan that implements beneficial operational changes once each new component of the Pre-CERP and CERP projects is completed.**

- **No Operation of the S-356 Pump Station:** The Miccosukee Tribe will not support the operation of the S-356 pump station as a component of CEPP. There are three primary reasons: 1) water quality issues exist which have not been adequately addressed (Note: Among the potential/existing water quality issues, testing and analysis to date of S-356 pumped water have

found zero dissolved oxygen, along with a very strong odor of sulfur; changes in the concentration, load, and distribution of P flows into the Park resulting from the use of S-356 have not been analyzed rigorously *vis-à-vis* the Consent Decree, and there is clear potential for an increase in the number of Consent Decree violations), 2) the net result of the use of S-356 is pumping water in a circle, *i.e.* S-356 pumps into L-29 Canal, L-29 water flows into NE Shark River Slough in the Park, then seepage of this water enters the L-31N, and, then again, S-356 into L-29 Canal, which is clearly not restoration, and 3) most important to the Tribe, the pumping into the L-29 Canal from S-356 reduces the flow through S-333 into the L-29, and, thus, results in higher water in WCA 3A and Tribal land. This latter consequence of S-356 utilization results in adverse impacts to Tribal lands in WCA 3A and the endangered snail kite and its critical habitat. **The S-356 pump station has no redeeming value at this point, and probably never will, and it certainly should be eliminated from consideration in the formulation of CEPP.**

- **Address Seepage Control As A Critical Requirement:** Seepage out of Northeast Shark River Slough in ENP remains a huge impediment to restoration. Simply and directly stated, the restoration of ENP and the entire Everglades cannot be achieved until the seepage between S-335 and G-211 is adequately managed. **CEPP must recognize this debilitating seepage limitation and be formulated to appropriately account for it.**

- **1-Mile Eastern Bridge Should Be Plugged:** The Tribe continues to strenuously object to the construction of the 1-Mile Eastern "Bridge to Nowhere" and contends that it is a waste of taxpayer money that will continue to delay the MWD project. Moreover, given the facts that additional flows into Northeast Shark River Slough are severely limited by seepage into the L-31N Canal, and that the 1-Mile Eastern Bridge that is now being constructed will concentrate current and additional flows on the eastern side of the Park, it is clear that the bridge should not be utilized until the seepage challenge is met. The Corps even predicts that the flow across Tamiami Trail will increase by over 15% once this bridge is complete without even changing operations, *i.e.* the seepage challenge will be exacerbated just by merely constructing the bridge. The proposed COP and CEPP NEPA processes must analyze this potential flooding threat, which could adversely impact the Miccosukee Resort, and other Miami-Dade County properties. **The openings under the bridge should either 1) remain blocked by leaving the existing Tamiami Trail in place, or 2) be blocked by fill, sheet pile, or some other technique, until the seepage challenge is appropriately met, thus forcing more of the flow to the west in Shark River Slough where seepage is much less of an issue.**

- **Reduce/Eliminate the "Big Red Arrow":** The "Big Red Arrow," *i.e.* the arrow depicted on water budget schematics depicting the huge amounts of water forced south out of the L-31N Canal into the area of Homestead and vicinity since the enlargement of the L-31N in the early 1980s, must be reduced to the maximum extent practicable. If not, the people of South Miami-Dade will be continue to be flooded beyond the level of protection authorized by Congress, and

the CEPP clearly has the potential to exacerbate this already bad situation. **Therefore, CEPP should have as a primary goal the elimination of the "Big Red Arrow."**

- **Maintain the G-3273 Trigger Gage:** Uncontrolled, high volumes of seepage into the L-31N Canal can cause and has exacerbated flooding in the built portion of Miami-Dade County, which includes Miccosukee property. Seepage also causes the "Big Red Arrow," which specifically leads to increased flooding in southern Miami-Dade. Historically, this seepage has been somewhat managed by discontinuing the controllable inflow of water into Northeast Shark River Slough when the G-3273 gage rises 6.8 feet NGVD. **Until seepage, and, thus, unacceptable flooding, are adequately addressed, there is little reason to believe that G-3272 trigger well is not going to remain a critical part of the water management system under CEPP.**

- **Clear Downstream of the Culverts to Increase Flows:** In 2009, the Park commissioned a professor from the University of Miami to evaluate the effectiveness of culvert swales in increasing flows from the WCAs to ENP. The culvert-swale approach is one method for effectively clearing the accumulation of sediment, vegetation (to include invasive exotics), detritus, and, literally, garbage downstream of the Tamiami Trail culverts that is significantly reducing the flows from north to south, *i.e.* rather than actually remove the blockage, swales enable the water to move around it. In January 2010, Dr. David A. Chin, PE, published his report. Dr. Chin's analysis indicates that the Miccosukee long-held position is correct, *i.e.* clearing downstream of the culverts will significantly increase flows (Note: It also reconfirms at least 2 prior studies done by the Corps). Key points from the report follow:

  - Even the most modest swale considered, *i.e.*, 500' by 30', at a constant L-29 stage of only 6.0 feet NAVD, will likely increase flows by 60% at one culvert set and 250% at the other … the most robust swale considered, *i.e.*, 1500' by 30', will provide for a 200% and 560% increase at the same culvert sets, respectively.

  - Even a worst case scenario for both culvert sets during sensitivity analysis provided for a 48% and 200% increase in flows with the 1500' by 30' swale option, while an equally plausible, but more favorable, marsh resistance increased flows by 520% and 830% for the same swale option.

  - Adding another culvert set at the swale locations provided only a little improvement in increased flows.

  - Replacing the culverts by bridges at the swale provided improvements, but not nearly as great as the increased flows predicted for simply building the swale.

  - When a bridge is simulated to replace the existing culvert set: "… it should be noted that, for a given spreader-canal configuration, water deliveries are independent of the bridge span as long as stage differences across the bridge opening are relatively small [which is the normal condition]."

These new and independent scientific/engineering findings provide great hope for major, quick improvements in the condition of the Everglades at a very reasonable cost. Dr. Chin's work convinced the Superintendant of ENP to conduct an actual Pilot Swale Project to evaluate Dr. Chin's findings in the field; although this pilot project was supposed to be implemented by October of 2010, it appears that the work now been cancelled. **Given that the evidence and possibilities are so compelling, and the deteriorating state of the Everglades so dire, the Corps should move forward with full scale swale projects immediately, and analyze the increased flow capabilities of such swales as a component of the CEPP EIS.**

- **Clear Downstream of the S-12s & Implement Other Measures Needed to Increase Flows:** The same hydraulic principles employed by Dr. Chin to the culvert swales also apply to the S-12s. Clearing downstream of these structures provides more opportunities for further increasing flows through the Everglades. Especially increasing flows from WCA 3A, which is flooded much of the time, to an area in the Park that has been unnaturally dried out over many years. In preparation for the development of the ERTP, the Corps performed an analysis of current water levels in WCA 3A *vis-à-vis* the 1960 and 1972 design specifications and expectations, and reported the results in MEMORANDUM FOR SAJ LEVEE SAFETY OFFICER (DUBA), Subject: EN-W Position Statement on WCA-3A Regulation Schedule Modifications, 9 September 2010. Major findings are [emphasis added]:

  - **Actual water levels are much higher than those for which WCA 3A was designed –** *"The analysis illustrated that under the current system conditions, as represented in the spreadsheet, the peak SPF S-12 headwater stage was computes 13.76 ft, NGVD and the peak SPV WCA-3A three gage average stage was computed as 15.20 ft, NGVD. The comparison of peak stages between the 1960 GDM WCA-3A design and the 2010 WCA-3A volumetric spreadsheet predictions indicate that the predicted SPF stage is higher than the WCA-3A design stages established in the original GDM and used to set the as-built crest elevation of L-29: 1.36 feet higher at the headwater of the S12 structures; 1.3 feet higher at the three station average for WCA-3A."*

  - **S-12 flows are crucial achieving lower water levels –** *"Sensitivity analysis performed utilizing the 2010 WCA-3A volumetric spreadsheet tool illustrated that the peak SPF stage is most sensitive to the amount of outflows being discharged from WCA-3A, with the primary outlet being the S-12s ..."*

  - **Must lower top of regulation schedule to the design envelope of 9.5 – 10.5 feet to mitigate for the S-12 discharge limitations –** *"... EN-W has concluded that the lowering of Zone A of the current WCA-3A Regulation Schedule to the 9.5-10.5 feet NGVD regulation schedule line from the 1960 GDM will provide an interim step to mitigate for the observed effects of the S-12s discharge limitations."*

  - **Much more than reducing the top of the regulation schedule is needed to lower water in WCA 3A –** *"The inclusion of the lowering of Zone A of the current WCA-3A Regulation Schedule within the proposed alternatives of the ongoing ERTP NEPA effort*

is a minimum requirement to demonstrate compatibility with the required interim water management criteria for WCA-3A. Additional water management operating criteria to further reduce the frequency and duration of high stages within WCA-3A should also be considered within the context of other ERTP Project considerations."

- **Decisive and prescribed measures are needed now to decrease the risk to "human health and safety"** – *"The ERTP Project's water management operating criteria should include the establishment of operational constraints at the S-12 structures based upon safety considerations for WCA-3A features and pertinent downstream areas, including the identification of infrastructure modifications to be implemented on a temporary basis to allow the reduction of risk to human health and safety. The stability analysis of the S-12s is predicated on a maximum design headwater stage of elevation 12.4 feet NGVD with the differential head across the structure limited to 5.5 feet; also, the as-built crest elevation of L-29 and crown elevation of Tamiami Trail (US-41) in the S-12A to S-12D reach has been established to protect against the risk of overtopping from an adjacent flood stage of elevation 12.4 feet NGVD. <u>The exceedances of these design conditions should be considered an immediate increase in risk to the human, health and safety afforded by the project feature and would require decisive and prescribed measures to reduce the WCA-3A stage</u>."*

- **ERTP alone will not sufficiently reduce the risk to human health and safety ... more is needed!** – *"Outside of the ERTP project, additional NEPA assessment would be required to implement infrastructure modifications on a temporary basis to allow the reduction of risk to human health and safety, or to implement other permanent structural alternative which may result from the future phase 2 analyses. Considering the limitations on discharge through the S-12 structures, downstream conveyance improvements at the S-12 structures (potentially including removal of portions of the old Tamiami Trail) or additional outlets are required to mitigate for increased SPF stages within WCA-3A."*

In the Corps Draft ERTP EIS published on March 4, 2011, the Corps reiterated the importance of clearing the downstream blockages of the S-12 structures, as well as other measures to increase the flow out of WCA 3A.

5.0 Conclusions *(DEIS at A-5-41)* [emphasis added]:

- *The predicted SPF stage is higher than the WCA-3A design stages established in the original GDM and used to set the as-built crest elevation for L-29.*

- *Outlet capacity of the S-12s has either reduced over time OR*[1] *was never as large as assumed for the original design routings.*

[1] The Tribe's takes exception to the word "OR" which should be "AND" as it is clear from the evidence, including e-mails from Corps Staff, that: 1) the S-12 design flows were never achieved and 2) the capacity of the S-12s has decreased over time based on analysis of the rating curves over time.

- *The peak SPF stage is not sensitive to modifying the top (i.e. Zone A) of the WCA-3A Regulation Schedule. The peak SPF stage is most sensitive to the amount of outflows being discharged from WCA-3A, with the primary outlet being the S-12s.*
- *Considering the limitations on discharge through the S-12 structures, additional outlets are required to mitigate for increased SPF stages.*
- *The most effective additional measure investigated to alleviate the problem involves further degradation of the L-28 to increase outflows; however, the downstream effects of this action cannot be adequately addressed with the spreadsheet model routing and would require a more robust hydraulic analysis.*
- *Implementation of the Modified Water Deliveries Conveyance and Seepage Control Features would also provide additional outlet capacity.*

7.0 Recommendations for Future High Water Control

- *Remove key sections of the Old Tamiami Trail to reduce current impediments to flow out of WCA-3A.*
- *Investigate the possibility of changing the operating criteria at S-343A, S-343B, and S-344.*
- *Perform S-12 downstream conveyance improvements, such as vegetation cleanout.*

ERTP has proposed major steps to decrease water levels in WCA 3A. If the Recommended Plan for the ERTP is implemented it should lessen the now recognized and documented risk to human "health and safety," to include a major threat to the members of the Miccosukee Tribe. But clearly, the Corps' own analyses specifies that more must be done to increase flows out of WCA-3A. **Additional measures that need to be addressed in the CEPP EIS include 1) clearing downstream of the S-12 structures, 2) removing as much as possible of Old Tamiami Trail, and 3) further degrading of the L-28 levee. These, and other measures that might help, need to be planned and analyzed in the CEPP EIS and implemented at the soonest.**

• **Impact on Endangered Species Must be Assessed – Multi-Species Approach Is Essential:** The CEPP EIS must analyze the impacts of operation of these CERP projects on all endangered and threatened species in the action area, which includes Lake Okeechobee, the northern estuaries, all of the WCAs and the Park. Such an analysis would include the impact of operations on the Tribal lands in WCA-3A, and on the endangered snail kite and its critical habitat there. Both the snail kite, and its critical habitat in WCA-3A, have suffered an alarming decline under the past thirteen years of discriminatory water management. These draconian actions, purportedly for the Cape Sable seaside sparrow ("Sparrow)., moved the Everglades, including Tribal lands, further away from restoration. As a result of these water management actions, which include IOP, the Everglade snail kite that lives on Tribal lands has suffered an

alarming decline reported at more than 50%, which is actually even greater.[2] *See* ERTP FEIS at 3-26. This decline is a direct result of more than thirteen years of S-12 gate closures, which degraded thousands of acres of snail kite critical habitat on Tribal lands in WCA-3A.

The Miccosukee Tribe, whose members have called the Everglades home since time immemorial, objected to these single-species water management actions on grounds that they would cause the damage the Tribe has witnessed. The ERTP FEIS confirms that damage to both WCA-3A and the snail kite has taken place. The FEIS states, ***"the snail kite population has progressively and dramatically decreased since 1999 ... the snail kite population essentially halved between 2000 and 2002 from approximately 3,400 birds to 1,700 birds; and halved again from approximately 1,500 to 1,600 birds in 2006, to approximately 685 birds in 2008."*** FEIS at 3-26. The estimated 2009 population size of 662 birds indicates that there is no sign of recovery (Cattau et al. 2009)." *Id.* A review of Table 3-1 in the FEIS shows that number of successful nests, and young fledged, have declined dramatically since the Corps began implementing the S-12 gate closings in 1998. *Id.* and *Table 3-3.* ***"WCA- 3A has been previously identified as the most critical component of snail kite habitat in Florida"*** and the lack of reproduction in this area in recent years is of principal concern. *Id.* ***"A population viability analysis conducted in 2006 predicts very high extinction probabilities within the next 50 years (Martin 2007).*** Given the 2009 population estimate (i.e. 662 birds) the extinction risk may be even greater than the previous estimate (Cattau et al. 2009)." 3-26 to 3-27. It is clear that the Tribe's concerns about the snail kite have been proven correct. The FEIS also recognizes that the alarming decline of the vegetation on snail kite critical habitat in WCA-3A. **"However, high water levels and extended hydroperiods have resulted in vegetation shifts within WCA-3A, degrading snail kite critical habitat."** FEIS at 3-28. A multi-species approach that builds on the ERTP process and scientific information is essential. The ERTP was the first process to actually take a real multi-species approach to water management. Before this, as described above, it has typically been single-species management. **The ERTP model for multi-species management must be a guiding principle of the CEPP.**

- **Restoration West of Shark River Slough Must Begin:** As discussed earlier, "critical habitat" for the "Sparrow" was not designated by FWS for western Shark River Slough, because this area is currently being unnaturally dried out for subpopulation A of the "Sparrow" when under restoration it will be made much wetter. Declaring critical habitat would have effectively blocked the future restoration of the Everglades. Based largely on the written defense of the FWS's Final Rule by the Tribe, and concerns that the proposed designation would not only stop Everglades Restoration, but cause the continued destruction of Tribal Land, a Federal Judge ruled in 2011 that the FWS was correct not to designate this area as "critical habitat." In addition

[2] While some government documents have reported a 50% decline, the drop from approximately 3,400 snail kites in 2000 to 662 in 2009 actually represents a startling population decline of 81%. This is considerably more than the 50% stated.

to stopping Everglades restoration, the Judge unequivocally recognized the damage being done to Tribal land by "Sparrow" deviations:

> *"Under the grip of the law of unintended consequences, however, these corrective plans* [*i.e.* deviations for the "Sparrow"] *produced untoward results. Some argue that the greater retention of water for longer periods of time in WCA 3A, intended for Sparrow conservation, precipitated abnormally high water levels in WCA 3A. The higher water levels in WCA 3A are thought to have imposed adverse effects on other endangered species and on members of the Miccosukee Tribe of Indians of Florida ("Tribe")—who reside on more than 100,000 acres of WCA 3A land—by flooding culturally significant sites."* Collyer Order at p. 13.

Settled: CERP is formulated to restore the Everglades and the CEPP process purports to begin the incremental restoration of the Central Everglades. The best science in the form of modeling and field studies show that restoration of the Everglades will result in the western portion of Shark River Slough being wetter. In contrast, the last 13 years of draconian water management actions allegedly for the "Sparrow" have made this area dryer and moved it away from restoration, while not helping the "Sparrow." The designation of "critical habitat" for this area would have required it to be dried out in perpetuity. <u>The FWS has officially decided, and a Federal Judge upheld the FWS decision, that at some point the CSSS-A area will be restored and be wetter</u>.

Unsettled: The only question that remains at this time is when does the Corps start allowing more flows into the area of western Shark River Slough so that restoration can in fact commence both for the areas north and south of Tamiami Trail? **Thus, the Tribe, for the sake of its land and culture in particular, and Everglades restoration in general, implores the Corps to begin the restoration of western Shark River Slough via both the COP and CEPP.**

- **<u>Decisive Action Required</u>:** From 2003 to 2007, the Miccosukee Tribe participated in the 4-year CSOP effort to attempt to achieve essentially the same outcomes that a new acronym, COP, is now supposed to achieve. At the end of the day, because of the unjustified non-support of a few, the consensus of many was rejected, and, to the detriment of the Tribe, nothing was implemented. This endless restoration planning without concrete results must not be repeated under either the COP or CEPP. **The Colonel must make a final decision for the CEPP based on the best information available in spite of the misguided demands that some may have. No more "kicking the can down the road." Another dead end excursion is not an option for the dying Everglades. Bold, decisive action that results in actual restoration is essential for success.**

CESAJ-EN-W 09 September 2010

MEMORANDUM FOR SAJ LEVEE SAFETY OFFICER (DUBA)

SUBJECT: EN-W Position Statement on WCA-3A Regulation Schedule Modifications

The USACE Jacksonville District Water Resources Engineering Branch (EN-W) has conducted a thorough review of the Central and South Florida Project (C&SF) Part 1 Supplement 33: General Design Memoranda (GDM) for Water Conservation Area 3 (June 1960) and the C&SF Part 1 Supplement 49: Agricultural and Conservation Areas General and Detail Design Memorandum (August 1972). The 1960 GDM documents the WCA-3A design criteria and design assumptions, including the 9.5-10.5 feet NGVD regulation schedule for WCA-3A that managed water levels in WCA-3A prior to the start of the Experimental Program of Water Deliveries to Everglades National Park in 1983. Under the Experimental Program, the WCA-3A Regulation Schedule zones and operational rules were initially modified as part of the two-year test of the Rainfall Plan starting in 1985. The modified WCA-3A Regulation Schedule and Rainfall Plan remained in effect through the end of the Experimental Program in 2000. As an outcome of the deliberations during development of the Interim Structural and Operational Plan (ISOP 2000-2002) and the Interim Operational Plan (IOP 2002-present), the WCA-3A regulation schedule was further changed with the modification of Zone D and the establishment of Zone E1.

Based on the review of WCA-3A design documents and in conjunction with the hypothesis that the S-12s are not capable of achieving the original design discharge of 32,000 cfs, EN-W has concluded that a detailed engineering assessment of the effects of the potential S-12s discharge limitations and the WCA-3A Regulation Schedule modifications on the frequency and duration of high water events was warranted. The engineering assessment should include a rigorous evaluation of Standard Project Flood (SPF) conditions within WCA-3A as these conditions have not been evaluated by the USACE Jacksonville District since the original 1960 and 1972 design documents.

EN-W has proposed a two-phase analysis approach for WCA-3A high water events including: phase 1(ongoing) - identification and assessment of interim water management criteria for WCA-3A, including operational changes proposed as part of the ongoing

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Everglades Restoration Transition Plan (ERTP) NEPA efforts; and phase 2(future) - a WCA-3A flood routing hydraulic analysis, incorporating current USACE risk analysis requirements focusing on potential human health and safety concerns resulting from WCA-3A stages, with identification of proposed water management operating criteria and potential infrastructure modifications to address identified concerns. The phase 1 effort was limited to hydrology and hydraulics assessment, while the phase 2 analysis will include additional engineering analysis conducted by hydrology and hydraulics, geotechnical, and structural design disciplines.

Findings of Phase 1 - To determine the ERTP interim water management criteria for WCA-3A, EN-W has completed a preliminary assessment based on the methodology identified in the 1960 GDM design document. The original design headwater of the S-12 structures is 12.4 feet and the peak three station average for WCA-3A under the SPF event was 13.90 ft, NGVD (C&SF Part I, Supplement 33). Since the current configuration of WCA-3A inflow and outflow structures differs from the 1960 GDM design document, a simple volumetric spreadsheet was developed of WCA-3A to determine the peak Standard Project Flood (SPF) stage within WCA-3A and at the S-12 structures based on current system conditions. Multiple inflow and outflow variables were identified and quantified to refine the calculations of the peak flows and stages for the SPF evaluation. The latest USGS rating curve for each of the S-12 structures was utilized in the analysis to incorporate the most current stage discharge measurements to more accurately incorporate present flow conditions. The analysis illustrated that under the current system conditions, as represented in the spreadsheet, the peak SPF S-12 headwater stage was computed as 13.76 ft, NGVD and the peak SPF WCA-3A three gage average stage was computed as 15.20 ft, NGVD. The comparison of peak stages between the 1960 GDM WCA-3A design and the 2010 WCA-3A volumetric spreadsheet predictions indicate that the predicted SPF stage is higher than the WCA-3A design stages established in the original GDM and used to set the as-built crest elevation of L-29: 1.36 feet higher at the headwater of the S12 structures; 1.3 feet higher at the three station average for WCA-3A. Sensitivity analysis

performed utilizing the 2010 WCA3A volumetric spreadsheet tool illustrated that the peak SPF stage is most sensitive to the amount of outflows being discharged from WCA-3A, with the primary outlet being the S-12's, and that the peak SPF stage is less sensitive to the configuration of the WCA-3A Regulation Schedule Zone A.

The schedule and scope for completion of the ongoing ERTP NEPA analysis precludes consideration of potential structural alternatives which would be proposed and evaluated in Phase 2. For immediate implementation through ERTP, prior to completion of the Phase 2, EN-W has concluded that the lowering of Zone A of the current WCA-3A Regulation Schedule to the 9.5-10.5 feet NGVD regulation schedule line from the 1960 GDM will provide an interim step to mitigate for the observed effects of the S-12s discharge limitations. Preliminary SFWMM modeling indicated that the following reductions in WCA-3A three station average high water frequency (as a percentage of the SFWMM 36-year period-of record, 1965-2000) may be reasonably expected from the lowering of Zone A: no significant change for stages above 11.75 feet NGVD (corresponds to S-12 headwater stage of 10.92 feet NGVD, based on historical regression); 1% reduction in stages exceeding 11.5 feet NGVD; 2-3% reduction in stages exceeding 11.0 feet NGVD; and 6-7% reduction in stages exceeding 10.5 feet NGVD.

The inclusion of the lowering of Zone A of the current WCA-3A Regulation Schedule within the proposed alternatives of the ongoing ERTP NEPA effort is a minimum requirement to demonstrate compatibility with the required interim water management criteria for WCA-3A. Additional water management operating criteria to further reduce the frequency and duration of high stages within WCA-3A should also be considered within the context of other ERTP Project considerations.

The ERTP Project's water management operating criteria should include the establishment of operational constraints at the S-12 structures based upon safety considerations for WCA-3A features and pertinent downstream areas, including the identification of infrastructure modifications to be implemented on a temporary

basis to allow the reduction of risk to human health and safety. The stability analysis of the S-12's is predicated on a maximum design headwater stage of elevation 12.4 feet NGVD with the differential head across the structure limited to 5.5 feet; also, the as-built crest elevation of L-29 and crown elevation of Tamiami Trail (US-41) in the S-12A to S-12D reach has been established to protect against the risk of overtopping from an adjacent flood stage of elevation 12.4 feet NGVD. The exceedance of these design conditions should be considered an immediate increase in risk to the human, health and safety afforded by the project features and would require decisive and prescribed measures to reduce the WCA-3A stage. In addition, application of the FDOT road base impact criteria to this reach of Tamiami Trail (estimated crown elevation of 14.95 feet) would result in a not to exceed regulated water stage of approximately elevation 11.5 feet NGVD adjacent to the roadbed (corresponds to S-12 headwater stage of 12.45 feet NGVD, based on historical regression). While this water stage could be temporarily exceeded and does not present the immediate risk of the SPF stage violation, nevertheless, it should be considered adverse with operational measures applied to reduce its duration.

Outside of the ERTP project, additional NEPA assessment would be required to implement infrastructure modifications on a temporary basis to allow the reduction of risk to human health and safety, or to implement other permanent structural alternatives which may result from the future phase 2 analyses. Considering the limitations on discharge through the S-12 structures, downstream conveyance improvements at the S-12 structures (potentially including removal of portions of the old Tamiami Trail) or additional outlets are required to mitigate for increased SPF stages within WCA-3A. The most effective additional measure investigated under phase 1 to alleviate the problem involves further degradation of the L-28 to increase outflows, although the potential for downstream effects, including impacts to the Tamiami Trail roadway and hydro-period/nesting condition effects on Cape Sable Seaside Sparrow Sub-population A, would require further investigations. Implementation of the Modified Water Deliveries Conveyance and

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Seepage Control Features and Tamiami Trail Improvements would also provide additional outlet capacity.

If you have any questions or require additional information, please contact me directly at extension 2105.

SEAN L. SMITH, P.E.
Chief, Water Resources Engineering Branch

OFFICE OF THE MAYOR
MIAMI-DADE COUNTY, FLORIDA

CARLOS A. GIMENEZ
MAYOR

January 18, 2012

Dr. Gina Paduano Ralph, Ph.D
Department of the Army, Jacksonville District Corps of Engineers
Planning Division, Environmental Branch
P.O. Box 4970
Jacksonville, FL 32232

RE: Scoping comments on the Central Everglades Planning Project (CEPP)

Dear Dr. Ralph:

Miami-Dade County has supported the Comprehensive Everglades Restoration Plan (CERP) and foundation projects, including initial components of the Biscayne Bay Coastal Wetlands (BBCW) and C-111 Spreader (West) that are on the way to completion. The County recognizes that improvements in the heart of the central Everglades are necessary to achieve ecological restoration benefits in the Water Conservation Areas (WCA), Everglades National Park (ENP), and estuaries. We also expect that improved quantity and quality of freshwater flow will not only benefit hydrology and the marsh ecosystem, but will also enhance potential for water deliveries for human water supply and to the southern estuaries. Increased stages in eastern portions of the WCA and ENP and in certain canals could affect flood protection level of service to the east, and seepage management must be included simultaneously with flow enhancement. However, seepage management components must also maintain both quality and quantity of water reaching wellfields, particularly during dry or drought periods. The "fast-tracked" CEPP represents an opportunity to link together water quality, storage, conveyance and seepage management components, to more holistically reverse ongoing decline in the Everglades system and demonstrate benefits, as compared to the standard compartmentalized and cumbersome planning process.

Although the CEPP promises a more timely and efficient procedure, it is important that the scope of plan formulation in CEPP be comprehensive, both in geographic scale and in addressing the three principal interests of Miami-Dade County in an integrated fashion: local and system wide ecological benefits, water supply, and seepage management. As a county uniquely situated among two National Parks, a National Marine Sanctuary, aquatic preserves, one of the world's most transmissive aquifers, and globally imperiled natural systems, Miami-Dade has a demonstrated commitment to environmental restoration, water quality, wellfield and flood protection, conservation land acquisition, and sustainability. The CEPP formulation should evaluate unique characteristics on a local scale, and not relegate them to a lesser standing at the terminus of the Everglades system. More specifically, the scope of CEPP formulation should address:

- Water quality, ecological and hydrological benefits, including effects on plant community, habitat structure, and listed species and other wildlife in Florida and Biscayne Bays, as well as within WCA3a and b, and ENP.
- Water quality and quantity with respect to Miami-Dade public wellfields, including surface-groundwater interactions and saltwater intrusion, particularly during dry season or in prolonged drought, and in view of sea level rise projections.
- Flood protection under various canal stages and high water conditions, including operational criteria and modeling of distribution of peak stages and flows at critical gauges (such as S-357, S-338, S-196, S-194, S-380, C6-Palm, S-26 and T5) and at reference residential and agriculture lands.

County staff understands that in the traditional USACE process, many of the issues of concern to Miami-Dade and other stakeholders are viewed as "constraints" rather than project objectives or targets for formulating alternatives. Early public presentations about CEPP by USACE and SFWMD staff suggest that modeling tools for plan formulation will not address flood protection, water quality, wellfields, or Florida Bay and Biscayne Bay in detail or with defined "performance measures". This approach represents a serious concern to Miami-Dade. However, we believe that unnecessary delays and costs, caused by repeated modeling efforts, revisions of alternatives, or challenges can be avoided by including all of the above issues from the outset in developing and evaluating a suite of restoration alternatives. This can be addressed in part through appropriate inclusion of sub-regional or local hydrologic dynamic models, particularly in areas where seepage management features are contemplated, and through extension of evaluation transects or targets to coastal transition zones and lands to the east of the L-30/31 boundary. In view of the potential benefits of increased freshwater flows as a climate-change adaptation strategy to address saltwater intrusion into both wetlands and groundwater wellfields, evaluation models should also be capable of addressing consensus sea level rise projections.

It is also strongly recommended that CEPP build upon modeling tools, as wells as evaluation factors, including surrogates for water quality and hydrologic targets for tree islands and protected species, that have been developed or extensively reviewed by earlier Project Development Teams working on DECOMP, ERTP, C-111, and BBCW. Information derived from these types of analyses, even if not labeled as "performance measures", should be used to evaluate, refine and recommend a preferred alternative suite of restoration elements and operations, including seepage management features. Miami-Dade County also recommends that the scope of benefits and cost analyses in CEPP include non-traditional approaches, such as valuation of ecosystem "services" that may derive from restoration, such as savings on costs of flood protection or drinking water treatment, and economic benefits of recreational or aesthetic values of natural habitats, fish and wildlife. Miami-Dade conducts surface and groundwater monitoring programs in Miami-Dade County, has extensive experience in stormwater management master planning, and has a robust collaboration with USGS focusing on development and application of ground and surface water modeling for wellfield protection. Miami-Dade may have water quality data or hydrologic modeling information that would be of assistance in the development of your EIS.

Lastly, Miami-Dade recognizes the importance of engaging stakeholders in the CEPP and that the fast-track presents challenges. However, we request that one or more CEPP public meetings or workshops directed at local stakeholders and their concerns be held in Miami-Dade, and recommend that similar regional meetings be held in other local jurisdictions south of Lake Okeechobee. Our staff is willing to assist you in locating an appropriate venue.

Technical staff in the Miami-Dade Permitting, Environment, and Regulatory Affairs (PERA) department and the Water and Sewer Department (WASD) can provide additional detailed input on modeling and hydrologic or ecological targets. Please contact Mr. Lee Hefty, Assistant Director of PERA Environmental Services at 305-372-6754 or via email at heftyn@miamidade.gov if you need additional information.

Sincerely,

Jack Osterholt
Deputy Mayor

c: Stuart J. Appelbaum, Chief, Planning and Policy Division
Charles Danger, PE, Interim Director, PERA
John Renfrow, PE, Director WASD
Lee N. Hefty, Assistant Director, PERA

Ralph, Gina P SAJ

From: Lou Gross [gross@nimbios.org]
Sent: Friday, January 20, 2012 11:18 AM
To: CEPPComments, SAJ
Cc: [redacted]
Subject: Comments on CEPP EIS from The Institute for Environmental Modeling

To: Dr. Gina Padua Ralph
U.S. Army Corps of Engineers
Planning Division
P.O. Box 4970
Jacksonville, FL 32232-0019
CEPPComments@usace.army.mil

From: Dr. Louis J. Gross
James R. Cox and Alvin and Sally Beaman Distinguished
Professor of Ecology and Evolutionary Biology and Mathematics
Director, National Institute for Mathematical and Biological
Synthesis (NIMBioS.org)
Director, The Institute for Environmental Modeling
University of Tennessee
Knoxville, TN 37996
gross@nimbios.org

I am responding to the request for comments to the CEPP Environmental Impact Statement (EIS) in my role as the Director of the Across Trophic Level Systems Simulation (ATLSS) project here at the University of Tennessee. ATLSS, supported by the USGS and the National Science Foundation, has been developed and utilized since 1995 to synthesize the best available scientific knowledge and utilize this in conjunction with hydologic models to assess the relative impacts of alternative restoration plans on key biotic components of the South Florida freshwater systems.

Adaptive management has been the operative paradigm for incorporating science into CERP decision making for Everglades restoration. The roles of monitoring, hydrologic and biotic modeling, and the generation/evaluation of alternative hydrologic scenarios were well defined and vetted under this process. If adaptive management has been replaced by another paradigm, a clear and straight-forward description of that process is needed.

The federal register notice and online Central Everglades Planning Project (CEPP) documents do not provide specific information about how best available science will be incorporated into decision making or into the hydrologic scenario generation/evaluation process. The Corp's Planning Process Transformation Pilot Program, upon which the CEPP EIS is based, appears to be an experimental and untested paradigm. We question the choice of the Everglades - a complex and highly degraded ecosystem - as a testing ground for this planning paradigm, given the potentially non-reversible nature of unsound decisions that could result from this process.

The South Florida Water Management Model (SFWMM) was used in the past to provide hydrologic modeling for alternative CERP scenarios. SFWMM scenarios were accompanied by calibration data generated using historical rainfall and transpiration data and historical water management schedules and structures. These data allowed output from the SFWMM to be compared to historical gauging station data and also provided an approximation of historical water depths over all spatial cells of the model area. Calibration/verification hydrologic data could then be used - in conjunction with monitoring data for species numbers and distribution - to

calibrate and verify the biotic models used to evaluate relative impacts of alternative scenarios on Everglades biota.

CEPP scenario hydrology will apparently be generated by the South Florida Regional Simulation Model (RSM). CEPP documents provide insufficient detail about RSM calibration data, scenario generation, incorporation of biotic models in the evaluation process, and continued monitoring of key ecosystem components to provide assurances that science will continue to have an appropriate role in decision-making.
The documents do not discuss a mechanism for how biotic assessments are to be carried out, how alternative planning is to be developed based upon these assessments, nor how scientific input from the expansive collection of biotic system models developed as part of CERP are to be supported and incorporated in the EIS.

We are particularly concerned that monitoring has been discontinued or reduced for key components of the Everglades biota (including white-tailed deer and the Florida panther in Everglades National Park) despite the fact that there is still insufficient understanding of these species responses to accurately project the impacts of hydrologic changes on their populations. For those species still being monitored, no central data repository has been established, although such a repository was a major element in CERP planning to provide for continued incorporation of best available science into models.

Shortening the time period for management decision-making for CEPP relative to the CERP process makes the transparent incorporation of best available science and continued monitoring to assess biotic impacts all the more urgent.

--
Louis J. Gross
James R. Cox and Alvin and Sally Beaman Distinguished Professor of Ecology and Evolutionary Biology
and Mathematics
Director, National Institute for Mathematical and Biological
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January 20, 2012

Dr. Gina Padua Ralph
U.S. Army Corps of Engineers
Planning Division
P.O. Box 4970
Jacksonville, FL 32232-0019

RE: Central Everglades Planning Project

Dear Dr. Padua Ralph:

Please accept this letter as formal comments regarding the Central Everglades Planning Project (CEPP) on behalf of Lee County Division of Natural Resources.

Lee County wishes to express its full support of the CEPP. Lee County is an 804-square-mile metropolitan area of approximately 600,000 residents located along the Gulf Coast of Southwest Florida. Known for its 50 miles of white sand beaches on the Gulf of Mexico, Lee County receives approximately 5 million visitors a year that generates approximately $3 billion in economic impacts. Lee County tourism employs 1 out of every 5 people within the County. To be sure, protection of our precious natural and water resources is critical to Lee County and its residents, as well as to our tourism industry. While the economic impact of the tourism industry can be measured in dollars and cents, we also benefit from the quality of life to which a healthy ecosystem contributes.

Central to a healthy ecosystem in Lee County is the protection and restoration of the Caloosahatchee River and Estuary, and the beneficial management of Lake Okeechobee. Thus, the stated goals and objectives of the Central Everglades Planning Project are strongly supported and have long been pursued by Lee County. Improving the quantity, quality, timing and distribution of water in the Northern Estuaries and throughout the Everglades will lead to a more naturally functioning system and restore natural habitat within the Caloosahatchee River and Estuary. Specifically, the reduction of high volume discharges from Lake Okeechobee to improve water quality of oyster and submerged aquatic vegetation in the Caloosahatchee River and Estuary is an objective long sought by Lee County.

Lee County applauds the efforts of the Army Corps of Engineers and the South Florida Water Management District for taking on such an ambitious project – both in scope and in time. The CEPP is a tremendous opportunity to take a large step forward in the progress of protecting and restoring the Caloosahatchee River and Estuary.

Lee County appreciates the opportunity to submit comments on the CEPP.

Sincerely,

Jed R. Schneck

JRS/bt

c. Roland Ottolini, P.E., Director – Lee County
Kurt Harclerode, Operations Manager – Lee County
John J. Fumero, Esquire – Sundstrom, Friedman & Fumero, LLP

Ralph, Gina P SAJ

From: carl woehlcke [redacted]
Sent: Friday, January 20, 2012 3:31 PM
To: CEPPComments, SAJ
Subject: Options to Consider in the Project PIR

Here are some options that should be considered within the CEPP PIR to partially substitute for or complement other proposed options 1. In-ground Storage Reservoirs in lieu of above ground reservoirs 2. Deep In-ground cells within any reservoirs (above or below ground) for chemical water treatment (perhaps with alum) and sequestration of removed Phosphorus in deepest parts of the cell 3. ASR wells to store water when there is excess water in the EAA and reservoirs and/or Lake Okeechobee are at or near capacity (having good connections to use Lake Okeechobee water would be important).
4. Deep (boulder zone) disposal wells to remove water that can not be stored and treated (e.g. brackish water in new in-ground reservoir cells and excess water imported from Lake Okeechobee during periods of regulatory discharge) (having good connections to use Lake Okeechobee water would be important).
5. Facilities to move and discharge water along the northern and western boundaries of Water Conservation Area 3.

The first 4 options are less land intensive than the options of above-ground reservoirs and STAs. They may well be cost-competitive.They are also less likely to engender conflicts between their planned uses and environmental values. The fifth option is necessary to distribute water to rehydrate WCA 3 and establish proper flows to achieve restoration.

Louis Carl Woehlcke, Ph.D.

GLADES SUGAR HOUSE

Sugar Cane Growers Cooperative of Florida

POST OFFICE BOX 666 BELLE GLADE, FLORIDA

33430-0666

January 19, 2012

U. S. Army Corps of Engineers
Dr. Gina Paduano Ralph
Email: CEPPcomments@usace.army.mil

Dear Dr. Ralph:

As sugar cane growers and refiners located in the Everglades Agricultural Area, we have a continuing and vital interest in the Comprehensive Everglades Restoration Plan and in the CEPP. Our interest is from two perspectives: we are major landowners and farmers in the region, and we depend on the operations of the Central & Southern Florida Flood Control project for water supply and flood protection. We worked hard supporting the Congressional approval of CERP as part of the Water Resources Development Act of 2000. We fully endorse WRDA 2000's statement of CERP's purpose: *"The overarching objective of the Plan is the restoration, preservation, and protection of the South Florida Ecosystem while providing for other water-related needs of the region, including water supply and flood protection."* The stated purpose of CERP in the Federal register's scoping document is the restoration and protection of the remaining Everglades while meeting the water related needs of the region. It goes on to describe the authorized project purposes of the C&SF project.

We endorse the CEPP goal of combining several conditionally authorized project components to develop an increment of CERP that will contribute to enhancing sheetflow through the Water Conservation Areas. CEPP recognizes the system wide nature of CERP and hence the need to address quantity, quality, timing, and distribution in an integrated manner through the construction and operation of multiple project components.

Telephone (561) 996-5556 Fax No. (561) 996-4747

We support streamlining the planning process though improved vertical integration of decision making within the Corps and this initiative's focus on balancing the level of detail in the planning process with the level of uncertainty appropriate for restoration planning. Nevertheless this new nationwide pilot program to modify the Corps' planning process must include the overarching commitment to meet all requirements of law and regulation albeit in an accelerated fashion.

We have several concerns with the scope of this project as we understand it. First, from the scoping letter it is not apparent what federal action is being proposed, therefore it is difficult to know what to comment on. We have been attending the public workshops hosted by the South Florida Ecosystem Restoration Task Force staff and Water Resource Advisory Commission (WRAC) briefing in an effort to learn more about the Central Everglades Planning initiative.

While we support your efforts to streamline the process to produce a Project Implementation Report (PIR), the desire for expeditious completion of a PIR must not outweigh the necessity for careful, comprehensive evaluation of alternatives, uninhibited by arbitrary or unrealistic constraints and assumptions.

We have the following specific comments on the planning assumptions and constraints:

- The planning scope must recognize that the present Lake Okeechobee Regulation Schedule is an interim one necessitated by concerns with levee integrity. A continuing program of levee improvements is underway that will allow the return to the previous storage capacity in the Lake. Recent statements by Col. Pantano indicate that the most important Dike repairs will be completed during the same time frame described for the CEPP. Additional water storage in the Lake should therefore be evaluated as part of the project's alternative analyses.

- Further, to be in accordance with the basic assurances afforded to stakeholders in WRDA 2000, the CERP without-project condition, and thus

the CEPP without-project condition should be comparable. While CERP used the Run 25 Lake schedule, the WSE Schedule was approved concurrent with CERP and should be used as the without-project condition for the CEPP.

- Assumptions concerning water quality must be based in reality. To assume Lake Okeechobee water meets the TMDL for the lake, without any project features on the horizon to accomplish that, seems foolhardy. The TMDL is designed to meet a much reduced load target for phosphorus flowing into Lake Okeechobee, not an in-lake concentration. The scientific discussion by government staff when the TMDL was developed made it clear that even if by some magic the load reduction limit could be achieved it would still take decades, if not centuries, for the in-lake phosphorus concentrations to reach 40 ppb. There would seem to be no need to accelerate the federal planning for this project if it is based on an assumption that cannot possibly be met for several decades, if ever.

- Assuming that the without-project condition Stormwater Treatment Areas are meeting some un-defined target that's tied up in two federal court cases, and the new water made available by CEPP will meet that same unknown target is inappropriate. Without-project conditions should be predicated on forecasts of the most likely conditions to prevail over the life of the project. Water quality improvement must be associated with the specific facility investments and regulatory actions necessary to achieve them. This is essential to the planning process as these activities may impact the availability of land for water storage and other purposes. The CEPP should integrate water quality and water quantity planning to ensure the most cost-effective use of available land resources and achieve the best balance among the four aspects of water flow essential to restoration—quantity, quality, timing and distribution. In evaluating the cost-effectiveness of various alternatives tradeoffs will be necessary, and the federal agencies must be prepared to make them.

- In considering increased storage, the examination of alternatives must be comprehensive. The Aquifer Storage and Recovery Projects (ASR) as envisioned by CERP have a compelling advantage over surface storage in

avoiding loss of water due to evapotranspiration as well as having minimal land requirements. The CERP plan would not have made it over the goal line without the inclusion of an ASR component. The pilot projects are underway and the Lake Okeechobee region's wells show promising results. This alternative for storage should be evaluated as part of the plan formulation analyses.

- Another alternative for providing increased water storage that must be addressed is increased use of Lake Okeechobee for storage beyond that provided historically. This is specifically addressed in the report of the NRC Committee on Everglades Restoration, (Re-Engineering Water Storage in the Everglades: Risks and Opportunities, NRC, 2005) and warrants further analysis in light of the increased storage capability that will be afforded by completion of the Hoover Dike improvements.

- There have been several processes over the last five years that have clouded the issue of what is considered part of CERP and what is not. To be successful within the time constraints you have chosen it is essential that the scope of the CEPP track very closely with the conceptual plans approved by Congress. With respect to the EAA, the actual footprint of the project in the final CERP document matches well with the land now owned by the District, and limiting the planning scope to that property meets the stated intent for the CEPP. Going beyond that footprint would trigger the need for a CERP Update as specified in the Programmatic Regulations and should not be part of this plan.

- The same approach must be taken with water flows from the Lake to the Everglades. Although the continued refinement of the computer models used for the CERP was expected, the scale of the Everglades flow values now being discussed in some circles is well beyond anything contemplated in WRDA 2000 and would clearly require a formal CERP update. The Central Everglades Plan must stay close to the flow volumes expected with the plan approval in WRDA 2000. This is especially important if you want to stay within the shortened timeframe for this analysis.

- Certain constraints were imposed on the plans to be recommended under CERP by the "Savings Clause" in WRDA 2000. The first provision protects water supplies for the various uses affected by CERP.

  "(5) SAVINGS CLAUSE.—
  (A) NO ELIMINATION OR TRANSFER.—Until a new source of water supply of comparable quantity and quality as that available on the date of enactment of this Act is available to replace the water to be lost as a result of implementation of the Plan, the Secretary and the non-Federal sponsor shall not eliminate or transfer existing legal sources of water, including those for—
  (i) an agricultural or urban water supply;
  (ii) allocation or entitlement to the Seminole Indian Tribe of Florida under section 7 of the Seminole Indian Land Claims Settlement Act of 1987 (25 U.S.C. 1772e);
  (iii) the Miccosukee Tribe of Indians of Florida;
  (iv) water supply for Everglades National Park; or
  (v) water supply for fish and wildlife."

While we have emphasized above that planning is to be based on the most likely without-project conditions in accordance with NEPA and Corps regulations, we remind the Corps that the savings clause imposes a constraint on plans based on conditions prevailing at the time of the enactment of WRDA 2000 and is an accounting calculation separate from the projections based on the present prevailing situation and the future most-likely without project condition.

With a stated purpose of enhancing sheet flow in the Everglades, and providing additional water from Lake Okeechobee for that purpose, the CEPP must include options that evaluate returning sheet flow to the Holey Land and Rotenberger properties adjacent to WCA-3A. To continue to isolate those areas will require additional engineering features to flow water around, rather than through, those areas, and severely limit the restoration of Everglades sheet flow over a large portion of the historic Everglades.

We applaud the Corps for its attempt to shift its emphasis in Everglades restoration from planning to construction of agreed upon and approved

project features. We continue to support the blueprint put forth with the Congressional and state legislative adoption of CERP in 2000.

Sincerely,

Barbara J. Miedema
Vice President, Public Affairs & Communications

BJM:swd

cc: Mr. Joe Collins, SFWMD, Chair
Mr. Kevin Powers, SFWMD, Vice Chair
Ms. Sandy Batchelor, SFWMD Board Member
Mr. Daniel DeLisi, SFWMD Board Member
Mr. James J. Moran, SFWMD Board Member
Mr. Daniel O'Keefe, SFWMD Board Member
Mr. Juan M. Portuondo, SFWMD Board Member
Mr. Timothy Sargent, SFWMD Board Member
Mr. Glenn J. Waldman, SFWMD Board Member
Mr. Matt Morrison, SFWMD
Mr. Tom Teets, SFWMD
Ms. Kimberly Taplin, USACE
Mr. Steven Kopecky, USACE

Ralph, Gina P SAJ

From: W. E. Ted Guy [redacted]
Sent: Tuesday, December 20, 2011 5:35 PM
To: CEPPComments, SAJ
Cc: 'SFWMD'
Subject: Comments on CEPP workshops

Col. Pantano & Lt. Col. Kinard:

We welcome the Corps and other agencies' push to "move water South" at long last, having studied the issues since the early 1980s. I note that SFRestore's "New" science "discovery" repeats what the Corps has known at least since its independent scientist panel published the Reconnaissance Report in 1994.

CERP Table 5-1 "Goals and Objectives" applies just as much today as it did when adopted in 1999 and should be followed. That seems to be the major flaw in the current CEPP: not restoring the natural flow instead of relying on new engineered "plumbing" projects. Without restoring the pond apple forest and the sawgrass sheet flow through the "River of Grass", we'll never achieve cleaning enough nutrients out of the water as it moves South to make it suitable for re-charging the Everglades.

I am an environmentalist board member of the Rivers Coalition and co-founder of the ROGER coalition of coalitions. (River of Grass Everglades/Estuary Restoration) Together these coalitions represent about 500,000 citizens of South Florida. Thanks for listening and thanks for involving stakeholders and the public in the CEPP!

W.E. "Ted" Guy, Jr.

[redacted]

Florida Department of Environmental Protection
Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

January 23, 2012

Dr. Gina Paduano Ralph
Jacksonville District, Planning Division
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

RE: Department of the Army, Jacksonville District Corps of Engineers – Scoping Notice – Central Everglades Planning Project (CEPP), Integrate and Accelerate Implementation of Comprehensive Everglades Restoration Plan Projects in South Florida.
SAI # FL201112066056

Dear Dr. Ralph:

The Florida State Clearinghouse has coordinated a review of the referenced scoping notice under the following authorities: Presidential Executive Order 12372; Section 403.061(42), *Florida Statutes*; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended.

The Florida Department of Environmental Protection (DEP) supports development of the CEPP and believes that it will compliment the State of Florida's efforts in improving water quality and restoring the Everglades. DEP staff recommends that the following issues and concerns be addressed during CEPP plan formulation:

- Because the new U.S. Army Corps of Engineers (USACE) nationwide Planning Transformation Pilot Program has introduced several enhanced procedures, such as identifying risks early in the process to aid in addressing uncertainties in plan formulation and improving vertical communication and decision making within the USACE, DEP recommends that the USACE maintain and provide a list of identified risks to the commenting agencies for their use in early issue resolution.
- The DEP believes that addressing water quality is one of the most critical components of this planning effort and is committed to addressing water quality in existing flows to the Everglades Protection Area consistent with the requirements of the state's phosphorus criterion. Staff requests that the USACE include, as part of the future without-project condition, the assumption that existing volumes of water will be

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treated to meet the objectives of the phosphorus criterion prior to discharge to the Everglades Protection Area.

- In addition to the water quantity and quality assumptions for the future without-project condition identified above, the DEP requests that the USACE use the existing quality of water flowing from Lake Okeechobee, and the delta between existing flows and future with-project flows, through the central flow path as a basis for planning additional treatment, storage or other features identified as part of the expedited planning process. As with the treatment of existing flows, the USACE should assume that any new water flowing to the Everglades Protection Area will be required to be treated to levels consistent with the phosphorus criterion.
- Please work closely with the local sponsor to establish expectations regarding cost sharing on all new components, or modifications to existing components, that ultimately result from the expedited planning process. In particular, cost sharing expectations for water quality projects need to be identified and resolved early on in the planning process.
- The State of Florida has spent a significant amount of time and money acquiring more than 243,000 acres of land for the implementation of the Comprehensive Everglades Restoration Plan (CERP). The DEP requests that the USACE focus its planning efforts for storage and treatment projects on lands already owned by the South Florida Water Management District (SFWMD).
- The CEPP assumes in the future without-project condition that the foundation projects, first generation CERP projects and second generation CERP projects are in place. However, the foundation projects have not been completed and the operation plans have not been developed, making project outcomes more difficult to predict. As part of the scoping phase of the CEPP project, the Integrated Delivery Schedule should be reevaluated to account for these revised project timeframes. The implementation schedule for second generation CERP projects that may influence the CEPP should be carefully considered as part of the expedited planning process.
- It is currently unclear whether the Modified Water Deliveries (MWD) project will be completed as it was originally envisioned. Any future with-project scenario that includes features originally identified under the MWD project should be identified as being the sole responsibility of the federal government, with the exception of cost-share commitments between the SFWMD and USACE for operations.

For further specific comments and recommendations, please refer to the enclosed DEP memorandum and contact Ms. Inger Hansen at (561) 682-2663.

As the local sponsor, the SFWMD has played an integral role in developing and implementing the CERP. As such, SFWMD staff has identified three issues of significance

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that must be addressed to enable the SFWMD to move forward with local sponsorship of the CEPP and meet the remaining milestones of the expedited planning process:

1. Water quality requirements, assumptions and cost-share. The SFWMD can only support assumptions for the CEPP future without-project condition that the SFWMD will treat current annual flows of approximately 850,000 acre-feet of water to a flow-weighted mean for total phosphorus of 13 parts per billion (ppb). All facilities needed to treat existing inflows, as proposed by the State of Florida in response to the U.S. Environmental Protection Agency's Amended Determination, would be non-federally funded. In its assumptions for the future with-project condition, the USACE should use the existing quality of water flowing from Lake Okeechobee through the central flow path as a basis for planning additional treatment facilities. Consistent with the treatment of existing flows, the USACE should also assume that new water flowing to the Everglades Protection Area will be treated to 13 ppb total phosphorus.
2. Use of existing SFWMD-owned lands in project formulation. SFWMD advises that the 243,000 acres currently acquired should be utilized to implement the initial increment of central Everglades restoration in an expeditious, cost-effective and commonsense manner (see attached map).
3. Inclusion in the CEPP future with-project condition of specific project features identified in the June 1992 General Design Memorandum and Environmental Impact Statement for Modified Water Deliveries to Everglades National Park. To date, features that were to be constructed as part of the MWD project – three gated culvert structures, three gated concrete headwall structures and degrading of the existing Levee 67 Extension and filling the borrow canal – have not been constructed or are only partially constructed. The SFWMD can support inclusion of these features in the future with-project condition only if the USACE indentifies in the CEPP documentation that construction and operation of these features will be cost-shared in accordance with the terms and conditions of the Project Cooperation Agreement between the SFWMD and USACE for this foundation project.

Please see the enclosed SFWMD letter and contact Mr. Tom Teets, Federal Policy Chief, at (561) 682-6993 for further details and assistance.

The Florida Department of Agriculture and Consumer Services (FDACS) fully supports the USACE's intent to conduct an integrated study of the subject CERP projects and the objective of restoring flows to the south and reducing harmful discharges to the east and west coast estuaries. There are, however, significant issues that need to be addressed if this effort is to be successful:

1. The process for developing the CEPP must clearly recognize the interim status of the current Lake Okeechobee Regulation Schedule; it would be inappropriate to assume the LORS08 schedule for either the with- or without-project scenarios. Planned repairs

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to the Herbert Hoover Dike should increase storage in the Lake, and the planning process should consider the availability of that additional storage in its analysis of project alternatives. Any additional demands on the Lake must be carefully evaluated in light of existing demands of both water users and the environment, as well as future demands from other CERP components that rely upon Lake water.

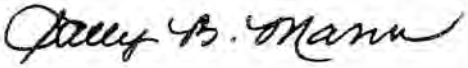
2. The planning process must realistically consider water quality concerns. The CERP is built upon assumptions regarding water quality that FDACS staff has difficulty accepting, since water quality constraints can prevent the movement of additional water through the central part of the system. The in-lake phosphorus concentration for Lake Okeechobee is one such constraint, even if it is assumed that the total maximum daily load for phosphorus will be met in the foreseeable future. Issues related to the Stormwater Treatment Areas (STAs) must also be addressed. Without resolving the legal and technical uncertainties characterizing the STAs as currently operated, the movement of additional water made available by the CEPP southward cannot be presumed.

For additional information, please see the enclosed FDACS letter and contact Mr. Ray Scott at (850) 410-6714 or Ms. Rebecca Elliott at (561) 682-6040.

Based on the information contained in the scoping notice and the enclosed state agency comments, at this stage, the state has no objections to the proposed federal action. To ensure the project's consistency with the Florida Coastal Management Program (FCMP), the concerns identified by our reviewing agencies must be addressed prior to project implementation. The state's continued concurrence will be based on the activity's compliance with FCMP authorities, including federal and state monitoring of the activity to ensure its continued conformance, and the adequate resolution of issues identified during this and subsequent reviews.

Thank you for the opportunity to review the public notice. Should you have any questions regarding this letter, please contact Ms. Lauren P. Milligan at (850) 245-2170.

Yours sincerely,



Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/lm
Enclosures

Florida State Clearinghouse

cc: Greg Knecht, DEP, OEP
Ernie Marks, DEP, OEP PCRS
Dianne Hughes, DEP, Southeast District
Deborah Oblaczynski, SFWMD
Ray Scott, FDACS
Forrest Watson, FDACS

Florida State Clearinghouse

Project Information	
Project:	FL201112066056
Comments Due:	01/11/2012
Letter Due:	01/20/2012
Description:	DEPARTMENT OF THE ARMY, JACKSONVILLE DISTRICT CORPS OF ENGINEERS - SCOPING NOTICE - CENTRAL EVERGLADES PLANNING PROJECT (CEPP), INTEGRATE AND ACCELERATE IMPLEMENTATION OF COMPREHENSIVE EVERGLADES RESTORATION PLAN PROJECTS IN SOUTH FLORIDA.
Keywords:	ACOE - CENTRAL EVERGLADES PLANNING PROJECT FOR CERP PROJECTS IN SOUTH FLORIDA
CFDA #:	12.104

Agency Comments:

AGRICULTURE - FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

The FDACS indicates full support for the USACE's intent to conduct an integrated study of the subject CERP projects and the objective of restoring flows to the south and reducing harmful discharges to the east and west coast estuaries. There are, however, significant issues that need to be addressed if this effort is to be successful. First, the process for developing the CEPP must clearly recognize the interim status of the current Lake Okeechobee Regulation Schedule; it would be inappropriate to assume the LORS08 schedule for either the With- or Without-Project scenarios. Planned repairs to the Herbert Hoover Dike should increase storage in the Lake, and the planning process should consider the availability of that additional storage in its analysis of project alternatives. Any additional demands on the Lake must be carefully evaluated in light of existing demands of both water users and the environment, as well as future demands from other CERP components (e.g., the C-43 Reservoir) that rely upon Lake water. Second, the planning process must realistically consider water quality concerns. The CERP is built upon assumptions regarding water quality that FDACS staff has difficulty accepting, because water quality constraints can prevent the movement of additional water through the central part of the system. The in-lake phosphorus concentration for Lake Okeechobee is one such constraint, even if it is assumed that the total maximum daily load (TMDL) for phosphorus will be met in the foreseeable future. Issues related to the Stormwater Treatment Areas (STAs) must also be addressed. Without resolving the legal and technical uncertainties characterizing the STAs as currently operated, the movement of additional water made available by the CEPP southward cannot be presumed.

FISH and WILDLIFE COMMISSION - FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

No comment from the FWC Division of Habitat and Species Conservation.

TRANSPORTATION - FLORIDA DEPARTMENT OF TRANSPORTATION

Released Without Comment

ENVIRONMENTAL PROTECTION - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

The DEP supports development of the CEPP and believes that it will compliment the State of Florida's efforts in improving water quality and restoring the Everglades. DEP staff recommends that the following issues and concerns be addressed during CEPP plan formulation: - Because the new USACE nationwide Planning Transformation Pilot Program has introduced several enhanced procedures, such as identifying risks early in the process to aid in addressing uncertainties in plan formulation and improving vertical communication and decision making within the USACE, DEP recommends that the USACE maintain and provide a list of identified risks to the commenting agencies for their use in early issue resolution. - The DEP believes that addressing water quality is one of the most critical components of this planning effort and is committed to addressing water quality in existing flows to the Everglades Protection Area consistent with the requirements of the state's phosphorus criterion. Staff requests that the USACE include, as part of the future without-project condition, the assumption that existing volumes of water will be treated to meet the objectives of the phosphorus criterion prior to discharge to the Everglades Protection Area. - In addition to the water quantity and quality assumptions for the future without-project condition identified above, the DEP requests that the USACE use the existing quality of water flowing from Lake Okeechobee, and the delta between existing flows and future with-project flows, through the central flow path as a basis for planning additional treatment, storage or other features identified as part of the expedited planning process. As with the treatment of existing flows, the USACE should assume that any new water flowing to the Everglades Protection Area will be required to be treated to levels consistent with the phosphorus criterion. For further specific comments and recommendations, please refer to the enclosed DEP memorandum.

SOUTH FLORIDA WMD - SOUTH FLORIDA WATER MANAGEMENT DISTRICT

The SFWMD transmitted a letter to the Florida State Clearinghouse on January 18, 2012. The letter provides the District's comments on the Department of the Army, Jacksonville District Corps of Engineers Scoping Notice for the Central Everglades Planning Project. For further information on the above comments, please contact Mr. Tom Teets, Federal Policy Chief, at (561) 682-6993 or tteets@sfwmd.gov. If you have any comments or questions regarding SFWMD's review, please contact Ms. Deborah Oblaczynski, Policy and Planning Analyst Specialist, at (561) 682-2544 or doblaczy@sfwmd.gov.

Memorandum

TO: Florida State Clearinghouse

THROUGH: Greg Knecht, Director
Office of Ecosystem Projects

FROM: Inger Hansen, Jerilyn Ashworth, William C. Kennedy, and Dianne Hughes

DATE: January 20, 2012

SUBJECT: U.S. Army Corps of Engineers, Jacksonville District – Scoping Notice – Central Everglades Planning Project – Okeechobee, Glades, Martin, Palm Beach, Broward, Miami-Dade and Monroe Counties, Florida.

Background:
The Florida Department of Environmental Protection sincerely appreciates the opportunity to provide comments on the U.S. Army Corps of Engineers' (Corps) proposed Central Everglades Planning Project (CEPP). The CEPP is being developed under the Corps' Planning Transformation Pilot Program, whereby the Corps is expediting the development of a Project Implementation Report/Environmental Impact Statement (PIR/EIS) under the Comprehensive Everglades Restoration Plan (CERP) and the National Environmental Policy Act. The CEPP is a consolidation of several CERP project components including: Everglades Agricultural Storage Reservoirs, Water Conservation Area 3 Decompartmentalization and Sheet Flow Enhancement, Everglades National Park Seepage Management and Everglades Rain-Driven Operations. To address the requirements of the PIR/EIS, the Corps is working with both federal and state agencies to gather information necessary to better define the issues and concerns that need to be addressed during the CEPP plan formulation.

Comments:
The Department believes that the CEPP compliments the State of Florida's efforts in improving water quality and restoring the Everglades. Successful restoration of the Everglades is contingent on integrating and streamlining both the state and federal efforts. As noted by the National Research Council's Committee on Independent Scientific Review of Everglades Restoration Progress (2010), "continued decline of some aspects of the ecosystem coupled with environmental and societal changes make accelerated progress in Everglades restoration even more important." The Department, therefore, strongly supports the Corps' effort on moving the Central Everglades restoration effort forward on an expedited schedule.

The CEPP is one of the Corps' seven nationwide Planning Transformation Pilot Programs to improve the federal planning process by significantly reducing the timeframe and process necessary to develop an EIS or, in the case of CERP, a PIR/EIS. The new program has introduced several enhanced procedures, such as identifying risks early in the process to aid in addressing uncertainties in plan formulation and improving vertical communication and decision making within the Corps. With regards to this particular item, the Department

recommends that the Corps maintain and provide a list of identified risks to the commenting agencies for their use in early issue resolution.

The Department believes that addressing water quality is one of the most critical components of this planning effort. The State of Florida is committed to addressing water quality with regard to the existing flows to the Everglades Protection Area consistent with the requirements of the state's phosphorus criterion. The Department requests that the Corps include, as part of the future without-project condition, the assumption that existing volumes of water will be treated to meet the objectives of the phosphorus criterion prior to discharge to the Everglades Protection Area.

In addition to the water quantity and quality assumptions for the future without-project condition identified above, the Department requests that the Corps use the existing quality of water flowing from Lake Okeechobee, and the delta between existing flows and future with-project flows, through the central flow path as a basis for planning additional treatment, storage or other features identified as part of the expedited planning process. As with the treatment of existing flows, the Corps should assume that any new water flowing to the Everglades Protection Area will be required to be treated to levels consistent with the phosphorus criterion.

The Department suggests that the Corps work closely with the local sponsor to establish expectations regarding cost sharing on all new components, or modifications to existing components, that ultimately result from the expedited planning process. In particular, cost sharing expectations for water quality projects need to be identified and resolved early on in the planning process.

The State of Florida, particularly the Department and the South Florida Water Management District (District), have spent a significant amount of time and money acquiring more than 243,000 acres of land for the implementation of the Comprehensive Everglades Restoration Plan. The Department requests that the Corps focus its planning efforts for storage and treatment projects on lands already owned by the District. The rationale for such limitations can be clearly articulated in the CEPP PIR/EIS. This focus would be in the best interest of taxpayers, as it will provide multiple benefits, including: elimination of evaluation of multiple footprints on lands not in District ownership, expediting the federal planning process and putting these significant investments to work.

The CEPP assumes in the future without-project condition that the foundation projects (specifically Modified Water Deliveries and South Dade C-111 projects), the first generation CERP projects and the second generation CERP projects are in place. However, the foundation projects have not been completed and the operation plans have not been developed, making project outcomes more difficult to predict.

As part of the scoping phase of the CEPP project, the Integrated Delivery Schedule (IDS) should be reevaluated. The current IDS shows that the DECOMP Part 1 project (now part of the CEPP)

will be constructed in 2017-2020, whereas some of the second generation CERP projects, such as BCWPA, are not scheduled to be constructed before the 2020 timeframe. The BCWPA project influences both water quality inflows to Water Conservation Area 3 and Everglades National Park. The Department suggests that an evaluation of the implementation schedule for second generation CERP projects that may influence the CEPP should be carefully considered as part of the expedited planning process.

It is currently unclear if the Modified Water Deliveries (MWD) project will be completed as it was originally envisioned. The construction of certain features and seepage management/flood control aspects of the MWD project have not been fully addressed. Any future with-project condition scenario that includes features originally identified under the MWD project should be identified as being the sole responsibility of the federal government, with the exception of cost-share commitments made between the SFWMD and the Corps for operations.

Department staff looks forward to continued participation throughout the planning process. The Department would like to reiterate its commitment to the restoration of the Greater Everglades ecosystem and "getting the water right." Should you have any questions on the comments provided, please do not hesitate to contact Ms. Inger Hansen at (561) 682-2663.

Electronic copies to:
Greg Knecht
Chad Kennedy
Ernie Marks
Inger Hansen
Jerilyn Ashworth
Dianne Hughes
Deinna Nicholson

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

January 20, 2012

Colonel Alfred A. Pantano, Jr.
Department of the Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Dear Colonel Pantano:

Subject: Department of the Army, Jacksonville District Corps of Engineers Intent to Prepare an Environmental Impact Statement for the Central Everglades Planning Project, Okeechobee, Glades, Martin, Palm Beach, Broward, Miami-Dade and Monroe counties, FL – Scoping Comments

The South Florida Water Management District submitted the attached letter in response to the U.S. Army Corps of Engineers (Corps) November 23, 2011 request for comments on the scope of the Central Everglades Planning Project (CEPP). These comments reflect the guidance received from the Governing Board at its January 12, 2012 business meeting concerning the goals and objectives of the Central Everglades Planning Project. Based on this direction, the District has identified three issues of significance, which are addressed in detail in the attached letter to the Florida State Clearinghouse.

- Water quality requirements, assumptions and cost-share;
- Use of existing District-owned lands in project formulation; and
- Inclusion in the CEPP "Future With Project Condition" of specific project features identified in the June 1992 General Design Memorandum and Environmental Impact Statement for Modified Water Deliveries to Everglades National Park.

The District is supportive of the Corps' reformed planning process, and is committed to moving Everglades restoration forward as envisioned in the CEPP. However, it is imperative that these issues be resolved early in the planning process so that both agencies – as trustees of the public's resources - have a clear understanding of our anticipated financial obligations prior to the onset of plan formulation.

In order to meet the expedited timetable envisioned for CEPP, the District and Corps should have agreed upon solutions by the first Decision Pont meeting scheduled for January 27, 2011. Tom Teets and I will be in Washington, D.C., to participate in this meeting.

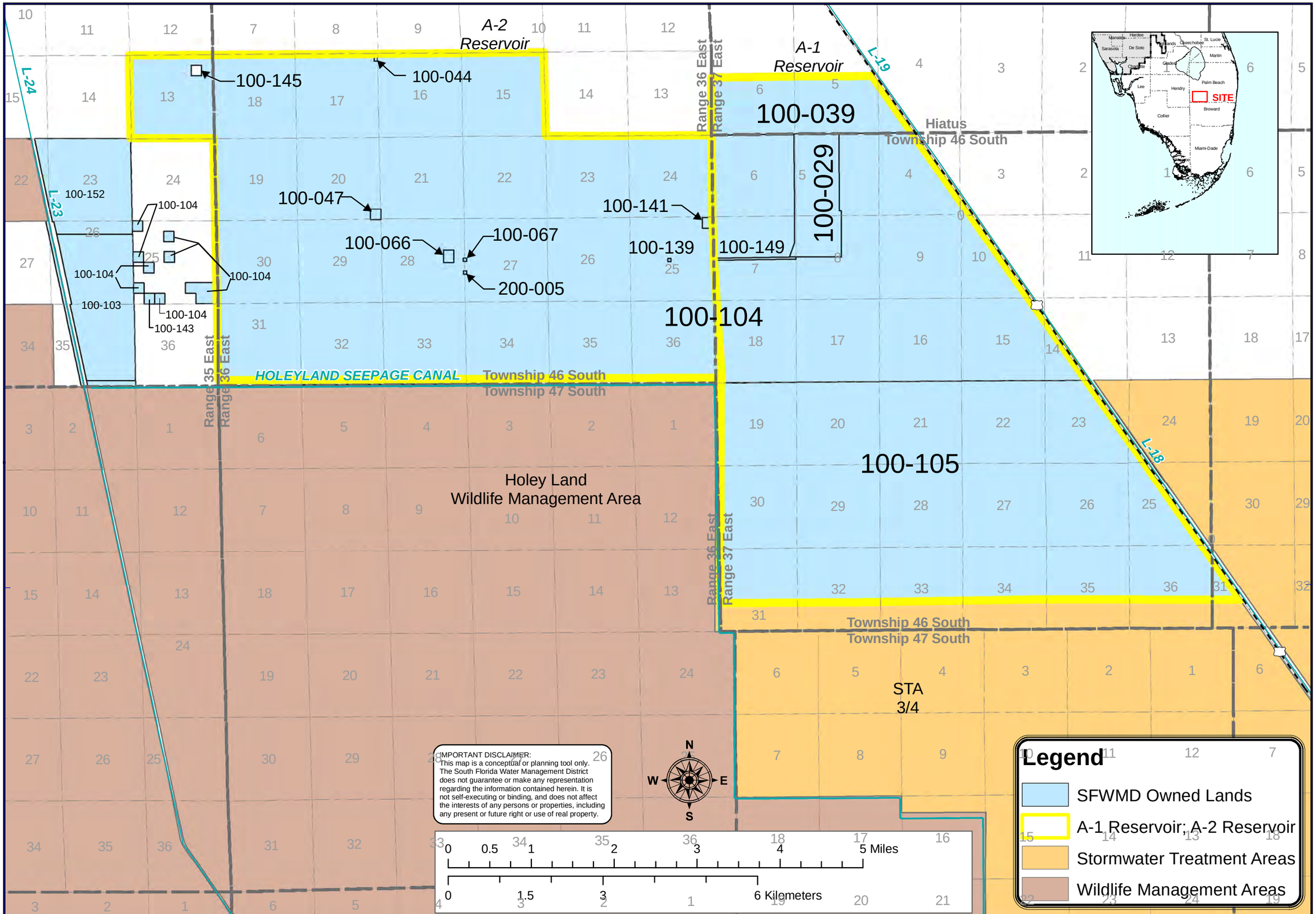
Should there be any questions associated with the District's comments, please contact Tom Teets, Federal Policy Chief, at (561) 682-6993 or tteets@sfwmd.gov.

Sincerely,

Melissa L. Meeker
Executive Director
South Florida Water Management District

MLM/bcl
Attachment

c: Stuart Appelbaum, USACE
Kimberly Taplin, USACE
Ernie Barnett, SFWMD
Tom Teets, SFWMD
Matthew Morrison, SFWMD
Greg Munson, FDEP
Greg Knecht, FDEP



UPDATED
10-JAN-2012

CENTRAL EVERGLADES STUDY

A-1 & A-2 Reservoirs

South Florida Water Management District
Land Acquisition Department
GIS SECTION
3301 Gun Club Road, West Palm Beach, Florida 33406
561-686-8800 - FL WATS 1-800-432-2045 - www.sfwmd.gov
MAILING ADDRESS: P.O. Box 24680 - West Palm Beach, FL 33416-4680

For copies of this map (\\Avd.sfwmd.gov\dfsroot\data\aa_gis\arc_data\maps\proj\CentralEverglades\am2012-01-09_MAP_frazem_CE_A1A2Tracts_District.mxd)which was produced on 1/9/2012 by JLS, contact the GIS Section

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

January 20, 2012

Ms. Lauren P. Milligan
Environmental Manager
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, MS 47
Tallahassee, FL 32399-3000

Dear Ms. Milligan:

Subject: Department of the Army, Jacksonville District Corps of Engineers Intent to Prepare an Environmental Impact Statement for the Central Everglades Planning Project, Okeechobee, Glades, Martin, Palm Beach, Broward, Miami-Dade and Monroe counties, FL – Scoping Comments

The South Florida Water Management District (District) appreciates the opportunity to provide comments on the scope of the Central Everglades Planning Project (CEPP) in accordance with the requirements of the regulations implementing the National Environmental Policy Act (NEPA), 40 C.F.R. Section 1501.7. The District has provided technical resources to the U.S. Army Corps of Engineers (Corps) during this project scoping phase and at its January12, 2012 business meeting, presented comprehensive information about the goals and objectives of the Central Everglades Planning Project to its Governing Board. The District's enclosed comments reflect the guidance provided by the Governing Board on the resolution of specific policy issues, which will be necessary prior to the Corps' first Decision Point and before proceeding as local sponsor into the execution phase of the project.

Background

The Comprehensive Everglades Restoration Plan (CERP) is an unprecedented 50/50 cost-share partnership between the federal government and the State of Florida, with the South Florida Water Management District authorized by the State as the local sponsor for CERP projects (373.1501(4), F.S.). Approved in Section 601(h) of the federal Water Resources Development Act of 2000, CERP is the framework for improving and restoring the quality, quantity, timing and distribution of water to the South Florida ecosystem, while providing for other water related needs of the region.

The Corps intends the Central Everglades Planning Project to be the next step in the ongoing implementation of CERP. Specifically, the purpose of the Central Everglades Planning Project is to develop an initial increment of CERP project features that provide for storage, treatment and conveyance of water south of Lake Okeechobee; removal of canals and levees within Water Conservation Area 3; and implementation of seepage management features to retain water within the natural system. The Corps has identified the following inter-related CERP projects to accomplish these objectives:

- Everglades Agricultural Storage Reservoirs
- Water Conservation Area 3 Decompartmentalization and Sheet Flow Enhancement
- Everglades National Park Seepage Management
- Everglades Rain-Driven Operations

Identified as one of seven pilot projects nationwide, the Corps intends to undertake and fast-track an integrated study effort on these projects through the development of an integrated Project Implementation Report and Environmental Impact Statement. This expedited study is being conducted under the Corps' newly reformed planning process that is designed to cut years from the planning process by completing and approving the Project Implementation Report through the Civil Works Review Board within 18 months.

Guidance on the expedited planning process from the Assistant Secretary of the Army (Civil Works) directs the Corps to determine the expected level of federal investment early in the decision-making process and to clearly communicate such decisions with the intended local sponsor and other stakeholders in order to appropriately steer plan formulation. For the Central Everglades Planning Project, this first Decision Point is scheduled for January 27, 2012.

As the local sponsor, the South Florida Water Management District has played an integral role in developing and implementing the Comprehensive Everglades Restoration Plan. Consequently, the District is uniquely positioned to provide valuable input for inclusion by the Corps in the Project Implementation Report. We also have a vested interest in the Corps' decisions on the expected level of federal investment in these cost-shared projects.

The District has identified three issues of significance that must be addressed if the District is to move forward with local sponsorship of the Central Everglades Planning Project, and if remaining milestones of the expedited planning process are to be met.

These issues of significance, described in detail below, are:

- Water quality requirements, assumptions and cost-share;
- Use of existing District-owned lands in project formulation; and
- Inclusion in the CEPP "Future With Project Condition" of specific project features identified in the June 1992 General Design Memorandum and Environmental Impact Statement for Modified Water Deliveries to Everglades National Park.

Water Quality Requirements, Assumptions and Cost-Share

A. Future Without Project Condition – Existing Water Flows to the Everglades Protection Area

As a part of its negotiations with the U.S. Environmental Protection Agency to achieve water quality requirements in the Everglades Protection Area, the District has proposed a suite of treatment and storage facilities – including a 54,000 acre-feet Flow Equalization Basin on the Everglades Agricultural Area A-1 parcel - that will treat existing flows from the Everglades Agricultural Area and Lake Okeechobee through the central flow path and to the Everglades Protection Area.

For the purposes of the Central Everglades Planning Project, the District can only support the Corps' assuming for the "Future Without Project Condition" that the District will treat current annual flows of approximately 850,000 acre-feet of water to a flow-weighted mean for total phosphorus of 13 parts per billion (ppb). All facilities needed to treat existing inflows, as proposed by the State of Florida in response to the U.S. Environmental Protection Agency's Amended Determination, would be non-federally funded.

B. Future With Project Condition – New Water Flows Identified by the Central Everglades Planning Project to the Everglades Protection Area

The quality of water leaving Lake Okeechobee to the south will be a key factor in determining the size and type of facilities necessary to treat the water before it flows into the Everglades Protection Area. As part of its assumptions for the Central Everglades Planning Project, the Corps should use the existing quality of water flowing from Lake Okeechobee through the central flow path as a basis for planning additional treatment facilities. Consistent with the treatment of existing flows, the Corps should also assume that new water flowing to the Everglades Protection Area will be treated to 13 ppb total phosphorus.

The District will support a 50/50 federal/District cost-share for storage, treatment and conveyance of volumes over and above existing annual flows in the central flow path that are redirected through the Everglades Agricultural Area to the Everglades Protection Area for restoration purposes. Central Everglades project features developed to treat new water should be cost-shared in accordance with CERP project cost-share provisions, Section 601(e) of the Water Resources Development Act of 2000. In addition, it should be noted that the Corps also has independent authority under Section 528 of the Water Resources Development Act of 1996 to 50/50 cost-share water quality improvement features that are essential for restoring the Everglades.

Use of Existing District-Owned Lands

As local sponsor, the District has to-date acquired more than 243,000 acres toward implementation of the Comprehensive Everglades Restoration Plan – 36,000 acres of which are ideally located for project utilization within the central Everglades flow path. To implement the initial increment of restoration for the central Everglades in an expeditious, cost-effective and commonsense manner, formulation of Central Everglades Planning Project features should be undertaken utilizing the lands already acquired by the District (Attachment).

It is the District's position that under NEPA, the Corps can choose to limit the scope of its analysis to District-owned lands so long as the CEPP Project Implementation Report and Environmental Impact Statement clearly explains the rationale for this option and its effects on the decision-making process. As allowed under NEPA, it would be in the best interest of the taxpayers to use the scoping process to focus plan formulation activities on District-owned lands, which will provide multiple benefits, including: eliminating any unnecessary evaluation of multiple footprints on lands not in public ownership; fast-tracking planning; and putting the land in which taxpayers have invested millions of dollars to work.

Inclusion of Specific Modified Water Deliveries to Everglades National Park Project Features

The Modified Water Deliveries to Everglades National Park project was authorized by Congress in 1989 as a federal foundation project critical to the restoration of Everglades National Park and Florida Bay. As Congress recognized in the Water Resources Development Act of 2000, Modified Waters is a prerequisite to some CERP projects and, as a foundation project, is not a part of CERP. Planning, design and construction of the

features associated with Modified Water Deliveries is the full responsibility of the federal government. In addition, the federal government is also responsible for reimbursing the local sponsor for 75 percent of the operations and maintenance for the life of the project.

The General Design Memorandum and Environmental Impact Statement for Modified Water Deliveries to Everglades National Park, dated June 1992, identified the following features that were to be constructed as part of the Modified Water Deliveries Project:

1. Three Gated Culvert Structures (S-345A, S-345B and S-345C)
2. Three Gated Concrete Headwall Structures (S-349A, S-349B and S-349C) located in the L-67A Borrow Canal
3. Degrading the existing Levee 67 Extension and filling the borrow canal

To date, these features have not been constructed—or are only partially constructed—and are not anticipated to be completed as part of the Modified Water Deliveries project. The Corps is currently considering whether these features are assumed to be a part of the "Future Without Project Condition" or "Future With Project Condition" in the Central Everglades Planning Project formulation process.

The District can support inclusion of these features in the "Future With Project Condition" only if the Corps identifies in the Central Everglades Project Implementation Report and Environmental Impact Statement that construction and operation of these features will be cost-shared in accordance with the terms and conditions of the Project Cooperation Agreement between the District and the Department of the Army to Improve Water Deliveries to Everglades National Park dated September 24, 1994 and its subsequent amendments. The District cannot agree to cost-share construction and operation of these features under the CERP authority, Section 601(e) of the Water Resources Development Act of 2000.

Summary

The District is a committed partner in the restoration of America's Everglades and is investing technical resources to assist the Corps in implementing the scoping phase of the Central Everglades Planning Project. While the District is fully supportive of the expedited planning process, definitive and prompt resolution of the District's issues of significance must be reached prior to the first Decision Point and before continuing into the execution phase of this process. In summary, the Corps should:

- Provide a 50/50 cost-share commitment for water quality features necessary to treat *new* volumes of water identified for restoration in the central flow path.
- Preclude the need for new land acquisition by focusing project formulation on District-owned lands to expedite planning and implementation.
- Provide a cost-share commitment for any incorporated Modified Water Deliveries project components for the federal government to fully fund land acquisition and construction, as well as 75 percent of operations and maintenance, as originally agreed to in the Project Cooperation Agreement for this foundation project.

The South Florida Water Management District has demonstrated a continued commitment to strengthening and fulfilling our role as local sponsor for the Comprehensive Everglades Restoration Plan. We look forward to receiving a timely decision from the Corps that resolves these important policy issues associated with the Central Everglades Planning Project and moves the restoration of America's Everglades expeditiously forward.

Should there be any questions associated with the District's comments, please contact Tom Teets, Federal Policy Chief, at (561) 682-6993 or tteets@sfwmd.gov.

Sincerely,

Melissa L. Meeker
Executive Director
South Florida Water Management District

MLM/bcl
Attachment

c: Stuart Appelbaum, USACE
Ernie Barnett, SFWMD
Shannon Estenoz, DOI
Greg Knecht, FDEP
Matthew Morrison, SFWMD
Greg Munson, FDEP
Colonel Al Pantano, USACE
SFWMD Governing Board Members
Kimberly Taplin, USACE
Tom Teets, SFWMD

bc: Carolyn Ansay, SFWMD
Abe Cooper, SFWMD
Beth Lewis, SFWMD
Deena Reppen, SFWMD
Paul Warner, SFWMD

Office of Agricultural
Water Policy
(850) 617-1700

Magnolia Center, Suite 200
1203 Governor's Square Boulevard
Tallahassee, Florida 32301

Florida Department of Agriculture and Consumer Services

Commissioner Adam H. Putnam

DATE: January 17, 2012

TO: Lauren P. Milligan, Environmental Manager, Florida State Clearinghouse

FROM: W. Ray Scott, Conservation and Water Policy Federal Programs Coordinator
Office of Agricultural Water Policy

RE: State Clearinghouse Review Comments – (SAI # FL20112066056)
Department of the Army, Jacksonville District Corps of Engineers – Scoping Notice – Central Everglades Planning Project (CEPP), Integrate and Accelerate Implementation of Comprehensive Everglades Restoration Plan Projects in South Florida

The Florida Department of Agriculture and Consumer Services (FDACS) appreciates the opportunity to provide comments for the NEPA scoping of the Central Everglades Planning Project (CEPP). We are submitting the following comments for consideration as part of the Florida State Clearinghouse consistency evaluation.

FDACS supports the Corps' intent to conduct an integrated study of the Everglades Agricultural Storage Reservoirs, Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement, Everglades National Park Seepage Management, and Everglades Rain-Driven Operations. In addition, we fully support the objective of restoring flows to the south and reducing harmful discharges to the east and west coast estuaries. Finally, we appreciate the Corps' effort to produce the CEPP Project Implementation Report (PIR) in an expedited manner. There are, however, significant issues that need to be addressed if this effort is to be successful.

First, the process for developing the CEPP must clearly recognize the interim status of the current Lake Okeechobee Regulation Schedule, and it would be inappropriate to assume the LORS08 schedule for either the With- or Without-Project scenarios. Planned repairs to the Herbert Hoover Dike should increase storage in the Lake, and the planning process should consider the availability of that additional storage in its analysis of project alternatives. Any additional demands on the Lake must be carefully evaluated in light of existing demands of both water users and the environment, as well as future demands from other CERP components (e.g., the C-43 Reservoir) that rely upon Lake water.

Second, the planning process must realistically deal with water quality considerations. The Comprehensive Everglades Restoration Plan (CERP) is built upon assumptions regarding water quality that we cannot continue to accept because water quality constraints can prevent the movement of additional water through the central part of the system. The in-lake phosphorus concentration for Lake Okeechobee is one such constraint, even if one assumes that the total maximum daily load (TMDL) for phosphorus will be met in the foreseeable future. Issues related to the Stormwater Treatment Areas (STAs) must also be addressed. Without resolving the legal and technical uncertainties characterizing the STAs as currently operated, it is hard to envision how additional water made available by the CEPP can be moved southward.

We look forward to participating in the development of the CEPP. Thank you for the opportunity to provide comments, and if you have questions regarding our comments please contact Ray Scott (850-410-6714) or Rebecca Elliott (561-682-6040).

Audubon of Florida * Audubon Society of the Everglades
Clean Water Action * Ding Darling Wildlife Society
Everglades Foundation * Florida Wildlife Federation
Florida Oceanographic Society * League of Women Voters of Florida
National Parks Conservation Association * Natural Resources Defense Council
Sierra Club * South Florida Audubon Society * Tropical Audubon Society

January 20, 2012

Attn: Gina Paduano Ralph, Ph.D
Department of the Army
Planning and Policy Division
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Dear Dr. Ralph;

On behalf of the undersigned organizations, we appreciate the opportunity to comment on Central Everglades Planning Project (CEPP) scoping. We share the Army Corps of Engineers' concerns regarding the urgent need for delivering increased water flows and the high costs of delay in Everglades restoration that threaten irreversible ecosystem damage. Thus, we strongly support the initiative to develop a CEPP Project Implementation Report (PIR) for Congressional approval by May 2013 that will reduce damaging discharges to east and west coast estuaries; restore habitat in the central Everglades, focusing on the "River of Grass"; and deliver "new" sources of clean water to the central Everglades and Everglades National Park (ENP).

The National Research Council of the National Academies Progress Toward Restoring The Everglades: Third Biennial Review 2010 stated: "Given the slower than anticipated pace of implementation and unreliable funding schedule, projects should be scheduled with the aim of achieving substantial restoration benefits as soon as possible." CEPP provides the opportunity to bundle the planning and implementation of several related projects, and the threats facing the central Everglades make it vital that a draft plan is prepared to be presented at the April 24, 2013 Civil Works Review Board Meeting as stated by Assistant Secretary Jo-Ellen Darcy. This will ensure that we can advance Everglades restoration in the central part of the Everglades ecosystem and avoid irreversible damage. To accomplish the CEPP in an efficient and meaningful way, the undersigned organizations strongly urge the Army Corps of Engineers (Corps) to include the following recommendations and considerations in CEPP scoping:

First, the CEPP must decompartmentalize a significant majority of Water Conservation Area (WCA) 3, improve the quality of water headed south, and help resolve seepage management issues to the east. Almost a decade of planning conducted as part of the Comprehensive Everglades Restoration Plan's (CERP's) WCA 3 Decompartmentalization and Sheet Flow Enhancement (Decomp) Project has identified many specific elements that should be included in the CEPP PIR; to help expedite current planning efforts, the CEPP should build on data and tools developed in previous Decomp Project Delivery Team (PDT) efforts. Planning by the South Water Management District as part of its River of Grass initiative also provides useful lessons

that should inform the CEPP. Incorporating previous planning efforts will allow CEPP to move forward at a speed needed to provide a PIR by 2013. In particular, the CEPP should:

- Incorporate the findings of the Decomp Physical Model as they become available in the next 18 months.
- Explore including the Decomp hydropattern restoration feature (i.e. spreader canals) along the northern border of WCA 3A.
- Consider innovative partial backfill and plugging opportunities of the L-67A and L-67C canals that could provide increased access and continued fishing opportunities, while at the same time ensuring the canals do not interfere with sheetflow in ways that have adverse ecological consequences, or result in adverse water quality impacts.
- Assess options to degrade, including by partially backfilling or plugging, the Miami Canal in order to allow water into WCA 3B.
- Analyze options to degrade the L-29 levee, including by way of new outlets and culverts.
- Explore phasing alternatives for planned additional elevation and bridging of Tamiami Trail, using information from the Department of Interior's November 2010 Tamiami Trail Modifications: Next Steps Final Environmental Impact Statement.
- Evaluate the use of available levee material to recreate tree islands.

As outlined in the recommendations of the National Research Council of the National Academies Progress Toward Restoring The Everglades: Third Biennial Review 2010, increased water storage is essential to Everglades restoration efforts. To that end, CEPP must evaluate implementing increased storage, treatment and conveyance in the Everglades Agricultural Area (EAA). Specifically, we urge Corps to include the following in its CEPP scoping:

- An evaluation of (1) the use of the lands known as the A1 and A2 parcels, which were purchased by the federal government pursuant to the Talisman Land Acquisitions Grant Agreement, as storm water treatment areas (STAs) and (2) the potential replacement acreage of any acres used for STAs with lands or other options (as required under the grant agreement) that would enable increased water flows to the central Everglades and ENP including Florida Bay.
- An estimation of storage needed to enable increased water flows to the central Everglades and ENP including Florida Bay and a discussion of options to provide needed additional storage.

In order to manage increased flows, it will be necessary to include improved seepage management. Specifically, we urge the Corps to:

- Evaluate the miners' proposed L-31N seepage pilot project, designed to resolve significant seepage out of ENP.
- Evaluate whether additional seepage components are needed to resolve seepage out of the central Everglades and ENP.

Operational changes will be needed to make use of many of the structural changes being considered as part of the CEPP. While we recognize that detailed consideration of operational

changes may be outside the scope of the CEPP, the environmental benefits of the CEPP will depend on operations currently in place or under evaluation in parallel processes. For that reason, we recommend that the CEPP assess the operational changes occurring or being considered as part of the Everglades Restoration Transition Plan and the Combined Operations Plan. In particular, the CEPP should:

- Consider opening the S-151 structure to allow additional flow into WCA 3B.
- Consider raising L-29 levels during short-term high-water emergencies.
- Evaluate the need for more appropriate water levels in WCA 3A, 3B, and ENP, as opposed to stair-step levels now often found moving among the areas and damaging the ecosystem.

While the CEPP cannot take on the challenges posed by the many related projects that are in operation or in planning stages, it should review the status and operations of projects such as the 8.5 Square Mile Area and C-111 Western and South Dade projects and highlight needed adjustments to ensure that they meet their stated goals and achieve ecological objectives.

We understand that the features of CEPP's first increment may be constrained by federal and state appropriations, and we further appreciate the tremendous amount of effort the Corps PDT will undertake to move this planning effort forward expediently. Water storage and water treatment must move forward together and it is important that water moved south is clean. We remain committed to assisting in this process and to helping ensure increased water flows to the central Everglades, relief to the northern estuaries, and ecological benefits for America's Everglades. The realization of ecological benefits from the first increment of CEPP is essential to build upon in order to gain support for future CEPP phases and other Everglades restoration efforts.

We look forward to working with you in this ambitious endeavor and invite any questions or comments you may have.

Sincerely,

Signatures waived to expedite delivery

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Appendix C.3.2 Agency Coordination and Public Involvement

Agency Coordination and Public Involvement Summary

Agency and Public Involvement Comment Response Matrix

Agency and Public Letters

Agency/Tribe Coordination Letters

C.3.2 Agency Coordination and Public Involvement

Agency coordination and public involvement has taken place throughout the CEPP planning process. Project Delivery Team (PDT) and public involvement has been a critical component of the development of this PIR. **Table C.3-2** provides a list of interagency coordination and public presentations conducted throughout the planning process for CEPP.

Table C.3-2. Agency Coordination and Public Involvement Summary

Action	Location	Date
NEPA Scoping Meetings	Plantation, FL	December 14, 2011
	Clewiston, FL	December 15, 2011
NEPA Final Array Public Meetings	Estero, FL	December 10, 2012
	Homestead, FL	December 11, 2012
	Clewiston, FL	December 12, 2012
	Stuart, FL	December 13, 2012
	Coconut Creek, FL	December 18, 2012
Project Delivery Team Meetings	West Palm Beach, FL	November 30, 2011
	West Palm Beach, FL	December 16, 2011
	West Palm Beach, FL	March 1, 2012
	West Palm Beach, FL	March 26, 2012
	West Palm Beach, FL	April 18, 2012
	West Palm Beach, FL	May 14, 2012
	West Palm Beach, FL	May 31, 2012
	Teleconference/Webinar	June 11, 2012
	Hobe Sound, FL	July 2 and 3 , 2012
	West Palm Beach, FL	July 31, 2012
	Teleconference/Webinar	August 14, 2012
	West Palm Beach, FL	September 4 and 5, 2012
	Teleconference/Webinar	October 1, 2012
	Teleconference/Webinar	October 15, 2012
	West Palm Beach, FL	October 24, 2012
	West Palm Beach, FL	November 16, 2012
	West Palm Beach, FL	December 5, 2012
	West Palm Beach, FL	December 19, 2012
	West Palm Beach, FL	January 15, 2013
	West Palm Beach, FL	January 23-24, 2013
	West Palm Beach, FL	March 5, 2013
	Teleconference/Webinar	March 20, 2013
	West Palm Beach, FL	May 10. 2013
	Teleconference/Webinar	June 14, 2013
	West Palm Beach, FL	July 1, 2013
	West Palm Beach, FL	July 8, 2013
South Florida Ecosystem Restoration Task Force	West Palm Beach, FL	October 27, 2011
	Coral Springs, FL	March 7, 2012
	Washington D.C.	June 19, 2012
	West Palm Beach, FL	December 7, 2012

Action	Location	Date
	West Palm Beach, FL	July 9. 2013
Workshop sponsored by South Florida Ecosystem Restoration Task Force Working Group	West Palm Beach, FL	November 30, 2011
	West Palm Beach, FL	December 16, 2011
	West Palm Beach, FL	January 25, 2012
	West Palm Beach, FL	March 1, 2012
	West Palm Beach, FL	March 9′ 2012
	Coral Springs, FL	April 17, 2012
	West Palm Beach, FL	May 15, 2012
	Jensen Beach, FL	June 26, 2012
	West Palm Beach, FL	August 29, 2012
	West Palm Beach, FL	August 30, 2012
	Doral, FL	September 26, 2012
	West Palm Beach, FL	October 25, 2012
	West Palm Beach, FL	November 19, 2012
	West Palm Beach, FL	February 13, 2013
	West Palm Beach, FL	February 25, 2013
Workshop sponsored by South Florida Ecosystem Restoration Task Force Science Coordination Group	West Palm Beach, FL	February 13 and 14, 2012
South Florida Ecosystem Restoration Task Force Joint Working Group and Science Coordination Group Meetings	West Palm Beach, FL	November 17, 2011
	Coral Springs, FL	February 15, 2012
	Coral Springs, FL	May 16, 2012
	West Palm Beach, FL	September 20, 2012
	West Palm Beach, FL	January 31, 2013
	West Palm Beach, FL	June 25, 2013
Water Resources Advisory Council	Miami, FL	November 3, 2011
	West Palm Beach, FL	January 5, 2012
	West Palm Beach, FL	February 2, 2012
	West Palm Beach, FL	March 8, 2012
	West Palm Beach, FL	April 5, 2012
	West Palm Beach, FL	May 3, 2012
	West Palm Beach, FL	August 2, 2012
	West Palm Beach, FL	September 6, 2012
	St. Cloud, FL	November 8, 2012
	West Palm Beach, FL	January 3, 2013
	West Palm Beach, FL	February 7, 2013
	Clewiston, FL	April 4, 2013
	West Palm Beach, FL	July 8, 2013
Water Resources Advisory Council Recreation Issues Team Briefings	West Palm Beach, FL	March 19, 2012
	West Palm Beach, FL	June 18, 2012
	West Palm Beach, FL	September 17, 2012
	West Palm Beach, FL	December 17, 2012

Action	Location	Date
	West Palm Beach, FL	March 18, 2013
Committee on Independent Scientific Review of Everglades Restoration Progress	Ft. Lauderdale, FL	January 26, 2012
	Ft. Lauderdale, FL	November 27, 2012
Ten County Coalition Meeting	Okeechobee, FL	March 30, 2012
South Florida Water Management District Governing Board	West Palm Beach, FL	January 12, 2012
	Hollywood, FL	February 9, 2012
	West Palm Beach, FL	March 15, 2012
	West Palm Beach, FL	April 12, 2012
	West Palm Beach, FL	May 10, 2012
	Okeechobee, FL	June 14, 2012
	West Palm Beach, FL	July 12, 2012
	West Palm Beach, FL	August 9, 2012
	West Palm Beach, FL	September 13, 2012
	West Palm Beach, FL	October 11, 2012
	West Palm Beach, FL	November 15, 2012
	West Palm Beach, FL	December 13, 2012
	Orlando, FL	February 14, 2013
	West Palm Beach	March 14, 2013
	West Palm Beach	April 11, 2013
	West Palm Beach	May 9. 2013
	West Palm Beach	June 13, 2013
	West Palm Beach	July 11, 2013
BASS Conservation Leaders Meeting	Ft. Lauderdale, FL	February 14, 2013
Annual Meeting with Miccosukee Tribe	Miami, FL	December 1, 2011
		December 6, 2012
Biscayne Bay Regional Restoration Coordination Team	Virginia Key, FL	September 26, 2012
	Virginia Key, FL	December 18, 2012

C.3.2 Agency and Public Involvement Comment Response Matrix

Table C.3-1. Comment response matrix detailing comments received during the CEPP planning process with USACE responses.

LETTER	Date Received	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
Seminole Tribe of Florida			
Seminole - 1	11-7-2012	The Seminole Tribe has been actively engaged in the South Florida Ecosystem Restoration effort for nearly 20 years. We have supported this effort technically and politically though all of these years. More specifically, we are constructing in full partnership with the Corps, an extensive water control system on the Big Cypress Reservation. This project is important to us and to our region and we appreciate the Corps' work and federal funding. But focusing solely on the land and water within our Reservation's legal boundaries is short-sighted. And this has been our position for nearly two decades. We have urged over and over again through all that planning efforts, including the Restudy which is the basis for CERP, to include the western basins in the Central Everglades system in the monitoring, modeling, data gathering, design, planning, and project implementation. So please appreciate our deep disappointment to be told that waters in the western basins that impact the CEPP are not included in the scope of CEPP because the monitoring, data gathering, and modeling have still not been done in this region, despite our repeated requests to do so for over 14 years. We applaud the Corps' drive to complete the CEPP planning process in 18 months, but we remain very concerned by the long-standing inattention to this region.	The Jacksonville District and the South Florida Water Management District are actively engaged in efforts hosted by the South Florida Ecosystem Restoration Task Force to identify and collect existing data, identify data gaps, and to facilitate the development of appropriate models to address the Western Basins. Part of this process includes capitalizing on knowledge gained from the ongoing construction of the Seminole Big Cypress Critical Project. We will continue to use regularly-scheduled Seminole Big Cypress Critical Project, Project Delivery Team meetings to collaboratively identify and address opportunities to improve that project's performance. In the course of these meetings we collectively determined that addressing the operation of the S-190 structure is a critical step prior to project modifications. Accordingly, the Jacksonville District is currently scoping a plan for a modification to the existing S-190 operations.
Seminole - 2	11-7-2012	Apart from the fact that we, a valued partner in Everglades Restoration by all accounts, have been effectively ignored in our repeated requests for monitoring, modeling, and planning in this region,	Please refer to response to Seminole -1.

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		we note that the federal government has an obligation through its trust responsibilities to restore the northwest corner of WCA 3A, where the Seminole Tribe of Florida retains hunting and fishing rights, at a minimum. Beyond CEPP, we would like to discuss further how the Corps and its State partner intend to address the Central Everglades north and west of the redline in the current CEPP models.	
Seminole - 3	11-7-2012	As to your specific suggestions for addressing our water supply concerns, we welcome your offers. Regarding your suggestion to exercise adaptive management of Basin 1 of the critical project, we look forward to working with your engineering and wetlands regulatory staff on crafting operational changes to the outlets and siphons in order to deliver more water to the native areas south of the West Feeder Canal in the Big Cypress Seminole Indian Reservation. We assume that such work will be eligible for funding under the Operations & Maintenance provisions of the project's Project Cooperation Agreement.	Please refer to response to Seminole -1
Seminole - 4	11-7-2012	Regarding the S-190 water control structure temporary deviation, we are encouraged by the option to work effectively within the existing regulation schedule to increase water storage in the West and North Feeder Canals, which will allow more water to replenish groundwater of the reservation. We would like to schedule meetings as soon as possible with the Corps and SFWMD to discuss the details and timing of the temporary deviation. I note here that we are also concerned about the structural integrity of the S-190 water control structure and urge the Corps and the District to carefully review the soundness of the structure and take all actions necessary to make it secure.	Please refer to response to Seminole -1

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Seminole - 5	11-7-2012	And thank you for the information on the Tribal Partnership Program as authorized by Section 203. We will take a careful review of this program and make a decision about whether or not to apply at a later date.	Thank you for your comment. The USACE will continue to maintain ongoing communications with the Seminole Tribe of Florida regarding the Big Cypress Reservation. Please refer to response to Seminole -1
Seminole - 6	11-7-2012	Managing water resources in South Florida is a steep challenge. The only way to meet this challenge is to work together to plan a future that balances competing needs fairly, which requires a more comprehensive view of the system. For as long as the monitoring and modeling in the western basins is not addressed, the South Florida Ecosystem restoration plan is incomplete.	Thank you for your comment. The USACE will continue to maintain ongoing communications with the Seminole Tribe of Florida regarding the Big Cypress Reservation. Please refer to response to Seminole -1
Seminole - 7	11-7-2012	We look forward to continue to work with you to remedy this situation and to address the pressing needs of the Tribe to correct the hydrology surrounding our Big Cypress Reservation.	Thank you for your comment. The USACE will continue to maintain ongoing communications with the Seminole Tribe of Florida regarding the Big Cypress Reservation. Please refer to response to Seminole -1
LOCAL MARTIN COUNTY (MC)			
MC - 1	6-15-2012	I understand that there are financial and time constraints on the initial segment of Central Everglades Planning so present plans do not include considering the Lake releases that now go into the estuaries. But I am hopeful that in the future we will incorporate systems in our planning to conserve these billions of gallons of fresh water now being sent to tide. This is freshwater that can be used to rejuvenate our aquifers and rehydrate the Everglades. I hope we will design the system to flow south up to 10,000 cfs, so that there truly will be a way to protect our estuaries. In addition to having as an eventual objective a significant southern flow from the Lake, I encourage us to actually move water south every opportunity we get. Not just consider the possibility during emergencies, but make moving water south part of the regular	The construction of a Flow Equalization Basin on the A-2 property will capture approximately 200,000 acre-feet on average annually of water that would be released into the northern estuaries and send it through the FEB into WCA 3. While this provides a minor benefit to the northern estuaries, it is 200,000 acre-feet less water being released into the estuaries compared to the no action alternative.

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		routine, even if it is just a few cfs.	
MC - 2	12 – 17-2012	It is so heartening that Army Corps is listening to our plea to protect the Estuary from Lake Okeechobee releases. We all recognize that 200,000 acre/feet is just a beginning, but it is a strong, positive beginning. There is no magic; it will take vast complex planning and significant funding. But now, Army Corps has embarked upon a path that can eventually lead to a solution; a solution requiring perseverance and continued dedication of us all to achieve.	Thank you for your comment.
CITY OF CORAL GABLES (CG)			
CG - 1	6-15-2012	As of May 8, 2012, legislation pertaining to supporting CEPP for the restoration of the Central Everglades was adopted.	Thank you for your comment.
ARTHUR R. MARSHALL FOUNDATION & FLORIDA ENVIRONMNETAL INSTITUTE (AM)			
AM - 1	1-21-2012	Re-connection of Lake O with WCA-3 is key to the Art Marshall vision of restoring sheet-flow from Kissimmee Basin to FL Bay. More Adaptive Management (AM) approaches are needed in this process. We appreciate the "enhanced public inclusion".	In accordance with the 2011 CERP Adaptive Management Integration Guide; an adaptive management plan has been developed and included in Annex D of the CEPP Project PIR and EIS.
AM - 2	2-2-2012	Reduced surface waters in South Florida are a major cause of the effect of decreased rainfall and resulting drought, discussed this with CEPP PDT Jan 31. Full understanding of the rainfall cycle is critical for CEPP alternatives.	Regional hydrologic models were used during plan formulation for the CEPP. These models provide daily, detailed estimates of hydrology across the 41-year period of record (January 1965-December 2005) and are used to evaluate the systems response to project alternatives by simulating major components of south Florida's hydrology including evapotranspiration, infiltration, overland and groundwater flow, canal flow, canal-groundwater seepage, levee seepage and current or proposed water management control structures and operational rules.
AM - 3	2-2-2012	The optimum approach to CERP/CEPP and restoring what was a much wetter Everglades, is to restore a massive amount of surface water in the form of Dynamic Storage and Sheetflow. Circumstantial	Thank you for your comment and information. Throughout the plan formulation different management measures have been assessed in order to meet the objectives of CEPP as well as the constraints. The final array of alternatives ranged from as passive as possible to

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		proof – Kissimmee River Restoration results. Precaution of NRC Peer Review Committee – Avoid engineered solutions where possible.	highly engineered.
AM - 4	3-15-2012	This is a follow up to the Marshall Plan vision and related documents. We recognize that this Marshall Plan may be a bit aggressive for CEPP increment 1, however, we think it's important that we keep our eyes on the prize of long-term vision, as CEPP interim goals and objectives are developed, consistent with CERP Table 5-1.	Thank you for your comment.
AM-5	3-8-2013	We appreciate the CEPP PDT aggressive approach to adaptive management (AM); extensive reference to the CERP ***Adaptive Management Integration Guide*** (AMIG) dated March, 2011; and the production of the extensive monitoring matrix (Monitoring Matrix) passed out at the Feb 25 CEPP Meeting and updated at CEPP PDT Meeting March 5, 2013. These written comments are a follow-up to ArtMarshall.org verbal comments made March 5, 2013. A Big question remains regarding the Monitoring Matrix and other factors: How to integrate multivariate requirements (targets) and the measurement of same, and synthesize for decision makers. In the March 5 CEPP PDT proceedings, the Top-Down approach folks (Generalists) appeared at odds with the Bottom-up approach folks (need to consider more details) with the latter group asking for more time to solve the puzzle. Here, stasis is a fleeting thing.	Regarding the question of how multiple factors will be integrated for decision makers: the CEPP Adaptive Management and Monitoring Plan (AM and Monitoring Plan) specifies that data will be provided to agencies, and if the data suggests that an improvement could be made for CEPP then such suggestions will be provided as well. It is important that the agencies consider the multiple factors; a method of synthesizing or "rolling up" the information is not dictated in the AM and Monitoring Plan. However the scientists will continue to provide data as understandably as possible, such as in formats of the ongoing System Status Reports (http://www.evergladesplan.org/pm/ssr_2009/ssr_main.aspx), the CERP Scientific Knowledge Gained document (http://www.evergladesplan.org/shared-definition/sd_2010.aspx), and the Stop Light Indicator Reports (http://www.sfrestore.org/documents/Final_System-wide_Ecological_Indicators.pdf) We will continue to seek ways to make the complex data of Everglades restoration accessible and understandable for decision makers and interested parties. Regarding the comment on PDT meeting preferences for a top-down vs. bottom-up presentation of the AM and Monitoring Plan, the full detailed plan is included in the CEPP PIR document for review (Annex D) for those who want all details.
AM-6	3-8-2013	Section 3 and Appendix D of the AMIG call out a variety of activities in the AM process to be undertaken by the PDT as follows:	Regarding Activity 2 and the monitoring matrix: The matrix was intended to summarize RECOVER's monitoring programs and how they may help to address the items discussed in the adaptive

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		• Activity 2: Establish / Refine Yellow Book description of Goals & Objectives [CERP Table 5-1]
		• Activity 4: Use conceptual ecological models (CEM), to develop testable hypothesis, and targets that reflect defining characteristics of the systems to be restored.
		• Activity 5: Continue consideration of CERP Yellow Book Goals & Objectives;
		  o Evaluate benefits
		  o Include management options matrix and costs
		• Activity 6: Monitoring; Develop project level monitoring plan; identify costs, decision-criteria [benefits]
		• Activity 7: Assessment; synthesize results
		
		Closer adherence to AMIG activities would improve the effort and provide better overall decision-support. Specifically:
		• Regarding AIMG Activity 2: While earlier CEPP PDT activities put potential CEPP achievements in context of meeting CERP Yellow Book Goals & Objectives in CERP Table 5-1, the Monitoring Matrix falls short of addressing all objectives in a balanced manner, e.g., addressing the extent to which spatial extent is increased. An Appendix to this report amplifies.
		• Regarding AIMG Activity 4: There is no regional CEM for the CEPP region under consideration. Performance measures and targets were developed using CEM's from other regions and a To-
			management portion of the AM and Monitoring Plan. The items discussed in the adaptive management portion were subjected to screening, described in the PDT presentation and in the PIR Annex D. Items that cannot be addressed with adaptive management actions in CEPP (such as operational adjustments or testing) were screened out of the AM Plan. Screening out items did not indicate a lack of importance of the items, but rather a *lack of ability to perform adaptive management to address the items*. There are not operational adjustments or other adaptive measures that could be taken to increase the spatial extent of CEPP and therefore a question about this may have been screened from the adaptive management portion of the plan despite its overall importance in CERP.
			
			Regarding Activity 4: Available Conceptual Ecological Models have been used in CERP and CEPP to identify problems, opportunities, goals, objectives, performance measures, and monitoring questions during the project study and in the development of the AM and Monitoring Plan. Since a CEM for the central part of CEPP is not available, scientific and local knowledge were used in lieu of developing a new model.
			
			Regarding Activity 5: The monitoring matrix was not intended to provide any information about project benefits. Project costs and benefits have been discussed in several PDT meetings, with presentations publically available. The dollar value of ecosystem services associated with CEPP is being calculated as a case study; a separate and parallel effort to the CEPP process for choosing a TSP. The results of the ecosystem services case study will be provided as soon as possible, but are not being used to select or influence the selection of the CEPP TSP. The Ecosystem Services report will be provided separate from the Draft PIR/EIS after it has been through the review process.
			
			Regarding Activity 6: The matrix was only intended to summarize RECOVER monitoring and CEPP's adaptive management questions. There was no intention to discuss or provide cost/benefit

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		tal CEM. Thus a hypothesis that the pond apple forest existed and provided habitat and functional value including significant uptake of nutrients has escaped scientific consideration. • Regarding AIMG Activity 5: The "Benefits" word has been used extensively, and options matrix with costs have been developed, however no dollar value has been put on benefits, yet, so as to provide a Benefits/Cost ratio, arguably the most important piece of info that could be provided to a decision-maker. The monitoring matrix does not provide this info. Benefits in dollars would best be provided by an Ecosystem Services Valuation (ESV) of the CEPP Tentatively Selected Plan (TSP), as briefed in an earlier CEPP meeting. Presentation of more info earlier on the ESV of the CEPP TSP would serve stakeholders and decision-makers. • Regarding AIMG Activity 6: Benefits/Cost Criteria are not included in the Monitoring Matrix, and only appear rhetorically in previous CEPP meetings; Activity 5 and Activity 7 comments apply. • Regarding AIMG Activity 7 on the call for synthesis (an often heard call in the CERP/CEPP process): As an extension of Activity 5 comments, the best synthesis possible would be the calculation of total benefits (B) and total costs (C), including projected life-cycle O&M costs. The resulting B:C ratio provides an indicator of return on investment and the extent that the	information in this matrix. Please see previous responses here. Regarding Activity 7: Concur with the usefulness of this type of synthesis. This information is provided in Section 6 of the CEPP PIR document. Benefits are not monetized in the USACE TSP selection process for ecosystem restoration projects. It is possible in the future that USACE may consider ecosystem services benefits as part of its TSP selection process for future projects, but many factors need to be considered to develop formal implementation policy by the agency. The Ecosystem Services report will be provided separate from the Draft PIR/EIS after it has been through the review process.

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		system has been optimized per the following statement: Maximize benefits while minimizing costs, long term. One observation: The more folks see the B:C synthesis, the more comfortable they are with it, especially for analysis of alternatives, as required by CERP Section 7.5.3.	
AM-7	3-8-2013	Consideration of USACE Engineering Circular EC 1165-2-212 dated 1 Oct 2011. EC 1165 states: "*Impacts to coastal and estuarine zones caused by sea-level change must be considered in all phases of civil works programs*". However there has been no visible consideration of the projected impacts of sea-level rise, nor consideration of the benefits of a rapidly executed CEPP implementation, as counter-measure to Sea Level Rise (SLR). Failure to consider the dollar value benefits of CEPP implementation as a counter-measure to SLR could result in an oversight in calculating the ESV of the CEPP TSP. Regarding the lack of discussion of SLR in CEPP proceedings, it is a puzzlement how about 10 member of the CEPP PDT and a quorum of the Science Coordination Group/Working Group could be involved in a Feb 14-15, 2013, "Technical Meeting" addressing SLR in detail, sponsored by FAU, yet avoid SLR discussion in CEPP PDT proceedings. As noted in verbal comment March 5, there are a number of consequences not to have SLR on the table. One occurred when a PDT Member representing agriculture, announced that he was going to be blunt, then stated CEPP may not meet institutional requirements established in CERP 2000, or words to that effect. With due appreciation for the business of Ag, a blunt response made in public comment is that we are not in a *business as usual* scenario. A regression to	Sea Level Rise (SLR) is addressed for the TSP in the Draft PIR/EIS in Section 6 and Annex I. A full analysis of SLR on CEPP and the effect of SLR on the expected benefits is located in Section 6.11.1.3 and Annex I. During the preliminary evaluation of CEPP ecosystem services the team could not find a viable means to consider CEPP as a counter-measure to SLR. The team will seek further information on this during their draft revisions. The Ecosystem Services report will be provided separate from the Draft PIR/EIS after it has been through the review process. In order for items to be included in the CEPP's Adaptive Management Plan, they must have project management options that can be reasonably tested and/or adjusted to improve restoration performance. Please see the screening criteria provided in Annex D.

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		the 2000 scenario is a de facto abandonment of adaptive management. The National Research Council Peer Review Panel has taken the strong position that climate change and sea level rise are a good reason to speed up the [CEPP] process, rather than proceed in business as usual fashion. SLR is arguably the best reason for engaging the AM process. More on this in future meetings.	
AM-8	3-8-2013	Cost-Effectiveness and Cost-Benefit terminology. These terms were mentioned in the context of being equivalent per the March 5 statement, paraphrased: *We have done the cost-benefit analysis and determined the cost-effective alternatives*. (Alt 1 and Alt4). The CERP Cost-Effectiveness and Incremental Cost Analysis approach is outlined in CERP Section 7.5.3. March 5 Public comment included a request for clarification of the use of these terms. The public comment view was that cost-benefit, better termed Benefit/Cost (Benefit divided by Cost to determine the B:C ratio), had not been determined, yet; also that it would come in the form of an Ecosystem Services Valuation (ESV) of the CEPP Tentatively Selected Plan. At the March 5 CEPP PDT meeting, a PDT member noted that there had been very little cost data provided. An earlier public comment noted that the CEPP Analysis of Alternatives did not appear to consider Operations and Maintenance (O&M) Costs, long term. Per PDT protocol, there was no further discussion or clarification on the public comment questions raised.	Cost effective/incremental cost analysis (CE/ICA) is used to evaluate and compare the production efficiency of alternatives, thus identifying plans that reasonably maximize ecosystem restoration. Cost effectiveness analysis begins with a comparison of the costs and outputs of alternative plans to identify the least cost plan for every level of output considered. Alternative plans are compared to identify those that would produce greater levels of output at the same cost, or at a lesser cost, as other alternative plans. Cost effective plans are then compared by examining the additional (incremental) costs for the additional (incremental) amounts of output produced by successively larger cost effective plans. The plans with the lowest incremental costs per unit of output for successively larger levels of output are the best buy plans. Costs are based initially on a rough order of magnitude and include pre-construction engineering and design and construction costs, interest during construction, as well as recurring operations and maintenance costs. Benefits are based on the habitat unit evaluation. Alternatives 1 and 4 were identified as being cost effective. Alternatives 2 and 3 were both more costly than Alternative 4 and provided fewer overall habitat units. Alternatives 2 and 4 were not cost effective. The ecosystem services evaluation will be conducted only on the recommended plan. The Ecosystem Services report will be provided separate from the Draft PIR/EIS after it has been through the review process.
AM-9	3-8-2013	Summary: The Monitoring Matrix in effect, is a multi-decision criteria approach, the results of which may be difficult for Top-Level decision makers to integrate (17 factors) in evaluating the success of	The monitoring matrix was not intended to list CERP objectives, habitat units, or targets. Please see discussion of this above. Discussion of Sea Level Rise in relation to CEPP is provided in Section

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		the project; as noted in the Appendix, the Monitoring Matrix does not include many other CERP Objectives, and extensive habitat unit approach (HUA) data. This has the potential of undermining the effort. More consideration of CERP Table 5-1 Goals & Objectives and other Activity called out by the CERP AMIG, would be helpful in clarifying matters for a decision-maker, including the extent to which CEPP provides a counter-measure to Sea Level Rise. Since not all "targets" have been considered in the Monitoring Matrix, addition to the 17 elements of the Matrix may make integration of the success outcome even more difficult. The best synthesis for a decision-maker would appear to be the total dollar Benefits to total dollar Cost ratio (B:C = B/C) as a means of measuring return on investment in a synthesis that could be understood by all. This suggests that the CEPP PDT process ought to begin to air the ESV of the CEPP TSP ASAP, as a matter of education and an indication of success that will sell the program on its own merit. These comments will be subject to final edit following the next CEPP PDT Meeting, any feedback from this input, and a preparation for future comments in the CEPP comment process.	6.11.1.3 and Annex I. The CEPP evaluation of ecosystem services is a separate and parallel effort to the TSP selection process and will not influence the selection of the TSP. The results of the evaluation will be provided in a separate document than the PIR/EIS after it has gone through a separate review process.
EVERGLADES COALITION: AUDUBON FLORIDA*EVERGLADES FOUNDATION*EVERGLADES LAW CENTER*CLEAN WATER ACTION *FLORIDA WILDLIFE FEDERATION *NATIONAL PARKS CONSERVATION ASSOCIATION *NATURAL RESOURCES DEFENSE COUNCIL (EC)			
EC - 1	6-1-2012	We're concerned that some of the agriculture community is suggesting that CEPP must "make up" for irrigation water lost due to implementation of LORS. It's critical that the focus of CEPP remain on environmental restoration objectives, while maintaining protection for water users.	The objective of CEPP is to send more water south from Lake Okeechobee to WCA 3 that would otherwise result in regulatory releases to the northern estuaries, while operating within zones above the baseflow zone of LORS. CEPP will maintain the current level of water supply for LOSA users under the 2008 LORS.
EC - 2	6-1-2012	We ask that the Corps and SFWMD reiterate a	The construction of a Flow Equalization Basin on the A-2 property

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		commitment to ensuring that CEPP results in meaningful restoration of the heart of the Everglades by sharpening the focus on restoration and increased water for the ecosystem. Thank you for your tremendous vision and hard work.	will capture 200,000 average annual acre-feet of water that would be released into the northern estuaries and send it through the FEB in WCA 3. While this provides a minor benefit to the northern estuaries, it is a step forward to reducing flows to the estuaries and it is 200,000 acre-feet of new water being sent to the Everglades.
EC – 3	11-13-2012	CEPP must take a clear step toward restoration. We are heartened to see that CEPP PDT has identified about 200,000 acre-feet of new water to be delivered to Central Everglades. However, for CEPP to meaningfully advance restoration and achieve ecological benefits, the plan must increase ecological connectivity and water conveyance between ENP and WCA 3A and 3B. Partial removal of L-29 levee represents the clear step forward needed to show progress. Full restoration of sheetflow for WCA 3A through 3B and into ENP is the ultimate goal, but it is understood that seepage issues constrain our ability to implement such restoration in one complete iteration. Given these concerns, it is vital that the CEPP include phased and/or locally preferred alternatives that will provide interim benefits while additional restoration components, including the authorized elevation and bridging of Tamiami Trail and other projects, come online.	The Corps supports reconnecting WCA 3A, WCA 3B and ENP as a functioning component of the Everglades ecosystem. Implementation of Alternative 4R2 would include three gated structures in the L-67 A levee, spoil removal along the west side of the L-67 A Canal in the proximity of the L-67A gated structures, construction of an ~ 8.5 mile levee in WCA 3B connecting the L-67 A levee to the L-29 levee, and removal of ~ 8 miles of the L-67 C levee and ~ 4.3 miles of the L-29 levee in the Blue Shanty flowway. Alternative 4R2 also includes construction of the western 2.6 mile Tamiami Trail bridge. An implementation plan for the TSP has been developed and is included in Section 6 of the CEPP Project PIR and EIS.
EC - 4	11-13-2012	CEPP must remain focused on ecological benefits. The CEPP process and robust stakeholder participation workshops have allowed for unprecedented dialogue and feedback. We acknowledge the effort required to be inclusive and applaud the PDT"s engagement efforts, but want to emphasize that it is not possible for CEPP, nor any other single project in the full CERP, to achieve each individual goal outlined in CERP. It is absolutely essential that CEPP achieve key restoration benchmarks of rerouting flow into NESRS. To do	Management measures and alternatives for the CEPP were formulated and evaluated based on achievement of project objectives. Project objectives identified for the CEPP are consistent with those of CERP. Section 601 (h) of WRDA 2000 (authorizing CERP) states "the overarching objective of the Plan is the restoration, preservation, and protection of the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection. Project objectives are included in Section 1 of the CEPP Project PIR and EIS.

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		this, the TSP must be selected based on its ability to achieve the following CEPP goals outlined in the December 2011 scoping: • Restore habitat in the central Everglades, focusing on the "river of grass" • Deliver "new" sources of clean water to the central Everglades and ENP, and • Reduce damaging discharges to east and west coast estuaries	
EC - 5	11-13-2012	Compatibility with CERP. We understand that the features of CEPP"s first increment are constrained by deferral and state appropriations, and appreciate the tremendous effort by the PDT to move their planning effort forward expediently. Given these limitations, it becomes even more critical to ensure that CEPP alternatives create opportunities for sheetflow that can be explained in future CERP efforts rather than creating an even more managed Everglades ecosystem by installing more pumps and other infrastructure.	Implementation of Alternative 4R2 would not include the construction of additional pump stations on the L-29 levee. During plan formulation, construction of pump stations on the L-29 levee was proposed as part of Alternative 3. Alternative 3 was not identified as the TSP. Implementation of Alternative 4R2 is compatible with future increments of the CERP. Alternative 4R2 also includes removal of a portion of the L-4 levee west of S-8, and backfilling the Miami Canal from ~1.5 miles south of S-8 to I-75 thereby reestablishing sheetflow in northern WCA-3A.
EC - 6	11-13-2012	Environmental groups have a common vision for the first iteration of central Everglades restoration, supported by numerous recreational stakeholders. This vision includes bridging the Tamiami Trail, decompartmentalizing WCA-3A, WCA-3B, and NESRS in ENP, and completely degrading the L-29 along the bottom of WCA-3B. Implementation of this vision includes a temporary berm along the existing "Blue Shanty" canal alignment as a construction phase which would be removed following the completion of the Tamiami Trail improvements and other projects.	Construction of the ~ 8.5 mile levee in WCA 3B connecting the L-67 A levee to the L-29 levee would be constructed in accordance with USACE Engineering Design and Levee Safety Criteria and consistent with design criteria jointly developed by the SFWMD and the Corps.
EC - 7	11-13-2012	We believe that a temporary Blue Shanty berm is a cost effective way to utilize existing canal and berm features in SW WCA-3B and ENP to achieve near-	Please see response to comment EC-6 above. Construction of the ~ 8.5 mile levee in WCA 3B connecting the L-67 A levee to the L-29 levee would be constructed in accordance with USACE Engineering

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		term benefits and "train" the River of Grass through two gated structures to be installed along lower L-67A during an initial CEPP phase. This feature is intended to allow for restoration of sheetflow, the creation of ride/slough habitat, and fishery improvement through marsh connectivity and should not be interpreted or designed as a flood control structure.	Design and Levee Safety Criteria and consistent with the design criteria developed jointly by the SFWMD and the Corps. The Corps concurs that construction of the levee in WCA 3B would provide a means to reconnect WCA 3A, WCA 3B and ENP.
EC - 8	11-13-2012	We remain committed to assisting in this process and to helping ensure increased water flows to the central Everglades, relief to the northern estuaries, and ecological benefits for America's Everglades. We look forward to working with you in this ambitious endeavor and invite any questions or comment you may have.	Thank you for your comment.
EC - 9	12/27/13	The Everglades Coalition has previously supported Central Everglades Planning Project (CEPP) goals to: 1) restore habitat in the central Everglades, focusing on the "River of Grass"; 2) deliver "new" sources of clean water to the central Everglades and Everglades National Park (ENP); and 3) reduce damaging discharges to the east and west coast estuaries. Removal of the L-29 along the bottom of WCA-3B is consistent with long term restoration goals and represents a clear step forward in Everglades restoration as it removes a barrier to sheet flow and will improve fishery conditions. Alternative 4 is the only alternative in CEPP which will begin more natural flow into Water Conservation Area (WCA) 3B and ENP, re-establish ridge and slough topography, and improve ecological connectivity, all of which are priority tenets of Everglades restoration.	Thank you for your comment.

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		Restoration of the Everglades should not significantly increase the footprint of levees in sensitive wetlands. Restoring the natural flow path of the Everglades, as proposed in Alternative 4, will reduce soil oxidation and loss in WCA 3B, increase biological connectivity, improve the mosaic of landscapes essential to the food chain, and provide more corridors and habitat for fish and wildlife. THEREFORE BE IT RESOLVED that the Everglades Coalition supports CEPP Alternative 4, with the WCA 3B river training structure implemented with a minimal footprint, as the best alternative for the environment. The Coalition requests that it be designated the Tentatively Selected Plan in the Project Implementation Report because it most comprehensively and meaningfully advances restoration goals, achieves ecosystem benefits, and increases ecological connectivity and water conveyance between ENP and Water Conservation Areas 3A and 3B.	
FLORIDA WILDLIFE FEDERATION (FWF)			
FWF - 1	6-4-13	The Florida Wildlife Federation respectfully requests the South Florida Water Management District Governing Board to re-affirm the District's role as local sponsor of the Central Everglades Planning Project (CEPP), which is currently being developed by the U.S. Army Corps of Engineers with District support. The CEPP has proposed an array of projects in its Alternative 4-R that, together with the District's and Governor Scott's Everglades Water Strategies	Thank you for your comment.

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		program, will move significant amounts of fresh water into Shark River Slough, the core of Everglades National Park. With these projects and the already commenced Picayune Strand restoration projects on the west and the C-111 spreader canal moving water into Taylor Slough on the east, the state and federal governments will secure the future of the park and revitalize a large portion of the historic "River of Grass" through Water Conservation Areas 3 A and B.	
FWF - 2	6-4-13	Specifically, we are asking SFWMD Governing Board to take such formal action as is necessary to permit release of the ACOE's Draft Project Implementation Report (PIR) for the proposed Tentatively Selected Plan, Alt.4-R. Release of the PIR will start compliance reviews under the National Environmental Policy Act and formal public comment, as modeling and refinements continue to address remaining concerns. Taking action now provides sufficient time to ensure that a Chiefs Report can be submitted to Congress by December 2013, making CEPP projects eligible for Congressional authorization under the Senate-passed Water Resource Development Act (WRDA). It is not possible to predict when the House will take up a WRDA bill. It would be politically foolish, however, for us in Florida not to make every attempt to meet the Senate's conditions and deadline for the next WRDA bill. Urging Congressional authorization for CEPP projects is not to say that other projects such as the Caloosahatchee and St. Lucie reservoirs, Broward Water Preserves, Biscayne Bay Coastal Wetlands should be sidelined. All of us are aware of	Thank you for your comment.

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		the enormity of the restoration laid out in the Comprehensive Everglades Restoration Plan, of which CEPP is a component. It is that enormity and its potential rewards that make "Everglades Restoration" *worth* implementing.	
FWF - 3	6-4-13	Florida Wildlife Federation's message is that we are still in "a process" and, at this point in that process, all of us should push forward to obtain Congressional authorization for CEPP projects. By statute and court orders, the District and its taxpayers have incurred an obligation to meet water quality standards; formally agreeing to the role of "local sponsor" for CEPP does not add to that obligation. Long term, implementing the projects proposed may make achieving those standards easier. If the Governing Board feels it needs an "escape clause," the process builds one in: the Project Construction Agreement. Prepared after design, the PCA spells out responsibilities for the costs of construction, operations and maintenance. You are NOT now being asked to sign a PCA.	Thank you for your comment.
FWF - 4	6-4-13	The Comprehensive Everglades Restoration Plan was adopted unanimously by the Florida Legislature in 2000, which also designated the South Florida Water Management District to be the state's "local sponsor." The plan also was adopted by Congress, winning every vote save that of one senator. At that time, it was anticipated that implementation would take thirty years to complete. As we approach the half-way point, the Federation urges all to continue moving forward to full implementation.	Thank you for your comment.
PUBLIC			
Jack Moller (JM) - 1	3-8-2012	At yesterday's meeting you stated the ACOE flow rate goal in the WCAs, Central Everglades, is to	It is not essential to have extremely high water depths when trying to facilitate high flow rates. The CERP "goals are to restore

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		obtain a 2.5 to 3.5 cm/sec flow for four weeks a year. What water depth in the WCAs will allow this flow rate to be obtained?	hydroperiods and sheetflow, not a particular flow velocity. These flow numbers are not CEPP targets because these have not been vetted through the RECOVER PM evaluation process. However, the design of the CEPP will strive to restore enough sheetflow to move the buoyant sediments ("floc") out of the sloughs and onto the ridges and, at the same time, not create an environment where the water depths get high enough to damage tree islands.
JM - 2	3-11-2012	Also, isn't 1.5 to 2 miles a day a bit fast for water to flow in the Everglades? This is what your goal of a few cm/sec converts to.	Again, this flow rate is not a goal. It is a short-term characteristic of sheetflow, and yes, 1.5-2.0 miles a day is fast for the Everglades, but probably essential for at least a few days, to entrain sediments and move them onto ridges.
JM - 3	3-11-2012	What new science, besides Dr. McVoy's work, has been found that verifies the pre-drainage flow rate of water in the Everglades was 1.5 miles per day or more?	There are numerous references that indicate that these flows are needed today to reverse current soil elevation changes on tree islands, ridges, and sloughs. A partial list of references from the Decomp Physical Model Science Plan is provided here. This list contains references for published, independently refereed scientific journal articles (the highest level of scientific review). Additional supporting references are listed at the end of this response document; those references have been vetted in extensive CERP and public forums.
JM - 4	3-11-2012	I heard you said to reach this 1.5 mile/day flow rate you only needed to increase the water volumes by 40%. What will this increase make the water depths in the Everglades become? Where do you measure the flow rate at?	There are no flow-monitoring stations in the ridge & slough habitats of the Everglades. Flows are calculated by computer models within indicator regions that have been established by RECOVER. The CEPP team will use computer models to answer your question concerning water volumes because we also want to make sure that water depths will not become excessive and that flows are measured correctly. Keep in mind that although the historic system probably had up to 40% more water, we do not anticipate that this project will provide the historic volume of water. CEPP will formulate and evaluate plans for a first increment of additional flows of water to the natural system. Please also keep in mind that CEPP does not want to create water depths that will damage tree islands. Determination of what the appropriate first increment of water flows into the natural system is the purpose of the CEPP study.
JM - 5	3-11-2012	Since the Everglades has few sloughs today and the old sloughs have non-slough vegetation in them	When the CEPP team talks about "sloughs" they are referring to the natural, linear waterways that water follows to move south through

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		how will this affect the flow rate of the water once you are able to push the desired amount of water into the Everglades?	the Everglades. A more extensive response is available upon request (letter 3-26-2012).
JM - 6	3-11-2012	Will this vegetation cause the flow rate to be reduced until all this nonslough vegetation is killed by drowning?	The goal of CEPP is to recreate natural sloughs (described in previous answer). Yes, there will be some vegetation transition over time. A more extensive response is available upon request (letter 3-26-2012).
JM - 7	3-11-2012	Will this vegetation problem create a need for more water to be pushed into the Everglades, at least until these old sloughs are reestablished?	The goal of putting more water in the Everglades is based upon the need to prevent peat oxidation and fires. A more extensive response is available upon request (letter 3-26-2012).
JM - 8	3-11-2012	If this is so what will be done to protect the islands and uplands? What will be done to prevent the hardwoods, which include willows, from being drowned? I am sure you know protection of these Everglades resources was approved by a vote of the Sustainable – to do no harm to the island, hardwoods (which includes the willows).	You concerns are understood and will be considered throughout the CEPP process. However, it is critical that you understand that we want to protect tree islands and even make efforts to bring some back. But willow has overtaken northern WCA3A and is not indicative of a healthy vegetation mosaic in that ware.
JM - 9	4-19-2012	Water depth issues have not been adequately addressed. More water in the Everglades will lead to no uplands and drowned wildlife. Questions: 1. What is the frequency of flooding the Everglades; will you have to flood them multiple times a year, once a year, or every other year to reach your desired goals of 40% more water to create an unnatural flow rate in the Everglades? 2. What is length of time for each flooding in the Everglades? 3. What is the water depth at its max depth when you obtain the desired 40% more water to increase an increase flow rate and how long will this depth have to be maintained to allow you to obtain your desired performance measure? 4. How much material will this flow rate move for each flooding?	The objectives of CEPP to enhance ecological values include to restore seasonal hydroperiods and distribution, to improve sheetflow patterns and surface water depths and durations, and to restore more natural water level responses to rainfall (for additional detail, reference Section 01 of the CEPP PIR). CEPP alternative configurations were developed to reduce the drainage effects from Miami Canal in the northern portions of WCA 3A and restore more sheetflow across the northwest portions of WCA 3A. The Miami Canal causes water levels in northern WCA 3A to recede well below the ground surface for long periods of time, which has resulted in extensive and documented losses of peat soils from oxidation and muck fires and resultant lowering of the ground surface elevations in northern WCA 3A by up to 3-ft in some areas. Alt 4R2 proposes to reverse the continued degradation of this area by backfilling a portion of the Miami canal north of I-75 to remove its drainage effects, re-distributing inflows through removal of approximately 2.9 miles of the south L-4 levee and increasing water flow into WCA 3A during the dry season. Water levels and durations within WCA 3A and 3B will vary across the landscape and from year-to-year if Alt4R2

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		5. How will you and we know when you can stop flooding the Florida Everglades and what are the bench marks being sought by these floodings of the Florida Everglades?	were implemented, consistent with the variability in rainfall, hydrologic conditions, and operations within the upstream basins (Lake Okeechobee, EAA, WCA 1, WCA 2). Generally, water levels in northern WCA-3A will stay above ground surface for longer and the depth and duration of the wet-season water levels will increase. The water level changes anticipated with implementation of Alt 4R2 are conducive to restoring a portion of the wetland hydrology that was lost as a result of the drainage effects from the construction of the Miami Canal through the marsh in northern WCA-3A. Details regarding the expected water level changes can be found in Section 5 and 6 and Appendix C.2.1 and C.2.2. In general, with implementation of Alt 4R2, water levels in Northwest and North Central WCA-3A are predicted by the period of record modeling results to remain above ground surface throughout the year to reduce continued soil oxidation and invasion of woody vegetation, significantly reduce the susceptibility of that area to risk of muck fire and beginning to restore the ridge and slough landscape that was evident in the western portion of this area in the 1940s. Water levels in the northeastern portion of WCA-3A are predicted by the POR modeling to remain conducive to maintaining the sawgrass plains in this area that were also evident in the 1940s Central WCA-3A will remain similar to today's condition, and water levels and durations in southern WCA 3A will be slightly reduced due to the increased outlet capacity (to WCA-3B and the expanded S-333) included in Alt 4R2.
JM - 10	10-22-2012	Email saying: See the attached and consider what was said in today's meeting and who is in control of this massive public works project called CERP, with 4 attachments of articles titled: "Big Sugar does not like NAFTA, Fanjul's, Monica and Clinton.doc, Fanjul on the phone while Clinton gets it from Monica.doc, The Washington Post reports on Clinton and Moica & Fanjul.doc, and to sherry with the Fanjul – Clinton connection.doc"	Thank you for your comment.

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JM - 11	10-22-2012	Attached to his email was information taken from the book EAA on water, soil, crops, and environmental management by Bottcher. The page (30) talks about much and peat.	Thank you for your comment and information.
JM - 12	10-22-2012	Email subject: another Fed. map showing sawgrass plain in WCA3N http://sofia.usgs.gov/publications/ofr/2004-1448/images/fig2x.gif	Thank you for your comment and information. This map is consistent with the objectives of CEPP to restore seasonal hydroperiods and distribution, to improve sheetflow patterns and surface water depths and durations, and to restore more natural water level responses to rainfall and reduce the drainage effects from Miami Canal in the northern portions of WCA 3A to restore sheetflow across the northwest portions of WCA 3A. The Miami Canal causes water levels in northern WCA 3A to recede well below the ground surface for long periods of time, which has resulted in extensive and documented losses of peat soils from oxidation and muck fires and resultant lowering of the ground surface elevations in northern WCA 3A by up to 3-ft in some areas (refer to Section 1.2 for additional details on problems to be addressed by CEPP).
JM - 13	10-22-2012	Email subject: another water vs. tree islands doc. http://www.evergladesplan.org/pm/pm_docs/ertp/022511_ertp_v2_app_a.pdf	Thank you for your comment and information.
JM - 14	10-22-2012	Email subject: another water vs. tree islands doc. http://www.evergladesplan.org/pm/pm_docs/ertp/022511_ertp_v2_app_a.pdf	Thank you for your comment and information.
JM - 15	10-22-2012	photo of building with stairs <http://sofia.usgs.gov/publications/circular/1182/buildingsub.jpg> This building at the Everglades Experiment Station was originally constructed at the land surface; latticework and stairs were added after substantial land subsidence.	Thank you for your comment and information.

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JM - 16	10-22-2012	Email subject: The Tree Islands are Predrainage <http://www.google.com/url?sa=t&rct=j&q=map%20of%20tree%20islands%20in%20the%20water%20conservation%20areas%20of%20fl&source=web&cd=92&ved=0CCYQFjABOFo&url=http%3A%2F%2Fclic.cses.vt.edu%2Fsoils%2Fwrite%2Fposters%2FC_Lynn_Coultas%2520-%2520Bone%2520Phosphorus%2520on%2520Fixed%2520Tree%2520Islands%25207.ppt&ei=KaaFUJ6fG4rY2gW4vIBA&usg=AFQjCNGPcIwPSLiy6ISpmefReFfqUJ5DdA> <http://webcache.googleusercontent.com/search?q=cache:6c-Wg5oDnW0J:clic.cses.vt.edu/soils/write/posters/C_Lynn_Coultas%2520-%2520Bone%2520Phosphorus%2520on%2520Fixed%2520Tree%2520Islands%25207.ppt+map+of+tree+islands+in+the+water+conservation+areas+of+FL&cd=92&hl=en&ct=clnk&gl=us>	Thank you for your comment and information.
JM - 17	10-22-2012	Email Subject: Tree Island Maps Everglades District Field Map WCA 2A, WCA 3A, WCA 3B	Thank you for your comment and information.
JM - 18	10-22-2012	Email subject: Tree Island Study http://www.sfrestore.org/issueteams/csop_advisory_team/2004meetings/12jan2004/WCA_3B_Presentation_FWS.pdf	Thank you for your comment and information.
JM - 19	10-22-2012	Email subject: WCA 3 Islands http://www.evergladesplan.org/shared-definition/shared_def_docs/sd_2010/111910/4-1-2_skd_revised_111910.pdf	Thank you for your comment and information.
JM - 20	11-29-2012	In regards to backfilling the Miami canal from 1.5 miles south of S-8 to I-75. This needs to be changed to allow for much of the existing levee to remain, and to flatten it to create much needed uplands.	Spoil mounds currently located adjacent to the Miami Canal from S-8 to S-339 have been identified to be removed and placed back into the Miami canal during construction of Alternative 4R2 to restore sheetflow. A portion of the spoil mounds currently located between

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		Distance between the uplands can be determined using flow studies; this will assure water being pushed south from EAA and Lake O will spread out across WCA3N.	S-339 and I-75 that coincide with the ridges of the ridge and slough landscape would remain. These spoil mounds have vegetation that has been planted and maintained by the FWC. In addition, mounds would be created during construction of Alternative 4R2 approximately every 1 mile from S-8 to I-75. These additional mounds would provide a source of upland habitat or refugia to wildlife during periods of high water.
JM - 21	11-29-2012	FWS is digging holes and building man made uplands in Lox NWR. If this is good for their land and habitat, can we assume that it would be good for CEPP as well?	Please see response to comment JM-20 above (Dated 11-29-2012). A portion of the spoil mounds located adjacent to the Miami Canal that coincide with the ridges of the ridge and slough landscape would remain. In addition, mounds would be created during construction of Alternative 4R2 approximately every 1 mile from S-8 to I-75; providing a source of upland habitat or refugia to wildlife during periods of high water.
JM - 22	12-12-2012	What is wrong with the Dec 2012 proposals? 1. The red line has not moved to include Holey Lands and Rays. 2. Within the EAA they are not using all the public land that is under plow for water storage and/or cleaning the water. There are lots of large public properties leased to ag that could go into deep water storage 3. There is no indication that they are planning to use the newly purchased US Sugar lands for water storage. 4. The Miami Canal in WCA3N is still a solid “black” line and must become a dotted or dashed “black” line indicating there is not going to be a complete back fill job but deep water refuge and adjacent uplands left. 5. They do not turn the L-29 into a spillway but instead want to install pumps. 6. They do not but gaps in the C11 Extension levee. There should be no pumps but the entire levee turned into a spillway as the agencies agreed to	Inclusion of operational and structural modifications to existing infrastructure and/or construction of new features in Holeyland WMA was considered during initial plan formulation efforts for the CEPP. These proposals within the WMA were not further pursued given water quality concerns. The quantity/quality management measures south of Lake Okeechobee are recommended to be located on and maximize the usage of the A-2 Compartment of the EAA land south of Lake Okeechobee that is owned by the State of Florida. The identified project lands are located between and adjacent to the North New River and Miami Canals, which reduces the need to construct any additional conveyance features to move water from Lake Okeechobee to the project features and the WCAs. The robust hydraulic connection to Lake Okeechobee creates flexibility in managing high water levels and improves the timing of water deliveries to the WCAs. The project lands are also adjacent to existing water quality components that are currently being used for environmental purposes, creating a unique ability to optimize C&SF operations. Existing infrastructure, including roads, pump stations, etc., are already in existence and would not require substantial efforts for utilization or any upgrade. Publicly owned lands in the

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		do—as I said their word is no good and they must put into writing what they are going to do and not do. 7. No place do they indicate public access locations or the type of access that will allowed from these places. Essentially they are closing all of the WCAs to public access. 8. They do not indicate that they are going to move any clean water into Holey Lands or Rays therefore they are either going to move dirty water or they are going block all water from entering these areas, either option is no good.	southern portion of EAA demonstrated better cost effectiveness on a cost per acre foot of storage and treatment when compared to other locations. The lands identified for the project have already been purchased and are owned by the State of Florida which reduces the risk and uncertainty associated with real estate costs and acquisitions. Implementation of Alternative 4R2 would include complete backfill of the Miami Canal from S-8 to I-75 starting approximately 1.5 miles south of S-8. Please see response to comment JM-27 above. A portion of the spoil mounds located adjacent to the Miami Canal that coincide with the ridges of the ridge and slough landscape would remain. In addition, mounds would be created during construction of Alternative 4R2 approximately every 1 mile from S-8 to I-75; providing a source of upland habitat or refugia to wildlife during periods of high water. Implementation of Alternative 4R2 would not include the construction of additional pump stations on the L-29 Levee. During plan formulation, construction of pump stations on the L-29 Levee was proposed as part of Alternative 3. Alternative 3 was not identified as the TSP. Gapping of the C-11 Extension is not included in Alternative 4R2. Gapping of the C-11 Extension was considered during plan formulation for the CEPP, but was not identified to be a cost effective measure. A recreation plan has been developed and included in CEPP Project PIR and EIS.
JM - 23	12-12-2012	Don't support these plans for above reasons. Corps states that will manage WCA3N to assure no harm to uplands, hardwoods and historical sawgrass prairie area. To manage water in WCA3N to only benefit ENP as they have stated and what appears to be the goal of the current set of plan options is	Environmental effects within northern WCA 3A are described in Section 5 of the PIR/EIS and Appendix C.2.1 and C.2.2. The purpose of CEPP is to improve conditions within WCA-3A, 3B and Everglades National Park. Implementation of the CEPP is expected to rehydrate much of northern WCA 3A by providing a means for redistributing treated STA discharges from the L-4 and L-5 in a manner that

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		only going to drown the WCA3N and assure complete destruction of the Everglades in this part of Florida.	promotes sheetflow and by removing the drainage effects associated with the Miami Canal. As a result of increased flows, depths and inundation durations, it is expected that shorter hydroperiods sawgrass marshes will transition to slough/open water marsh communities in northwestern WCA-3A. Increased flow within northwestern WCA 3A would aid to reduce woody vegetation and dense sawgrass stands and help to promote a mosaic of wetland vegetation types within this area.
JM - 24	2-21-13	After reviewing the last power point on CEPP and finally figuring out how to open the web page which houses the information about CEPP I now realize why you all have avoided providing the answer to the questions we have been asking about how much water and for how long the planned deep water will be in the WCAs. From what I read you will push 20% more water than is established as the current high water levels and hold this amount of water in the WCAs for more than 40% of the year. Is this a correct reading of your data and plan? If this not a correct reading then what is a correct reading stated in maximum planned high water depth and duration of the planned high water events? Mind you this does not consider storm events which will push these planned high water events to even deeper water depths causing more destruction of the Everglades. If it is the correct reading or your data and plan than this is not Everglades restoration but the drowning of the WCAs -- Florida's Everglades to save the EAA and Federally owned Everglades.	The increase in water flow to WCA-3A will occur primarily in the dry season to reverse the current trend of water levels in northern WCA 3A receding well below the ground surface for long periods of time, which has resulted in extensive and documented losses of peat soils from oxidation and muck fires and resultant lowering of the ground surface elevations in northern WCA 3A by up to 3-ft in some areas (Refer to Section 1.2). The CEPP TSP incorporates the Zone A schedule included in the current operation schedule for WCA-3A under ERTP. As such, inflows from Lake Okeechobee would not occur when stages in the WCA-3A are above Zone A consistent with current operations. The period of record modeling predictions, which include the storm events in the historical record (1965 to 2005), indicate that wet-season water levels in some years may be slightly increased (due to the loss in soil storage associated with improved ground water levels in northern WCA-3A), however the peak stage and duration of those events will decrease as a result of the increased outlet capacity from WCA-3A provided with Alt4R2. (Refer to Appendix A, WCA-3A 3-gage average stage-duration curve, for specific gages within WCA-3A refer to Appendix C.2.2).
JM - 25	2-21-13	I also understand there is one more public meeting on CEPP and then a formal public comment time. Is	The last Task Force sponsored workshop was held on the 25th of February. USACE will be hosting public meetings once the CEPP Draft

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		this correct? Is there a real opportunity for the public to bring about meaningful change to the current CEPP plan or is this a done deal? What agency is responsible for the current CEPP plan and will impellent the final plan? Where will the funds come from to do CEPP? the Federal government, SFWMD or State of FL?	PIR/EIS is released to the public and published in the Federal Registrar. We have tried to be careful about separating the USACE's public meetings (which are required under NEPA) from the Task Force's workshops which are above and beyond the required public input process and do not count toward the USACE's NEPA obligations. USACE and the SFWMD, as the non-Federal sponsor, are responsible for development and approval of the CEPP plan as well as implementation of the plan. The USACE and the South Florida Water Management District are responsible for funding CEPP with a 50/50 cost share.
JM-26	3-6-13	We spent a lot time with you and other decision makers and planners. I thank you for your time. However, I understand that the newest and final plan will flood the WCAs all year. These plans will keep water so deep 40% of the time that the water will be above what is today's maximum water depths. You did not respond to my questions about this deep water situation caused by your CERP-CEPP plans.	We appreciate your participation in the stakeholder engagement process utilized during the planning process. The CEPP plan does not intend to hold water levels above today's maximum water depths 40% of the time. As we explained during the CEPP Project Delivery Team meetings and Task Force hosted public workshops, the increase in water flow to WCA-3A will occur primarily in the dry season to reverse the current trend of water levels in northern WCA 3A receding well below the ground surface for long periods of time, which has resulted in extensive and documented losses of peat soils from oxidation and muck fires and resultant lowering of the ground surface elevations in northern WCA 3A by up to 3-ft in some areas (Refer to Section 1.2). The CEPP TSP incorporates the Zone A schedule included in the current operation of WCA-3A under ERTP. As such, inflows from Lake Okeechobee would not occur when stages in the WCA-3A are above Zone A consistent with current operations. The period of record modeling predictions, which include the storm events in the historical record (1965 to 2005), indicate that wet-season water levels in some years may be slightly increased (due to the loss in soil storage associated with improved ground water levels in northern WCA-3A), however the peak stage and duration of those events will decrease as a result of the increased outlet capacity from

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			WCA-3A provided with Alt4R2. For additional analyses, please refer to Appendix A, Section A.8.3.2.1 (WCA-3A 3-gauge average stage-duration curve), and Appendix C.2.2 for hydrologic performance at specific gages within WCA-3A. Two complete sets of RSM-BN and RSM-GL hydrologic model performance measure output for the baselines and Alt4R2 are posted on the Everglades Plan public web site for the CERP: http://www.evergladesplan.org/pm/projects/proj_51_cepp.aspx
JM-27	3-6-13	When I read in the newspaper that the currently desired CEPP plans harmed water supply to SE FL I knew you would put more water in the WCAs. These plans are not restoration but destruction of the Everglades. We explained in may terms why so much water is not restoration but a destruction plan for the Everglades. CERP is not merely restoration of Everglades National Park which is what it has become.	The CEPP plan incorporates multiple components of the overall Comprehensive Everglades Restoration Plan (CERP) framework authorized by WRDA 2000. The objectives of the Comprehensive Plan are restoration of the Everglades ecosystem while providing for other water-related needs. The CEPP TSP provides a significant increment of restoration for the natural system and also includes an increment of improvement for other water related needs, specifically 12 MGD and 5 MGD improvements to water supply for Broward and Miami-Dade county respectively. The objectives of the CEPP TSP are to not focused on Everglades Park, rather, focus on improving natural system conditions within WCA-3A, 3B as well as Everglades National Park.
JM-28	3-6-13	Since the decision makers have decided to ignore our input I have sent to my Congressional delegation a request to stop funding CERP and will work to get everyone I know to do the same. I am also encouraging groups I know to file litigation under the endangered species act because so much water is going to harm not only these animals the WCAs but the Big Cypress National Preserve. You are going to drown the eastern third of the Big Cypress like you have already drowned Zone 4 of the Stair Steps.	The natural system performance metrics and water levels targeted by CEPP TSP were developed by RECOVER through extensive scientific research, scrutiny, are based upon peer reviewed science and represent conditions under which the Everglades is expected to flourish throughout the system. (Refer to Appendix G on Performance Measures)
JM-29	3-6-13	How can you call it restoration when most of the year there will be more water in the WCAs than is currently legally allowed and when the current high	The increase in water flow to WCA-3A will occur primarily in the dry season to reverse the current trend of water levels in northern WCA 3A receding well below the ground surface for long periods of time,

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		water line is reached the area is closed to human activity because the wildlife is being harmed by this high water? I would like a response to this question.	which has resulted in extensive and documented losses of peat soils from oxidation, muck fires and resultant lowering of the ground surface elevations in northern WCA 3A by up to 3-ft in some areas (Refer to Section 1.2). The CEPP TSP incorporates the Zone A schedule included in the current operation of WCA-3A under ERTP. As such, inflows from Lake Okeechobee would not occur when stages in the WCA-3A are above Zone A consistent with current operations. The period of record modeling predictions, which include the storm events in the historical record (1965 to 2005), indicate that wet-season water levels in some years may be slightly increased (due to the loss in soil storage associated with improved ground water levels in northern WCA-3A), however, the peak stage and duration of those events will decrease as a result of the increased outlet capacity from WCA-3A provided with Alt4R2. For additional analyses, please refer to Appendix A, Section A.8.3.2.1 (WCA-3A 3-gauge average stage-duration curve), and Appendix C.2.2 for hydrologic performance at specific gages within WCA-3A. Two complete sets of RSM-BN and RSM-GL hydrologic model performance measure output for the baselines and Alt4R2 are posted on the Everglades Plan public web site for the CERP: http://www.evergladesplan.org/pm/projects/proj_51_cepp.aspx
JM-30	7-1-13	There is a large amount of information on the dollars per day for whitetail deer and duck hunting in American and FL. Also, the Wilderness Society had a study done on the Externalities of Water Management in the Everglades. This study reported there was, at that time, a million dollars worth of frogs removed from the Everglades a year. Of course frogging would have been north of US 41 because one cannot frog in Everglades National Park.	We have accessed the information on the value per day of deer and duck hunting and will use it for the CEPP ecosystem services assessment. The Ecosystem Services report will be provided separate from the Draft PIR/EIS after it has been through the review process. We are seeking the information on frogging and will include it in the CEPP ecosystem services assessment if possible. The primary challenge is in determining how much CEPP would change the amount of frogging that takes place in the Everglades. The Ecosystem Services report will be provided separate from the Draft PIR/EIS after it has been through the review process.

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		This was taken from the report given today; page 16, on ecological services from CEPP/CERP.	
JM-31	7-1-13	Do they include the recreational value of pink shrimp? Or just the commercial shrimp industry dollars? They have a dollar value for recreational fishing but not for pink shrimp.	Only the commercial value of pink shrimp was included in the CEPP ecosystem services report because this was the aspect for which we could calculate a change with CEPP. The value of the change in commercial pink shrimp catch is included in the assessment. The Ecosystem Services report will be provided separate from the Draft PIR/EIS after it has been through the review process.
JM-32	7-1-13	Why is the value of potable water not included in the report about the value to society by CEPP?	At the time that this comment was submitted, the team was determining the value of the water supply improvements. If sufficient data is available to calculate the value of the water supply improvements, they will be included in the final draft of the assessment.
JM-33	7-1-13	Did I understand the speaker who addressed the issue of water for irrigation correctly in that the data, the dollar value, of the water in CEPP is worth more than $22+ million to the growers of sugar cane. In other words the taxpayer is giving these folks a $22+million gift of water.	The results presented on this date were preliminary results, calculated before the CEPP TSP was determined. The final draft of the assessment shows a relatively small benefit of CEPP to agriculture south of Lake Okeechobee, and a much larger benefit to society due to the restoration in the Greater Everglades and estuaries.
JM-34	7-1-13	On slides in the presentation Keefe_20130701CEPPPD I find this slide: There are two red lines. The one on the left follows the existing levees. The one on the right follows no levee. When you and other talk about above and below the "red line" which "red line" are you talking about? Also, what is the purpose of the "red line" in the right picture? The same right picture red line is in other slides.	In regard to two different redlines, as we clarified during the PDT meeting, there was an error on one of the slides where the “redline” had shifted south as result of a formatting error on that slide (the redline is a drawn on to the background map) Clarification of the “Red Line” referred to throughout CEPP’s planning: The red line is just an accounting tool, that is, a way to keep track of the amount of water flowing southward into the remaining Everglades areas (i.e. Water Conservation Areas).

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		Please explain in detail what these two red lines mean to the planning team and stake holders.	
JM-35	7-1-13	The "fluke" red line should be the line that delineates the area north and west that is to be protected as areas that are to have water managed to protect the sawgrass and myrtles. Maybe this is a good sign and should be included in the future model assumptions.	Please refer to response above for JM-34, 7-1-13.
JM-36	7-1-13	The historical and oldest available map that I sent you all indicate that the sawgrass and myrtle area before drainage was east of the Mud Canal and north of the "fluke red line". The other areas were ridge and slough. Freddy has talked about this a lot and explained why the old airboat trails were located where they were. Talk with him again to get a better understanding of this vegetation-water-user relationship. Remember--- X amount water in at the top per day means X amount of water out the bottom per day. The bigger and lower the weirs the faster the water will flow. But, you have to keep enough water back to prevent over draining the WCAs.	The conditions in the system represented by the 1940s Davis Map represent a drained condition and conditions in northern WCA 3A after 1971 represent a drained condition after construction of the Miami Canal on the north end and impounded conditions in the southern end of WCA 3A due to the levees. The goal of the CEPP is to remove the drainage effects of the Miami Canal in northern WCA-3A, restore more natural distribution of water inflows into WCA-3A and reconnect WCA 3A to 3B by providing additional outlet structures into 3B as well as increasing capacity of the outlet structure discharging into the L-29 canal. The increase in outlet capacity of WCA-3A amounts to an additional 2650 cfs to be used in conjunction with the existing outlets of WCA 3A. This increase in outlet capacity will provide increased capability to improve conditions within WCA-3A from existing water flows as well as the increase in inflow proposed by CEPP TSP in the dry season. Passive weirs were considered early on in the planning process. The weirs were screened out due to operable gated culvert structures providing more capability of these structures to pass flow throughout the range of water levels expected in WCA 3A. Weirs must be fixed at particular heights which can limit the amount of water that can be passed through the system. When weirs are sized to extreme conditions, the tradeoff is a reduction in the amount of flow that could be passed through the system under more average or drier conditions. The structures proposed in the CEPP TSP are designed and intended to remain open under extreme conditions unless the design high water condition for the additional bridging

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			and road raising for the Tamiami Trail Next Steps project of 9.7 feet is reached in the L-29 canal. The period of record analysis conducted for CEPP indicated that condition was only reached for approximately 15 days out of the entire 41 years. Therefore, use of gated culvert structures perform similar to a weir but also provide much more capability to flow water out of WCA-3A under the full range of water levels. The concept of ONLY having weirs in the L-67A levee was also considered in the analyses conducted to develop the CERP plan in 1999. That option was also eliminated during that planning process for the same reasons - that greater benefits could be achieved with the use of 6 gated culvert structures in the mid and lower portions of L67A and inclusion of some overflow weirs in the upper northern reaches of L67A for extreme events. Since CEPP is a first increment towards decompartmentalizing the system, the CEPP effort proposes that consideration of those weirs be considered in planning the next increment of CERP to ensure that CEPP provides a meaningful increment towards improving conditions within WCA-3A without over-draining given the limited amount of water budget available in this first increment.
JM-37	7-1-13	Also, since the savings clause protects water supply for ag, urban and wildlife and flood protection equivalent to the conditions that existed at the time of passage of CERP does this also apply to fish, wildlife and plants?	The savings clause provisions included in WRDA 2000 are specific to maintaining existing levels of flood control and water supply for agriculture, municipal and industrial users provided by the Central and Southern Flood Control project. The project assurances provisions of WRDA 2000 assure that the water made available by CERP to restore the natural system is reserved for the natural system and protected from other consumptive use purposes. The goals for CEPP and CERP is to restore more natural water levels and fluctuations that are beneficial to the ecosystem and is based upon the best peer reviewed scientific information available about the needs of the natural system and is therefore protective of the natural system.
JM-38	7-1-13	I do not see or hear any talk about the rate of water depth increase or water rise. This is important because if the water rises too fast	The performance metrics considered in the development of the CEPP TSP include recession and accession rates that are beneficial for the natural system. The CEPP period of record analyses indicate that

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		and/or the wrong time of the year there will be serious harm to many plants and animals. Can you all develop a chart, graph or some other instrument that shows everyone how fast the water depth will increase per day for a normal year, high rain event year and low rain event year? Such data should be developed for WCA3A, WCA3B, WCA2A, WCA2B, ENP. Such data should be developed for both estuaries and Lake O.	recession and accession rates of water levels within WCA-3A, 3B and ENP are much improved over today's conditions with the plan (Refer to Appendix C.2.2). The CEPP plan incorporates a significant change in operations towards a rain-driven delivery of water through the system based upon ecologically desirable water levels throughout WCA-3A. 3B and ENP based upon seasonal needs of the ecosystem. It is a rain-driven pull to move water through the system as opposed to stage-based regulatory push release from the WCA's that currently exists today. The climate of south Florida is such that conditions in the system are largely driven by not only the amount of rainfall in any given year but where the rainfall occurs throughout the system. That is why a 41 year period of record rainfall analyses is done when planning and designing modifications to the water management system. This allows for evaluation of the broad range of conditions that may be experienced with proposed modifications. The information you request regarding how fast water depth will increase per day for any year is available in the model ouput posted. This output includes the hydrographs which shows water level changes during every year of the simulation period at various locations throughout the system as well as the period of record average stage-duration curves. Two complete sets of RSM-BN and RSM-GL hydrologic model performance measure output for the baselines and Alt4R2 are posted on the Everglades Plan public web site for the CERP: http://www.evergladesplan.org/pm/projects/proj_51_cepp.aspx
JM-39	7-1-13	What is this-- new divide structure in L29 and new discharge? Jack Moller New divide structure in L29 canal; New discharge, subject to FDEP permitting and Settlement Agreement monitoring	The new divide structure in the L-29 canal is proposed to maximize benefits of the Blue Shanty flowway and the 2.6 mile bridge associated with the DOI Tamiami Trail Next Steps project that focus flows within the remnant deep slough areas in that area, reducing seepage losses to the east while also providing the operational flexibility to rehydrate the eastern portions of northeast Shark River Slough through the 1-mile eastern bridge. All inflows into Everglades National Park are subject to monitoring and compliance with the Settlement Agreement. The CEPP plan

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			does re-distribute the water enter into Everglades National Park that must be taken into consideration as part of compliance with the Settlement Agreement.
JM-40	7-1-13	There is a problem in the slide presentation for today's L67 structure discussion. This is found on the following page of the document to be presented today. We should not use the information from the CSOP modeling because we do not know the design criteria that was given to the engineers to use as they developed their plans and models. If the proper design criteria is uses, to not over drain WCA3A & B and to not allow the water to go over the current regulatory depth or elevation, we can then design the weirs to the proper size and configuration to allow the water that flows in at the top the flow out the bottom. In other words "X" amount in today means "X" amount out at the bottom today. This is sheet flow.	The information provided during the July 1, 2013 PDT meeting included modeling efforts conducted during CSOP as a means of providing information from previous planning efforts which considered weirs in the L-67A. Concur that the goals and objectives of that effort and CEPP are different and the modeling tool and period or record rainfall considered in that effort must be taken into account when interpreting model results. The CSOP modeling results presented were based upon structures in the L-67A levee that included both gated culvert structures with adjacent sheetpile weir segments and relied on the existing S-356 pump station to manage increased seepage into WCA-3B and NE Shark River Slough. The CSOP results presented at that PDT meeting also did not include the effects of those alternatives to flooding or water supply implications to the lower east coast. While the alternative that rose to the top during that analysis did include the hybrid gated culvert structure with sheetpile weir segments, it is most important to recognize that the culvert structures were required to be closed when stages in WCA 3B approached 8.3 feet due to concerns from FFWCC about resources within WCA 3B as well as flooding concerns from uncontrolled inflows into WCA 3B. The CEPP plan proposes to keep the gated culvert structures in the Blue Shanty Flowway open until the design high water in L-29 canal reaches 9.7 feet associated with design of the DOI Tamiami Trail Next Steps additional bridging and road raising limit is reached which maximizes benefits to WCA 3A, 3B and ENP. The Blue Shanty levee proposed in CEPP ensures that project constraints for maintaining flood protection and water supply to the lower east coast developed areas are maintained, ensures goals for CERP for restoration of north to south flow of water is restored consistent with the landscape and ensures water levels and remaining tree island resources within the larger eastern portions of WCA 3B that has experienced subsidence are protected.

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JM-41	7-2-13	I would like to thank you both for the opportunity to listen, attend and participate in the meetings about CERP like you held yesterday. I suggest that instead of having a few moments for public comment that you allow public comment after each item. Each item on yesterday's agenda was/is very important. This idea is what I did while running ARC. After each management plan we had public comment. By doing this we had a much more productive meeting and meaningful dialog with staff and the public. Also, who owns the carbon that is sequestered in CERP-CEPP? Does the ACOE, SFWMD, State, County, City, landowner, Tribe? The value of this by-product of CERP-CEPP is very high and could well lead to many legal issues as those who think they own these carbon credits decide they want the money or the ability to trade these credits for their own benefit.	Thank you for your helpful feedback on the presentations. As a result of your comment, more public comment time was provided in subsequent meetings. Regarding the carbon: the results of the CEPP ecosystem services assessment do not imply ownership or the ability to sell or trade carbon credits. In response to this comment we have clarified this point in the report. In addition we are seeking legal review of the report to make sure our wording states clearly that the report does not imply the ability to sell or trade the carbon. The Ecosystem Services report will be provided separate from the Draft PIR/EIS after it has been through the review process.
JM-42	7-2-13	This is the value of WCAs to FL's economy. "FWC economic analysis estimates indicate that the ECWMA generated an estimated annual economic impact of $260,658,075 for the State and Southeast Florida region. This estimated annual economic impact has aided in the creation of an estimated 2,654 jobs." http://myfwc.com/media/2575828/ECWMA-Area-Overview.pdf I suggest that the folks working on this value issue check all the state records on this topic. All you need to do is keep a healthy habitat and not	Thank you for the reference to the FWC material. We have been working with FWC to produce the ecosystem services report. Please note that in the report we focus specifically on the changes made by CEPP, rather than total values of areas. We also focus on net results in order to be transparent about the negative and positive effects of CEPP; for example, when calculating carbon sequestration due to peat improvements with CEPP we also calculated the negative effects of carbon emissions due to construction and operating pumps. The preliminary results show so far that in all cases the negative values are much smaller than the positive results, which is a positive economic result for Florida and the nation due to CEPP. . The Ecosystem Services report will be provided separate from the Draft PIR/EIS after it has been through the review process.

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		drown the area to continue allowing the area to make money for Floridian and the nation. What harm will the current CEPP plan have on the known archeological sites?	Through consultation with stakeholders, such as State and Tribal Historic Preservation Officers and Indian tribes, USACE has taken into account the effects of this undertaking on cultural resources and is considering ways to avoid, minimize or mitigate adverse effects.
JM-43	7-2-13	Right now the S12A and S12B are closed while the water in the WCAs and other areas upstream are about to be closed because of too much water. It is the summer. It is the wet season. Water in the Everglades should be freely flowing into ENP. If we had weirs this would be the case. As it is now someone will close the gates or structures at the bottom and start the drowning process of all the land to Orlando and oceans again. Please share this with the members of the team working on CEPP. Some of them raised the issue of trust. This is an example of why gates or control structures other than weirs are not desirable.	The CEPP plan will enhance our ability to move water through the Everglades by providing an additional 2650 cfs outlet capacity to WCA 3A. Please refer to response to JM-36 7-1-13 regarding weirs.
JM-44	7-3-13	Do you all have a map showing the expected annual ponding depths in WCA3A after CEPP is completed? If so will you send it to me. Also, while looking at the large volume of data you sent me on Monday I find that there are no maps showing the ponding depths in WCA3A for Oct. 1996. Why is this month missing? Is there a map for Oct 1996? I find maps for most all Oct.-years.	The average annual ponding depth maps for the Existing Condition Base and Alt 4R2 were sent to you via email from Chris McVoy on 7-8-13. Please refer to Section 6.2.1 for difference in average annual ponding depths between Alt 4R2 and Future Without Project condition. During the alternative modeling and evaluation process, difference maps were not generated for every year in the POR, however, the differences in water levels can be seen for each year in the POR on the hydrographs for various locations within the system. Two complete sets of RSM-BN and RSM-GL hydrologic model performance measure output for the baselines and Alt4R2 are posted on the Everglades Plan public web site for the CERP: http://www.evergladesplan.org/pm/projects/proj_51_cepp.aspx The hydrologic output produced following the identification of ALT4R2 as the TSP included difference maps comparing hydroperiod

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			and stages between ALT4R2 and each of the CEPP baselines. This information is additionally included in Appendix A (Engineering), Annex A-2 (Hydrologic Modeling), Reference 6.
JM-45	7-4-13	The issue of pushing too much water into the WCAs is not a new one. As you can see the FWC took a position on this matter many years ago. The current CEPP plan that plans on having deep water held in WCA3A is not acceptable. Whoever is responsible for this planning process should have never taken to the Col. a plan that causes ponding, flooding, and harm to the WCAs. They should have sent it back to the engineers and said you must redo the plan so that it does not cause harm to the WCAs.	The increase in water flow to WCA 3A will occur primarily in the dry season to reverse the current trend of water levels in northern WCA 3A receding well below the ground surface for long periods of time, which has resulted in extensive and documented losses of peat soils from oxidation, muck fires and resultant lowering of the ground surface elevations in northern WCA 3A by up to 3-ft in some areas (Refer to Section 1.2). The CEPP TSP incorporates the Zone A schedule included in the current operation of WCA-3A under ERTP. As such, inflows from Lake Okeechobee would not occur when stages in the WCA 3A are above Zone A consistent with current operations. The period of record modeling predictions, which include the storm events in the historical record (1965 to 2005), indicate that wet-season water levels in some years may be slightly increased (due to the loss in soil storage associated with improved ground water levels in northern WCA-3A), however, the peak stage and duration of those events will decrease as a result of the increased outlet capacity from WCA-3A provided with Alt4R2. For additional analyses, please refer to Appendix A, Section A.8.3.2.1 (WCA-3A 3-gauge average stage-duration curve), and Appendix C.2.2 for hydrologic performance at specific gages within WCA-3A. Two complete sets of RSM-BN and RSM-GL hydrologic model performance measure output for the baselines and Alt4R2 are posted on the Everglades Plan public web site for the CERP: http://www.evergladesplan.org/pm/projects/proj_51_cepp.aspx
JM-46			
Ed Fielding - 1	12-17-2012	It's so heartening that the Corps is listening to our plea to protect the Estuary from Lake O releases. We all recognize that 200,000ac/ft is just a beginning but it's strong and positive. Many thanks --for your strong efforts in this quest.	Thank you for your comment.

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Emilio Lopez (EL) - 1	12-20-2012	Because the threat of stormwater pollution, as documented by SFWMD website, is of national proportion and not limited to the Everglades or Florida, can the technology be implemented in stormwater curb inlets, in cities of S FL that are willing to participate in the research, to determine the effectiveness of the technology? Lopez technologies can provide additional sources to show the effectiveness of the technology thus far.	Water quality is not one of the objectives of CEPP and the project authority is focused on modifications of the Central and Southern Florida Flood Control project which is comprised of the regional water management system. Thank you for your comment and information.
Larry Fink (LF) – 1	11-23-2012	The following South Florida ecosystem restoration and protection critical performance objectives/measures are absent from or subsumed by/demoted under more general performance objectives/measures in the downloaded list: Everglades -- timing, extent, magnitude, duration, and frequency of natural fires (pyroperiod) to crop back aggressively colonizing plant species, such as cattail -- tree island coverages* -- minimum and maximum flows and levels to establish and maintain target tree island target coverages -- limiting nutrient concentrations and loads to outstanding Florida Waters to attain and maintain applicable human and wildlife uses, reduce the magnitudes, durations, and frequencies of color- and turbidity-related light limitation, contaminated peat accretion, algae blooms, and dissolved oxygen sags to acceptable levels, and reduce the magnitudes, durations, and frequencies of noncompliance with the associated nutrient and nutrient-related Water Quality Standards -- sulfate concentrations and loads to restore the mercury-impaired human and wildlife uses of the Everglades in response to the reduced inorganic	Each of the project performance measures for the CEPP planning effort are derived from those performance measures approved for use by RECOVER. The members of RECOVER have extensive experience working in south Florida and Everglades wetlands ecosystems. These members are considered by their peers to be the experts in their fields. Performance measures are used to make the correlation between hydrologic output and ecosystem functions and evaluate the degree to which proposed alternative plans will meet restoration objectives. The project team will utilize performance measures developed from the Lake Okeechobee, Northern Estuaries and Greater Everglades Ridge and Slough Conceptual Ecological Model (CEM). These CEM have been extensively peer reviewed and provide the framework for the planning and assessment of the CERP. CEPP has addressed other factors critical to ecosystem restoration in the PIR/EIS including an assessment of the potential effects on water quality.

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		mercury wet and dry atmospheric deposition fluxes to the Everglades under the statewide mercury TMDL -- time-to-recovery, because a recovery of sufficient ecosystem structures, functions, and throughputs to constitute a restored Everglades and the human and wildlife uses to which it is put and the environmental services it provides outside the planning horizon for CEPP is of inherently less value than a recovery that occurs within that planning horizon, all other things being equal. Estuaries, Lagoons and Bays -- freshwater flows to reduce the magnitudes, durations, and frequencies of osmotic stress-related estuarine and marine life barriers to migration, reduced reproductive success, and mortality at each life stage, including prized sport fish species and endangered marine wildlife -- limiting nutrient, sediment, and toxicant concentrations and loads to estuaries -- minimum photosynthetically active radiation (PAR) flux to estuarine submersed aquatic vegetation (SAV) as a function of depth and color and turbidity, which are, in turn, functions of dissolved organic carbon, suspended solids, and nutrient concentrations and loads -- dissolved organic carbon concentrations and loads to Florida Bay to restore the mercury-impaired human and wildlife uses of Florida Bay -- time-to-recovery as per the Everglades As a consequence of these critical omissions or demotions to a secondary consideration status, the quality of the source water required to achieve the water quantity performance measures is of no	

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		consequence, and neither is the time to recovery of the water quality of the Everglades, Biscayne Bay, or Florida Bay ecosystems, so the in-place contaminated sediment in Lake Okeechobee and the impacted zones in the Northern Everglades need not be remediated to accelerate recovery. Thus, the following water quality constraints imposed by WARDA 1996 and 2000 have been rescinded by administrative fiat**: -- existing water quality must not be degraded, e.g., first do no harm, -- all WQS must be met, including but not limited to nutrients, turbidity, dissolved oxygen, and mercury, and -- wherever practicable, water quality benefits will be integrated into the infrastructure design and operation plans, as long as that can be done without interfering with the attainment of their water quantity performance objectives.	
LF – 2	11-23-2012	It is good to know at this critical juncture that the USACE-Jacksonville and the local sponsor of the C&SF Project feel free to ignore the Clean Water Act and WRDA 1996 and 2000 when it comes to the source water, design, and operation of infrastructure for South Florida ecosystem restoration and protection. This misapprehension will form the basis of a lawsuit filed to ensure a more comprehensive approach with appropriate source water and infrastructure design and operation constraints that attain and maintain minimum water quality as well as minimum and maximum water quantity. Knowing this, feel free to contest these fatal flaws in public comments rather than going along, either actively or passively, with	The USACE and NFS with the consent of the FDEP intend to construct and operate the CEPP project in a manner that is consistent and in compliance with the Clean Water Act and other State water quality criteria as they exist today and as they may be amended at the time of feature construction.

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		the demotion of water quality constraints to secondary or nonexistent status.	
David Charland (DC)-1	3-12-13	As I understand the current CERP plans they completely ignore the necessity of hydro periods and the need of the land to be dry at least part of the year. I am a long time resident that has enjoyed the Glades before Area 1 & 2 were turned into lakes and when area 3 was much drier than it is currently. Destroying the remaining Glades and probably parts of the Big Cypress in the name of Restoration is not acceptable. Take a ride out Alligator Alley and look at the sea of Cat Tails. Used to be mostly Sawgrass.	The conditions in the system today were brought about by the drainage and impoundments created as a result of construction of the Central and Southern Florida Flood Control project. The Miami Canal has caused over-drainage of the upper reaches of WCA 3A and the levees have resulted in ponding of water in the southern reaches of WCA 3A. The objectives for CEPP and CERP are to restore more natural water levels and fluctuations that are beneficial to the ecosystem and is based upon the best peer reviewed scientific information available about the needs of the natural system. The plan and operations of the system will provide for restoration of seasonal hydroperiods and includes appropriate recession of water levels in the dry season for ridges and sloughs.
DC-2	3-12-13	If you can't come up with a plan that makes sense, why not do what should have been done when this whole mess really became an obvious failure and that is condemn all the agricultural land south of the Lake? About 30 years ago the Florida Wildlife Federation had a seminar in West Palm Beach and the conclusion of many of the working groups was that the only way to prevent the area from becoming an extension of the Cities on both coasts was to get ownership of the land. Here we are 30 years later about to spend $Billions for a system that won't work, or won't work to restore the Everglades. The ACOE is a great group of professionals but they aren't and have never been in restoration business. The current mess is largely the fault of their mind set. I can remember Lake O when the water was as clear as gin and hand a white sand bottom. Now it has a foot or more black goop on the bottom and you can't see 6" into the water.	Thank you for your comment.
DC-3	3-12-13	In any case please enter my comments in the record. They probably won't amount to a hill of	Thank you for your comment.

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		beans, but at least I did what I could do. If you don't understand the history of South Florida and the Glades, read "The Swamp" by Michael Grunwald and Tom Shirley's "On Patrol", also Toch Brown's "Toch". Thank you.	
SUGAR CANE GROWERS COOPERATIVE OF FLORIDA (SUGAR)			
Sugar-1	3-29-12	We have many concerns about the scoping comment responses as well as the direction the Central Everglades Planning Project (CEPP) is taking. Please accept the following additional comments on behalf of Sugar Cane Growers Cooperative of Florida regarding this initiative.	Thank you for your comments.
Sugar-2	3-29-12	The Comprehensive Everglades Restoration Plan (CERP), consisting of some-68 components, was designed to protect and restore the remaining Everglades while meeting the water related needs of the region. This included improving the timing, flow and distribution of water while providing the level of service for flood protection and water supply as of the date of enactment of CERP, known as the Savings Clause protections. In all likelihood Congress would not have approved CERP without the broad-base stakeholder support that was derived by the commitments to meet the needs for both the built and natural environments	Thank you for your comment.
Sugar-3	3-29-12	We noted that the project team has modified its goals by adding "Enhance Economic Values and Social Well Being" in its goals and objectives statement at the March 26, 2012 Project Delivery Team meeting. However the sub-objectives under this goal give us concern. The presentation stated, "the formulation and evaluation of alternatives will include the objective of providing water supply as incidental to the objective of fulfilling the ecological needs of the South Florida ecosystem." And further states, "Water retained in the Lake that is not	Project objectives identified for CEPP are consistent with those of CERP. Section 601 (h) of WRDA 2000 (authorizing CERP) states "the overarching objective of the Plan is the restoration, preservation, and protection of the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection. Project objectives are included in Section 1 of the Draft CEPP Project PIR and EIS. The CEPP TSP, Alt4R2, provides for maintaining the current level of water supply cut-backs to the Lake Okeechobee Service area and 14 MGD and 5 MGD increase in water supply to users in Broward and Miami-Dade County respectively.

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		identified for the natural system may be available for water supply." These two sub-objectives clearly indicate to us that water supply needs are not being addressed on equal footing as Congress intended when approving the CERP.	
Sugar-4	3-29-12	While we support the Corps' desire to streamline the process and acknowledge the National Academy of Science's recommendation to evaluate groups of complementary components to achieve benefits that would not be attained with the piece-by-piece approach, we are concerned that an appropriate evaluation of alternatives to flow more water through the Central Everglades will not be conducted. The CEPP cannot be undertaken in a vacuum. It must consider current and on-going Lake Okeechobee and Everglades projects in the region (including the rehabilitation of the Herbert Hoover Dike), projects anticipated to be built during the planning horizon, and it must be compatible with and complementary to whatever remedy is adopted to settle the federal litigation.	The planning assumptions included in CEPP planning process did take into account projects anticipated to be built within the planning horizon. Please refer to Section 2 for details on those assumptions.
Sugar-5	3-29-12	One of the objectives of the CEPP is to capture and divert water from the Lake now lost to tide to reduce harmful discharges to the Caloosahatchee and St. Lucie Estuaries. CERP envisioned that these discharges would be stored in a series of strategically located Aquifer Storage and Recovery Wells (ASR) to provide carry over storage capacity or storage in a series of deep above ground reservoirs in the Everglades Agricultural Area (EAA), Caloosahatchee Basin and the St. Lucie Basin. The plan was also dependent on improving conveyance capacity within the EAA canal network.	It is important to recognize that CEPP is an increment of restoration and did not intend to provide all of the benefits identified in CERP plan. The CEPP effort included a robust plan formulation and evaluation process that included a robust stakeholder engagement process in developing the final array of plans that were evaluated in detail for this first increment of diverting flows currently being discharged to the estuary and re-directing those flows south. There is still much that will need to be done in future increments of CERP to address the needs of the northern estuaries. It was further identified that the existing canal conveyance capacity within the EAA are sufficient to accommodate the water budget and treatment capabilities available for this first increment.
Sugar-6	3-29-12	Subsequent to the passage of CERP, the state pledged the Everglades Conveyance and Regional Treatment (ECART) project, and the EAA-Al	The SFWMD's plan, entitled the Long-Term Plan for Achieving Water Quality Goals for the Everglades Protection Area Tributary Basins (LTP), was developed and subsequently incorporated into the EFA in

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		Reservoir as critical components of the Long-Term Plan to meet Everglades water quality standards as mandated by the Florida Legislature in the 2003 amendments to the Everglades Forever Act (Section 373.4592(3) Florida Statutes). The Long Term Plan is periodically updated by the South Florida Water Management District (SFWMD) and submitted to the Florida Department of Environmental Protection (FDEP) for approval. The legislation mandates that SFWMD and DEP annually report to the Governor and the Florida Legislature summarizing the water conditions in the Everglades Protection Area, the status of the impacted areas, the status of the construction of the Stormwater Treatment Areas, the implementation of on-farm Best Management Practices, and actions to monitor and control exotic species. Section 373.4592{13) Florida Statutes. It was the intent of the Legislature that "implementation of the Long-Term Plan shall be integrated and consistent with the implementation of the projects and activities in the congressionally authorized components of the CERP so that unnecessary and duplicative costs will be avoided." Clearly, there was a well thought out plan, including process development and engineering components, that was mandated by the Florida Legislature for the Long-Term Plan and by the Congress for CERP.	2003. Consistent with the requirements of the EFA, the LTP was subsequently amended to include additional remedial measures, including expansion of the original STAs. In January 2007, the Everglades Conveyance and Regional Treatment (ECART) project, which was designed to improve the movement of stormwater runoff in the Everglades Agricultural Area, was added to the LTP. The Everglades Agricultural Area (EAA) A-1 Storage Reservoir project, a feature of the CERP whose authorization is contingent on Congressional Approval of a report by the Corps Chief of Engineers, was complementary to the goals of the LTP but was never incorporated into the LTP. At this time, ECART is not envisioned to be constructed as previously planned, but other new projects will be constructed to enable the SFWMD to achieve the Everglades phosphorus criterion. The new projects, documented in the *Restoration Strategies Regional Water Quality Plan* (RS Plan) dated April 27, 2012. In 2013, the Florida legislature modified the EFA to incorporate the RS Plan into the LTP. The RS Plan provides alternative strategies for achieving the water quality goals of the EPA. The SFWMD will continue to report annually to the Governor and Florida legislature on the performance of the STAs and the progress of LTP implementation and will continue to integrate CERP projects into state water quality planning as proposed in the CEPP.
Sugar-7	3-29-12	While undertaking CEPP, the Corps must be mindful of the Savings Clause requirements in CERP-that there shall be no elimination or transfer of existing legal sources of water, existing as of December 2000, until a new source of water supply of comparable quality is available. The Savings Clause constraint should be built into the front end of the screening process for any alternative to move forward. Given the decision to use the LORS08 Lake	Savings Clause requirements were a constraint for CEPP. The Savings Clause analysis is located in Annex B of the Draft PIR/EIS.

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		Schedule as the future without project planning condition, and the lack of support for recognizing the ability to store more water in Lake Okeechobee as improvements are made to the Herbert Hoover Dike, we are concerned that a plan to meet the objectives of CEPP, and the requirements of the Savings Clause, will not possible.	
Sugar-8	3-29-12	Also puzzling are the scoping comment responses regarding ASR wells as a component that will not be evaluated as part of the *first increment* of CEPP, but will be put off to be evaluated at a later date. The preliminary data regarding the effectiveness of ASR technology are promising and other than the Lake, this may be the only viable solution to store water for carry-over supply	The first increment of CEPP did not include detailed evaluation of the system of regional ASR wells that were included as a component of the CERP plan.
Sugar-9	3-29-12	During the March 9, 2012 EAA component screening presentation, a matrix was presented evaluating the costs and benefits between deep and shallow storage. Both configurations will require canal conveyance improvements. Deep storage reservoirs have the potential to provide additional storage and flow capacity albeit at a higher cost. Focusing on improved utilization of the storage capacity in the Lake would seem likely to be a part of the most cost effective alternative.	The CERP Plan did not envision utilization of Lake Okeechobee as a storage reservoir for water supply, rather, that the Lake stages would remain within the ecologically desired envelope more often due to the storage available both north and south of the Lake as well as the system of ASR wells around the Lake. Operational changes were incorporated into the hydrologic modeling conducted for the CEPP alternatives, including the TSP Alternative 4R2, in an effort to optimize CEPP system-wide performance within the existing flexibility of the 2008 LORS. More specifically, the hydrologic modeling of the CEPP alternatives included proposed revisions to the 2008 LORS decision tree outcome maximum allowable discharges dependant on the following criteria: Lake Okeechobee inflow and climate forecasts (class limits were modified for tributary hydrologic conditions, seasonal climate outlook, and multi-seasonal climate outlook), stage level (regulation zone), and stage trends (receding or ascending). While some refinements were made within the operational flexibility available in the 2008 LORS, consistent with the original modeling intent, the final operational assumptions ultimately extended beyond this flexibility due to adjustments made to the tributary/climatological classifications. Additional information and documentation of these assumptions can be found in the

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			Engineering Appendix (Appendix A). The FEB is the least cost option and compatible with future increments of CERP. The 12ft Reservoir provides the greatest benefits to the everglades; however, the cost was prohibitive for the marginal benefit gained and the 12ft Reservoir configurations were eliminated from further consideration. A full description of the evaluation and screening are provided in Section 3 of the CEPP Draft PIR/EIS.
Sugar-10	3-29-12	We believe that NEPA requires that all reasonable alternatives be evaluated as part of the process and that evaluation must include the option of storing additional water in Lake Okeechobee. As the National Research Council said in its Second Biennial Report in 2008, *"Lake Okeechobee is a critical linchpin of the South Florida Ecosystem...The challenges of water quantity and quality in the Lake have important ramifications for the entire ecosystem because the Lake supports important elements of the region's biota, and it also has the potential to serve as a major source of water storage and water supply for downstream ecosystems. This potential will become more critical if other planned and proposed sources of water do not become available."* At page 186. The Corps is at that critical decision point now.	Please refer to response to Sugar-9 3-29-12 above.
Sugar-11	3-29-12	The second juggernaut in the CEPP is the water quality constraint. The without-project condition assumes that water quality standards under the Clean Water Act are being met. While this seems straightforward, it is anything but.	All alternatives were evaluated to be in compliance with WQBEL.

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		The issue is tied up in two federal court cases under two different judges. While there are ongoing discussions and negotiations regarding this issue between state and federal parties, there currently is no agreement on what the water quality standards will be or what projects on what lands will be necessary to achieve the ultimate standard.	
Sugar-12	3-29-12	These issues must be resolved so that the CEPP planners know what water quality target must be met. Potentially the same set of state owned lands could be identified to meet existing water flow as an outcome to the federal litigation as well as for the new water to be delivered as part of CEPP. How this water quality dispute is resolved also has obvious financial ramifications to the South Florida Water Management District, as well as the state.	All alternatives were evaluated to be in compliance with WQBEL.
Sugar-13	3-29-12	Please make available the Memorandum of Record for Decision Point 1 that was reached on January 27, 2012 and the Risk Register that will help planners evaluate potential risks associated with various assumptions during the modeling phase. In view of the accelerated beginning of the CEPP process we view these comments as a supplement to our previous submission during the formal scoping process.	This information can be made available through a formal request pursuant to the Freedom of Information Act
Sugar-14	3-29-12	Please reconsider your position regarding your goals and objectives in meeting the water related	Thank you for your comment.

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		needs of the region, the future storage capabilities of Lake Okeechobee and the need to integrate on-going and future planned Lake Okeechobee/Everglades initiatives into the CEPP process.	
FLORIDA CRYSTALS CORPORATION (CRYSTALS)			
CRYSTALS-1	03-30-2012	Florida Crystals continues to support the goal of the CEPP, which as we understand it, is to bring important restoration projects on-line sooner, consistent with the approved 1999 Comprehensive Everglades Restoration Plan. The 1999 Approved Plan calls for restoring the Everglades while providing for other water-related needs of South Florida. For purposes of the CEPP, this means (among other things) addressing the water supply needs of existing uses that rely on Lake Okeechobee, and designing a project that uses lands purchased in the Everglades Agricultural Area (EAA) and elsewhere to implement the 1999 Approved Plan. We believe that the Corps can develop a plan for the CEPP which meets those criteria and remains true to the stakeholder consensus that led to Congressional authorization of the 1999 Approved Plan. Our comments today focus on the integration of the CEPP with other ongoing activities, and the Corps' commitment to provide pre-CERP levels of service to agricultural and urban water uses in the CEPP development process.	The CEPP TSP provides an increment of restoration of the central Everglades ecosystem as well as an increment of improvement to water supply for other water-related needs. The CEPP TSP, Alt 4R2 provides for a 14 MGD and 5 MGD increase in water supply to users in Broward and Miami-Dade County respectively, while maintaining the existing level of water supply cut-backs to the Lake Okeechobee Service area.

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CRYSTALS-2	03-30-2012	Misidentification of Stakeholder Comments.As an initial matter, the Corps misidentified comments from agricultural stakeholders in its Scoping Response.Florida Crystals' comments were identified as the comments of the Sugar Cane Growers Cooperative of Florida (and labeled as "Sugar") comments, comments, while the Cooperative's comments were identified as the comments of Florida Crystals (and labeled as "Crystals"). The Corps should correct this error.	The Scoping Comment response matrix was corrected and is located in Appendix C.3 of the Draft PIR/EIS.
CRYSTALS-3	03-30-2012	Projects Included within the CEPP. We previously identified nine components of the 1999 Approved Plan which fit the general description of the CEPP. The Scoping Response confirms that five of those components are included, included a sixth component ("Bird Drive Recharge Area (U)") which we did not identify, and was silent regarding the remaining four projects on our list.Scoping Response, at 46 (response to Sugar-2)	The component Q "Water Conservation Area 3A and 3B Levee Seepage Management" is included in the Broward Water Preserve Area Project which has completed the planning phase and awaiting authorization from Congress. Inclusion of structural and operational modifications to existing infrastructure and/or construction of new features in Holeyland WMA was considered during initial plan formulation efforts for the CEPP (refer to Appendix E for details). Features within the WMAs were not further pursued given water quality concerns. The CEPP effort did not consider Lake Okeechobee Regulation Schedule (F) components of CERP. The 1999 Approved plan in regards to component F states "*The Lake Okeechobee Regulation Schedule will be modified in order to take advantage of the additional storage facilities identified in the construction features. Two additional zones will be added to the schedule. The first zone will trigger discharges to the north of the Lake reservoir and the Everglades Agricultural Area reservoir. The second higher zone will trigger the Lake Okeechobee aquifer storage and recovery facilities to begin injecting water from the Lake." The CEPP planning effort did not include the storage area north of Lake Okeechobee or the system of ASR components of CERP.*" The CEPP planning effort did not include CERP components for storage north of Lake Okeechobee or the regional system of ASR wells around Lake Okeechobee. CEPP is not intended to be a final PIR for CERP implementation, only an increment of restoration in the central Everglades portion of the

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			system.
CRYSTALS-4	03-30-2012	The Corps needs to explain why it is not including in the CEPP all of the relevant components of the 1999 Approved Plan. The Corps' Federal Register notice indicated that the CEPP is the "heart of CERP" and is the Corps' effort to address water levels in Lake Okeechobee, water deliveries to the Water Conservation Areas, and sheetflow in the Everglades. 76 Fed. Reg. 75539 (Dec. 2, 2011).The project components left off the Corps' list all address those issues. Moreover, the Corps appears to be considering proposals in the CEPP that are addressed by those missing components, e.g., consideration of seepage management measures along the WCA 3A and 3B levee (which is missing component "Q"). We are concerned that failure to include them signals that the Corps effectively is abandoning them. Abandoning components of the 1999 Approved Plan is too significant a change to the CERP for the Corps to do it silently. If the Corps does not include them in the CEPP, then you should explain why and set forth how the Corps intends to address them in some separate process.	Consistent with the other planning efforts conducted to date on CERP components, the CEPP effort was purposefully focused on the components of CERP that would provide an initial increment of restoration for the central everglades ecosystem. It was recognized in the 1999 Approved Plan (CERP) that implementation would require that the plan be divided into smaller implementable packages of components. It was further recognized that an adaptive assessment strategy requires incremental implementation of the plan components and each increment would be planned and designed to carry the program one step closer to the ultimate goal of ecosystem restoration (Central and Southern Florida Project Comprehensive Review Study, Final Feasibility Report and PEIS, page 10-7) The CERP component Q “Water Conservation Area 3A and 3B Levee Seepage Management” is included in the Broward Water Preserve Area Project which has completed the planning phase and awaiting authorization from Congress. CEPP is not intended to be a final PIR for CERP implementation, only an increment of restoration in the central Everglades portion of the system.
CRYSTALS-5	03-30-2012	We have a much greater concern that the CEPP itself is not integrated with other ongoing Corps and SFWMD projects in the same locations and dealing with the same subject matter. The CERP was conceived of as the "Comprehensive Everglades Restoration Plan. The expectation of stakeholders and Congress was that the 1999 Approved Plan would be integrated with and guide all changes to the Central and Southern Florida Project.See, e.g., WRDA 2000, §601(b)(1)(B) (directing Corps to integrate implementation of CERP "with ongoing Federal and State projects	The plan anticipates on-going efforts and project within the study area such as the State’s Restoration Strategies Plan, Modified Water Deliveries to Everglades National Park, C-111 South Dade Project, Tamiami Trail Next Steps additional bridging and road raising, Herbert Hoover Dike Rehabilitation as well as other CERP Projects (BCWPA, IRL-South, Site 1, BBCW, C-111 SC, C-43 Reservoir). These projects were represented in the POR modeling analyses used to develop the CEPP plan to ensure the plan is fully integrated with these other projects. The recommended plan works with and within the context of all of these on-going projects. Please refer to Section 2 for details on the future with-out project assumptions that were incorporated into the with-plan condition.

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		and activities); WRDA 1996, § 528(b)(2)(B), -(3)(A), -(c)(1) (providing that ongoing Corps actions should be consistent with Governor's Commission for Sustainable South Florida conceptual plan, which is the template of the CERP). The Corps announced the CEPP as "[a]n integrated study effort" for the Central Everglades that will "set the direction for the next decade of CERP implementation." 76 Fed. Reg. 75539 (Dec. 2, 2011)	Again, CEPP is not intended to be a final PIR for CERP implementation, only an increment of restoration in the central Everglades portion of the system.
CRYSTALS-6	03-30-2012	Despite that guidance the Corps is not integrating other agency activities, such as the rehabilitation of the Herbert Hoover Dike (HHD) and the Lake Okeechobee regulation schedule (e.g., making permanent the 2008 regulation schedule, which is discussed further below). The Corps also is not addressing the State's Long- Term Plan to address Everglades water quality issues approved by the Florida Legislature, § 373.4596(3), Fla. Stat. The Long-Term Plan, in particular, calls for canal conveyance improvements in the EAA and construction of a reservoir at the EAA A-1 site that would include opportunities for agricultural water storage. The Corps also is not addressing the measures under consideration related to ongoing court cases that would affect water quality and discharges from the EAA to the Water Conservation Areas. These measures are inherently interrelated with any CEPP plan designed to use the A-1 site or which involved changes in water flows in the EAA, and yet the CEPP without explanation does not include them within its scope.	Please refer to response to CRYSTALS-5 03-30-2012.
CRYSTALS-7	03-30-2012	The lack of integration of the CEPP with these other projects hobbles the ability of the Corps	High water levels within Lake Okeechobee would cause significant impacts to the littoral zone. The lake's natural resources are

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		and SFWMD to address the water- related needs of the region. By keeping activities related to Lake Okeechobee separate, the Corps is taking off the table reasonable alternatives related to the lake which could address water storage. By not integrating the CEPP with consideration of new Stormwater Treatment Areas and related features in ongoing litigation, the Corps has two different projects that potentially will use the same SFWMD-owned lands in the EAA and that will compete for the same limited pool of funds at the SFWMD. The result has been confusion, because the public does not know which lands in the EAA are available for the CEPP or whether the SFWMD will be able to afford to participate in the CEPP at all.This lack of integration is inconsistent with Congress' directives to the Corps. See, e.g., WRDA 2000, § 601(b)(1)(B) ("In carrying outthe Plan, the Secretary shall integrate the [1999 Approved Plan] with ongoing Federal and State projects and activities."); 33 U.S.C. § 2282a(f)(1)(A)(i) ("assessments for a water resources project shall include recommendations for alternatives … that, as determined in accordance with the non-Federal interest for the project, promote integrated water resources management").	dependent on the littoral zone since it provides nursery areas, spawning areas, foraging areas, and roosting areas required for completion of life cycles. The frequency and duration of inundation of the littoral zone would increase with higher lake levels. High lake stages result in loss of beneficial littoral zone plant communities in favor of introduced exotics. (e.g. torpedo grass) as well as impacts to wading birds and other water-dependent wildlife. The planning assumptions included in CEPP planning process did take into account projects anticipated to be built within the planning horizon, please refer to Section 2 for details on those assumptions. The with-plan analyses conducted also included the State's Restoration Strategies plan for an FEB on the A-1 parcel of the Tallisman tract within the EAA to be constructed in the planning area which will be affected by CEPP. The CEPP plan proposes to implement a similar FEB on the adjacent A-2 parcel of the Tallisman tract that would be fully integrated and operated in conjunction with the State's A-1 FEB.
CRYSTALS-8	03-30-2012	We recommend that the Corps make the CEPP a truly integrated study that will allow all relevant proposals and activities to be evaluated together. This will facilitate transparency regarding available land and funds for new projects, and allow everyone to know the trade-offs inherent in each element of these activities. It is also more likely to identify a plan with the most benefits for the least cost.	Please refer to response to CRYSTALS-7 3-30-2012 above.

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CRYSTALS-9	03-30-2012	Status of 2008 Lake Okeechobee Regulation Schedule (LORS 2008) The Corps' Scoping Response heightens our concerns about Lake Okeechobee water supply issues. In particular, the Scoping Response makes it appear that the Corps is using the CEPP to convert LORS 2008 from an interim to a long-term, effectively permanent regulation schedule.	CEPP assumed current operations of Lake Okeechobee (Lake Okeechobee Regulation Schedule (LORS 2008) in the future without project condition. The CEPP team recognizes that when it was approved LORS 2008 was identified as an interim schedule USACE expects to operate under the 2008 LORS until the earlier of (1) implementation of a new Lake Okeechobee schedule as a component of the system-wide operating plan to accommodate CERP (Band 1 Projects) and the State of Florida's Acceler8 Projects, or (2) completion of HHD seepage berm construction or equivalent dike repairs for reaches 1, 2, and 3. Until a new operating schedule is developed under a different, future study, LORS 2008 is the best estimate for future without project operations. Based on the hydrologic modeling conducted for the CEPP TSP (Alternative 4R2), it is anticipated that changes to the 2008 LORS will be needed in order to achieve the complete ecological benefits envisioned through implementation of CEPP and to address the minor to moderate adverse effects indicated with future without project condition. The CEPP PIR will not be the mechanism to propose or conduct the required NEPA evaluation of modifications to the Lake Okeechobee Regulation Schedule. It is possible that future efforts to revise the Lake Okeechobee schedule may result in even greater benefits from the proposed CEPP features and provide improvements to water supply for the LOSA.
CRYSTALS-10	03-30-2012	In its Final EIS for the LORS 2008 regulation schedule (which was adopted in the Record of Decision), the Corps stated: "The Corps expects to operate under the LORS until the earlier of (1) implementation of a new Lake Okeechobee schedule as a component of the system-wide operating plan to accommodate the Comprehensive Everglades Restoration Plan (CERP Band 1 projects) and the State of Florida's fast track Acceler8 projects, or (2) completion	CEPP assumed current operations of Lake Okeechobee (Lake Okeechobee Regulation Schedule (LORS 2008) in the future without project condition. The CEPP team recognizes that when it was approved LORS 2008 was identified as an interim schedule. USACE expects to operate under the 2008 LORS until the earlier of (1) implementation of a new Lake Okeechobee schedule as a component of the system-wide operating plan to accommodate CERP (Band 1 Projects) and the State of Florida's Acceler8 Projects, or (2) completion of HHD seepage berm construction or equivalent dike repairs for reaches 1, 2, and 3.. Until a new operating schedule is developed under a different, future study, LORS 2008 is the best estimate for operations.

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		of the [Herbert Hoover Dike] HHD seepage berm construction or equivalent dike repairs for reaches 1, 2 and 3. [T]he Corps will timely shift from the interim LORS to a new schedule with the intent to complete any necessary schedule modifications or deviations concurrent with completion of (1) or (2)." LORS 2008 Final SEIS iv (Nov. 2007) (emphasis added).	
CRYSTALS-11	03-30-2012	The Corps' assurances that LORS 2008 would be a relatively short-term plan were part of the basis for many stakeholders in South Florida to not oppose it in 2008. At that time, the Band 1 Projects all were scheduled to be completed by 2015, which meant that LORS 2008 was projected to be in effect for only seven years.	CEPP assumed current operations of Lake Okeechobee (Lake Okeechobee Regulation Schedule (LORS 2008) in the future without project condition. The CEPP team recognizes that when it was approved LORS 2008 was identified as an interim schedule. USACE expects to operate under the 2008 LORS until the earlier of (1) implementation of a new Lake Okeechobee schedule as a component of the system-wide operating plan to accommodate CERP (Band 1 Projects) and the State of Florida's Acceler8 Projects, or (2) completion of HHD seepage berm construction or equivalent dike repairs for reaches 1, 2, and 3.. Until a new operating schedule is developed under a different, future study, LORS 2008 is the best estimate for future without project operations.
CRYSTALS-12	03-30-2012	In its Scoping Response for the CEPP, the Corps now is indicating that LORS 2008 is a long-term, or even permanent, schedule. First, instead of assuming that LORS 2008 will no longer be in effect once the "Band 1 Projects" and the key HHD repairs are complete, the Corps now assumes it could remain in effect for the next 50 years regardless of those projects' completion. The Scoping Response states that "[t]he future without project condition includes the assumption that the Herbert Hoover Dike (HHD) rehabilitation will be complete." Scoping Response, at 22 (response to FDACS-1).The Corps also assumes that the projects previously referred to as "Band 1 Projects" will be complete:	CEPP assumed current operations of Lake Okeechobee (Lake Okeechobee Regulation Schedule (LORS 2008) in the future without project condition. The CEPP team recognizes that when it was approved LORS 2008 was identified as an interim schedule. USACE expects to operate under the 2008 LORS until the earlier of (1) implementation of a new Lake Okeechobee schedule as a component of the system-wide operating plan to accommodate CERP (Band 1 Projects) and the State of Florida's Acceler8 Projects, or (2) completion of HHD seepage berm construction or equivalent dike repairs for reaches 1, 2, and 3. . Until a new operating schedule is developed under a different, future study, LORS 2008 is the best estimate for future without project operations. Based on the hydrologic modeling conducted for the CEPP TSP (Alternative 4R2), it is anticipated that changes to the 2008 LORS will

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		the future without project condition includes the "First Generation" and "Second Generation" (i.e., the Corps is assuming that they will be completed), which when combined with the CEPP itself, represents all of the projects formerly identified as the "Band 1 Projects." In other words, both of the triggers for revision of the "interim" LORS 2008 will occur prior to, or concurrent with, the CEPP. Yet, the Corps Scoping Response indicates that "the LORS 08 schedule will be used" as the future without project condition. The Scoping Response also states that "[t]he CEPP study will not be the mechanism for changing LORS," Scoping Response, p. 22 (response to FDACS-1), and that "any analyses conducted during the study will not predetermine a change to the lake schedule … as a result of additional CERP project implementation," id. at 38 (response to Crystals-3). If the CEPP is the "CERP project implementation" that will trigger changes to LORS 2008 (as indicated by the Corps in 2008), then the logical time to consider such changes to the lake schedule would be in the CEPP itself. The Corps' refusal to even consider such changes is inconsistent with its commitments made in 2008.	be needed in order to achieve the complete ecological benefits envisioned through implementation of CEPP and to address the minor to moderate adverse effects indicated with future without project condition. The CEPP PIR will not be the mechanism to propose or conduct the required NEPA evaluation of modifications to the Lake Okeechobee Regulation Schedule.
CRYSTALS-13	03-30-2012	Second, the Corps appears to be changing its triggers for revisiting LORS 2008. In 2008, the Corps identified two separate triggers for revisiting LORS 2008: completion of a subset of HHD rehabilitation measures ("seepage berm construction or equivalent dike repairs on reaches 1, 2, and 3"), and the completion of the CERP Band 1 Projects and Acceler8 projects. LORS 2008 Final SEIS iv (Nov. 2007) (quoted above).	CEPP assumed current operations of Lake Okeechobee (Lake Okeechobee Regulation Schedule (LORS 2008) in the future without project condition. USACE expects to operate under the 2008 LORS until the earlier of (1) implementation of a new Lake Okeechobee schedule as a component of the system-wide operating plan to accommodate CERP (Band 1 Projects) and the State of Florida's Acceler8 Projects, or (2) completion of HHD seepage berm construction or equivalent dike repairs for reaches 1, 2, and 3. Until a new operating schedule is developed under a different, future

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		Now, in its Scoping Response, the Corps states only that "LORS will be revisited upon completion of HHD modifications." Scoping Response at 37 (response to Crystals-2). This new formulation completely drops the trigger associated with completion of the early CERP projects (which will be fully accomplished through the CEPP itself), and it apparently makes consideration of a new regulation schedule dependent on completion of all HHD repairs, which will not be done for many years. The effect is to allow the Corps to keep LORS 2008 in effect for decades, contrary to what the agency told stakeholders only a few years ago.	study, LORS 2008 is the best estimate for future without project operations. Based on the hydrologic modeling conducted for the CEPP TSP (Alternative 4R2), it is anticipated that changes to the 2008 LORS will be needed in order to achieve the complete ecological benefits envisioned through implementation of CEPP and to address the minor to moderate adverse effects indicated with future without project condition. The CEPP PIR will not be the mechanism to propose or conduct the required NEPA evaluation of modifications to the Lake Okeechobee Regulation Schedule.
CRYSTALS-14	03-30-2012	The Corps' failure to consider changes to LORS 2008 in the CEPP also appears inconsistent with the 1999 Approved CERP Plan. The 1999 Approved Plan includes a new "Lake Okeechobee Regulation Schedule (F)" as a Plan component. The purpose of that component, in *part,* was to develop operational rules for "discharges … to the Everglades Agricultural Area reservoir."\Final CERP Integrated Feasibility Study and Programmatic EIS, at 9-29 (1999). According to the 1999 Approved Plan, "[m]ost of the operational features will be implemented in association with related construction features." Id.For the "Lake Okeechobee Regulation Schedule (F)" component, one of the logical times to implement it would be in plan development for the "Everglades Agricultural Storage Reservoirs (G)" component, which the Scoping Response indicates is part of the CEPP.For the Corps now to say that it will not consider operational changes to Lake Okeechobee in association with the CEPP is inconsistent with the 1999 Approved Plan	The 1999 Approved plan in regards to component F states "*The Lake Okeechobee Regulation Schedule will be modified in order to take advantage of the additional storage facilities identified in the construction features. Two additional zones will be added to the schedule. The first zone will trigger discharges to the north of the Lake reservoir and the Everglades Agricultural Area reservoir. The second higher zone will trigger the Lake Okeechobee aquifer storage and recovery facilities to begin injecting water from the Lake." The CEPP planning effort did not include the storage area north of Lake Okeechobee or the system of ASR components of CERP."* The CEPP planning effort did not include CERP components for storage north of Lake Okeechobee or the regional system of ASR wells around Lake Okeechobee. The 1999 Approved Plan did not envision higher stages in Lake Okeechobee associated with storage for water supply, rather, that the Lake stages would remain within the ecologically desired envelope more often due to the storage available both north and south of the Lake as well as the system of ASR wells around the Lake. Operational changes were incorporated into the hydrologic modeling conducted for the CEPP alternatives, including the TSP Alternative

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			4R2, in efforts to optimize CEPP system-wide performance within the existing flexibility of the 2008 LORS. More specifically, the hydrologic modeling of the CEPP alternatives included proposed revisions to the 2008 LORS decision tree outcome maximum allowable discharges dependant on the following criteria: Lake Okeechobee inflow and climate forecasts (class limits were modified for tributary hydrologic conditions, seasonal climate outlook, and multi-seasonal climate outlook), stage level (regulation zone), and stage trends (receding or ascending). While some refinements were made within the operational flexibility available in the 2008 LORS, consistent with the original modeling intent, the final operational assumptions ultimately extended beyond this flexibility due to adjustments made to the tributary/climatological classifications. Additional information and documentation of these assumptions can be found in the Engineering Appendix (Appendix A).
CRYSTALS-15	03-30-2012	Many stakeholders are very concerned that the Corps is abandoning its commitments made in 2008 that the LORS 2008 schedule would be an interim schedule, and is making the LORS 2008 schedule permanent. This has the potential to undermine the CEPP, because it affects whether stakeholders will have the benefit of the Savings Clause enacted in 2000 with the changes made in the CEPP. The Corps can address this issue by agreeing to consider changes in the Lake Okeechobee regulation schedule as part of the CEPP and defining the water supply level of service in effect in 2000 as one of the goals of the CEPP. Also, if the Corps' statements in the Scoping Response regarding the longevity of LORS 2008 were mistaken, then the agency should immediately clarify its position.	The CEPP TSP provides an increment of restoration of the central Everglades ecosystem as well as an increment of improvement to water supply for other water-related needs. The CEPP TSP, Alt 4R2, provides for a 14 MGD and 5 MGD increase in water supply to users in Broward and Miami-Dade County respectively while maintaining the current level of water supply cut-backs to the Lake Okeechobee Service area. Based on the hydrologic modeling conducted for the CEPP TSP (Alternative 4R2), it is anticipated that changes to the 2008 LORS will be needed in order to achieve the complete ecological benefits envisioned through implementation of CEPP and to address the minor to moderate adverse effects indicated with future without project condition. The CEPP PIR will not be the mechanism to propose or conduct the required NEPA evaluation of modifications to the Lake Okeechobee Regulation Schedule.
CRYSTALS-16	03-30-2012	Study Biases Related to Lake Okeechobee Water Storage. The Scoping Response also indicates that the Corps is building an inappropriate bias into the CEPP study related to storage and water	The 1999 Approved Plan for CERP did not envision higher stages in Lake Okeechobee associated with storage for water supply, rather, that the Lake stages would remain within the ecologically desired envelope more often due to the storage available both north and

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		levels in Lake Okeechobee. In response to a comment about the need for more water storage in the lake, the Corps stated that it would not consider changes to LORS 2008 in the CEPP and justified that decision based (in part) on the impacts of higher water levels on lake ecology.See Scoping Response, at 37 (response to Crystals-2). By so doing, it appears the Corps is taking "off the table" additional water storage in the lake based on the Corps' pre-study decision that the alleged impacts of higher water levels on in-lake vegetation will outweigh any regional benefits that could be provided by additional water storage in the Lake. This will bias the CEPP's analysis, because it means that the Corps is unwilling to consider alternative plans which would reduce storage needs in the EAA and still avoid significant impacts to in-lake resources. We believe that is entirely inappropriate.	south of the Lake as well as the system of ASR wells around the Lake. Based on the hydrologic modeling conducted for the CEPP TSP (Alternative 4R2), it is anticipated that changes to the 2008 LORS will be needed in order to achieve the complete ecological benefits envisioned through implementation of CEPP and to address the minor to moderate adverse effects indicated with future without project condition. The CEPP PIR will not be the mechanism to propose or conduct the required NEPA evaluation of modifications to the Lake Okeechobee Regulation Schedule. It is possible that future efforts to revise the Lake Okeechobee schedule may result in even greater benefits from the proposed CEPP features and further improvements to water supply for the LOSA.
CRYSTALS-17	03-30-2012	The Corps also appears to be assuming that LORS 2008 will be implemented in the future, without the adaptive protocols adopted by the South Florida Water Management District in 2010.When LORS 2008 was implemented, the SFWMD developed protocols designed to provide operational guidance in areas where the schedule alone is ambiguous. Among other adjustments, the protocols reflect the desire to eliminate Base Flow releases to the St. Lucie Estuary when the LORS 2008 schedule assumed they would be made. Recent modeling of the "Future Without Project Condition" (which will be the "no action" alternative under NEPA) shows significant reduction in the Lake stage and a noticeable increase in water shortage severity in	The Adaptive Protocols is a part of the SFWMD's operational recommendations provided to the Corps.

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		several drought years. One of the causes of this reduction in the level of service for water supply is likely the way the LORS 2008 Schedule was assumed to be implemented for the FWO condition.	
CRYSTALS-18	03-30-2012	The Corps' failure to consider in-lake storage alternatives is inconsistent with important policy directives.The Florida Legislature made an express statutory finding "that additional water storage may be an appropriate use of Lake Okeechobee." § 373.4592(1), Fla. Stat. The Corps justified the cost of repairs to the HHD, as recently as last month in the FY 2013 Civil Works Budget Detail prepared for Congress, on grounds that such repairs "will allow the Corps to hold more water safely in the Lake, … enable the Corps to release excess water to the estuaries … in a more controlled, less damaging fashion," and "enable the Corps to release more water during dry periods to benefit the ecosystem of the Everglades." The National Research Council, in its 2008 Second Biennial Review of the CERP, stated that "rehabilitation of [HHD] may offer synergistic opportunities for creating additional CERP storage and managing water levels for the benefit of the littoral zone, and the costs, benefit, and hydrological and ecological viability of these options should be considered in any analysis of CERP storage alternatives." National Research Council, Progress Toward Restoring the Everglades: The Second Biennial Review, 182-83 (2008).The Corps should consider such options in the CEPP in light of these statements and recommendations.	The benefits to HHD rehabilitation articulated in the Corps' FY 2013 Civil Works Budget Detail are correctly stated. It should be noted that changes to the Water Control Plan governing lake operations will also be required in order to realize the benefits of HHD rehabilitation. Such changes will be conducted in accordance with NEPA. The CEPP TSP, Alt 4R2, provides for a 14 MGD and 5 MGD increase in water supply to users in Broward and Miami-Dade County respectively while maintaining the current level of water supply cut-backs to the Lake Okeechobee Service area.
CRYSTALS-19	03-30-2012	This study does not comport with NEPA. The Corps is indicating that it is not going to consider	A full array of reasonable alternatives was considered. A full explanation of how the final array of alternatives was determined is

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		reasonable alternatives to its proposals to store water in the EAA as opposed to in Lake Okeechobee. All environmental impact statements require an analysis of reasonable alternatives to a proposal. 42 U.S.C. § 4332(2)(C)(iii). Corps project recommendations, in particular, are required to include alternatives that "promote integrated water resource management," without "budgetary or other policy" constraints. 33 U.S.C. § 2282a(f)(1)(A)-(B). Agencies cannot categorically refuse to consider reasonable alternatives because the agency has pre-decided a discretionary policy choice. 40 CFR §§ 1502.2(e), 1502.14(a), -(c). The Corps, use of a "no action" alternative which does not represent reality, as discussed above with regard to the SFWMD operating protocols, is also inconsistent with NEPA. The Corps should take an unbiased, hard look at the environmental choices and include alternatives that would use the lake for water storage instead of adding all new storage in the EAA, and use an accurate "no action,, alternative	provided in Section 3 of the Draft CEPP PIR/EIS.
CRYSTALS-20	03-30-2012	Modifications to the Lake Okeechobee Regulation Schedule may be the easiest and least expensive alternative to provide additional water storage for environmental and human needs. We urge the Corps not to "stack the deck" at the start of the CEPP process, by refusing to even consider such modifications	The CEPP TSP, Alt 4R2, provides for a 14 MGD and 5 MGD increase in water supply to users in Broward and Miami-Dade County respectively while maintaining the current level of water supply cut-backs to the Lake Okeechobee Service area.
CRYSTALS-21	03-30-2012	Loss of Agricultural Water Supply. As indicated in our earlier comments, Florida Crystals continues to be very concerned about the potential loss of water supply as a result of the CEPP. The Scoping Response does not dispute that LORS 2008	The CEPP TSP, Alt 4R2, provides for a 14 MGD and 5 MGD increase in water supply to users in Broward and Miami-Dade County respectively while maintaining the current level of water supply cut-backs to the Lake Okeechobee Service area.

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		provides less water supply to agricultural uses than the previous WSE regulation schedule. See Scoping Response at 39-40 (response to Crystals-10). The Corps, own documents indicate that the LORS 2008 has a significant negative effect on agricultural water supply:attached is a 2007 Corps analysis which shows major negative impacts to agricultural water supply from that schedule. History has borne out those projections, as the water shortage in the spring of 2011 was made more severe by the releases of water from the Lake under the LORS 2008 Schedule. We are very concerned that the CEPP appears in contrary to the Savings Clause in WRDA 2000 as a result of its approach to water storage in Lake Okeechobee	Savings Clause requirements were a constraint for CEPP. The Savings Clause analysis is located in Annex B of the Draft PIR/EIS.
CRYSTALS-22	03-30-2012	Recent presentations of hydrologic modeling outputs for the "Future Without Project Condition" reinforce our concerns about impairing the protections of the Savings Clause.In those presentations, water supply restrictions in the Lake Okeechobee Service Area are projected to increase. It is impossible based on the information presented to specify what is causing the impact but at least one of the reasons is likely to be the assumptions about the C-44 Reservoir, a CERP project. The Project Implementation Report for the Indian River Lagoon (IRL) indicates that operation of the C-44 Reservoir will lead to a significant reduction in flow to the lake in low-water conditions.The Savings Clause prohibits the Corps from implementing such measures to the detriment of existing water uses without ensuring that there is a replacement source available. The IRL Project Implementation Report failed to consider the impact of this reduction in flow to	Savings Clause requirements were a constraint for CEPP. The Savings Clause analysis is located in Annex B of the Draft PIR/EIS.

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		Lake on other users in the Lake Okeechobee Service Area. The fact that the Corps appears to be ignoring the Savings Clause in its analyses of other CERP components, and is implementing the C-44 project despite Savings Clause issues, is troublesome	
CRYSTALS-23	03-30-2012	Once again, the Corps should avoid the problem of waters supply reductions by considering changes to the lake regulation schedule to provide additional storage	The CEPP TSP, Alt 4R2, provides for a 14 MGD and 5 MGD increase in water supply to users in Broward and Miami-Dade County respectively while maintaining the current level of water supply cut-backs to the Lake Okeechobee Service area.
CRYSTALS-24	03-30-2012	Limitation of CEPP to 1999 Approved CERP Plan. We previously commented that WRDA 2000 and the Programmatic Regulations require the Corps to limit the CEPP Project Implementation Report to the 1999 Approved Plan. The Scoping Response did not seem to respond to that point. We recognize the recommendation of the National Research Council that the Corps should follow an "incremental adaptive restoration" approach, and we support the concept of adaptive management in the scientific context. However, that recommendation does not override the limitations in Congress' approval of the 1999 Approved Plan the procedural requirements contained in the Programmatic Regulations or the requirements in NEPA concerning supplementation of the 1999 Programmatic EIS for the CERP. If the Corps believes it can make significant changes to the 1999 Approved Plan through the CEPP Project Implementation Report, then it needs to explain the legal basis for that position	Consistent with the other planning efforts conducted to date on CERP components, the CEPP effort was purposefully focused on the components of CERP that would provide an initial increment of restoration for the central everglades ecosystem. It was recognized in the 1999 Approved Plan (CERP) that implementation would require that the plan be divided into smaller implementable packages of components. It was further recognized that an adaptive assessment strategy requires incremental implementation of the plan components and each increment would be planned and designed to carry the program one step closer to the ultimate goal of ecosystem restoration (Central and Southern Florida Project Comprehensive Review Study, Final Feasibility Report and PEIS, page 10-7).
CRYSTALS-25	03-30-2012	Water Quality Planning Considerations. The	All alternatives were evaluated to be in compliance with WQBEL.

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		Scoping Response does not explain how the Corps can plan the CEPP without knowing the land requirements and water quality targets of the ongoing water quality litigation. See Scoping Response at 49 (response to Sugar-8). The Corps should identify those requirements as soon as possible, because they are fundamental planning constraints which both limit the types of plans which can be considered for the CEPP and whether the SFWMD has the financial resources to satisfy the CEPP.	
CRYSTALS-26	03-30-2012	Water Supply Planning Considerations. The Scoping Response indicates that the Corps will include goals and performance measures related to improved water supply and economic well-being, in response to our suggestion. Scoping Response at 49 (response to Sugar-9). We appreciate the Corps' response to our suggestion. However, we are concerned that the water supply goals are being treated only as "incidental" to other goals for the CEPP, and that only "[w]ater retained in the Lake that is not identified for the natural system may be available for water supply." Corps' Presentation to PDT Regarding CEPP "Revised Objectives," Slide 4 (March 26, 2012). By this language, the Corps is subordinating the water supply needs of the people of South Florida to other goals, which is contrary to the 1999 Approved Plan and WRDA 2000. The Corps does not need to put local communities in a subservient position in order to achieve the environmental goals of the CEPP, and should treat the water supply objective as co-equal with other objectives in the CEPP.	Water supply performance for the LOSA was considered in the formulation of management measures for storage and treatment. Water supply performance was measured by calculating the total cutback volumes (water demand not met) for the eight worst drought years during the 41 year period of analysis. Water supply performance was included as part of the screening criteria during plan formulation of the storage and treatment features within the EAA. The option recommended in the final array of alternatives is a 28,000 acre FEB. The 28,000 acre FEB with Lake Okeechobee operations optimized for water supply maximized benefits while minimizing costs. See Section 3 and Appendix E.1 of the PIR/EIS for further explanation of how this measure was incorporated into plan formulation.
CRYSTALS-27	03-30-2012	Improved Flood Protection. The Scoping Response indicates that the Corps will include "protecting	The CEPP planning effort did not formulate plans for improvements to flood protection within the EAA.

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		existing levels of flood protection" as a planning constraint. Scoping Response at 50 (response to Sugar-10). While we appreciate that improvement, we remind the Corps that we asked the Corps to use as a performance measure improving flood protection, because that is one of the specific authorized features of the EAA reservoir component contained in the 1999 Approved Plan. We ask the Corps not to abandon the goal of improving flood protection that was part of the 1999 Approved Plan and is a key component of the Central & Southern Florida Flood Control Project	
CRYSTALS-28	03-30-2012	Restoration/Rehydration of Holey Land and Rotenberger Wildlife Management Areas. In response to our comment that the Corps should consider improvements to the Holey Land and Rotenberger Wildlife Management Areas as part of the CEPP, the Scoping Response indicates that "[t]he Corps will consider information from previous studies undertaken by the SFWMD to consider this option and determine if applicable for inclusion in the CEPP." Scoping Response at 40, 50 (response to Crystals-11 and Sugar-13). We are unaware of any studies by the SFWMD which address this issue; please identify them so Florida Crystals and others can provide input	Inclusion of structural and operational modifications to existing infrastructure and/or construction of new features in Holeyland and Rotenberger WMA was considered during initial plan formulation efforts for the CEPP (refer to Appendix E for details). Features within the WMA were not further pursued given water quality concerns.
CRYSTALS-29	03-30-2012	In addition, given the Corps' effort to fast-track the CEPP, it is unclear how much time the Corps has to determine if the Holey Land and Rotenberger components of the 1999 Approved Plan should be included in the CEPP. We continue to recommend that the Corps incorporate these components into the CEPP.	Inclusion of structural and operational modifications to existing infrastructure and/or construction of new features in Holeyland WMA was considered during initial plan formulation efforts for the CEPP (refer to Appendix E for details). Features within the WMA were not further pursued given water quality concerns.

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CRYSTALS – 30	10-16-2012	This letter supplements previous letters (1-20-2012 and 3-30-2012). CRYSTALS supports restoration of S Florida and CEPP will represent a great step forward if important projects can be brought online sooner.	Thank you for your comment.
CRYSTALS – 31	10-16-2012	We recommend that the Corps re-initiate formal scoping pursuant to NEPA. The previous scoping period was premature because no proposal had been developed.	A series of NEPA Final Array public meetings were held at 5 locations throughout south Florida December 10-13 and 18, 2012. These public meetings presented the process, the final array of alternatives and discussed the NEPA analyses that will be used on the final array. The CEPP NEPA and plan formulation process includes a robust public process that provides numerous opportunities for agency, Tribal and public participation.
CRYSTALS – 32	10-16-2012	We have several comments how the Corps should approach analysis of alternatives to the CEPP proposal for the EAA. 1. Most important is the consideration of alternatives. 2. The Corps should disclose the alternatives to be analyzed prior to issuance of the draft EIS/PIR. 3. The screening evaluation in the PDT process does not constitute consideration of alternatives for purposes of NEPA. We recommend that if the Corps intends to consider alternatives developed and rejected in the PDT process, that it fully analyze those alternatives in the draft EIS/PIR and identify the criteria by which they were rejected in the PDT process. We don't think this has been done to date. 4. The Corps should analyze an array of reasonable alternatives, and not limit its analysis of alternative to those which it prefers. Potential trade-offs need to be analyzed thoroughly (through the recent NRC guidance).	1 and 2. See response above to CRYSTALS-2. The final array of alternatives were disclosed in December 2012 and are included in this draft PIR/EIS. Public comments have been encouraged throughout the entire CEPP plan formulation process. 3. Information exchanged during PDT meetings was considered in selection of the final array of alternatives for detailed evaluation under NEPA. A detailed description of the screening and evaluation process are included in Section 3 – Formulation of Alternative Plans and Section 4 0 Evaluation and Comparison of Alternative Plans in the CEPP Draft PIR/EIS. 4. A full array of reasonable alternatives was considered. A full explanation of how the final array of alternatives was determined is provided in Section 3 of the Draft CEPP PIR/EIS. 5. Each of the project performance measures for the CEPP planning effort are derived from those performance measures approved for use by RECOVER and the USACE. These performance measures were used to evaluate the final array. Please refer to Section 3 of the Draft PIR and Appendix E for criteria and cost information. 6. The CEPP TSP, Alt 4R2, maintains the current level of water supply cut-backs to the Lake Okeechobee Service area and provides a 14 MGD and 5 MGD increase in water supply to users in Broward and Miami-Dade County, respectively.

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		5. The Corps should be clear in the draft EIS/PIR regarding the evaluation of criteria being applied to each alternative. At 8-29-2012 PDT meeting, cost was a primary consideration in rejecting a 12-foot deep reservoir on the A-2 site. The Corps should identify the relative costs of all these options and the level of costs which it deems to be cost prohibitive. 6. Concerned the Corps is not developing alternative in the PDT process which would address the serious water supply concerns of agricultural interests and public utilities. 1999 plan was premised on both maintaining and improving water supply for existing uses.	
CRYSTALS – 33	10-16-2012	Since it would take relatively little additional storage in Lake Okeechobee to address the water supply concerns of agricultural and urban uses, we once again ask the Corps to examine such options.	The CEPP TSP, Alt 4R2, provides for a 14 MGD and 5 MGD increase in water supply to users in Broward and Miami-Dade County, respectively, while maintaining the current level of water supply cutbacks to the Lake Okeechobee Service area.
CRYSTALS – 34	10-16-2012	The draft PIR/EIS should address whether there is a plan to re-wet the FEBs with local runoff to prevent release of phosphorus from the dried soils to the STAs.	The A-1 FEB and A-2 FEB will operate as a singular FEB. The FEB will accept runoff from the Everglades Agricultural Area (EAA) when the FEB depth is below 3.8 feet (ft). Water from Lake Okeechobee will be accepted when the FEB depth is below 2.0 ft. Discharges from the FEB will be discontinued when FEB depth is below 0.5 ft. No supplemental water supply will be provided to the FEB to prevent dry outs.
CRYSTALS – 35	10-16-2012	A 12-foot reservoir should be analyzed in the NEPA document, even though it was screened out as an alternative due to cost. It was identified as providing the greatest benefits for the Everglades.	The FEB is the least cost option. The 12ft Reservoir provides the greatest benefits to the everglades; however, the cost is prohibitive given the marginal increase in benefits and the 12ft Reservoir configurations were eliminated from further consideration. A full description of the evaluation and screening are provided in Section 3 of the CEPP Draft PIR/EIS.
CRYSTALS – 36	10-16-2012	The Corps should analyze an alternative regarding excess storage in Lake Okeechobee rather than the	See response above to CRYSTALS-33.

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		A-2 FEB.	
CRYSTALS – 37	10-16-2012	The Corps should analyze an alternative that would use the A-2 site for agricultural water storage.	Alternatives for the CEPP were formulated and evaluated based on achievement of project objectives. Project objectives identified for the CEPP are consistent with those of CERP. Section 601 (h) of WRDA 2000 (authorizing CERP) states "the overarching objective of the Plan is the restoration, preservation, and protection of the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection. Project objectives are included in Section 1 of the Draft CEPP Project PIR and EIS.
CRYSTALS – 38	10-16-2012	We recommend the Corps also include alternatives related to the delivery and/or management of Lake Okeechobee water before it reaches WCA-3A. The Corps should analyze and consider the reduction of phosphorus using the EAA canals, therefore bypassing the STAs.	Proposed non-CERP projects, including the SFWMD Restoration Strategies project, will ensure that water considered part of the existing water budget will undergo treatment to meet applicable water quality standards.
CRYSTALS - 39	10-16-2012	Another alternative that needs to be the potential for excess lake water to be delivered to the Holey Land and Rotenberger Wildlife Management Areas.	Inclusion of structural and operational modifications to existing infrastructure and/or construction of new features in Holeyland WMA was considered during initial plan formulation efforts for the CEPP. Features within the WMA were not further pursued given water quality concerns.
CRYSTALS - 40	10-16-2012	How is the Corps going to integrate its NEPA review of the two FEBs proposed for the A-1 and A-2 sites? They're clearly connected actions, with cumulative impacts.	The proposed FEB on the A-1 site was analyzed and included in the "No Action Alternative" in the draft EIS/PIR. The Draft EIS for the Everglades Agricultural Area A-1 Shallow Flow Equalization Basin was posted for public review on February 22, 2013.
CRYSTALS - 41	10-16-2012	We hope that agency analyses of phosphorus reductions that will result from use of the A-1 FEB are correct. Also hope that addition of "new" water from Lake Okeechobee will not diminish the phosphorus reduction performance of STA3/4 and Compartment B, or cause a violation of WQBEL. Need to state that if there is a violation, EAA runoff would be the first to be treated.	Water quality for the A-1 FEB is presented in the Draft EIS for the Everglades Agricultural Area A-1 Shallow Flow Equalization Basin. The analysis of the A-2 FEB is presented in the CEPP Draft PIR/EIS.
CRYSTALS - 42	1-4-2013	NEPA requires analysis of all alternatives and their environmental effects, including water quality. We	Environmental Effects were analyzed for all alternatives , including water quality in Section 5 and Appendix C.2.1 and Appendix C.2.2 in

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		ask that the draft PIR/EIS analyze the likely water quality effects of each alternative in the WCA's and ENP.	the CEPP Draft PIR/EIS.
CRYSTALS - 43	1-4-2013	In addition, Corps should also demonstrate various alternatives will result in compliance with WQBELs in the NPDES permits for STAs and provisions of the Consent Decree. Such analysis is appropriate in light of the federal agencies' recent court decision which indicated that compliance with NPDES permits for STAs would not necessarily lead to compliance with the Consent Decree.	All alternatives were evaluated to be in compliance with WQBELs.

Table C.3-2. Comment response matrix of emails received through the Task Force.

Email	Date Received	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
ARTHUR R. MARSHALL FOUNDATION & FLORIDA ENVIRONMNETAL INSTITUTE (AM)			
AM - 1	6/19/12	First, we have a group of Summer Interns also monitoring the phone conference broadcast (our cyberlink server is down). In attending the recent Central Everglades Project Planning (CEPP) process, the interns have been fully briefed on the implications of CERP Table 5-1 Goals & Objectives; they also appreciate the CEPP Project Delivery Team (PDT) relating CEPP Goals and objectives, AKA Management Measures, to CERP Table 5-1 Yellow Book goals as required by the 2011 Adaptive Management Integrated Guide (AMIG) activity 5 protocols. However when the Task Force goals were mentioned starting with getting the water right and ending with foster compatibility with the built up environment, there were a bunch of puzzled looks, on faces not previously exposed to the TF Goals. Perhaps there should be some attempt at fostering compatibility of CEPP and the TF goals, as a better framework of how the TF sees CEPP meeting TF goals, even though CEPP is an Adaptive Management application of CERP, and therefore subject to CERP Table 5-1.	Thank you for your comment.
AM - 2	6/19/12	Second, the CEPP PDT approach has not dealt directly with the AMIG activity 4 requirements that a Conceptual Ecological Model (CEM) be developed for projects such as CEPP with a given boundary per all the other regional CEM's developed for CERP; the CEPP boundary remains fuzzy under the wishbone concept per CEPP PPT presentations. As indicated previously, the CEPP PDT is using a Ridge & Slough CEM, and apparently the Total System CEM, and	Project objectives for the CEPP are consistent with the goals and objectives of the C&SF Restudy. Project objectives for the CEPP are presented in Section 1 of the PIR/EIS. The project team has utilized performance measures to evaluate alternative plans. These performance measures were developed from the Lake Okeechobee, Northern Estuaries and Greater Everglades Ridge and Slough Conceptual Ecological Models (CEM).

Email	Date Received	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
		"performance measure transfer". This obviates a full consideration of historic significant habitat between Lake O and WCA-3 including the pond apple forest and the sawgrass plains. Our view is that this is a CEPP deficiency because the approach insufficiently goes in the direction of CERP Table 5-1 Goals & Objectives, especially regarding the ecological goals, including habitat and functional value of the pond apple forest and the sawgrass plains.	
AM - 3	6/19/12	Third, we appreciate that there will be an ecosystem services valuation (ESV) of the CEPP tentatively selected plan. However it would appear a better approach to use an ESV approach for analysis of various alternatives to depict benefit to cost as a measure of return on investment (ROI) for final selection decision-support for the configuration with the greatest ROI. The habit unit approach appears much less viable.	In practice, USACE ecosystem restoration studies typically measure the ecosystem benefits of alternative plans in terms of habitat units. Habitat units are basically the product of acreage and a Habitat Suitability Index (HSI). The HSI is scaled from 0 to 1, with 1 being a pristine acre. The with-project and without-project habitat units are calculated and the difference between the two is known as the habitat unit lift. This habitat unit lift is the primary benefit used by economists in the cost effectiveness/incremental cost analysis (CE/ICA) to determine best buys and cost-effectiveness among possible alternative plans. Consistent with Corps guidance, habitat units will be used for the CEPP as the basis to compare alternatives and select a plan. The ecosystem services evaluation will be conducted only on the recommended plan. The Ecosystem Services report will be provided separate from the Draft PIR/EIS after it has been through the review process.
AM - 4	6/19/12	Finally, especially on behalf of our Arthur R. Marshall Summer Interns who are looking at the viability of using ESV in the CEPP configuration selection process, we appreciate that many of the Task Force members and supporting staff, and CEPP PDT members were at the GEER/INTECOL conference. The interns used this a networking opportunity to expand their knowledge on the CEPP process and related matters such as Sea Level Rise. Our letter of 12 June to the Honorable Rachel Jacobson amplifies.	Thank you for your comment.

Email	Date Received	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
PUBLIC			
Don Wisdom	7/25/13	The major project that I was not able to complete during my tour as the DE in Jacksonville was restoration of the Kissimmee River to it's natural flow. I am still very interested in anything that I can do to buy Big Sugar out and restore the natural flow. Would you please send me a map depicting before and after the agricultural interests were able to divert the Kissimmee's natural flow to the east and west. Please include property owned by agriculture and that which is government owned.	In terms of property maps and pre and post maps, SFWMD should have the information you are requesting.
Jack Moller (JM) - 1	9-27-2012	Too much water in the Everglades, should not be adding more because of the stress on the wildlife. Have said this since 1999 without a suitable response.	Environmental effects within northern WCA 3A are described in Section 5 of the Draft PIR/EIS and Appendix C.2.1 and Appendix C.2.2. Implementation of the CEPP is expected to rehydrate much of northern WCA 3A by providing a means for redistributing treated STA discharges from the L-4 and L-5 in a manner that promotes sheetflow and by removing the drainage effects associated with the Miami Canal. Implementation of any of the CEPP alternatives is expected to significantly improve conditions for aquatic invertebrates, fish species, amphibian and reptile communities, and resident bird species. CEPP implementation may negatively affect mammals dependent on upland habitat due to increased water flow.
JM - 2	9-27-2012	ENP wants 100% of historic annual water volumes, but only 50% of the Everglades is left. If ENP owned the WCAs they would not do this because they know if will destroy the Everglades. Question no one has answered: How can a flood today become tomorrow's CERP goal and call this restoration?	The objectives of CEPP are not to flood WCA 3A. The increase in water flow to WCA 3A will occur primarily in the dry season to reverse the current trend of water levels in northern WCA 3A receding well below the ground surface for long periods of time, which has resulted in extensive and documented losses of peat soils from oxidation, muck fires and resultant lowering of the ground surface elevations in northern WCA 3A by up to 3-ft in some areas (Refer to Section 1.2). The CEPP TSP incorporates the Zone A schedule included in the current operation of WCA 3A under ERTP. As such, inflows from Lake Okeechobee would not occur when stages in the WCA 3A are above Zone A consistent with current operations. Additionally, Alt 4R2 includes increased outlet capacity from WCA 3A to better manage extreme wet events.

Email	Date Received	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
			Alt 4R2 generally produced improved inundation patterns in north-western WCA 3A reaching over 70 percent of habitat unit restoration targets for ridge and slough. Water depths for Alt 4R2 in northeast-ern WCA 3A are more conducive to shorter hydroperiods sawgrass marshes. Alt 4R2 would act to rehydrate northern WCA 3A promoting peat accretion, reducing the potential for high intensity fires and promoting transition from upland to wetland vegetation.
JM - 3	10-25-2012	• Don't trust models on elevations/depths because they can't give me a duplicate graph with water depths/elevations in the WCAs along transect L2 using the same data points and processes as graphs presented a few weeks ago. • Need to get them to talk about seepage control from S side of WCA2B and all along US 27 boundary area; there were boils during 1990s flood. • Do not think all tree islands are needed to fill the Miami Canal. Talked about this during 10-22 meeting. • Problem with entire CERP project is DOI/NPS won't allow this or that. They're only interested in protecting their property. • Want answers to all of my questions sent to whole group that attended 10-22 meeting	The regional hydrologic models proposed as the primary tools for evaluation of the final array have been validated through the Corps Engineering Model Certification process established under the Engineering and Construction (E&C) Science and Engineering Technology (SET) Initiative and/or reviewed during an Agency Technical Review. These models are considered to be appropriate tools for planning for the CEPP. Please see response to comment JM-27 above (Dated 11-29-2012). A portion of the spoil mounds located adjacent to the Miami Canal would remain. In addition, mounds would be created during construction of Alternative 4R2 approximately every 1 mile from S-8 to I-75. The location of seepage management features were identified during evaluation for CEPP. Seepage management features were determined to be needed along the southern portion of WCA 3B and northern portion of ENP. Answers to questions submitted to the USACE during the plan formulation for the CEPP are provided within herein.
JM - 4	10-25-12	The data they presented today was not what they presented on 10/22/12. Today they talked about lowering the water levels from what they desired before 10/22/12. BUT, the amount of water they want to push, after reducing the amount, into the	The CEPP TSP incorporates the Zone A schedule included in the current operation of WCA 3A under ERTP. As such, inflows from Lake Okeechobee would not occur when stages in the WCA 3A are above Zone A consistent with current operations. Therefore, CEPP does not propose to push water into WCA 3A when it is over schedule.

Email	Date Received	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
		WCAs is still 60% of the time over schedule. This is NOT restoration but clearly a calculated desire by some to bring about a drastic change in the Everglades and to full fill what Aaron Hegar told Tom Shirley and I which was if they do what they want to do they will change the area from Everglades to a littoral zone type habitat. Their plans are very wrong.	Additionally, Alt 4R2 includes increased outlet capacity from WCA 3A to better manage extreme wet events. The objectives of CEPP are not to flood WCA 3A. The increase in water flow to WCA 3A will occur primarily in the dry season to reverse the current trend of water levels in northern WCA 3A receding well below the ground surface for long periods of time, which has resulted in extensive and documented losses of peat soils from oxidation, muck fires and resultant lowering of the ground surface elevations in northern WCA 3A by up to 3-ft in some areas (Refer to Section 1.2).
JM - 5	10-25-12	And, once the things below are done what is the time line for the ACOE to put their "finished stamp" on the project design? What happened to the yellow book plan of building a pumping station at the end of L-28, where we call Sands Point? This pump was to pull water around the N end of the WCA3N and push it into the heart of Shark Slough valley and on to ENP. Is this pump still being built? Why not? Don't know if you're still watching. The conversation from 230 to about 250 was all about how we can use EDEN and field data to get to the depiction of data you're looking for I think. The other point that was that some of the analysis has to wait through the screening phase until we have an RSM model run which is happening over the next few weeks.	The CERP Plan did not include a pump station at the end of L-28. The CERP Central Lakebelt Storage component included measures to capture excess water in WCA-2B and divert water through improved L-37 and L33 borrow canals to Northeast Shark River Slough to meet targets or to the Central Lakebelt Storage Area. The Central Lakebelt Storage area component is not included in this first increment of restoration of the central Everglades.
JM - 6	10-25-12	Example of what I was talking about at 10-22 meeting: In the data reported at the 10-25-12 meeting the water gauge numbers do not match the water gauge numbers that we are accustom to seeing and using to calculate water elevations and depths. Why did the CERP people change these numbers? If you recall I said the same while on WRAC many years ago. My friend thinks the Corps	The regional hydrologic models proposed as the primary tools for evaluation of the final array included the Regional Simulation Model-Basins (RSMBN) and the Regional Simulation Model Glades-LECSA Implementation (RSMGL). The iModel was also used as part of the plan formulation process for the CEPP. These models were developed by the Hydrologic and Environmental Systems Modeling Department of the SFWMD. Output from the regional models was readily provided to the public during plan formulation for the CEPP.

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		is cooking the books. Bosses need to ask why engineers are changing base reporting data and not using what is in place. Where is conversion table to allow folks to follow this ever changing data reporting strategy?	Locations at which model output is provided (*i.e.* Gages, Indicator Regions, Transects etc.) is standard and has not changed from prior use of these models for other CERP projects.
JM - 7	10-26-12	To help with better identification of the area of WCA3N that is to have water managed so that the saw grass is major vegetation type to survive CERP water management goals I have created the following map from Google Earth. The area north of the red line should be considered saw grass prairies with the area west of the orange line being the strongest or healthiest saw grass prairie habitat. The area north of the red line was never ridge and slough, see federal map below. Consider the area west of the orange line as being a transition zone between the deeper water in the ridge and slough area to the west of the Miami River and the historical saw grass prairie. This is strictly my personal opinion and I look forward to other folks thoughts on this topic. (map attached with line drawn on it)	Thank you for your comment and information Alt 4R2 generally produced improved inundation patterns in northwestern WCA 3A reaching over 70 percent of habitat unit restoration targets for ridge and slough. Water depths for Alt 4R2 in northeastern WCA 3A are more conducive to shorter hydroperiods sawgrass marshes. Alt 4R2 would act to rehydrate northern WCA 3A promoting peat accretion, reducing the potential for high intensity fires and promoting transition from upland to wetland vegetation.
JM-8	7/12/13	This, below, was taking from one of the documents from Monday's, July 8, 2013, meeting. It was in the back up material--if needed section. What is the biological differences between "open water" and "open marsh"? Also can you tell me how many acres of each habitat type, "open water" and "open marsh" are in ALT4 or the most recent model run i.e. ALT4R1 etc.?	Open water = unvegetated areas such as ponds, lakes, rivers, bays and estuaries. Open marsh = open water-dominated freshwater marsh with a mix of sparse graminoids and/or herbaceous vegetation (spikerush, low stature sawgrass, arrowhead, swamp-lily, to name a few). No one has done the calculation in acres between the two for the entire CEPP domain. ELVeS is the model, so we can run it if needed.
Larry Fink (LF) - 1	7-6-2012	Quoting from Page 160 of 267 of the NAS CROGEE Biennial Report on Everglades Restoration	Response provided by Shannon Estenoz (DOI): To my knowledge the Task Force does not have, at this time, intentions to proceed on a

Email	Date Received	AGENCY/PUBLIC COMMENT	CORPS RESPONSE
		(http://www.nap.edu/openbook.php?record_id=13422&page=9): "ELM appears to be the only water quality model that has been approved for use by the USACE and that is actually used in CERP project planning (although not widely so). However, it is not listed among the modeling tools for use in the Central Everglades Planning Project (USACE and SFWMD, 2012). Other water quality models that seem essential to an ongoing Central Everglades Planning Project, such as the Dynamic Model for Stormwater Treatment areas (DMSTA), have not undergone a formal, external peer review. External peer review is important, particularly for models that are used extensively in the planning process, and peer review of the DMSTA is a high priority." Please advise how the SFERTF intends to proceed in this regard, USEPA's acceptance of DMSTA as an expedient notwithstanding.	specific course of action related to this subject. On the substance of your comment, please see the perspective expressed in italics by DOI technical staff below .DMSTA is the most widely used and accepted water quality model in South Florida for evaluation of Stormwater Treatment Area (STA) design and performance. It has been used by DOI, EPA, SFWMD, USACE, and others for multiple purposes, especially those related to STA performance, and has been certification by the USACE for use in the Central Everglades Planning Project. For further information on the model's wide use and acceptance, please see the DMSTA page on Dr. William Walker's web site -- http://www.wwwalker.net/dmsta/index.htm <http://www.wwwalker.net/dmsta/index.htm> . Also, please refer to a recent, peer-reviewed article published in a scientific journal by Drs. Walker and Kadlec on the use of DMSTA (below). W.W. Walker Jr, and R.H. Kadlec (2011). Modeling phosphorus dynamics in Everglades wetlands and Stormwater Treatment Areas. Critical Reviews in Environmental Science and Technology, 41:430-446.
LF - 2	7-9-2012	I have read Dr. Walker's web page and the referenced article. Despite its general acceptance, growing accolades, and pending certification by USACE, DMSTA is limited in the water quality parameters it can model, i.e., P, and the physical, chemical, and biological processes important to the transport, transformation, storage, and release of P from the various compartments of engineered and impounded natural wetlands. The former deficiency is only problematic if no surface water constituent other than P is to be considered as a constraint on restoration infrastructure design, operation, or maintenance and/or a source of environmental impacts deriving there from. Based on the CEPP process to which I have been exposed to date, I am under the impression that no surface water constituent other than P is being recognized as a	DMSTA is the most widely used and accepted water quality model in South Florida for evaluation of Stormwater Treatment Area (STA) design and performance. It has been used by DOI, EPA, SFWMD, USACE, and others for multiple purposes, especially those related to STA performance, and has been validated and approved for use by the USACE for use in the Central Everglades Planning Project. At this time, regional predictive tools are not available for pollutants other than phosphorus. While progress is being made on understanding the factors that affect mercury cycling within the Everglades, no modeling tools are available that can predict the effects of CEPP hydrology on mercury methylation dynamics. Given the strong correlation between atmospheric mercury deposition and methylmercury concentrations in fish and surface water, the most effective means of reducing mercury concentrations is to reduce atmospheric deposition. To this end, the FDEP is developing a state-wide TMDL for mercury emissions. Achieving the guidance

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		constraint in evaluating restoration design, operation, or maintenance alternatives. This includes mercury, despite the fact that the Everglades and Florida Bay are listed as mercury-impaired waters under the Clean Water Act. Please disabuse me of this impression if you have evidence or intention to the contrary. The latter deficiency is only problematic if the time-to-recovery of the Everglades and Florida Bay is not of primary importance in evaluating restoration alternatives without and with remediation of contaminated sediments. Based on the posted rejection of my recommendation to include time-to-recovery in the alternatives evaluation table, the time-to-recovery of the system is not considered of primary importance in the CEPP process. SFERTF is dependent on SFWMD staff to perform the required water quality modeling to evaluate the water quality impacts of the preferred restoration alternative and various viable alternatives that will be considered in the EIS. SFWMD has not reported, is not reporting, and will not report time-to-recovery information as part of the evaluation of design, operation, or maintenance alternatives according to the CEPP process unless directed to do so by SFERTF, and it is my impression that SFERTF has no intention of directing SFWMD staff to report time-to-recovery or to add time-to-recovery as a performance objective, evaluation criterion, or water quality constraint as part of the restoration alternatives evaluation process. Please disabuse me of this impression if you have evidence or intention to the contrary.	concentrations will require national and international cooperation far beyond the control of any local or regional agency. Time to recovery was not added to the evaluation per this commenter's request; however, the timing of habitat recovery is incorporated into the benefits evaluation for all alternatives. The timing of habitat recovery is also implicitly incorporated into the calculation of the project's average annual ecosystem benefit.
LF - 3	6-19-2012	(1) What objective criteria must each of the following sovereign submerged lands and uplands	Each CEPP project component will be evaluated for compliance with state and federal water quality criteria as part of the CERPRA

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		conditions or activities meet to be considered inherently incompatible with the attainment of Everglades restoration water quality performance objectives within 10 years of completion of all CEPP projects: (a) in general, (b) Florida's 10 ppb Total Phosphorus Water Quality Standard in particular; (c) EPA's 0.3 ppm Total Mercury Water Quality Criterion in fish flesh in particular: (i) unremediated in-place contaminated Lake Okeechobee sediments? (ii) unremediated in-place contaminated Everglades Agricultural Area (EAA) soils? (iii) unremediated in-place contaminated Everglades interior marsh soils? (iv) any EAA agricultural practice?	permitting process initiated during plans and specifications development. To address EPA's 0.3 ppb Total Mercury Water Quality Criterion in Fish flesh, the FDEP is developing a state-wide Total Maximum Daily Limit for mercury. Regarding contaminated soils or sediments in South Florida, any required remediation will continue to be part of project planning and land management processes.
LF – 4	6-19-2012	(1) How is the development of Florida's statewide mercury TMDL now on public notice being coordinated with CEPP to ensure that the sulfate-mercury relationship is not an insurmountable barrier to Everglades restoration?	There is no information available that either sulfur or mercury will be an insurmountable barrier to restoration. The FDEP's October 29, 2012 Draft TMDL for Mercury focuses on the control of in-state sources of atmospheric and point source mercury emissions. The draft TMDL specifically exempts non-point sources of mercury such as stormwater from the TMDL waste load allocation. The CEPP project is not a source of point source mercury emissions and therefore will not be affected directly by the FDEP mercury TMDL. There is no draft or planned TMDL for sulfur.
LF - 5	6-19-2012	(1) When will the State of Florida numerical Class III 10 ppb Water Quality Standard (WQS) for Total Phosphorus (TP) be met at the points of discharge to the Northern Everglades under the announced agreement between EPA and FDEP?	(1) The September 2012 Consent decree requires that the Water Quality Based Effluent Limitation (WQBEL) be fully met after the completion of the SFWMD's Restoration Strategies plan in 2025. This deadline is specifically written into NPDES and EFA permits. (2) The Restoration Strategies plan was modeled using the DMSTA

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		(2) What independent water quality modeling of the combined operation, maintenance, and remediation of Lake Okeechobee, the EAA, the proposed shallow reservoirs, and the existing and proposed Stormwater Treatment Areas did EPA perform using EPA-approved water quality models to validate the agreed-upon plan for attainment and maintenance of Everglades 10 ppb TP WQS within the agreed-upon timeframe?	model. This modeling output was reviewed by experts at DOI and EPA. The modeling report is publically available on the SFWMD website. DMSTA modeling was performed by the SFWMD for the CEPP project to determine the effect of the A2 FEB on phosphorus concentrations of water entering northern WCA3A. This modeling effort was reviewed by DOI and USACE experts as part of the CEPP planning process.
Dave Zuhusky	8/8/13	Can you tell me what the timeline is for the construction of the C-43 reservoir project that is supposed to be built along the Caloosahatchee River. Our waters in the Pine Island Sound and beaches near Ft. Myers are being fouled and polluted by the discharges from Lake Okeechobee. Also, do you know of ways I could learn more about the overall cleanup of the Everglades. Thank you for your assistance.	The Caloosahatchee River (C-43) West Basin Storage Reservoir project Record of Decision was transmitted to Congress for authorization on April 13, 2011. We are currently waiting for the next Water Resources Development Act (WRDA) to authorize this project and a few others. The last WRDA was in 2007 and we are hoping for another one soon. I have attached the current Fact Sheet for that project. For more information about this project and the other Comprehensive Everglades Restoration Plan (CERP) projects please go to http://www.evergladesplan.org/index.aspx. This web site will give you information on all of the CERP projects as well as upcoming public meetings, events and documents out for review.

Audubon Florida * Everglades Foundation * Everglades Law Center
Clean Water Action * Florida Wildlife Federation
National Parks Conservation Association * Natural Resources Defense Council

November 13 2012

Attn: Gina Paduano Ralph, Ph.D
Department of the Army
Planning and Policy Division
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Dear Dr. Ralph;

On behalf of the undersigned organizations, we appreciate the opportunity to comment on Central Everglades Planning Project (CEPP) scoping. As you know, we strongly support the Army Corps of Engineers' efforts to deliver a CEPP project implementation report by May 2013. Over the last 12 months, the Jacksonville team has accomplished an astonishing amount of progress in formulating alternatives that can address the urgent need for delivering increased water flows into the central Everglades and Everglades National Park (ENP). Given that the final array of alternatives will be presented and a Tentatively Selected Plan will soon be chosen, we wanted to take the opportunity to provide feedback in advance of the next Project Delivery Team (PDT) meeting and public workshop.

<u>CEPP must take a clear step toward restoration.</u>

We are heartened to see that the CEPP PDT team has identified an estimated 200,000 acre-feet of new water that can be delivered to the central Everglades. However, for CEPP to meaningfully advance restoration and achieve ecological benefits, the plan must increase ecological connectivity and water conveyance between ENP and Water Conservation Areas (WCAs) 3A and 3B. Partial removal of the L-29 levee represents the clear step forward needed to show progress.

Full restoration of sheetflow from WCA 3A through 3B and into ENP is the ultimate goal, but it is understood that seepage issues constrain our ability to implement such restoration in one complete iteration. Given these concerns, it is vital that the CEPP include phased and/or locally preferred alternatives that will provide interim benefits while additional restoration components, including the authorized elevation and bridging of Tamiami Trail and other projects, come online.

<u>CEPP must remain focused on ecological benefits.</u>

The CEPP process and robust stakeholder participation workshops have allowed for unprecedented dialogue and feedback. We acknowledge the effort required to be inclusive and applaud the PDT's engagement efforts, but want to emphasize that it is not possible for CEPP, nor any other single project in the full Comprehensive Everglades Restoration Plan (CERP), to achieve each individual goal outlined in CERP. It is absolutely essential that CEPP achieve key restoration benchmarks of rerouting flow into Northeast Shark River Slough. To do this, the Tentatively Selected Plan must be selected based on its ability to achieve the following CEPP goals outlined in the December 2011 scoping:

- Restore habitat in the central Everglades, focusing on the "River of Grass";
- Deliver "new" sources of clean water to the central Everglades and ENP; and
- Reduce damaging discharges to east and west coast estuaries.

Compatibility with CERP

We understand that the features of CEPP's first increment are constrained by federal and state appropriations, and appreciate the tremendous effort by the PDT to move this planning effort forward expediently. Given these limitations, it becomes even more critical to ensure that CEPP alternatives create opportunities for sheetflow that can be expanded in future CERP efforts rather than creating an even more managed Everglades ecosystem by installing more pumps and other infrastructure.

Environmental groups have a common vision for the first iteration of central Everglades restoration, supported by numerous recreational stakeholders. This vision includes bridging Tamiami Trail, decompartmentalizing WCA-3A, WCA-3B, and Northeast Shark River Slough in ENP, and completely degrading the L-29 along the bottom of WCA-3B. Implementation of this vision includes a ***temporary*** berm along the existing "Blue Shanty" canal alignment as a construction phase which would be removed following the completion of the Tamiami Trail improvements and other projects.

We believe that a temporary Blue Shanty berm is a cost effective way to utilize existing canal and berm features in southwest WCA-3B and ENP to achieve near-term benefits and "train" the River of Grass through two gated structures to be installed along lower L-67A during an initial CEPP phase. This feature is intended to allow for restoration of sheetflow, the creation of ridge-and-slough habitat, and fishery improvement through marsh connectivity and should not be interpreted or designed as a flood control structure.

We remain committed to assisting in this process and to helping ensure increased water flows to the central Everglades, relief to the northern estuaries, and ecological benefits for America's Everglades. We look forward to working with you in this ambitious endeavor and invite any questions or comments you may have.

Sincerely,

/Signatures waived to expedite delivery/

Megan Tinsley, Everglades Policy Associate
Audubon Florida

Kathleen Aterno, Florida Director
Clean Water Action

Eric Eikenberg, Chief Executive Officer
Everglades Foundation

Lisa Interlandi, Executive Director
Everglades Law Center

Manley Fuller, President
Florida Wildlife Federation

Dawn Shirreffs,
Everglades Restoration Program Manager
National Parks Conservation Association

Bradford Sewell, Senior Attorney
Natural Resources Defense Council

Everglades Coalition

1000 Friends of Florida
Arthur R. Marshall Foundation
Audubon of Florida
Audubon Society of the Everglades
Audubon of Southwest Florida
Caloosahatchee River Citizens Association/ Riverwatch
Clean Water Action
Clean Water Network
Collier County Audubon Society
Conservancy of Southwest Florida
Defenders of Wildlife
Ding Darling Wildlife Society
Earthjustice
Environment Florida
The Environmental Coalition
Everglades Coordinating Council
Everglades Foundation
Everglades Law Center
Florida Conservation Alliance
Florida Defenders of the Environment
Florida Keys Environmental Fund
Florida Native Plant Society
Florida Oceanographic Society
Florida Wildlife Federation
Friends of the Arthur R. Marshall Loxahatchee Wildlife Refuge
Friends of the Everglades
Hendry Glades Audubon Society
Izaak Walton League Florida Division
Izaak Walton League Florida Keys Chapter
Izaak Walton League Mangrove Chapter
Izaak Walton League of America
Last Stand
League of Women Voters of Florida
Loxahatchee River Coalition
Martin County Conservation Alliance
National Audubon Society
National Parks Conservation Association
National Wildlife Federation
National Wildlife Refuge Association
Natural Resources Defense Council
The Ocean Conservancy
The Pegasus Foundation
REEF RELIEF
Sanibel-Captiva Conservation Foundation
Save It Now, Glades!
Sierra Club
Sierra Club Broward Group
Sierra Club Calusa Group
Sierra Club Central Florida Group
Sierra Club Florida Chapter
Sierra Club Loxahatchee Group
Sierra Club Miami Group
The Snook and Gamefish Foundation
South Florida Audubon Society
Tropical Audubon Society
The Urban Environment League
World Wildlife Fund

RESOLUTION SUPPORTING ALTERNATIVE 4 FOR CENTRAL EVERGLADES PLANNING PROJECT

WHEREAS, the Everglades Coalition is committed to the restoration of America's Everglades, and protecting lands critical to the future of Florida's environment, drinking water, economy, recreation and quality of life; and

WHEREAS, the Everglades Coalition has previously supported Central Everglades Planning Project (CEPP) goals to: 1) restore habitat in the central Everglades, focusing on the "River of Grass"; 2) deliver "new" sources of clean water to the central Everglades and Everglades National Park (ENP); and 3) reduce damaging discharges to the east and west coast estuaries.

WHEREAS, removal of the L-29 along the bottom of WCA-3B is consistent with long term restoration goals and represents a clear step forward in Everglades restoration as it removes a barrier to sheet flow and will improve fishery conditions;

WHEREAS, Alternative 4 is the only alternative in CEPP which will begin more natural flow into Water Conservation Area (WCA) 3B and ENP, re-establish ridge and slough topography, and improve ecological connectivity, all of which are priority tenets of Everglades restoration;

WHEREAS, restoration of the Everglades should not significantly increase the footprint of levees in sensitive wetlands;

WHEREAS, restoring the natural flow path of the Everglades, as proposed in Alternative 4, will reduce soil oxidation and loss in WCA 3B, increase biological connectivity, improve the mosaic of landscapes essential to the food chain, and provide more corridors and habitat for fish and wildlife.

THEREFORE BE IT RESOLVED that the Everglades Coalition supports CEPP Alternative 4, with the WCA 3B river training structure implemented with a minimal footprint, as the best alternative for the environment. The Coalition requests that it be designated the Tentatively Selected Plan in the Project Implementation Report because it most comprehensively and meaningfully advances restoration goals, achieves ecosystem benefits, and increases ecological connectivity and water conveyance between ENP and Water Conservation Areas 3A and 3B.

Approved December 27, 2012

Dawn Shirreffs, National Co-Chair
954-961-1280 x 205
dshirreffs@npca.org

Jennifer Hecker, State Co-Chair
239-262-0304 x 250
jenniferh@conservancy.org

The City of Coral Gables

June 15, 2012

Ingrid Sotelo, Chief
Miami Regulatory Division
U.S. Army Corps of Engineers
9900 S.W. 107th Avenue, Suite #203
Miami, FL 33176

Dear Ingrid Sotelo:

At the City of Coral Gables City Commission meeting held on May 8, 2012, legislation (Resolution No. 2012-91) pertaining to supporting the Central Everglades Planning Project for the restoration of the Central Everglades was adopted.

This resolution is being forwarded to you for your information and files.

Sincerely

Walter J. Foeman
City Clerk

WJF/yd

Encl: Resolution No. 2012-91

RECEIVED
JUN 25 2012
MIAMI REGULATORY OFFICE
JAX DISTRICT, USACE

CITY OF CORAL GABLES, FLORIDA

RESOLUTION NO. 2012-91

RESOLUTION OF THE CITY COMMISSION OF CORAL GABLES SUPPORTING THE CENTRAL EVERGLADES PLANNING PROJECT FOR THE RESTORATION OF THE CENTRAL EVERGLADES; AND FURTHER DIRECTING THE CITY CLERK TO TRANSMIT A COPY OF THIS RESOLUTION TO THE OFFICIALS AS STATED HEREIN.

WHEREAS, the Greater Everglades Ecosystem is a globally imperiled habitat and the primary source of drinking water for the City of Coral Gables; and

WHEREAS, Everglades National Park is critical to South Florida's tourism, with nearly a million people visiting each year; 30 percent of whom are from outside the United States; and

WHEREAS, the Everglades ecosystem has continued to decline in the face of restoration delays and an expedited solution is needed to increase the quality, quantity, timing and distribution of freshwater flows into the central Everglades, Everglades National Park and Florida and Biscayne Bay; and

WHEREAS, increased deliveries of water south of Lake Okeechobee will reduce damaging discharges to the Caloosahatchee and St. Lucie estuaries; and

WHEREAS, the goal of the Central Everglades Planning Project (CEPP) is to significantly reduce planning times and deliver a finalized plan, for a suite of restoration projects in the central Everglades within 18 months; and

WHEREAS, full support and funding by the State of Florida and the U.S. Congress is needed to implement this project, protect regional water supply, create much needed jobs and strengthen the local economy;

NOW, THEREFORE, BE IT RESOLVED BY THE COMMISSION OF THE CITY OF CORAL GABLES:

SECTION 1. That the foregoing **"WHEREAS"** clauses are hereby ratified and confirmed as being true and correct and are hereby made a specific part of this Resolution upon adoption hereof.

SECTION 2. That the City of Coral Gables supports the completion of a Project Implementation Report (PIR) by the South Florida Water Management District and the U.S. Army Corps of Engineers through the CEPP by May 2013 that addresses key obstacles for restoring freshwater flows and implements meaningful ecological and economic benefits toward restoring America's Everglades.

SECTION 3. That the City Commission does hereby direct the City Clerk to transmit a certified copy of this resolution to the South Florida Water Management District, U. S. Army Corps of Engineers, and the Tropical Audubon Society.

SECTION 4. This resolution shall become effective upon the date of its passage and adoption herein.

PASSED AND ADOPTED THIS EIGHTH DAY OF MAY, A.D., 2012.
(Moved: Anderson/ Seconded: Quesada)
(Yeas: Anderson, Cabrera, Kerdyk, Quesada, Cason)
(Unanimous: 5-0 Vote)
(Agenda Item: C-2)

APPROVED:

JIM CASON
MAYOR

ATTEST:

WALTER J. FOEMAN
CITY CLERK

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

CRAIG E. LEEN
CITY ATTORNEY

STATE OF FLORIDA • COUNTY OF MIAMI DADE
I, HEREBY CERTIFY that the foregoing
(Pages 1 – 2, inclusive)
is a true and correct copy of the original
on file in this office.

DATE

CITY CLERK

2

Florida Crystals Corporation
One North Clematis Street
Suite 200
West Palm Beach, FL 33401

William F. Tarr
Vice President
P: 561-366-5157
F: 561-651-1280

January 4, 2013

VIA E-MAIL AND U.S. MAIL

Dr. Gina Padua Ralph
U.S. Army Corps of Engineers
Planning Division
P.O. Box 4970
Jacksonville, Florida 32232-0019

Re: Central Everglades Planning Project

Dear Dr. Ralph:

I am writing to supplement the comments of Florida Crystals and its affiliates, including Okeelanta Corporation and New Hope Sugar Company, regarding the analysis of alternatives in the Central Everglades Planning Project (CEPP). For the last 18 months this company has been very engaged in the development of the state's Restoration Strategies Plan and we want to make sure the CEPP is fully compatible with that plan.

NEPA requires that for each alternative, the U.S. Army Corps of Engineers (Corps) must analyze the reasonably-foreseeable environmental impacts (40 CFR § 1508.8) and "any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented" (42 U.S.C. § 4332(2)(C)(v)). Among those impacts are potential water quality impacts resulting from implementation of the CEPP. We ask that in the draft Project Implementation Report / Environmental Impact Statement (PIR/EIS), the Corps analyze the likely water quality effects of each alternative in the Water Conservation Areas (WCA's) and Everglades National Park.

In addition to estimating the water quality effects, the Corps also should demonstrate that the various alternatives will result in compliance with (a) the Water Quality Based Effluent Limitations contained in the NPDES permits for the Stormwater Treatment Areas

(STAs), and (b) the provisions of the Consent Decree in United States v. South Florida Water Management District, Case No. 88-1886 (S.D. Fla.). Such an analysis is appropriate in light of the federal agencies' recent court submission which indicated that compliance with the NPDES permits for the STAs would not necessarily lead to compliance with the Consent Decree and that "augmented remedial measures and projects" might be required. See the United States' Opposition to State Parties' Motion for Declaratory Order, pages 9-11 (filed November 26, 2012 in Case No. 88-1886).

Thank you for considering our comments. We look forward to continuing to work with the Corps as it moves forward with development of the CEPP. With kind regards, I remain,

Yours truly,

William Tarr
Vice President
Florida Crystals Corporation

/jcd
Copy w/encl. (via e-mail) to:
Mr. Joe Collins, SFWMD, Chair
Mr. Kevin Powers, SFWMD, Vice Chair
Ms. Sandy Batchelor, SFWMD Board Member
Mr. Daniel DeLisi, SFWMD Board Member
Mr. James J. Moran, SFWMD Board Member
Mr. Daniel O'Keefe, SFWMD Board Member
Mr. Juan M. Portuondo, SFWMD Board Member
Mr. Timothy Sargent, SFWMD Board Member
Mr. Glenn J. Waldman, SFWMD Board Member
Ms. Melissa Meeker, SFWMD
Mr. Ernie Barnett, SFWMD
Mr. Matt Morrison, SFWMD
Mr. Tom Teets, SFWMD
Ms. Kimberly Taplin, USACE
Mr. Steven Kopecky, USACE
Mr. Dennis Duke, Interior
Mr. Neal McAliley

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March 30, 2012

VIA E-MAIL AND U.S. MAIL

Dr. Gina Padua Ralph
U.S. Army Corps of Engineers
Planning Division
P.O. Box 4970
Jacksonville, Florida 32232-0019

Re: Central Everglades Planning Project

Dear Dr. Ralph:

I am writing to provide additional comments of Florida Crystals and its affiliates, including Okeelanta Corporation and New Hope Sugar Company, on the Central Everglades Planning Project (CEPP). We appreciate the U.S. Army Corps of Engineers' (Corps) consideration of our initial comments on the scope of the CEPP. Based upon our review of the Corps' response to those comments issued March 1, 2012 (Scoping Response), we want to reiterate and expand upon several important points.

Florida Crystals continues to support the goal of the CEPP, which as we understand it, is to bring important restoration projects on-line sooner, consistent with the approved 1999 Comprehensive Everglades Restoration Plan. The 1999 Approved Plan calls for restoring the Everglades while providing for other water-related needs of South Florida. For purposes of the CEPP, this means (among other things) addressing the water supply needs of existing uses that rely on Lake Okeechobee, and designing a project that uses lands purchased in the Everglades Agricultural Area (EAA) and elsewhere to implement the 1999 Approved Plan. We believe that the Corps can develop a plan for the CEPP which meets those criteria and remains true to the stakeholder consensus that led to

Congressional authorization of the 1999 Approved Plan. Our comments today focus on the integration of the CEPP with other ongoing activities, and the Corps' commitment to provide pre-CERP levels of service to agricultural and urban water uses in the CEPP development process.

Misidentification of Stakeholder Comments. As an initial matter, the Corps misidentified comments from agricultural stakeholders in its Scoping Response. Florida Crystals' comments were identified as the comments of the Sugar Cane Growers Cooperative of Florida (and labeled as "Sugar") comments, while the Cooperative's comments were identified as the comments of Florida Crystals (and labeled as "Crystals"). The Corps should correct this error.

Projects Included within the CEPP. We previously identified nine components of the 1999 Approved Plan which fit the general description of the CEPP. The Scoping Response confirms that five of those components are included, included a sixth component ("Bird Drive Recharge Area (U)") which we did not identify, and was silent regarding the remaining four projects on our list. Scoping Response, at 46 (response to Sugar-2).

The Corps needs to explain why it is not including in the CEPP all of the relevant components of the 1999 Approved Plan. The Corps' Federal Register notice indicated that the CEPP is the "heart of CERP" and is the Corps' effort to address water levels in Lake Okeechobee, water deliveries to the Water Conservation Areas, and sheetflow in the Everglades. 76 Fed. Reg. 75539 (Dec. 2, 2011). The project components left off the Corps' list all address those issues. Moreover, the Corps appears to be considering proposals in the CEPP that are addressed by those missing components, e.g., consideration of seepage management measures along the WCA 3A and 3B levee (which is missing component "Q"). We are concerned that failure to include them signals that the Corps effectively is abandoning them. Abandoning components of the 1999 Approved Plan is too significant a change to the CERP for the Corps to do it silently. If the Corps does not include them in the CEPP, then you should explain why and set forth how the Corps intends to address them in some separate process.

We have a much greater concern that the CEPP itself is not integrated with other ongoing Corps and SFWMD projects in the same locations and dealing with the same subject matter. The CERP was conceived of as the "Comprehensive Everglades Restoration Plan."

The expectation of stakeholders and Congress was that the 1999 Approved Plan would be integrated with and guide all changes to the Central and Southern Florida Project. See, e.g., WRDA 2000, §601(b)(1)(B) (directing Corps to integrate implementation of CERP "with ongoing Federal and State projects and activities); WRDA 1996, § 528(b)(2)(B), -(3)(A), -(c)(1) (providing that ongoing Corps actions should be consistent with Governor's Commission for Sustainable South Florida conceptual plan, which is the template of the CERP). The Corps announced the CEPP as "[a]n integrated study effort" for the Central Everglades that will "set the direction for the next decade of CERP implementation." 76 Fed. Reg. 75539 (Dec. 2, 2011).

Despite that guidance the Corps is not integrating other agency activities, such as the rehabilitation of the Herbert Hoover Dike (HHD) and the Lake Okeechobee regulation schedule (e.g., making permanent the 2008 regulation schedule, which is discussed further below). The Corps also is not addressing the State's Long-Term Plan to address Everglades water quality issues approved by the Florida Legislature, § 373.4596(3), Fla. Stat. The Long-Term Plan, in particular, calls for canal conveyance improvements in the EAA and construction of a reservoir at the EAA A-1 site that would include opportunities for agricultural water storage. The Corps also is not addressing the measures under consideration related to ongoing court cases that would affect water quality and discharges from the EAA to the Water Conservation Areas. These measures are inherently interrelated with any CEPP plan designed to use the A-1 site or which involved changes in water flows in the EAA, and yet the CEPP without explanation does not include them within its scope.

The lack of integration of the CEPP with these other projects hobbles the ability of the Corps and SFWMD to address the water-related needs of the region. By keeping activities related to Lake Okeechobee separate, the Corps is taking off the table reasonable alternatives related to the lake which could address water storage. By not integrating the CEPP with consideration of new Stormwater Treatment Areas and related features in ongoing litigation, the Corps has two different projects that potentially will use the same SFWMD-owned lands in the EAA and that will compete for the same limited pool of funds at the SFWMD. The result has been confusion, because the public does not know which lands in the EAA are available for the CEPP or whether the SFWMD will be able to afford to participate in the CEPP at all. This lack of integration is inconsistent with Congress' directives to the Corps. See, e.g., WRDA 2000, § 601(b)(1)(B) ("In carrying out the Plan, the Secretary

shall integrate the [1999 Approved Plan] with ongoing Federal and State projects and activities…"); 33 U.S.C. § 2282a(f)(1)(A)(i) ("assessments for a water resources project shall include recommendations for alternatives … that, as determined in accordance with the non-Federal interest for the project, promote integrated water resources management").

We recommend that the Corps make the CEPP a truly integrated study that will allow all relevant proposals and activities to be evaluated together. This will facilitate transparency regarding available land and funds for new projects, and allow everyone to know the trade-offs inherent in each element of these activities. It is also more likely to identify a plan with the most benefits for the least cost.

Status of 2008 Lake Okeechobee Regulation Schedule (LORS 2008). The Corps' Scoping Response heightens our concerns about Lake Okeechobee water supply issues. In particular, the Scoping Response makes it appear that the Corps is using the CEPP to convert LORS 2008 from an interim to a long-term, effectively permanent regulation schedule.

In its Final EIS for the LORS 2008 regulation schedule (which was adopted in the Record of Decision), the Corps stated:

"The Corps expects to operate under the LORS until the earlier of (1) implementation of a new Lake Okeechobee schedule as a component of the system-wide operating plan to accommodate the Comprehensive Everglades Restoration Plan (CERP Band 1 projects) and the State of Florida's fast track Acceler8 projects, or (2) completion of the [Herbert Hoover Dike] HHD seepage berm construction or equivalent dike repairs for reaches 1, 2 and 3. [T]he Corps will timely shift from the interim LORS to a new schedule with the intent to complete any necessary schedule modifications or deviations concurrent with completion of (1) or (2)." LORS 2008 Final SEIS iv (Nov. 2007) (emphasis added).

The Corps' assurances that LORS 2008 would be a relatively short-term plan were part of the basis for many stakeholders in South Florida to not oppose it in 2008. At that time, the Band 1 Projects all were scheduled to be completed by 2015, which meant that LORS 2008 was projected to be in effect for only seven years.

In its Scoping Response for the CEPP, the Corps now is indicating that LORS 2008 is a long-term, or even permanent, schedule. First, instead of assuming that LORS 2008 will no longer

be in effect once the "Band 1 Projects" and the key HHD repairs are complete, the Corps now assumes it could remain in effect for the next 50 years regardless of those projects' completion. The Scoping Response states that "[t]he future without project condition includes the assumption that the Herbert Hoover Dike (HHD) rehabilitation will be complete." Scoping Response, at 22 (response to FDACS-1). The Corps also assumes that the projects previously referred to as "Band 1 Projects" will be complete: the future without project condition includes the "First Generation" and "Second Generation" (i.e., the Corps is assuming that they will be completed), which when combined with the CEPP itself, represents all of the projects formerly identified as the "Band 1 Projects." In other words, both of the triggers for revision of the "interim" LORS 2008 will occur prior to, or concurrent with, the CEPP. Yet, the Corps Scoping Response indicates that "the LORS 08 schedule will be used" as the future without project condition. The Scoping Response also states that "[t]he CEPP study will not be the mechanism for changing LORS," Scoping Response, p. 22 (response to FDACS-1), and that "any analyses conducted during the study will not predetermine a change to the lake schedule … as a result of additional CERP project implementation," id. at 38 (response to Crystals-3). If the CEPP is the "CERP project implementation" that will trigger changes to LORS 2008 (as indicated by the Corps in 2008), then the logical time to consider such changes to the lake schedule would be in the CEPP itself. The Corps' refusal to even consider such changes is inconsistent with its commitments made in 2008.

Second, the Corps appears to be changing its triggers for revisiting LORS 2008. In 2008, the Corps identified two separate triggers for revisiting LORS 2008: completion of a subset of HHD rehabilitation measures ("seepage berm construction or equivalent dike repairs on reaches 1, 2, and 3"), and the completion of the CERP Band 1 Projects and Acceler8 projects. LORS 2008 Final SEIS iv (Nov. 2007) (quoted above). Now, in its Scoping Response, the Corps states only that "LORS will be revisited upon completion of HHD modifications." Scoping Response at 37 (response to Crystals-2). This new formulation completely drops the trigger associated with completion of the early CERP projects (which will be fully accomplished through the CEPP itself), and it apparently makes consideration of a new regulation schedule dependent on completion of all HHD repairs, which will not be done for many years. The effect is to allow the Corps to keep LORS 2008 in effect for decades, contrary to what the agency told stakeholders only a few years ago.

The Corps' failure to consider changes to LORS 2008 in the CEPP also appears inconsistent with the 1999 Approved CERP Plan. The 1999 Approved Plan includes a new "Lake Okeechobee Regulation Schedule (F)" as a Plan component. The purpose of that component, in part, was to develop operational rules for "discharges … to the Everglades Agricultural Area reservoir." Final CERP Integrated Feasibility Study and Programmatic EIS, at 9-29 (1999). According to the 1999 Approved Plan, "[m]ost of the operational features will be implemented in association with related construction features." Id. For the "Lake Okeechobee Regulation Schedule (F)" component, one of the logical times to implement it would be in plan development for the "Everglades Agricultural Storage Reservoirs (G)" component, which the Scoping Response indicates is part of the CEPP. For the Corps now to say that it will not consider operational changes to Lake Okeechobee in association with the CEPP is inconsistent with the 1999 Approved Plan.

Many stakeholders are very concerned that the Corps is abandoning its commitments made in 2008 that the LORS 2008 schedule would be an interim schedule, and is making the LORS 2008 schedule permanent. This has the potential to undermine the CEPP, because it affects whether stakeholders will have the benefit of the Savings Clause enacted in 2000 with the changes made in the CEPP. The Corps can address this issue by agreeing to consider changes in the Lake Okeechobee regulation schedule as part of the CEPP and defining the water supply level of service in effect in 2000 as one of the goals of the CEPP. Also, if the Corps' statements in the Scoping Response regarding the longevity of LORS 2008 were mistaken, then the agency should immediately clarify its position.

Study Biases Related to Lake Okeechobee Water Storage. The Scoping Response also indicates that the Corps is building an inappropriate bias into the CEPP study related to storage and water levels in Lake Okeechobee. In response to a comment about the need for more water storage in the lake, the Corps stated that it would not consider changes to LORS 2008 in the CEPP and justified that decision based (in part) on the impacts of higher water levels on lake ecology. See Scoping Response, at 37 (response to Crystals-2). By so doing, it appears the Corps is taking "off the table" additional water storage in the lake based on the Corps' pre-study decision that the alleged impacts of higher water levels on in-lake vegetation will outweigh any regional benefits that could be provided by additional water storage in the Lake. This will bias the CEPP's analysis, because it means that the Corps is unwilling

to consider alternative plans which would reduce storage needs in the EAA and still avoid significant impacts to in-lake resources. We believe that is entirely inappropriate.

The Corps also appears to be assuming that LORS 2008 will be implemented in the future, without the adaptive protocols adopted by the South Florida Water Management District in 2010. When LORS 2008 was implemented, the SFWMD developed protocols designed to provide operational guidance in areas where the schedule alone is ambiguous. Among other adjustments, the protocols reflect the desire to eliminate Base Flow releases to the St. Lucie Estuary when the LORS 2008 schedule assumed they would be made. Recent modeling of the "Future Without Project Condition" (which will be the "no action" alternative under NEPA) shows significant reduction in the Lake stage and a noticeable increase in water shortage severity in several drought years. One of the causes of this reduction in the level of service for water supply is likely the way the LORS 2008 Schedule was assumed to be implemented for the FWO condition.

The Corps' failure to consider in-lake storage alternatives is inconsistent with important policy directives. The Florida Legislature made an express statutory finding "that additional water storage may be an appropriate use of Lake Okeechobee." § 373.4592(1), Fla. Stat. The Corps justified the cost of repairs to the HHD, as recently as last month in the FY 2013 Civil Works Budget Detail prepared for Congress, on grounds that such repairs "will allow the Corps to hold more water safely in the Lake, … enable the Corps to release excess water to the estuaries … in a more controlled, less damaging fashion," and "enable the Corps to release more water during dry periods to benefit the ecosystem of the Everglades." The National Research Council, in its 2008 Second Biennial Review of the CERP, stated that "rehabilitation of [HHD] may offer synergistic opportunities for creating additional CERP storage and managing water levels for the benefit of the littoral zone, and the costs, benefit, and hydrological and ecological viability of these options should be considered in any analysis of CERP storage alternatives." National Research Council, Progress Toward Restoring the Everglades: The Second Biennial Review, 182-83 (2008). The Corps should consider such options in the CEPP in light of these statements and recommendations.

This study does not comport with NEPA. The Corps is indicating that it is not going to consider reasonable alternatives

to its proposals to store water in the EAA as opposed to in Lake Okeechobee. All environmental impact statements require an analysis of reasonable alternatives to a proposal. 42 U.S.C. § 4332(2)(C)(iii). Corps project recommendations, in particular, are required to include alternatives that "promote integrated water resource management," without "budgetary or other policy" constraints. 33 U.S.C. § 2282a(f)(1)(A)-(B). Agencies cannot categorically refuse to consider reasonable alternatives because the agency has pre-decided a discretionary policy choice. 40 CFR §§ 1502.2(e), 1502.14(a), -(c). The Corps' use of a "no action" alternative which does not represent reality, as discussed above with regard to the SFWMD operating protocols, is also inconsistent with NEPA. The Corps should take an unbiased, hard look at the environmental choices and include alternatives that would use the lake for water storage instead of adding all new storage in the EAA, and use an accurate "no action" alternative.

Modifications to the Lake Okeechobee Regulation Schedule may be the easiest and least expensive alternative to provide additional water storage for environmental and human needs. We urge the Corps not to "stack the deck" at the start of the CEPP process, by refusing to even consider such modifications.

Loss of Agricultural Water Supply. As indicated in our earlier comments, Florida Crystals continues to be very concerned about the potential loss of water supply as a result of the CEPP. The Scoping Response does not dispute that LORS 2008 provides less water supply to agricultural uses than the previous WSE regulation schedule. See Scoping Response at 39-40 (response to Crystals-10). The Corps' own documents indicate that the LORS 2008 has a significant negative effect on agricultural water supply: attached is a 2007 Corps analysis which shows major negative impacts to agricultural water supply from that schedule. History has borne out those projections, as the water shortage in the spring of 2011 was made more severe by the releases of water from the Lake under the LORS 2008 Schedule. We are very concerned that the CEPP appears in contrary to the Savings Clause in WRDA 2000 as a result of its approach to water storage in Lake Okeechobee.

Recent presentations of hydrologic modeling outputs for the "Future Without Project Condition" reinforce our concerns about impairing the protections of the Savings Clause. In those presentations, water supply restrictions in the Lake Okeechobee Service Area are projected to increase. It is impossible based on the information presented to specify what is causing the impact but

at least one of the reasons is likely to be the assumptions about the C-44 Reservoir, a CERP project. The Project Implementation Report for the Indian River Lagoon (IRL) indicates that operation of the C-44 Reservoir will lead to a significant reduction in flow to the lake in low-water conditions. The Savings Clause prohibits the Corps from implementing such measures to the detriment of existing water uses without ensuring that there is a replacement source available. The IRL Project Implementation Report failed to consider the impact of this reduction in flow to Lake on other users in the Lake Okeechobee Service Area. The fact that the Corps appears to be ignoring the Savings Clause in its analyses of other CERP components, and is implementing the C-44 project despite Savings Clause issues, is troublesome.

Once again, the Corps should avoid the problem of waters supply reductions by considering changes to the lake regulation schedule to provide additional storage.

Limitation of CEPP to 1999 Approved CERP Plan. We previously commented that WRDA 2000 and the Programmatic Regulations require the Corps to limit the CEPP Project Implementation Report to the 1999 Approved Plan. The Scoping Response did not seem to respond to that point. We recognize the recommendation of the National Research Council that the Corps should follow an "incremental adaptive restoration" approach, and we support the concept of adaptive management in the scientific context. However, that recommendation does not override the limitations in Congress' approval of the 1999 Approved Plan; the procedural requirements contained in the Programmatic Regulations; or the requirements in NEPA concerning supplementation of the 1999 Programmatic EIS for the CERP. If the Corps believes it can make significant changes to the 1999 Approved Plan through the CEPP Project Implementation Report, then it needs to explain the legal basis for that position.

Water Quality Planning Considerations. The Scoping Response does not explain how the Corps can plan the CEPP without knowing the land requirements and water quality targets of the ongoing water quality litigation. See Scoping Response at 49 (response to Sugar-8). The Corps should identify those requirements as soon as possible, because they are fundamental planning constraints which both limit the types of plans which can be considered for the CEPP and whether the SFWMD has the financial resources to satisfy the CEPP.

Water Supply Planning Considerations. The Scoping Response indicates that the Corps will include goals and performance

measures related to improved water supply and economic well-being, in response to our suggestion. Scoping Response at 49 (response to Sugar-9). We appreciate the Corps' response to our suggestion. However, we are concerned that the water supply goals are being treated only as "incidental" to other goals for the CEPP, and that only "[w]ater retained in the Lake that is not identified for the natural system may be available for water supply." Corps' Presentation to PDT Regarding CEPP "Revised Objectives," Slide 4 (March 26, 2012). By this language, the Corps is subordinating the water supply needs of the people of South Florida to other goals, which is contrary to the 1999 Approved Plan and WRDA 2000. The Corps does not need to put local communities in a subservient position in order to achieve the environmental goals of the CEPP, and should treat the water supply objective as co-equal with other objectives in the CEPP.

Improved Flood Protection. The Scoping Response indicates that the Corps will include "protecting existing levels of flood protection" as a planning constraint. Scoping Response at 50 (response to Sugar-10). While we appreciate that improvement, we remind the Corps that we asked the Corps to use as a performance measure improving flood protection, because that is one of the specific authorized features of the EAA reservoir component contained in the 1999 Approved Plan. We ask the Corps not to abandon the goal of improving flood protection that was part of the 1999 Approved Plan and is a key component of the Central & Southern Florida Flood Control Project.

Restoration/Rehydration of Holey Land and Rotenberger Wildlife Management Areas. In response to our comment that the Corps should consider improvements to the Holey Land and Rotenberger Wildlife Management Areas as part of the CEPP, the Scoping Response indicates that "[t]he Corps will consider information from previous studies undertaken by the SFWMD to consider this option and determine if applicable for inclusion in the CEPP." Scoping Response at 40, 50 (response to Crystals-11 and Sugar-13). We are unaware of any studies by the SFWMD which address this issue; please identify them so Florida Crystals and others can provide input.

In addition, given the Corps' effort to fast-track the CEPP, it is unclear how much time the Corps has to determine if the Holey Land and Rotenberger components of the 1999 Approved Plan should be included in the CEPP. We continue to recommend that the Corps incorporate these components into the CEPP.

Thank you for considering our comments. We look forward to providing additional comments as the CEPP moves forward and the agencies develop specific proposals for public review.

With kind regards, I remain,

Yours truly,

William Tarr
Vice President
Florida Crystals Corporation

/jcd
Enclosure
Copy w/encl. (via e-mail) to:
Mr. Joe Collins, SFWMD, Chair
Mr. Kevin Powers, SFWMD, Vice Chair
Ms. Sandy Batchelor, SFWMD Board Member
Mr. Daniel DeLisi, SFWMD Board Member
Mr. James J. Moran, SFWMD Board Member
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Ms. Kimberly Taplin, USACE
Mr. Steven Kopecky, USACE
Mr. Dennis Duke, Interior
Mr. Tom MacVicar
Mr. Neal McAliley
Mr. Galen Miller

US Army Corps
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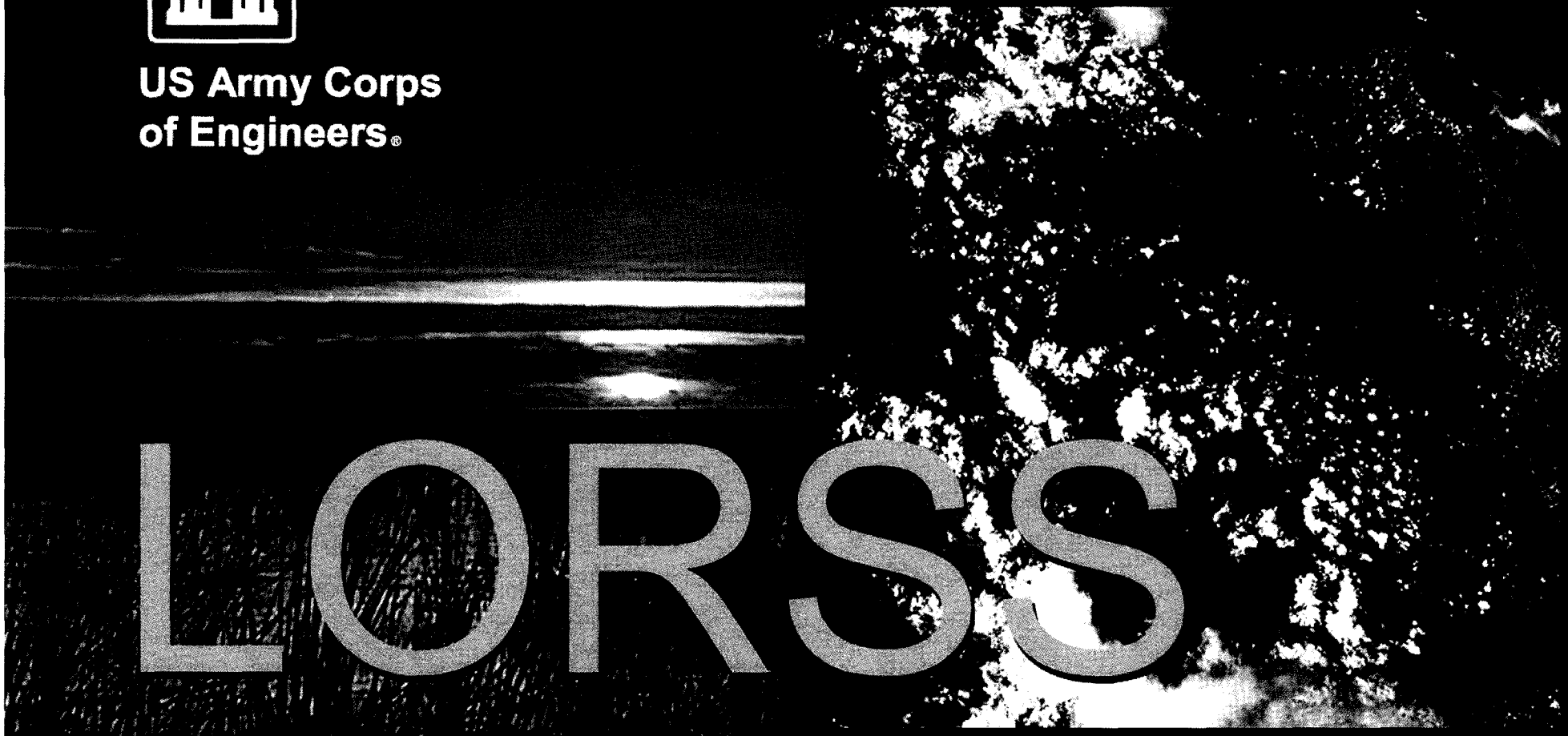


LORSS

Lake Okeechobee Regulation Schedule Study

Study Performance Objectives

Public Health & Safety	Lake Ecology	Waterway Navigation	Estuaries – Caloosahatchee & St. Lucie	Greater Everglades	Water Supply
Herbert Hoover Dike Structural Stability	Flora/ Fauna Threatened/ Endangered Species	Commercial/ Recreational Traffic Regional Economy	Flora/Fauna Threatened/Endangered Species Regional Economy	Flora/ Fauna Threatened/ Endangered Species	Human & Agricultural Consumption Needs of Environment

Agenda

- Background
- Revisions to Tentatively Selected Plan (TSP) for Lake Regulation Schedule
- Revisions to Draft Supplemental Environmental Impact Statement (SEIS)
- Summary
- Comments

Study Progress

2003 - 2005
High Water/
Hurricane
Activity

Aug - Oct 2006
Released draft SEIS
& TSP for Public
Review

Nov- Mar 2007
Revised draft
SEIS and TSP

Oct 2007
Release final
SEIS
& TSP for 30 Day
Public Review

Aug 2005
Initiated
LORSS
Study

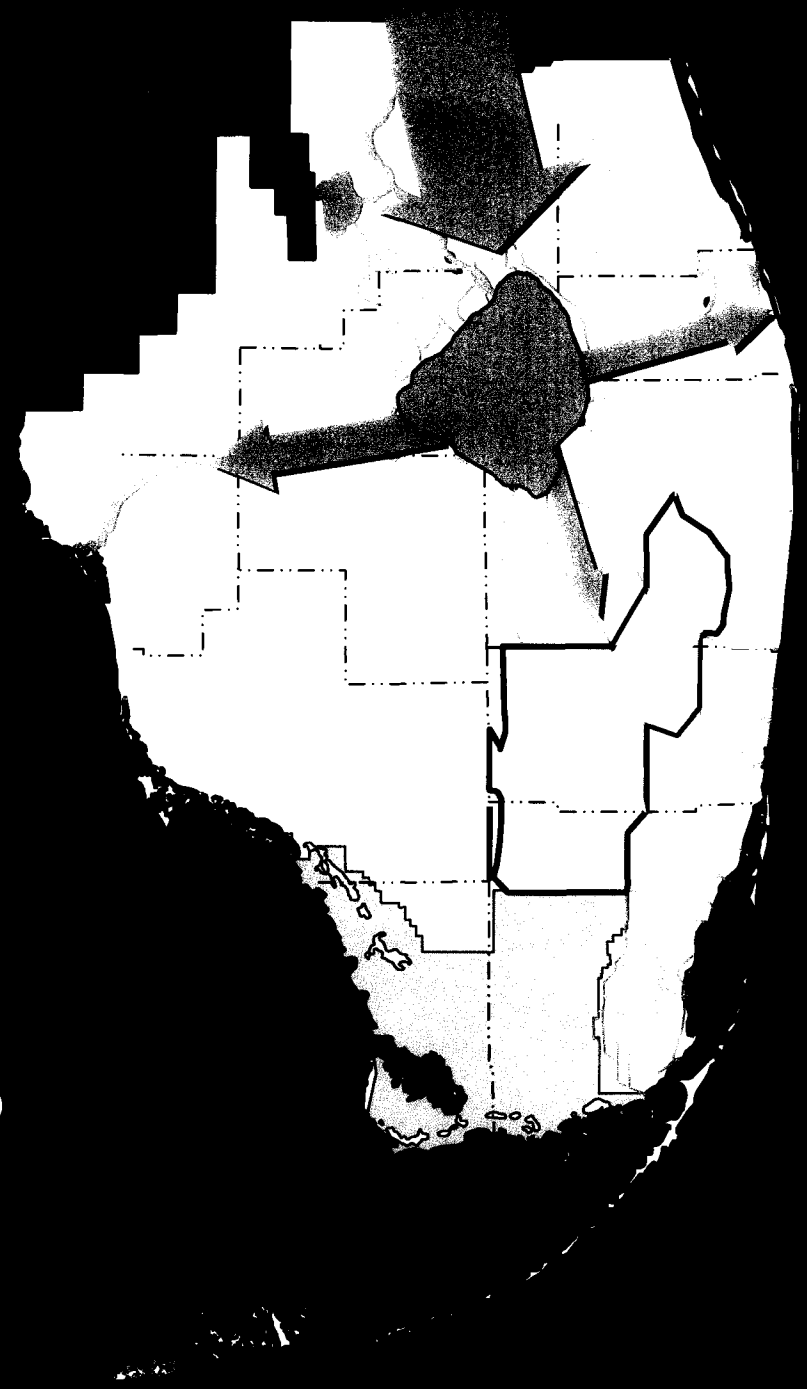
Oct 2006
Received
Public
Comments

6 Jul – 20 Aug 2007
Released revised draft
SEIS & TSP
for 45 Day Public
Review

Nov – Dec 2007
Approve new Lake
Okeechobee
Regulation
Schedule

Lake Management Challenges

One foot of rainfall in an already wet Okeechobee / Kissimmee basin equals about a *four-foot rise* in Lake Okeechobee. It would take about 75 days (max flow) to 230 days (preferred estuary flow) to return the lake to its original elevation.



Study Goals & Objectives

- Ensure public health and safety
- Manage Lake Okeechobee at lower lake levels
- Reduce high regulatory releases to the estuaries
- Meet Congressionally authorized project purposes

Key Study Assumptions & Constraints

- SFWMD - temporary forward pumps
- SFWMD - implement new Lake Okeechobee Water Shortage Management Plan (DRAFT)
- Herbert Hoover Dike integrity
- Existing C&SF infrastructure
- Storm Water Treatment Area (STA) 3 & 4 capacity
- Simulation period-of-record 36 years (1965 - 2000)

What We Heard

- 17.25 high lake constraint
- Consider SFWMD public / private lands for Lake water storage
- Water supply concerns
- Non-Typical Operations
- More equitable discharges to estuaries and WCA
- Release more low flows to reduce high discharges
- Concerns due to extreme high releases to Caloosahatchee Estuary
- Economic costs of high releases
- Account for wet weather cycle
- Release more water south
- Increase storm water treatment areas and storage reservoirs

What We've Done

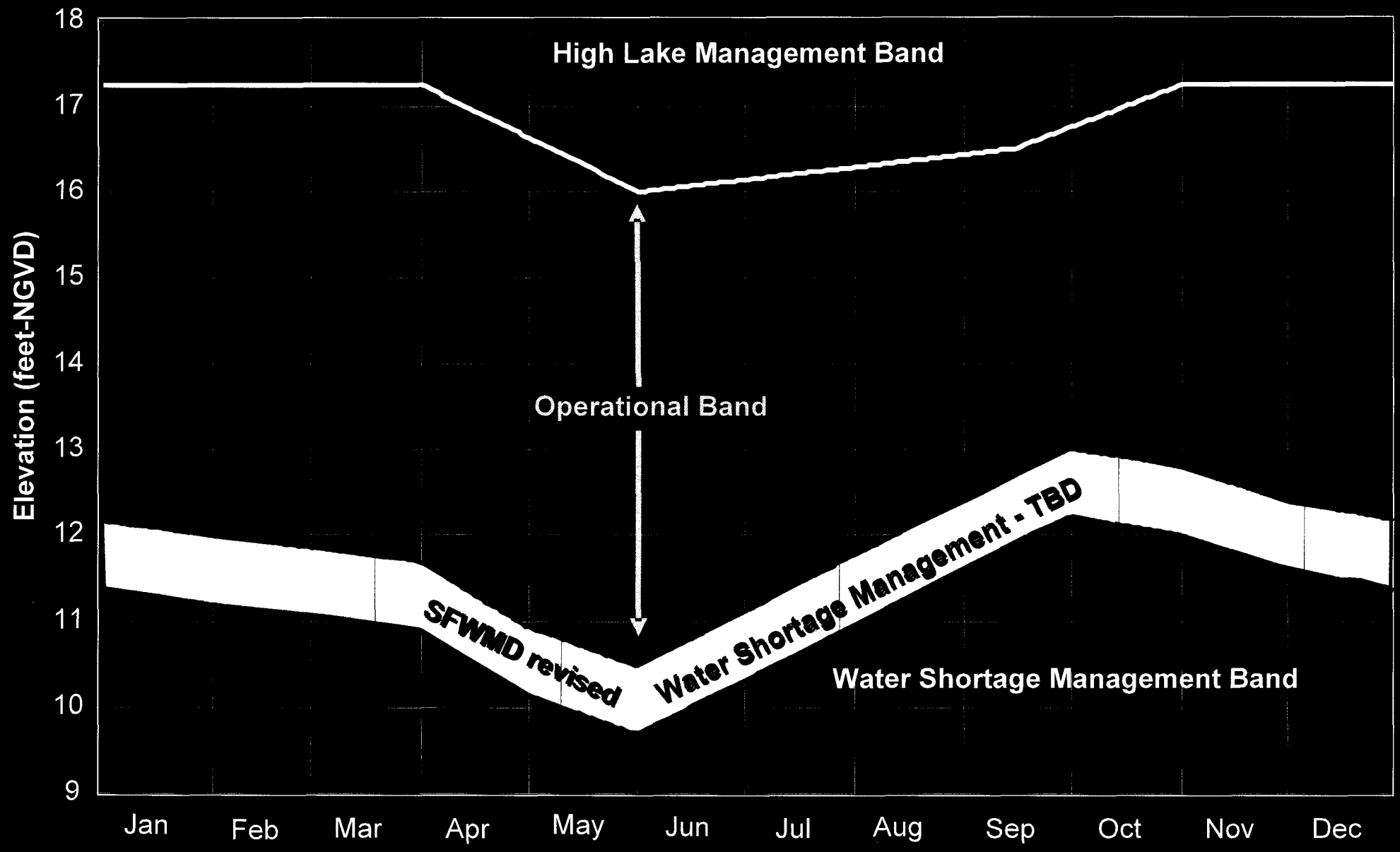
- Treats 17.25 as performance measure
- Manages the lake at lower elevations
- Allows for quicker response and operational flexibility to lake conditions and tributary inflows
- Improves preferred flow to the coastal estuaries
- Is equal to (extreme) and modestly improves (intermediate) high flow discharges to coastal estuaries
- Provides for base flow to the Caloosahatchee and St Lucie estuaries
- Measures pulse releases at S-79
- Allows for use of SFWMD lands for storage
- Expanding agency coordination on lake operations

Tentatively Selected Plan

Revised

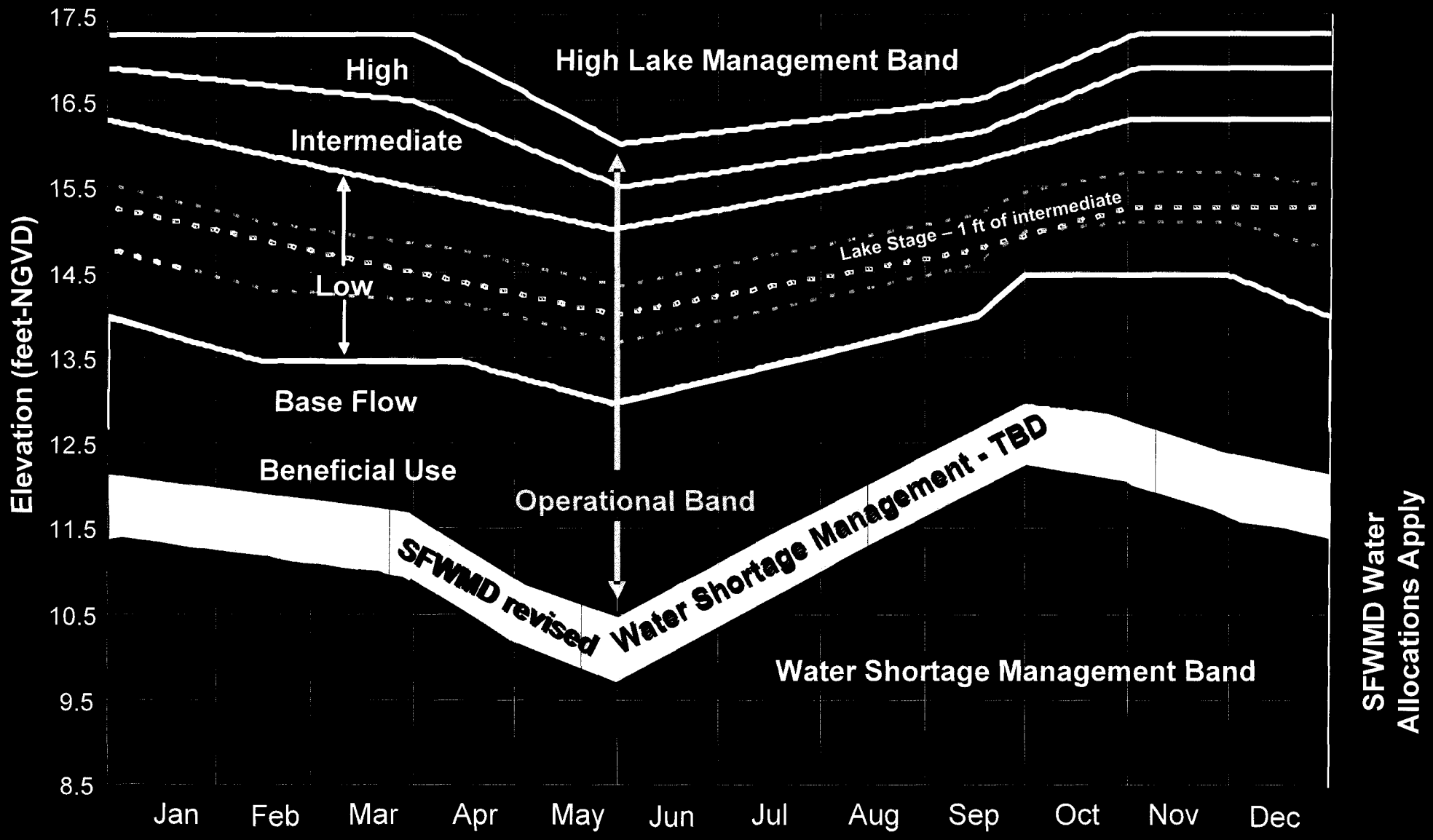
Revised TSP

Part A



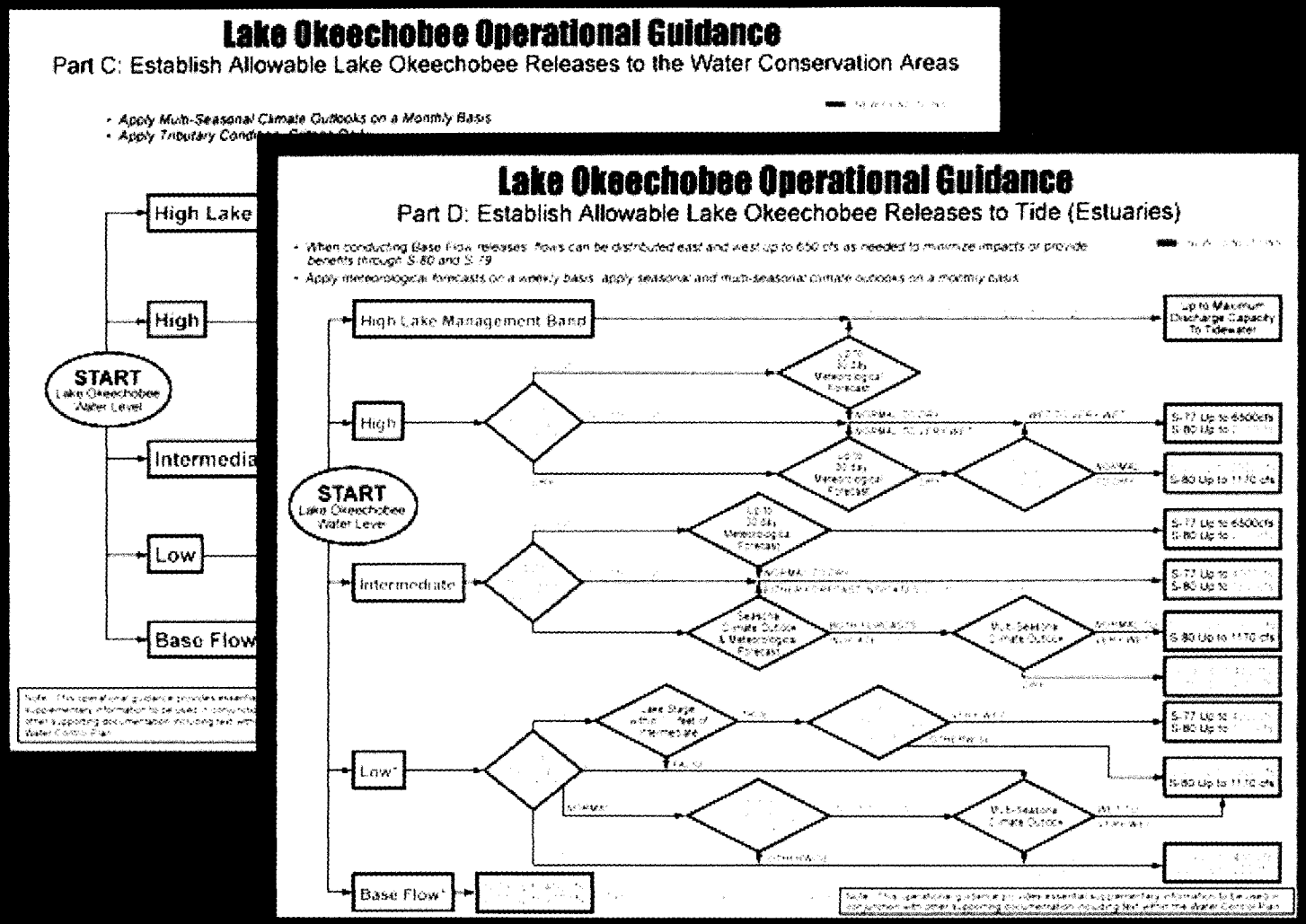
Part B

Revised TSP
Regulation Schedule Management Bands



Revised TSP - Operational Guidelines

Parts C&D



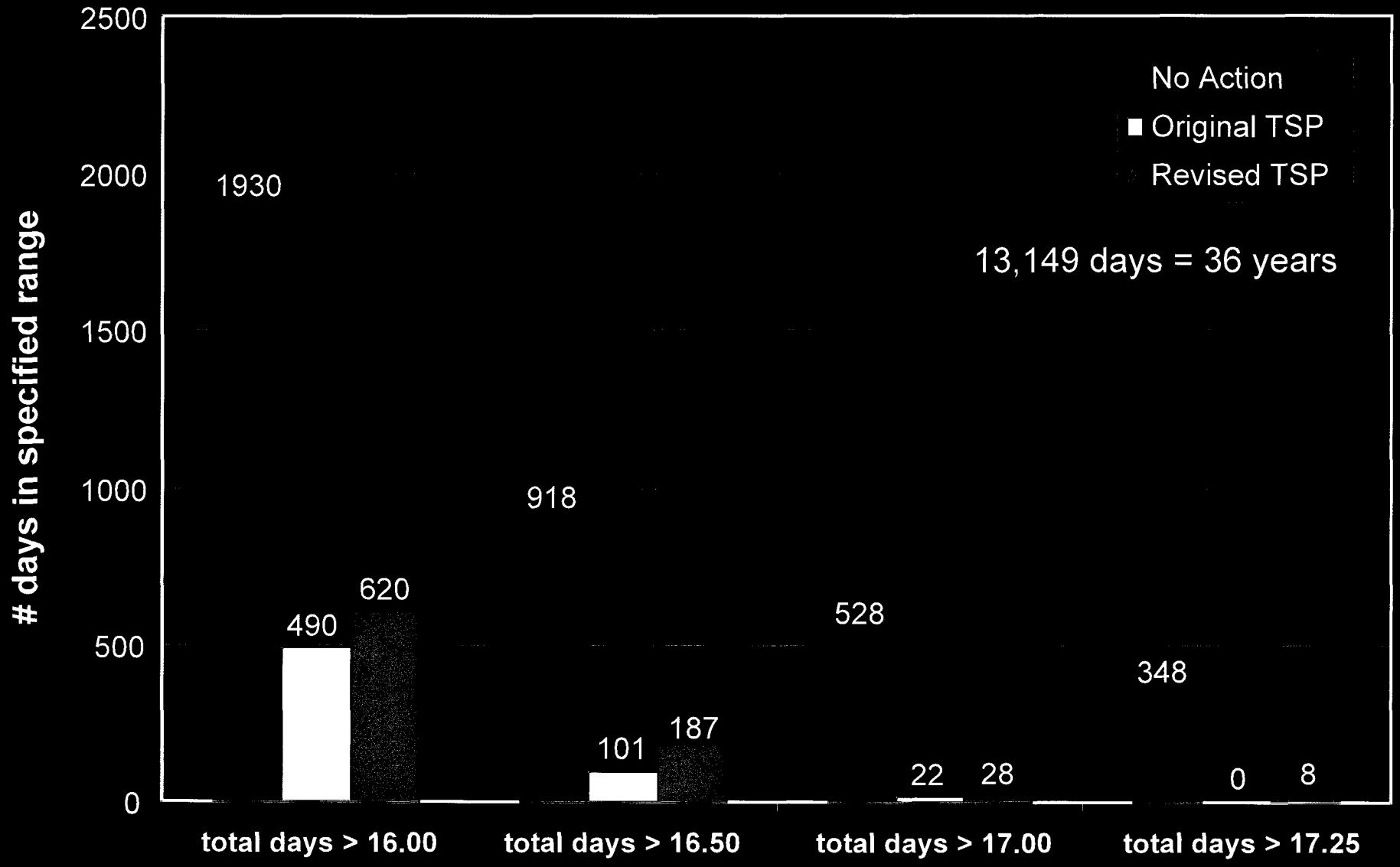
TSP Performance
Lake Okeechobee

Revised

TSP Performance

Lake Okeechobee - Public Safety

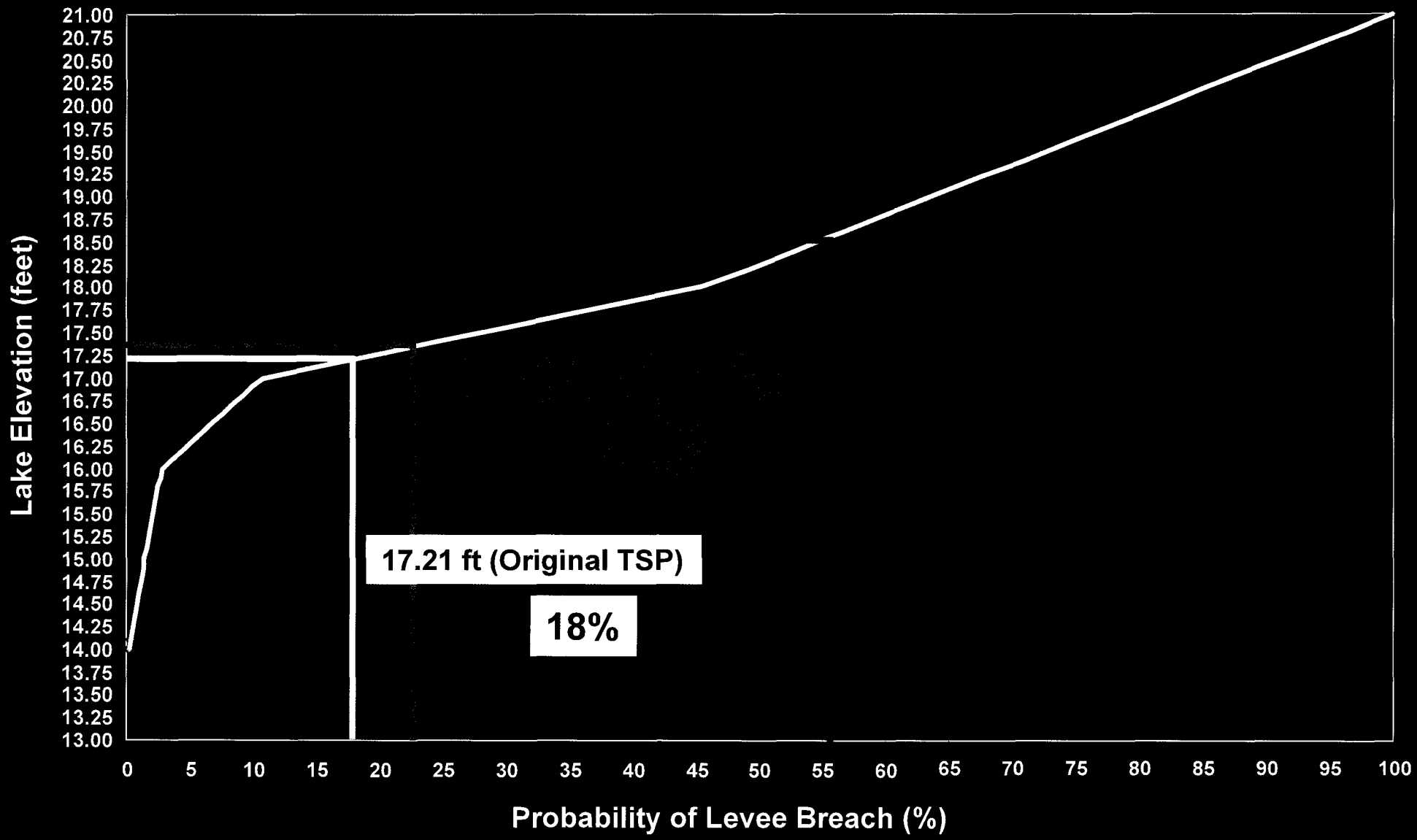
Summary of Lake High Stages (>16.00)



TSP Performance

Lake Okeechobee - Public Safety

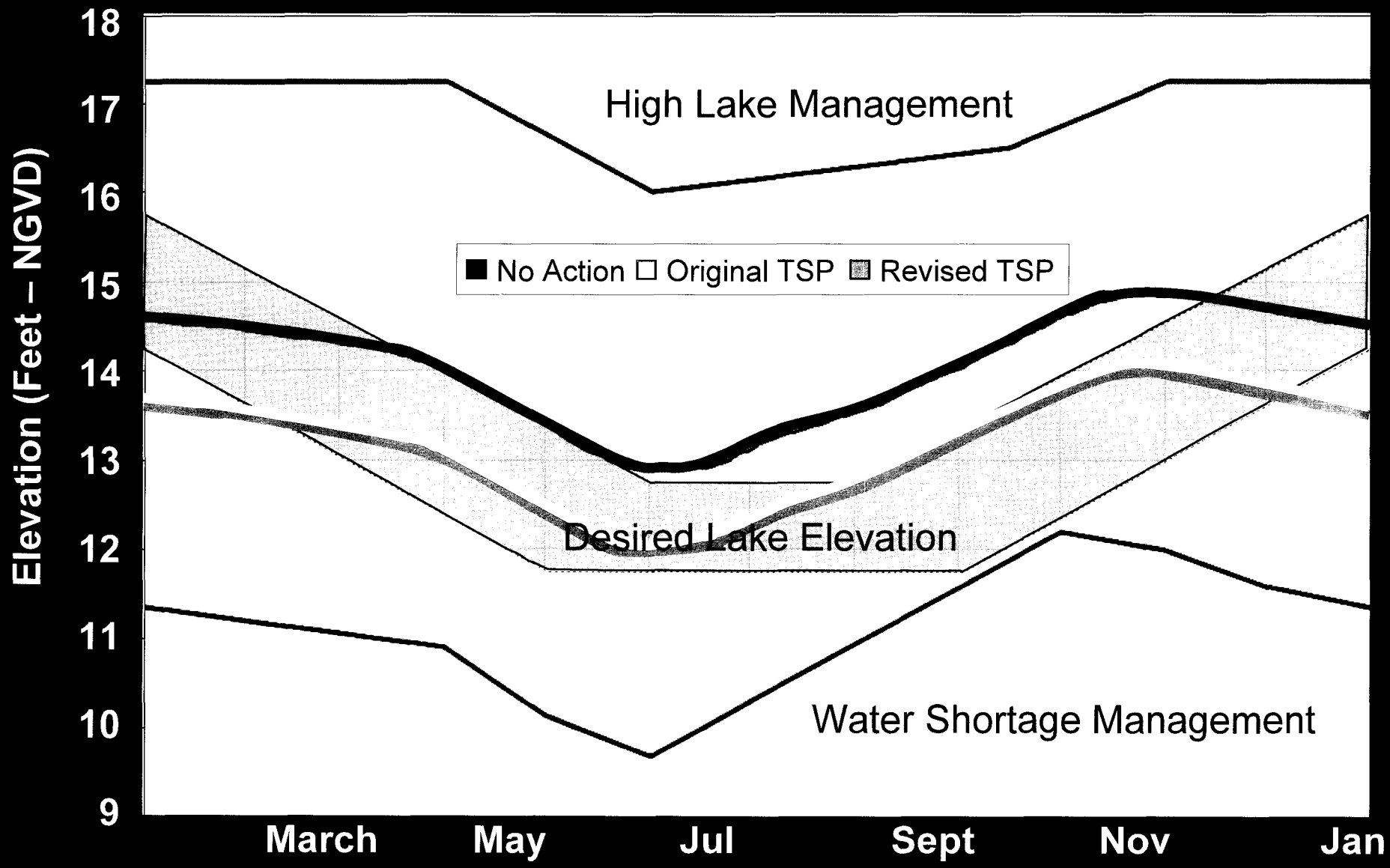
Combined probability of a levee breach at selected lake stages (without intervention)



TSP Performance

Lake Okeechobee - Ecological

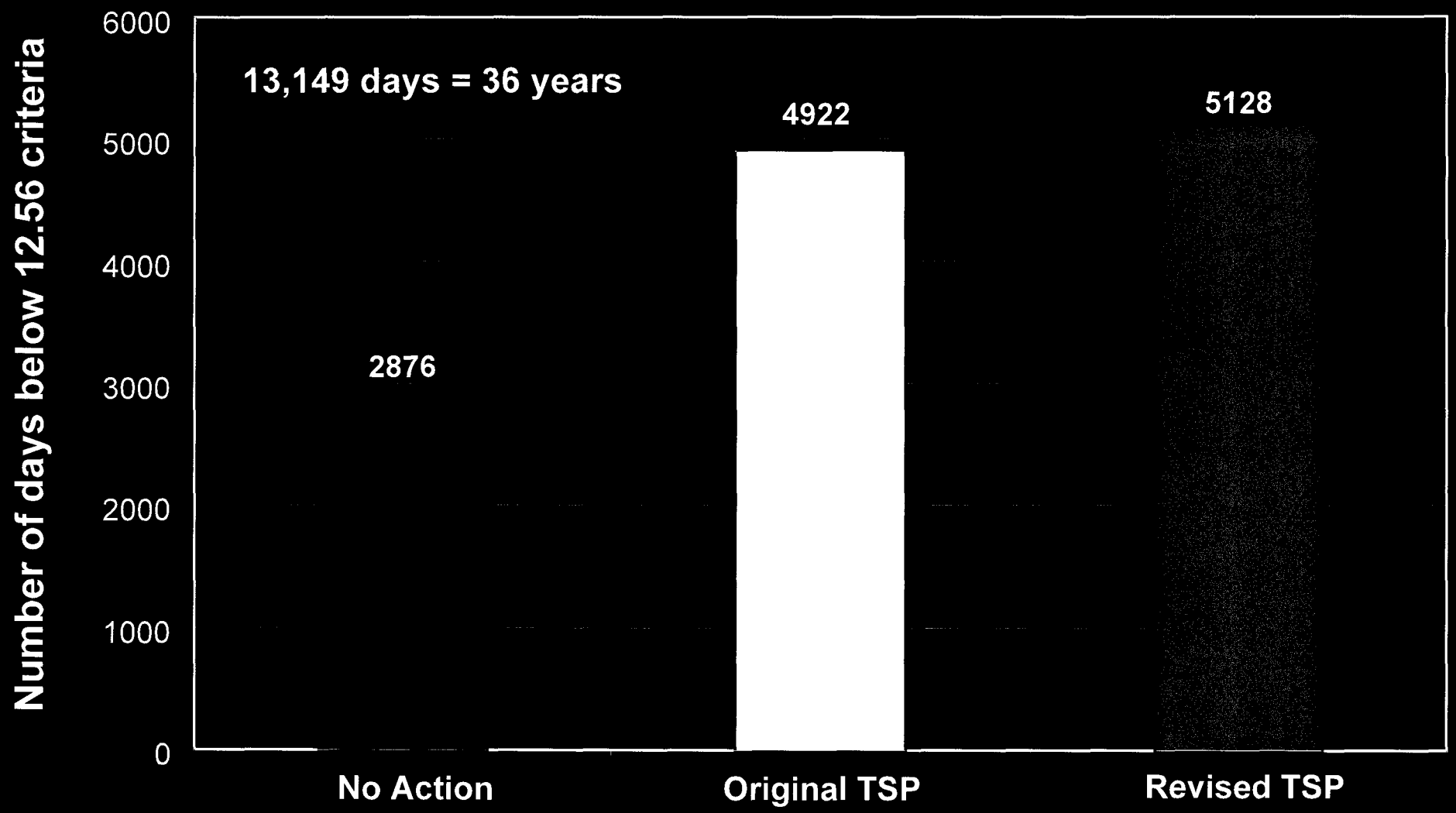
Lake Daily Average Elevation



TSP Performance

Lake Okeechobee Waterway - Navigation

Summary of Navigation Criteria, 12.56 feet



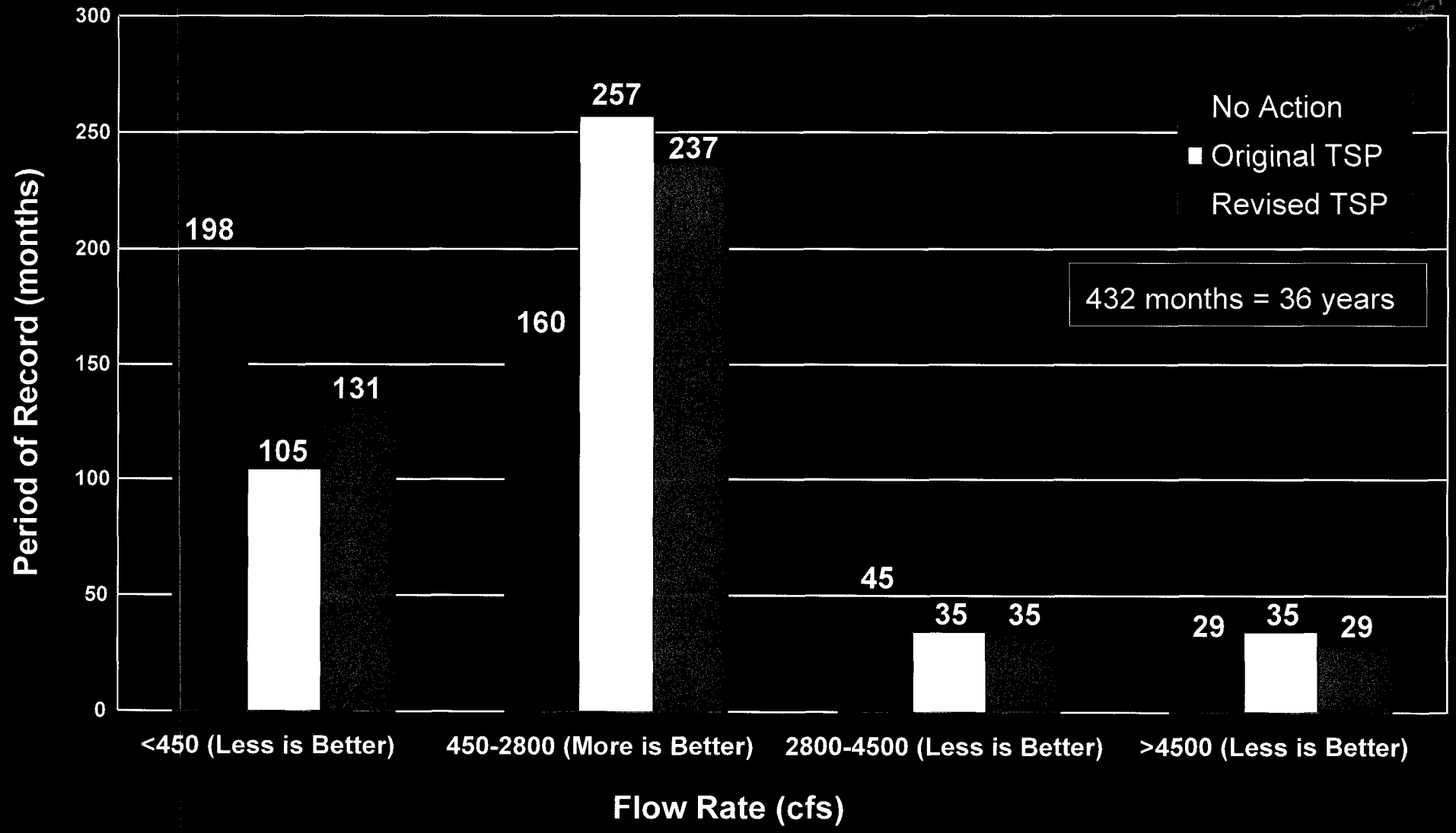
TSP Performance
Estuaries
Greater Everglades

Revised

TSP Performance

Caloosahatchee Estuary

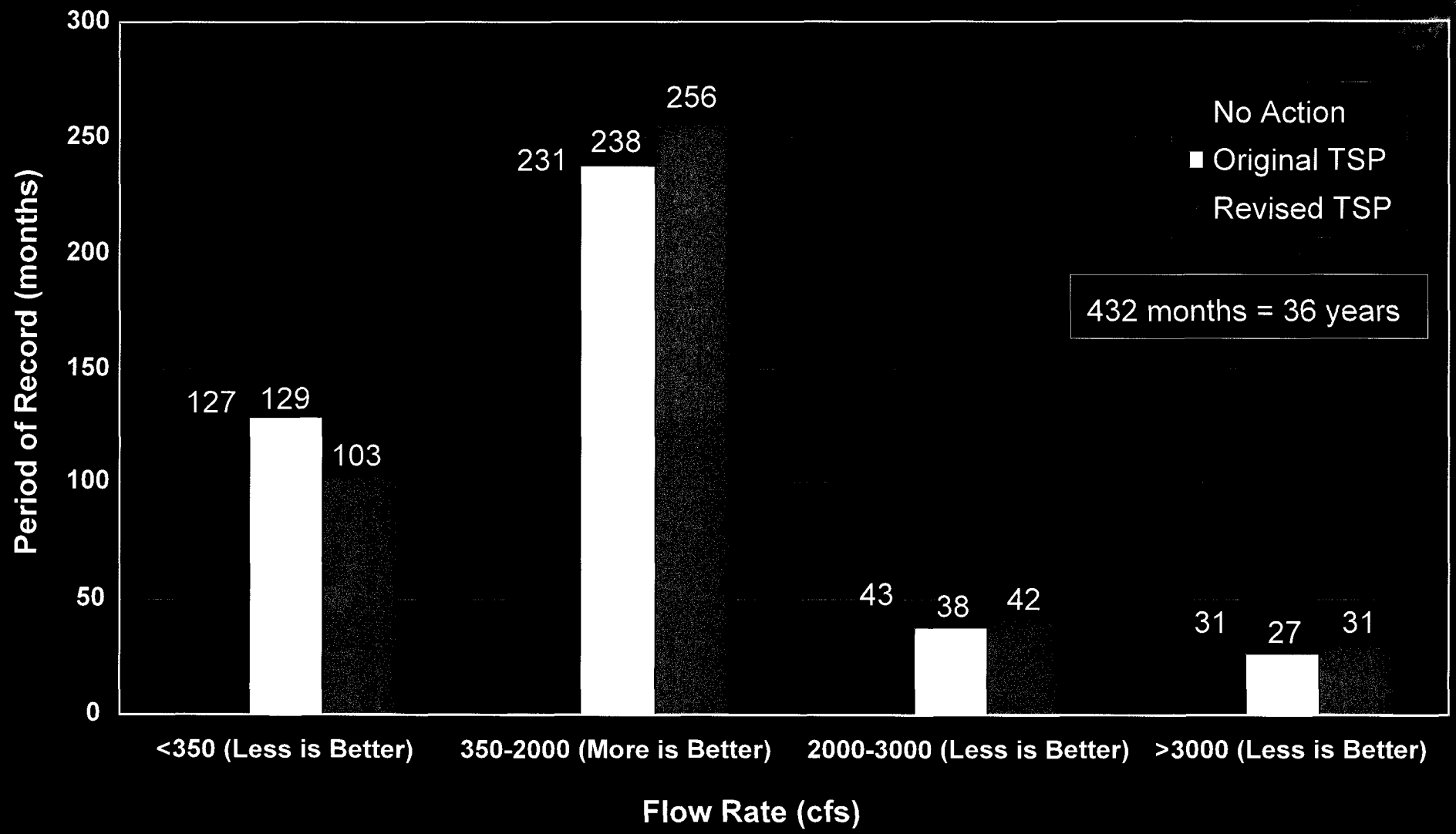
Distribution of Mean Monthly Estuary Inflows



TSP Performance

St. Lucie Estuary

Distribution of Mean Monthly Estuary Inflows



Greater Everglades

Performance Measures: Peat-dry out, tree island inundation, recession rates, water reversals, and snail kite habitat

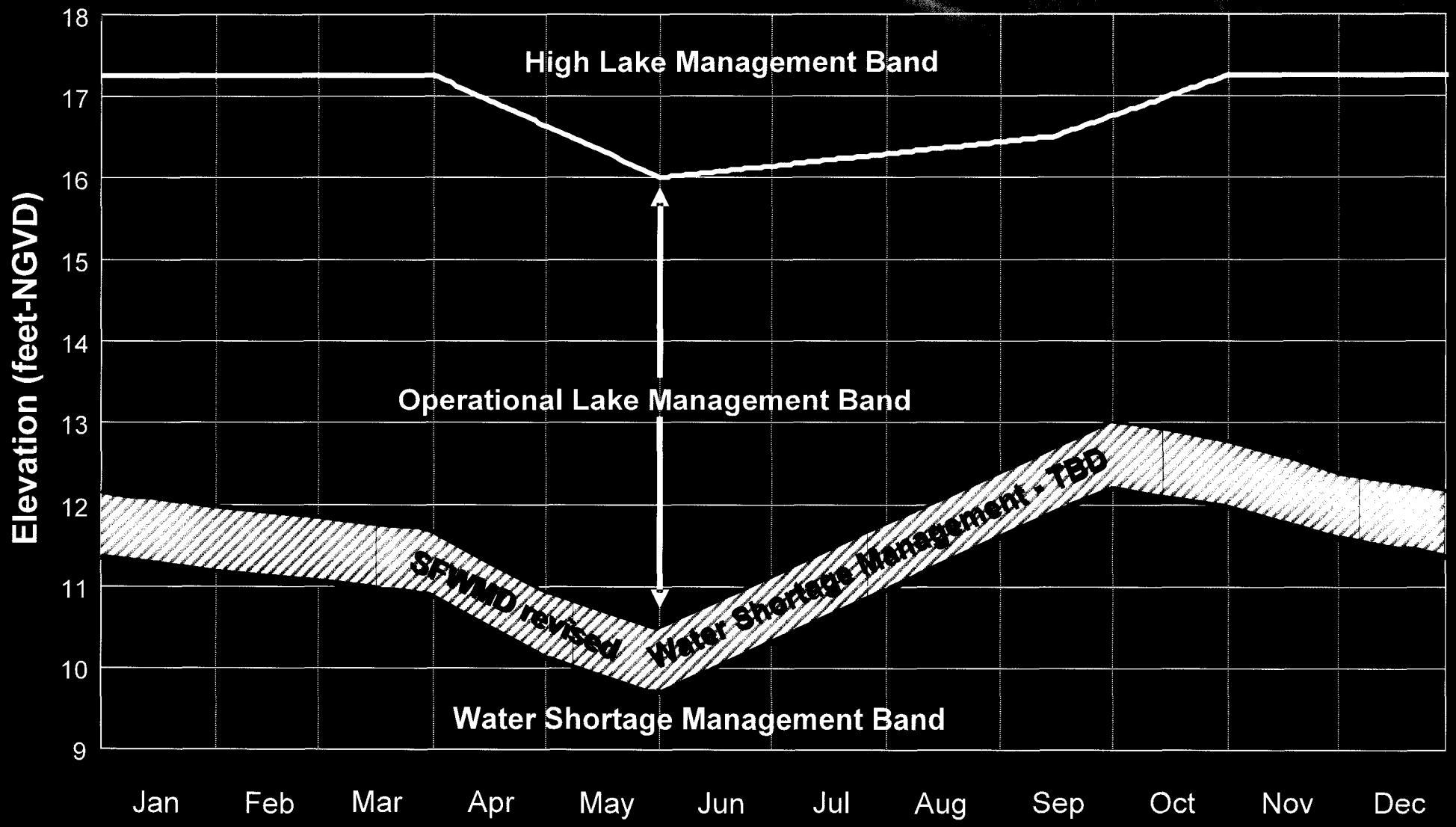
- Results show only minor differences between the alternatives analyzed
- Ecologically, none of the differences are significant

TSP Performance
Water Supply

Revised

TSP Performance

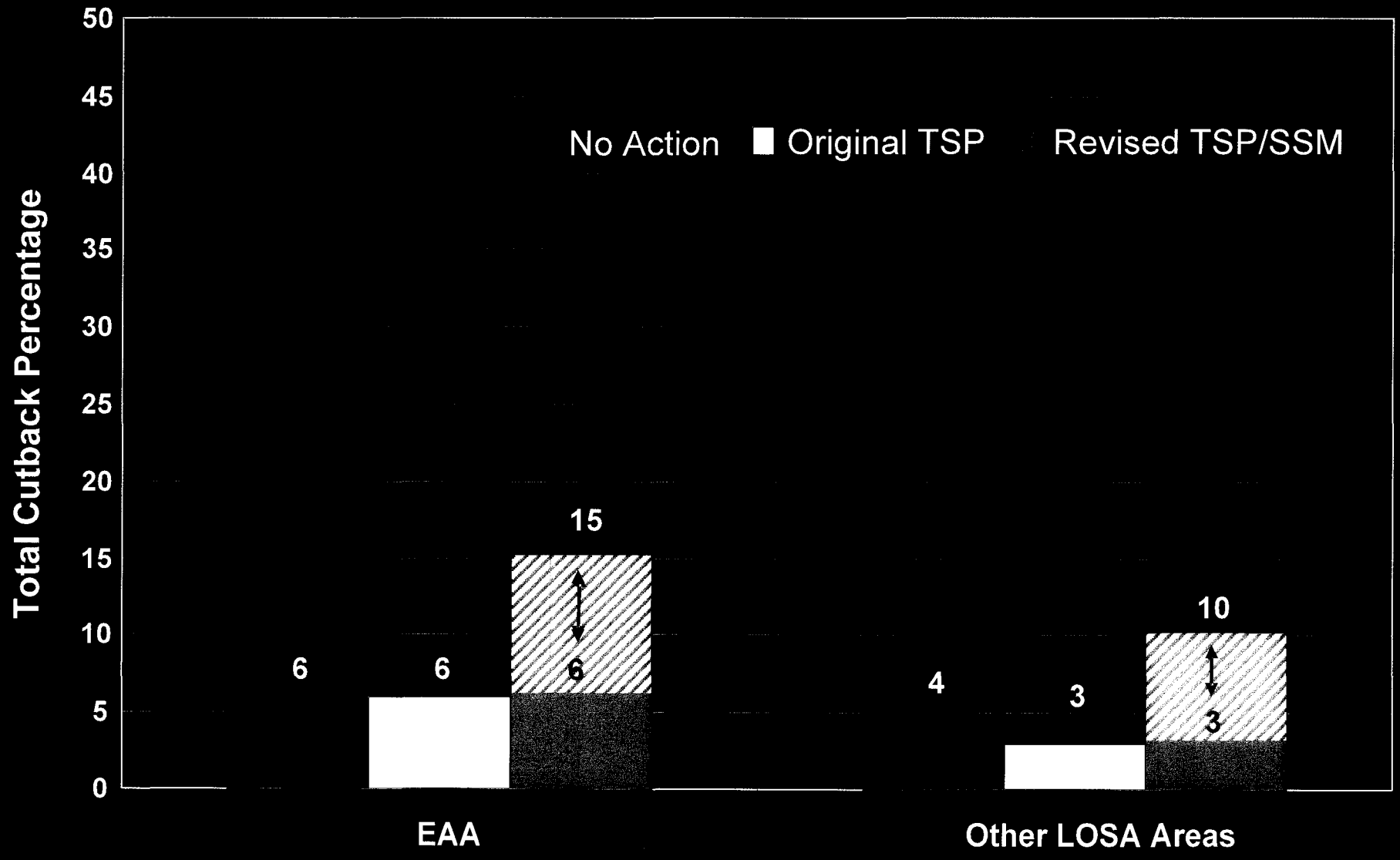
Water Supply – Revised TSP



TSP Performance

Water Supply

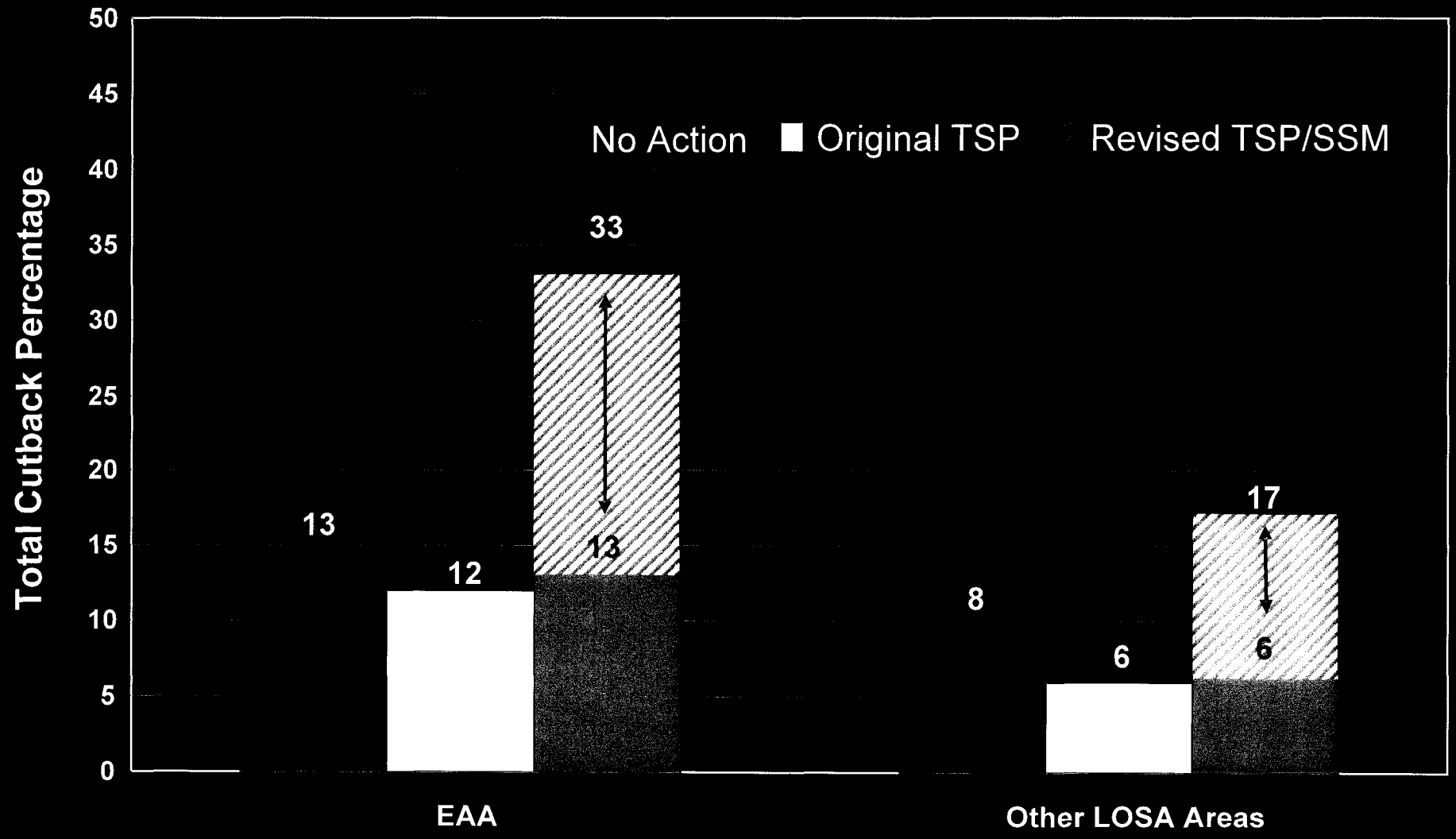
Mean Annual EAA / LOSA Supplemental Irrigation Demands not met for 1965-2000



TSP Performance

Water Supply

Mean Annual EAA / LOSA Supplemental Irrigation
Demands not met for five drought years 1971, 1975, 1981, 1985 and 1989



Study Performance Objectives

Public Health & Safety	Lake Ecology	Waterway Navigation	Estuaries – Caloosahatchee & St. Lucie	Greater Everglades	Water Supply
Herbert Hoover Dike Structural Stability	Flora/ Fauna Threatened/ Endangered Species	Commercial/ Recreational Traffic Regional Economy	Flora/Fauna Threatened/Endangered Species Regional Economy	Flora/ Fauna Threatened/ Endangered Species	Human & Agricultural Consumption Needs of Environment
Minimize High Lake Stages	Minimize Extreme Lake Stages (High & Low)	Minimize Lake Stages < 12.56 ft.	Minimize Extreme Rates of Flow	Maintain Desirable Water Depths & Hydroperiods	Meet Demand

LORSS Schedule

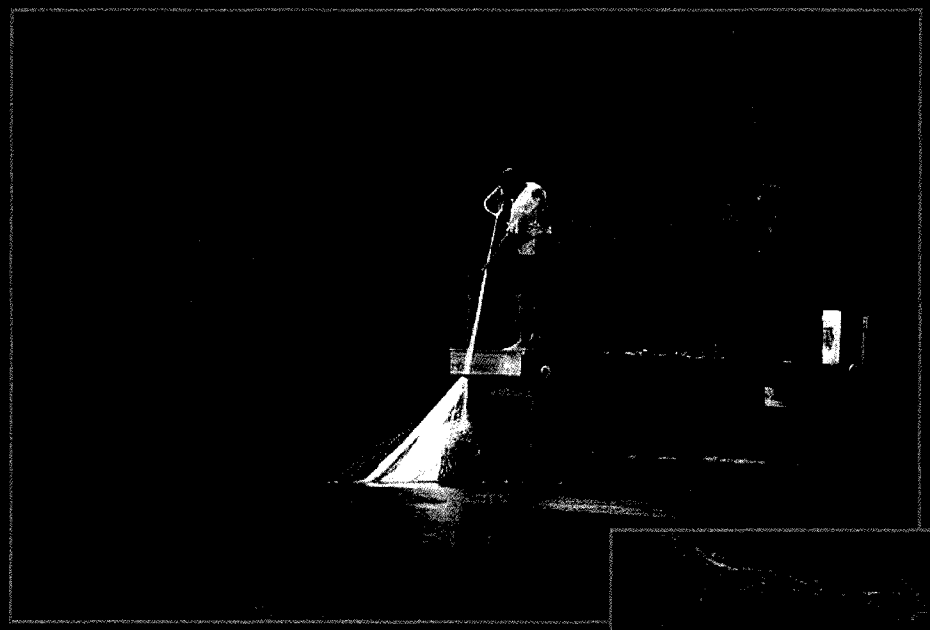
Task	Begin	End
Revised DSEIS in Fed Register	6 July 2007	
45 Day Public Comment Period	6 July 2007	20 Aug 2007
NEPA and WCP Public Meetings	7, 8, 13 & 14	Aug 2007
Final SEIS compiled	20 Aug 2007	20 Sept 2007
Final SEIS in Fed Register	5 Oct 2007	
30 Day Public Comment Period	5 Oct 2007	5 Nov 2007
FSEIS ROD & WCP Approval	Nov - Dec 2007	
Implement Interim Schedule	Jan 2008	

Public Comments

Jacksonville District website
www.saj.usace.army.mil

Contact: Yvonne L. Haberer
U.S. Army Corps of Engineers
Jacksonville District
701 San Marco Blvd.
Jacksonville, FL 32207-8175

Email: LORSSComments@saj02.usace.army.mil



Comments

LORSS
Lake Okeechobee Regulation Schedule Study

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October 16, 2012

VIA E-MAIL AND U.S. MAIL

Dr. Gina Padua Ralph
U.S. Army Corps of Engineers
Planning Division
P.O. Box 4970
Jacksonville, Florida 32232-0019

Re: Central Everglades Planning Project

Dear Dr. Ralph:

I am writing to provide further comments of Florida Crystals and its affiliates, including Okeelanta Corporation and New Hope Sugar Company, on the Central Everglades Planning Project (CEPP). This letter supplements our previous comment letters dated January 20, 2012, and March 30, 2012.

Florida Crystals supports the restoration of the South Florida ecosystem consistent with the approved 1999 Comprehensive Everglades Restoration Plan (1999 Approved Plan). That plan recognized the importance of restoring the hydrology of the Everglades while at the same time providing for the other water-related needs of communities in the region, including water supply and flood protection for all uses. To the extent that the CEPP can bring important projects on-line sooner, while remaining true to the balance and consensus reached in the 1999 Approved Plan, it will represent a great step forward.

1. Plan Development and Scoping

At the time of our previous comment letters, the U.S. Army Corps of Engineers (Corps) had not actually proposed any specific project for the CEPP. This made it extremely difficult to provide meaningful input, because there was nothing specific for members of the public to consider. When we pointed out that "scoping" was

premature under the National Environmental Policy Act (NEPA), the Corps "request[ed] [our] continued participation and feedback throughout the CEPP planning process." Corps' Scoping Response, at 46 (March 1, 2012).

Based on recent public workshops and presentations, it appears that project features within CEPP are taking shape. Federal and state planners have screened various alternatives north of the "redline" within the Everglades Agricultural Area (EAA), and appear to be proposing a Flow Equalization Basin (FEB) on the 14,000 acre so-called A-2 Compartment. Elements south of the "redline," within the Water Conservation Areas (WCA) and Everglades National Park, are still ill-defined other than a notion to partially fill the Miami Canal to promote sheetflow in WCA-3A. From what we can tell, the Corps has not identified final proposals for the elements of the CEPP in the Water Conservation Areas and Everglades National Park, nor has it identified revised operational rules for Lake Okeechobee needed to achieve the benefits of the proposed structural changes. Since all of these plan elements are interdependent, it is difficult to assess them in isolation and it is unclear when the Corps will announce a proposal for the overall CEPP that integrates all of the plan elements.

With the forthcoming identification of a specific proposal for overall CEPP, we recommend that the Corps re-initiate formal scoping pursuant to NEPA. NEPA regulations contemplate scoping after an agency proposal has been announced. 40 CFR § 1501.7; 33 CFR Part 230, App. C. The previous scoping period was premature because no proposal had been developed. Once the agency announces its proposal for the overall CEPP (which presumably will be in the coming months), the public will be in a position to provide meaningful comments. The Corps should not rush through development of the CEPP at the expense of public participation and input.

Reinitiating scoping will not delay the project. The CEPP proposal for the EAA element is to build an FEB on the A-2 site that would operate in conjunction with an FEB on the adjacent A-1 site, now part of the state's NPDES permits and Consent Order to meet water quality objectives. The proposed plan elements for the two sites apparently would have interdependent operations. The Corps issued its scoping notice for an Environmental Impact Statement (EIS) for the A-1 site proposal on August 28, 2012. Presumably the Corps cannot expect to complete its NEPA process for the CEPP element on the A-2 site before it completes the NEPA

process on the proposal to build an FEB on the A-1 site, because otherwise it cannot fully analyze all of the cumulative impacts of the two proposals. Re-initiating scoping on the CEPP element would put the two NEPA processes on a parallel schedule. Even if reinitiating scoping caused some delay, that would be a small price for having the public more fully engaged in the development of the CEPP.

In our continuing effort to provide constructive input, we offer these comments regarding the analysis of the EAA element of the CEPP for which a preliminary proposal has been identified. Since the Corps has indicated that each element of the CEPP is interdependent with the other portions, we reserve the right to provide additional comments as the Corps reveals more of its intentions to the public.

2. Alternatives to Proposed EAA Plan Elements

A. General Comments. We have several comments regarding how the Corps should approach the analysis of alternatives to the CEPP proposal for the EAA. First, the most important aspect of the Corps' forthcoming EIS for the CEPP is the consideration of alternatives. It is federal policy to "[u]se the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of those actions upon the quality of the human environment." 40 CFR § 1500.2(e). The discussion of alternatives "is the heart of the environmental impact statement" and should "sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decision maker and the public." 40 CFR § 1502.14. While the Corps is devoting significant time to developing a proposed plan for the CEPP, it is equally important that it develop a range of reasonable alternatives to that plan so that the choices are sharply defined.

Second, in light of the importance of the alternatives analysis, the Corps should disclose the alternatives to be analyzed prior to issuance of the draft EIS/Project Implementation Report (PIR). The alternatives developed by the Corps so far might be configured in ways that miss important issues or which otherwise fail to sharply define the choices for decision makers. Disclosing those alternatives before issuance of the draft EIS/PIR would enable members of the public to suggest improvements to them before they are analyzed fully, which could save time later in the process by minimizing the need to revise alternatives between the draft and

final EIS/PIR. We make this point because the "Central Everglades Process" chart being used by the Corps in various presentations states that the agency will "Develop TSP [Tentatively Selected Plan] and PIR" at the same time. *See, e.g.,* CEPP Formulation Overview, at 5 (Aug. 29, 2012). Since a draft EIS/PIR must identify and analyze alternatives to the agency's proposal, 33 CFR § 385.26(b), this suggests that the Corps may not inform the public of which alternatives it is considering until the draft EIS/PIR is issued. (Read literally, it also suggests that the Corps will not fully identify its proposal to the public until the draft EIS/PIR is issued.) Presumably, the Corps did not intend to suggest such a late disclosure by this chart, and plans to identify a full suite of alternatives before preparation of the draft EIS/PIR. Such an approach would be consistent with the requirement in the Programmatic Regulations that "*[b]efore completion of the draft Project Implementation Report, the Corps of Engineers and the non-Federal sponsor shall provide the South Florida Ecosystem Restoration Task Force with information about alternative plans developed and evaluated for the Project Implementation Report.*" 33 CFR § 385.26(a)(2) (emphasis added).

Third, the screening evaluation in the Project Delivery Team (PDT) process does not constitute consideration of alternatives for purposes of NEPA. The PDT does not include members of the public, agency participation in the PDT does not "substitute for consultation, coordination or other activities required by applicable law," and [d]ocuments and work products prepared or developed by the [PDT] [are] not … self-executing." 33 CFR § 385.17(c)-(d). Moreover, the PDT process inherently involves policy choices relating to cost, comparative environmental effects in different natural areas, and political factors, and those choices are obscured by the fact that potential plan formulations are developed in closed meetings of computer modelers. While such a process may be appropriate for purposes of developing a Tentatively-Selected Plan, NEPA requires that the policy choices be revealed to senior agency decision makers and the public so that they can make their own judgments about the best way to move forward. We recommend that if the Corps intends to consider alternatives developed and rejected in the PDT process, that it fully analyze those alternatives in the draft EIS/PIR and identify the criteria by which they were rejected in the PDT process. We do not believe that this has been done to date, based on the presentations we have reviewed.

Fourth, the Corps should analyze an array of reasonable alternatives, and not limit its analysis of alternatives to those which it prefers. NEPA regulations require consideration of reasonable alternatives "not within the jurisdiction of the [Corps]." 40 CFR § 1502.14(c). "Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant." *Forty Most Asked Questions Concerning CEQ's NEPA Regulations*, 46 Fed. Reg. 18026 (March 17, 1981), Answer to Question 2a. Moreover, the regulations require the Corps to analyze alternatives that "sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decision maker and the public." 40 CFR § 1502.14. Such alternatives typically are those which are not necessarily favored by the Corps (or all other agencies), but which highlight the trade-offs inherent in plan development. This means that the Corps should not artificially restrict the range of alternatives being analyzed in the draft EIS/PIR to those which the agency prefers, or which meet some unstated technical or policy criteria. We previously have expressed concern that the Corps is artificially screening out alternatives that it does not prefer related to increased water storage in Lake Okeechobee and may be prioritizing environmental interests in the lake over environmental interests elsewhere in the region. *See, e.g.*, March 30, 2012 Comment Letter, at 4-8. It also appears that the Corps may be impliedly prioritizing the Holey Land and Rotenberger Wildlife Management Areas over the Northern Estuaries and the Water Conservation Areas. The Corps should analyze alternatives in the EIS/PIR which it does not prefer, but which represent valid alternative means to achieve the project goals. The Corps should let the members of the public decide which alternatives they prefer, especially because the end result of the CEPP process will be to present a proposal to the people's elected representatives in Congress. The fact that the Corps analyzes certain alternatives does not mean that it supports such an alternative, but only means that it is allowing members of the public to make up their own minds. We are recommending such analyses in the same spirit, because we cannot know whether any individual alternative merits our support until we see the Corps' thorough analysis of it.

This is especially important in light of recent guidance of the National Research Council ("NRC") in its fourth biennial report on the "Progress Toward Restoring the Everglades" (July 2012). The

NRC is an independent scientific review body which provides input regarding progress toward achieving the natural system goals of the 1999 Approved Plan. In its most recent report, the NRC highlighted the "difficulty in achieving restoration goals for all ecosystem components in all portions of the Everglades," and indicated that "[n]early all Everglades restoration projects carry tradeoffs," including "tradeoffs between water quality and quantity." Since "[t]hese tradeoffs can be produced deliberately or as unintended consequences of project sequencing," the NRC recommended that there be "rigorous scientific analyses" of tradeoffs. In the context of the CEPP, the Corps needs to follow this advice of the NRC and expressly analyze different types of plan options so that potential tradeoffs are explored.

Fifth, the Corps should be clear in the draft EIS/PIR regarding the evaluation criteria being applied to each alternative. In the August 29, 2012 PDT meeting, it appears that cost was a primary consideration in rejecting a 12-foot deep reservoir on the A-2 site, and the proposed FEB was characterized as cost effective at $165 million. See CEPP Formulation Overview, at 13-14 (Aug. 29, 2012). The Corps should identify the relative costs of all of these options and the level of costs which it deems to be cost prohibitive. Similarly, the Corps should identify the criterion it is using to weigh relative impacts to environmental interests in Lake Okeechobee, the Northern Estuaries, and the WCA's.

Finally, we are concerned that the Corps is not developing alternatives in the PDT process which would address the serious water supply concerns of agricultural interests and public utilities. We have noted in both previous comment letters that the 1999 Approved Plan was premised on both maintaining and *improving* water supply for existing uses. The Florida Legislature, in approving the SFWMD's participation as local sponsor, expressly stated that one of the plan's purposes was "the *enhancement* of water supplies." § 373.470(3)(b)(2), Fla. Stat. (emphasis added). This is illustrated by the "Everglades Agricultural Area Storage Reservoirs (G)" component of the 1999 Approved Plan, which called for water storage for agricultural users to mitigate any adverse effect caused by increased deliveries to the WCA's. Moreover, Congress prohibited the "eliminat[ion] or transfer [of] existing legal sources of water" in plan implementation "[u]ntil a new source of water supply of comparable quantity and quality as that

available on the date of enactment of [WRDA 2000] is available." WRDA 2000, Pub. L. No. 106-541, § 601(h)(5).

Despite these commitments, the Corps has exhibited an unwillingness to consider alternatives that would modify water regulation schedules to increase the water supply in Lake Okeechobee. *See, e.g.,* Corps' Scoping Response, at 37. In contrast, at the June 2012 public workshop there were extensive presentations regarding potential modifications to the regulation schedules to address perceived environmental concerns in the lake and in the Northern Estuaries. *See, e.g.,* Lake Okeechobee Ecology and Tier 2 Alternatives Evaluation (June 26, 2012). Moreover, to the extent the Corps has modeled effects of CEPP on water supply, it is our understanding that there would have been worse performance if the CEPP had been in place during the 2001 drought. We remain very concerned that the Corps is making no effort to address the important and valid water supply concerns of multiple uses in the development of the CEPP. Since it would take relatively little additional storage in Lake Okeechobee to address the water supply concerns of agricultural and urban uses, we once again ask the Corps to examine such options. This would be consistent with the Corps' significant progress in rehabilitating the Herbert Hoover Dike, and the Corps' assurances in 2008 that the current Lake Okeechobee Regulation Schedule would be revisited as progress was made on the dike rehabilitation efforts.

B. Potential Alternatives for Analysis

i. Alternatives Identified in the PDT Process

It appears that the Corps may have identified in the PDT process at least some potential alternatives related to the EAA elements of the CEPP.

Proposed Action. The Corps has identified the Proposed Action as a 14,000 acre FEB on the A-2 site which will operate in conjunction with the separately proposed FEB on the A-1 site. From what we understand, the Proposed Action assumes that the FEB will reduce phosphorus levels in the water delivered to it, and that the FEB will not have to be kept wet (like an STA) to avoid releasing phosphorus from the soil after drying out.

The Proposed Action will need to define how Lake Okeechobee water control structures will be operated with the "new" water

delivered to the FEB on the A-2 site. The 2008 Lake Okeechobee Regulation Schedule was modeled with the assumption that regulatory releases to the WCA's would be limited to ~60,000 acre feet per year. Lake Okeechobee Regulation Schedule Study, Final EIS, at 22-23 (Nov. 2007). The CEPP apparently assumes that an additional 200,000 acre feet of regulatory releases will be made from Lake Okeechobee to the WCA's, more than quadrupling deliveries from the lake.

In analyzing the Proposed Action, the Corps should critically analyze the validity of its assumptions underlying that plan. In particular, the Corps should analyze how "new" lake water can be held in the proposed FEB for the A-2 site, and whether all of the additional 200,000 acre feet identified for treatment in STA 3/4 and Compartment B can be delivered through that FEB. In addition, the Corps should analyze whether in fact the FEB will reduce phosphorus levels in the lake water delivered to it. The Corps also should analyze the assumption that the FEB could be allowed to dry-out, as there is a risk that phosphorus trapped in the soil of the FEB could be released. Keeping the FEB wet, even in dry periods, would require special water deliveries to the FEB when all water users need water, and could exacerbate water supply conflicts. The draft PIR/EIS should address whether there is a plan to re-wet the FEBs with local runoff in such a way that release of phosphorus from the dried soils will not be passed on the STAs. If so the basis for such a plan, and the data used to derive it, should be presented.

No Action. NEPA regulations also require the Corps to analyze the "No Action" alternative. 40 CFR § 1502.14(d). Based on indications to date, it appears that the No Action alternative would assume no new water management features on the A-2 site, but would assume that an FEB would be built on the A-1 site. Since the CEPP assumes there is excess capacity in the A-1, STA 3/4 and Compartment B facilities, the No-Action Plan should to provide some of the benefits expected by adding the A-2 site. This information should be presented as part of the No-Action Plan.

Reservoir Options. It appears that the Corps has considered several reservoir configurations on the A-2 site, including reservoirs with depths in the range of 4-12 feet. *See, e.g.,* CEPP Overview, at 11-13 (Aug. 29, 2012). In particular, the PDT screening exercise indicated that "[t]he 12-ft Reservoir provides the greatest benefits for the Everglades; however, the cost is

prohibitive and 12-ft Reservoir configurations were eliminated from further consideration." *Id.* at 13. Even if the Corps eliminated a 12-foot deep reservoir on the A-2 site for purposes of identifying the agency's proposal, that does not mean that it should be eliminated from the NEPA analysis. Based on this preliminary analysis, we assume that the Corps will include at least the 12-foot reservoir as an alternative for analysis, because that could highlight the tradeoff between providing additional water and cost.

ii. Additional Alternatives for Analysis

In addition to those alternatives identified by the PDT, we ask the Corps to analyze several other alternatives to its Proposed Action in the draft EIS/PIR. All of these alternatives could meet the CEPP's goals of delivering "new" water to the Water Conservation Areas, and are reasonable from a technical and economic standpoint.

Lake Okeechobee Storage Alternative. The Corps should include an alternative that would store additional water in Lake Okeechobee instead of at the A-2 site. The Corps would do this through modification of Lake Okeechobee operations or the regulation schedule and Water Control Plan if necessary. As noted above, the 2008 Lake Okeechobee Regulation Schedule assumes a limitation on regulatory releases to the WCA's of approximately 60,000 acre feet per year. The Proposed Action seeks to deliver approximately 200,000 additional acre feet per year to the WCA's. Under this alternative, the Corps would store and move the additional water from Lake Okeechobee to the A-1 FEB or directly to STA 3/4 and Compartment B when there is capacity. This alternative also could analyze conveyance improvements in the EAA to facilitate delivery of that water.

This alternative is reasonable from a technical standpoint. Water levels in Lake Okeechobee historically were maintained at significantly higher stages than currently occur under the 2008 Lake Okeechobee Regulation Schedule. The primary reason why the Corps adopted the 2008 schedule was due to the age of the Herbert Hoover Dike, and the belief that rehabilitation of the dike is needed to safely hold higher water levels in the lake. Since 2008, the Corps has made significant progress in its rehabilitation of the Herbert Hoover Dike. Earlier this year, the Corps reported to local stakeholders that all repairs were scheduled to be completed by approximately 2022 and the repairs in the most critical segments

would be complete sooner. *See, e.g.*, Herbert Hoover Dike Rehabilitation Project, Water Resources Advisory Commission, at 15 (Feb. 2, 2012). It is unclear that any additional improvements to the dike would be necessary for this alternative, because it could require only a relatively small amount of additional water to be stored in the lake. Recent statements by the Corps have confirmed that the 20 miles of slurry wall that have been completed have addressed the most at-risk sections of the dike. Even if dike rehabilitation work would need to be completed to accommodate more water storage, the time frame for substantial completion of this project is comparable to a realistic schedule for the CEPP, which after plan development, approval by Congress and the Florida Legislature, and construction, probably could not be implemented until at least 2020.

A limited lake-storage alternative would present multiple advantages over the Proposed Action. This alternative would allow for the storage of much greater quantities of water than the Proposed Action, and presumably would be able to store amounts of water comparable to or greater than the "12-foot Reservoir" alternative which the PDT determined "provides the greatest benefits for the Everglades." CEPP Overview, at 13 (Aug. 29, 2012). Since at least some of the storage could be achieved almost immediately without regard to the longer-term dike repairs, this alternative could provide benefits to the WCA's much sooner than the Proposed Action. This alternative would avoid the need to spend any funds at the A-2 site (estimated at $165 million for the Proposed Action), freeing up those funds for CEPP elements south of the EAA. To the extent that additional funds would be needed to expedite repairs of the Herbert Hoover Dike, those funds would serve the dual purpose of public safety and environmental restoration.

The Corps does not have to prefer the lake-storage alternative at this stage, but it must include it in the draft EIS/PIR to "sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decision makers and the public." 40 CFR § 1502.14.

<u>EAA Water Supply Alternative.</u> The Corps also should analyze an alternative that would use the A-2 site for agricultural water storage. Currently, it appears that the Corps assumes that all water stored at the A-2 site would be used for environmental purposes only; it is our impression that the Corps has not looked

in the PDT process at the potential for the site also to provide agricultural water supply. This is contrary to the 1999 Approved Plan, where the EAA reservoir feature explicitly called for stored water to be used both for agricultural and environmental water supply.

An EAA Water Supply Alternative would be consistent with the "Everglades Agricultural Storage Reservoirs (G)" component identified in the 1999 Approved Plan. As described in that plan (at pages 9-9 and 9-10),

> "Runoff from the EAA, Miami and North New River Canal Basins and regulatory releases from Lake Okeechobee will be pumped into the reservoirs. [There would be three equally sized compartments.] Compartment 1 discharges will be used to meet EAA irrigation demands only. Compartment 2 discharges will be used to meet environmental demands as a priority and can be used to supply a portion of agricultural demands if the environmental demands equals zero. Compartment 3 discharges will be used to meet environmental demands."

Since the Corps separately is considering an FEB on the A-1 site, which is equivalent to a compartment that will discharge EAA runoff into STA 3/4 and Compartment B, the A-2 site could be used for both environmental and agricultural water supply.

We are concerned that the failure to include an agricultural water supply feature to the A-2 reservoir signals a de-facto abandonment of the 1999 Approved Plan. At a minimum, in addition to analyzing additional water storage in the lake, the Corps should include an alternative consistent with the 1999 Approved Plan in which the EAA reservoir would store water for both agricultural and environmental uses. If the Corps is unwilling to consider such alternatives, then it should prepare a Comprehensive Plan Modification Report pursuant to the Programmatic Regulations, and explain to Congress how it plans to address water supply to agricultural users and flood protection in the EAA.

<u>Conveyance, Delivery and Treatment Alternatives.</u> We recommend that the Corps also include alternatives related to the delivery and/or management of Lake Okeechobee water before it reaches WCA-3A. The Proposed Action calls for water to be sent from Lake

Okeechobee to the FEB on the A-2 site, and then sent to STA 3/4 or Compartment B for treatment before being discharged directly to WCA-3A. From what we understand, the Corps assumes that phosphorus levels in the lake water will be reduced as a result of storage in the FEB and treatment in the Stormwater Treatment Areas.

The Corps should consider the efficacy of canal improvements within the EAA, which could improve the ability to deliver more water to the Central Everglades. In particular, improvements to the Eastern Bolles Canal could improve the ability to deliver additional flow to the STA's in wet periods when the canals otherwise are at capacity.

The Corps also should evaluate the phosphorus reduction abilities of the EAA canals themselves. It long has been known by the SFWMD that phosphorus concentrations decrease in water being conveyed in primary EAA canals. For example, there is significant long-term data indicating the STA 3/4 Supply Canal reduces phosphorus levels by approximately 25 ppb from the point where water enters that canal at the G-370 and G-372 structures to the point where it enters STA 3/4. (A summary of this data is attached.) It has also been demonstrated that water that is now sent to the STAs from Lake Okeechobee is much higher in phosphorus when it leaves the lake than it is when it enters the STAs. The Corps should analyze this phosphorus-reduction effect in the CEPP, because it both provides an opportunity for additional phosphorus removal, and the bypassing of the STA 3/4 Supply Canal in the Proposed Action could have the effect of reducing treatment of the "new" water delivered from the lake.

Another alternative the Corps should analyze is the potential for excess lake water to be delivered to the Holey Land and Rotenberger Wildlife Management Areas, which are located in the EAA, perhaps in the manner (for the Holey Land) discussed at the August 29, 2012 PDT meeting. This concept was raised by several Everglades scientists at a recent PDT meeting, and by representatives of interests in the Northern Estuaries. Both of these areas are unnaturally dry, do not function as historic Everglades marshes, and could benefit from rehydration and provide additional system-wide benefits by facilitating the conveyance of more excess Lake water to the Central Everglades. So long as existing users' water supply is not compromised, there is an opportunity to deliver excess water from Lake Okeechobee to these areas to restore their natural hydrology and to reduce the amount

that must be diverted to the estuaries. This is an example of the type of trade-off the National Research Council thought should be debated, and it seems like an opportunity for restoration that the Corps should not ignore.

Each of these concepts has the potential to be combined with different alternatives in the draft EIS/PIR. We recommend that you consider them, either alone or in combination, as they have the potential to improve the performance of other alternatives. We suggest them here because we believe that the EIS/PIR should sharply define the choices, not because we know that they will be effective or even that we support them. Like other members of the public, we need the Corps to present the options and analyze them so that we have sufficient information to make informed decisions.

iii. Integration of Review of CEPP and A-1 Flow Equalization Basins

The Corps needs to address the coordination between the EAA elements of the CEPP and the new water quality restoration measures for the EAA. There now are two proposals for FEB's that would store water for delivery to STA 3/4 and Compartment B: one 14,000-acre FEB on the A-1 site proposed by the SFWMD related to the recent water quality settlement with federal agencies, and a second 14,000-acre FEB on the A-2 site proposed by the Corps as an element of the CEPP. Both of these FEB's would be located on the property purchased from the Talisman Sugar Company in the 1990s. Under the CEPP both FEB's would operate in conjunction with one another, but under the water quality settlement the A-1 is operated solely to serve its existing drainage area.

We recommend that the Corps explain how it will integrate its NEPA review of the two FEB's proposed for the A-1 and A-2 sites. These two FEB's clearly are connected actions, with cumulative impacts. NEPA regulations generally require agencies to include in a single NEPA document "proposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action." 40 CFR § 1520.4(a). Yet, the Corps is moving forward with two separate EIS's on the two FEB's at the same time. This appears to be an improper approach to NEPA review, which at a minimum will complicate the analysis of cumulative impacts of the two FEB's. The Corps should very clearly explain how these two NEPA reviews will be coordinated to minimize overlap, ensure that

cumulative impacts are evaluated fully, and avoid any predetermined outcomes for the CEPP.

The Corps also should clearly explain how the two FEB's will be operated in relation to STA 3/4 and Compartment B. It has been explained by the Corps and the SFWMD at public meetings that the FEB on the A-1 site would receive only EAA runoff, and would hold that water before treatment in STA 3/4 and Compartment B to meet the Water Quality Based Effluent Limitation (WQBEL) in the new NPDES permits. The agencies also have explained that the FEB on the A-2 site would receive "new" water from Lake Okeechobee, and that it can be treated in STA 3/4 and Compartment B when there is excess capacity there, without causing a violation of the WQBEL. The operational rules for these two FEB's should be made explicit in the two NEPA documents, so that there is no confusion at a later date.

We hope that the agencies' analysis of phosphorus reductions that will result from use of the A-1 FEB are correct. We also hope that the addition of "new" water from Lake Okeechobee will not diminish the phosphorus reduction performance of STA 3/4 and Compartment B, or cause a violation of the WQBEL. However, the Corps should make clear that if there is a violation of the WQBEL in the NPDES permits for STA 3/4 and Compartment B, that the first priority for treatment in those stormwater treatment areas will be EAA runoff. In other words, if the agencies later determine that the inflows to STA 3/4 and Compartment B need to be reduced in order to comply with the NPDES permits, then inflows of "new" water from Lake Okeechobee should be the first to be reduced. This is important because the first priority of STA 3/4 and Compartment B is to treat EAA runoff. The Corps therefore should make clear in the various NEPA documents, including the draft EIS/PIR for the CEPP, the operational rules for sending water to STA 3/4 and Compartment B. The Corps also should make clear that EAA runoff will be 'held harmless' if there is a WQBEL violations in STA 3/4 and Compartment B resulting from introduction of new water from Lake Okeechobee.

From what the agencies have explained at public workshops, the goal of the CEPP is to increase annual regulatory releases from the lake to the WCA's from ~60,000 acre feet to ~260,000 acre feet. The CEPP project in the EAA to accomplish that goal is the combination of a new FEB on the A-2 site and what is assumed to be an existing FEB on the A-1 site. That indicates that an FEB the

size of the entire A-1 site might not be needed to handle EAA flows, and that the proposed A-1 FEB is at least in part being designed for restoration purposes. This would open up opportunities for 50-50 federal-state cost sharing on at least part of the proposed A-1 FEB, which could help stretch the total state dollars available to restore the Everglades.

Thank you for considering our comments. We look forward to continuing to work with the Corps as it moves forward with development of the CEPP. With kind regards, I remain,

Yours truly,

William Tarr
Vice President
Florida Crystals Corporation

/jcd
Enclosure
Copy w/encl. (via e-mail) to:
Mr. Joe Collins, SFWMD, Chair
Mr. Kevin Powers, SFWMD, Vice Chair
Ms. Sandy Batchelor, SFWMD Board Member
Mr. Daniel DeLisi, SFWMD Board Member
Mr. James J. Moran, SFWMD Board Member
Mr. Daniel O'Keefe, SFWMD Board Member
Mr. Juan M. Portuondo, SFWMD Board Member
Mr. Timothy Sargent, SFWMD Board Member
Mr. Glenn J. Waldman, SFWMD Board Member
Ms. Melissa Meeker, SFWMD
Mr. Matt Morrison, SFWMD
Mr. Tom Teets, SFWMD
Ms. Kimberly Taplin, USACE
Mr. Steven Kopecky, USACE
Mr. Dennis Duke, Interior
Mr. Neal McAliley

The charts below show the relationship between the flow, load and concentration of the water pumped from the District's primary canals (Miami(G-372) and North New River (G-372)) toward STA 3/4 and the flow that actually enters the STA. The data show a 1.3 percent reduction in the flow quantity over the 7 year period the STA has been operating with an accompanying 23 percent reduction in load and 26 percent reduction in phosphorus concentration.

Figure 1. Flow pumped from the District's primary canals (Miami(G-372) and NNR (G-372)) and the flow that enters STA-3/4. (in thousands of acre-feet)

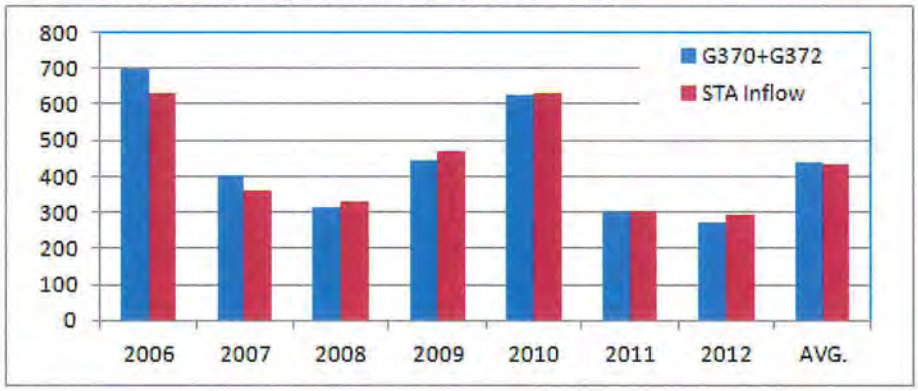


Figure 2. Phosphorus Load pumped from the District's primary canals (Miami(G-372) and NNR (G-372)) and the load that enters STA-3/4. (in kilograms)

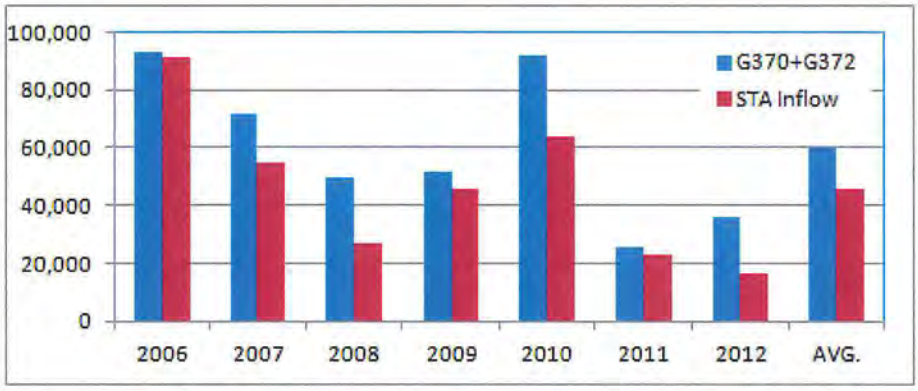
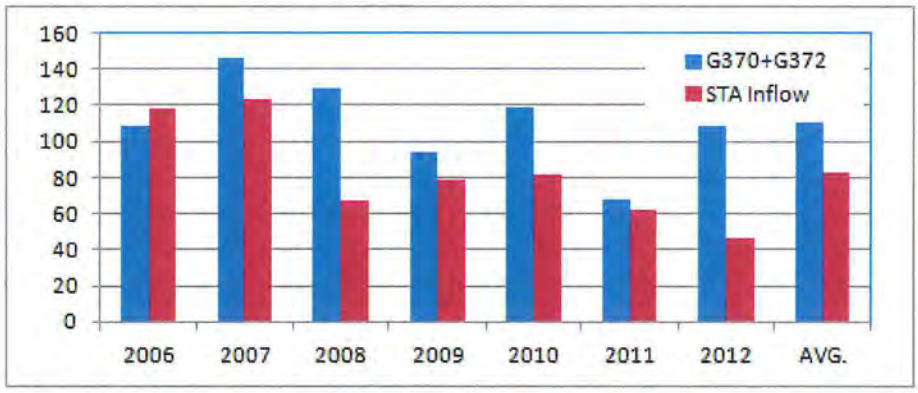


Figure 3. Phosphorus concentration of runoff pumped from the District's primary canals (Miami(G-372) and NNR (G-372)) and the concentration that enters STA-3/4. (in kilograms)



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Commissioner, District 5

TARYN KRYZDA, CPM
County Administrator

December 17, 2012

LTC. Thomas M. Greco
Deputy District Commander
United States Army Corps of Engineers
1400 Centrepark Boulevard
Suite 750
West Palm Beach, FL 33401

Dear Colonel Greco:

It is so heartening that Army Corps is listening to our plea to protect the Estuary from Lake Okeechobee releases. We all recognize that 200,000 acre/feet is just a beginning, but it is a strong, positive beginning. There is no magic; it will take vast complex planning and significant funding. But now, Army Corps has embarked upon a path that can eventually lead to a solution; a solution requiring perseverance and continued dedication of us all to achieve.

Many thanks for your strong efforts in this quest.

In gratitude,

Ed Fielding

Ed Fielding
Martin County Commissioner
District 2

EF:rz

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1000 Friends of Florida • Audubon Florida
Clean Water Action • CRCA Riverwatch
Everglades Foundation • Everglades Law Center
Everglades Trust • Florida Wildlife Federation
National Parks Conservation Association • Sierra Club

June 1, 2012

Colonel Alfred A. Pantano, Jr.
U.S. Army Corps of Engineers
701 San Marco Boulevard
Jacksonville, FL 32207-0019

Melissa Meeker
Executive Director
South Florida Water Management District
3301 Gun Club Road
West Palm Beach FL 33406

Re: Central Everglades Planning Project

Dear Col. Pantano and Ms. Meeker,

We write to express our great appreciation to you and your hardworking team for your efforts in moving forward the Central Everglades Planning Project ("CEPP"). This project has the potential to provide significant benefits for the natural system on a timeframe that recognizes the immediate need to reverse ongoing declines in the Everglades ecosystem. We are concerned, however, with recent statements by some members of the agricultural community suggesting that CEPP must "make up" for irrigation water lost due to implementation of the Lake Okeechobee Regulation Schedule of 2008 (LORS 08), or risk violations of the Savings Clause. This position is entirely without merit and is contradicted by State and Federal law, the Programmatic Regulations, and interpreting guidance memoranda.

As the Water Resources Development Act of 2000 ("WRDA 2000") provides, "the overarching objective of the Plan is the restoration, preservation, and protection of the South Florida Ecosystem while providing for other water-related needs of the region, including water supply and flood protection." Thus, we believe it is critical to ensure the focus of CEPP remains on environmental restoration objectives, while maintaining the protections for water users envisioned by WRDA 2000. To this end, we're pleased the presentations at the May 14, 2012 CEPP Project Delivery Team meeting indicated that all

alternatives currently being evaluated provide environmental benefits for the Everglades and estuaries without reducing agricultural water supplies.

We understand the agricultural community's desire to use the CEPP planning process as a means of increasing its level of certainty for water supply purposes to levels experienced under previous Lake regulation schedules. However, CEPP is simply not the appropriate forum in which to undertake a revision of the Lake's regulation schedule. Additionally, LORS 08 was "an intervening non-CERP action," and therefore, any diminished quantity of water that any user may experience as a result of that non-CERP action does not result in a Savings Clause violation.

WRDA 2000 contains the provision commonly known as the Savings Clause. It states, "[u]ntil a new source of water supply of comparable quantity and quality as that available on the date of the enactment of this Act is available to replace the water to be lost *as a result of implementation of the Plan*, the Secretary and the non-federal sponsor shall not eliminate or transfer existing legal sources of water, including those fo an agricultural or urban water supply."[1] This provision requires that the existing legal sources of water for the environment, agriculture, or any user not be eliminated *as a result of implementation of the Plan.* LORS 08 was not developed as part of CERP, but rather was developed and implemented because of threats to human health and safety due to a compromised dike.

The Programmatic Regulations Pre-CERP Baseline Memorandum makes clear that governmental actions can and will affect CERP projects outside the scope of CERP,[2] without triggering violations of the Savings Clause, and the CERP Guidance Memoranda even include the Lake Okeechobee Regulation Schedule as an example of such an intervening condition.[3]

The Programmatic Regulations state, "In many cases, the existing legal sources and levels of service for flood protection that existed in December 2000 will be altered or changed before a CERP project is implemented. These changes may result from actions by Federal, State and local governments – actions that are wholly outside the Plan process. These 'intervening' non-Plan conditions, brought about by the implementation and operation of non-Plan actions after December 2000, but before a Plan project becomes operational, will change the hydrologic conditions from those reflected in the Pre-CERP Baseline."[4]

The CERP Pre-CERP Baseline Guidance Memoranda states:

> "Examples [of such 'intervening non-Plan conditions] include…changes to operations of the C&SF Project system (e.g., IOP, CSOP, *Lake Okeechobee Regulation Schedule*)…This Guidance Memorandum provides guidance to PDTs in their analyses when dealing with intervening non-CERP activities. In general, the

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[1] WRDA 2000, § 601(h)(4)(A) (*emphasis added*).
[2] *See* Programmatic Regulations Pre-CERP Baseline Memorandum at 10 (April 2005).
[3] *See* Guidance Memoranda at 3-8, 2007.
[4] Programmatic Regulations Pre-CERP Baseline Memorandum at 10 (April 2005).

following principles will apply:

> The Savings Clause does not require CERP to make up for reductions in quantity and quality of existing legal sources of water or levels of service for flood protection caused by intervening non-CERP activities, but it does prohibit CERP projects from further reductions."[5]

Using LORS 08 as a planning constraint for CEPP is not a violation of the Savings Clause. Any reduced level of service for agricultural uses since the passage of WRDA 2000 as a result of LORS 0 is an intervening non-Plan condition, and therefore, any resulting diminished quantities of water to any user does not violate the Savings Clause.

We support current efforts to maximize flexibility within the LORS 08 schedule to increase environmental benefits to the Everglades while reducing harmful discharges to the estuaries and protecting the ecology of Lake Okeechobee. However, we are concerned about any suggestions to use CEPP as a vehicle for changing the regulation schedule. The Lake regulation schedule involves a suite of issues that have been in the past, and will continue in the future, to be the subject of complex and independent decision-making. Sweeping those issues into CEPP would impossibly complicate efforts to formulate a restoration project for the central Everglades in an 18-month timeframe. CEPP, given its importance and scope, must maintain its focus on restoring the natural system within the limits of LORS 08 and other constraints established at the outset of this planning process.

As LORS 08 is the current operating regime, incorporating it as the "future without plan" condition is appropriate. Reliance on any other plan yet to be developed as part of a process outside of CERP and CEPP, would be speculative. We note that Congress understood that a variety of factors might affect the precise suite of projects and plans that would comprise CERP; what mattered was not "adherence to the modeling on which the April, 1999 Plan was based," but rather "restoration of the Everglades."[6] In short, Congress made clear that it would not want adherence to modeling that did not reflect current conditions to impede progress toward Everglades restoration.[7]

Instead of considering wholesale revisions to LORS 08 or a new regulation schedule entirely, we are pleased to see that the involved agencies are evaluating additional flexibility within the existing schedule as a way to maximize benefits to the natural system. We are encouraged by early modeling results which suggest that by utilizing the flexibility built into LORS 08, we can further minimize harmful impacts to the

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[5] Guidance Memoranda at 3-8, 2007 (*emphasis added*).

[6] Legislative Report to the U.S. Senate Committee on Environment and Public Works for WRDA 2000 at 40-41 (emphasis added). The report states:

> Endorsement of the Plan as a restoration framework is not intended as an artificial constraint on innovation in its implementation. The committee does not expect rigid adherence to the Plan as it was submitted to Congress…*Restoration of the Everglades is the goal*, not adherence to the modeling on which the April, 1999 Plan was based.

[7] *Id.*

Caloosahatchee and St. Lucie estuaries, while also increasing water quantities delivered south for the Everglades without reducing the levels of service for agricultural users. As the CEPP progresses into the evaluation and development of plan components, we urge the team to identify and select the components that produce the greatest quantity of beneficial water for the natural system and to clearly identify that water so that it can be reserved by the South Florida Water Management District for these purposes.

We ask the U.S. Army Corps of Engineers and the South Florida Water Management District to reiterate a commitment to ensuring that CEPP results in meaningful restoration of the heart of Everglades by sharpening the focus on restoration and increased water for the ecosystem. We remain committed to supporting this groundbreaking effort, and thank you again for your tremendous vision and hard work.

Sincerely,

(signatures waived to expedite delivery)

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Kevin Powers, SFWMD, Vice Chair
Sandy Batchelor, SFWMD Board Member
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James J. Moran, SFWMD Board Member
Daniel O'Keefe, SFWMD Board Member
Juan M. Portuondo, SFWMD Board Member
Timothy Sargent, SFWMD Board Member
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Lt. Col. Tom Greco, U.S. Army Corps of Engineers
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Secretary

MICHAEL D. TIGER
Treasurer

November 7, 2012

Colonel Alan M. Dodd
Jacksonville District Commander
United States Army Corps of Engineers
701 San Marco Blvd.
Jacksonville, Florida 32207-8175

Dear Colonel Dodd:

Thank you for your response letter of October 5, 2012, regarding hydration on the Big Cypress Reservation and other federal lands adjacent to the southern border of our Reservation. While we appreciate the acknowledgement of the Seminole Tribe of Florida's commitment to restoring the South Florida Ecosystem, we are not convinced that the Corps of Engineers understands vital importance of a healthy ecosystem to our identity as the Seminole Tribe of Florida. While we focus on the lands within the reservation boundaries, we also watch the land and water that surrounds this boundary because our history is not limited to the lines on current day maps. Our future will be controlled by a large extent by the decisions made regarding land use and water control all around our reservation. So we look to our region, including lands in the western basins, to see how the federal, state, and local governments are providing resources and planning for a healthy future. And what we now see causes great distress.

As you note in your letter, the Seminole Tribe has been actively engaged in the South Florida Ecosystem Restoration effort for nearly 20 years. We have supported this effort technically and politically through all of these years. More specifically, we are constructing in full partnership with the Corps, an extensive water control system on the Big Cypress Reservation. This project is important to us and to our region and we appreciate the Corps' work and federal funding. But focusing solely on the land and water within our Reservation's legal boundaries is short-sighted. And this has been our position for nearly two decades. We have urged over and over again through all the planning efforts, including the Restudy which is the basis for CERP, to include the western basins in the Central Everglades system in the monitoring, modeling, data gathering, design, planning, and project implementation. So please appreciate our deep disappointment to be told that waters in the western basins that impact the Central Everglades Planning Project (CEPP) are not included in the scope of CEPP because the monitoring, data gathering, and modeling have still not been done in this region, despite our repeated requests to do so for over 14 years. We applaud the Corps' drive to complete the CEPP planning process in 18 months, but we remain very concerned by the long-standing inattention to this region.

Apart from the fact that we, a valued partner in Everglades Restoration by all accounts, have been effectively ignored in our repeated requests for monitoring, modeling, and planning in this region, we note that

the federal government has an obligation through its trust responsibilities to restore the northwest corner of WCA 3A, where the Seminole Tribe of Florida retains hunting and fishing rights, at a minimum. Beyond CEPP, we would like to discuss further how the Corps and its State partner intend to address the Central Everglades north and west of the redline in the current CEPP models.

As to your specific suggestions for addressing our water supply concerns, we welcome your offers. Regarding your suggestion to exercise adaptive management of Basin 1 of the critical project, we look forward to working with your engineering and wetlands regulatory staff on crafting operational changes to the outlets and siphons in order to deliver more water to the native areas south of the West Feeder Canal in the Big Cypress Seminole Indian Reservation. We assume that such work will be eligible for funding under the Operations & Maintenance provisions of the project's Project Cooperation Agreement.

Regarding the S-190 water control structure temporary deviation, we are encouraged by the option to work effectively within the existing regulation schedule to increase water storage in the West and North Feeder Canals, which will allow more water to replenish groundwater of the reservation. We would like to schedule meetings as soon as possible with the Corps and the South Florida Water Management District (District) to discuss the details and timing of the temporary deviation. I note here that we are also concerned about the structural integrity of the S-190 water control structure and urge the Corps and the District to carefully review the soundness of the structure and take all actions necessary to make it secure.

And thank you for the information on the Tribal Partnership Program as authorized by Section 203. We will take a careful review of this program and make a decision about whether or not to apply at a later date.

Managing water resources in South Florida is a steep challenge. The only way to meet this challenge is to work together to plan a future that balances competing needs fairly, which requires a more comprehensive view of the system. For as long as the monitoring and modeling in the western basins is not addressed, the South Florida Ecosystem restoration plan is incomplete.

We look forward to continue to work with you to remedy this situation and to address the pressing needs of the Tribe to correct the hydrology surrounding our Big Cypress Reservation. I have directed my staff to arrange another meeting with the Corps through Ms. Garrett.

Thank you for your attention to this critical resource issues for the Seminole Tribe.

Sho-na-bish,

James E. Billie
Chairman of the Tribal Council

Jeb/Pd

Cc: Jim Shore, General Counsel, Seminole Tribe of Florida
Craig D. Tepper, Director, Environmental Resource Management Department, Seminole Tribe of Florida
FILE

GLADES SUGAR HOUSE

Sugar Cane Growers Cooperative of Florida

POST OFFICE BOX 666 BELLE GLADE, FLORIDA

33430-0666

March 29, 2012

Dr. Gina Padua Ralph
U.S. Army Corps of Engineers
Planning Division
P.O. Box 4970
Jacksonville, FL 32232-0019

Re: Central Everglades Planning Project

Dear Dr. Ralph:

We have many concerns about the scoping comment responses as well as the direction the Central Everglades Planning Project (CEPP) is taking. Please accept the following additional comments on behalf of Sugar Cane Growers Cooperative of Florida regarding this initiative.

The Comprehensive Everglades Restoration Plan (CERP), consisting of some-68 components, was designed to protect and restore the remaining Everglades while meeting the water related needs of the region. This included improving the timing, flow and distribution of water while providing the level of service for flood protection and water supply as of the date of enactment of CERP, known as the Savings Clause protections. In all likelihood Congress would not have approved CERP without the broad-base stakeholder support that was derived by the commitments to meet the needs for both the built and natural environments.

We noted that the project team has modified its goals by adding "Enhance Economic Values and Social Well Being" in its goals and objectives statement at the March 26, 2012 Project Delivery Team meeting. However the sub-objectives under this goal give us concern. The presentation stated, *"the formulation and evaluation of alternatives will include the objective of providing water supply as **incidental** to the objective of fulfilling the ecological needs of the South Florida ecosystem."* And further states, *"Water retained in the Lake that is not identified for the natural system **may** be available for water supply."* These two sub-objectives clearly indicate to us that water supply needs are not being addressed on equal footing as Congress intended when approving the CERP.

While we support the Corps' desire to streamline the process and acknowledge the National Academy of Science's recommendation to evaluate groups of complementary components to

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achieve benefits that would not be attained with the piece-by-piece approach, we are concerned that an appropriate evaluation of alternatives to flow more water through the Central Everglades will not be conducted. The CEPP cannot be undertaken in a vacuum. It must consider current and on-going Lake Okeechobee and Everglades projects in the region (including the rehabilitation of the Herbert Hoover Dike), projects anticipated to be built during the planning horizon, and it must be compatible with and complementary to whatever remedy is adopted to settle the federal litigation.

One of the objectives of the CEPP is to capture and divert water from the Lake now lost to tide to reduce harmful discharges to the Caloosahatchee and St. Lucie Estuaries. CERP envisioned that these discharges would be stored in a series of strategically located Aquifer Storage and Recovery Wells (ASR) to provide carry over storage capacity or storage in a series of deep above ground reservoirs in the Everglades Agricultural Area (EAA), Caloosahatchee Basin and the St. Lucie Basin. The plan was also dependent on improving conveyance capacity within the EAA canal network.

Subsequent to the passage of CERP, the state pledged the Everglades Conveyance and Regional Treatment (ECART) project, and the EAA- A1 Reservoir as critical components of the Long-Term Plan to meet Everglades water quality standards as mandated by the Florida Legislature in the 2003 amendments to the Everglades Forever Act (Section 373.4592(3) Florida Statutes). The Long Term Plan is periodically updated by the South Florida Water Management District (SFWMD) and submitted to the Florida Department of Environmental Protection (FDEP) for approval. The legislation mandates that SFWMD and DEP annually report to the Governor and the Florida Legislature summarizing the water conditions in the Everglades Protection Area, the status of the impacted areas, the status of the construction of the Stormwater Treatment Areas, the implementation of on-farm Best Management Practices, and actions to monitor and control exotic species. Section 373.4592(13) Florida Statutes. It was the intent of the Legislature that *"implementation of the Long-Term Plan shall be integrated and consistent with the implementation of the projects and activities in the congressionally authorized components of the CERP so that unnecessary and duplicative costs will be avoided."* Clearly, there was a well thought out plan, including process development and engineering components, that was mandated by the Florida Legislature for the Long-Term Plan and by the Congress for CERP.

While undertaking CEPP, the Corps must be mindful of the Savings Clause requirements in CERP—that there shall be no elimination or transfer of existing legal sources of water, existing as of December 2000, until a new source of water supply of comparable quality is available. The Savings Clause constraint should be built into the front end of the screening process for any alternative to move forward. Given the decision to use the LORS08 Lake Schedule as the future without project planning condition, and the lack of support for recognizing the ability to store more water in Lake Okeechobee as improvements are made to the Herbert Hoover Dike, we are concerned that a plan to meet the objectives of CEPP, and the requirements of the Savings Clause, will not be possible.

Also puzzling are the scoping comment responses regarding ASR wells as a component that will not be evaluated as part of the *first increment* of CEPP, but will be put off to be evaluated at a later date. The preliminary data regarding the effectiveness of ASR technology are promising and other than the Lake, this may be the only viable solution to store water for carry-over supply.

During the March 9, 2012 EAA component screening presentation, a matrix was presented evaluating the costs and benefits between deep and shallow storage. Both configurations will require canal conveyance improvements. Deep storage reservoirs have the potential to provide additional storage and flow capacity albeit at a higher cost. Focusing on improved utilization of the storage capacity in the Lake would seem likely to be a part of the most cost effective alternative.

We believe that NEPA requires that all reasonable alternatives be evaluated as part of the process and that evaluation must include the option of storing additional water in Lake Okeechobee. As the National Research Council said in its Second Biennial Report in 2008, *"Lake Okeechobee is a critical linchpin of the South Florida Ecosystem...The challenges of water quantity and quality in the Lake have important ramifications for the entire ecosystem because the Lake supports important elements of the region's biota, and it also has the potential to serve as a major source of water storage and water supply for downstream ecosystems. This potential will become more critical if other planned and proposed sources of water do not become available."* At page 186. The Corps is at that critical decision point now.

The second juggernaut in the CEPP is the water quality constraint. The without-project condition assumes that water quality standards under the Clean Water Act are being met. While this seems straightforward, it is anything but. The issue is tied up in two federal court cases under two different judges. While there are ongoing discussions and negotiations regarding this issue between state and federal parties, there currently is no agreement on what the water quality standards will be or what projects on what lands will be necessary to achieve the ultimate standard.

These issues must be resolved so that the CEPP planners know what water quality target must be met. Potentially the same set of state owned lands could be identified to meet existing water flow as an outcome to the federal litigation as well as for the new water to be delivered as part of CEPP. How this water quality dispute is resolved also has obvious financial ramifications to the South Florida Water Management District, as well as the state.

Please make available the Memorandum of Record for Decision Point 1 that was reached on January 27, 2012 and the Risk Register that will help planners evaluate potential risks associated with various assumptions during the modeling phase. In view of the accelerated beginning of the CEPP process we view these comments as a supplement to our previous submission during the formal scoping process.

Please reconsider your position regarding your goals and objectives in meeting the water related needs of the region, the future storage capabilities of Lake Okeechobee and the need to integrate on-going and future planned Lake Okeechobee/Everglades initiatives into the CEPP process.

We look forward to working with you to make this effort a success.

Sincerely,

Barbara J. Miedema
Vice President, Public Affairs & Communications

BJM:swd

cc: Ms. Melissa Meeker, Executive Director, SFWMD
Mr. Joe Collins, SFWMD, Chair
Mr. Kevin Powers, SFWMD, Vice Chair
Mr. Sandy Batchelor, SFWMD Board Member
Mr. Daniel DeLisi, SFWMD Board Member
Mr. James J. Moran, SFWMD Board Member
Mr. Daniel O'Keefe, SFWMD Board Member
Mr. Juan M. Portuondo, SFWMD Board Member
Mr. Timothy Sargent, SFWMD Board Member
Mr. Glenn J. Waldman, SFWMD Board Member
Mr. Matt Morrison, SFWMD
Mr. Tom Teets, SFWMD
Ms. Kimberly Taplin, USACE
Mr. Steven Kopecky, USACE

MARTIN COUNTY
BOARD OF COUNTY COMMISSIONERS
2401 S.E. MONTEREY ROAD • STUART, FL 34996

Telephone: 772.288.5421
Fax: 772.288.5432
Email: efieldin@martin.fl.us

DOUG SMITH
Commissioner, District 1

ED FIELDING
Commissioner, District 2

PATRICK HAYES
Commissioner, District 3

SARAH HEARD
Commissioner, District 4

EDWARD CIAMPI
Commissioner, District 5

TARYN KRYZDA, CPM
County Administrator

STEPHEN FRY
County Attorney

Via Email

June 15, 2012

LTC Thomas M. Greco
Deputy District Commander, SF
US Army Corps of Engineers
1400 Centrepark Boulevard
West Palm Beach, FL 33401

Kimberley A. Taplin
Deputy Program Manager
US Army Corps of Engineers
1400 Centrepark Boulevard
West Palm Beach, FL 33401

Matt Morrison
Principal Scientist
SFWMD
3301 Gun Club Road
West Pam Beach, FL 33406

Pam Mac'Kie
Intergovernmental Representative
SFWMD
3301 Gun Club Road
West Palm Beach, FL 33406

Dear Col., Kim, Matt and Pam:

Your visit with us was greatly appreciated. I understand that there are financial and time constraints on the initial segment of Central Everglades Planning so present plans do not include considering the Lake releases that now go into the estuaries.

But, I am hopeful that in the future we will incorporate systems in our planning to conserve these billions of gallons of fresh water now being sent to tide. This is fresh water that can be used to rejuvenate our aquifers and rehydrate the Everglades. I hope we will design the system to flow south up to 10,000cfs, so that there truly will be a way to protect our estuaries.

In addition to having as an eventual objective a significant southern flow from the Lake, I encourage us to actually move water south every opportunity we get. Not just consider the possibility during emergencies, but make moving water south part of the regular routine, even if it is just a few cfs.

Please call on me when I can be of assistance. Many thanks for your support and strong efforts on behalf of Martin County.

Sincerely,

Ed Fielding
Martin County Commissioner
District 2

EF:rz

TELEPHONE
772-288-5400

WEB ADDRESS
http://www.martin.fl.us

FLORIDA WILDLIFE FEDERATION

Affiliated With National Wildlife Federation

Manley K. Fuller, III, President
2545 Blairstone Pines Drive, Tallahassee, FL 32301
Post Office Box 6870, Tallahassee, FL 32314-6870

Phone: (850) 656-7113
Fax: (850) 942-4431
website: www.fwfonline.org

June 4, 2013

Mr. Daniel O'Keefe
Governing Board Chairman
South Florida Water Management District
Post Office Box 24680
West Palm Beach, FL 33416-4680

Dear Chairman O'Keefe:

The Florida Wildlife Federation respectfully requests the South Florida Water Management District Governing Board to re-affirm the District's role as local sponsor of the Central Everglades Planning Project (CEPP), which is currently being developed by the U.S. Army Corps of Engineers with District support.

The CEPP has proposed an array of projects in its Alternative 4-R that, together with the District's and Governor Scott's Everglades Water Strategies program, will move significant amounts of fresh water into Shark River Slough, the core of Everglades National Park. With these projects and the already commenced Picayune Strand restoration projects on the west and the C-111 spreader canal moving water into Taylor Slough on the east, the state and federal governments will secure the future of the park and revitalize a large portion of the historic "River of Grass" through Water Conservation Areas 3 A and B.

Specifically, we are asking SFWMD Governing Board to take such formal action as is necessary to permit release of the ACOE's Draft Project Implementation Report (PIR) for the proposed Tentatively Selected Plan, Alt.4-R. Release of the PIR will start compliance reviews under the National Environmental Policy Act and formal public comment, as modeling and refinements continue to address remaining concerns. Taking action now provides sufficient time to ensure that a Chief's Report can be submitted to Congress by December 2013, making CEPP projects eligible for Congressional authorization under the Senate-passed Water Resource Development Act (WRDA). It is not possible to predict when the House will take up a WRDA bill. It would be politically foolish, however, for us in Florida not to make every attempt to meet the Senate's conditions and deadline for the next WRDA bill.

Urging Congressional authorization for CEPP projects is not to say that other projects such as the Caloosahatchee and St. Lucie reservoirs, Broward Water Preserves, Biscayne Bay

Coastal Wetlands should be sidelined. All of us are aware of the enormity of the restoration laid out in the Comprehensive Everglades Restoration Plan, of which CEPP is a component. It is that enormity and its potential rewards that make "Everglades Restoration" *worth* implementing.

Florida Wildlife Federation's message is that we are still in "a process" and, at this point in that process, all of us should push forward to obtain Congressional authorization for CEPP projects. By statute and court orders, the District and its taxpayers have incurred an obligation to meet water quality standards; formally agreeing to the role of "local sponsor" for CEPP does not add to that obligation. Long term, implementing the projects proposed may make achieving those standards easier. If the Governing Board feels it needs an "escape clause," the process builds one in: the Project Construction Agreement. Prepared after design, the PCA spells out responsibilities for the costs of construction, operations and maintenance. You are NOT now being asked to sign a PCA.

The Comprehensive Everglades Restoration Plan was adopted unanimously by the Florida Legislature in 2000, which also designated the South Florida Water Management District to be the state's "local sponsor." The plan also was adopted by Congress, winning every vote save that of one senator. At that time, it was anticipated that implementation would take thirty years to complete. As we approach the half-way point, the Federation urges all to continue moving forward to full implementation.

Sincerely,

Manley Fuller

Manley K. Fuller
President

cc:
Governor Rick Scott
Col. Alan Dodd
Shannon Estenoz

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

'0 7 FEB 2012

Planning and Policy Division
Environmental Branch

Honorable Colley Billie
Chairman, Miccosukee Tribe of Indians of Florida
Post Office Box 440021, Tamiami Station
Miami, Florida 33144

Dear Chairman Billie:

The Jacksonville District, U.S. Army Corps of Engineers (Corps) is beginning preparation of a National Environmental Policy Act assessment for the Central Everglades Planning Project (CEPP). The goal of CEPP is to develop an integrated, comprehensive technical plan for the first increment of project features to be recommended for authorization for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem. The Corps respectfully requests to meet with you and your staff routinely throughout the planning process to ensure any issues or concerns the Tribe may have are identified and we receive your input regarding development of this plan. The Corps is requesting a standing bimonthly (every other month) meeting with you and/or designated staff to discuss the Tribe's views on the CEPP. This bimonthly meeting request is in addition to tribal staff's participation in the regular Project Delivery Team meetings. The rationale behind this request is to provide a standing opportunity for open dialogue and government-to-government consultation throughout the CEPP planning process.

The next step for implementation of the Comprehensive Everglades Restoration Plan (CERP) is to redirect water that is currently discharged to the east and west coast estuaries from Lake Okeechobee and restore water flow to the south, allowing for restoration of natural habitat conditions and water flow in the central Everglades and re-connecting the ecosystem from Lake Okeechobee to Everglades National Park and Florida Bay. The CEPP (Figure 1) will develop the initial increment of project features that provide for water storage, treatment and conveyance south of Lake Okeechobee, removal of canals and levees within Water Conservation Area 3, and seepage management features to retain water within the natural system.

The CERP components identified to accomplish this include the Everglades Agricultural Storage Reservoirs, Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement, Everglades National Park (ENP) Seepage Management, and Everglades Rain-Driven Operations. These components make up the heart of CERP aimed at restoring more natural quantity, quality, timing and distribution of water flows to the remaining portions of the River of Grass. An integrated study effort on these projects is needed to set the direction for the next decade of CERP implementation.

We look forward to the opportunity to meet with you. Please contact Ms. Kim Taplin at 561-801-0285 at your earliest convenience to schedule these bimonthly meetings.

Sincerely,

Alfred A. Pantano, Jr.
Colonel, U.S. Army
District Commander
02/07/12

Enclosure

Copy Furnished:

Bernie Roman, Miccosukee Tribal Attorney, PO Box 440021 Tamiami Station, Miami, Florida 33144
Fred Dayhoff, Section 106 and NAGPRA Consultant, PO Box 440021 Tamiami Station, Miami, Florida 33144
James Erskine, Water Resources Director, PO Box 440021 Tamiami Station, Miami, Florida 33144
Rory Feeney, Miccosukee Wildlife Director, PO Box 440021 Tamiami Station, Miami, Florida 33144
Terry Rice, Colonel (Ret'd), PhD, PE, Miccosukee Everglades Consultant, 6526 S Kanner Highway, PMB 316, Stuart, Florida 34997

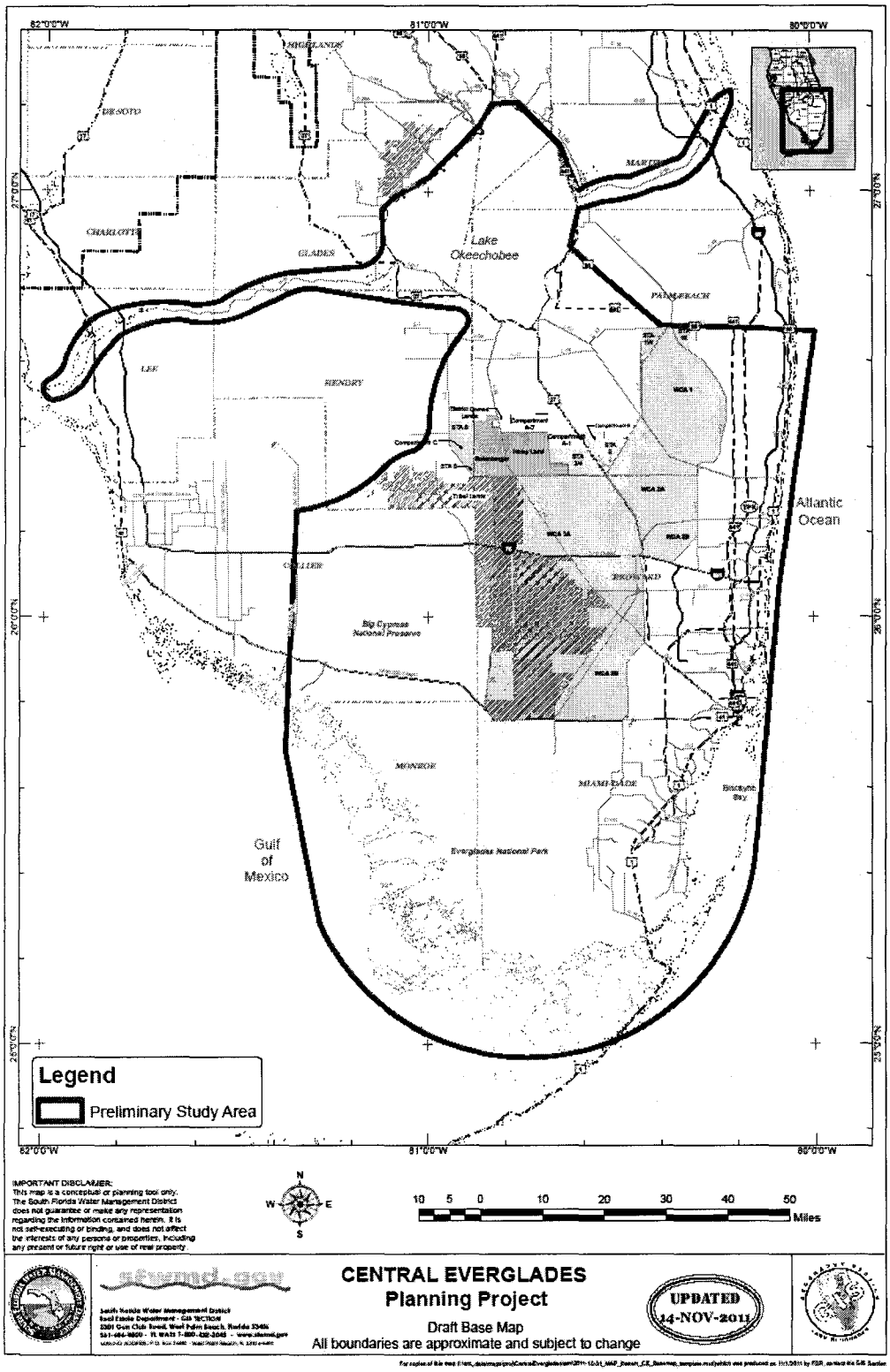

Figure 1. Central Everglades Planning Project Preliminary Study Area.

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning and Policy Division
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We look forward to the opportunity to meet with you. Please contact Ms. Kim Taplin at 561-801-0285 at your earliest convenience to schedule these bimonthly meetings.

Sincerely,

Alfred A. Pantano, Jr.
Colonel, U.S. Army
District Commander
02/27/12

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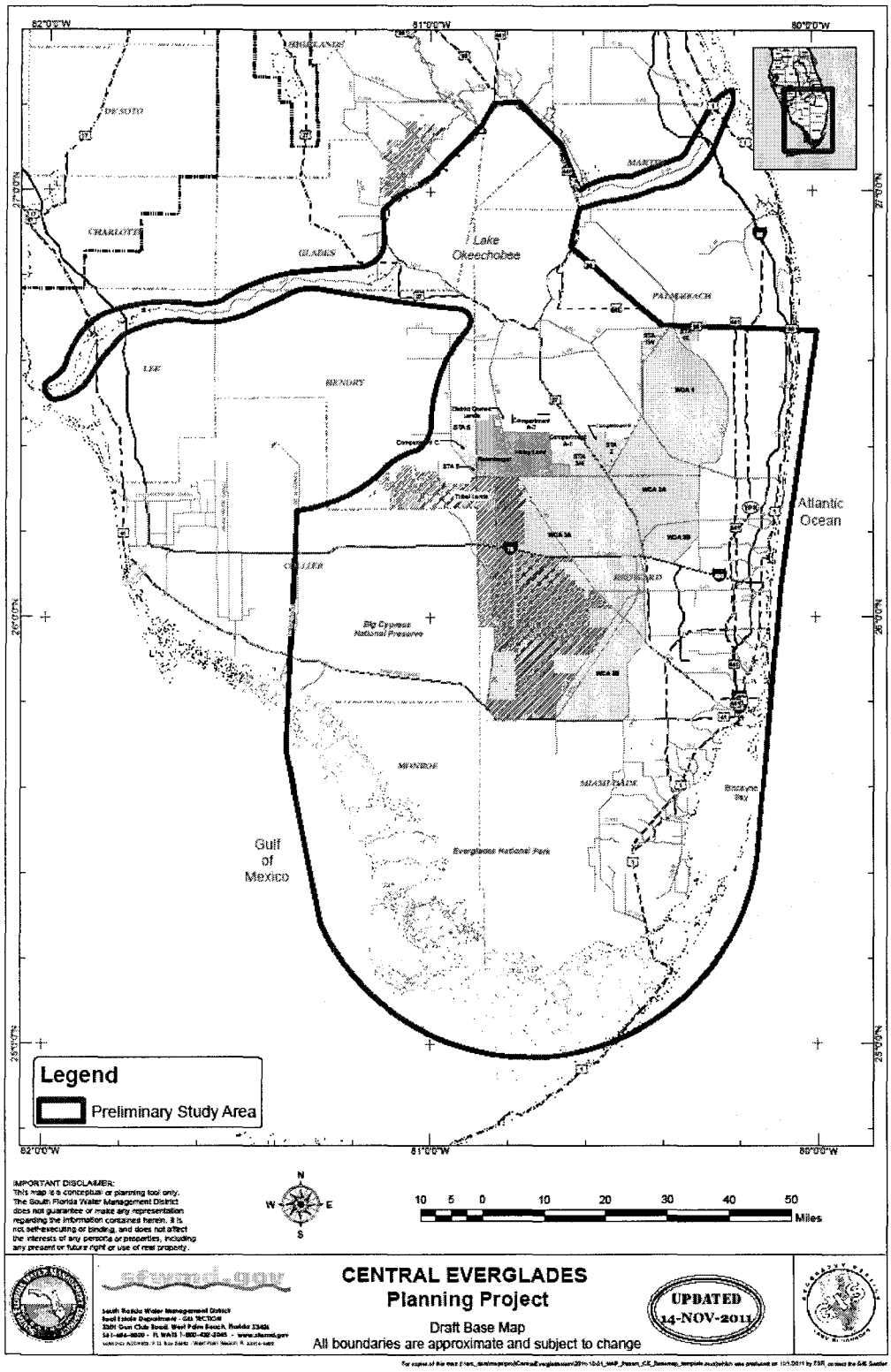

Figure 1. Central Everglades Planning Project Preliminary Study Area.

Ralph CESAJ-PD-?/2336
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Summa CESAJ-PD
Bush CESAJ-PD-PD
Appelbaum CESAJ-PD
~~Pax~~ CESAJ-OC
Hobbie CESAJ-PM
LTC Barker CESAJ-DED
Gapinski CESAJ-DX
COL Pantano CESAJ-DE

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DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

0 7 FEB 2012

Planning and Policy Division
Environmental Branch

Honorable James Billie
Chairman, Seminole Tribe of Florida
6300 Stirling Boulevard
Hollywood, Florida 33024

Dear Chairman Billie:

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Alfred A. Pantano, Jr.
Colonel, U.S. Army
District Commander
27 Jul 12

Enclosure

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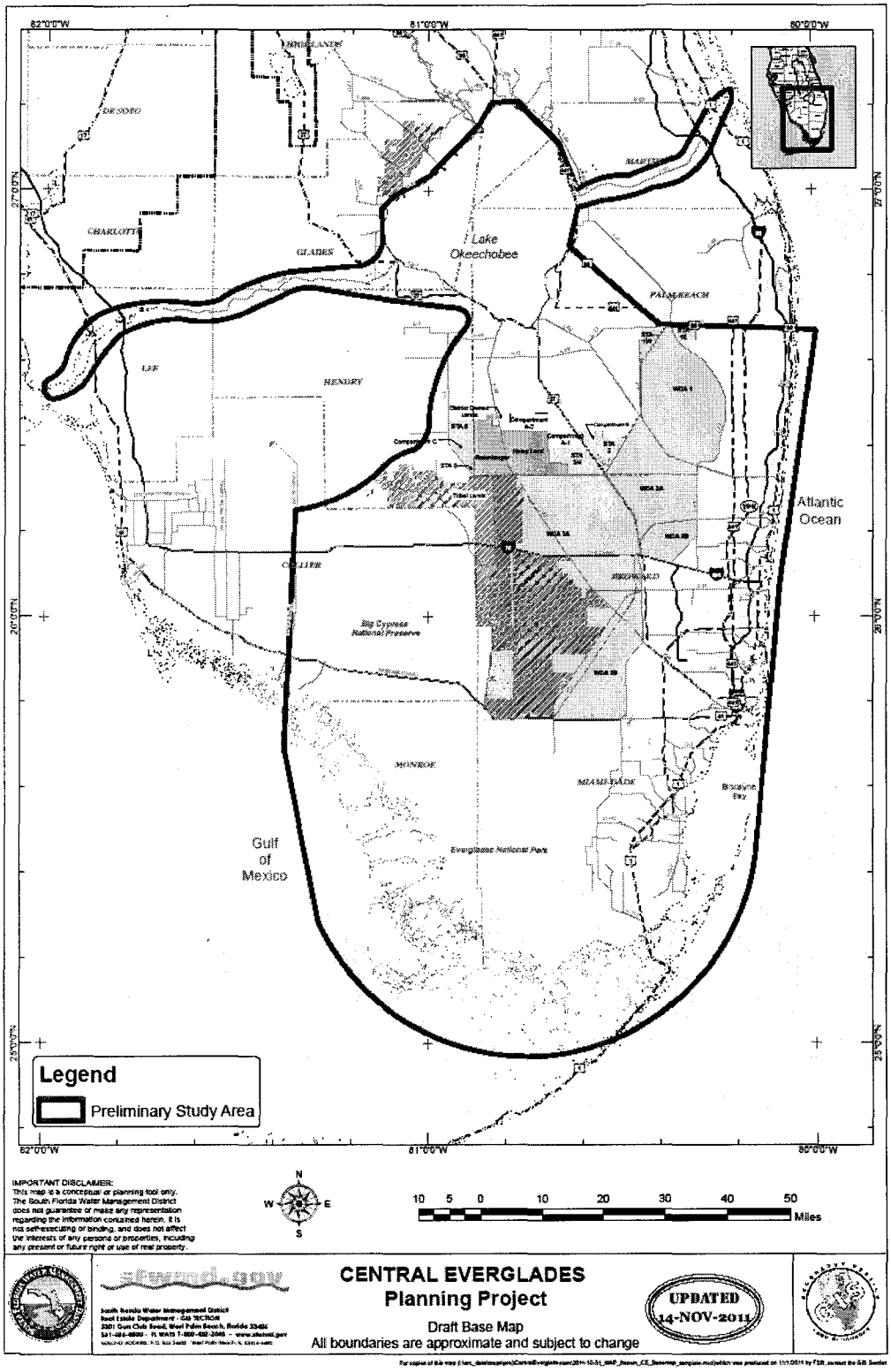
Craig Tepper, Director of Water Resource Management, Seminole Tribe of Florida, 6300 Stirling Road, Hollywood, Florida 33024
Jim Shore, General Counsel, Seminole Tribe of Florida, 6300 Stirling Road, Hollywood, Florida 33024
Willard Steele, Seminole Tribe of Florida, Tribal Historic Preservation Officer, 30290 Josie Billie Highway, PMP 1004, Clewiston, Florida 33440



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Gapinski CESAJ-DX
COL Pantano CESAJ-DE NP 02/07/12

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January 2012

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

Honorable James Billie
Chairman, Seminole Tribe of Florida
6300 Stirling Boulevard
Hollywood, Florida 33024

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Sincerely,

Alfred A. Pantano, Jr.
Colonel, U.S. Army
District Commander
02/27/12

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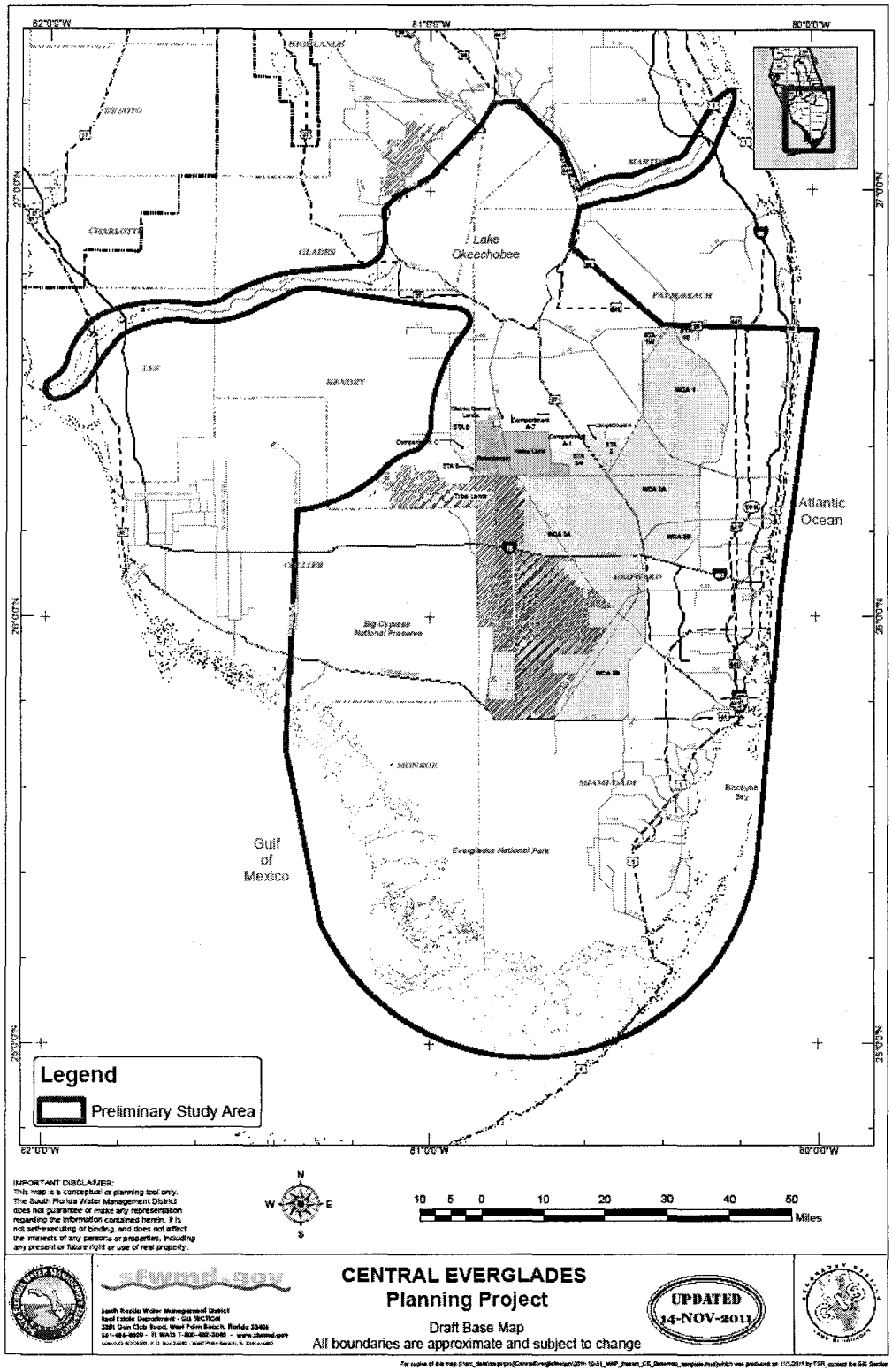

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Gapinski CESAJ-DX
COL Pantano CESAJ-DE

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January 2012

Appendix C.3.3 Draft Project Implementation Report (PIR) and Environmental Impact Statement (EIS) Notice of Availability

Statement of Recipients

Draft PIR and EIS Notice of Availability (NOA)

C.3.3 Statement Recipients

The November 23, 2011 scoping letter was mailed to the parties listed in **Table C.3-5**. The August 27, 2013 Notice of Availability (NOA) of the Draft EIS letter was mailed to the same list of stakeholders. Recipients include Federal, State, and local agencies, affected Indian Tribes, and other interested private organizations and individuals. A complete mailing list is available upon request.

Table C.3-3. List of Recipients

Recipients	
Federal	Federal Emergency Management Administration
	Federal Maritime Commission
	National Center for Environmental Health
	U.S. Department of Agriculture (Natural Resources Conservation Service and U.S. Forest Service)
	U. S. Department of Commerce (National Oceanic and Atmospheric Administration, Florida Keys National Marine Sanctuary, and National Marine Fisheries Service)
	U.S. Department of Homeland Security (U.S. Coast Guard 7th District)
	U.S. Department of Housing and Urban Development
	U.S. Department of the Interior (Bureau of Indian Affairs, National Park Service [Big Cypress National Preserve, Biscayne National Park, Everglades National Park], U.S. Fish and Wildlife Service, U.S. Geological Survey, Office of Environmental Policy and Compliance)
	U.S. Department of Justice
	U.S. Environmental Protection Agency
	U.s. Department of Transportation (Federal Highway Administration)
	U.S. Congressman – Florida Districts 17, 18, 19, 20, 21, 22, 23, 24, 25
	U.S. Senators – Florida
State	Florida Department of Agriculture and Consumer Services (Office of Agricultural Water Policy)
	Florida Department of Environmental Protection
	Florida Department of Transportation
	Florida Fish and Wildlife Conservation Commission
	Florida Keys Aqueduct Authority
	Florida Governor's Office
	Florida House Representatives - Districts 78, 82, 83, 84, 85, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120
	Florida State Clearinghouse
	Florida State Senators - Districts 25, 27, 28, 29, 30, 32, 33, 34, 35, 36, 38, 39, 40
	South Dade Soil and Water Conservation District
	South Dade Government Center

Recipients	
	South Florida Regional Planning Council
	Southwest Florida Regional Planning Council
	South Florida Water Management District
	State Historic Preservation Office
	University of Florida Cooperative Extension Office, Homestead, Florida
Tribe	Miccosukee Tribe of Indians of Florida
	Mucogee (Creek) Nation of Oklahoma
	Poarch Band of Creek Indians
	Seminole Nation of Oklahoma
	Seminole Tribe of Florida
County Agencies	Broward County Biological Resources Division
	Broward County Environmental Protection and Growth Management
	Lee County Public Utilities
	Martin County
	Miami-Dade County Department of Environmental Resources Management
	Miami-Dade County Department of Planning and Zoning
	Miami-Dade County Park & Recreation
	Miami-Dade County Water & Sewer
	Miami-Dade County Water Resources
	Monroe County Growth Management Department
	Palm Beach County Water Resources
County Government	Broward County Board of County Commissioners
	Miami-Dade County Board of County Commissioners
	Monroe County Board of Commissioners
	Palm Beach County Board of Commissioners
Municipalities	City of Delray Beach
	City of Florida City
	City of Fort Lauderdale
	City of Hollywood
	City of Homestead
	City of Lighthouse Point
	City of Pembroke Pines
	City of Sanibel
	City of Miami
	Lake Worth Drainage District
	South Broward Drainage District
	Town of Medley
	Town of Southwest Ranches
Libraries	Collier County Public Library, Everglades City Branch
	Broward County Public Library, Ft. Lauderdale Branch
	Miami-Dade Public Library, Homestead Branch
	Miami-Dade Public Library, Main Branch
	Northwest Regional Library, Coral Springs
Groups and Organizations	100 Friends of Florida
	Airboat Association of Florida

Recipients	
	Broward 298s
	Broward County Airboat Association
	Charleston Museum
	Clean Water Action
	Coopertown Airboat
	Dade County Farm Bureau
	Defenders of Wildlife
	Duke University
	Environmental and Land Use Law Center
	Everglades Coordination Council
	Everglades Foundation
	Everglades Protection Society
	Florida Atlantic University
	Florida Gulf Coast University
	Florida Biodiversity Project
	Florida International University
	Florida Keys Fishing Guides Association
	Florida Limerock and Aggregate Institute
	Florida Wildlife Federation
	Friends of the Everglades
	Homestead/Florida City Chamber of Commerce
	Las Palmas Homeowners Association
	Naples Pathways Coalition,
	National Parks Conservation Association
	Natural Resources Defense Council
	Northwestern University
	Nova University, Environmental and Land Use Law Center
	The Nature Conservancy
	Reef Relief
	Rutgers University
	Sierra Club
	Sierra Club, Miami Group
	South Florida Ecosystem Restoration Task Force
	The Conservancy
	Trail Glades Bassmasters of Miami
	Tropical Audubon Society
	Trust for Public Land
	University of Chicago, Field Museum of Natural History
	University of Florida
	University of Miami, School of Law
	University of West Florida
	Wildlife Foundation of Florida
	World Wildlife Fund of Florida
Businesses	Alednam Development
	Applied Environmental Services

Recipients	
	Coopertown Airboat
	Florida Power and Light
	Everglades Research Group, Inc
	Everglades Safari Park
	Florida Citrus Mutual
	Florida Rock Industries
	Gator Park
	Greenacres Farm
	Lehtinen, Vargas and Riedi
	Lewis, Longman and Walker
	Lincoln Financial
	Lone Star Environmental Studies
	Mac Vicar, Frederico and Lamb
	Miami Engineering Company
	Milian-Swain and Associates
	Palm Beach Post
	Pentavista Corporation
	Radio One, Pepper Hamilton
	Rinkers Materials Corporation
	Salem Communications Corporation
	South Dade News Leader
	Tarmac America
	White Rock Quarries
	WVCG Radio

C.3.3 Draft PIR/EIS Notice of Availability

The Notice of Availability (NOA) was published in the Federal Register and mailed to interested stakeholders August 30, 2013 to begin the 45 day review period. The Draft EIS was filed in accordance with ER-FRL-8994-7, Amended Environmental Impact Statement Filing System Guidance for Implementing 40 CFR 1506.9 and 1506.10 of the Council on Environmental Quality's Regulations Implementing the National Environmental Policy Act and made available for public and agency review. The draft EIS was published on the following websites:
http://www.evergladesplan.org/pm/projects/proj_51_cepp.aspx

and

http://www.saj.usace.army.mil/About/DivisionsOffices/Planning/EnvironmentalBranch/EnvironmentalDocuments.aspx#Multiple_Counties

A comment response matrix will be included in the Final EIS detailing comments received on the Draft EIS with USACE responses.

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

To Whom It May Concern:

Pursuant to the National Environmental Policy Act (NEPA) and the U.S. Army Corps of Engineers (Corps) Regulation (33 CFR 230.11), this letter constitutes the Notice of Availability of the Central Everglades Planning Project Draft Project Implementation Report and Environmental Impact Statement (PIR/EIS). The project is located in south Florida, in St. Lucie, Martin, Okeechobee, Glades, Hendry, Palm Beach, Broward, Miami-Dade, Monroe, Collier, Lee, and Charlotte Counties.

The Draft PIR/EIS is available for your review on www.evergladesplan.org and the Corps' Environmental planning website, under multiple counties:

http://www.evergladesplan.org/pm/projects/proj_51_cepp.aspx

http://www.saj.usace.army.mil/About/DivisionsOffices/Planning/EnvironmentalBranch/EnvironmentalDocuments.aspx#Multiple_Counties

A printed copy of the report is also available at the following libraries:

OKEECHOBEE COUNTY PUBLIC LIBRARY 206 S.W. 16TH STREET OKEECHOBEE, FLORIDA 34974	MAIN LIBRARY 100 S. ANDREWS AVENUE, FORT LAUDERDALE, FL 33301
MAIN LIBRARY 101 W FLAGLER ST. MIAMI, FL 33130	MAIN LIBRARY 3650 SUMMIT BOULEVARD WEST PALM BEACH, FL 33406
BLAKE LIBRARY 2351 SE MONTEREY RD STUART, FL 34996	

Any comments you may have must be submitted in writing to the letterhead address by October 13, 2013. Questions concerning the project can be submitted to Dr. Gretchen Ehlinger at the letterhead address or at CEPPcomments@usace.army.mil. Dr. Ehlinger may also be reached by telephone at 904-232-1682.

Sincerely,

Eric P. Summa
Chief, Environmental Branch

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

To Whom It May Concern:

Pursuant to the National Environmental Policy Act and the U.S. Army Corps of Engineers Regulation (33 CFR 230.11), this letter constitutes the Notice of Availability of the Central Everglades Planning Project Draft Project Implementation Report and Environmental Impact Statement. The project is located in St. Lucie, Martin, Okeechobee, Glades, Hendry, Palm Beach, Broward, Miami-Dade, Monroe, Collier, Lee, and Charlotte Counties, FL.

Any comments you may have must be submitted in writing to the letterhead address by October 13, 2013. Questions concerning this project can be submitted to Dr. Gretchen Ehlinger at Gretchen.S.Ehlinger@usace.army.mil or by telephone at 904-232-1682.

Sincerely,

Eric P. Summa
Chief, Environmental Branch

Enclosure

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

Dear Librarian:

Enclosed is a copy of the Central Everglades Planning Project Draft Project Implementation Report and Environmental Impact Statement. The project is located in south Florida in St. Lucie, Martin, Okeechobee, Glades, Hendry, Palm Beach, Broward, Miami-Dade, Monroe, Collier, Lee, and Charlotte Counties.

This Draft Project Implementation Report and Environmental Impact Statement is being provided for public review pursuant to the National Environmental Policy Act. We request that you make the copy available for public viewing in the reference section of your library for a period of 45 days (August 30 – October 13, 2013), after which it may be disposed.

Thank you for your assistance in this matter. If you have any questions or need further information, please contact Dr. Gretchen Ehlinger at 904-232-1682.

Sincerely,

Eric P. Summa
Chief, Environmental Branch

Enclosure

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

Ms. Lauren P. Milligan
Florida Department of Environmental Protection
State Clearinghouse
3900 Commonwealth Boulevard, MS 47
Tallahassee, Florida 32399-3000

Dear Ms. Milligan:

Pursuant to the National Environmental Policy Act, enclosed for State agency review and comment are 17 CDs of the Central Everglades Planning Project Draft Project Implementation Report (PIR) and Environmental Impact Statement (EIS). The project is located in south Florida, in St. Lucie, Martin, Okeechobee, Glades, Hendry, Palm Beach, Broward, Miami-Dade, Monroe, Collier, Lee, and Charlotte Counties.

Any comments you may have on the Draft PIR/EIS must be submitted in writing to the letterhead address by October 13, 2013. Any questions concerning the Draft PIR/EIS or requests for additional copies of the report should be directed to Dr. Gretchen Ehlinger at 904-232-1682, or e-mail at: Gretchen.S.Ehlinger@usace.army.mil.

Sincerely,

Eric P. Summa
Chief, Environmental Branch

Enclosures

APPENDIX C.4

ENVIRONMENTAL COMPLIANCE INFORMATION

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C.4 COMPLIANCE WITH ENVIRONMENTAL LAWS, STATUES AND EXECUTIVE ORDERS

The following documents required compliance with specific Federal acts, Executive Orders (E.O.) and other applicable environmental laws. The following sections provide a summary of environmental compliance with each Act, E.O. or applicable law.

C.4.1 Anadromous Fish Conservation Act

Anadromous fish species would likely not be affected by the proposed project. The project would be in compliance with this Act upon review of this document by the National Marine Fisheries Service.

C.4.2 Archaeological Resources Protection Act 1979

This Act works to protect and preserve historic and cultural resources of Federal lands, including Indian lands through a permit system authorizing scholarly study and excavation of cultural properties, as well as provide sanctions for unauthorized use, removal, or damage to any archaeological resource 16 U.S.C. §§432-33; 36 CFR Part 296. The term resource includes human remains, pottery, basketry, bottles, weapon projectiles, rock carvings and paintings, tools, structures or portions thereof, graves, skeletal remains 16 U.S.C. § 470bb(1). Resources of 'recent' origin (less than 100 years) are not protected by ARPA. U.S. v. Shivers, 96 F.3d 120. This project is in compliance with this Act.

C.4.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act, enacted in 1940 prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. While areas of foraging habitat utilized by bald eagle may be within the project area, impacts to these areas are not likely to adversely affect this protected species. The project would be in compliance with this Act upon review of this document and associated Biological Assessment (BA) by U.S. Fish and Wildlife Service (USFWS).

C.4.4 Clean Air Act

The existing air quality within South Florida is considered good. Section 176 (c) of the Clean Air Act requires that Federal agencies assure that their activities are in conformance with the federally approved Clean Air Act state implementation plans for geographical areas designated as "non-attainment" and "maintenance" areas under the Act. The proposed project is not located within a "non-attainment" area since there are none within the State of Florida. The only new potential source of air pollution as a result of this project would be from construction of pump station(s). Pursuant to rule 62-210.300(3)(a)(21)(b), operations staff would be required to determine if stations would be exempt from air permitting or if an air general permit would be required. Upon this determination, the project would be in compliance with this Act.

C.4.5 Clean Water Act of 1972

Full compliance would be achieved with issuance of a Water Quality Certification (WQC) under Section 401 from the State of Florida. A Section 404 (b)(1) evaluation has been prepared in **Appendix C.4.32**. The project may require dewatering permits and National Pollution Discharge Elimination System permits depending on means and methods of construction. All required permits would be obtained prior to construction activities. All State water quality standards would be met. Water quality is expected to improve with the proposed project. The project would be in compliance with this Act.

C.4.6 Coastal Barrier Resources Act and Coastal Barrier Improvement Act of 1990

There are no designated coastal barrier resources in the project area that would be affected by the proposed project. These Acts are not applicable.

C.4.7 Coastal Zone Management Act of 1972

A Federal Consistency determination has been prepared in accordance with the provisions of 15 CFR 930 and is located in **Appendix C.4.33**. The U.S. Army Corps of Engineers (USACE) has considered the enforceable policies of the State of Florida's management program as requirements to be adhered to in addition to existing Federal agency statutory mandates. The proposed project would be consistent to the maximum extent practicable with the enforceable policies of Florida's approved Coastal Zone Management program. This project would be in compliance upon review of this document by the State of Florida and issuance of Water Quality Certification.

C.4.8 Endangered Species Act of 1973

The proposed project has been coordinated with the USFWS and National Marine Fisheries Service (NMFS). The Corps requested concurrence from the USFWS on federally listed species and critical habitat that may be present in the project area in a letter dated January 23, 2013. The USFWS provided concurrence on the species list on May 10, 2013. See **Annex A** for the complete list of federally listed species and critical habitat provided in the BA that was prepared for this project. Consultation with the USFWS was formally initiated on April 1, 2013 with preparation of a BA. USFWS is expected to provide a Biological Opinion (BO) (**Annex A** – Biological Opinion) by December 17, 2013.

A programmatic Endangered Species Act Section 7 consultation for the Comprehensive Everglades Restoration Plan (CERP) was prepared on March 15, 2013 to evaluate potential effects of CERP, including the proposed CEPP, on listed species and designated critical habitat under the NMFS' purview. Due to the restoration opportunities provided by this project, the USACE anticipates concurrence on the determination of effects on all species under NMFS purview. Upon final review from the NMFS the proposed project would be fully coordinated as mandated under the Endangered Species Act. Further, upon review of this document by the USFWS and the NMFS, the proposed project would be in full compliance with the Act.

C.4.9 Estuary Protection Act of 1968

The proposed project would provide increased opportunities to redirect water that is currently discharged to the Caloosahatchee and St. Lucie Estuaries for flood control purposes, allowing for the re-establishment of oyster and sea grass populations that are important for providing water quality and habitat functions within the Northern Estuaries. The project would increase flows from Southern Everglades National Park to Florida Bay and result in favorable changes to salinity levels to improve conditions for key species such as seagrasses, seatrout, pink shrimp, and crocodiles. The proposed project is in compliance with the goals of this Act.

C.4.10 Farmland Protection Policy Act of 1981

Coordination with the United States Department of Agriculture (USDA) and National Resources Conservation Service (NRCS)to meet the requirements of the Farmland Protection Policy Act, 7 U.S.C. § 4201, is ongoing. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. The land is also used as cropland, pastureland, rangeland, forest land, or other land, but cannot be used as urban built-up land. According to 7 CFR 657.5, unique farmland is land other than prime farmland that is used for the production of specific high value food and fiber crops. These lands are not used in producing feed, food,

fiber, forage, and/or oilseed crops. Almost all land in central and southern Florida used for agricultural production has been designated unique farmland. CEPP Alternative 4R2 contains many components, and when detailed design information that locates each of the plan components becomes available, it can then be determined how many acres of unique farmland would be affected. The NRCS will then complete Form AD 1006 to inventory the loss of acres of unique farmland from agricultural production. The project will be in compliance with this Act upon availability of design information and coordination with NRCS.

C.4.11 Federal Water Project Recreation Act of 1965, As Amended

The effects of the proposed action on outdoor recreation have been considered and are presented in **Appendix F**. The CEPP recreation plan identifies, evaluates, and addresses the impacts of CEPP implementation on existing recreational use within the South Florida ecosystem and identifies and evaluates potential new recreation, public use, and public educational opportunities. Continued recreation planning would be performed during detailed project engineering and design. This project would not adversely affect existing recreational opportunities. This project is in compliance with the goals of this Act.

C.4.12 Fish and Wildlife Coordination Act of 1958, As Amended

The central objective of the Fish and Wildlife Coordination Act is to allow for equal consideration of wildlife resources. Representatives from USFWS have been involved in project planning, development, and evaluation with particular interests in effects to fish and wildlife resources and natural wildlife management areas. Planning Aid Letters (PAL) were provided to the USACE on January 20, 2012, March 27, 2012 and December 12, 2012. USFWS provided a Draft Fish and Wildlife Coordination Act Report (CAR) on July 19, 2013 and it has been included within **Annex A**. The project is in compliance with the goals of this Act.

C.4.13 Farmland Protection Policy Act of 1981

The Farmland Protection Policy Act is intended to minimize the unnecessary and irreversible conversion of farmland to nonagricultural uses. Coordination with the USDA and NRCS to meet the requirements of the Farmland Protection Policy Act is ongoing. When detailed design information that locates each of the plan components is completed, it can then be determined how many acres of unique farmland would be affected by the project. The proposed project would be in compliance with the goals of this Act upon completion of coordination of detailed design information.

C.4.14 Magnusson-Stevens Fishery Conservation and Management Act

The Magnusson-Stevens Fishery Conservation and Management Act, 16USC 1801 et seq. Public Law 104-208 reflects the secretary of Commerce and Fishery Management Council authority and responsibilities for the protection of Essential Fish Habitat (EFH). Federal agencies that fund, permit, or carry out activities that may adversely impact EFH are required to consult with the NMFS regarding the potential effects of their actions on EFH. This project has been coordinated with NMFS. A draft EFH assessment was provided on February 20, 2013. An official concurrence letter should be forthcoming after agency and public review of the draft PIR/EIS. Due to the restoration opportunities provided by the proposed project, the USACE anticipates concurrence with the determination that the CEPP should benefit EFH. The EFH assessment is included in **Appendix C.4.34.6.8**. Upon final review of the EFH assessment from the NMFS, the proposed project would be in full compliance with the goals of this Act.

C.4.15 Marine Mammal Protection Act of 1972

West Indian manatees inhabit the coastal and major inland waters of south Florida including Central and Southern Florida Project canals. Manatees are not expected to be adversely affected by the proposed project. Consultation with the USFWS has been initiated for the manatee, and a determination by USACE of not likely to adversely affect was made (**Annex A** – Biological Opinion). Incorporation of the safeguards used to protect threatened and endangered species during construction and operation would protect West Indian manatees within the area. The proposed project would be in compliance with this Act upon review of this document by the USFWS.

C.4.16 Marine Protection, Research and Sanctuaries Act

This Act is not applicable. Ocean disposal of dredged material is not proposed as a part of the tentatively selected plan.

C.4.17 National Environmental Policy Act of 1969

This Act encourages public participation and comment on Federal projects, and requires agencies to cooperate with other Federal agencies, State, and local governments, and to involve public stakeholders. Initial public coordination began with the distribution of a scoping letter, dated November 23, 2011, announcing the preparation of an Environmental Impact Statement (EIS) and inviting public and agency comment (**Appendix C.3**). Public scoping meetings were held December 14, 2011 in Plantation, Florida and December 15, 2011 in Clewiston Florida. A Notice of Intent to prepare an EIS was published in the Federal Register (76 FR 75539) December 2, 2011. Five NEPA public workshops were held December 10, 2012 in Estero, Florida; December 11, 2012 in Homestead, Florida; December 12, 2012 in Clewiston, Florida; December 13, 2012 in Stuart, Florida; and December 18, 2012 in Coconut Creek, Florida to present the preliminary final array of alternatives. Environmental information on this project has been compiled, and a Draft EIS has been prepared. A Notice of Availability for this Draft EIS will be published in the Federal Register, and the Draft EIS will be circulated for a period of 45 days. A public meeting is planned during the comment period for the Draft EIS. Upon public and agency review and comment on this document preparation, circulation of the Final EIS, and signing of the Record of Decision, this project would be in full compliance with this Act.

C.4.18 National Historic Preservation Act of 1966 (Inter alia)

The proposed project is in compliance with the National Historic Preservation Act, as amended (PL89-665). As part of the requirements and consultation process contained within the National Historic Preservation Act implementing regulations of 36 CFR 800, this project is also in compliance through ongoing consultation with the Archaeological and Historic Preservation Act, as amended (PL93-29), Archeological Resources Protection Act (PL96-95), American Indian Religious Freedom Act (PL 95-341), Executive Order 11593, 13007, and 13175, the Presidential Memo of 1994 on Government to Government Relations and appropriate Florida Statutes. Consultation with the Florida State Historic Preservation Officer (SHPO), appropriate federally recognized tribes, and other interested parties was initiated December 27, 2011 and is ongoing. See **Appendix C.5** for details of the ongoing consultation. Through consultation with SHPO and STOF THPO, it was agreed that Section 106 consultation would not be completed during the current feasibility phase of the project; however, consultation would be complete prior to construction. Any additional project specific surveys for cultural resources and site evaluations will be conducted during the Pre-construction Engineering and Design Phase of the project. National Register eligible properties were taken into account while planning this undertaking. The project will be in compliance with the goals of this Act upon completion of coordination as stated above.

C.4.19 Native American Graves Protection and Repatriation Act as Amended

Federal agencies must make an inventory of all Indian human remains and funerary objects in its possession and control, attempt to identify the affiliated tribe, and repatriate the items to the appropriate group. This Act also applies to inadvertent discoveries, in that there is a required delay in the disturbance of a site containing human remains until consultation with affiliated tribes is accomplished. The proposed project is in compliance.

C.4.20 Resource Conservation and Recovery Act, As Amended By the Hazardous and Soils Waste Amendments of 1984, CERCLA As Amended by the Superfund Amendments and Reauthorization Act of 1966, Toxic Substances Control Act of 1976

Hazardous, toxic and radioactive waste surveys would be conducted as required. The removal and excavation as described in the proposed action is not expected to result in the discovery or generation of HTRW materials. The proposed action would involve ground disturbances. The proposed project is in compliance with these Acts.

C.4.20.1 USACE – Comprehensive Everglades Restoration Policy – Residual Agricultural Chemicals, USACE-ASA-CW Policy, September 2011.

To address the issues presented by low-level residual agricultural chemicals present on CERP project lands, the Assistant Secretary of Army for Civil Works provided a policy memorandum on September 14, 2011. A copy of the policy is attached and incorporated into the formulation of the proposed project.

C.4.21 Rivers and Harbors Act of 1899

The proposed project would not obstruct navigable waters of the United States. The project has been subject to public notice and other evaluations normally conducted for activities subject to the Act. The proposed project is in compliance with the goals of this Act.

C.4.22 Submerged Lands Act of 1953

The proposed project would reduce freshwater flows to the Caloosahatchee Estuary and the St. Lucie Estuary and provide freshwater overland flow to Florida Bay that will ultimately benefit the ecological habitats that occur on submerged lands of the State of Florida. No construction is expected on submerged lands; therefore the project is in compliance with the goals of this Act.

C.4.23 Wild and Scenic Rivers Act of 1968, As Amended

There are no designated wild and scenic river reaches within the project area that would be affected by project related activities. This Act is not applicable.

C.4.24 E.O. 11514, Protection of the Environment

E.O. 11514 directs Federal agencies to “initiate measures needed to direct their policies, plans, and programs so as to meet national environmental goals.” The objectives of the project are focused on environmental protection. The project is in compliance with the goals of this E.O.

C.4.25 E.O. 11593, Protection and Enhancement of the Cultural Environment

E.O. 11593 directs Federal agencies to provide leadership in preserving, restoring and maintaining the historic and cultural environment of the Nation. Agencies of the executive branch of the Government (hereinafter referred to as "Federal agencies") shall (1) administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations, (2) initiate measures necessary to direct their policies, plans and programs in such a way that federally owned sites, structures, and

objects of historical, architectural or archaeological significance are preserved, restored, and maintained for the inspiration and benefit of the people, and (3), in consultation with the Advisory Council on Historic Preservation (16 U.S.C. 470i), institute procedures to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures and objects of historical, architectural or archaeological significance. The project is in compliance with this E.O.

C.4.26 E.O. 11988, Flood Plain Management

E.O. 11988 directs Federal agencies to avoid siting projects in floodplains and to avoid inducing further development of flood-prone areas. The project is not a development but rather a restoration action. Commitment of lands to project restoration would preclude such development. The proposed action would help restore and preserve the natural and beneficial uses of the floodplain. The project would be operated in a manner that would not increase flooding of private property. The project is in compliance with the goals of this E.O.

C.4.27 E.O. 11990, Protection of Wetlands

E.O. 11990 directs Federal agencies to avoid developing and locating projects in wetlands. The proposed project area is located within freshwater wetlands. The nature of this project is that it involves operations in wetlands, and no other practicable alternative to locating this project in avoidance of wetland exists. The objectives of the project are focused on environmental protection. A net functional benefit to wetlands within and adjacent to the project area is expected. The project is in compliance with the goals of this E.O.

C.4.28 E.O. 12962, Recreational Fisheries

E.O. 12962 requires the evaluation of federally funded, permitted, or authorized actions on aquatic systems and recreational fisheries. Effects to recreational fisheries would be negative or positive depending on the activity and location. Recreational fishing by boat would be negatively impacted by back filling the Miami canal and access in L-67C Canal could be lost by placement of the blue shanty levee (could be offset by installing a ramp from the Blue Shanty Levee into the L-67C Canal). Bank Fishing opportunities could be positively increased by addition of access points around proposed structures. The proposed project also has the potential to improve recreational fisheries in Florida Bay and southwestern coastal estuaries and provide slight improvements in recreational fisheries in the Caloosahatchee and St. Lucie Estuaries. Implementation of CEPP is expected to significantly improve conditions for fish species throughout much of the Greater Everglades. The largest percent gains in daily average fish density were predicted within northern Water Conservation Area 3A (WCA 3A) and Northeast Shark River Slough (NESRS). In these areas, fish densities increased in excess of 30%, with extremes over 80%. Other areas within Shark River Slough should also experience appreciable gains in fish density due to increased flows, thus enhancing fishing opportunities. This project is in compliance with the goals of this E.O.

C.4.29 E.O. 12898, Environmental Justice

E.O. 12898 directs Federal agencies to provide full participation of minorities and low-income populations in the Federal decision-making process, and further directs agencies to fully disclose any adverse effects of plans and proposals on minority and low-income populations. There was sufficient public input to feel confident that scoping was successful and that the breadth of the potential impacts were communicated and understood by the public. During Scoping and subsequent public meetings no subjects or issues were presented as possible environmental impacts that may be disproportionate towards minority and or low income populations. The objectives of the project are focused on environmental protection. Implementation of the project would benefit all population groups by

providing restoration of wetlands and other natural resources within the project area. Therefore the project is not expected to have disproportionately high and adverse human health or environmental impacts on minority or low-income populations. The project is in compliance with the goals of this E.O.

C.4.30 E.O. 13045 Protection of Children

E.O. 13045, requires each Federal agency to "identify and assess environmental risks and safety risks [that] may disproportionately affect children and ensure that its "policies, programs, activities, and standards address disproportionate risks to children that results from environmental health risks or safety risks." The proposed project is not expected to have environmental or safety risks that may disproportionately affect children. The project is in compliance with the goals of this E.O.

C.4.31 E.O. 13089 Coral Reef Protection

There are no hardground or coral reef communities located within the proposed project site or the nearshore waters affected by the project. The project is not expected to adversely impact coral reefs or coral reef resources. This E.O. is not applicable.

C.4.32 E.O. 13122 Invasive Species

The proposed project has the potential to allow expansion of exotic and/or invasive species, due to construction and operational changes to the current water management system. Construction measures to reduce the spread of exotic and/or invasive species would be included in the contract specifications. A nuisance and exotic vegetation control plan has been prepared and is included in **Annex D**. The objectives of the plan are to prevent and/or reduce the establishment of non-native species within the project area. The project is in compliance with the goals of this E.O.

C.4.33 E.O. 13175, Consultation and Coordination with Indian Tribal Governments

E.O. 13175 sets forth fundamental principles to guide agencies in formulating and implementing policies that have tribal implications. The E.O. goes on to set forth policymaking criteria to which agencies must adhere to the extent permitted by law. These principles an policymaking criteria apply to an agency's "regulations, legislative comments or proposed legislation, and other policy statements or actions" that have "substantial direct effects on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes" (Sec.1(a)). The project is in compliance with this E.O. See **Appendix C.3** and **Appendix C.5** for further details.

C.4.34 E.O. 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

Migratory and resident bird species have been observed within the project area and are likely to use available habitat for foraging, nesting, and breeding. The proposed project is not expected to destroy migratory birds, their active nests, their eggs, or their hatchlings. The proposed project is expected to benefit migratory birds by improving habitat and increasing availability of forage species (amphibians, fish, aquatic and invertebrates) for wading birds. The project is in compliance with the goals of this E.O.

C.4.35 Memorandum on Government-to-Government Relations with Native American Tribal Governments 1994

This Presidential Memorandum directs the Federal government to operate within a government-to-government relationship with federally recognized Native American tribes. The head of each executive department and agency shall be responsible for ensuring that the department or agency operates within a government-to-government relationship with federally recognized tribal governments. Each executive department and agency shall apply the requirements of the E.O. 12875 ("Enhancing the

Intergovernmental Partnership") and E.O. 12866 ("Regulatory Planning and Review") to design solutions and tailor Federal programs, in appropriate circumstances, to address specific or unique needs of tribal communities. The USACE has consulted with the Miccosukee Indian Tribe of Florida and the Seminole Tribe of Florida during the NEPA process and during planning efforts for the CEPP. This project is in compliance with the goals of this memorandum. Coordination letters are included in **Appendix C.3** and **Appendix C.5**.

C.4.36 Seminole Indian Lands Claim Settlement Act of 1987

The Florida Indian (Seminole) Land Claims Settlement Act of 1987 directed the SFWMD the State of Florida, and the Seminole Tribe to execute an agreement for the purposes of resolving tribal land claims and settling the lawsuit filed by the Seminole Tribe, which involved certain land claims within the State. Agreements to resolve tribal land claims were executed between the three parties, which included conveyance of land and payment of consideration to the tribe, and implementing legislation by the Congress of the United States and Legislature of the State of Florida. An agreement known as the Water Rights Compact (Compact) was executed between the State of Florida, the District, and the Seminole Tribe of Indians of Florida. The Compact specifically defined tribal water rights. This Compact was adopted into Federal and state law. It includes a series of provisions establishing the Tribe's rights and creating several '"entitlements" to water for each of the Tribe's reservations. Water supply deliveries to the two Seminole reservations within the CEPP study area are not significantly affected by CEPP. Any "modeled" decreases in water supply deliveries would not be expected under real-world conditions due to the Compact requirements. Complete performance summaries for water supply to the reservations is included in **Appendix C.2.2**. This project is in compliance with this Act.

C.4.37 Compliance with Florida Statues

The State of Florida has enacted several laws pertaining to implementation of CERP projects. These include amendments to Section 373.026 (8), Florida Stature (F.S.), which establish a requirement for the South Florida Water Management District (SFWMD) to submit a report for review and approval by the Florida Department of Environmental Protection (FDEP) prior to formal submission of a request for authorization from Congress and prior to receiving an appropriation of state funds for construction and other implementation activities (except the purchase of lands from willing sellers); the enactment of Section 373.1501 F.S., which establishes the intent of the Florida Legislature with respect to CERP and the criteria for FDEP approval and the procedures to be followed by the SFWMD and FDEP for submitting and reviewing requests for approval; the enactment of Section 373.1502 F.S., which establishes permitting requirements and a process for the submittal, review, and issuance of certain regulatory permits for CERP projects; and the enactment of Section 373.470 and Section 373.472 F.S., establishing the "Save Our Everglades Trust Fund," funding and reporting requirements, and procedures for distributions from the trust fund.

The SFWMD's State Compliance Report addressing the criteria for approval listed in Section 373.1501 F.S. is included in **Annex B**. In addition to the above-described statutory requirements, other sections of Chapters 373 (Water Resources) and 403 (Environmental Control) of the Florida Statutes include requirements that may apply to various aspects of CERP project planning and implementation. In particular, Chapter 403 F.S. and the administrative laws adopted in accordance with Chapters 373 and 403 F.S., contain the requirements for facilities that involve the discharge or potential discharge of pollutants to surface and groundwaters, and the discharge of air pollutants, including facilities regulated under the Federal Clean Water and Safe Drinking Water Acts and the Federal Clean Air Act. Based on the information contained in this PIR, the Tentatively Selected Plan complies with the applicable

provisions of the Florida Statutes. A detailed explanation of how the project complies with the applicable requirements for CERP projects contained in the Florida Statutes can be found in **Annex B**.

C.4.38 CLEAN WATER ACT SECTION 404(B)(1) EVALUATION

PREFACE This document is a programmatic Section 404(b)(1) Evaluation for the CEPP EIS. As such it addresses, at a general level, the potential environmental effects of the wetland and aquatic ecosystem alterations expected from dredge and fill and the construction of the structural components of the tentatively selected plan. Subsequent site-specific Section 404(b)(1) Evaluations are intended to be done for individual project components, or groups thereof, in sufficient detail for final decision making and for full compliance with the Section 404(b)(1) Guidelines and National Environmental Policy Act requirements. This should be sufficient to qualify for, and in the event that subsequent decisions render the project in compliance with, Section 404(b) of the Clean Water Act and exempt from Water Quality Certification.

C.4.38.3.1 Location

The study area (**Figure C.4-1**) for the Central Everglades Planning Project (CEPP) encompasses the Northern Estuaries (St. Lucie River and Estuary (including Indian River Lagoon) and the Caloosahatchee River and Estuary), Lake Okeechobee, a portion of the Everglades Agricultural Area, the Water Conservation Areas; Everglades National Park (ENP), the Southern Estuaries (specifically focused on Florida Bay), and portions of the Lower East Coast.

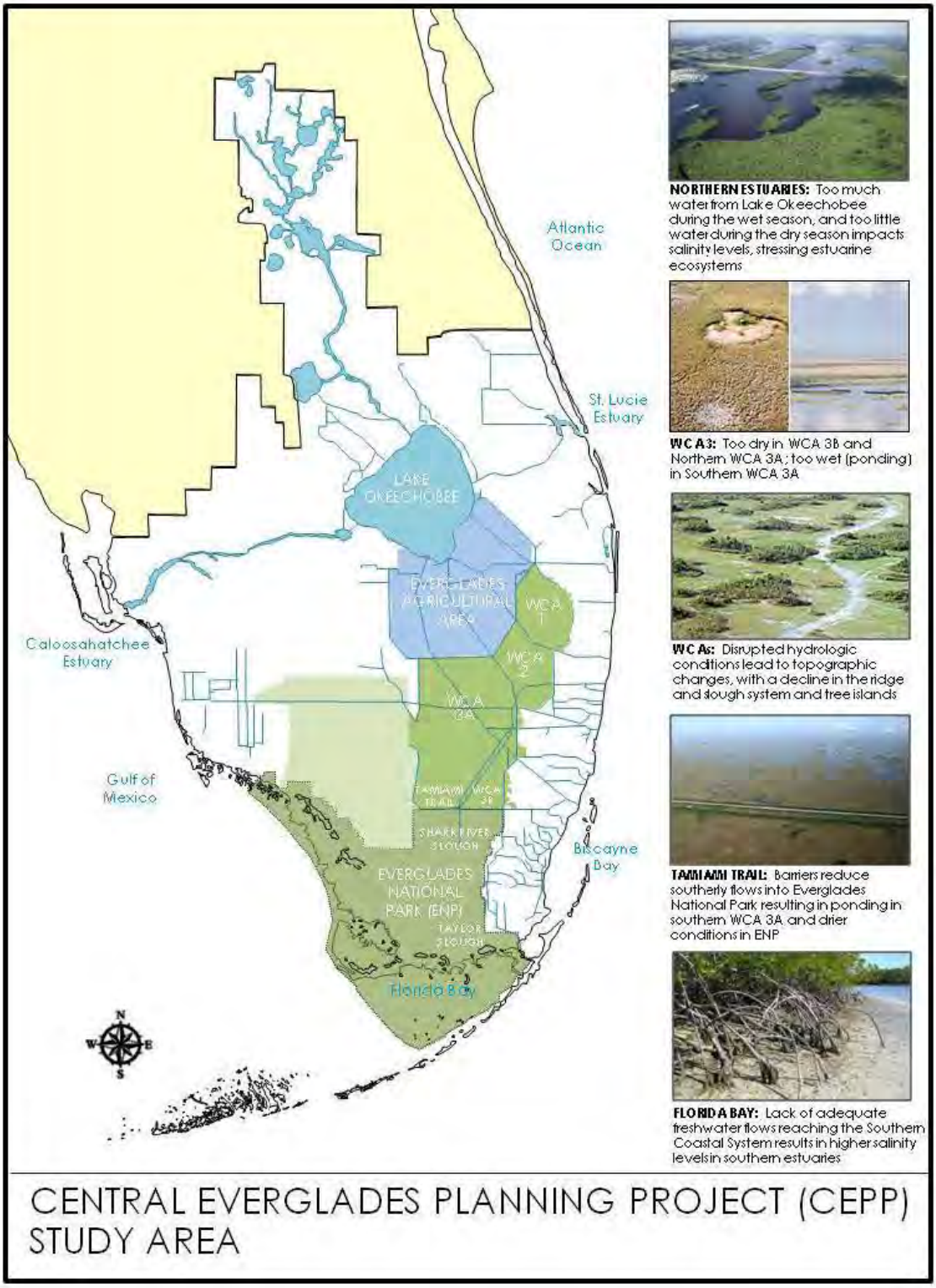


Figure C.4-1. Project Area Map

C.4.38.3.2 Project Description

C.4.38.3.2.1 Plan Features

The components of the TSP, Alternative 4R2, are organized into four geographic areas: North of the Redline, South of the Redline, the Green/Blue lines and along the Yellowline.

I. **Everglades Agricultural Area (EAA)** (North of the Redline) includes construction and operations to divert, store and treat Lake Okeechobee regulatory releases.

Storage and treatment of new water will be possible with the construction of a 14,000 acre FEB and associated distribution features on the A-2 footprint that is operationally integrated with the state-funded and state-constructed A-1 FEB and existing STAs. The A-2 FEB will accept EAA runoff and a portion of the Lake Okeechobee water currently discharged to the estuaries. This Lake Okeechobee water is diverted to the FEB when FEB/STAs and canals have capacity. The C-44 reservoir also collects water that would go to the St. Lucie Estuary, and CEPP modifies operations of the reservoir to return a portion of this water back to Lake Okeechobee, from which water can be delivered to the FEB or used to provide water supply deliveries.

It is anticipated that changes to the 2008 LORS will be needed in order to achieve the complete ecological benefits envisioned through implementation of CEPP. Operational changes to the LORS were incorporated into the hydrologic modeling conducted for the CEPP alternatives, including Alternative 4R2, in efforts to optimize CEPP system-wide performance within the current Zones of the 2008 LORS. More specifically, the hydrologic modeling of the CEPP alternatives included proposed revisions to the 2008 LORS decision tree outcome maximum allowable discharges dependant on the following criteria: Lake Okeechobee inflow and climate forecasts (class limits were modified for tributary hydrologic conditions, seasonal climate outlook, and multi-seasonal climate outlook), stage level (regulation zone), and stage trends (receding or ascending). While some refinements were made within the operational flexibility available in the 2008 LORS, assumptions ultimately extended beyond this flexibility due to adjustments made to the tributary/climatological classifications. Additional information and documentation of these assumptions are found in the **Appendix A** (Engineering) of the CEPP PIR. The CEPP PIR will not be the mechanism to propose or conduct the required NEPA evaluation of modifications to the Lake Okeechobee Regulation Schedule.

II. **WCA 2A and Northern WCA 3A** (South of the Redline) includes conveyance features to deliver and distribute existing flows and the redirected Lake Okeechobee water through WCA 3A.

Backfilling 13.5 miles of the Miami Canal between I-75 and 1.5 miles south of the S-8 pump station, and converting the L-4 canal into a spreader canal by removing 2.9 miles of the southern L-4 levee are the key features needed to ensure spatial distribution and flow directionality of the water entering WCA 3A.

Conveyance features to move water into and through the northwest portion of WCA 3A include: a gated culvert to deliver water from the L-6 Canal to the remnant L-5 Canal, a new gated spillway to deliver water from the remnant L-5 canal to the western L-5 canal (during L-6 diversion operations); a new gated spillway to deliver water from STA 3/4 to the S-7 pump station during peak discharge events (eastern flow route is not typically used during normal operations), including L-6 diversion operations; approximately 13.6 miles of conveyance improvements to the L-5 Canal; a new pump station to maintain Seminole Tribe, STA-5, and STA-6 water supply deliveries west of the L-4 Canal; and new gated culverts and an associated new canal to deliver water from the Miami Canal (downstream of S-8, which pulls water

from the L-5 Canal) to the L-4 Canal, along with potential design modifications to the existing S-8 and G-404 pump stations.

The Miami Canal will be backfilled to approximately 1.5 feet below the peat surface of the adjacent marsh. Spoil mounds on the east and west side of the Miami Canal from S-8 to I-75 will be used as a source for Miami Canal backfill material. Refuge for fur-bearing animals and other upland species will continue to be provided by the retention of 22 of the highest priority Florida Fish and Wildlife Conservation Commission (FWC) enhanced spoil mounds between S-339 to I-75 and the creation of additional upland landscape (constructed tree islands) approximately every mile along the entire reach of the backfilled Miami canal section (S-8 to I-75) where historic ridges or tree islands once existed. The constructed tree islands will block flow down the backfilled canal due to the tree island having a profile across the landscape that varies, or undulates, in elevation. Miami Canal constructed tree island design details will be determined during CEPP preconstruction, engineering and design (PED) phase. Tree island design, construction/planting will be coordinated with appropriate science team members with expertise in these topics to accomplish the restoration vision and intent of CEPP's canal backfilling and tree island construction. A diverse array of species will be planted, including trees, shrubs, and herbaceous species that are appropriate for these tree islands. Additional details are located in **Appendix A**.

III. **Southern WCA 3A, WCA 3B, and ENP** (Green/Blue Lines) includes conveyance features to deliver and distribute water from WCA3A to WCA 3B and ENP.

A new Blue Shanty levee extending from Tamiami Trail northward to the L-67A levee will be constructed. This Blue Shanty levee will divide WCA 3B into two subunits, a large eastern unit (3B-E) and a smaller western unit, the Blue Shanty Flowway (3B-W). A new levee is the most efficient means to restore continuous southerly sheetflow through a practicable section of WCA 3B and alleviates concerns over effects on tree islands by maintaining lower water depths and stages in WCA 3B-E. The width of the 3B-W flow-way is aligned to the width of the downstream 2.6-Mile Tamiami Trail Next Steps bridge, optimizing the effectiveness of both the flow-way and bridge.

In the western unit, construction of two new gated control structures on the L-67A, removal of the L-67C and L-29 Levees within the flowway, and construction of a divide structure in the L-29 Canal will enable continuous sheetflow of water to be delivered from WCA 3A through WCA 3B-W to ENP. A gated control structure will also be added to the L-67A, outside the flowway, to improve the hydroperiod of the eastern unit of WCA 3B. Spoil mounds along the northwestern side of the L-67A Canal, in the proximity to the three new L-67A structures, will also be removed to facilitate sheetflow connectivity with the WCA 3A marsh.

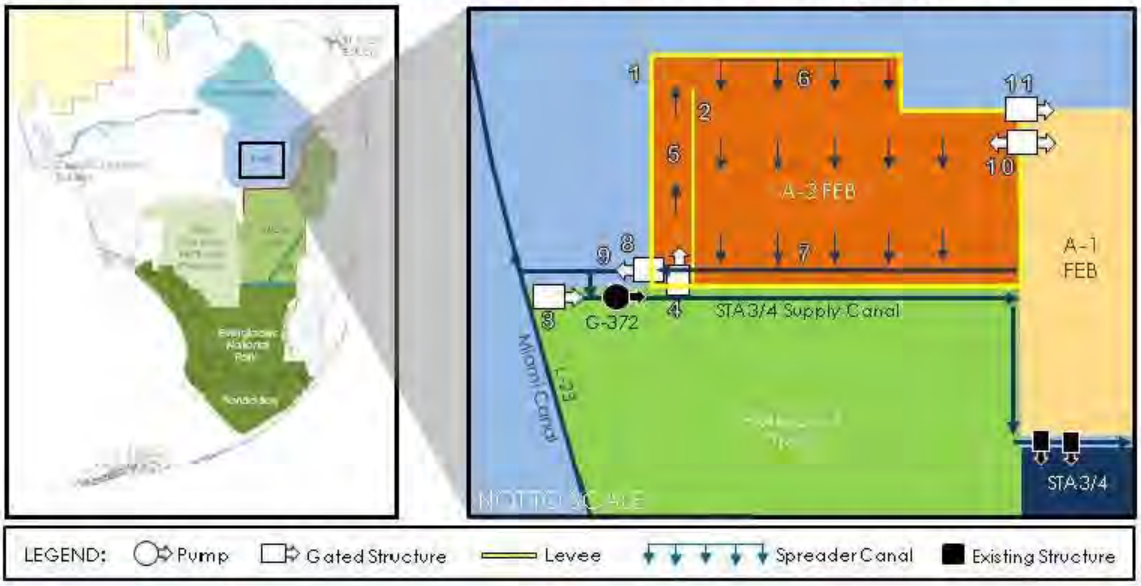
Increased outlet capability at the S-333 structure at the terminus of the L-67A canal, removal of approximately 5.5 miles of the L-67 Extension Levee, and removal of approximately 6 miles of Old Tamiami Trail between the ENP Tram Road and the L-67 Extension Levee will facilitate additional deliveries of water from WCA 3A directly to ENP. Detailed design and construction of these features will consider improving recreation access and minimize project footprints due to the nature of these environmentally sensitive areas.

IV. **Lower East Coast Protective Levee (Yellowline):** Includes features primarily for seepage management, which are required to mitigate for increased seepage resulting from the additional flows into WCA 3B and ENP.

A newly constructed pump station with a combined capacity of 1,000 cfs will replace the existing temporary S-356 pump station, and a 4.2-mile partial depth seepage barrier will be built along the L-31N Levee south of Tamiami Trail.

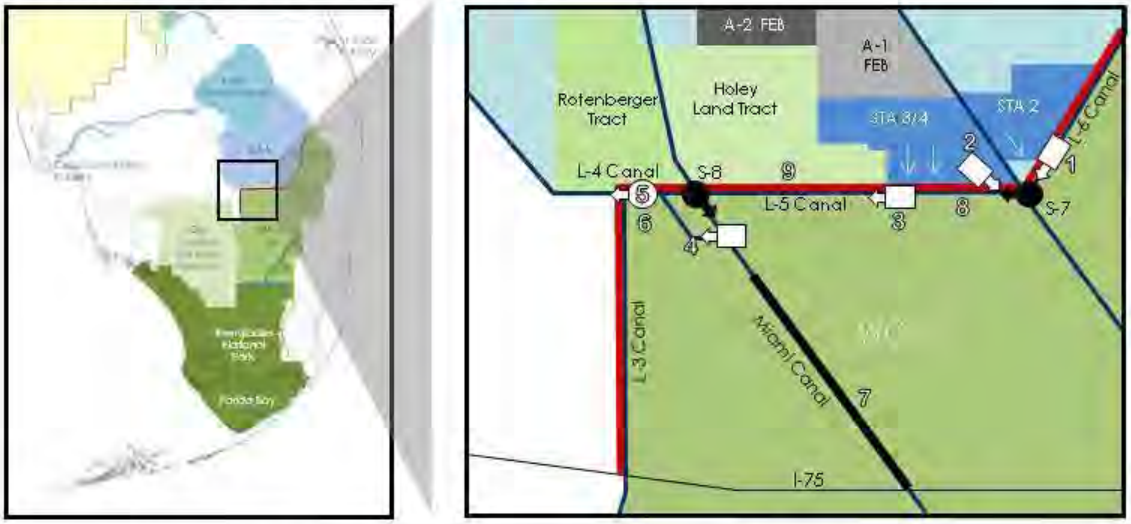
There is an existing 2-mile seepage cut-off wall in the same vicinity that was constructed by a permittee as mitigation. There is a possibility that the same permittee may construct an additional 5 miles of seepage wall south of the 2-mile seepage wall, if permitted. Since the capability and effectiveness of the existing seepage wall to mitigate seepage losses from ENP remains under investigation, the CEPP TSP conservatively includes an approximately 4.2mile long, 35 feet deep tapering seepage barrier in the event construction is necessary.

The specific feature locations are shown in **Figure C.4-2** through **Figure C.4-5** (also see end of **Section 6** foldout figure). Further details of features are available in **Appendix A**.



#	STRUCTURE	STRUCTURE/FEATURE TYPE	CFS	TECHNICAL NOTES
1	L-624	Levee		Perimeter Levee (~ 20 miles, 11.3 feet high, 14 feet wide, 3:1 side slope)
2	L-625	Levee		Interior levee (~ 4 miles, 11.3 feet high, 12 feet wide, 3:1 side slope)
3	S-623	Gated Spillway	3700	Delivers water from Miami Canal to existing G-372 pump station
4	S-624	Gated Sag Culvert (FEB inflow structure)	1550	Receives water from existing pump station G-372 via STA 3/4 Supply Canal and delivers it to C-624 FEB inflow canal
5	C-624	FEB Inflow Canal	1550	Conveys water from FEB inflow structure S-624 to FEB C-624 E spreader canal (length: ~ 4 miles)
6	C-624E	FEB Spreader Canal		Distributes FEB inflows across northern FEB; sheetflow within FEB is generally north to south (length: ~ 4 miles)
7	C-625E	FEB Collection Canal	400	Existing seepage canal for STA 3/4 Supply Canal, used to supplement FEB sheetflow during normal operating conditions
8	S-625	Gated Culverts (FEB discharge structure)	1550	Delivers water to FEB outflow canal (C-625W)
9	C-625W	FEB Outflow Canal	1550	FEB Outflow Canal is the extended seepage canal for the STA 3/4 Supply Canal; delivers water via existing G-372 pump station to STA 3/4 for water quality treatment
10	S-628	Gated Culvert (FEB intake/discharge structure)	930	Delivers water in both directions between A-2 FEB and A-1 FEB for operational flexibility
11	S-627	Emergency Overflow weir	445	Location to be determined
A-2 FEB design also includes an exterior seepage collection system (not illustrated):				
	C-626	Seepage Canal	400	~ 11 miles
	S-626	Seepage Pump Station	500	Delivers seepage back into the FEB outflow canal C-625W

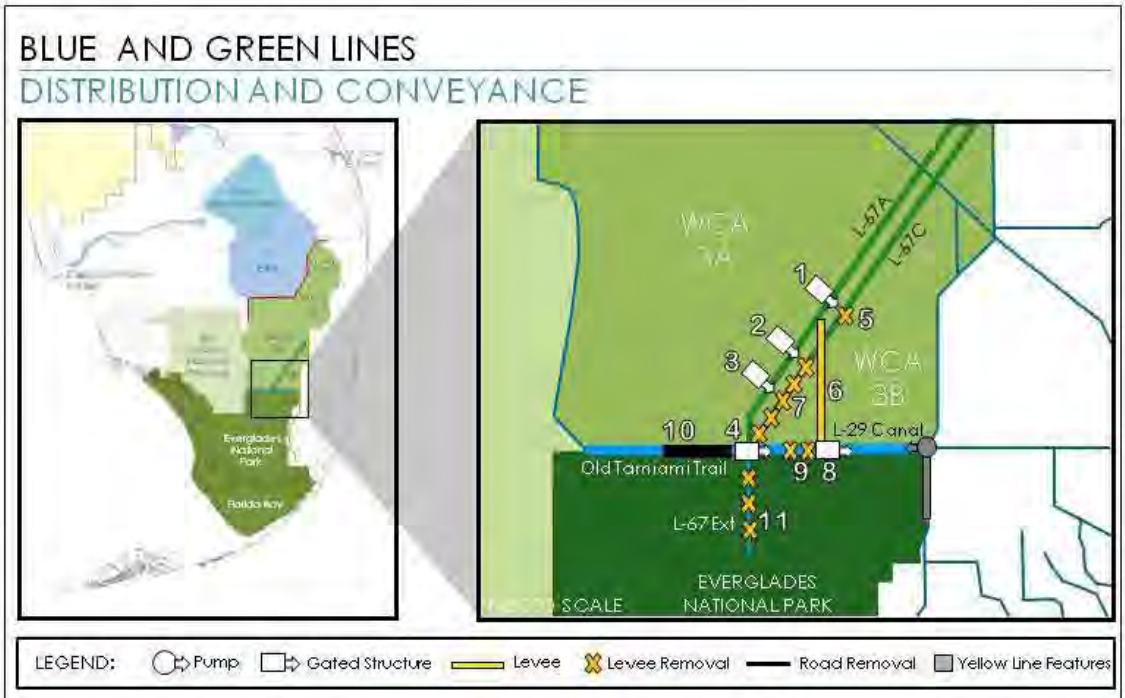
Figure C.4-2. TSP Treatment and Storage Features and Location



LEGEND: Pump | Gated Structure | Levee Removal | Existing Structure

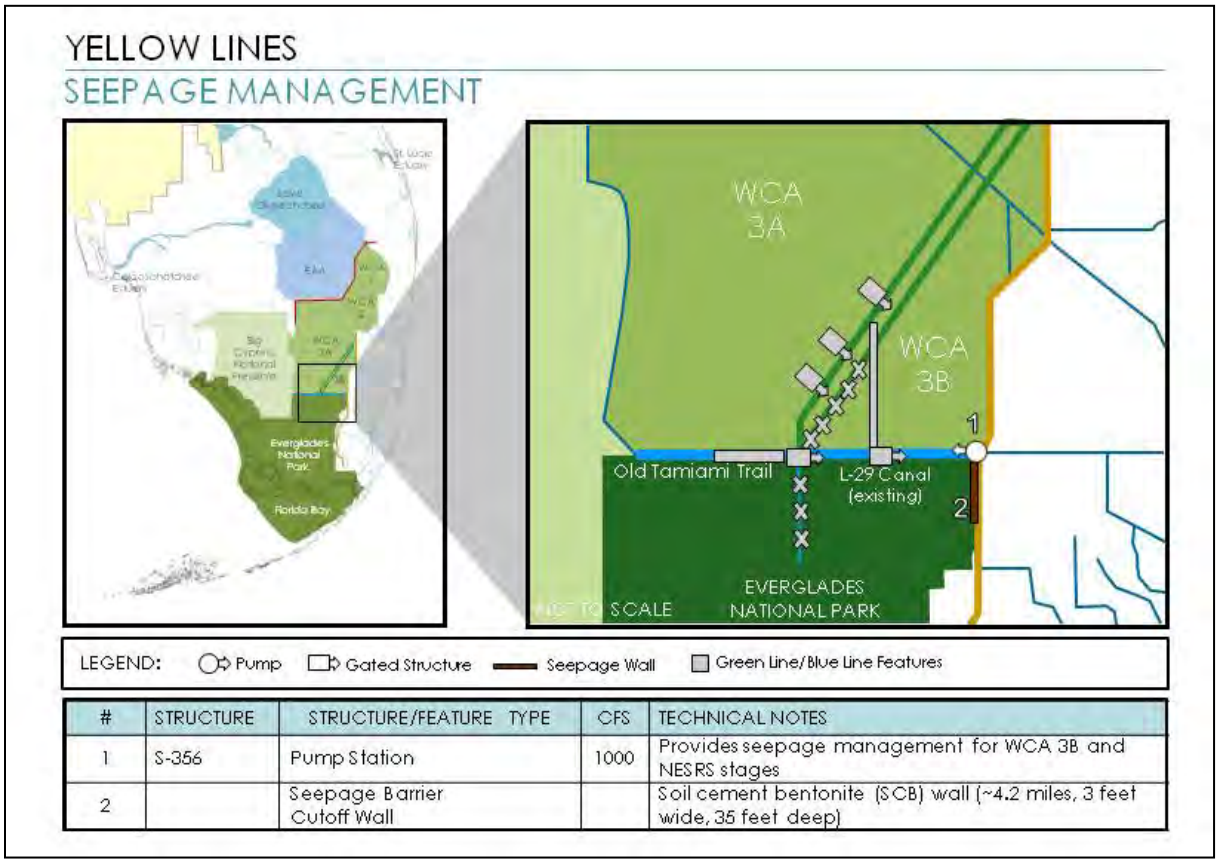
#	STRUCTURE	STRUCTURE/FEATURE TYPE	CFS	TECHNICAL NOTES
1	S-620	Gated Culvert	500	Delivers water from L-6 Canal to L-5 Canal
2	S-621	Gated Spillway	2500	Closed to direct STA 3/4 discharges to western L-5 Canal during normal operations; controls water from STA 3 /4 to the existing S-7 pump station during peak events
3	S-622	Gated Spillway	500	Delivers water from east to west in L-5 Canal (replaces existing L-5 canal plug)
4	S-8A	Gated Culverts with Canal	3080 & 1020	Existing S-8 pump station delivers water from L-5 Canal to Miami Canal; S-8A delivers water from Miami Canal to L-4 Canal (3120 cfs) and remaining Miami Canal segment (1040 cfs); potential design modifications to the existing S-8/G-404 complex will be assessed during PED
5	S-630	Pump Station	360	Delivers water from L-4 Canal west to maintain existing water supply deliveries
6		L-4 Levee Removal		Removes ~2.9 miles of south L-4 Levee
7		Miami Canal Backfill with Tree Islands Mounds		Remove ~ 13.5 miles of Miami Canal , from 1.5 miles south of S-8 to I-75; tree island mounds create habitat and promote sheetflow in WCA-3A within the footprint of the former Miami Canal
8		L-5 Remnant Canal	500	Enlarging canal to expand capacity of L-5 Canal (between S-621 & S-622)
9		L-5 Canal	3000	Enlarging canal to expand capacity of L-5 Canal (between S-622 & S-8)

Figure C.4-3. TSP Northern Conveyance and Distribution Features and Location.



#	STRUCTURE	STRUCTURE/FEATURE TYPE	CFS	TECHNICAL NOTES
1	S-631	Gated Culvert	500	Delivers water from WCA 3A to 3B, east of L-67D Levee
2	S-632	Gated Culvert	500	Delivers water from WCA 3A to 3B, west of L-67D Levee
3	S-633	Gated Culvert	500	Delivers water from WCA 3A to 3B, west of L-67D Levee
4	S-333 (N)	Gated Spillway w/new canal	1150	Delivers water from L-67A Canal to L-29 Canal; supplements existing S-333 gated spillway
5		L-67C Levee Removal Gap		Gap, ~ 6000 feet (corresponding to S-631)
6	L-67D	Blue Shanty Levee		Levee, ~ 8.5 miles, connecting from L-67A to L-29 (6 feet high, 14-foot crest width, 3:1 side slopes)
7		L-67C Levee Removal		Complete removal of ~ 8 miles from New Blue Shanty Levee (L-67D)south to intersection of L-67A/L-67C; L-67C canal is not backfilled
8	S-355W	Gated Spillway	1230	Maintains water deliveries to eastern L-29 Canal
9		Levee Removal (L-29)		Removal of ~ 4.3 miles between L-67A and Blue Shanty Levee intersection with L-29 Levee
10		Removal of remnants of Old Tamiami Trail roadway		Removal of ~ 6 miles of roadway west of L-67 Extension
11		L-67 Extension Levee Removal and Canal Backfill)		Complete removal of ~ 5.5 miles of remaining L-67 Extension, including S-346 culvert

Figure C.4-4. TSP Southern Distribution and Conveyance Features and Location.



#	STRUCTURE	STRUCTURE/FEATURE TYPE	CFS	TECHNICAL NOTES
1	S-356	Pump Station	1000	Provides seepage management for WCA 3B and NESRS stages
2		Seepage Barrier Cutoff Wall		Soil cement bentonite (SCB) wall (~4.2 miles, 3 feet wide, 35 feet deep)

Figure C.4-5. TSP Seepage Management Features and Location.

C.4.38.2 Authority and Purpose

The Comprehensive Everglades Restoration Plan (CERP) was approved in Section 601 of Water Resources Development Act (WRDA) of 2000. The authority for the preparation of the Central Everglades Planning Project (CEPP) Project Implementation Report (PIR), one of a number of site-specific projects, is contained in Section 601(d) WRDA 2000. The U.S. Army Corps of Engineers (USACE) and the South Florida Water Management District (SFWMD) have executed a Design Agreement for the design of elements of the CERP and South Florida Ecosystem Restoration project (Design Agreement, May 2000). The direction and guidance for the development of CEPP are contained within the CERP Master Program Management Plan (MPMP), which was developed and approved by USACE and SFWMD for the purposes of describing the framework and processes to be used for managing and monitoring implementation of CERP.

The Central and Southern Florida (C&SF) Flood Control Project, as constructed, had unintended adverse impacts to the Greater Everglades including the Northern Estuaries, WCA 3, ENP, and Florida Bay. Historically, freshwater flowed southward from Lake Okeechobee to Florida Bay from surface (sloughs, transverse glades, and overland from through wetlands) and groundwater sources and resulted in a mosaic of vegetative communities as well as narrower range of salinity fluctuations in Florida Bay than exist today. While historic conditions sustained healthy and extensive ecological communities (ridge and slough, wet prairies, tree islands, sawgrass prairies, mangrove communities and seagrass beds) these communities have been degraded under the managed system. The purpose of CEPP is to improve the quantity, quality, timing, and distribution of water flows to the central Everglades (WCA 3 and ENP).

C.4.38.3 General Description of Dredged or Fill Material

Several project features are expected to involve the discharge of dredged or fill material into wetlands or other aquatic resources such as the Miami Canal or excavation in wetlands for conveyance purposes. However, specific information is unknown at this time. Additional 404(b)1 documents would be done for individual features when actual fill material needs are identified. The specific characteristics (general characteristics discussed below), quantities, and sources of dredged or fill material would be determined during planning and design activities for each component.

C.4.38.3.1 General Characteristics of Material

The soils in the Everglades are primarily composed of peats and mucks. Deep, clean sands characterize the area east of the Everglades and south of Lake Okeechobee with wet, gray or grayish-brown, sandy soils underlain by sandy clay cover the area west of the Everglades. The peat and muck soils, which are dark brown to nearly black, cover approximately 90 percent of the area being considered in the study area. They were formed in marshes or swamps by the partial decay of plant materials, with some admixture of mineral soil in the case of muck. Peat, by definition, consists of 65 percent or more organic material with relatively little mineral matter. Muck on the other hand, consists of 25 to 65 percent plant material mixed with sand, silt, and clay. The peat and muck soils may differ from each other in the kind of plant material that they contain, in the corresponding depths, and/or in the nature of the underlying material. The peat and muck may rest directly on limestone or on an intermediate layer of sand or marl. The highly organic soils have been divided into four types: Okeechobee muck, Okeelanta peaty muck, Everglades peaty muck, and Everglades peat. A fifth type of organic soil, which is not extensive in the area, is Loxahatchee peat. Where peat is encountered in the borrow area, it would be removed and not used as construction material.

The material may be reused or would be disposed of offsite in a Class 1 landfill. Soil testing would be conducted to better define the soil characteristics and as a result of that soil testing, other disposal options may be pursued.

C.4.38.3.2 Quantity of Material (cubic yards)

Material would be produced for disposal with the construction of the A-2 FEB components; the construction of L-6 diversion and hydropattern restoration feature components; and construction of distribution, conveyance and seepage management components in southern WCA 3 and ENP.

C.4.38.3.3 Source of Material

The material consists of peat and muck excavated from within EAA, WCA-3 and ENP. The features of the Tentatively Selected Plan would be installed from the edge of Miami Canal (N), STA 3/4 Supply Canal and Outflow Canal, L-6, L-5, L-4, L-28, L-67A, L-67C, L-67 Extension and L-29 canals, as well as Tamiami Trail. Existing mounds of excavated material would be used to backfill and augmented when necessary with clean fill.

C.4.38.4 Description of the Proposed Discharge Site

C.4.38.4.1 Location

The excess excavated material would be deposited in an approved Class 1 landfill, either being disposed of incurring tipping fees or being used as good landfill cover daily. Placement of material in a landfill is not a discharge per se. The exact Class I landfill has not yet been identified. The excavated material would be assumed to be in the “worse case” condition encountered on other projects within the area.

Soil testing would be performed prior to construction of each component. As a result of soil testing, other disposal options may be pursued for clean dredged or excavated material including placement in the Miami Canal in which case the specific soil characteristics would be evaluated for discharge impacts.

C.4.38.4.2 Size

The exact Class I landfill has not yet been identified; therefore, the size of the Class I landfill is not available at this time. It is anticipated that CEPP would be constructed in stages as described within the Implementation Plan (refer to **Section 5 of the Draft PIR/EIS**) and that due to construction sequencing, several potential interim staging, stockpile, or temporary disposal sites may be required.

C.4.38.4.3 Site

A confined site would be used. The excess excavated material would be hauled by truck from the site and deposited or disposed of in an approved Class I landfill. Disposal of material in a landfill is not a fill per-se evaluated under the Clean Water Act.

C.4.38.4.4 Habitat

The excavated material deposition or disposal site would be an approved Class I landfill. Excavated material of good quality would also be deposited in the Miami Canal and the L-67 Extension that were former conveyance canals and degraded wetlands.

C.4.38.4.5 Timing and Duration of Discharge

Installation timing of the project features has yet to be determined. The time and duration of discharge would be further defined during the detailed design phase.

C.4.38.5 Description of Disposal Method

The excavated material would be hauled by truck to an approved Class I landfill. Similarly, if the excavated material is used as fill, it would be trucked to placement or staging stockpile areas.

C.4.38.6 Factual Determinations (Section 230.11)

C.4.38.6.1 Physical Substrate Determinations

C.4.38.6.1.1 Substrate Elevation and Type

The natural topography of the area is nearly flat with slopes less than two percent, with the exception of the unnatural features (canals and levee, **Table C.4-1**).

C.4.38.6.1.2 Sediment Type

The substrate at the installation site, including EAA, the WCAs, and ENP, is calcium carbonate limestone rock overlain with peat and muck soils.

C.4.38.6.1.3 Dredge/Fill Material Movement

No appreciable movement of material is anticipated during construction. The material is intended to be removed to the limestone rock. Excavation of rock for structures may be necessary. Once the project features are installed and the Miami Canal backfill completed and stabilized, movement of fill and surface soils is not expected. Some minor erosion may occur in specific areas if high rain events induce flooding during, or immediately after, construction. Best management practices would be employed during construction to control movement of sediment into undisturbed areas and areas outside the construction footprint.

C.4.38.6.1.4 Physical Effects on Benthos

No adverse impacts to benthic organisms are anticipated other than displacement of those organisms in the construction footprint of the proposed project. The benthos in the canals being filled would be buried under the fill material; however these highly prolific organisms are expected to quickly re-establish in the natural wetlands restored through improved hydrology.

C.4.38.6.2 Water Circulation, Fluctuation, and Salinity Determination

An ecological monitoring plan (**Annex D**) has been developed to monitor hydrology, water quality, and associated changes within the project area.

C.4.38.6.3 Suspended Particulate/Turbidity Determinations

During project construction, a temporary short-term increase in suspended particulates may occur in the canals and ponded areas associated with levee removal and canal backfilling. Best management practices would be used to minimize the suspension and transport of soils, levee materials, and roadway materials into water adjacent to or downstream of the construction area including use of sediment controls, turbidity screens, or sediment blockages for adjacent wetlands.

In general, any short-term impacts to water quality associated with construction of the project would be ameliorated by construction sequencing, best management practices for erosion and sedimentation control, and monitoring during construction. Longer-term impacts to water quality not associated with fill and associated with the operation of project features would be addressed through operational monitoring and adaptive management actions, if potentially adverse affects are observed or predicted.

C.4.38.6.3.1 Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site

Although site-specific information is unknown at this time, temporary localized increases in suspended particulates and turbidity levels can be expected during construction of some of project features. Such increases are generally short term and insignificant. All appropriate measures to reduce and contain turbidity would be employed so State Water Quality Standards would not be violated.

C.4.38.6.3.2 Effects on Chemical and Physical Properties of the Water Column

C.4.38.6.3.2.1 Light Penetration

During construction operations there would be a temporary insignificant reduction in light penetration in the canals in the immediate vicinity of the activity. Once construction is complete, light penetration is expected to return to pre-construction levels.

C.4.38.6.3.2.2 Dissolved Oxygen

During construction operations there would be a temporary reduction in the dissolved oxygen content in the water column due to organic sediment oxygen demand from the disturbed soils in the immediate vicinity of the activity. Once construction is complete, dissolved oxygen is expected to return to pre-construction levels.

C.4.38.6.3.2.3 Toxic Metals, Organics, and Pathogens

Generally no toxic metals, anthropogenic organics, or pathogens are anticipated at this time to be released by project construction. Additional discussion on these items would be provided during further planning and design on project components.

C.4.38.6.3.2.4 Aesthetics of the Water Column

During construction, visual aesthetics would be negatively impacted. After completion, aesthetics would improve due to a reduction in exotic species.

C.4.38.6.3.3 Effects on Biota

C.4.38.6.3.3.1 Primary Productivity and Photosynthesis

Disposal of excavated materials would adversely affect wetlands in the immediate vicinity of construction by destroying vegetation and smothering biota. However, project operation would improve the primary productivity and photosynthesis due to an increase in quality of wetland habitat.

C.4.38.6.3.3.2 Suspension/Filter Feeders

During construction operations there would be a temporary increase in turbidity and possibly a decrease in suspension/filter feeders due to construction activities. This temporary increase in turbidity would be short-term and should not have any long-term negative impact on these highly fecund organisms. The implantation of the project should benefit these organisms by creating a better quality wetland habitat.

C.4.38.6.3.3.3 Sight Feeders

During construction operations there would be a temporary increase in turbidity and possibly a decrease in sight feeders due to construction activities. No significant impacts on these organisms are expected as the majority of sight feeders are highly mobile and can move outside the affected area. When the project is operational, sight feeders would benefit from the better quality wetland habitat.

C.4.38.6.4 Contamination Determinations

From the 1920s through the 1960s, most of the land parcels incorporated in the FEB project footprint were cultivated for agricultural use. A few parcels continue to be farmed; however, crops and/or cultivation practices have changed dramatically. Residual pesticide contamination associated with past and present crop production can be detected in the soils on many of the parcels; however, at concentrations that are not likely to present unacceptable risks to human health or environmental receptors. For parcels that are frequently inundated under present hydrologic conditions, the proposed project is not likely to significantly increase the risk of environmental harm associated with the fate and transport of the residual contamination. For parcels that are not frequently inundated under present hydrologic conditions, the proposed project may increase the risk of environmental harm associated with the fate and transport of residual contamination; however, the USFWS has reviewed the testing and analysis performed on these lands and determined that remedial actions do not appear to be warranted. Additional hazardous, toxic and radioactive waste (HTRW) investigations may be conducted to determine what project top-soils might require isolation (by encapsulating in levee berms) to minimize the risk of contaminant bioaccumulation or mobilization.

C.4.38.6.5 Aquatic Ecosystem and Organism Determinations

No long-term adverse impacts on aquatic organisms are anticipated. Wetland and estuarine ecosystems are expected to greatly improve because of implementation of tentatively selected plan, Alternative 4R2. The proposed project is not expected to cause or contribute to violations of State Water Quality Standards, jeopardize the existence of any federally endangered or threatened species, nor impact a marine sanctuary. No significant degradation is expected and all appropriate and practicable steps would taken to minimize impacts. Improvements to upland and wetland habitats are predicted with the construction of Alternative 4R2. The filling of the canals and removal of the roads is expected to

reestablish a more natural sheetflow, which would restore wetland habitat and improve estuarine water quality.

C.4.38.6.5.1.1 Effects on Plankton

No adverse impacts to plankton are anticipated. Concentration of freshwater diatoms should increase, at a minimum, in a narrow zone associated with water deliveries into ENP.

C.4.38.6.5.1.2 Effects on Benthos

No adverse impacts to benthic organisms are anticipated other than displacement of those organisms in the construction footprint of the proposed project. Reduction of freshwater flows to the Caloosahatchee Estuary and the St. Lucie Estuary and an increase of freshwater flows to Florida Bay would provide improved habitat for the benthos.

C.4.38.6.5.1.3 Effects on Nekton

There should be no adverse impacts to freshwater swimming aquatic organisms including fishes during construction. Additionally, no adverse impacts are expected downstream in the waters of Florida Bay and the adjacent coastline. Estuarine fish species most likely to occur in these areas include the small forage species such as killifish (*Cyprinodon* spp. and *Fundulus* spp.), mosquito fish (*Gambusia affinish*), juvenile sciaenids (*Leiostomus* spp.), silversides (*Atherinidae*) and mullets (*Mugil* spp.). Larger secondary consumers include gray snapper (*Lutjanus griesus*), tarpon (*Megalops atlantica*), snook (*Centopomus* spp.), red drum (*Sciaenops ocellatus*) and spotted seatrout (*Cynoscion nebulosus*). Freshwater deliveries through ENP would provide improved habitat and nursery opportunities for fishes in downstream estuaries connecting coastal wetlands to the bay.

C.4.38.6.5.1.4 Effects on Aquatic Food Web

Periphyton forms the base of the food web within the project area. Implementation of the project is expected to increase periphyton mat biomass and productivity throughout the site as well as freshwater diatoms. No adverse impacts to the aquatic food web are anticipated, other than minor temporary impacts within the construction footprint of the proposed spreader channels.

C.4.38.6.5.2 Effects on Special Aquatic Sites

C.4.38.6.5.2.1 Hardground and Coral Reef Communities

There are no hardground or coral reef communities located within the proposed project site or the nearshore waters affected by the project. Corals found within the waters of Biscayne Bay are outside of the area of potential effect.

C.4.38.6.5.2.2 Sanctuaries and Refuges

Biscayne National Park and a portion of Everglades National Park are downstream of the project area and are recognized as tropical marine environments of national significance well known for their productive reef ecosystems that play a critical role in the dynamics of the larger Florida Keys reef ecosystem. The project is intended to improve the quantity, timing, and distribution of water delivered to Florida Bay and should not have a negative effect on the sanctuaries and refuges.

C.4.38.6.5.2.3 Wetlands

The dominant vegetation community in the region is a matrix of sawgrass prairie with tree islands. At the lowest elevations near the coast, mangroves replace the freshwater wetlands. The transition zone between the mangroves and the freshwater prairie is a needle rush-salt grass zone on the freshwater

side, but stunted scrub mangrove on the coastal side. As a result of the project, approximately 127 acres of wetlands would be removed by construction and excavation activities. This loss is considered minimal and is not anticipated to have any adverse effects. The proposed project is anticipated to provide positive ecological benefits, including improving hydroperiods and hydropatterns in ENP, by improving the quantity, timing, and distribution of water delivered to the downstream estuaries, Florida Bay, and other receiving waters.

C.4.38.6.5.2.4 Mud Flats

There are no mud flats within the construction footprint or areas impacted by the proposed project.

C.4.38.6.5.2.5 Vegetated Shallows

Submerged aquatic vegetation (SAV) is present throughout the nearshore waters. The trend shows the following species in order from the shoreline to the deeper waters: widgeon grass (*Ruppia maritime*), turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium filiforme*), shoal grass (*Halodule wrightii*) and Johnsons seagrass (*Halophila johnsonii*). Reduction of freshwater flows to the Caloosahatchee Estuary and the St. Lucie Estuary and an increase of freshwater flows to Florida Bay would provide improvements to SAV. .

C.4.38.6.5.2.6 Riffle and Pool Complexes

There are no riffle or pool complexes within the project footprint and none should be impacted by the proposed project.

C.4.38.6.5.3 Threatened and Endangered Species

There are 41 federally listed threatened and endangered species potentially present in the project area. The USACE and U.S. Fish and Wildlife Service (USFWS) are presently consulting on a determination of 'no effect' or 'not likely to adversely affect' decision for all federally listed species within the project area, with the exception of the Cape Sable seaside sparrow for which a may affect, likely to adversely affect determination has been made. A Biological Assessment is included within **Annex A** to document potential effects to threatened and endangered species. A Biological Opinion from the USFWS on the effect of implementation of the proposed project on any endangered and/or threatened species would be determined and included in **Annex A** of the Final Project Implementation Report and Environmental Impact Statement.

C.4.38.6.6 Proposed Disposal Site Determinations

Excavated material would be used to fill approximately 13.5 miles of the Miami Canal and the L-67 extension and bring the road side ditches to ambient grade along both sides of all roads to be removed. There would be no long-term adverse impacts to the project area resources as a result of the placement of the excavated material.

C.4.38.6.6.1 Mixing Zone Determination

The dredged material would not cause unacceptable changes in the mixing zone water quality requirements as specified by the State of Florida's Water Quality Certification permit procedures. No adverse impacts related to depth, current velocity, direction and variability, degree of turbulence, stratification, or ambient concentrations of constituents are expected from implementation of the project.

C.4.38.6.6.2 Determination of Compliance with Applicable Water Quality Standards

CEPP complies with water quality standards applicable to the project and adjacent waters. Proposed features are located in and adjacent to waters designated as Class III by the State of Florida. In accordance with Florida Administrative Code (F.A.C.) Rule 62-302 ("Surface Water Quality Standards"), the use classification of Class III waters is "Recreation, Propagation, and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife." In addition to the minimum and general criteria for surface waters found in Section 62-302.500(1) F.A.C., there are numerous water quality criteria for specific parameters for Class III waters listed in Section 62-302.530, F.A.C. Although the proposed plan is not expected to affect most of the parameters listed in this rule, certain parameters (e.g., turbidity, dissolved oxygen and nutrients) listed in the criteria may be affected by construction and operations activities. The construction and operation of the proposed project components would comply with Federal and state water quality standards.

C.4.38.6.7 Potential Effects on Human Use Characteristics

C.4.38.6.7.1 Municipal and Private Water Supply

No municipal or private water supplies would be adversely impacted by the implementation of the project. Refer to **Section 4** and **Appendix C.2.1** for additional information pertaining to CEPP water supply analyses.

C.4.38.6.7.2 Recreational and Commercial Fisheries

Recreational fishing by boat would be negatively impacted by backfilling the Miami Canal and access in L-67C Canal could be lost by placement of the Blue Shanty levee (could be offset by installing a ramp from the Blue Shanty Levee into the L-67C Canal). Bank fishing opportunities could be positively increased by addition of access points around proposed structures. The proposed project would benefit recreational and commercial fisheries through salinity improvements within the Northern and Southern Estuaries.

C.4.38.6.7.3 Water Related Recreation

Water related recreation may be reduced by some project features and improved by other project features. Further detail is included in **Appendix F**.

C.4.38.6.7.4 Aesthetics

The proposed project would enhance the overall aesthetics of the project area. The backfilling of canals, degradation of levees and the creation of a flow way in WCA 3B would restore sheetflow to the greater Everglades ecosystem. Exotic plant control may enhance the aesthetics of the area.

C.4.38.6.7.5 Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves

The project would enhance environmental conditions at these types of sites within the project area. For more information refer to Section **C.4.32.8.5.2.2 Sanctuaries and Refuges.**

C.4.38.6.8 Essential Fish Habitat

C.4.38.6.8.1 Essential Fish Habitat in the Area

The project area includes two distinct regional estuarine and nearshore coastal systems: The southern estuaries including Biscayne Bay and Florida Bay; and the northern estuaries including the Caloosahatchee River and the St. Lucie Estuary.

The southern estuaries, a shallow estuarine system (average depth less than three feet), comprise Biscayne National Park and a large portion of Everglades National Park. Florida Bay is the main receiving water of the Greater Everglades, heavily influenced by changes in timing, distribution, and quantity of freshwater flows into the southern estuaries. Lake Okeechobee discharges into the two northern estuaries. The St. Lucie Canal feeds into the St. Lucie Estuary, and the Caloosahatchee Canal/River feeds into the Caloosahatchee Estuary to the west.

Biscayne Bay and Florida Bay

The southern estuaries contain essential fish habitat for corals; coral reef and live bottom habitat; red drum (*Sciaenops ocellatus*); penaeid shrimps (*Penaeus* spp.); spiny lobster (*Panulirus argus*); other coastal migratory pelagic species and the snapper-grouper complex. Species generally present in the southern estuaries region include brown shrimp (*Penaeus aztecus*), pink shrimp (*Penaeus duorarum*), white shrimp (*Penaeus* sp.), spiny lobster, stone crab (*Menippe mercenaria*), gulf stone crab, red drum, Spanish mackerel (*Scomberomorus maculatus*), and gray snapper (*Lutjanus griseus*). Essential fish habitat in the southern estuaries is comprised of seagrasses, estuarine mangroves, intertidal flats, the estuarine water column, live/hard bottoms, and coral reefs.

Caloosahatchee River

The Caloosahatchee River estuary contains essential fish habitat for juvenile brown shrimp, juvenile gray snapper (*Lutjanus griseus*), smalltooth sawfish (*Pristia pectinata*), juvenile pink shrimp, adult and juvenile red drum, adult and juvenile Spanish mackerel, and juvenile stone crab. Downstream habitats include oyster reefs and seagrass beds (submerged aquatic vegetation).

St. Lucie Estuary

The proposed project is within the jurisdiction of the South Atlantic Fishery Management Council (SAFMC) and is located in areas designated as EFH for wormrock, live bottom habitat, for the American oyster (*Crassostrea virginica*); pink shrimp; white shrimp, and brown shrimp ; Florida red drum; grouper (*Epinephelus* spp.); gray snapper (*Lutjanus griseus*); white grunt (*Haemulon plumieri*); red porgy (*Pagrus pagrus*); spiny lobster; and the snapper-grouper complex. In addition, the nearshore hardbottom habitat outside of the St. Lucie Estuary is designated as Essential Fish Habitat-Habitat Areas of Special Concern (EFH-HAPC) for the snapper-grouper complex.

C.4.38.6.8.2 Assessment of Effects on Hardground and Coral Reef Communities

This project is not expected to have an effect on coral reef or hard bottom communities in the project area. There are no coral reefs or hard bottom communities located within the proposed project site or the nearshore waters affected by the project. Corals found within Florida Bay and Biscayne Bay are outside the area of potential effect.

C.4.38.6.8.3 Assessment of Effects on Sanctuaries and Refuges

Biscayne National Park and a portion of Everglades National Park are downstream of the project area and are recognized as tropical marine environments of national significance well known for their productive reef ecosystems that play a critical role in the dynamics of the larger Florida Keys reef ecosystem. The proposed project is intended to improve the quantity, timing, and distribution of water delivered to Florida Bay.

C.4.38.6.8.4 Assessment of Effects on Wetlands

The dominant vegetation community in the region is a matrix of sawgrass prairie with tree islands. At the lowest elevations near the coast mangroves replace the freshwater wetlands. The transition zone between the mangroves and the freshwater prairie is a needle rush-salt grass zone on the freshwater side, but stunted scrub mangrove on the coastal side. As a result of the project approximately 127 acres of wetlands would be removed by construction and excavation activities. This loss is considered minimal and is not anticipated to have any adverse effects. The proposed project is anticipated to provide positive ecological benefits, including improving hydroperiods and hydropatterns in ENP, by improving the quantity, timing, and distribution of water delivered to the downstream estuaries, Florida Bay, and other receiving waters.

C.4.38.6.8.5 Assessment of Effects on Mud Flats

There are no mud flats within the construction footprint or areas impacted by the project.

C.4.38.6.8.6 Assessment of Effects on Vegetated Shallows

SAV is present throughout the nearshore waters. The trend shows the following species in order from the shoreline to the deeper waters: widgeon grass (*Ruppia maritime*), turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium filiforme*), shoal grass (*Halodule wrightii*) and Johnsons seagrass (*Halophila johnsonii*). Reduction of freshwater flows to the Caloosahatchee Estuary and the St. Lucie Estuary and an increase of freshwater flows to Florida Bay would provide improvements to SAV. Without operational changes and/or active pumping the project is not anticipated to have any effect on SAV.

C.4.38.6.8.7 Assessment of Effects on Riffle and Pool Complexes

There are no riffle or pool complexes within the project footprint and none should be impacted by the project.

C.4.38.6.9 Assessment of Effects on Plankton

No adverse impacts to plankton are anticipated. Concentration of freshwater diatoms should increase at a minimum in a narrow zone associated with water deliveries into ENP.

C.4.38.6.10 Assessment of Effects on Benthos

No adverse impacts to benthic organisms are anticipated other than displacement of those organisms in the construction footprint of the project.

C.4.38.6.11 Assessment of Effects on Nekton

There should be no adverse impacts to freshwater swimming aquatic organisms including fishes during construction. Additionally, no adverse impacts are expected downstream in the waters of Florida Bay and the adjacent coastline. Estuarine fish species most likely to occur in these areas include the small forage species such as killifish (*Cyprinodon* spp. and *Fundulus* spp.), mosquito fish (*Gambusia affinish*), juvenile sciaenids (*Leiostomus* spp.), silversides (*Atherinidae*) and mullets (*Mugil* spp.). Larger secondary consumers include gray snapper (*Lutjanus griesus*), tarpon (*Megalops atlantica*), snook (*Centopomus* spp.), red drum (*Sciaenops ocellatus*) and spotted seatrout (*Cynoscion nebulosus*). Freshwater deliveries through ENP would provide improved habitat and nursery opportunities for fishes in downstream estuaries connecting coastal wetlands to the bay.

C.4.38.6.12 Determination of Effects on Essential Fish Habitat

The overall benefit to the regional system is expected to be far greater than the localized adverse effects. The restoration of hydrology of the Greater Everglades ecosystem and the increase in spatial extent of protected wetland acreage in the region would produce extensive cumulative beneficial effects. These beneficial effects are expected to substantially outweigh the cumulative adverse effects produced by the aquatic ecosystem alterations that may be necessary to construct some of the project components.

C.4.38.7 Determination of Cumulative Effects on the Aquatic Ecosystem

The overall benefit to the regional system is expected to be far greater than the localized adverse effects. The hydrologic restoration of the Greater Everglades ecosystem and the increase in spatial extent of protected wetland acreage in the region would produce extensive cumulative beneficial effects. These beneficial effects are expected to substantially outweigh the cumulative adverse effects produced by the aquatic ecosystem alterations that may be necessary to construct some of the project features.

C.4.38.8 Determination of Secondary Effects on the Aquatic Ecosystem

No adverse secondary impacts on the aquatic ecosystem would occur as a result of the construction. During construction the sites would be contained with sedimentation barriers. Erosion would be controlled by appropriate erosion control techniques. Sedimentation would be controlled during construction. An ecological and water quality monitoring plan would be implemented during and after construction and specific environmental commitments, engineering and design commitments, and operational commitments would be incorporated to avoid, minimize, and/or mitigate for adverse effects.

C.4.38.9 Findings of Compliance or Non-Compliance with the Restrictions on Discharge

C.4.38.9.1 No significant adaptations of the guidelines were made relative to this evaluation.

C.4.38.9.2 At the time of the project planning phase no practicable alternatives exist which meet the study objectives involving discharge of some small fill into waters of the United States.

C.4.38.9.3 At this time, no practicable alternatives exist which have less adverse impact on the aquatic ecosystem without presenting other significant adverse environmental consequences. The alternatives all have overwhelming beneficial impacts.

C.4.38.9.4 The discharge of fill materials is not anticipated to cause or contribute to violations of any applicable state water quality standards for Class III waters or Outstanding Florida Waters where applicable. The discharge operation is not anticipated to violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

C.4.38.9.5 The placement of fill materials in the project area is not anticipated to jeopardize the continued existence of any species listed as threatened and endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended.

C.4.38.9.6 The placement of fill material is not anticipated to result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife and special aquatic sites. The life stages of aquatic species and

other wildlife is not anticipated to be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic and economic values are not anticipated.

C.4.38.9.7 Based on the guidelines, the proposed discharge site for the discharge of fill and/or dredged material is specified as complying with the requirements of these guidelines.

C.4.39 Coastal Zone Management Act Consistency Statement

FLORIDA COASTAL MANAGEMENT PROGRAM
FEDERAL CONSISTENCY EVALUATION PROCEDURES

Central Everglades Planning Project
St. Lucie, Martin, Okeechobee, Glades, Hendry, Palm Beach, Broward, Miami-Dade, Monroe, Collier, Lee and Charlotte Counties

Enforceable Policy. Florida State Statues considered "enforceable policy" under the Coastal Zone Management Act (www.dep.state.fl.us/cmp/federal/24_statutes.htm).

Applicability of the Coastal Zone Management Act.
The following table summarizes the process and procedures under the Coastal Zone Management Act for Federal Actions and for non-Federal Applicants*.

Item	Non-Federal Applicant (15 CFR 930, subpart D)	Federal Action (15 CFR 930, subpart C)
Enforceable Policies	Reviewed and approved by NOAA (in FL www.dep.state.fl.us/cmp/federal/24_statutes.htm)	Same
Effects Test	Direct, Indirect (cumulative, secondary), adverse or beneficial	Same
Review Time	6 months from state receipt of Consistency Certification (30-days for completeness notice) Can be altered by written agreement between State and applicant	60 Days, extendable (or contractible) by mutual agreement
Consistency	Must be Fully Consistent	To Maximum Extent Practicable**
Procedure Initiation	Applicant provides Consistency Certification to State	Federal Agency provides "Consistency Statement" to State
Appealable	Yes, applicant can appeal to Secretary (NOAA)	No (NOAA can "mediate")
Activities	Listed activities with their geographic location (State can request additional listing within 30 days)	Listed or Unlisted Activities in State Program
Activities in Another State	Must have approval for interstate reviews from NOAA	Interstate review approval NOT required
Activities in Federal Waters	Yes, if activity affects state waters	Same

* There are separate requirements for activities on the Outer Continental Shelf (subpart E) and for "assistance to an applicant agency" (subpart F).
** Must be fully consistent except for items prohibited by applicable law (generally does not count lack of funding as prohibited by law, 15 CFR 930.32).

Coastal Zone Consistency Statement by Statute/Enforceable Policy

CHAPTER 161, F.S., BEACH AND SHORE PRESERVATION

Coastal areas are among the state's most valuable natural, aesthetic, and economic resources; and they provide habitat for a variety of plant and animal life. The state is required to protect coastal areas from imprudent activities that could jeopardize the stability of the beach-dune system, accelerate erosion, provide inadequate protection to upland structures, endanger adjacent properties, or interfere with public beach access. Coastal areas used, or likely to be used, by sea turtles are designated for nesting, and the removal of vegetative cover that binds sand is prohibited. This statute provides policy for the regulation of construction, reconstruction, and other physical activities related to the beaches and shores of the state. Additionally, this statute requires the restoration and maintenance of critically eroding beaches.

Response: The proposed plans and information would be submitted to the state in compliance with this chapter. No work is proposed seaward of the mean high water line and would not affect shorelines or shoreline processes.

CHAPTER 163, PART II, F.S., INTERGOVERNMENTAL PROGRAMS: GROWTH POLICY, COUNTY AND MUNICIPAL PLANNING: LAND DEVELOPMENT REGULATION

The purpose of this statute is to provide for the implementation of comprehensive planning programs to guide and control future development in the state. The comprehensive planning process encourages units of local government to preserve, promote, protect, and improve the public health, safety, comfort, good order, appearance, convenience, law enforcement and fire prevention, and general welfare; prevent the overcrowding of land and avoid undue concentration of population; facilitate the adequate and efficient provision of public facilities and services; and conserve, develop, utilize, and protect natural resources within their jurisdictions.

Chapter 163 , Part II Intergovernmental Programs: Growth Policy; County and Municipal Planning; Land Development Regulation
Enforceable policy includes only:

Sections 163.3164 Local Government Comprehensive Planning and Land Development Regulation Act; definitions;

.3177(6)(a) requiring a future land use plan element designating proposed future general distribution, location, and extent of the uses of land for residential uses, commercial uses, industry, agriculture, recreation, conservation, education, public buildings and grounds, other public facilities, and other categories of the public and private uses of land.

(10)(h). public facilities and services needed to support development shall be available concurrent with the impacts of such development in accordance with s. 163.3180. [see .3180(2)(a-c), (5)(a&c), (6), and (8); below].

(10)(l). consider land use compatibility issues in the vicinity of all airports in coordination with the Department of Transportation and adjacent to or in close proximity to all military installations in coordination with the Department of Defense.

(11)(a). innovative approaches to development which may better serve to protect environmentally sensitive areas, maintain the economic viability of agricultural and other predominantly rural land uses, and provide for the cost-efficient delivery of public facilities and services.

(11)(c). maximize the use of existing facilities and services through redevelopment, urban infill development, and other strategies for urban revitalization.

.3178(1) local government comprehensive plans restrict development activities where such activities would damage or destroy coastal resources, and that such plans protect human life and limit public expenditures in areas that are subject to destruction by natural disaster.

(2)(d-j); studies, surveys, and data; be consistent with coastal resource plans prepared and adopted pursuant to general or special law; and contain:

(d) A component which outlines principles for hazard mitigation and protection of human life against the effects of natural disaster, including population evacuation, which take into consideration the capability to safely evacuate the density of coastal population proposed in the future land use plan element in the event of an impending natural disaster. The Division of Emergency Management shall manage the update of the regional hurricane evacuation studies, ensure such studies are done in a consistent manner, and ensure that the methodology used for modeling storm surge is that used by the National Hurricane Center.

(e) A component which outlines principles for protecting existing beach and dune systems from human-induced erosion and for restoring altered beach and dune systems.

(f) A redevelopment component which outlines the principles which shall be used to eliminate inappropriate and unsafe development in the coastal areas when opportunities arise.

(g) A shoreline use component that identifies public access to beach and shoreline areas and addresses the need for water-dependent and water-related facilities, including marinas, along shoreline areas. Such component must include the strategies that will be used to preserve recreational and commercial working waterfronts as defined in s. 342.07.

(h) Designation of coastal high-hazard areas and the criteria for mitigation for a comprehensive plan amendment in a coastal high-hazard area as defined in subsection (9). The coastal high-hazard area is the area below the elevation of the category 1 storm surge line as established by a Sea, Lake, and Overland Surges from Hurricanes (SLOSH) computerized storm surge model. Application of mitigation and the application of development and redevelopment policies, pursuant to s. 380.27(2), and any rules adopted thereunder, shall be at the discretion of local government.

(i) A component which outlines principles for providing that financial assurances are made that required public facilities will be in place to meet the demand imposed by the completed development or redevelopment. Such public facilities will be scheduled for phased completion to coincide with demands generated by the development or redevelopment.

(j) An identification of regulatory and management techniques that the local government plans to adopt or has adopted in order to mitigate the threat to human life and to control proposed development and

redevelopment in order to protect the coastal environment and give consideration to cumulative impacts.

.3180(2)(a-c), (a) Consistent with public health and safety, sanitary sewer, solid waste, drainage, adequate water supplies, and potable water facilities shall be in place and available to serve new development no later than the issuance by the local government of a certificate of occupancy or its functional equivalent. Prior to approval of a building permit or its functional equivalent, the local government shall consult with the applicable water supplier to determine whether adequate water supplies to serve the new development will be available no later than the anticipated date of issuance by the local government of a certificate of occupancy or its functional equivalent. A local government may meet the concurrency requirement for sanitary sewer through the use of onsite sewage treatment and disposal systems approved by the Department of Health to serve new development.

(b) Consistent with the public welfare, and except as otherwise provided in this section, parks and recreation facilities to serve new development shall be in place or under actual construction no later than 1 year after issuance by the local government of a certificate of occupancy or its functional equivalent. However, the acreage for such facilities shall be dedicated or be acquired by the local government prior to issuance by the local government of a certificate of occupancy or its functional equivalent, or funds in the amount of the developer's fair share shall be committed no later than the local government's approval to commence construction.

(c) Consistent with the public welfare, and except as otherwise provided in this section, transportation facilities needed to serve new development shall be in place or under actual construction within 3 years after the local government approves a building permit or its functional equivalent that results in traffic generation.

(5)(a&c),

(a) … planning and public policy goals may come into conflict with the requirement that adequate public transportation facilities and services be available concurrent with the impacts of such development. … in urban centers transportation cannot be effectively managed and mobility cannot be improved solely through the expansion of roadway capacity, that the expansion of roadway capacity is not always physically or financially possible, and that a range of transportation alternatives is essential to satisfy mobility needs, reduce congestion, and achieve healthy, vibrant centers.

(c) … developments located within urban infill, urban redevelopment, urban service, or downtown revitalization areas or areas designated as urban infill and redevelopment areas under s. 163.2517, which pose only special part-time demands on the transportation system, are exempt from the concurrency requirement for transportation facilities. A special part-time demand is one that does not have more than 200 scheduled events during any calendar year and does not affect the 100 highest traffic volume hours.

(6) a de minimis impact [on a transportation facility] is consistent with this part.

(8) When assessing the transportation impacts of proposed urban redevelopment within an established existing urban service area, 110 percent of the actual transportation impact caused by the previously existing development must be reserved for the redevelopment…

.3194(1)(a); After a comprehensive plan, or element or portion thereof, has been adopted in conformity with this act, all development undertaken by, and all actions taken in regard to development orders by, governmental agencies in regard to land covered by such plan or element shall be consistent with such plan or element as adopted.

.3202(2)(a-h); Local land development regulations shall contain specific and detailed provisions necessary or desirable to implement the adopted comprehensive plan and shall as a minimum:

(a) Regulate the subdivision of land.

(b) Regulate the use of land and water for those land use categories included in the land use element and ensure the compatibility of adjacent uses and provide for open space.

(c) Provide for protection of potable water wellfields.

(d) Regulate areas subject to seasonal and periodic flooding and provide for drainage and stormwater management.

(e) Ensure the protection of environmentally sensitive lands designated in the comprehensive plan.

(f) Regulate signage.

(g) Provide that public facilities and services meet or exceed the standards established in the capital improvements element required by s. 163.3177 and are available when needed for the development, or that development orders and permits are conditioned on the availability of these public facilities and services necessary to serve the proposed development. Not later than 1 year after its due date established by the state land planning agency's rule for submission of local comprehensive plans pursuant to s. 163.3167(2), a local government shall not issue a development order or permit which results in a reduction in the level of services for the affected public facilities below the level of services provided in the comprehensive plan of the local government.

(h) Ensure safe and convenient onsite traffic flow, considering needed vehicle parking.

.3220(2)&(3).

(2) (a) The lack of certainty in the approval of development can result in a waste of economic and land resources, discourage sound capital improvement planning and financing, escalate the cost of housing and development, and discourage commitment to comprehensive planning.

(b) Assurance to a developer that upon receipt of his or her development permit or brownfield designation he or she may proceed in accordance with existing laws and policies, subject to the conditions of a development agreement, strengthens the public planning process, encourages sound capital improvement planning and financing, assists in assuring there are adequate capital facilities for the development, encourages private participation in comprehensive planning, and reduces the economic costs of development.

(3) In conformity with, in furtherance of, and to implement the Local Government Comprehensive Planning and Land Development Regulation Act and the Florida State Comprehensive Planning Act of

1972, it is the intent of the Legislature to encourage a stronger commitment to comprehensive and capital facilities planning, ensure the provision of adequate public facilities for development, encourage the efficient use of resources, and reduce the economic cost of development.

Response: The proposed project has been coordinated with various Federal, state and local agencies during the planning process. The project meets the primary goal of the State Comprehensive Plan through preservation and protection of the environment.

CHAPTER 186, F.S., STATE AND REGIONAL PLANNING

The state comprehensive plan provides basic policy direction to all levels of government regarding the orderly social, economic, and physical growth of the state. The goals, objectives, and policies of the state comprehensive plan are statewide in scope and are consistent and compatible with each other. The statute provides direction for the delivery of governmental services, a means for defining and achieving the specific goals of the state, and a method for evaluating the accomplishment of those goals.

Response: The proposed project has been coordinated with various Federal, state and local agencies during the planning process. The project meets the primary goal of the State Comprehensive Plan through preservation and protection of the environment.

CHAPTER 252, F.S., EMERGENCY MANAGEMENT

The state of Florida is vulnerable to a wide range of emergencies, including natural, technological, and manmade disasters and this vulnerability is exacerbated by the tremendous growth in the state's population, especially the growth in the number of persons residing in coastal areas, in the elderly population, in the number of seasonal vacationers, and in the number of persons with special needs. This statute directs the state to reduce the vulnerability of its people and property to natural and manmade disasters; prepare for, respond to and reduce the impacts of disasters; and decrease the time and resources needed to recover from disasters. Disaster mitigation is necessary to ensure the common defense of Floridians' lives and to protect the public peace, health, and safety. The policies provide the means to assist in the prevention or mitigation of emergencies that may be caused or aggravated by the inadequate planning or regulation of facilities and land uses. State agencies are directed to keep land uses and facility construction under continuing study and identify areas that are particularly susceptible to natural or manmade catastrophic occurrences.

Response: This project is a restoration project and provides increased ability to store water in the natural system during hurricanes or floods. All structures will be built to Federal and state standards. This project would be consistent with the efforts of the Division of Emergency Management.

CHAPTER 253, F.S., STATE LANDS

The Board of Trustees of the Internal Improvement Trust Fund (Trustees) is vested and charged with the acquisition, administration, management, control, supervision, conservation, protection, and disposition of all lands owned by the state. Lands acquired for preservation, conservation and recreation serve the public interest by contributing to the public health, welfare and economy. In carrying out the requirements of this statute, the Trustees are directed to take necessary action to fully: conserve and protect state lands; maintain natural conditions; protect and enhance natural areas and ecosystems; prevent damage and depredation; and preserve archaeological and historical resources. All submerged lands are considered single-use lands to be maintained in natural condition for the

propagation of fish and wildlife and public recreation. Where multiple-uses are permitted, ecosystem integrity, recreational benefits and wildlife values are conserved and protected.

Chapter 253 State Lands

No lease of the type covered by this law shall be granted, sold, or executed south of 26° north latitude off Florida's west coast and south of 27° north latitude off Florida's east coast…. After July 31, 1990, no oil or natural gas lease shall be granted, sold, or executed covering lands located north of 26°00'00" north latitude off Florida's west coast to the western boundary of the state bordering Alabama … or located north of 27°00'00" north latitude off Florida's east coast to the northern boundary of the state bordering Georgia ….

Response: The proposed project would conserve, protect, restore and enhance natural conditions within state lands. This project would make a positive contribution to preserving water, fish and wildlife, cultural, and wetland resources within the State of Florida and therefore, complies with the intent of this chapter.

CHAPTER 258, F.S., STATE PARKS AND PRESERVES

The statute addresses the state's administration of state parks, aquatic preserves, and recreation areas, which are acquired to emblemize the state's natural values and to ensure that these values are conserved for all time. Parks and preserves are managed for the non-depleting use, enjoyment, and benefit of Floridians and visitors and to contribute to the state's tourist appeal. Aquatic Preserves are recognized as having exceptional biological, aesthetic, and scientific value and are set aside for the benefit of future generations. Disruptive physical activities and polluting discharges are highly restricted in aquatic preserves. State managed wild and scenic rivers possess exceptionally remarkable and unique ecological, fish and wildlife, and recreational values and are designated for permanent preservation and enhancement for both the present and future.

Response: The proposed project includes constructing a Flow Equalization Basin (FEB) on the state-owned lands in the Everglades Agricultural Area. The FEB would capture approximately 200,000 acre-feet of water that is currently being discharged from Lake Okeechobee to tide in the St. Lucie and Caloosahatchee Estuaries. The water would be stored and treated to improve water quality prior to be discharged south into the Greater Everglades.

The St. Lucie Estuary is a designated Estuary of National Significance and Outstanding Florida Water. The North Fork of the St. Lucie River is a state aquatic preserve and part of Florida's "Save Our Rivers" program. The Indian River Lagoon is part of the National Estuary Program and an aquatic preserve. The proposed FEB would improve delivery of water to the St. Lucie Estuary and Indian River Lagoon by reducing the frequency and volume of high level flows from Lake Okeechobee, thus reducing the potential for impacts to estuarine and nearshore biota.

The Caloosahatchee River and Estuary are at the head of a vast estuarine and marine ecosystem that includes aquatic preserves managed by the State of Florida (e.g., Matlacha Pass, Estero Bay, and Pine Island Sound Aquatic Preserves), the Charlotte Harbor National Estuary Program, and the J. N. Ding Darling National Wildlife Refuge (NWR) Complex which includes the Caloosahatchee, Matlacha Pass, Pine Island, and Island Bay NWRs; along with numerous other state and local parks and recreation areas. The aquatic preserves are also outstanding Florida water bodies. The proposed FEB would reduce the frequency and volume of high flows from Lake Okeechobee, thus reducing the impacts of low salinities on the estuarine and nearshore biota.

The proposed project area includes state-owned lands in Water Conservation Areas (WCA) 3. The proposed project features act to rehydrates northern WCA 3A thereby increasing the spatial extent of wetlands. Additional project features will aid to reconnect WCA 3B and Everglades National Park, providing enhancement of sheetflow and restoration of historic ridge and slough landscape features.

Everglades National Park and the Florida Bay National Marine Sanctuary are within the project area and contain productive estuarine and wetland ecosystems that include aquatic preserves along with local parks and recreation areas. The aquatic preserves are also outstanding Florida water bodies. The proposed project would improve freshwater delivery to coastal wetlands and adjacent estuaries and redistribute flow to salt water wetlands and nearshore bay areas and result in favorable changes to salinity levels. The impacts to the aquatic resources are anticipated to be beneficial for key species such as seatrout, pink shrimp, and crocodiles.

Biscayne National Park is at the headwaters of historic creeks and productive estuarine and marine ecosystems, including aquatic preserves, along with local parks and recreation areas. The Biscayne Bay Aquatic Preserves are Outstanding Florida Waters. The proposed project would not affect the delivery of water to Biscayne Bay.

The proposed project would help enhance environmental conditions at state parks or aquatic preserves in the region. The proposed project would comply with the intent of this chapter.

CHAPTERS 259, F.S., LAND ACQUISITION FOR CONSERVATION OR RECREATION

The statute addresses public ownership of natural areas for purposes of maintaining the state's unique natural resources; protecting air, land, and water quality; promoting water resource development to meet the needs of natural systems and citizens of this state; promoting restoration activities on public lands; and providing lands for natural resource based recreation. Lands are managed to protect or restore their natural resource values, and provide the greatest benefit, including public access, to the citizens of this state.

Response: The potentially affected property is currently in public ownership. These chapters do not apply.

CHAPTERS 260, F.S., FLORIDA GREENWAYS AND TRAILS ACT

A statewide system of greenways and trails is established in order to conserve, develop, and use the natural resources of Florida for healthful and recreational purposes. These greenways and trails provide open space benefiting environmentally sensitive lands and wildlife and provide people with access to healthful outdoor activities. The greenways and trails serve to implement the concepts of ecosystem management while providing, where appropriate, recreational opportunities such as horseback riding, hiking, bicycling, canoeing, jogging, and historical and archaeological interpretation.

Response: The potentially affected property is currently in public ownership. This project is in compliance with the intent of this Chapter.

CHAPTER 267, F.S., HISTORICAL RESOURCES

The management and preservation of the state's archaeological and historical resources are addressed by this statute. This statute recognizes the state's rich and unique heritage of historic resources and directs the state to locate, acquire, protect, preserve, operate and interpret historic and

archeological resources for the benefit of current and future generations of Floridians. Objects or artifacts with intrinsic historic or archeological value located on, or abandoned on, state-owned lands or state-owned submerged lands belong to the citizens of the state. The state historic preservation program operates in conjunction with the National Historic Preservation Act of 1966 to require state and federal agencies to consider the effect of their direct or indirect actions on [significant] historic and archeological resources. These resources cannot be destroyed or altered unless no prudent alternative exists. Unavoidable impacts must be mitigated.

Response: The U.S. Army Corps of Engineers has initiated consultation under Section 106 of the National Historic Preservation Act with the State Historic Preservation Officer, the Miccosukee Tribe of Indians of Florida, and the Seminole Tribe of Florida and would meet all responsibilities under Chapter 267.

CHAPTER 288, F.S., COMMERCIAL DEVELOPMENT AND CAPITAL IMPROVEMENTS

The framework to promote and develop general business, trade, and tourism components of the state economy are established in this statute. The statute includes requirements to protect and promote the natural, coastal, historical, and cultural tourism assets of the state; foster the development of nature-based tourism and recreation; and upgrade the image of Florida as a quality destination. Natural resource-based tourism and recreational activities are critical sectors of Florida's economy. The needs of the environment must be balanced with the need for growth and economic development.

Response: The proposed project would be compatible with tourism for this area and therefore, is consistent with the goals of this Chapter.

CHAPTER 334, F.S., TRANSPORTATION ADMINISTRATION

The statute addresses the state's policy concerning transportation administration. It establishes the responsibilities of the state, the counties, and the municipalities in the planning and development of the transportation systems serving the people of the state and to assure the development of an integrated, balanced statewide transportation system. This is necessary for the protection of public safety and general welfare and for the preservation of all transportation facilities in the state.

Response: No public transportation systems would be impacted by this project.

CHAPTER 339, F.S., TRANSPORTATION FINANCE AND PLANNING

The statute addresses the finance and planning needs of the state's transportation system.

Response: No public transportation systems would be impacted by this project.

CHAPTER 370, F.S., SALTWATER LIVING RESOURCES

This chapter directs the state to preserve, manage and protect the marine, crustacean, shell and anadromous fishery resources in state waters; to protect and enhance the marine and estuarine environment; to regulate fishermen and vessels of the state engaged in the taking of such resources within or without state waters; to issue licenses for the taking and processing products of fisheries; to secure and maintain statistical records of the catch of each such species; and to conduct scientific, economic, and other studies and research.

Response: The proposed project would help improve ecological conditions in the estuaries. Implementation of the project would provide direct positive impacts on saltwater resources within the

Caloosahatchee Estuary and St. Lucie Estuary by reducing the frequency and volume of high level flows from Lake Okeechobee and improve the salinity balance. This will benefit seagrass, oysters, fish, and wildlife. Implementation of the proposed project would provide direct positive impacts on saltwater resources within Florida Bay and adjacent southwestern coastal estuaries by redistributing freshwater runoff from the watershed to provide a more natural and historic overland flow through transverse glades and existing coastal wetlands that will reduce hyper-saline conditions and improve the overall salinity balance. This course of action would provide benefits for key species such as seatrout, pink shrimp, and crocodiles as well as seagrass, fisheries and wildlife. Based on the overall impacts , the project is consistent with the goals of this chapter.

CHAPTER 372, F.S., LIVING LAND AND FRESHWATER RESOURCES

This chapter establishes the Game and Freshwater Fish Commission (now called the Florida Fish and Wildlife Conservation Commission) and directs it to manage freshwater aquatic life and wild animal life and their habitat to perpetuate a diversity of species with densities and distributions that provide sustained ecological, recreational, scientific, educational, aesthetic, and economic benefits.

Response: The proposed project would have a long-term beneficial effect on freshwater aquatic life and wildlife. The proposed project would increase the foraging opportunities for wading birds and other wildlife within the proposed FEB. The project would have a long-term beneficial effect on freshwater aquatic life and wildlife within the Caloosahatchee River and St. Lucie River through attenuation of peak high flows during the wet season thus improving the salinity envelope for these species. The proposed project would rehydrate WCA 3A, 3B and Everglades National Park, add wetland habitat, and is expected to significantly improve conditions for apple snails, fish, amphibians, alligators, and wading bird species throughout much of the Greater Everglades. The proposed project would also distribute freshwater flows through Taylor Slough to provide a more natural and historic overland flow within the freshwater wetlands adjacent to Florida Bay. Implementation of the proposed project would provide direct positive impacts on saltwater resources within Florida Bay and adjacent southwestern coastal estuaries by redistributing freshwater runoff from the watershed to provide a more natural and historic overland flow through transverse glades and existing coastal wetlands that would reduce hyper-saline conditions and improve the overall salinity balance. The proposed project is consistent with the intent of this chapter.

CHAPTER 373, F.S., WATER RESOURCES

The waters in the state of Florida are managed and protected to conserve and preserve water resources, water quality, and environmental quality. This statute addresses sustainable water management; the conservation of surface and ground waters for full beneficial use; the preservation of natural resources, fish, and wildlife; protecting public land; and promoting the health and general welfare of Floridians. The state manages and conserves water and related natural resources by determining whether activities will unreasonably consume water; degrade water quality; or adversely affect environmental values such as protected species habitat, recreational pursuits, and marine productivity.

Specifically, under Part IV of Chapter 373, the Department of Environmental Protection, water management districts, and delegated local governments review and take agency action on wetland resource, environmental resource, and stormwater permit applications, which address the construction, alteration, operation, maintenance, abandonment, and removal of any stormwater management system, dam, impoundment, reservoir, or appurtenant work or works, including dredging, filling and construction activities in, on, and over wetlands and other surface waters.

Response: The proposed project includes constructing a Flow Equalization Basin (FEB) on the State-owned lands in the Everglades Agricultural Area. The FEB would capture approximately 200,000 acre-feet of water that is currently being discharged from Lake Okeechobee to tide in the St. Lucie and Caloosahatchee Estuaries. The water would be stored and treated to improve water quality prior to being discharged south into the Greater Everglades. The additional 200,000 acre feet of water that was previously lost to tide would flow southward, rehydrating historic marshes, providing enhancement of sheetflow and restoration of historic ridge and slough landscape features, and improving groundwater recharge.

The proposed project incorporates restoration components primarily intended to benefit freshwater wetlands and estuarine resources by distributing freshwater flows through WCA 3A, WCA 3B and Everglades National Park. This includes the installation/construction of a flow equalization basin, pump stations, flow-ways, levees, gated structures and the removal and backfilling of canals. The goals and objectives of this project are to improve habitat conditions for native wildlife species. Impacts of this project have been detailed within an Environmental Impact Statement and in the Section 404(b)(1) Clean Water Act Evaluation (Appendix C.4.3.2). This project is in compliance with the intent of this Chapter.

The non-Federal sponsor for this project is the SFWMD, which is the state agency responsible for implementing this statute. The USACE and the SFWMD have coordinated planning efforts to ensure compatibility with established policies. The project is consistent with the goals of this chapter.

CHAPTER 375, F.S., OUTDOOR RECREATION AND CONSERVATION LANDS

The statute addresses the development of a comprehensive multipurpose outdoor recreation plan. The purpose of the plan is to document recreational supply and demand, describe current recreational opportunities, estimate the need for additional recreational opportunities, and propose the means to meet the identified needs.

Response: The potentially affected property is currently in public ownership. This project is in compliance with the intent of this Chapter.

CHAPTER 376, F.S., POLLUTANT DISCHARGE PREVENTION AND REMOVAL

Regulating the transfer, storage, and transportation of pollutants, and the cleanup of pollutant discharges is essential for maintaining the coastal waters, estuaries, tidal flats, beaches, and public lands adjoining the seacoast in as close to a pristine condition as possible. The preservation of the seacoast as a source of public and private recreation and the preservation of water and certain lands are matters of the highest urgency and priority. This statute provides a framework for the protection of the state's coastline from spills, discharges, and releases of pollutants as a result of the transfer, storage, and transportation of such products. The discharge of pollutants into or upon any coastal waters, estuaries, tidal flats, beaches, and lands adjoining the seacoast of the state is prohibited. The statute provides for hazards and threats of danger and damages resulting from any pollutant discharge to be evaluated; requires the prompt containment and removal of pollution; provides penalties for violations; and ensures the prompt payment of reasonable damages from a discharge. Portions of Chapter 376, F.S., serve as a complement to the national contingency plan portions of the federal Water Pollution Control Act.

Response: The contract specifications would prohibit the contractor from dumping oil, fuel, or hazardous wastes in the work area and would require that the contractor adopt safe and sanitary measures for the disposal of solid wastes. A spill prevention plan would be required.

CHAPTER 377, F.S., ENERGY RESOURCES

The statute addresses the regulation, planning, and development of the energy resources of the state. The statute provides policy to conserve and control the oil and gas resources in the state, including products made therefrom and to safeguard the health, property and welfare of Floridians. The Department of Environmental Protection (DEP) is authorized to regulate all phases of exploration, drilling, and production of oil, gas, and other petroleum products in the state. The statute describes the permitting requirements and criteria necessary to drill and develop for oil and gas. DEP rules ensure that all precautions are taken to prevent the spillage of oil or any other pollutant in all phases of extraction and transportation. The state explicitly prohibits pollution resulting from drilling and production activities. No person drilling for or producing oil, gas, or other petroleum products may pollute land or water; damage aquatic or marine life, wildlife, birds, or public or private property; or allow any extraneous matter to enter or damage any mineral or freshwater-bearing formation. Penalties for violations of any provisions of this chapter are detailed.

Chapter 377 Energy Resources
Not approved as enforceable policy: Sections 377.06, .24(9), and .242(1)(a)5. All deal with regulation of oil and gas resources.

Response: This project does not involve the exploration; drilling or production of gas, oil or petroleum product and therefore, this chapter does not apply.

CHAPTER 379, F.S., FISH AND WILDLIFE CONSERVATION

The framework for the management and protection of the state of Florida's wide diversity of fish and wildlife resources are established in this statute. It is the policy of the state to conserve and wisely manage these resources. Particular attention is given to those species defined as being endangered or threatened. This includes the acquisition or management of lands important to the conservation of fish and wildlife. This statute contains specific provisions for the conservation and management of marine fisheries resources. These conservation and management measures permit reasonable means and quantities of annual harvest, consistent with maximum practicable sustainable stock abundance, as well as ensure the proper quality control of marine resources that enter commerce.

Additionally, this statute supports and promotes hunting, fishing and the taking of game opportunities in the State. Hunting, fishing, and the taking of game are considered an important part in the state's economy and in the conservation, preservation, and management of the state's natural areas and resources.

Chapter 379 Fish and Wildlife Conservation.
Not approved as enforceable policy: Sections 379.2551 and .362.

379.2511? [no 379.2551 shown] Lease of state-owned water bottoms for growing oysters and clams.

379.362 Wholesale and retail saltwater products dealers; regulation.

Response: The goals and objectives of this project are to improve habitat conditions for native wildlife species. This project is in compliance with the intent of this Chapter.

CHAPTER 380, F.S., LAND AND WATER MANAGEMENT

Land and water management policies are established to protect natural resources and the environment; and to guide and coordinate local decisions relating to growth and development. The statute provides that state land and water management policies, to the maximum possible extent, be implemented by local governments through existing processes for the guidance of growth and development and that all the existing rights of private property be preserved in accord with constitutions of this state and of the United States. The chapter establishes the Areas of Critical State Concern designation, the Florida Communities Trust as well as the Florida Coastal Management Act. The Florida Coastal Management Act provides the basis for the Florida Coastal Management Program which seeks to protect the natural, commercial, recreational, ecological, industrial, and aesthetic resources of Florida's coast.

Chapter 380 Land and Water Management

Not approved as enforceable policy: Section 380.23(3)(d). [consistency review of] Federal activities within the territorial limits of neighboring states when the Governor and the department determine that significant individual or cumulative impact to the land or water resources of the state would result from the activities.

Response: The proposed project incorporates restoration components primarily intended to benefit freshwater wetlands and estuarine resources by distributing freshwater flows through WCA 3A, WCA 3B and Everglades National Park. This includes the installation/construction of a flow equalization basin, pump stations, flow-ways, levees, gated structures and the removal and backfilling of canals. The goals and objectives of this project are to improve habitat conditions for native wildlife species. Impacts of this project have been detailed within an Environmental Impact Statement. This project is in compliance with the intent of this Chapter.

CHAPTER 381, F.S., PUBLIC HEALTH: GENERAL PROVISIONS

The statute establishes public policy concerning the state's public health system, which is designated to promote, protect, and improve the health of all people in the state.

Chapter 381 Public Health: General Provisions
Enforceable policy includes only Sections 381.001, .0011, .0012, .006, ,0061, .0065, .0066, and .0067.
381.001 Legislative intent; public health system.
381.0011 Duties and powers of the Department of Health.
381.0012 Enforcement authority.
381.006 Environmental health.
381.0061 Administrative fines.
381.0065 Onsite sewage treatment and disposal systems; regulation.
381.0066 Onsite sewage treatment and disposal systems; fees.
381.0067 Corrective orders; private and certain public water systems and onsite sewage treatment and disposal systems.

Response: This project would not affect the state's public health system and therefore, this Chapter is not applicable.

CHAPTER 388, F.S., MOSQUITO CONTROL

Mosquito control efforts of the state are to achieve and maintain such levels of arthropod control as will protect human health and safety and foster the quality of life of the people, promote the economic development of the state, and facilitate the enjoyment of its natural attractions by reducing the number of pestiferous and disease-carrying arthropods. It is the policy of the state to conduct arthropod control in a manner consistent with protection of the environmental and ecological integrity of all lands and waters throughout the state.

Response: The proposed project would not further the propagation of mosquitoes or other pest arthropods and with the restoration of sheetflow, standing water would be reduced, thus potentially reducing the propagation of mosquitoes. This project is in compliance with the intent of this Chapter.

CHAPTER 403, F.S., ENVIRONMENTAL CONTROL

Environmental control policies conserve state waters; protect and improve water quality for consumption and for the propagation of fish and wildlife; and maintain air quality to protect human health and plant and animal life. This statute provides wide-ranging authority to address various environmental control concerns, including air and water pollution; electrical power plant and transmission line siting; the Interstate Environmental Control Compact; resource recovery and management; solid and hazardous waste management; drinking water protection; pollution prevention; ecosystem management; and natural gas transmission pipeline siting.

Chapter 403 Environmental Control
Not approved as enforceable policy: Section 403.7125(2) and (3).

(2) The owner or operator of a landfill …shall establish a fee, or a surcharge on existing fees or other appropriate revenue-producing mechanism, to ensure the availability of financial resources for the proper closure of the landfill.

(3) An owner or operator of a landfill … may provide financial assurance to the department in lieu of the requirements of subsection (2).

Response: A draft Environmental Impact Statement addressing project impacts has been prepared and would be reviewed by the appropriate resource agencies including the Florida Department of Environmental Protection. Environmental protection measures would be implemented to ensure that no lasting adverse effects on water quality, air quality, or other environmental resources would occur. The project complies with the intent of this chapter.

CHAPTER 553, F.S., BUILDING AND CONSTRUCTION STANDARDS

The statute addresses building construction standards and provides for a unified Florida Building Code.

Chapter 553 Building and Construction Standards.
Enforceable policy includes only Sections 553.73 and .79.

553.73 Florida Building Code.

553.79 Permits; applications; issuance; inspections.

Response: A draft Environmental Impact Statement addressing project impacts has been prepared and would be reviewed by the appropriate resource agencies including the Florida Department of Environmental Protection. Environmental protection measures would be implemented to ensure that no lasting adverse effects on water quality, air quality, or other environmental resources would occur. Water Quality Certification would be sought from the State prior to construction. The project complies with the intent of this chapter.

CHAPTER 582, F.S., SOIL AND WATER CONSERVATION

It is the state's policy to preserve natural resources; control and prevent soil erosion, prevent floodwater and sediment damages and to further the conservation, development and use of soil and water resources, and the disposal of water. Farm, forest, and grazing lands are among the basic assets of the state; and the preservation of these lands is necessary to protect and promote the health, safety, and general welfare of its people. These measures help to preserve state and private lands, control floods, maintain water quality, prevent impairment of dams and reservoirs, assist in maintaining the navigability of rivers and harbors, preserve wildlife and protect wildlife habitat, protect the tax base, protect public lands, and protect and promote the health, safety, and general welfare of the people of this state.

Response: Project construction and implementation would include appropriate erosion control plans and measures to ensure compliance with the intent of the chapter.

CHAPTER 597, F.S., AQUACULTURE

The statute establishes public policy concerning the cultivation of aquatic organisms in the state. The intent is to enhance the growth of aquaculture, while protecting Florida's environment. This includes a requirement for a state aquaculture plan which provides for the coordination and prioritization of state aquaculture efforts, the conservation and enhancement of aquatic resources and which provides mechanisms for increasing aquaculture production for the creation of new industries, job opportunities, income for aquaculturists, and other benefits to the state.

Response: The proposed project does not include aquaculture activities, and therefore, this Chapter does not apply.

APPENDIX C.5

CULTURAL RESOURCES CONSULTATION INFORMATION

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C.5 CULTURAL RESOURCE CONSULTATION INFORMATION

This appendix provides details pertaining to consultation concerning cultural resources as of August 05, 2013. Consultation is currently ongoing and expected to continue until Section 106 is complete.

C.5.1 Abbreviations

ACHP – Advisory Council on Historic Preservation
BIA – Bureau of Indian Affairs
CEPP – Central Everglades Planning Project
CR – Cultural Resources
EAA – Everglades Agricultural Area
ENP – Everglades National Park
ERTP – Everglades Restoration Transition Plan
FBAR – Florida Bureau of Archaeological Research
MTIF – Miccosukee Tribe of Indians of Florida
NEPA – National Environmental Protection Act
SFWMD – South Florida Water Management District
SHPO – State Historic Preservation Office
STOF – Seminole Tribe of Florida *(to mean THPO unless otherwise specified)*
THPO – Tribal Historic Preservation Office
USACE – U.S. Army Corps of Engineers
WCA – Water Conservation Area

C.5.2 Specific Consultation

Table C.5.2.1 is a representative sample of consultation efforts that have occurred up to August 05, 2013 and does not present every occurrence. The Corps acted as lead.

Table C.5.2.1. Synopsis of Consultation

Date	*Group*	*Form*	*Consultation Synopsis*
12/14/2011	MTIF	Phone	Introductions, Discussed possible date to meet and discuss CEPP
12/27/2011	STOF, MTIF, SHPO, ENP	Letter	USACE letter dated 12-27-2011 asking for bi-weekly consultation
12/28/2011	STOF	Email	USACE emailed electronic version of letter dated 12-27-2011 asking for formal consultation.
12/28/2011	MTIF	Fax	USACE faxed letter dated 12-27-2011 asking for bi-weekly formal consultation
1/6/2012	STOF	Email	USACE asking for face to face meeting with THPO.
1/13/2012	MTIF	Meeting	USACE to discuss CEPP Sampling Strategy for WCA3, Predictive modeling for EAA A-1, A-2; Phased approach to CR investigations, and consulting every two weeks.
1/24/2012	MTIF	Letter	USACE received NEPA scoping response letter from Tribe
1/30/2012	SHPO	Phone	USACE spoke with Deputy SHPO regarding necessity for programmatic agreement. SHPO declined need at this time.
2/5/2012	ENP	Email	USACE emailed ENP Chief of Cultural Resources to set up meeting to discuss project

2/6/2012	STOF, SHPO, MTIF	Phone	USACE contacted each group individually to inquire about the need for testing in WCA3.
2/8/2012	STOF, SFWMD	Meeting	USACE, THPO, and SFMWD meeting regarding CEPP Sampling Strategy for WCA3, Predictive modeling for EAA A-1, A-2; Phased approach to CR investigations, and consulting every two weeks.
2/9/2012	STOF	Email	USACE sending requested documentation for EAA
2/10/2012	STOF	Email	USACE and THPO discussed best methodology for soil sample collection
2/16/2012	SFWMD	Phone/Web	Participants discussed slides for March 21st meeting, discussed need for testing in EAA A-1 and A-2 and need to speak with SHPO, and consultation process between partners.
2/21/2012	SFMWD	Phone	Participants discussed CEPP Field Testing Plan for WCA3, EAA A-1 and A-2
2/23/2012	MTIF	Fax	USACE faxed CEPP Field Testing Plan for WCA3, EAA A-1 and A-2 to cultural resource rep.
2/24/2012	STOF, SFWMD	Phone	USACE, SFWMD and THPO conference call - CEPP Field Testing Plan for WCA3 EAA A-1 and EAA A-2.
3/1/2012	STOF, SFWMD	Meeting	USACE met with THPO at PDT meeting. CR were discussed. THPO requested CR to be covered during PDT meetings.
3/5/2012	STOF, SFWMD	Email	USACE emailed 3-1-2012 PDT NEPA Slides
3/5/2012	STOF, SFWMD	Email	USACE emailed revised CEPP Field Testing Plan for WCA3 EAA A-1 and EAA A-2
3/6/2012	STOF, SFWMD	Email	USACE and THPO discuss changes of CEPP Field Testing Plan for WCA3 EAA A-1 and EAA A-2
3/6/2012	STOF, ENP, SHPO, MTIF	Letter	USACE letter dated 03-06-2012 asking for concurrence on CEPP Field Testing Plan for WCA3 EAA A-1 and A-2
3/16/2012	SHPO	Letter	Letter received from SHPO concurring with USACE recommendations to conduct necessary CR surveys within areas of potential effect.
3/19/2012	STOF, SFWMD	Email	USACE emailed electronic version of letter dated 03-06-2012 discussed above
3/20/2012	STOF, SFWMD	Phone	USACE, THPO and SFWMD discuss additional changes to CEPP Field Testing Plan and ERTP vs. CEPP
3/21/2012	SFWMD	Meeting	USACE presented difference between ERTP and CEPP, discussed necessity for testing EAA A-1 and A-2, and programmatic agreement based on consultation
3/22/2012	STOF, SFWMD	Email	USACE provided requested information to THPO in regards to tree islands
3/23/2012	STOF, SFWMD	Email	USACE provided requested information to THPO
3/26/2012	STOF, SFWMD	Email	USACE emailed revised draft CEPP Field Testing Plan for WCA3, EAA A-1 and A-2. USACE asked specific questions for THPO opinions/concerns.
3/29/2012	SFMWD	Meeting	USACE to provide basis for CR investigations for CEPP. Where are they needed and why.
3/30/2012	STOF, SFWMD	Email	USACE provided update to participants regarding FBAR discussions concerning curation/collection strategy for CEPP
03/30/2012	MTIF	Phone	Participants discussed collection strategy for CEPP
4/4/2012	STOF, SFWMD	Phone/Web	USACE gave CEPP update to participants. Discussed project timeline, SFMWD would do EAA A-1 separate from CEPP as part of their court ordered water quality requirement.

4-15-2012	MTIF	Phone	Update on CEPP
4/27/2012	SHPO, FBAR, SFWMD	Meeting	USACE, SFWMD, SHPO, FBAR meeting regarding CEPP, particularly EAA A-1 required testing
4/29/2012	MTIF	Mail	Sent requested material to cultural resources representative
5/1/2012	FBAR	Phone	Discussed methodology for CEPP WCA3, EAA A-1 and A-2
5/3/2012	MTIF	Phone	Discussed test areas within WCA3 and cultural issues
5/10/2012	STOF, SFWMD	Phone/Web	USACE, THPO and SFWMD CEPP update
5/14/2012	STOF, SFWMD, FBAR	Phone/Web	Discussed EAA A-1 and methodology
5/15/2012	FBAR	Phone	Discussed EAA A-1 and A-2 methodology
5/29/2012	STOF	Phone	Discussed EAA A-1 and A-2 methodology
5/30/2012	SFMWD	Phone	USACE and SFMWD discuss EAA A-1
5/30/2012	STOF, SFWMD, FBAR, SHPO	Phone/Web	USACE, THPO, SHPO, FBAR and SFWMD discussed CEPP, SFWMD water quality remedy and EAA A-1 methodology
6/6/2012	BIA	Letter	USACE letter dated 7/06/2012 to BIA asking for consultation (no response)
6/6/2012	ACHP	Letter	USACE letter to ACHP invitation to enter into consultation pursuant to Appendix A of CRF 800
6/14/2012	MTIF	Phone	Discussed airboat access for WCA3
6/18/2012	MTIF	Phone	USACE and CR Representative discussed EAA A-1
6/20/2012	STOF, FBAR, SHPO, SFWMD	Meeting	USACE, THPO, FBAR, SFWMD, and SHPO Face to Face meeting regarding CEPP CR update, EAA A-1 as State project.
6/21/2012	MTIF	Fax	USACE sent requested information
7/12/2012	MTIF	Letter	USACE letter dated 7/12/2012 asking for concurrence of the field testing plan for CEPP Phase I Survey - WCA 3
7/13/2012	MTIF	Signature	USACE received signed concurrence of 7/12/2012 letter
8-17-2012	ACHP	Letter	Letter received from ACHP accepting participation in consultation pursuant to the Criteria for Council Involvement in Reviewing Individual Section 106 Cases to help ensure that historic properties are fully considered in the management and control of water resources in the Everglades
9/25/2012	STOF, SFWMD	Meeting	USACE, STOF Representatives, SFWMD Face to Face meeting regarding CEPP - Biologist and THPO
10/4/2012	SFWMD, FWS	Meeting	USACE and SFMWD discuss plantings on WCA3 islands
10/24/2012	STOF, SFWMD	Phone/Web	USACE, THPO, SFWMD discussed island plantings in WCA3, and CR investigation update
11/16/2012	STOF, FBAR, SFMWD, ENP, SHPO, ACHP	Phone/Web	USACE, STOFTHPO, SHPO, FBAR, ENP, ACHP discuss CEPP Alternatives and CR
12/7/2012	MTIF	Meeting	USACE met with representative to discuss project alternatives, concerns were noted and relayed to rest of team and management
12/20/2012	STOF, FBAR, SFMWD, ENP, SHPO	Phone/Web	Participants discussed Draft Alternatives and potential effects to cultural resources by those alternatives that are known at this time, and results of WCA3 Phase I Survey.
01/17/2013	STOF, FBAR, SFMWD, ENP, SHPO, ACHP	Phone/Web	Participants discussed changes to Alternatives and potential effects to cultural resources.

2/21/2013	STOF, FBAR, SFMWD, ENP, SHPO, ACHP	Phone/Web	Participants discussed Tentatively Selected Plan and the potential effects to cultural resources previously not discussed, draft operations manual for project was introduced, and discussed EAA A-2 collection strategy.
3/8/2013	STOF, SFWMD	Meeting	USACE met with STOF THPO to discuss concerns related to CEPP project schedule for cultural resources, CEPP vs. ERTP, level of effort needed for Section 106 compliance for a feasibility study, inundation of human remains.
3/19/2013	STOF	Letter	STOF letter to USACE dated 3/19/2013 response 3/8/2013 meeting with USACE.
4/1/2013	SHPO, STOF, MTIF	Letter	USACE letter dated 4/01/2013 requesting consultation/comment on CEPP Phase I WCA 3 Draft Report.
5/23/2013	STOF	Phone	STOF requested meeting to discuss concerns regarding CEPP Phase I WCA 3 Draft Report.
5/23/2013	STOF	Letter	STOF Phase I WCA 3 Draft Report comment letter dated 5/23/2013 received by USACE via email.
6/10/2013	SFWMD, FBAR	Phone/Web	Discussed material discovered during the EAA A-2 Phase I Survey.
6/16/2013	STOF	Letter	STOF Legal Department provided comments to the draft PIR
6/18/2013	SHPO	Letter	SHPO Phase I WCA 3 Draft Report Comment Letter received by USACE via email.
6/20/2013	STOF	Letter	USACE letter dated 6/19/2013 response to STOF concerns regarding inundation of human resources, CEPP, and adaptive management.
6/20/2013	SFWMD	Email	USACE sent via email for review, the Phase I Survey Draft Report for the CEPP EAA A-2.
6/20/2013	STOF, FBAR, SFMWD, SHPO, ACHP	Phone/Web	Discussed changes to alternatives (4R2) and modeling results. Updated CEP Project and ongoing surveys.
7/26/2013	SHPO, STOF, MTIF	Letter	USACE letter dated 7/26/2013 requesting comments on CEPP Phase I Survey for EAA A-2 Revised Draft Report.
7/26/2013	SHPO, STOF, MTIF	Letter	USACE letter dated 7/26/2013 requesting comments on CEPP Phase I Survey for the L-67 Ext. Corridor Draft Report.
7/26/2013	SFWMD	Email	USACE sent electronically the CEPP Phase I Survey for the L-67 Ext. Draft Report to SFWMD for review.
8/5/2013	STOF, SFMWD	Meeting	USACE and STOF Representatives for Environmental Compliance and THPO meeting to discuss CEPP Alt. 4R2.

C.5.3 Correspondence Letters: Federal and State Agencies

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

NOV 23 2011

TO WHOM IT MAY CONCERN:

The Jacksonville District, U.S. Army Corps of Engineers (Corps) is beginning preparation of a National Environmental Policy Act assessment for the Central Everglades Planning Project. The goal of the Central Everglades Planning Project is to develop an integrated, comprehensive technical plan, including the first increment of project features to be recommended for authorization, for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem.

The Everglades ecosystem encompasses a system of diverse wetland landscapes that are hydrologically and ecologically connected across more than 200 miles from north to south and across 18,000 square miles of southern Florida. In 2000, the U.S. Congress authorized the Federal government, in partnership with the State of Florida, to embark upon a multi-decade, multi-billion dollar Comprehensive Everglades Restoration Plan (CERP) to further protect and restore the remaining Everglades ecosystem while providing for other water-related needs of the region. CERP involves modification of the existing network of drainage canals and levees that make up the Central and Southern Florida Flood Control Project to restore the south Florida ecosystem.

Construction has begun on the first generation of CERP project modifications already authorized by Congress. These include the Picayune Strand Restoration, the Indian River Lagoon South and Site 1 Impoundment projects. Project Implementation Reports have been completed, or are nearing completion, for the second generation of CERP projects for Congressional authorization, including Biscayne Bay Coastal Wetlands-Phase 1, the Broward County Water Preserve Areas, the Caloosahatchee River (C-43) West Basin Storage Reservoir, and the C-111 Spreader Canal Western Project. All of these CERP projects utilize lands that were acquired by the State and Federal government to meet CERP goals of increasing the extent of wetlands, reducing damaging freshwater discharges to the coastal estuaries, and reducing seepage losses from the natural system. These projects contribute significant ecological benefits to the system and the specific regional habitats in which they are located. These initial CERP projects were intended to provide initial and immediate ecological benefits and set the conditions along the margins of the system that help ensure increased water flows to the interior of the system will not cause adverse effects.

The next step for implementation of CERP is to redirect water that is currently discharged to the east and west coast estuaries from Lake Okeechobee and restore water flow to the south, allowing for restoration of natural habitat conditions and water flow in the central Everglades and re-connecting the ecosystem from Lake Okeechobee to Everglades National Park and Florida Bay. The Central Everglades Planning Project (Figure 1) will develop the initial increment of the project features that provide for storage, treatment and conveyance south of Lake Okeechobee, removal of canals and levees within Water Conservation Area 3 and seepage management features to retain water within the natural system. The CERP Projects identified to accomplish this include the Everglades Agricultural Storage Reservoirs, Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement, Everglades National Park Seepage Management, and Everglades Rain-Driven Operations. These projects make up the heart of CERP aimed at restoring more natural quantity, quality, timing and distribution of water flows to the remaining portions of the river of grass. An integrated study effort on these projects is needed to set the direction for the next decade of CERP implementation.

The Corps will hold a Public Workshop December 14 from 6:30 to 9:00 p.m. at the Sheraton Suites Plantation, Plantation I/II Room, 311 North University Drive, Plantation, Florida and December 15, 2011 from 6:30 to 9:00 p.m. at the John Boy Auditorium, 1200 South W.C. Owen Avenue, Clewiston, Florida. The formal portion of the workshop will begin at 7:30 p.m. The Central Everglades Planning Project team will be available prior to and after the formal presentation to provide information and answer questions about the projects and development of a proposed plan. Interested attendees can call 904-232-1613 for Spanish translation or other special services.

We invite the participation of Federal and State agencies, Native American Tribes, local agencies, interested parties and individuals in providing comments and identifying any issues or concerns. Please share this notice with any interested party. Please send any comments you may have to the attention of Gina Paduano Ralph, Ph.D. (904-232-2336) at the letter head address or email gina.p.ralph@usace.army.mil no later than 30 days from the date of this letter. All individuals providing comments will be included in future mailings. Others may be added to the mailing list by making a written request (postcard) to the same address or by email.

Sincerely,

Stuart J. Appelbaum
Chief, Planning and Policy Division

Enclosure

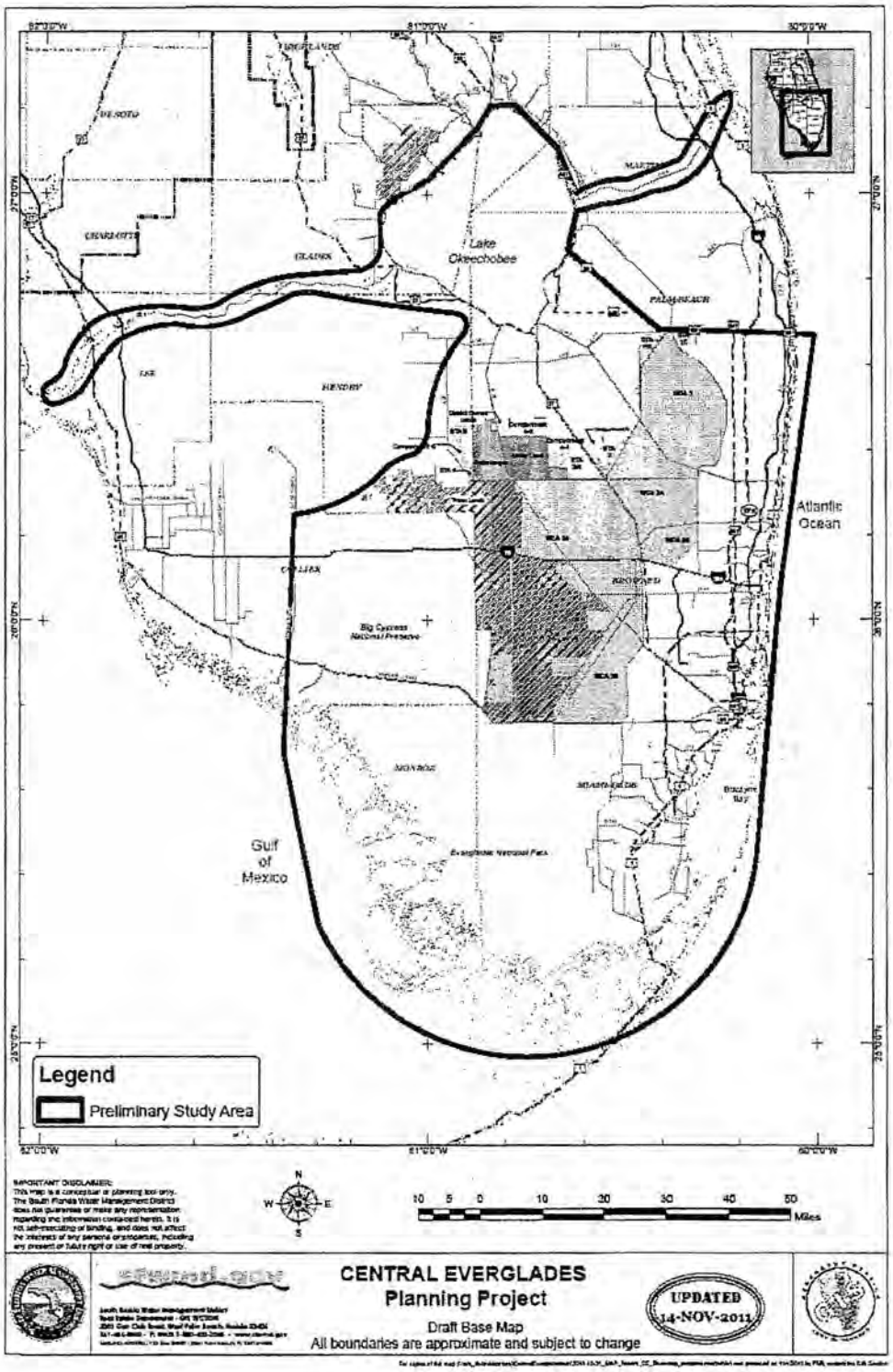

Figure 1. Central Everglades Planning Project Preliminary Study Area.

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

Ms. Melissa Memory
Everglades and Dry Tortugas National Parks
Chief of Cultural Resources
40001 State Road 9336
Homestead, Florida 33034

Dear Ms. Memory:

As stated in the National Environmental Policy Act scoping letter dated December 07, 2011, the U.S. Army Corps of Engineers (Corps), Jacksonville District, in partnership with the South Florida Water Management District (SFWMD), have initiated an 18-month expedited pilot project known as the Central Everglades Planning Project (CEPP). The goal of the CEPP is to develop an integrated, comprehensive technical plan for the first increment of project features to be recommended for authorization for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem. The scope of this project includes increments of the following Comprehensive Everglades Restoration Plan (CERP) components: Everglades Agricultural Area Storage Reservoirs, Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement, Everglades National Park Seepage Management, and Everglades Rain-Driven Operations.

Under Section 106 of the National Historic Preservation Act of 1966, as amended and implementing regulations 36 CFR Part 800, as amended, we are assessing our needs for information regarding historic or undocumented traditional cultural properties that might be affected by the undertaking. Although the exact project footprint has yet to be determined, due to the expeditious nature of CEPP, the Corps is currently conducting an extensive review of the Florida Master Site Files (FMSF) to identify previously recorded cultural resource sites and to ascertain the adequacy of past cultural resources surveys conducted within the larger CEPP study area. To insure internal deadlines are met for this project, FMSF review, identification of areas in need of Phase I Survey, and development of a survey methodology are projected to be completed by the end of January 2012. Tentatively, initiation of Phase I Surveys will start mid-March 2012. This will ensure that any necessary cultural resource investigations are completed in a timely manner.

Therefore, we would like to extend an invitation for you or a designated member of your staff to consult with us throughout this process to ensure that all concerns are addressed during these efforts. It is expected that one-on-one discussions regarding the project could take place as monthly or bi-monthly meetings, and either in person or via conference call. Ms. Cindy Thomas has been designated as Corps Staff Archaeologist for CEPP, and will be initiating contact with you (or designee) immediately upon response to this letter. Any questions or concerns that you may have at this time can also be addressed by Ms. Thomas by contacting her at (904) 232-1180 or via email: Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Alfred A. Pantano, Jr.
Colonel, U.S. Army
District Commander

12/27/11

Enclosure

Thomas/CESAJ-PD-EP/1180
Kinard/CESAJ-DD
Applebaum/CESAJ-ED
Taplin/CESAJ-DR-W
Summa/CESAJ-ED-E
Acosta/CESAJ-PD-EP
FOR Garrett/CESAJ-PM-E CT 12/27/11
Vitek/CESAJ-PM
Goral/CESAJ-OC
FOR Hobbie/SESAJ-PPMD
Gapinski/CESAJ-DX
LTC Barker/CESSAJ-DD
COL Pantano/CESAJ-DE
12/27/11

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

Mr. Robert F. Bendus
Division of Historical Resources
State Historic Preservation Officer
500 South Bronough Street
Tallahassee, Florida 32399-0250

Dear Mr. Bendus:

As stated in the National Environmental Policy Act scoping letter dated December 07, 2011, the U.S. Army Corps of Engineers (Corps), Jacksonville District, in partnership with the South Florida Water Management District (SFWMD), have initiated an 18-month expedited pilot project known as the Central Everglades Planning Project (CEPP). The goal of the CEPP is to develop an integrated, comprehensive technical plan for the first increment of project features to be recommended for authorization for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem. The scope of this project includes increments of the following Comprehensive Everglades Restoration Plan (CERP) components: Everglades Agricultural Area Storage Reservoirs, Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement, Everglades National Park Seepage Management, and Everglades Rain-Driven Operations.

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Therefore, we would like to extend an invitation for you or a designated member of your staff to consult with us throughout this process to ensure that all concerns are addressed during these efforts. It is expected that one-on-one discussions regarding the project could take place as monthly or bi-monthly meetings, and either in person or via conference call. Ms. Cindy Thomas has been designated as Corps Staff Archaeologist for CEPP, and will be initiating contact with you (or designee) immediately upon response to this letter. Any questions or concerns that you may have at this time can also be addressed by Ms. Thomas by contacting her at (904) 232-1180 or via email: Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Alfred A. Pantano, Jr.
Colonel, U.S. Army
District Commander
12/27/11

Enclosure

Copy Furnished:
Ms. Laura Kammerer, Deputy State Historic Preservation Officer for Review and Compliance, 500 South Bronough Street, Tallahassee, Florida 32399

Thomas/CESAJ-PD-EP/1180
Kinard/CESAJ-DD
Applebaum/CESAJ-ED
Taplin/CESAJ-DR-W
Summa/CESAJ-ED-E
Acosta/CESAJ-PD-EP
For Garrett/CESAJ-PM-E CT 12/27/11
Vitek/CESAJ-PM
Goral/CESAJ-OC
For Hobbie/SESAJ-PPMD
Gapinski/CESAJ-DX
LTC Barker/CESSAJ-DD
COL Pantano/CESAJ-DE AJP 12/27/11

FLORIDA DEPARTMENT *of* STATE

RICK SCOTT
Governor

KEN DETZNER
Secretary of State

Mr. Eric Summa
Planning Division
Jacksonville USACE
P.O. Box 4970
Jacksonville, Florida 32232-0019

March 16, 2012

Re: DHR Project File No. 2012-01115/ Received by DHR: March 8, 2012
Project: Central Everglades Planning Project
Counties: Broward, Palm Beach

Dear Mr. Summa:

Our office received and reviewed the above referenced project application in accordance with Section 106 of the National Historic Preservation and the National Environmental Policy Acts as amended, to assess possible adverse impacts to cultural resources (any prehistoric or historic district, site, building, structure, or object) listed, or eligible for listing, in the National Register of Historic Places.

Our office concurs with the recommendations of your agency for the necessity for a cultural resource survey of the area of potential effect for the proposed project. We look forward to reviewing the resultant survey report. As you know, the resultant survey report must conform to the specification set forth in Chapter 1A-46, *Florida Administrative Code,* and be forwarded to this agency in order to complete the review and consultation processes for this undertaking and its impacts to historic properties. The results of the analysis should determine if significant cultural resources would be disturbed by this development. In addition, if significant remains are located, the data described in the report and the consultant's conclusions will assist this office as well in determining measures to be taken to avoid or minimize adverse impacts to any historic properties identified.

If you have any questions concerning our comments, please contact Michael Hart, Historic Sites Specialist, by phone at 850.245.6333, or by electronic mail at Michael.Hart@dos.myflorida.com. Your continued interest in protecting Florida's historic properties is appreciated.

Sincerely,

Laura A. Kammerer

Laura A. Kammerer
Deputy State Historic Preservation Officer
For Review and Compliance

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

MAR 0 6 2012

Mr. Dan B. Kimball
Superintendent
Everglades National Park
40001 State Road 9336
Homestead, Florida 33034-6733

Dear Mr. Kimball:

The U.S. Army Corps of Engineers (Corps), Jacksonville District, along with the South Florida Water Management District (SFWMD), is studying the environmental effects of the proposed Central Everglades Planning Project (CEPP). The goal of the Central Everglades Planning Project is to deliver within two years a finalized plan, known as a Project Implementation Report (PIR), for a suite of restoration projects in the central Everglades. This PIR is in preparation to seek Congressional authorization for the CEPP as part of the Comprehensive Everglades Restoration Plan (CERP). The project will incorporate updated science and technical information gained over the last decade to identify projects on lands already in public ownership to be selected as the next generation of CERP components.

The CEPP is incorporating some previously defined projects that have already addressed cultural resource concerns. Once the final array of alternatives are identified consultation with your office, site file reviews, cultural resource surveys, and determinations of significance and eligibility for listing of historic properties to the National Register of Historic Places, will continue until the Section 106 process of the NHPA, 36 CFR Part 800, Protection of Historic Properties, and the National Environmental Policy Act of 1969, as amended, are complete.

Based on goals specified by CEPP, the following areas will be consulted on at this time: Water Conservation Areas 3A and 3B, and Everglades Agricultural Area A-1 and A-2 (previously known as Component A).

Water Conservation Areas 3A and 3B – Florida Master Site File research indicates the presence of previously recorded sites, most of which were identified via remote sensing. These sites have not been verified with either surface or subsurface investigations.

Similarly, the Everglades Agricultural Area A-1 and A-2 – Florida Master Site File research indicates that this area has not undergone systematic cultural resource investigations. Therefore, the Corps proposes to conduct an archaeological survey and assessment of specific areas within both WCA3 and EAA A-1 and A-2 in accordance with the enclosed field testing plan enclosed.

The Corps seeks your comments on this proposed plan of action and looks forward to working with you. Any questions or concerns that you may have at this time can be addressed by Ms. Cindy Thomas by contacting her at (904) 232-1180 or via email: Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Eric Summa.
Chief, Environmental Branch

Enclosure

Copy Furnished:
Ms. Melissa Memory, Everglades and Dry Tortugas National Parks, Chief of Cultural Resources, 40001 State Road 9336, Homestead, Florida 33034

Thomas/CESAJ-PD-EP/1180
Summa/CESAJ-ED-E
Acosta/CESAJ-PD-EP
Garrett/CESAJ-PM-E
Hughes/CESAJ-PD-EP

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

MAR 0 6 2012

Mr. Robert F. Bendus
Division of Historical Resources
State Historic Preservation Officer
500 South Bronough Street
Tallahassee, Florida 32399-0250

Dear Mr. Bendus:

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The Corps seeks your comments on this proposed plan of action and looks forward to working with you. Any questions or concerns that you may have at this time can be addressed by Ms. Cindy Thomas by contacting her at (904) 232-1180 or via email: Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Eric Summa
Chief, Environmental Branch

Enclosure

Copy Furnished:
Ms. Laura Kammerer, Deputy State Historic Preservation Officer for Review and Compliance, 500 South Bronough Street, Tallahassee, Florida 32399

CT Thomas/CESAJ-PD-EP/1180
Summa/CESAJ-ED-E
Acosta/CESAJ-PD-EP
Garrett/CESAJ-PM-E
Hughes/CESAJ-PD-EP

JUL 06 2012

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

Mr. David Saunders
Bureau of Indian Affairs
Eastern Regional Office
545 Marriott Drive
Suite 700
Nashville, Tennessee 37214

Dear Mr. Saunders:

The U.S. Army Corps of Engineers (Corps) and the South Florida Water Management District (District) are conducting an integrated reconnaissance and feasibility study for the Central Everglades Planning Project (CEPP) and are studying associated environmental effects. The CEPP is looking at combining a suite of projects, many of which have been previously implemented throughout south Florida. The target of the CEPP is to deliver within two years, a finalized plan known as a Project Implementation Report (PIR) for restoration projects in the central Everglades. The CEPP PIR will be prepared and ultimately submitted to Congress for authorization for the CEPP as part of the Comprehensive Everglades Restoration Plan (CERP) implemented in 1999, visit http://www.evergladesplan.org/pm/projects/proj_51_cepp.aspx for further information.

The CEPP was announced to the public on November 01, 2011. On December 20, 2011, the Corps began consulting on a bi-weekly basis (at least) with the Miccosukee Tribe of Indians of Florida's NAGPRA Representative and the Seminole Tribe of Florida's, Tribal Historic Preservation Office concerning cultural resources. It is the intention of the Corps to continue this level of consultation with all parties until such time that Section 106 of the National Historic Preservation Act, as amended is complete.

Ms. Cynthia Thomas has been designated as Corps staff Archaeologist for the CEPP. If you would like to provide comments on historic properties located on lands within Bureau of Indian Affairs jurisdiction, please submit comments in writing to Cynthia Thomas. Also, any questions

JUL 0 6 2012

or concerns regarding the project may also be addressed to Ms. Thomas by contacting her at (904) 232-1180 or via email: Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Eric L. Bush
Chief, Planning and Policy Division

Copies Furnished:

Dr. Christina Stringer, Bureau of Indian Affairs, Natural Resources Officer, 545 Marriott Drive, Suite 700, Nashville, Tennessee 37214

Thomas/CESAJ-PD-EP/1180
Summa/CESAJ-ED-E
Acosta/CESAJ-PD-EP
Vitek/CESAJ-PM

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

JUN 0 6 2012

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

Mr. Reid Nelson
Advisory Council on Historic Preservation
Old Post Office Building
1100 Pennsylvania Avenue, NW, Suite 803
Washington, DC 20004

Dear Mr. Nelson:

The U.S. Army Corps of Engineers (Corps) and the Assistant Secretary of the Army senior leadership have collaboratively worked to identify and discuss opportunities to modernize the Civil Works Planning Program to better address water resources challenges that face the nation. One priority for addressing these challenges is shortening the time between initiation of a planning study and initiation of construction by incorporating both the current Reconnaissance and Feasibility phases into a single cohesive preauthorization process in a targeted goal of 18 months.

The Central Everglades Planning Project (CEPP) is one of seven projects chosen to be a part of the Corps initiated National Planning Pilot Program. The CEPP is identified as a multiagency study with the Corps as the lead agency in partnership with the South Florida Water Management District (SFWMD). The target of the CEPP is to deliver within two years, a finalized plan known as a Project Implementation Report (PIR) for a suite of restoration projects in the central Everglades. This PIR is in preparation to seek Congressional authorization for the CEPP as part of the Comprehensive Everglades Restoration Plan (CERP) implemented in 1999. Enclosure 1 provides information regarding the approach for the new study plan. Also, visit http://www.evergladesplan.org/pm/projects/proj_51_cepp.aspx for further information regarding CEPP including but not limited to public comments, Working Group Meetings and Planning and Development Team Meetings.

Under Section 106 of the National Historic Preservation Act of 1966, as amended and implementing regulations 36CFR 800, as amended, we are assessing our needs for information regarding historic properties that may be affected by the undertaking. Although the exact suite of previously implemented projects have yet to be determined, due to the expeditious nature of CEPP, the Corps has completed an extensive review of LiDar data, historic and modern aerial photographs, and historic land records (e.g. General Land Office, plat maps, surveyors notes, etc.) to ascertain high probability of historic sites location. In addition, USACE has conducted

an extensive search of the Florida Bureau of Archaeological Research, Florida Master Site Files (FMSF) to identify previously recorded cultural resource sites within the study area, and to ascertain the adequacy of past cultural resource surveys conducted within the larger CERP study area (Enclosure 2). Simultaneously, as previously implemented projects are identified to be a part of CEPP we will continue to do consultation, background reviews, cultural resource surveys, and determinations of significance and eligibility for listing of historic properties to the National Register of Historic Places until compliance with the National Historic Preservation Act is complete.

Enclosure 3 provides a summary of previous cultural resources investigations within the CEPP Feasibility Study area of potential effect (APE), in addition to a summary of project specific alternatives for many of the previously implemented projects under consideration for the CEPP. Currently, only two previously implemented projects have been identified as part of the CEPP: Decomp and Component A-1 and A-2. Through consultation with the State Historic Preservation Office (SHPO), the Seminole Tribe of Florida Tribal Historic Preservation Office (STOF-THPO), and the Miccosukee Tribe of Indians of Florida Cultural Resource Representative, it was determined that identification and assessment of historic properties within the areas is warranted, therefore a sampling strategy and field testing plan was developed. Fieldwork for WCA3 will be completed prior to the PIR, however , due to litigation between the SFWMD and the leasee that is currently preventing access to the property, fieldwork for Component A-1 and A-2 may be delayed until after the PIR, but prior to construction. As stated previously, once other previously implemented projects are identified, we will continue with the Section 106 process until complete. Finally, once the final array of alternatives are selected we will then determine effects, if any, and provide documentation in accordance with 36 CFR 800.11.

In addition to contacting your office, Corps has identified other potential consulting parties, and pursuant to 36 CFR 800.4, is consulting with Florida federally recognized tribal governments (Miccosukee Tribe of Indians of Florida, and Seminole Tribe of Florida) on at least a bi-weekly basis, Florida's SHPO, and Everglades National Park (Enclosure 4).

At this time, the Corps would like to extend an invitation for you or a designated member of your staff to review the information provided to determine whether to enter into consultation pursuant to Appendix A, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases,* of 36 CFR Part 800. Ms. Cindy Thomas has been designated as Corps Staff Archaeologist for CEPP. Any questions or concerns that you may have can be addressed by Ms. Thomas by contacting her at (904) 232-1180 or via email: Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Kenneth R Quipp

for Eric Summa
Chief, Environmental Branch

Milford Wayne Donaldson, FAIA
Chairman

Clement A. Price Ph.D.
Vice Chairman

John M. Fowler
Executive Director

Preserving America's Heritage

August 17, 2012

Lieutenant General Thomas P. Bostick
Commanding General
U.S. Army Corps of Engineers
441 G. Street, NW
Washington, DC 20314-1000

REF: Project Implementation Report for the Central Everglades Planning Project

Dear Lieutenant General Bostick:

The Advisory Council on Historic Preservation (ACHP) has been invited to participate in the referenced undertaking by the Jacksonville District of the Corps of Engineers to help ensure that historic properties are fully considered in the management and control of water resources in the Everglades. Pursuant to the Criteria for Council Involvement in Reviewing Individual Section 106 Cases (Appendix A to our regulations, 36 CFR Part 800) we believe the criteria are met for our participation in this undertaking. Development and implementation of plans to better manage water resources will involve important questions of policy and interpretation and could have substantial impacts to important historic properties. Accordingly, the Advisory Council on Historic Preservation will participate in consultation with the Jacksonville District on this undertaking.

By copy of this letter we are also notifying Mr. Eric Summa, Chief of the Jacksonville District's Environmental Branch, of our decision to participate in consultation.

Our participation will be handled by Dr. Tom McCulloch, who can be reached at 202-606-8554 or at tmcculloch@achp.gov. We look forward to working with the Corps on this important project.

Sincerely,

John M. Fowler
Executive Director

ADVISORY COUNCIL ON HISTORIC PRESERVATION
1100 Pennsylvania Avenue NW, Suite 803 • Washington, DC 20004
Phone: 202-606-8503 • Fax: 202-606-8647 • achp@achp.gov • www.achp.gov

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

APR 01 2013

Mr. Robert F. Bendus
Division of Historical Resources
State Historic Preservation Officer
500 South Bronough Street
Tallahassee, Florida 32399-0250

Dear Mr. Bendus:

The U.S. Army Corps of Engineers (Corps), Jacksonville District in partnership with the South Florida Water Management District is conducting a feasibility study for the Central Everglades Planning Project (DHR Project File No. 2012-01115). As part of that study, a cultural resource survey was conducted within Water Conservation Area 3 resulting in the draft report titled, *Central Everglades Planning Project Cultural Resources Survey of Water Conservation Areas 3A and 3B, Broward and Miami-Dade Counties, Florida.* The draft report contains recommendations on determinations of effects, however the Corps has yet to make a final determination and reserves the right to do so upon submission of the final report. As per request of the Compliance Review Supervisor, Dr. Timothy Parsons, the draft report has been provided electronically for review.

Please provide your comments within 30 calendar days of receipt of this letter. If there are any questions, contact Ms. Cynthia Thomas at 904-232-1180 or e-mail Cynthia.G.Thomas@usace.army.mil. An electronic copy of this letter has been provided to Dr. Timothy Parsons, Compliance Review Supervisor.

Sincerely,

Kenneth R. Quigley

for Eric P. Summa
Chief, Environmental Branch

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

05 MAY 2010

REPLY TO
ATTENTION OF

CESAJ-PD

MEMORANDUM FOR: CEMVP-PD-F (Michelle Kniep)

SUBJECT: ATR Review of Cultural Resources Analyses for Central Everglades Planning Project

1. The Central Everglades Planning Project (CEPP) is an increment of the larger Comprehensive Everglades Restoration Plan. Jacksonville District has been developing an integrated Project Implementation Report (PIR) and Environmental Impact Statement (EIS) for CEPP. The Review Plan for CEPP describes a set of five intermediate Agency Technical Reviews. ATR-1 (objectives, management measures, screening methods), ATR-2 (formulation and screening alternatives), and ATR-3 (evaluation of final alternatives to identify TSP) are complete. Unfortunately, neither the Review Plan nor the ATR team included a specialist in cultural resources analysis. The Jacksonville District would like to have this review completed now rather than wait for ATR-4. Therefore, we request the following reviews be completed.

2. Please provide a review of the draft cost estimate for cultural resources to verify that the costs are valid, reasonable and comprehensive. These costs are for the life of the project (estimated 40 years). The cost estimate is enclosed and can be furnished electronically if requested.

3. Please provide a review of the PIR main document Sections 2, 4, and 5 for both cultural resources compliance under Section 106 of the National Historic Preservation Act and Native Americans sections that address consultation in fulfillment of our Trust responsibilities pursuant to Executive Orders 13007- Indian Sacred Sites, Executive Order 13175- Consultation and Coordination with Indian Tribal Governments, and Executive Order 12898- Executive Order on Environmental Justice. The reviewer can access the PIR and provide comment in Dr. Checks.

4. Please provide a review the PIR Appendices C.1, C.2.1, and C.2.2 for both cultural resources compliance and Native American consultation.

5. If you have questions or require additional information, please contact Cindy Thomas at Cynthia.G.Thomas@usace.army.mil or by phone at 904-232-1180.

Encl

ERIC L. BUSH
Chief, Planning and Policy Division

CF: CESAD-PD (w/encl) (D. Bauman)

FLORIDA DEPARTMENT *of* STATE

RICK SCOTT
Governor

KEN DETZNER
Secretary of State

Ms. Cynthia Thomas
Jacksonville District Corps of Engineers
701 San Marco Blvd.
PD-C Floor 4W
Jacksonville, FL 32207

June 18, 2013

Re: DHR Project File No.: 2013-2375
Corps of Engineers Performance Work Statement No.: W912EP-10-D-0018
Revised Draft Report: Cultural Resource Investigations of Water Conservation Areas 3A and 3B, Everglades, Broward and Miami-Dade Counties, Florida

Dear Ms. Thomas:

Our office received and reviewed the above referenced survey report in accordance with Section 106 of the *National Historic Preservation Act of 1966* (Public Law 89-665), as amended in 1992, and *36 C.F.R., Part 800: Protection of Historic Properties*, and Chapter 267 of the *Florida Statutes*, for possible adverse impact to cultural resources (any prehistoric or historic district, site, building, structure, or object) listed, or eligible for listing, in the National Register of Historic Places (NRHP).

The revised draft report submitted for SHPO review details fieldwork conducted by New South Associates as part of the Central Everglades Planning Project (CEPP). The report includes the results of archaeological survey of 30 tree islands, and survey and recording of 10 historic canal segments. We note that a forthcoming report from New South will document an assessment of Al Bryan's Camp and Phase II testing of three prehistoric sites.

Archaeological Survey

Fifteen archaeological sites were investigated as the result of the tree island survey. These included five previously known sites and ten newly identified sites. The historic structures survey documented six historic canals in ten segments, and 20 associated structures including levees, pump stations, etc.

The five previously recorded sites (8DA2144, 8BD2145, 8DA2207, and 8DA2212) were not ground-truthed following their initial identification through remote sensing. None of these sites were identified during subsurface testing efforts. New South noted that despite these results,

cultural material may be present within other portions of these five islands that went untested. Although no NRHP eligibility or management recommendations were provided by New South for the sites that went unidentified, this office recommends avoidance of the sites. If avoidance is not feasible, we recommend more testing to definitely determine the presence or absence of subsurface archaeological resources.

Of the ten sites newly identified by New South during the course of this project, four (8BD4975, 8BD4978, 8BD4979, and 8BD4980) were recommended as eligible for the NRHP, four (8BD4974, 8BD4976, 8BD4799, and 8BD4982) were recommended as potentially eligible for the NRHP, one (8BD4981) was recommended as not eligible for the NRHP, and one (8DA12830) remains unevaluated. New South recommended that these sites be avoided during any project activities. If avoidance is not feasible, New South recommended mitigation.

The four sites recommended as potentially eligible (8BD4974, 8BD4976, 8BD4977, and 8BD4982) are associated with human remains. This office recommends no further testing and avoidance of the sites during project activities. If avoidance is not feasible, further consultation and mitigation may be necessary.

Due to lack of integrity, 8BD4981 was recommended as not eligible for listing in the NRHP. No further work is recommended for this site.

Historic Canals and Structure Survey

The Miami Canal (8BD4840/8DA6525) and South New River Canal (8BD4153) were determined eligible for the NRHP prior to this survey project. New South recommended that sections of the canal evaluated specifically as part of this survey be listed as eligible, as well. The other historic canals and levees (8BD4987/8DA12829, 8BD4988, and 8DA12826) lack integrity and are recommended not eligible.

Two structures associated with the canals (8BD4984 and 8BD4985) are recommended as eligible for the NRHP. Two historic bridges identified during survey (8BD4986 and 8DA12828) are recommended not eligible by New South.

Based on the information provided, upon receiving the final report the SHPO plans to concur with New South's determinations of eligibility. We note, however, that the sites recommended as "potentially eligible" require more investigation prior to a SHPO eligibility determination.

As part of the final report, please submit the following documents:

- **Florida Master Site File Archaeological Site Forms** for newly recorded and updated archaeological sites.
- **Historic Structure Forms** for 8BD4984 and 8BD4985.
- **Historical Bridge Forms** for 8BD4986 and 8DA12828.

For any questions concerning these comments, please contact me by electronic mail at Timothy.Parsons@DOS.MyFlorida.com, or by phone at 850.245.6333. We appreciate your continued interest in protecting Florida's historic properties.

Sincerely,

Timothy A. Parsons, Ph.D., RPA
Compliance Review Supervisor
and Deputy State Historic Preservation Officer

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

2 6 JUL 2013

Planning and Policy Division
Environmental Branch

Mr. Robert F. Bendus
Division of Historical Resources
State Historic Preservation Officer
500 South Bronough Street
Tallahassee, Florida 32399-0250

Dear Mr. Bendus:

The U.S. Army Corps of Engineers (Corps) in partnership with the South Florida Water Management District (District) are conducting a feasibility study for the Central Everglades Planning (CEP) Project (DHR Project File No. 2012-01115). A component of the feasibility study will be the construction and operation of a 14,000 acre Flow Equalization Basin (FEB) within the Everglades Agricultural Area Cell A-2 (EAA A-2). For your records, in 2002 this parcel was consulted under the description Everglades Agricultural Area Storage Reservoirs Project Component A (DHR Project File No. 2002-09656).

Following consultation with your office on 2012 April 27 and subsequent review of previous research conducted in the area (Survey # 5610 and 4869), the Corps concluded that additional investigations would be required for the EAA A-2 FEB footprint. With the use of historic and modern aerials, the Corps identified vegetation anomalies within the project area, and contracted Southeastern Archaeological Research Inc. to conduct field investigations of those specific areas. As a result, three prehistoric midden sites (8PB16037, 8PB16039, and 8PB16040) and one historic agricultural work camp (8PB16038) were identified The Corps has determined that only prehistoric site 8PB16039 meets the criteria for eligibility for listing on the National Register of Historic Places.

For the CEPP feasibility study, only preliminary FEB design plans have been developed, which makes it impracticable for the Corps to make a final determination of effect on significant cultural resources at this time. Once Congress has authorized the CEP Project and the FEB enters into the detailed design phase, the Corps will make a final determination of effect for site 8PB16039. In addition, consultation will be needed to identify methods to address potential impacts to site 8PB106040, which contains human remains. Currently the EAA A-2 property is under lease to Florida Crystals by the District and actively cultivated with sugar cane.

As per request of the Deputy Historic Preservation Officer, Dr. Timothy Parsons, the draft report titled, *Central Everglades planning Project, Cultural Resources Investigation of the Everglades Agricultural Area Cell A-2, Palm Beach County, Florida* has been provided electronically for review.

In accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended, we ask for your comments on the above referenced draft report and concurrence on the Corps eligibility determinations within 30 calendar days of receipt of this letter. If you have any questions, please contact Ms. Cindy Thomas at (904) 232-1180 or via email Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Eric Summa
Chief, Environmental Branch

Copy Furnished:
Dr. Timothy Parsons, Compliance Review Supervisor, Deputy State Historic Preservation Officer.

Thomas/CESAJ-PD-C/1180
McCullough/CESAJ-PD-EP
Taplin/CESAJ-PD-C
Summa/CESAJ-ED-E
Acosta/CESAJ-PD-EP

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

26 JUL 2013

Planning and Policy Division
Environmental Branch

Mr. Robert F. Bendus
Division of Historical Resources
State Historic Preservation Officer
500 South Bronough Street
Tallahassee, Florida 32399-0250

Dear Mr. Bendus:

The U.S. Army Corps of Engineers (Corps) and Everglades National Park (ENP) conducted a Phase I Survey of a 5.38-mile corridor along the L-67 Extension (L-67 Ext.) as part of the Central Everglades Planning Project (CEPP) feasibility study from January 16 through January 18, 2013. The CEPP proposes to use material from the L-67 Ext. levee to backfill the associated borrow canal. The area of potential effect (APE) for this proposed feature of CEPP consists of a 46-meter wide corridor starting at Tamiami Tail (U.S. 41) running south 5.38-miles along the L-67 Ext.

With the use of historic and modern aerial photographs, and in consultation with ENP, the Corps concluded that areas with high probability for site locations did not exist within the APE. To verify these findings, the project archaeologist along with ENP staff visited specific locations and conducted surface inspections and subsurface testing. No cultural material over 50 years of age was observed. As a result, the Corps has determined that there will be no effect to historic properties within the APE of the proposed backfilling and levee degrading of the L-67 Ext.

As per request of the Deputy Historic Preservation Officer, Dr. Timothy Parsons, the draft report titled, *Phase I Archeological Survey of a 5.38-Mile Corridor Along the L-67 Extension* has been provided electronically for review.

In accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended, we ask for your comments on the above referenced draft report and concurrence on the Corps determination of no effect within 30 calendar days of receipt of this letter. If you have any questions, please contact Ms. Cindy Thomas at (904) 232-1180 or via email Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Eric Summa
Chief, Environmental Branch

Copy Furnished:
Dr. Timothy Parsons, Compliance Review Supervisor, Deputy State Historic Preservation Officer.

C.5.4 Correspondence Letters: Native Americans

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

DEC 27 2011

Planning Division
Environmental Branch

Honorable Colley Billie
Chairman, Miccosukee Tribe of Indians of Florida
Post Office Box 440021, Tamiami Station
Miami, Florida 33144

Dear Chairman Billie:

As stated in the National Environmental Policy Act scoping letter dated December 07, 2011, the U.S. Army Corps of Engineers (Corps), Jacksonville District, in partnership with the South Florida Water Management District (SFWMD), have initiated an 18-month expedited pilot project known as the Central Everglades Planning Project (CEPP). The goal of the CEPP is to develop an integrated, comprehensive technical plan for the first increment of project features to be recommended for authorization for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem. The scope of this project includes increments of the following Comprehensive Everglades Restoration Plan (CERP) components: Everglades Agricultural Area Storage Reservoirs, Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement, Everglades National Park Seepage Management, and Everglades Rain-Driven Operations.

Under Section 106 of the National Historic Preservation Act of 1966, as amended and implementing regulations 36 CFR Part 800, as amended, we are assessing our needs for information regarding historic or undocumented traditional cultural properties that might be affected by the undertaking. Although the exact project footprint has yet to be determined, due to the expeditious nature of CEPP, the Corps is currently conducting an extensive review of the Florida Master Site Files (FMSF) to identify previously recorded cultural resource sites and to ascertain the adequacy of past cultural resources surveys conducted within the larger CEPP study area. To insure internal deadlines are met for this project, FMSF review, identification of areas in need of Phase I Survey, and development of a survey methodology are projected to be completed by the end of January 2012. Tentatively, initiation of Phase I Surveys will start mid-March 2012. This will ensure that any necessary cultural resource investigations are completed in a timely manner.

Therefore, we would like to extend an invitation for you or a designated member of your staff to consult with us throughout this process to ensure that all concerns are addressed during these efforts. It is expected that one-on-one discussions regarding the project could take place as monthly or bi-monthly meetings, and either in person or via conference call. Ms. Cindy Thomas has been designated as Corps Staff Archaeologist for CEPP, and will be initiating contact with you (or designee) immediately upon response to this letter. Any questions or concerns that you may have at this time can also be addressed by Ms. Thomas by contacting her at (904) 232-1180 or via email: Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Alfred A. Pantano, Jr.
Colonel, U.S. Army
District Commander
12/27/11

Enclosure

Copies Furnished:
Mr. Bernie Roman, Miccosukee Tribal Attorney, PO Box 440021 Tamiami Station, Miami, Florida 33144
Mr. Fred Dayhoff, Section 106 and NAGPRA Consultant, PO Box 440021 Tamiami Station, Miami, Florida 33144
Mr. Rory Feeney, Fish and Wildlife Director, PO Box 440021 Tamiami Station, Miami, Florida 33144

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

Honorable James Billie
Chairman, Seminole Tribe of Indians of Florida
6300 Stirling Boulevard
Hollywood, Florida 33024

Dear Chairman Billie:

As stated in the National Environmental Policy Act scoping letter dated December 07, 2011, the U.S. Army Corps of Engineers (Corps), Jacksonville District, in partnership with the South Florida Water Management District (SFWMD), have initiated an 18-month expedited pilot project known as the Central Everglades Planning Project (CEPP). The goal of the CEPP is to develop an integrated, comprehensive technical plan for the first increment of project features to be recommended for authorization for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem. The scope of this project includes increments of the following Comprehensive Everglades Restoration Plan (CERP) components: Everglades Agricultural Area Storage Reservoirs, Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement, Everglades National Park Seepage Management, and Everglades Rain-Driven Operations.

Under Section 106 of the National Historic Preservation Act of 1966, as amended and implementing regulations 36 CFR Part 800, as amended, we are assessing our needs for information regarding historic or undocumented traditional cultural properties that might be affected by the undertaking. Although the exact project footprint has yet to be determined, due to the expeditious nature of CEPP, the Corps is currently conducting an extensive review of the Florida Master Site Files (FMSF) to identify previously recorded cultural resource sites and to ascertain the adequacy of past cultural resources surveys conducted within the larger CEPP study area. To insure internal deadlines are met for this project, FMSF review, identification of areas in need of Phase I Survey, and development of a survey methodology are projected to be completed by the end of January 2012. Tentatively, initiation of Phase I Surveys will start mid-March 2012. This will ensure that any necessary cultural resource investigations are completed in a timely manner.

Therefore, we would like to extend an invitation for you or a designated member of your staff to consult with us throughout this process to ensure that all concerns are addressed during these efforts. It is expected that one-on-one discussions regarding the project could take place as monthly or bi-monthly meetings, and either in person or via conference call. Ms. Cindy Thomas has been designated as Corps Staff Archaeologist for CEPP, and will be initiating contact with you (or designee) immediately upon response to this letter. Any questions or concerns that you may have at this time can also be addressed by Ms. Thomas by contacting her at (904) 232-1180 or via email: Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Alfred A. Pantano, Jr.
Colonel, U.S. Army
District Commander
12/27/14

Enclosure

Copies Furnished:
Mr. Willard Steele, Seminole Tribe of Florida, Tribal Historic Preservation Officer, 32090 Josie Billie Highway, PMP 1004, Clewiston, Florida 33440
Jim Shore, General Counsel, Seminole Tribe of Florida, 6300 Stirling Road, Hollywood, Florida 33024

Thomas/CESAJ-PD-EP/1180
Kinard/CESAJ-DD
Applebaum/CESAJ-ED
Taplin/CESAJ-DR-W
Summa/CESAJ-ED-E
Acosta/CESAJ-PD-EP
for Garrett/CESAJ-PM-E CT 12/27
Vitek/CESAJ-PM
Goral/CESAJ-OC
Hobbie/SESAJ-PPMD
Gapinski/CESAJ-DX
LTC Barker/CESSAJ-DD
COL Pantano/CESAJ-DE AP 12/27/14

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

DEC 0 7 2011

Planning and Policy Division
Environmental Branch

Honorable Colley Billie
Chairman, Miccosukee Tribe of Indians of Florida
Post Office Box 440021, Tamiami Station
Miami, Florida 33144

Dear Chairman Billie:

The Jacksonville District, U.S. Army Corps of Engineers (Corps) is beginning preparation of a National Environmental Policy Act assessment for the Central Everglades Planning Project. The goal of the Central Everglades Planning Project would be to develop an integrated, comprehensive technical plan for the first increment of project features to be recommended for authorization for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem. The Corps respectfully requests to meet with you and your staff routinely throughout this planning process to ensure any issues or concerns the Tribe may have are identified and we receive your input regarding the development of this plan. Additionally, the Corps would also like to invite you or your designated staff to participate on the Project Delivery Team that will be conducting the technical analyses and evaluations in support of plan development and selection. I, along with select staff, would be pleased to meet with you to discuss Central Everglades Planning Project.

The Everglades ecosystem encompasses a system of diverse wetland landscapes that are hydrologically and ecologically connected across more than 200 miles from north to south and across 18,000 square miles of southern Florida. In 2000, the U.S. Congress authorized the Federal government, in partnership with the State of Florida, to embark upon a multi-decade, multi-billion dollar Comprehensive Everglades Restoration Plan (CERP) to further protect and restore the remaining Everglades ecosystem while providing for other water-related needs of the region. CERP involves modification of the existing network of drainage canals and levees that make up the Central and Southern Florida Flood Control Project.

Since 2000, much progress has been made. Construction has begun on the first generation of CERP project modifications already authorized by Congress. These include the Picayune Strand Restoration, the Indian River Lagoon South and Site 1 Impoundment projects. Project Implementation Reports have been completed, or are nearing completion, for the second generation of CERP projects for Congressional authorization, including Biscayne Bay Coastal Wetlands – Phase 1, the Broward County Water Preserve Areas, the Caloosahatchee River (C-43) West Basin Storage Reservoir, and the C-111 Spreader Canal Western Project. All of these CERP projects utilize lands that were acquired by the State and Federal government to meet CERP goals of increasing the extent of wetlands, reducing damaging freshwater discharges to the coastal estuaries, and reducing seepage losses from the natural system. These projects contribute significant ecological benefits to the system and the specific regional habitats in which they are located. These initial CERP projects were intended to provide initial and immediate ecological benefits and set the conditions along the margins of the system that help ensure increased water flows to the interior of the system will not cause adverse effects.

The next step for implementation of CERP is to redirect water that is currently discharged to the east and west coast estuaries from Lake Okeechobee and restore water flow to the south, allowing for restoration of natural habitat conditions and water flow in the central Everglades and re-connecting the ecosystem from Lake Okeechobee to Everglades National Park and Florida Bay. The Central Everglades Planning Project (Figure 1) will develop the initial increment of project features that provide for storage, treatment and conveyance south of Lake Okeechobee, removal of canals and levees within Water Conservation Area 3, and seepage management features to retain water within the natural system. The CERP projects identified to accomplish this include the Everglades Agricultural Storage Reservoirs, Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement, Everglades National Park (ENP) Seepage Management, and Everglades Rain-Driven Operations. These projects make up the heart of CERP aimed at restoring more natural quantity, quality, timing and distribution of water flows to the remaining portions of the river of grass. An integrated study effort on these projects is needed to set the direction for continued CERP implementation.

The Corps will also hold a Public Workshop December 14 from 6:30 to 9:00 p.m. at the Sheraton Suites Plantation, Plantation I/II Room, 311 North University Drive, Plantation, Florida and December 15, 2011 from 6:30 to 9:00 p.m. at the John Boy Auditorium, 1200 South W.C. Owen Avenue, Clewiston, Florida. The formal portion of the workshop will begin at 7:00 p.m. The CES team will be available prior to and after the formal presentation to provide information and answer questions about the projects and development of a proposed plan. Interested attendees can call 904-232-1613 for any special services.

We look forward to the opportunity to meet with you. Please contact Kim Taplin 561-801-0285 at your earliest convenience to schedule.

Sincerely,

Alfred A. Pantano, Jr.
Colonel, U.S. Army
District Commander
12/07/11

Enclosure

Copy Furnished:

Bernie Roman, Miccosukee Tribal Attorney; PO Box 440021 Tamiami Station; Miami, Florida 33144
Fred Dayhoff, Section 106 and NAGPRA Consultant; PO Box 440021 Tamiami Station; Miami, Florida 33144
James Erskine, Water Resources Director; PO Box 440021 Tamiami Station; Miami, Florida 33144
Rory Feeney, Miccosukee Wildlife Director; PO Box 440021 Tamiami Station; Miami, Florida 33144
Terry Rice, Colonel (Ret'd), PhD, PE; Miccosukee Everglades Consultant; 6526 S Kanner Highway, PMB 316; Stuart, Florida 34997

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

DEC 07 2011

Planning and Policy Division
Environmental Branch

Honorable James Billie
Chairman, Seminole Tribe of Florida
6300 Stirling Boulevard
Hollywood, Florida 33024

Dear Chairman Billie:

The Jacksonville District, U.S. Army Corps of Engineers (Corps) is beginning preparation of a National Environmental Policy Act assessment for the Central Everglades Planning Project. The goal of the Central Everglades Planning Project would be to develop an integrated, comprehensive technical plan for the first increment of project features to be recommended for authorization for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem. The Corps respectfully requests to meet with you and your staff routinely throughout the planning process to ensure any issues or concerns the Tribe may have are identified and we receive your input regarding development of this plan. Additionally, the Corps would also like to invite you or your designated staff to participate on the Project Delivery Team that will be conducting the technical analyses and evaluations in support of plan development and selection. I, along with select staff, would be pleased to meet with you to discuss the Central Everglades Planning Project.

The Everglades ecosystem encompasses a system of diverse wetland landscapes that are hydrologically and ecologically connected across more than 200 miles from north to south and across 18,000 square miles of southern Florida. In 2000, the U.S. Congress authorized the Federal government, in partnership with the State of Florida, to embark upon a multi-decade, multi-billion dollar Comprehensive Everglades Restoration Plan (CERP) to further protect and restore the remaining Everglades ecosystem while providing for other water-related needs of the region. CERP involves modification of the existing network of drainage canals and levees that make up the Central and Southern Florida Flood Control Project.

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The next step for implementation of CERP is to redirect water that is currently discharged to the east and west coast estuaries from Lake Okeechobee and restore water flow to the south, allowing for restoration of natural habitat conditions and water flow in the central Everglades and re-connecting the ecosystem from Lake Okeechobee to Everglades National Park and Florida Bay. The Central Everglades Planning Project (Figure 1) will develop the initial increment of project features that provide for storage, treatment and conveyance south of Lake Okeechobee, removal of canals and levees within Water Conservation Area 3, and seepage management features to retain water within the natural system. The CERP components identified to accomplish this include the Everglades Agricultural Storage Reservoirs, Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement, Everglades National Park (ENP) Seepage Management, and Everglades Rain-Driven Operations. These components make up the heart of CERP aimed at restoring more natural quantity, quality, timing and distribution of water flows to the remaining portions of the river of grass. An integrated study effort on these projects is needed to set the direction for the next decade of CERP implementation.

The Corps will also hold a Public Workshop December 14 from 6:30 to 9:00 p.m. at the Sheraton Suites Plantation, Plantation I/II Room, 311 North University Drive, Plantation, Florida and December 15, 2011 from 6:30 to 9:00 p.m. at the John Boy Auditorium, 1200 South W.C. Owen Avenue, Clewiston, Florida. The formal portion of each workshop will begin at 7:00 p.m. The Central Everglades Planning Project team will be available prior to and after the formal presentation to provide information and answer questions about the projects and development of a proposed plan. Interested attendees can call 904-232-1613 for any special services.

We look forward to the opportunity to meet with you. Please contact Kim Taplin 561-801-0285 at your earliest convenience to schedule.

Sincerely,

Alfred A. Pantano, Jr.
Colonel, U.S. Army
District Commander
12/27/11

Enclosure

Copy Furnished:

Craig Tepper, Director of Water Resource Management, Seminole Tribe of Florida, 6300 Stirling Road, Hollywood, Florida 33024
Jim Shore, General Counsel, Seminole Tribe of Florida, 6300 Stirling Road, Hollywood, Florida 33024
Willard Steele, Seminole Tribe of Florida, Tribal Historic Preservation Officer, 30290 Josie Billie Highway, PMP 1004, Clewiston, Florida 33440

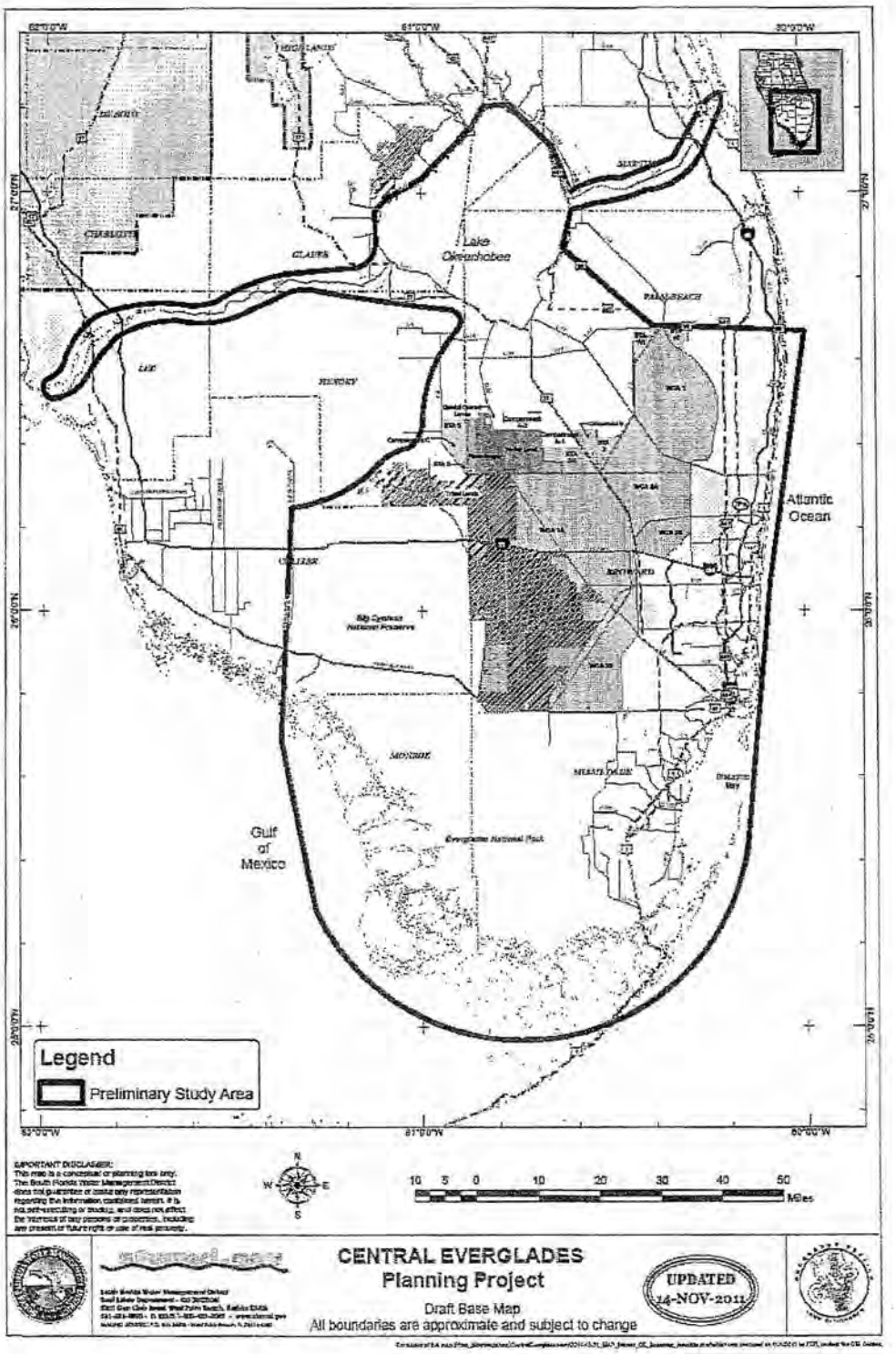

Figure 1. Central Everglades Planning Project Preliminary Study Area.

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

OCT 15 2012

Planning and Policy Division
Environmental Branch

Mr. Jim Shore
Seminole Tribe of Florida
General Council
6300 Stirling Road
Hollywood, Florida 33024

Dear Mr. Shore:

On behalf of the U.S. Army Corps of Engineers (Corps), Jacksonville District, I would like to thank the Seminole Tribe of Florida for collaborating with the Corps on the development and ratification of the Everglades Restoration Transition Plan (ERTP) Programmatic Agreement and Human Remains Policy, and for the continued participation in ongoing formal consultation for the Central Everglades Planning Project (CEPP).

In your letter dated September 26, 2012, your office requested formal consultation concerning the development of a broader human remains protocol in connection with the ongoing consultation for CEPP. As you know, CEPP is an accelerated planning project, which requires a great deal of consultation and coordination to insure that all interested parties' concerns are considered. Currently, CEPP is covered under the Comprehensive Everglades Restoration Plan (CERP) Human Remains Policy that was signed in 2008. Due to the importance placed on human remains and burial resources and our Trust responsibilities, the Corps does not view it as appropriate for the human remains protocol covering all Jacksonville District civil works projects within Florida to be developed in connection with CEPP (which focuses on water and related resources in the south Florida region). A broader human remains policy covering all of the Corps of Engineers' civil works missions within the Jacksonville District's area of responsibility in Florida should be developed separately and independently of any project.

We would like to extend an invitation for you or a designated member(s) of your staff to discuss the path forward toward achieving our mutual goal of developing the human remains protocol. Mr. Daniel Hughes has been designated as the Jacksonville District staff archaeologist for the development of this document and will be initiating contact with you (or your designee) by November 16, 2012.

Please contact Mr. Hughes at (904) 232-3028 or via email: Daniel.B.Hughes@usace.army.mil, or the Jacksonville District's Tribal Liaison, Ms. Natalie Garrett at (561) 472-8878 or via email: Natalie.S.Garrett@usace.army.mil with any concerns or questions you may have.

Sincerely,

Alan M. Dodd
Colonel, U.S. Army
District Commander

Copy Furnished:

Mr. James Charles, Lewis, Longman & Walker, P.A., 515 North Flagler Drive, Suite 1500 West Palm Beach, Florida 33401
Mr. Stephen Walker, Lewis, Longman & Walker, P.A., 515 North Flagler Drive, Suite 1500, West Palm Beach, Florida 33401
Ms. Patricia Power, Bose Public Affairs Group, 1120 20th Street, N.W., Washington, DC 20036
Mr. Danny Tommie, Seminole Tribe of Florida, 6300 Stirling Road, Hollywood, Florida 33024
Mr. Craig Tepper, Seminole Tribe of Florida, 6300 Stirling Road, Hollywood, Florida 33024
Mr. Paul N. Backhouse, Seminole Tribe of Florida, 30290 Josie Billie Hwy, PMB 1004, Clewiston, Florida 33440
Ms. Anne Mullins, Seminole Tribe of Florida, 30290 Josie Billie Hwy, PMB 1004, Clewiston, Florida 3340
Mr. Matthew Morrison, South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, Florida 33406
Ms. Cynthia Thomas, U.S. Army Corps of Engineers, 701 San Marco Boulevard, Jacksonville, Florida 32207
Ms. Kimberley Taplin, U.S. Army Corps of Engineers, 701 San Marco Boulevard, Jacksonville, Florida 32207
Mr. Daniel Hughes, U.S. Army Corps of Engineers, 701 San Marco Boulevard, Jacksonville, Florida 32207
Mr. John Pax, U.S. Army Corps of Engineers, 701 San Marco Boulevard, Jacksonville, Florida 32207
Mr. Matt Donaldson, U.S. Army Corps of Engineers, 701 San Marco Boulevard, Jacksonville, Florida 32207
Ms. Natalie S. Garrett, U.S. Army Corps of Engineers, 701 San Marco Boulevard, Jacksonville, Florida 32207

SEMINOLE TRIBE OF FLORIDA

6300 STIRLING ROAD
HOLLYWOOD, FLORIDA 33024
PHONE (954) 966-6300

WEBSITE:
http://www.semtribe.com

Tribal Officers:
JAMES E. BILLIE
Chairman

TONY SANCHEZ, JR.
Vice Chairman

PRISCILLA D. SAYEN
Secretary

MICHAEL D. TIGER
Treasurer

November 7, 2012

Colonel Alan M. Dodd
Jacksonville District Commander
United States Army Corps of Engineers
701 San Marco Blvd.
Jacksonville, Florida 32207-8175

Dear Colonel Dodd:

Thank you for your response letter of October 5, 2012, regarding hydration on the Big Cypress Reservation and other federal lands adjacent to the southern border of our Reservation. While we appreciate the acknowledgement of the Seminole Tribe of Florida's commitment to restoring the South Florida Ecosystem, we are not convinced that the Corps of Engineers understands vital importance of a healthy ecosystem to our identity as the Seminole Tribe of Florida. While we focus on the lands within the reservation boundaries, we also watch the land and water that surrounds this boundary because our history is not limited to the lines on current day maps. Our future will be controlled by a large extent by the decisions made regarding land use and water control all around our reservation. So we look to our region, including lands in the western basins, to see how the federal, state, and local governments are providing resources and planning for a healthy future and what we now see causes great distress.

As you note in your letter, the Seminole Tribe has been actively engaged in the South Florida Ecosystem Restoration effort for nearly 20 years. We have supported this effort technically and politically through all of these years. More specifically, we are constructing in full partnership with the Corps, an extensive water control system on the Big Cypress Reservation. This project is important to us and to our region and we appreciate the Corps' work and federal funding. But focusing solely on the land and water within our Reservation's legal boundaries is short-sighted. And this has been our position for nearly two decades. We have urged over and over again through all the planning efforts, including the Restudy which is the basis for CERP, to include the western basins in the Central Everglades system in the monitoring, modeling, data gathering, design, planning, and project implementation. So please appreciate our deep disappointment to be told that waters in the western basins that impact the Central Everglades Planning Project (CEPP) are not included in the scope of CEPP because the monitoring, data gathering, and modeling have still not been done in this region, despite our repeated requests to do so for over 14 years. We applaud the Corps' drive to complete the CEPP planning process in 18 months, but we remain very concerned by the long-standing inattention to this region.

Apart from the fact that we, a valued partner in Everglades Restoration by all accounts, have been effectively ignored in our repeated requests for monitoring, modeling, and planning in this region, we note that

SEMINOLE TRIBE OF FLORIDA

the federal government has an obligation through its trust responsibilities to restore the northwest corner of WCA 3A, where the Seminole Tribe of Florida retains hunting and fishing rights, at a minimum. Beyond CEPP, we would like to discuss further how the Corps and its State partner intend to address the Central Everglades north and west of the redline in the current CEPP models.

As to your specific suggestions for addressing our water supply concerns, we welcome your offers. Regarding your suggestion to exercise adaptive management of Basin 1 of the critical project, we look forward to working with your engineering and wetlands regulatory staff on crafting operational changes to the outlets and siphons in order to deliver more water to the native areas south of the West Feeder Canal in the Big Cypress Seminole Indian Reservation. We assume that such work will be eligible for funding under the Operations & Maintenance provisions of the project's Project Cooperation Agreement.

Regarding the S-190 water control structure temporary deviation, we are encouraged by the option to work effectively within the existing regulation schedule to increase water storage in the West and North Feeder Canals, which will allow more water to replenish groundwater of the reservation. We would like to schedule meetings as soon as possible with the Corps and the South Florida Water Management District (District) to discuss the details and timing of the temporary deviation. I note here that we are also concerned about the structural integrity of the S-190 water control structure and urge the Corps and the District to carefully review the soundness of the structure and take all actions necessary to make it secure.

And thank you for the information on the Tribal Partnership Program as authorized by Section 203. We will take a careful review of this program and make a decision about whether or not to apply at a later date.

Managing water resources in South Florida is a steep challenge. The only way to meet this challenge is to work together to plan a future that balances competing needs fairly, which requires a more comprehensive view of the system. For as long as the monitoring and modeling in the western basins is not addressed, the South Florida Ecosystem restoration plan is incomplete.

We look forward to continue to work with you to remedy this situation and to address the pressing needs of the Tribe to correct the hydrology surrounding our Big Cypress Reservation. I have directed my staff to arrange another meeting with the Corps through Ms. Garrett.

Thank you for your attention to this critical resource issues for the Seminole Tribe.

Sho-na-bish,

James E. Billie
Chairman of the Tribal Council

Jeb/Pd

Cc: Jim Shore, General Counsel, Seminole Tribe of Florida
Craig D. Tepper, Director, Environmental Resource Management Department, Seminole Tribe of Florida
FILE

Miccosukee Tribe of Indians
of Florida

Business Council Members
Colley Billie, Chairman

Jasper Nelson, Ass't. Chairman
Jerry L. Cypress, Treasurer

Andrew Bert Sr., Secretary
William M. Osceola, Lawmaker

January 20, 2012

Colonel Alfred Pantano (Alfred.A.Pantano@usace.army.mil)
United States Army Corps of Engineers
701 San Marco Blvd.
The Prudential Building
Jacksonville, Florida 32207-8175

Via E-Mail and Express Mail

Re: Comments by the Miccosukee Tribe of Indians of Florida on the NEPA Scoping for the Central Everglades Planning Project (CEPP)

Attention: Dr. Gina Paduano Ralph at CEPPComments@usace.army.mil

Dear Colonel Pantano:

Enclosed, please find the official comments of the Miccosukee Tribe of Indians of Florida in response to your request regarding scoping for the Central Everglades Planning Project (CEPP) under the National Environmental Policy Act (NEPA).

For over 13 years, allegedly to protect the Cape Sable seaside sparrow, discriminatory water management actions have flooded and degraded hundreds of thousands of acres of Tribal Everglades in Water Conservation Area 3A that are vital to the culture and way of life of the Tribe. The high water levels caused by these actions also posed a threat to the health and safety of the Miccosukee community and brought the Snail Kite to the verge of extinction. Sadly, a vast area of the Everglades, which the government promised to preserve in a natural state *in perpetuity* for the Tribe, has been severely degraded.

Based upon our experts' review of the Corps' selected plan for the Everglades Restoration Transition Plan (ERTP) as presented in your recently released Final Environmental Impact Statement dated March 4, 2011, the Tribe is cautiously optimistic that the ERTP should begin to alleviate some of the harm in Water Conservation Area 3A caused by more than a decade of discriminatory water management actions. In addition, the Corps has an opportunity under the Combined Operational Plan for the Modified Water Deliveries and C-111 projects to move Everglades Restoration even further ahead. While this plan has yet to be developed, a water management plan that moves us farther toward

P.O. Box 440021, Tamiami Station, Miami, Florida 33144, (305) 223-8380, fax (305) 223-1011
Constitution Approved by the Secretary of the Interior, January 11, 1962

restoration would make significant strides in protecting the Miccosukee culture and cultural resources once implemented.

Now, the Corps is proposing the Central Everglades Planning Project to develop a plan for a suite of projects in the Central Everglades to prepare for Congressional authorization as Comprehensive Everglades Restoration Plan (CERP). As you know, the Tribe has long raised concerns that vital restoration projects were being delayed and that the Central Everglades was being left out of the CERP process. Therefore, the Tribe is pleased to see an emphasis on projects for the central Everglades, which is the Tribe's traditional homeland. The Tribe, which has participated in more than twenty years of restoration planning, is concerned that to date no CERP projects that would benefit the Central Everglades, including Tribal lands, have been built. The Tribe is hopeful that the CEPP process will not turn into yet another planning process that produces no restoration results. In addition, care must be taken to ensure that projects are designed and implemented in such a way that they follow all applicable law. Finally, any so-called "new science" must not be used to attempt to justify sacrificing the Tribal Everglades in WCA-3A for the Park downstream. Thus, we believe it is very important that you sincerely consider, and adequately address, during your NEPA process, all the issues and concerns that have been identified by our experts if you are to actually achieve success.

As always, the Tribe expects that all agencies not only comply with all federal environmental statutes, but also with their Trust Responsibility to the Miccosukee people.

Finally, the Tribe hopes that the plan that is devised will treat all parts of the Everglades, and all species, equally and will only deliver water that is clean. Only by protecting all parts of the Everglades equally, and delivering clean water, will the goal of Everglades Restoration be achieved.

Sincerely,

Colley Billie
Chairman

MEMORANDUM

TO: Chairman Colley Billie
Miccosukee Tribe of Indians of Florida

FROM: Mr. James Erskine, Acting Miccosukee Water Resources Director; Mr. Rory Feeney, Miccosukee Wildlife Director; Col. (Ret'd) Terry L. Rice, PhD, PE; Ms. Joette Lorion, Environmental Consultant

DATE: January 13, 2012

SUBJECT: Identification of Issues and Concerns to Be Addressed in the Central Everglades Planning Project ("CEPP") National Environmental Policy Act ("NEPA") Document Proposed by the US Army Corps of Engineers.

The following memorandum includes our expert analyses of the issues and concerns that the Army Corps of Engineers ("Corps") should address in the National Environmental Policy Act ("NEPA") document that the Corps plans to prepare related to the Central Everglades Planning Project ("CEPP"). The Notice of Intent to prepare an Environmental Impact Statement ("EIS") for CEPP was issued in the Federal Register on December 2, 2011. A Public Notice sent by the Corps stated that: "Public comments on the Central Everglades Planning Project are being accepted through January 20, 2012. Thus, we recommend that this memorandum be submitted to the U.S. Army Corps of Engineers on or before January 20, 2012, as the Miccosukee Tribe's issues and concerns.

Background: Beginning as early as the 1880s, humans began modifying the natural hydrology of South Florida and the Everglades. Over the years, anthropogenic changes have, among other things, removed areas from the natural system, caused some areas to flood while others are dried out, and, in general, stopped the natural flow of water through the Greater Everglades Ecosystem.

Finally in 1989, the U.S. Congress directed the U.S. Army Corps of Engineers to begin the restoration of flows through the Everglades "to the extent practicable" in Public Law 101-229, the Everglades National Park Protection and Expansion Act, which authorized the Modified Water Deliveries ("MWD") project. The February 1991 Environmental Impact Statement ("EIS") on the MWD project stated that the Everglades National Park Protection and Expansion Act authorized construction of the project based on "the environmental benefits to be derived by the Everglades ecosystem in general and by the park in the particular." EIS at 3. The 1992 Final EIS promised that the project would benefit approximately 100,000 acres of wetlands in NESR, 600,000 acres of wetlands in WCA-3, and 200,000 acres within the Shark River Slough Basin of the Park. FEIS at EIS-32. The expectation of Congress was that this project would be completed

by approximately 1997. Despite a Government Accountability Office ("GAO") Report and Congressional hearings on the delay of the MWD project, it is now 2013 and the Corps is still years away from total completion given the original scope of the project.

On a parallel track with the MWD project, the Corps agreed to modify C-111 South Dade components of the Central and South Florida project ("C&SF") in order to restore flows through Taylor Slough, which eventually enter Florida Bay. As with the MWD project, the C-111 modifications have been in the works for over two decades without being completed. The completion of both the MWD and C-111 projects, and an operational plan to implement them, are extremely important to the Miccosukee Tribe. This is primarily because they will permit increased water to move south through the historic flow path of the Everglades, thus relieving Tribal land in WCA 3A north of Tamiami Trail from unnatural inundation and ongoing, irreversible destruction.

While these two projects were being planned and implemented at a snail's pace, the Fish and Wildlife Service ("FWS") declared jeopardy on the Cape Sable seaside sparrow ("the Sparrow") in 1997 under the provisions of the Endangered Species Act ("ESA"). The draconian and discriminatory water management changes, which the Corps made at the behest of the FWS, further exacerbated the flooding of Tribal land. The Corps began with emergency deviations in December 1997, and followed these with the Interim Structural and Operational Plan ("ISOP") in 1999, and the Interim Operational Plan ("IOP") in 2002; each made the flooding of Tribal land progressively worse. As preposterous as it sounds, all of these operational plans moved the Everglades further away from the restoration and have not helped the "Sparrow."

In 2003, the Corps began planning operational rules for the day that the MWD and C-111 projects would be completed. This effort was dubbed the Combined Structural and Operational Plan ("CSOP"). Tribal representatives participated in more than 22 meetings of a CSOP advisory team formed by the Task Force under the mistaken assumption that all the interests actually supported the goal of finally operating these projects in a manner that would begin the restoration process. After four years of intensive work on the part of many, to include the Tribe's representatives, and a consensus agreement on the part of a large majority of participants, the Corps abandoned the CSOP effort. ENP, with the support of their environmental allies, refused to support the plan for clearly unjustifiable reasons, including that the proposed Alternative 5R would allegedly harm the western "Sparrow" subpopulation A. As discussed herein, this issue is both a red herring and contrary to Everglades restoration.

In reality, the CSOP hydrologic modeling had revealed the obvious: The implementation of the MWD project and more natural flows would make the "Sparrow" habitat south of the Miccosukee Reserved Area ("MRA"), which has been unnaturally dried out since 1997, much wetter. This revelation was in diametric opposition to the FWS demands to artificially dry this area out over the past 13 years. The dilemma that the Tribe had realized and expounded for years, was now front and center; water managers could either continue to 1) unnaturally dry out the western side of the Park or 2) restore the area … not both.

During this same period, the FWS was responding to a lawsuit which required the Service to consider this area for designation as "critical habitat" under the provisions of the ESA. If this area was in fact designated "critical habitat," then it would have to be unnaturally dried out forever, and Everglades restoration would be permanently blocked. Based primarily on the Tribe's technical and scientific arguments, along with the Corps' modeling, the FWS rejected the establishment of this area as "critical habitat." The FWS was challenged in Federal Court, but, again, due to the Tribe's support in that case, the Judge upheld the FWS decision to not establish "critical habitat" and to permit Everglades restoration to move forward. The only question that remains now is when does the Corps start allowing more flows into this area, including through the S-12 gates under the contemplated Combined Operational Plan ("COP"), and eventually CERP, so that restoration can in fact commence both north and south of Tamiami Trail?

In 2010, after 13 years of discriminatory water management actions, purportedly for the "Sparrow," the Corps finally listened to two major points the Miccosukee Tribe had been making for years regarding these operations: 1) WCA 3A was being severely impacted by IOP and the previous "Sparrow" operations, as evidenced by the destruction that had been experienced, which is highlighted by the continuing loss of tree islands, the plummeting of the snail kite population from over 3,500 birds in 2000 to less than 700 in 2008, and the conversion of Everglades marsh habitat into a shallow lake, and 2) by far the most important, the "health and safety" of the Miccosukee Tribe was being threatened by operating WCA 3A at water levels well above its design specifications. This recognition by the Corps stemmed from the Tribe's Equal Protection lawsuit in which Tribal members and representatives, to include Chairman Colley Billie, gave testimony and resulted in the Corps' development of the Everglades Restoration Transition Plan ("ERTP"). As a result, the Corps issued a Final Environmental Impact Statement ("FEIS") in December of 2011, which proposed major changes to address the "health and safety" of the Tribe and the high water in WCA 3A. If the ERTP is finally implemented as proposed in the FEIS, the Tribe may finally be provided some relief from the damaging, discriminatory water management actions that have been going on for over 13 years.

In June 22, 2011, while the ERTP was in process, the Tribe provided NEPA scoping comments on the Combined Operational Plan ("COP"), which is the new acronym that replaced CSOP for the (CSOP operational plan that will be implemented once the construction of the MWD and C-111 projects is completed, which was once called CSOP. The COP will replace the ERTP when completed. If the Issues/Concerns that were provided to the Corps by the Tribe are adequately addressed, the COP has the potential of providing even more benefits for the Everglades and Tribe than the proposed ERTP promises to accomplish. However, since the COP has yet to be developed, and structures still need to be constructed, that remains to be seen.

In October 2011, with some CERP projects having been abandoned and others seriously delayed, the Corps and other announced yet another new planning effort to push forward certain central Everglades components of CERP. Yet another acronym was created and the Central Everglades Planning Project (CEPP) was announced with great fanfare. To date, the details of CEPP are

limited to power points, "fact" sheets, letters and a Federal Register Notice. The Federal Register Notice states that the goal of the CEPP effort is "to develop an integrated, comprehensive technical plan, including the first increment of projects, for delivering the right quantity, quality, timing and distribution of water needed to restore and reconnect the central Everglades ecosystem." It identifies the CERP components that are included as the following projects: Everglades Agricultural Area Storage Reservoirs; Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement; Everglades National Park Seepage Management; and Everglades Rain Driven Operations. According to a Corps fact sheet, "The goal of the Central Everglades Planning Project is to deliver within two years a finalized plan, known as a Project Implementation Report, for a suite of restoration projects in the central Everglades to prepare for Congressional authorization as part of the Comprehensive Everglades Restoration Plan (CERP)." It is difficult to discern from the scanty information whether CEPP will be just another endless planning effort or projects will actually be built.

The statement in the Federal Register Notice that, "Since 2000 much progress has been made," is highly misleading. Nothing could be farther from the reality of missed deadlines and abandoned projects. The Tribe has been contending for almost a decade that projects were being seriously delayed, and that the "heart of the Everglades," including Tribal Everglades, was being left out of CERP. Even the Committee on Independent Scientific Review of everglades Progress (CISRERP) echoed the Tribe's concerns. In its 2006 Biennial Review, CISRERP found that important projects necessary to re-establish sheet flow in the Everglades are, ***"far behind the original schedule."*** It further recognized that, ***"anticipated restoration progress in the Water Conservation Areas and Everglades National Park appears to be lagging behind the production of natural system benefits in other parts of the Everglades."*** The 2008 Biennial Review warned that, ***"Ongoing delay to South Florida ecosystem restoration not only has postponed improvements to the hydrological condition but also has allowed ecological decline to continue."*** The Review concluded that, ***"It's too early to evaluate the response of the ecosystem to CERP Projects because none have been implemented."*** It is disingenuous based on reality for the Corps to attempt to fool the public into thinking that "much progress has been made" or that it is expediting projects that have been seriously delayed.

While the Tribe is pleased to see after all these years that there is finally a focus on creating a plan to move projects for the Central Everglades forward, it remains to be seen whether CEPP will be yet another new acronym for yet another endless planning effort or whether projects to restore the Central Everglades will actually be built. The Tribe, whose entire culture and way of life depends on a healthy Everglades ecosystem has long sought for its traditional homeland to be restored. Yet, the Tribe cannot help but have any optimism that it might have tempered by the many plans that it has worked on for so many years, only to see them cast aside when politics intervened. In the Tribe's experience, it remains to be seen whether projects necessary to restore the "heart of the Everglades" will ever be authorized and implemented. Moreover, depending on how the plan is designed, and implemented, the CEPP could either benefit or harm Tribal lands and interests in the Everglades, especially since the State failed to meet the December 31, 2006

deadline to meet water quality standards in the Everglades Protection Area. Thus, the following comments are provided in response to a Public Notice by the Corps requesting scoping comments and must be addressed in the CEPP NEPA process.

Miccosukee Tribe Issues/Concerns
That Must Be Addressed in the NEPA Process Include:

- **An EIS Is Required:** The CEPP formulation and implementation will have "*a significant impact on the human environment.*" Therefore, **the document that is required to be prepared by the Corps under the National Environmental Policy Act ("NEPA") must be an Environmental Impact Statement ("EIS").**

- **All Applicable Law Must be Followed:** While the Tribe is not opposed to the significantly delayed CERP process becoming more efficient, it is opposed to any streamlining that comes at the expense of compliance with all applicable laws. As always, the Tribe expects the Corps to comply with the National Environmental Policy Act ("NEPA"), the Endangered Species Act ("ESA"), the Federal Advisory Committee Act ("FACA"), the Clean Water Act, the U.S. Constitution, the Corps' Trust responsibility to the Tribe, and all other applicable laws.

- **ERTP, Not IOP, Should Be the Base Condition:** The Corps concluded in the Final Environmental Impact Statement (FEIS) on the Everglades Restoration Transition Plan ("ERTP") that, due to safety and endangered species concerns, that "IOP is no longer a viable option" for water management within WCA-3A and the South Dade Conveyance System." ERTP FEIS at xiii. The Corps argued when it stopped using the Test 7 operational plan as a base condition in the EIS process that it could no longer be used because it was contrary to the ESA. Similarly here, the Corps cannot rely on IOP as the base condition for CEPP in the NEPA process, because it is not viable. In addition, the ERTP should be replacing IOP in the very near future and prior to any NEPA document being produced.

- **Ensure No Adverse Impacts to Miccosukee Tribe Culture & Cultural Resources:** Corps' analysis and planning often do not adequately take into consideration the impacts of Corps project operations on the Miccosukee Tribe's Culture and Cultural Resources, before most projects/actions are authorized for implementation. **The Corps must perform a comprehensive review of all potential adverse impacts of all proposed actions under the CEPP on the Miccosukee Tribe's Culture and Cultural Resources in the action area, which includes WCA-3 and the Park, and ensure that any adverse impacts are eliminated prior to implementation of the selected alternative. Certainly, the assurance of the "health and safety" of the Tribe must be paramount.**

- **Must Produce Benefits for Tribal Lands in WCA 3A:** The CEPP process should incorporate a revised WCA-3A regulation schedule targeted at the restoration of the entire central Everglades that incorporates a multispecies management approach building upon what was achieved with the ERTP and hopefully will be achieved under COP. Any regulation scheduled developed in the CEPP process must provide restoration of the Tribal Everglades in

WCA-3A, as well as the Park. The Corps must be careful during the NEPA process not to succumb to unreasonable demands by the Park, or any other interests, to provide more water than the CEPP can reasonably deliver without sacrificing other areas of the Everglades, such as the Tribal Everglades in WCA-3A. **The pursuit of the unnecessary, unreasonable, and impossible often prevents the achievable.** The Tribal Everglades must benefit from CEPP.

- **CEPP Must Decrease WCA 3A Flooding:** WCA-3A water levels must become more natural as defined by the Natural Systems Model ("NSM") and the CERP documented -1 foot below to +2.5 feet above ground envelope to protect the few remaining tree islands. According to the December 2011 FEIS on the ERTP, for WCA-3, the result of lowering Zone A and extensions of Zones E1 and D can be seen in the modeling for the southern areas of WCA 3, such as Indicator Region 124, Figure A-H-7 and Figure A-H-8. FEIS at 4-36. The FEIS explains that the stages show a significant reduction (by as much as 0.2 or 0.3 feet) from about the highest 5 percent to about the 50% of the time range. *Id.* The results of lowering the zones under the ERTP Alternative 9E1 can be seen in Figure A-H-10 for the southern areas of WCA 3A. The number of high weeks (392) under the current condition (IOP) was reduced to 252 weeks under Run 9E1. *Id.* According to the FEIS, this equated to a 36 per cent reduction in exceedance of the high water stage criterion with no increase of low water events. *Id.* The modeling also shows that the numbers of weeks of sustained high water above 2.5 ft. in Indicator Region 14 has been reduced from 412 weeks under IOP to 260 weeks under ERTP 9E1. *See* FEIS at B-1-99. The Corps concluded: "The alternative that best met the ERTP objectives of improving conditions within WCA 3A for the snail kite, wood stork and other wildlife species, while maintaining protection for the CSSS and meeting Congressionally-authorized C&SF Project purposes, became the ERTP." FEIS at 2-31. Alternative 9E1 is the recommended plan. FEIS at *xiii.* ***CEPP* must reduce damaging high water levels in WCA 3A even more than the proposed ERTP and the anticipated COP. So-called "new science," which in many cases is old science that has been discarded, must not be misused as an excuse to drown the Tribal Everglades to provide more water to the Park downstream.**

Health And Safety Must Be a Priority: The Corps' recent FEIS for the ERTP quotes a letter of Miccosukee Tribal Chairman Colley Billie which states: ***"For far too many years, as a direct result of discriminatory water management actions, hundreds of thousands of acres of Tribal everglades in Water Conservation Area 3A have been flooded and degraded ... It has threatened the health and safety of the Miccosukee community."*** FEIS at 4-89. In 2008, the Tribe filed an Equal Protection lawsuit, pending in the Eleventh Circuit Court of Appeals, that detailed the threats that these discriminatory water management actions posed to the Tribal Everglades in WCA-3A, and to the health and safety of the Miccosukee people. In July 2010, the USACE Water Resources Engineering Branch (EN-W) conducted a review of the original General Design Memorandum for WCA-3A. *See* ERTP FEIS at 1-19; *see* Memo of Sean Smith as Exhibit A. Based upon the results of this review, the Corps concluded that a rigorous evaluation of the Standard Project Flood conditions within WCA-3A should be conducted. *Id.* As a result of the Corps' Phase I analysis of high water events, the Corps discovered that "based on

current system conditions as simulated in the water budget spreadsheet, the current configuration of WCA-3A would result in an increase in the SPF stage for WCA-3A of between 1.3 and 1.4 feet compared to the WCA-3A design assumptions." *Id.* Through this analysis, the Corps also discovered the blindingly obvious: "that peak SPF stage is increased over the original design due to the reduction in outlet capacity from WCA-3A through the S-12s." *Id.* The Corps recognized that the "Discharge through the S-12 structures is essential for managing the WCA-3A SPF peak stage." FEIS at A-5-33. The FEIS concluded that: "Leaving IOP in place is not an acceptable option due to the snail kite habitat issues and L-29 levee high stage concerns." FEIS at G-1-10. In light of this safety analysis, the FEIS concluded that it is "prudent for the USACE to recommend the lowering of Zone A of the WCA-3A Regulation Schedule as a risk reduction measure." FEIS at 1-20. The FEIS further concluded that the 1960 WCA-3A 9.5 to 10.5 feet, NGVD Regulation Schedule is a "required component for the interim water management criteria for WCA-3A Zone A under ERTP, necessary to mitigate for the observed effects of the discharge limitations of the S-12 spillways." *Id.* In light of these findings, **any CEPP water management actions that may impact water levels in WCA-3 must account for the specific flood stage of the L-29 levee system as detailed in the US Army Corps of Engineers 2011 General Design Memorandum for WCA-3A.** (see Exhibit A attached). This is vital to protecting the Miccosukee community located downstream of the L-29 levee. Finally, any safety studies that have been, or are being, conducted on the L-31 levee and the Lake Okeechobee dike must also be taken into account. **Health and safety of the Miccosukee Tribe, and the public, must be the top priority in the CEPP process.**

- **CEPP Must Incorporate Storage As a Priority:** As with water quality treatment, storage must also be incorporated. The nutrient enriched flows that are discharged from Lake Okeechobee could easily overload the current stormwater treatment system, and impact the Everglades wetlands. Incorporating storage facilities must be a central component of the CEPP and should be scheduled for construction and implementation early in the sequencing process. It is a tragedy that the Everglades Agricultural Area ("EAA") Reservoir Phase 1, one of the first CERP projects, was abandoned after many months of construction and an expenditure of more than $250 million dollars. If the EAA Reservoir Phase 1 had not been abandoned, both it and the Bolles and Cross Canal Projects, could have been completed by December 2009. Additionally, although the EPA Amended Determination stated that a Flow Equalization Basin ("FEB") built on this site could meet the Water Quality Based Effluent Limit in WCA-3 by 2013, no action has been taken to build an FEB on this site that was paid for by federal tax dollars. **Constructing storage at the soonest must be a priority if CEPP is too succeed.**

- **Rehydrate Only With Clean Water to Protect Northern WCA-3A and WCA-3B:** Flows into the dry areas of northern WCA-3A and through WCA-3B should be restored to the greatest extent practicable toward achieving historical flows and levels and only if the water is clean. Dirty water, *i.e.* water containing concentrations of phosphorus greater than 10 ppb should never be utilized for rehydration of unnaturally dried out areas. **In general, CEPP should never**

permit rehydration with dirty water and should always strive for natural flows and levels to the greatest extent practicable.

- **<u>CEPP Must Incorporate Solutions to Stop Western Basins Pollution</u>:** Any project truly geared at delivering more water clean water to the *"Central Everglades"* must incorporate solutions for the western basins. Discharges through the S-140 and the S-190 water control structures continually deliver phosphorus laden waters onto Tribal lands and into WCA-3A. Recent data from the 2011 South Florida Environmental Report shows that the combined discharge from the S-140 and S-190 water control structures comprised nearly 30% of the total phosphorus load discharged to WCA-3A. The S140 water control structure discharged 9.2 metric tons of phosphorus with a FWMC of 55 ppb directly onto Tribal lands and into WCA-3A. This was the single largest structure discharge into WCA-3A in 2010. The S-190 water control structure discharged 7.6 metric tons of phosphorus with a FWMC of 73 ppb directly into the L-28 Interceptor canal, which terminates on Tribal lands in WCA 3A (2011 SFER Appendix 3A-5). The SFWMD inflow station at the terminal end of the L-28 Interceptor canal had a discharge geometric mean phosphorus concentration of 65.2 ppb in WY 2010 (SFER 2011; Appendix 3-4).

The combined impacts and phosphorus load from these discharges has had a devastating effect on Tribal lands and WCA-3A. The Central Everglades Planning Process provides an invaluable opportunity to develop and implement solutions that will cooperatively benefit Tribal lands and the water conservation area. These solutions were outlined in the Comprehensive Everglades Restoration Plan (CERP) and in the Big Cypress - L-28 Interceptor Modifications Project description which calls for canal modifications and water quality treatment for these basins:

> *Big Cypress - L-28 Interceptor Modifications Project (www.evergladesplan.org)*
>
> *Modification of levees and canals, water control structures, pumps, and stormwater treatment areas (with a total storage capacity of 7,600 acre-feet) will re-establish sheetflow from the West Feeder Canal across the Big Cypress Reservation and into the Big Cypress National Preserve, maintain flood protection on Seminole Tribal lands, and ensure that inflows to the North and West Feeder Canals meet applicable water quality standards. Upstream flows entering the West and North Feeder Canals will be routed through two stormwater treatment areas to be located at the upstream ends of the canals. Sheetflow will be re-established south of the West Feeder Canal consistent with the Seminole Tribe's Conceptual Water Conservation System master plan.*

The Central Everglades Planning Process is the time to initiate the long overdue planning process for the CERP Big Cypress - L-28 Interceptor Modifications and provide a solution for the devastating discharges from the L-28 Interceptor Canal and the S-140 water control structure..

- **<u>No More Dirty Water, No Rehydration with Dirty Water, & No Use of WCAs As *De Facto* STAs</u>:** Unlike a lake or a stream in which pollutant discharges undergo relatively quick

and complete mixing, the Everglades is being eaten away by P pollution like a cancer. Cancer starts at a point and eventually spreads throughout the body unless stopped. Like a cancer, phosphorus pollution eats away from the points it enters the Glades, and continuously spreads further and further into unimpacted areas. It will eventually destroy the vast majority of what's left, if not the entire Everglades, unless it is stopped.

If damage occurred until the cause of the damage was stopped, and was then reversed in approximately the same time it took to cause that damage, this damage would be considered reparable, or reversible. This is not what occurs in the Everglades. Recreating tree islands and extracting high concentration of phosphorus from the soil may never be achieved by nature except in geological timeframes; and extirpated species will never be replaced. Even if humans could reverse the damage in a shorter time, which at present they cannot, it would certainly be cost prohibitive, and require many, many years to complete. Whether these restorations can be achieved is unknown, and, if they could, the time to achieve them is centuries, millennia, or longer. Even in the best case scenario, this damage is, for all intents and purposes, irreparable. It only makes sense that stopping this irreparable damage is the prudent first step to restoration, and, in the minds of many, including the Miccosukee Tribe, the mandatory first step.

It should be clear to all that restoration of the Everglades has not begun, as the Everglades continues today to be irreversibly destroyed. Restoration can only begin once the irreversible damage is stopped, and that day is, at best, far in the future.

The water quality issue was supposed to have been resolved by December 31, 2006 when the State, now under an Order of the Court, was supposed to have achieved inflows into the Everglades that ensured the Water Quality Standard was being met. The State's meeting this deadline in a timely fashion was a base assumption of the CERP Restudy, and the success of CERP, in accordance with the projected schedule, depended on it. However, this has yet to be achieved, and under the current best case scenario, may not be achieved until 2020. There is a possibility under the EPA Amended Determination that the Water Quality Based Effluent Limitation ("WQBEL") for WCA could be met by 2013 if a Flow Equalization Basin ("FEB") on the Talisman land was constructed, but no such reservoir is even being planned let alone being constructed. Moreover, as all who work on Everglades restoration know, the best case scenario is rarely, if ever, realized.

In addition, CISRERP has invited an analysis of "trade-offs between water quality and quantity," which opens the door wide for those who would destroy one part of the Everglades for the benefit of another. At the heart of this is the utilization of vast areas of the Everglades (both WCAs and Tribal Land) as *de facto* STAs. To permit the State to utilize Tribal Land as STAs in order to achieve 10 ppb P in the Park is diametrically opposed to actually restoring the Everglades, contrary to the Consent Decree and the Clean Water Act, and anathema to the Miccosukee Tribe. The Tribe will not permit Tribal land to be utilized as an STA.

Therefore, the Tribe does and will not support a CEPP that 1) increases the amount of dirty water brought into the Everglades Protection Area, or 2) restores flows to the

Everglades Protection Area with dirty water, until the restoration water meets the 10 ppb P criterion mandated by the Clean Water Act. Even more, Tribal land will not be utilized as an STA. The 10 ppb P criterion must be a major performance measure in CEPP and water quality must be thoroughly analyzed and evaluated in the CEPP process.

- **No More Dirty Water - Water Quality Must Be Met:** The Federal Register defines the primary objective of the CEPP as follows: "*The next step for the implementation of CERP is to redirect water that is currently discharged to the east and west coast estuaries from Lake Okeechobee and restore flow to the South...*" The CEPP process cannot attempt to restore more water into the central Everglades from the north, *i.e.* from the Everglades Agricultural Area ("EAA") and Lake Okeechobee until the State meets water quality standards in the water being delivered to the Everglades Protection Area. The State of Florida failed to meet the December 31, 2006 deadline, as recognized by Judge Gold, to ensure that waters discharged to the Everglades Protection Area meets water quality standards, including a numeric criterion of 10 ppb Phosphorus ("P"). Thus, waters discharged from Lake Okeechobee are laden with pollution. The most recent data for the 2011 South Florida Environmental Report shows that the open water Lake total phosphorus concentrations were 118 ppb for WY2010 and had a five year average of 172 ppb (2011 SFER; Table 10-12). To accomplish the stated goal of redirecting Lake Okeechobee flows south, while maintaining the water quality standards as a constraint, as presented and discussed at the Water Resources Advisory Commission (WRAC) on Thursday, January 6, 2012, treatment must incorporated. Without the appropriate treatment, redirected flows from Lake Okeechobee will greatly increase the nutrient loads to the water conservation areas, causing further degradation of Tribal lands within the Everglades ecosystem." **Once flow at natural rates, levels, and quality is "practicable," then, and only then, should more water be brought into the Everglades; given the current rate of progress, this is many years into the future, if ever.**

- **No Trade-Offs Permitted:** One hears discussions at times about trade-offs" in Everglades restoration. Although not clearly nor precisely framed, CISRERP has invited an analysis of "trade-offs between water quality and quantity," which opens the door wide for those who would destroy one part of the Everglades for the benefit of another. At the heart of this is the utilization of vast areas of the Everglades (both WCAs and Tribal Land) as *de facto* STAs in the restoration process. The Tribe is concerned that under the guise of "new science" some will attempt to use the CEPP process to seek a plan that forces large volumes of water through some areas, like WCA-3A, for the possible benefit of other areas, like the Park to the south. These are not new arguments, but old ones previously rejected and now being recirculated. There was much discussion during the Restudy process about how too much water could devastate the last vast expanse of sawgrass left in existence in WCA-3A. It was decided that all areas of the Everglades were to be restored. The Tribe is deeply concerned by the so-called "new science" that some are using to support sending greater volumes of water through the Everglades than was envisioned by CERP. It should be noted that much of the modeling on this new science that was done did not take into account any constraints for water supply, flood control, or the fact that half of the

Everglades is gone. The Tribe will resist any effort to drown the Tribal Everglades for the alleged benefit of the Park downstream. As discussed in the section on endangered species, Tribal lands and the endangered snail kite have suffered from the high water effects of discriminatory water management. The Miccosukee Tribe never endorsed "trade-offs", which is essentially *"Animal Farm"* equality for the Everglades, or the use of Tribal land as a *de facto* STA. Using the Tribe's Everglades in WCA-3A as a *de facto* STA to clean the water before it gets to the Park is also specifically prohibited by the Consent Decree (Judge Moreno's Court). **CEPP must endorse as a guiding principle that no area of the Everglades will be destroyed/sacrificed for the benefit of another are of the Everglades by planned CERP projects, or for that matter, any proposed project.**

- **CEPP Must Not Delay Already Delayed MWD Project Components:** According to the Congressional Research Service ("CRS") Report to Congress dated March 17, 2005, ***"Mod Waters was originally estimated to be completed by 1997, yet some now argue it is unclear when or even whether the project will be completed."*** Another study on the delay of the Modified Water Deliveries Project ("MWD Project") conducted by the Inspector General of the Department of the Interior dated March 2006, discusses the cost of delay: ***"The Corps estimates that damage to tree islands resulting from the current high water levels could be as much as 246 acres per year and the cost to restore the islands ranges from $12.3 million to $123 million per year."*** The CRS Report further stated that: "***Section 601(b)(2)(D)(iv) of WRDA 2000 provides that Mod Water must be completed before appropriations can be made to construct other restoration projects in the east Everglades."*** Moreover, the 2006 Biennial Review by CISRERP warned that: "***Since the Mod Waters Project is an assumed precursor for the WCA-3A Decomprtmentalization and Sheetflow Enhancement part 1 (Decomp) project, further delays in the project's completion may ultimately delay funding appropriations for Decomp.***" The committee recommended that: ***"Mod Waters should be completed without further delay."*** In its 2008 Biennial Review CISRERP warned, "***If this relatively modest restoration project cannot proceed and provide some restoration benefits, the outlook for CERP is dismal.***" The CEPP must not be used as an excuse to bypass Congressional intent or to delay the construction of vital MWD Project components, which have already been seriously delayed. The Tribe is concerned that some will attempt to delay important aspects of this project by incorporating them into the CEPP, which may never be authorized. The Tribe will be opposed to any attempt to do so. **Completion and implementation of the MWD Project must be a pre-condition to the CEPP and a "without project condition" under NEPA.**

- **Decompartmentalization of WCA-3:** The Tribe agrees with the CISRERP that, if MWD does not get completed, the outlook for CERP is dismal and, unfortunately, the MWD Project is still far from completion. The CERP Decompartmentalization Project is also well behind the scheduled January 2010 completion date for construction of certain components contained in Section 10 of the Yellow Book. The Tribe cannot help but wonder if this new planning effort, with a new acronym, was devised to obfuscate this important fact. However, in the event that the

CEPP planning effort actually moves forward, plans for the Decompartmentalization of WCA-3 should incorporate more than the hydrologic modification features proposed for north of I-75 by the DECOMP PDT Team. When incorporating the Decompartmentalization of WCA-3 into the CEPP all of the canals in the L-28 system should be considered for removal in addition to the entire Maimi canal and L-67 canal system to truly provide restoration of the "Central Everglades." As the Decompartmentalization of WCA 3 progresses, careful and consistent consultation with the Tribe should take place to ensure that the cultural meeting places of the Miccosukee people and Tribal camps are not adversely impacted.

- **Analyze Expanding the Capacity of S-333:** All water that the Park desires for rehydration of Northeast Shark River Slough cannot flow through WCA-3B without causing significant irreversible destruction. As much water as is naturally possible should be funneled through WCA-3B, and, if more is available to satisfy the desires of the Park, then it should be provided via S-333, at least until the CERP eastern rehydration projects are completed. In order to provide this additional water, the CEPP should look at increasing the capacity of S-333. During the development of "Sparrow" deviations in the late 1990s, it was decided to increase the S-333 capacity from 1,350 cfs to 2,000 cfs, as documented in the 2002 IOP Final EIS, but this was never accomplished. The tentatively selected plan for COP also included the same increase in capacity for the S-333 structure, but COP was abandoned. **It is only prudent to finally analyze increasing the size of S-333 in order to ensure the Park can receive the higher volumes of water at a faster rate that it claims it needs.**

- **8.5 Square Mile Area Must Be Protected:** After years of debate, a project to protect the people of the 8.5 Square Mile Area ("8.5 SMA") from project induced flooding was authorized by Congress and constructed by the Corps of Engineers. There still are many associated with the Park that would like to see the remaining homes removed; under the mandate of Congress, this is not going to happen. **The Corps must ensure the people of the 8.5 SMA are afforded the protection they are authorized, and must not let another 8.5 SMA debate paralyze the restoration process and stop the CEPP from being implemented.**

- **CEPP Transitional Plan Is Essential:** There remain several components of both the MWD and C-111 projects that must be formulated, designed, and constructed. These components will not be all completed at the same time; it will take years for all to be completed. Similarly, the components of the different projects that will constitute the CEPP to deliver what the Corps refers to as "incremental" restoration will also come on line at different times. Thus, the **CEPP should contain a transitional plan that implements beneficial operational changes once each new component of the Pre-CERP and CERP projects is completed.**

- **No Operation of the S-356 Pump Station:** The Miccosukee Tribe will not support the operation of the S-356 pump station as a component of CEPP. There are three primary reasons: 1) water quality issues exist which have not been adequately addressed (Note: Among the potential/existing water quality issues, testing and analysis to date of S-356 pumped water have

found zero dissolved oxygen, along with a very strong odor of sulfur; changes in the concentration, load, and distribution of P flows into the Park resulting from the use of S-356 have not been analyzed rigorously *vis-à-vis* the Consent Decree, and there is clear potential for an increase in the number of Consent Decree violations), 2) the net result of the use of S-356 is pumping water in a circle, *i.e.* S-356 pumps into L-29 Canal, L-29 water flows into NE Shark River Slough in the Park, then seepage of this water enters the L-31N, and, then again, S-356 into L-29 Canal, which is clearly not restoration, and 3) most important to the Tribe, the pumping into the L-29 Canal from S-356 reduces the flow through S-333 into the L-29, and, thus, results in higher water in WCA 3A and Tribal land. This latter consequence of S-356 utilization results in adverse impacts to Tribal lands in WCA 3A and the endangered snail kite and its critical habitat. **The S-356 pump station has no redeeming value at this point, and probably never will, and it certainly should be eliminated from consideration in the formulation of CEPP.**

- **Address Seepage Control As A Critical Requirement:** Seepage out of Northeast Shark River Slough in ENP remains a huge impediment to restoration. Simply and directly stated, the restoration of ENP and the entire Everglades cannot be achieved until the seepage between S-335 and G-211 is adequately managed. **CEPP must recognize this debilitating seepage limitation and be formulated to appropriately account for it.**

- **1-Mile Eastern Bridge Should Be Plugged:** The Tribe continues to strenuously object to the construction of the 1-Mile Eastern "Bridge to Nowhere" and contends that it is a waste of taxpayer money that will continue to delay the MWD project. Moreover, given the facts that additional flows into Northeast Shark River Slough are severely limited by seepage into the L-31N Canal, and that the 1-Mile Eastern Bridge that is now being constructed will concentrate current and additional flows on the eastern side of the Park, it is clear that the bridge should not be utilized until the seepage challenge is met. The Corps even predicts that the flow across Tamiami Trail will increase by over 15% once this bridge is complete without even changing operations, *i.e.* the seepage challenge will be exacerbated just by merely constructing the bridge. The proposed COP and CEPP NEPA processes must analyze this potential flooding threat, which could adversely impact the Miccosukee Resort, and other Miami-Dade County properties. **The openings under the bridge should either 1) remain blocked by leaving the existing Tamiami Trail in place, or 2) be blocked by fill, sheet pile, or some other technique, until the seepage challenge is appropriately met, thus forcing more of the flow to the west in Shark River Slough where seepage is much less of an issue.**

- **Reduce/Eliminate the "Big Red Arrow":** The "Big Red Arrow," *i.e.* the arrow depicted on water budget schematics depicting the huge amounts of water forced south out of the L-31N Canal into the area of Homestead and vicinity since the enlargement of the L-31N in the early 1980s, must be reduced to the maximum extent practicable. If not, the people of South Miami-Dade will be continue to be flooded beyond the level of protection authorized by Congress, and

the CEPP clearly has the potential to exacerbate this already bad situation. **Therefore, CEPP should have as a primary goal the elimination of the "Big Red Arrow."**

- **Maintain the G-3273 Trigger Gage:** Uncontrolled, high volumes of seepage into the L-31N Canal can cause and has exacerbated flooding in the built portion of Miami-Dade County, which includes Miccosukee property. Seepage also causes the "Big Red Arrow," which specifically leads to increased flooding in southern Miami-Dade. Historically, this seepage has been somewhat managed by discontinuing the controllable inflow of water into Northeast Shark River Slough when the G-3273 gage rises 6.8 feet NGVD. **Until seepage, and, thus, unacceptable flooding, are adequately addressed, there is little reason to believe that G-3272 trigger well is not going to remain a critical part of the water management system under CEPP.**

- **Clear Downstream of the Culverts to Increase Flows:** In 2009, the Park commissioned a professor from the University of Miami to evaluate the effectiveness of culvert swales in increasing flows from the WCAs to ENP. The culvert-swale approach is one method for effectively clearing the accumulation of sediment, vegetation (to include invasive exotics), detritus, and, literally, garbage downstream of the Tamiami Trail culverts that is significantly reducing the flows from north to south, *i.e.* rather than actually remove the blockage, swales enable the water to move around it. In January 2010, Dr. David A. Chin, PE, published his report. Dr. Chin's analysis indicates that the Miccosukee long-held position is correct, *i.e.* clearing downstream of the culverts will significantly increase flows (Note: It also reconfirms at least 2 prior studies done by the Corps). Key points from the report follow:

  - Even the most modest swale considered, *i.e.*, 500' by 30', at a constant L-29 stage of only 6.0 feet NAVD, will likely increase flows by 60% at one culvert set and 250% at the other … the most robust swale considered, *i.e.*, 1500' by 30', will provide for a 200% and 560% increase at the same culvert sets, respectively.

  - Even a worst case scenario for both culvert sets during sensitivity analysis provided for a 48% and 200% increase in flows with the 1500' by 30' swale option, while an equally plausible, but more favorable, marsh resistance increased flows by 520% and 830% for the same swale option.

  - Adding another culvert set at the swale locations provided only a little improvement in increased flows.

  - Replacing the culverts by bridges at the swale provided improvements, but not nearly as great as the increased flows predicted for simply building the swale.

  - When a bridge is simulated to replace the existing culvert set: "… it should be noted that, for a given spreader-canal configuration, water deliveries are independent of the bridge span as long as stage differences across the bridge opening are relatively small [which is the normal condition]."

These new and independent scientific/engineering findings provide great hope for major, quick improvements in the condition of the Everglades at a very reasonable cost. Dr. Chin's work convinced the Superintendant of ENP to conduct an actual Pilot Swale Project to evaluate Dr. Chin's findings in the field; although this pilot project was supposed to be implemented by October of 2010, it appears that the work now been cancelled. **Given that the evidence and possibilities are so compelling, and the deteriorating state of the Everglades so dire, the Corps should move forward with full scale swale projects immediately, and analyze the increased flow capabilities of such swales as a component of the CEPP EIS.**

- **Clear Downstream of the S-12s & Implement Other Measures Needed to Increase Flows:** The same hydraulic principles employed by Dr. Chin to the culvert swales also apply to the S-12s. Clearing downstream of these structures provides more opportunities for further increasing flows through the Everglades. Especially increasing flows from WCA 3A, which is flooded much of the time, to an area in the Park that has been unnaturally dried out over many years. In preparation for the development of the ERTP, the Corps performed an analysis of current water levels in WCA 3A *vis-à-vis* the 1960 and 1972 design specifications and expectations, and reported the results in MEMORANDUM FOR SAJ LEVEE SAFETY OFFICER (DUBA), Subject: EN-W Position Statement on WCA-3A Regulation Schedule Modifications, 9 September 2010. Major findings are [emphasis added]:

  - **Actual water levels are much higher than those for which WCA 3A was designed –** *"The analysis illustrated that under the current system conditions, as represented in the spreadsheet, the peak SPF S-12 headwater stage was computes 13.76 ft, NGVD and the peak SPV WCA-3A three gage average stage was computed as 15.20 ft, NGVD. The comparison of peak stages between the 1960 GDM WCA-3A design and the 2010 WCA-3A volumetric spreadsheet predictions indicate that the predicted SPF stage is higher than the WCA-3A design stages established in the original GDM and used to set the as-built crest elevation of L-29: 1.36 feet higher at the headwater of the S12 structures; 1.3 feet higher at the three station average for WCA-3A."*

  - **S-12 flows are crucial achieving lower water levels –** *"Sensitivity analysis performed utilizing the 2010 WCA-3A volumetric spreadsheet tool illustrated that the peak SPF stage is most sensitive to the amount of outflows being discharged from WCA-3A, with the primary outlet being the S-12s ..."*

  - **Must lower top of regulation schedule to the design envelope of 9.5 – 10.5 feet to mitigate for the S-12 discharge limitations –** *"... EN-W has concluded that the lowering of Zone A of the current WCA-3A Regulation Schedule to the 9.5-10.5 feet NGVD regulation schedule line from the 1960 GDM will provide an interim step to mitigate for the observed effects of the S-12s discharge limitations."*

  - **Much more than reducing the top of the regulation schedule is needed to lower water in WCA 3A –** *"The inclusion of the lowering of Zone A of the current WCA-3A Regulation Schedule within the proposed alternatives of the ongoing ERTP NEPA effort*

is a minimum requirement to demonstrate compatibility with the required interim water management criteria for WCA-3A. Additional water management operating criteria to further reduce the frequency and duration of high stages within WCA-3A should also be considered within the context of other ERTP Project considerations."

- **Decisive and prescribed measures are needed now to decrease the risk to "human health and safety"** – *"The ERTP Project's water management operating criteria should include the establishment of operational constraints at the S-12 structures based upon safety considerations for WCA-3A features and pertinent downstream areas, including the identification of infrastructure modifications to be implemented on a temporary basis to allow the reduction of risk to human health and safety. The stability analysis of the S-12s is predicated on a maximum design headwater stage of elevation 12.4 feet NGVD with the differential head across the structure limited to 5.5 feet; also, the as-built crest elevation of L-29 and crown elevation of Tamiami Trail (US-41) in the S-12A to S-12D reach has been established to protect against the risk of overtopping from an adjacent flood stage of elevation 12.4 feet NGVD. <u>The exceedances of these design conditions should be considered an immediate increase in risk to the human, health and safety afforded by the project feature and would require decisive and prescribed measures to reduce the WCA-3A stage</u>."*

- **ERTP alone will not sufficiently reduce the risk to human health and safety ... more is needed!** – *"Outside of the ERTP project, additional NEPA assessment would be required to implement infrastructure modifications on a temporary basis to allow the reduction of risk to human health and safety, or to implement other permanent structural alternative which may result from the future phase 2 analyses. Considering the limitations on discharge through the S-12 structures, downstream conveyance improvements at the S-12 structures (potentially including removal of portions of the old Tamiami Trail) or additional outlets are required to mitigate for increased SPF stages within WCA-3A."*

In the Corps Draft ERTP EIS published on March 4, 2011, the Corps reiterated the importance of clearing the downstream blockages of the S-12 structures, as well as other measures to increase the flow out of WCA 3A.

5.0 Conclusions *(DEIS at A-5-41)* [emphasis added]:

- *The predicted SPF stage is higher than the WCA-3A design stages established in the original GDM and used to set the as-built crest elevation for L-29.*

- *Outlet capacity of the S-12s has either reduced over time OR*[1] *was never as large as assumed for the original design routings.*

[1] The Tribe's takes exception to the word "OR" which should be "AND" as it is clear from the evidence, including e-mails from Corps Staff, that: 1) the S-12 design flows were never achieved and 2) the capacity of the S-12s has decreased over time based on analysis of the rating curves over time.

- *The peak SPF stage is not sensitive to modifying the top (i.e. Zone A) of the WCA-3A Regulation Schedule. The peak SPF stage is most sensitive to the amount of outflows being discharged from WCA-3A, with the primary outlet being the S-12s.*
- *Considering the limitations on discharge through the S-12 structures, additional outlets are required to mitigate for increased SPF stages.*
- *The most effective additional measure investigated to alleviate the problem involves further degradation of the L-28 to increase outflows; however, the downstream effects of this action cannot be adequately addressed with the spreadsheet model routing and would require a more robust hydraulic analysis.*
- *Implementation of the Modified Water Deliveries Conveyance and Seepage Control Features would also provide additional outlet capacity.*

7.0 Recommendations for Future High Water Control

- *Remove key sections of the Old Tamiami Trail to reduce current impediments to flow out of WCA-3A.*
- *Investigate the possibility of changing the operating criteria at S-343A, S-343B, and S-344.*
- *Perform S-12 downstream conveyance improvements, such as vegetation cleanout.*

ERTP has proposed major steps to decrease water levels in WCA 3A. If the Recommended Plan for the ERTP is implemented it should lessen the now recognized and documented risk to human "health and safety," to include a major threat to the members of the Miccosukee Tribe. But clearly, the Corps' own analyses specifies that more must be done to increase flows out of WCA-3A. **Additional measures that need to be addressed in the CEPP EIS include 1) clearing downstream of the S-12 structures, 2) removing as much as possible of Old Tamiami Trail, and 3) further degrading of the L-28 levee. These, and other measures that might help, need to be planned and analyzed in the CEPP EIS and implemented at the soonest.**

• **Impact on Endangered Species Must be Assessed – Multi-Species Approach Is Essential:** The CEPP EIS must analyze the impacts of operation of these CERP projects on all endangered and threatened species in the action area, which includes Lake Okeechobee, the northern estuaries, all of the WCAs and the Park. Such an analysis would include the impact of operations on the Tribal lands in WCA-3A, and on the endangered snail kite and its critical habitat there. Both the snail kite, and its critical habitat in WCA-3A, have suffered an alarming decline under the past thirteen years of discriminatory water management. These draconian actions, purportedly for the Cape Sable seaside sparrow ("Sparrow)., moved the Everglades, including Tribal lands, further away from restoration. As a result of these water management actions, which include IOP, the Everglade snail kite that lives on Tribal lands has suffered an

alarming decline reported at more than 50%, which is actually even greater.[2] *See* ERTP FEIS at 3-26. This decline is a direct result of more than thirteen years of S-12 gate closures, which degraded thousands of acres of snail kite critical habitat on Tribal lands in WCA-3A.

The Miccosukee Tribe, whose members have called the Everglades home since time immemorial, objected to these single-species water management actions on grounds that they would cause the damage the Tribe has witnessed. The ERTP FEIS confirms that damage to both WCA-3A and the snail kite has taken place. The FEIS states, ***"the snail kite population has progressively and dramatically decreased since 1999 ... the snail kite population essentially halved between 2000 and 2002 from approximately 3,400 birds to 1,700 birds; and halved again from approximately 1,500 to 1,600 birds in 2006, to approximately 685 birds in 2008."*** FEIS at 3-26. The estimated 2009 population size of 662 birds indicates that there is no sign of recovery (Cattau et al. 2009)." *Id.* A review of Table 3-1 in the FEIS shows that number of successful nests, and young fledged, have declined dramatically since the Corps began implementing the S-12 gate closings in 1998. *Id.* and *Table 3-3.* ***"WCA- 3A has been previously identified as the most critical component of snail kite habitat in Florida"*** and the lack of reproduction in this area in recent years is of principal concern. *Id.* ***"A population viability analysis conducted in 2006 predicts very high extinction probabilities within the next 50 years (Martin 2007).*** Given the 2009 population estimate (i.e. 662 birds) the extinction risk may be even greater than the previous estimate (Cattau et al. 2009)." 3-26 to 3-27. It is clear that the Tribe's concerns about the snail kite have been proven correct. The FEIS also recognizes that the alarming decline of the vegetation on snail kite critical habitat in WCA-3A. **"However, high water levels and extended hydroperiods have resulted in vegetation shifts within WCA-3A, degrading snail kite critical habitat."** FEIS at 3-28. A multi-species approach that builds on the ERTP process and scientific information is essential. The ERTP was the first process to actually take a real multi-species approach to water management. Before this, as described above, it has typically been single-species management. **The ERTP model for multi-species management must be a guiding principle of the CEPP.**

- **Restoration West of Shark River Slough Must Begin:** As discussed earlier, "critical habitat" for the "Sparrow" was not designated by FWS for western Shark River Slough, because this area is currently being unnaturally dried out for subpopulation A of the "Sparrow" when under restoration it will be made much wetter. Declaring critical habitat would have effectively blocked the future restoration of the Everglades. Based largely on the written defense of the FWS's Final Rule by the Tribe, and concerns that the proposed designation would not only stop Everglades Restoration, but cause the continued destruction of Tribal Land, a Federal Judge ruled in 2011 that the FWS was correct not to designate this area as "critical habitat." In addition

[2] While some government documents have reported a 50% decline, the drop from approximately 3,400 snail kites in 2000 to 662 in 2009 actually represents a startling population decline of 81%. This is considerably more than the 50% stated.

to stopping Everglades restoration, the Judge unequivocally recognized the damage being done to Tribal land by "Sparrow" deviations:

> *"Under the grip of the law of unintended consequences, however, these corrective plans* [*i.e.* deviations for the "Sparrow"] *produced untoward results. Some argue that the greater retention of water for longer periods of time in WCA 3A, intended for Sparrow conservation, precipitated abnormally high water levels in WCA 3A. The higher water levels in WCA 3A are thought to have imposed adverse effects on other endangered species and on members of the Miccosukee Tribe of Indians of Florida ("Tribe")—who reside on more than 100,000 acres of WCA 3A land—by flooding culturally significant sites."* Collyer Order at p. 13.

Settled: CERP is formulated to restore the Everglades and the CEPP process purports to begin the incremental restoration of the Central Everglades. The best science in the form of modeling and field studies show that restoration of the Everglades will result in the western portion of Shark River Slough being wetter. In contrast, the last 13 years of draconian water management actions allegedly for the "Sparrow" have made this area dryer and moved it away from restoration, while not helping the "Sparrow." The designation of "critical habitat" for this area would have required it to be dried out in perpetuity. <u>The FWS has officially decided, and a Federal Judge upheld the FWS decision, that at some point the CSSS-A area will be restored and be wetter</u>.

Unsettled: The only question that remains at this time is when does the Corps start allowing more flows into the area of western Shark River Slough so that restoration can in fact commence both for the areas north and south of Tamiami Trail? **Thus, the Tribe, for the sake of its land and culture in particular, and Everglades restoration in general, implores the Corps to begin the restoration of western Shark River Slough via both the COP and CEPP.**

- **<u>Decisive Action Required</u>:** From 2003 to 2007, the Miccosukee Tribe participated in the 4-year CSOP effort to attempt to achieve essentially the same outcomes that a new acronym, COP, is now supposed to achieve. At the end of the day, because of the unjustified non-support of a few, the consensus of many was rejected, and, to the detriment of the Tribe, nothing was implemented. This endless restoration planning without concrete results must not be repeated under either the COP or CEPP. **The Colonel must make a final decision for the CEPP based on the best information available in spite of the misguided demands that some may have. No more "kicking the can down the road." Another dead end excursion is not an option for the dying Everglades. Bold, decisive action that results in actual restoration is essential for success.**

CESAJ-EN-W 09 September 2010

MEMORANDUM FOR SAJ LEVEE SAFETY OFFICER (DUBA)

SUBJECT: EN-W Position Statement on WCA-3A Regulation Schedule Modifications

The USACE Jacksonville District Water Resources Engineering Branch (EN-W) has conducted a thorough review of the Central and South Florida Project (C&SF) Part 1 Supplement 33: General Design Memoranda (GDM) for Water Conservation Area 3 (June 1960) and the C&SF Part 1 Supplement 49: Agricultural and Conservation Areas General and Detail Design Memorandum (August 1972). The 1960 GDM documents the WCA-3A design criteria and design assumptions, including the 9.5-10.5 feet NGVD regulation schedule for WCA-3A that managed water levels in WCA-3A prior to the start of the Experimental Program of Water Deliveries to Everglades National Park in 1983. Under the Experimental Program, the WCA-3A Regulation Schedule zones and operational rules were initially modified as part of the two-year test of the Rainfall Plan starting in 1985. The modified WCA-3A Regulation Schedule and Rainfall Plan remained in effect through the end of the Experimental Program in 2000. As an outcome of the deliberations during development of the Interim Structural and Operational Plan (ISOP 2000-2002) and the Interim Operational Plan (IOP 2002-present), the WCA-3A regulation schedule was further changed with the modification of Zone D and the establishment of Zone E1.

Based on the review of WCA-3A design documents and in conjunction with the hypothesis that the S-12s are not capable of achieving the original design discharge of 32,000 cfs, EN-W has concluded that a detailed engineering assessment of the effects of the potential S-12s discharge limitations and the WCA-3A Regulation Schedule modifications on the frequency and duration of high water events was warranted. The engineering assessment should include a rigorous evaluation of Standard Project Flood (SPF) conditions within WCA-3A as these conditions have not been evaluated by the USACE Jacksonville District since the original 1960 and 1972 design documents.

EN-W has proposed a two-phase analysis approach for WCA-3A high water events including: phase 1(ongoing) - identification and assessment of interim water management criteria for WCA-3A, including operational changes proposed as part of the ongoing

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Everglades Restoration Transition Plan (ERTP) NEPA efforts; and phase 2(future) - a WCA-3A flood routing hydraulic analysis, incorporating current USACE risk analysis requirements focusing on potential human health and safety concerns resulting from WCA-3A stages, with identification of proposed water management operating criteria and potential infrastructure modifications to address identified concerns. The phase 1 effort was limited to hydrology and hydraulics assessment, while the phase 2 analysis will include additional engineering analysis conducted by hydrology and hydraulics, geotechnical, and structural design disciplines.

Findings of Phase 1 - To determine the ERTP interim water management criteria for WCA-3A, EN-W has completed a preliminary assessment based on the methodology identified in the 1960 GDM design document. The original design headwater of the S-12 structures is 12.4 feet and the peak three station average for WCA-3A under the SPF event was 13.90 ft, NGVD (C&SF Part I, Supplement 33). Since the current configuration of WCA-3A inflow and outflow structures differs from the 1960 GDM design document, a simple volumetric spreadsheet was developed of WCA-3A to determine the peak Standard Project Flood (SPF) stage within WCA-3A and at the S-12 structures based on current system conditions. Multiple inflow and outflow variables were identified and quantified to refine the calculations of the peak flows and stages for the SPF evaluation. The latest USGS rating curve for each of the S-12 structures was utilized in the analysis to incorporate the most current stage discharge measurements to more accurately incorporate present flow conditions. The analysis illustrated that under the current system conditions, as represented in the spreadsheet, the peak SPF S-12 headwater stage was computed as 13.76 ft, NGVD and the peak SPF WCA-3A three gage average stage was computed as 15.20 ft, NGVD. The comparison of peak stages between the 1960 GDM WCA-3A design and the 2010 WCA-3A volumetric spreadsheet predictions indicate that the predicted SPF stage is higher than the WCA-3A design stages established in the original GDM and used to set the as-built crest elevation of L-29: 1.36 feet higher at the headwater of the S12 structures; 1.3 feet higher at the three station average for WCA-3A. Sensitivity analysis

performed utilizing the 2010 WCA3A volumetric spreadsheet tool illustrated that the peak SPF stage is most sensitive to the amount of outflows being discharged from WCA-3A, with the primary outlet being the S-12's, and that the peak SPF stage is less sensitive to the configuration of the WCA-3A Regulation Schedule Zone A.

The schedule and scope for completion of the ongoing ERTP NEPA analysis precludes consideration of potential structural alternatives which would be proposed and evaluated in Phase 2. For immediate implementation through ERTP, prior to completion of the Phase 2, EN-W has concluded that the lowering of Zone A of the current WCA-3A Regulation Schedule to the 9.5-10.5 feet NGVD regulation schedule line from the 1960 GDM will provide an interim step to mitigate for the observed effects of the S-12s discharge limitations. Preliminary SFWMM modeling indicated that the following reductions in WCA-3A three station average high water frequency (as a percentage of the SFWMM 36-year period-of record, 1965-2000) may be reasonably expected from the lowering of Zone A: no significant change for stages above 11.75 feet NGVD (corresponds to S-12 headwater stage of 10.92 feet NGVD, based on historical regression); 1% reduction in stages exceeding 11.5 feet NGVD; 2-3% reduction in stages exceeding 11.0 feet NGVD; and 6-7% reduction in stages exceeding 10.5 feet NGVD.

The inclusion of the lowering of Zone A of the current WCA-3A Regulation Schedule within the proposed alternatives of the ongoing ERTP NEPA effort is a minimum requirement to demonstrate compatibility with the required interim water management criteria for WCA-3A. Additional water management operating criteria to further reduce the frequency and duration of high stages within WCA-3A should also be considered within the context of other ERTP Project considerations.

The ERTP Project's water management operating criteria should include the establishment of operational constraints at the S-12 structures based upon safety considerations for WCA-3A features and pertinent downstream areas, including the identification of infrastructure modifications to be implemented on a temporary

basis to allow the reduction of risk to human health and safety. The stability analysis of the S-12's is predicated on a maximum design headwater stage of elevation 12.4 feet NGVD with the differential head across the structure limited to 5.5 feet; also, the as-built crest elevation of L-29 and crown elevation of Tamiami Trail (US-41) in the S-12A to S-12D reach has been established to protect against the risk of overtopping from an adjacent flood stage of elevation 12.4 feet NGVD. The exceedance of these design conditions should be considered an immediate increase in risk to the human, health and safety afforded by the project features and would require decisive and prescribed measures to reduce the WCA-3A stage. In addition, application of the FDOT road base impact criteria to this reach of Tamiami Trail (estimated crown elevation of 14.95 feet) would result in a not to exceed regulated water stage of approximately elevation 11.5 feet NGVD adjacent to the roadbed (corresponds to S-12 headwater stage of 12.45 feet NGVD, based on historical regression). While this water stage could be temporarily exceeded and does not present the immediate risk of the SPF stage violation, nevertheless, it should be considered adverse with operational measures applied to reduce its duration.

Outside of the ERTP project, additional NEPA assessment would be required to implement infrastructure modifications on a temporary basis to allow the reduction of risk to human health and safety, or to implement other permanent structural alternatives which may result from the future phase 2 analyses. Considering the limitations on discharge through the S-12 structures, downstream conveyance improvements at the S-12 structures (potentially including removal of portions of the old Tamiami Trail) or additional outlets are required to mitigate for increased SPF stages within WCA-3A. The most effective additional measure investigated under phase 1 to alleviate the problem involves further degradation of the L-28 to increase outflows, although the potential for downstream effects, including impacts to the Tamiami Trail roadway and hydro-period/nesting condition effects on Cape Sable Seaside Sparrow Sub-population A, would require further investigations. Implementation of the Modified Water Deliveries Conveyance and

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SUBJECT: EN-W Position Statement on WCA-3A Regulation Schedule Modifications

Seepage Control Features and Tamiami Trail Improvements would also provide additional outlet capacity.

If you have any questions or require additional information, please contact me directly at extension 2105.

SEAN L. SMITH, P.E.
Chief, Water Resources Engineering Branch

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

MAR 0 6 2012

Mr. Fred Dayhoff
Section 106 and NAGPRA Consultant
Miccosukee Tribe of Indians of Florida
PO Box 440021 Tamiami Station
Miami, Florida 33144

Dear Mr. Dayhoff:

The U.S. Army Corps of Engineers (Corps), Jacksonville District, along with the South Florida Water Management District (SFWMD), is studying the environmental effects of the proposed Central Everglades Planning Project (CEPP). The goal of the Central Everglades Planning Project is to deliver within two years a finalized plan, known as a Project Implementation Report (PIR), for a suite of restoration projects in the central Everglades. This PIR is in preparation to seek Congressional authorization for the CEPP as part of the Comprehensive Everglades Restoration Plan (CERP). The project will incorporate updated science and technical information gained over the last decade to identify projects on lands already in public ownership to be selected as the next generation of CERP components.

The CEPP is incorporating some previously defined projects that have already addressed cultural resource concerns. Once the final array of alternatives are identified consultation with your office, site file reviews, cultural resource surveys, and determinations of significance and eligibility for listing of historic properties to the National Register of Historic Places, will continue until the Section 106 process of the NHPA, 36 CFR Part 800, Protection of Historic Properties, and the National Environmental Policy Act of 1969, as amended, are complete.

Based on goals specified by CEPP, the following areas will be consulted on at this time: Water Conservation Areas 3A and 3B, and Everglades Agricultural Area A-1 and A-2 (previously known as Component A).

Water Conservation Areas 3A and 3B – Florida Master Site File research indicates the presence of previously recorded sites, most of which were identified via remote sensing. These sites have not been verified with either surface or subsurface investigations.

Similarly, the Everglades Agricultural Area A-1 and A-2 – Florida Master Site File research indicates that this area has not undergone systematic cultural resource investigations. Therefore, the Corps proposes to conduct an archaeological survey and assessment of specific areas within both WCA3 and EAA A-1 and A-2 in accordance with the enclosed field testing plan enclosed.

The Corps seeks your comments on this proposed plan of action and looks forward to working with you. Any questions or concerns that you may have at this time can be addressed by Ms. Cindy Thomas by contacting her at (904) 232-1180 or via email: Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Eric Summa.
Chief, Environmental Branch

Enclosure

Copy Furnished:
Mr. Rory Feeney, Fish and Wildlife Director; PO Box 440021 Tamiami Station, Miami, Florida 33144

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

MAR 0 6 2012

COPY

Mr. Willard Steele
Seminole Tribe of Florida
Tribal Historic Preservation Officer
32090 Josie Billie Highway, PMP 1004
Clewiston, Florida 33440

Dear Mr. Steele:

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Sincerely,

Eric Summa.
Chief, Environmental Branch

Enclosure

Copy Furnished:
Mr. Paul Backhouse, Seminole Tribe of Florida, Deputy Tribal Historic Preservation Officer, 32090 Josie Billie Highway, PMP 1004, Clewiston, Florida 33440
Ms. Anne Mullins, Seminole Tribe of Florida, Compliance Review Supervisor, 32090 Josie Billie Highway, PMP 1004, Clewiston, Florida 33440
Mr. Elliot York, Archaeological Data Analyst, 32090 Josie Billie Highway, PMP 1004, Clewiston, Florida 33440

SEMINOLE TRIBE OF FLORIDA
TRIBAL HISTORIC PRESERVATION OFFICE

TRIBAL HISTORIC
PRESERVATION OFFICE

SEMINOLE TRIBE OF FLORIDA
AH-TAH-THI-KI MUSEUM

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PRISCILLA D. SAYEN

TREASURER
MICHAEL D. TIGER

July 10, 2012

Dan Hughes
U.S. Army Corps of Engineers
Jacksonville District Office
Attn.: CESAJ-PD-EP
701 San Marco Boulevard
Jacksonville, Florida 32207

RE: Phase I Historical & Archaeological Survey of the Miami Canal within WCA-3A, Levee 5 Spreader Channel, Levee 4-5 Spreader Channel Pump Station, Broward & Dade Counties, FL, Panamerican Consultants, Inc. (June 2012)

Mr. Hughes:

Thank you for the opportunity to review the above reference report provided to our office on June 25, 2012. I noted during my review of the report that the results of the survey indicate that there are several potentially NR eligible archaeological sites identified (including 8BD4836, 8BD4837, and 8BD4839) that will be potentially adversely impacted by the proposed action. We respectfully would like to be consulted with regard to any further action that might affect these sites, including any further archaeological research or inundation of the known resources. Based on the conclusions of the report The Seminole Tribe of Florida respectfully recommends monitoring by an archaeologist that meets the Secretary of the Interiors Standards during any ground disturbance in high probability areas for archaeological materials in the event that construction inadvertently impacts a previously unknown archaeological site.

Please contact our office regarding further consultation on this project.

Sincerely,

Paul Backhouse, Ph.D., RPA
Acting Tribal Historic Preservation Office, Seminole Tribe of Florida

CC: Natalie Garret, Tribal Liaison
Eric P. Summa, Chief Environmental Branch

JUL 12 2012

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

Mr. Fred Dayhoff
NAGPRA Representative, Tribal Consultant
Miccosukee Tribe of Indians of Florida
P.O. Box 440021
Miami, Florida 33144

Dear Mr. Dayhoff:

As part of the Central Everglades Planning Project (CEPP), the U.S. Army Corps of Engineers (Corps) in partnership with the South Florida Water Management District (District), are planning to conduct archaeological investigations of tree islands and levees and/or canals within Water Conservation Area (WCA) 3A and 3B. The purpose of this testing is to determine what archaeological resources are in the area that may be effected by the project and to determine National Register of Historic Places (NRHP) eligibility of those archaeological resources. Results of this testing will guide and inform the CEPP team and consultation concerning cultural resources will continue as the project develops.

Because of the unique nature of the environment a research design was developed, through consultation, specifically for WCA 3A and 3B, which includes both tree islands and historic canals/levees. Provided below is an overview of how archaeological investigations within WCA 3A and 3B will be carried out. We seek your concurrence on this methodology, which was originally presented in full in our letter on 06 March 2012.

1. Through consultation with the Miccosukee Tribe of Indians of Florida and Seminole Tribe of Florida, 45.89 miles of historic levees/canals and 33 tree islands were selected for investigations.
2. Levee/Canals and any associated features will be recorded and assessed for NRHP eligibility.
3. Tree islands will undergo a surface inspection before shovel testing.

JUL 12 2012

4. Shovel tests will start on the outside edge of the tree island and work inward toward the center. If artifacts are discovered, progress towards the center will stop. To better understand the history of the site, two 50-centimeter shovel tests will be dug in the highest portion of the site. This method will enable the Corps and the District to answer specific questions about the historic use of the area, while leaving most of the site undisturbed.
5. An archaeologist who specializes in identifying human remains will be in the field at all times. All material recovered from shovel tests will be scanned for the presence of human remains.
6. In the event that human remains are located during fieldwork, all work on the tree island will cease and any material collected from that tree island will be reburied. Human remains or funerary items will not be photographed.
7. All artifacts collected for analysis will be returned to the tree island they were recovered from by January 31, 2013. If human remains are inadvertently discovered during lab analysis, such material and any associated funerary items will be returned to the location in which they were recovered as soon as possible.

At this time, we seek your concurrence on the methodology for testing tree islands and historic canals/levees within WCA 3A and 3B. If you concur, please sign and date on the line provided below and return this letter to Ms. Cynthia Thomas. It is understood that all agreed upon methodologies are subject to review by the Tribal Chairman and that approval may be withdrawn with cause at any time during the project, at which point a new agreement, if any, will be written. Any questions or concerns that you may have can also be addressed by Ms. Thomas by contacting her at (904) 232-1180 or via email: Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Eric P. Summa
Chief, Environmental Branch

CONCURRENCE: Fred E. Dayhoff
Miccosukee Tribe of Indians of Florida, NAGPRA Representative and Consultant

DATE: July 13 2012

SEMINOLE TRIBE OF FLORIDA

TELEPHONE
(954) 967-3900

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(954) -967-3463

WEBSITE:
www.seminoletribe.com

6300 STIRLING ROAD
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Tribal Officers:

JAMES E. BILLIE
Chairman

TONY SANCHEZ, JR.
Vice Chairman

PRISCILLA D. SAYEN
Secretary

MICHAEL D. TIGER
Treasurer

VIA ELECTRONIC & REGULAR U.S. MAIL

September 26, 2012

Colonel Alan M. Dodd
U.S. Army Corps of Engineers
Jacksonville District
Post Office Box 4970
Jacksonville, Florida 32331-0019

Re: Everglades Restoration Transition Plan

Dear Colonel Dodd:

I am pleased to inform you that on September 14, 2012, the Seminole Tribe of Florida's Tribal Council formally ratified both the Programmatic Agreement and Human Remains Policy for the Environmental Restoration Transition Plan ("ERTP"). Further, the Tribal Council has elected to participate in the Programmatic Agreement as a Signatory Party. Please find attached a copy of the Programmatic Agreement signed by Chairman James E. Billie. We appreciate the United States Army Corps of Engineers' ("Corps") efforts in cooperatively developing both documents with the Seminole Tribe. Burial resources hold significant cultural and religious importance to the Seminole Tribe. Therefore, we are especially pleased with the development of the Human Remains Policy for ERTP and the Corps' commitment to protect burial resources as trust resources.

This commitment was acknowledged by Colonel Pantano during our May 15, 2012, formal consultation. During that meeting, Colonel Pantano suggested and committed to the development of a Human Remains Policy for ERTP. Colonel Pantano also suggested and committed to developing, in consultation with the Seminole Tribe, a global human remains

policy that would govern all Corps activities throughout Florida. This commitment by Colonel Pantano is reflected in the ERTP Programmatic Agreement. As Colonel Pantano suggested, the global policy would build off the ERTP Human Remains Policy and the 2008 Comprehensive Everglades Restoration Plan Human Remains Policy.

We look forward to the opportunity to collaborate with the Corps in fulfilling the Corps' commitment to the Seminole Tribe to develop a global human remains policy. Both the Corps and the Seminole Tribe will benefit from an agreed upon, streamlined process for the treatment of burial resources. Such a policy will ensure outcomes that timely further project goals in a culturally sensitive manner. The Corps staff has committed to developing a global policy by June 2013, which we believe is a reasonable timeframe.

We are currently conducting formal consultation with the Corps in connection with the Central Everglades Planning Project ("CEPP"). We appreciate the Corps involving the Seminole Tribe and considering cultural resource issues early on in the process. Considering the early stages of CEPP, we believe that CEPP presents an excellent opportunity for the timely development of the global human remains policy. It is important that both the Seminole Tribe and the Corps continue to act on the commitments made to ensure a cooperative approach to the treatment of burial resources and the progress made thus far continues. Therefore, we respectfully request, in connection with CEPP, the Corps initiate formal consultation with the Seminole Tribe to develop the global human remains policy. Thank you again for your time and consideration.

Sincerely,

Jim Shore, General Counsel
Seminole Tribe of Florida

cc:

Cynthia Thomas – U.S. Army Corps of Engineers
Matt Morrison – U.S. Army Corps of Engineers
Kim Taplin – U.S. Army Corps of Engineers
Daniel Hughes – U.S. Army Corps of Engineers
John Pax – U.S. Army Corps of Engineers
Matt Donaldson – U.S. Army Corps of Engineers
Natalie S. Garrett – U.S. Army Corps of Engineers
Danny Tommie – Seminole Tribe of Florida
Paul N. Backhouse – Seminole Tribe of Florida
Anne Mullins – Seminole Tribe of Florida
Craig Tepper – Seminole Tribe of Florida
Patricia Power – Bose Public Affairs Group
Stephen Walker – Lewis, Longman & Walker, P.A.
James Charles – Lewis, Longman & Walker, P.A.

SEMINOLE TRIBE OF FLORIDA
TRIBAL HISTORIC PRESERVATION OFFICE

TRIBAL HISTORIC
PRESERVATION OFFICE

SEMINOLE TRIBE OF FLORIDA
AH-TAH-THI-KI MUSEUM

30290 JOSIE BILLIE HWY
PMB 1004
CLEWISTON, FL 33440

PHONE: (863) 983-6549
FAX: (863) 902-1117

TRIBAL OFFICERS

CHAIRMAN
JAMES E. BILLIE

VICE CHAIRMAN
TONY SANCHEZ, JR.

SECRETARY
PRISCILLA D. SAYEN

TREASURER
MICHAEL D. TIGER

March 19, 2013

Erica Summa
Chief, Environmental Branch
U.S. Army Corps of Engineers
Jacksonville District Office
Attn.: CESAJ-PD-EP
701 San Marco Boulevard
Jacksonville, Florida 32207

RE: Comprehensive Everglades Project Plan (CEPP)-Development of Adaptive Management Plan (AMP) and Memorandum of Agreement (MOA)

Mr. Summa:

I wish to thank you and the Jacksonville District, USACE for meeting with our staff on March 8, 2013 to discuss the next steps for the Central Everglades Project Plan (CEPP). We are encouraged that the Jacksonville District, USACE is committed to developing an Adaptive Management Plan (AMP) that would address STOF concerns by incorporating key provisions of the Everglades Restoration Transition Plan (ERTP) to address cultural resources and human remains including the avoidance of unnatural inundation. Further, this AMP would be formalized by a legally binding Section 106 Compliance Document in the form of a Memorandum of Agreement (MOA).

Based on our meeting and the commitments made, we believe development of an AMP is an appropriate measure to address unexpected and unwanted impacts to burial resources including unnatural inundation. Similar to the Human Remains Policy developed for ERTP, the AMP would be drafted to address the limited knowledge of the resources within the Area of Potential Effect ensuring culturally sensitive treatment of burial resources; a “Plan B” as it was characterized during our meeting. In order to move forward on this initiative, we respectfully request another meeting with Cindy Thomas, Susan Kaynor, and you to formalize the parameters and timeframes for the AMP. Please provide us some potential dates that you, Cindy and Susan would be available.

I would note that Tribal Historic Preservation Office (THPO) staff were somewhat alarmed by statements by USACE technical staff as to the potential effect of CEPP and ERTP operations. As we understand it ERTP appears to have the potential to cause effects that are contrary to those previously communicated

during previous meetings by key USACE staff. During previous ERTP consultations we were lead to believe that ERTP operations would lower watertables throughout the area of potential effect. During our March 8th meeting we were informed that the watertable within Shark River Slough would actually be elevated. This area is well known to contain high frequencies of cultural resources and the lack of explanation for the inconsistency in operation delivery is alarming. The potential for different kinds of impacts from project to project to the same resources highlights the need for a uniform treatment plan for burial resources. Regardless of the project design, purpose or funding, the one constant that remains unwavering is the fact that unnatural inundations is an unacceptable impact that must be avoided. This was acknowledged by Colonel Grosskruger in the 2008 CERP Human Remains Policy and was further strengthen by Colonel Pantano in the ERTP Human Remains Policy. The differences between ERTP and CEPP also highlight the need to consult with the Seminole Tribe on all the projects as a whole versus project by project. In order to ensure project goals and culturally sensitive treatment of burials is achieved, a more global view of the projects (how they work together) and associated cultural resources is needed so as to avoid misunderstandings such as what has occurred. We therefore respectfully request that great care is taken in the future to accurately explain the potential effects of a particular project on places that might have cultural significance for the Seminole Tribe of Florida. We look forward to working with you to develop the above documents.

Regards,

Paul N, Backhouse, Ph.D., Tribal Historic Preservation Officer

CC: Cynthia Thomas, Archaeologist, USACE
Susan Kaynor, Ecosystem Branch, USACE
Anne Mullins, Deputy THPO, Seminole Tribe of Florida
Bradley Mueller, Compliance Supervisor, Seminole Tribe of Florida
James E. Charles, Attorney/Shareholder, Lewis, Longman & Walker, P.A.

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

APR 01 2013

Planning Division
Environmental Branch

Mr. Fred Dayhoff
NAGPRA Representative, Consultant to Miccosukee Tribe
Box 68 Old Loop Road
Ochopee, Florida 34141

Dear Mr. Dayhoff:

The U.S. Army Corps of Engineers (Corps), Jacksonville District in partnership with the South Florida Water Management District is conducting a feasibility study for the Central Everglades Planning Project (DHR Project File No. 2012-01115). As part of that study, a cultural resource survey was conducted within Water Conservation Area 3 resulting in the draft report titled, *Central Everglades Planning Project Cultural Resources Survey of Water Conservation Areas 3A and 3B, Broward and Miami-Dade Counties, Florida.* The draft report contains recommendations on determinations of effects, however the Corps has yet to make a final determination and reserves the right to do so upon submission of the final report.

Please provide your comments within 30 calendar days of receipt of this letter. If there are any questions, contact Ms. Cynthia Thomas at 904-232-1180 or e-mail Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Eric P. Summa
Chief, Environmental Branch

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

APR 01 2013

Planning Division
Environmental Branch

Mr. Paul Backhouse
Tribal Historic Preservation Officer
Seminole Tribe of Florida
Ah Tah Thi Ki Museum
34725 West Boundary Road
Clewiston, Florida 33440

Dear Mr. Backhouse:

The U.S. Army Corps of Engineers (Corps), Jacksonville District in partnership with the South Florida Water Management District is conducting a feasibility study for the Central Everglades Planning Project (DHR Project File No. 2012-01115). As part of that study, a cultural resource survey was conducted within Water Conservation Area 3 resulting in the draft report titled, *Central Everglades Planning Project Cultural Resources Survey of Water Conservation Areas 3A and 3B, Broward and Miami-Dade Counties, Florida.* The draft report contains recommendations on determinations of effects, however the Corps has yet to make a final determination and reserves the right to do so upon submission of the final report. As per your request the draft report has been provided electronically for review.

Please provide your comments within 30 calendar days of receipt of this letter. If there are any questions, contact Ms. Cynthia Thomas at 904-232-1180 or e-mail Cynthia.G.Thomas@usace.army.mil. An electronic copy of this letter has been provided to the following members of your staff: Anne Mullins, Alison Swing, Brad Mueller and Elliott York.

Sincerely,

Eric P. Summa
Chief, Environmental Branch

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

19 JUN 2013

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

Paul Backhouse, Ph.D, RPA
Museum Director and Tribal Historic Preservation Officer
30290 Josie Billie Hwy, PMB 1004
Clewiston, FL 33440

Dear Dr. Backhouse,

Thank you for the invitation to meet with you and your staff members on May 15. I found the discussion to be helpful, enlightening (as it was my first time on the Seminole reservation) as well as very productive. I hope to continue the dialogue well into the future.

You may recall that at the close of our meeting, I offered to write a summary of what was discussed in addition to directly responding to your letter dated March 15, 2013. In your March letter you requested a face to face meeting to discuss Adaptive Management and its potential application to Central Everglades Planning Project (CEPP) as well as requesting clarifying information on the Everglades Restoration Transition Plan (ERTP).

During our meeting, we covered the status of CEPP, with specific focus of where the project fits in the civil works process and how this study phase is different from implementation. We also discussed ERTP as an example of a project in the Operations and Maintenance stage of the civil works implementation process. Finally, we discussed Adaptive Management as an implementation strategy, how it relates to an effects determination, and where we believe we can jointly focus our energies in the future toward addressing your concerns over inundation of human remains.

In summary, Jacksonville District recognizes the Seminole Tribe's interest in incorporating adaptive management principles into CEPP. The Sec 106 consultation process will allow for continued coordination and development of appropriate adaptive management principles, also known as contingency measures, if warranted as the plan design, construction and operations are refined. Such determinations will be made when we have more detailed and refined information, which will enable the most accurate predictions in water deliveries south into the Everglades.

In the interim, we intend to continue the cultural resource identification work underway in CEPP, will make preliminary effects determinations based upon best available information, and will continue to consult with you as additional surveys are planned and conducted throughout the project. We would also like your continued collaboration on the development of the updated Jacksonville District Human Remains Policy, a commitment from our current and former District Commander. We expect this new policy to replace the existing CERP 2008 Human Remains Policy, and be applied to all civil works and regulatory projects within the Jacksonville District, including CEPP in the implementation phase. This is a large endeavor which has the potential to serve us for many years, but will only occur if we are equally committed to its development.

Finally, at the meeting we discussed how adaptive management principles/contingency plans have already been incorporated into the ERTP project, including your concerns regarding the expected water levels in Shark River Slough through the implementation of ERTP. For more detailed and specific information, we will ensure that the all necessary members of the ERTP team will be available to discuss water levels at the next ERTP quarterly meeting currently scheduled for July 18, 2013.

Again, I appreciate the opportunity to meet with you and your staff and would like to continue such discussions, preferably face-to-face, with some frequency in the future. In the interim, I intend to pursue quickening the pace of our Human Remains policy and will ensure that we have appropriate stakeholders present for the discussions. If you have any additional questions with regards to the Human Remains policy, feel free to contact Natalie Garrett, Tribal Liaison; questions concerning CEPP, please contact Cynthia Thomas, CEPP Cultural Resources Lead or questions concerning ERTP, contact Grady Caulk, ERTP Cultural Resources Lead. As always, I am available to assist you in any way that I can, so do not hesitate in contacting me when necessary.

Sincerely,

19 JUN 2013

Eric P. Summa
Chief, Environmental Branch

Copy Furnished:
Susan Kaynor, Section Chief, Ecosystem Branch, USACE
Anne Mullins, Deputy THPO, Seminole Tribe of Florida
Bradley Mueller, Compliance Supervisor, Seminole Tribe of Florida
James E. Charles, Attorney/Shareholder, Lewis, Longman & Walker, P.A.

for

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

2 6 JUL 2013

Planning and Policy Division
Environmental Branch

Mr. Fred Dayhoff
NAGPRA Representative, Tribal Consultant
Miccosukee Tribe of Indians of Florida
P.O. Box 440021
Miami, Florida 33144

Dear Mr. Dayhoff:

The U.S. Army Corps of Engineers (Corps) in partnership with the South Florida Water Management District (District) are conducting a feasibility study for the Central Everglades Planning (CEP) Project (DHR Project File No. 2012-01115). A component of the feasibility study will be the construction and operation of a 14,000 acre Flow Equalization Basin (FEB) within the Everglades Agricultural Area Cell A-2 (EAA A-2). For your records, in 2002 this parcel was consulted under the description Everglades Agricultural Area Storage Reservoirs Project Component A (DHR Project File No. 2002-09656).

Following consultation with your office on 2012 April 27 and subsequent review of previous research conducted in the area (Survey # 5610 and 4869), the Corps concluded that additional investigations would be required for the EAA A-2 FEB footprint. With the use of historic and modern aerials, the Corps identified vegetation anomalies within the project area, and contracted Southeastern Archaeological Research Inc. to conduct field investigations of those specific areas. As a result, three prehistoric midden sites (8PB16037, 8PB16039, and 8PB16040) and one historic agricultural work camp (8PB16038) were identified The Corps has determined that only prehistoric site 8PB16039 meets the criteria for eligibility for listing on the National Register of Historic Places.

For the CEPP feasibility study, only preliminary FEB design plans have been developed, which makes it impracticable for the Corps to make a final determination of effect on significant cultural resources at this time. Once Congress has authorized the CEP Project and the FEB enters into the detailed design phase, the Corps will make a final determination of effect for site 8PB16039. [redacted]. Currently the EAA A-2 property is under lease to Florida Crystals by the District and actively cultivated with sugar cane.

In accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended, we seek your comments on the draft report titled, *Central Everglades Planning Project, Cultural Resources Investigation of Everglades Agricultural Area Cell A-2, Palm Beach County, Florida* within 30 calendar days of receipt of this letter. If you have any questions, please contact Ms. Cindy Thomas at (904) 232-1180 or via email Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Eric Summa
Chief, Environmental Branch

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
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Planning and Policy Division
Environmental Branch

Mr. Fred Dayhoff
NAGPRA Representative, Tribal Consultant
Miccosukee Tribe of Indians of Florida
P.O. Box 440021
Miami, Florida 33144

Dear Mr. Dayhoff:

The U.S. Army Corps of Engineers (Corps) and Everglades National Park (ENP) conducted a Phase I Survey of a 5.38-mile corridor along the L-67 Extension (L-67 Ext.) as part of the Central Everglades Planning Project (CEPP) feasibility study from January 16 through January 18, 2013. The CEPP proposes to use material from the L-67 Ext. levee to backfill the associated borrow canal. The area of potential effect (APE) for this proposed feature of CEPP consists of a 46-meter wide corridor starting at Tamiami Tail (U.S. 41) running south 5.38-miles along the L-67 Ext.

With the use of historic and modern aerial photographs, and in consultation with ENP, the Corps concluded that areas with high probability for site locations did not exist within the APE. To verify these findings, the project archaeologist along with ENP staff visited specific locations and conducted surface inspections and subsurface testing. No cultural material over 50 years of age was observed. As a result, the Corps has determined that there will be no effect to historic properties within the APE of the proposed backfilling and levee degrading of the L-67 Ext.

In accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended, we ask for your comments on the enclosed draft report titled, *Phase I Archeological Survey of a 5.38-Mile Corridor Along the L-67 Extension* within 30 calendar days of receipt of this letter. If you have any questions, please contact Ms. Cindy Thomas at (904) 232-1180 or via email Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Eric Summa
Chief, Environmental Branch

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
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JACKSONVILLE, FLORIDA 32232-0019

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Planning and Policy Division
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Museum Director and Tribal Historic Preservation Officer
30290 Josie Billie Hwy, PMB 1004
Clewiston, Florida 33440

Dear Dr. Packhouse:

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For the CEPP feasibility study, only preliminary FEB design plans have been developed, which makes it impracticable for the Corps to make a final determination of effect on significant cultural resources at this time. Once Congress has authorized the CEP Project and the FEB enters into the detailed design phase, the Corps will make a final determination of effect for site 8PB16039. In addition, consultation will be needed to identify methods to address potential impacts to site 8PB106040, which contains human remains. Currently the EAA A-2 property is under lease to Florida Crystals by the District and actively cultivated with sugar cane.

As per request of your office, the draft report titled, *Central Everglades planning Project, Cultural Resources Investigation of the Everglades Agricultural Area Cell A-2, Palm Beach County, Florida* has been provided electronically for review.

In accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended, we seek your comments on the above referenced draft report within 30 calendar days of receipt of this letter. If you have any questions, please contact Ms. Cindy Thomas at (904) 232-1180 or via email Cynthia.G.Thomas@usace.army.mil.

Sincerely,

Eric Summa
Chief, Environmental Branch

Copy Furnished:
Ann Mullins, Deputy THPO, Seminole Tribe of Florida
Bradley Mueller, Compliance Supervisor, Seminole Tribe of Florida
Alison Swing, Compliance Analyst, Seminole Tribe of Florida

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
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Sincerely,

Eric Summa
Chief, Environmental Branch

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Bradley Mueller, Compliance Supervisor, Seminole Tribe of Florida
Alison Swing, Compliance Analyst, Seminole Tribe of Florida