ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

Planned Temporary Deviation 1981 Lake Kissimmee, Cypress, and Hatchineha (KCH) Interim Regulation Schedule

Osceola and Polk Counties

US Army Corps of Engineers ®
Jacksonville District

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FINDING OF NO SIGNIFICANT IMPACT

PLANNED TEMPORARY DEVIATION 1981 LAKE KISSIMMEE, CYPRESS, AND HATCHINEHA INTERIM REGULATION SCHEDULE

OSCEOLA AND POLK COUNTIES, FLORIDA

The U.S. Army Corps of Engineers, Jacksonville District (Corps) has conducted an environmental analysis in accordance with the National Environmental Policy Act of 1969, as amended. The Final Environmental Assessment (EA) dated 18 March 2020, for the 1981 LAKE KISSIMMEE, HATCHINEHA AND CYPRESS INTERIM REGULATION SCHEDULE addresses restoration opportunities and feasibility in Osceola and Polk Counties, Florida. The Final EA, incorporated herein by reference, evaluated various alternatives that would allow flexibility to maintain reduced releases from Lake Kissimmee to avoid Kissimmee River overbank flow that may have potential effects to the completion of Kissimmee River Restoration construction in the study area. The recommended plan is Alterative B and includes:

- A Planned Temporary Deviation to the Lake Kissimmee, Hatchineha and Cypress Interim Regulation Schedule that would raise the low summer pool elevation from 49.0 to 51.0 feet, NGVD29 in order to better facilitate construction along the Kissimmee River. The intent of the deviation is to limit Lake Kissimmee releases to 900 cfs or less until 1 June in order to facilitate Kissimmee River Restoration (KRR) construction in Reach 2 by preventing flows at S-65A from exceeding 900 cfs and flooding the construction site. The temporary deviation raises the regulation schedule from February 1 through June 1 creating Zone B1 which will provide greater operational flexibility to SFWMD and increases the likelihood of providing flows within the desirable range for the Corps' on-going construction. The top of Zone B1 would linearly transition from February 1 at elevation 52.5 feet to June 1 at elevation 51 feet. This new zone will provide the South Florida Water Management District (SFWMD) the flexibility to begin the recession at any elevation below 52.5 feet and to maintain releases from Lake Kissimmee as measured at S-65A up to 900 cfs as long as the Lake stage remains in Zone B or B1. If the stage is within 0.5 foot of Zone B1 then releases should be made to bring the stage back down to the regulation schedule within 15 days.

In addition to a "no action" plan and recommended plan, two other alternatives were evaluated. These alternatives included: Alternative C) raise the KHC regulation schedule low summer pool elevation from 49.0 to 51.75 feet, NGVD29 on 1-June and continue to recede to 51.0 until 1-August; and Alternative D) a deviation to raise the KHC regulation schedule low summer pool elevation from 49.0 to 52.50 feet, NGVD29 on 1-June and continue to recede to 51.0 until 1-August. Refer to Section 2 of the Draft EA for evaluation of alternatives.

For all alternatives, the potential effects to the following resources were evaluated as noted in the table below:

	In-depth evaluation conducted	Brief evaluation due to minor effects	Resource unaffected by action
Aesthetics	☐	☐	☒
Air quality	☐	☐	☒
Aquatic resources/wetlands	☐	☒	☐
Invasive species	☐	☐	☒
Fish and wildlife habitat	☐	☒	☐
Threatened/Endangered species	☐	☒	☐
Historic properties	☐	☐	☒
Other cultural resources	☐	☐	☒
Floodplains	☐	☒	☐
Hazardous, toxic & radioactive waste	☐	☐	☒
Hydrology	☐	☒	☐
Land use	☐	☐	☒
Navigation	☐	☐	☒
Noise levels	☐	☐	☒
Public infrastructure	☐	☐	☒
Socio-economics	☐	☐	☒
Soils	☐	☐	☒
Tribal trust resources	☐	☐	☒
Water quality	☐	☐	☒
Climate change	☐	☐	☒

All practical means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan. The following best management practices (BMPs) as detailed in the EA will be implemented to minimize impacts: 1) Recession rates to meet fish and wildlife needs would be below the maximum rates of 0.5 feet per month and may be lower than 0.25 feet per month; 2) Standard fish and wildlife recommendations for dry season operations, dated 2015, would be followed to provide guidance on how to minimize adverse effects of reversals on Everglade snail kite nesting and wading bird foraging; 3) Keeping Zone A discharges to avoid risk of flooding adjacent agricultural, rural, and endangered species habitat; and 4) The deviation could be terminated at any time when hydrometerological conditions cause greater impacts than expected/discussed in the EA.

No compensatory mitigation is required as this is a temporary operational change. Pursuant to section 7 of the Endangered Species Act of 1973 (Public Law 93-205, 16 U.S.C. 1531 et seq.), as amended, the U.S. Army Corps of Engineers determined that the recommended plan may affect but is not likely to adversely affect the following federally listed species or their designated critical habitat: Everglade snail kite and wood stork. The U. S. Fish and Wildlife Service (USFWS) concurred with the Corps' determination on February 12, 2020. Pursuant to Section 106 of the National Historic Preservation Act of 1966 (Public Law 89-665), as amended, the U.S. Army Corps of Engineers determined that the recommended plan has no potential to cause effects on historic properties.

Public review of the Draft EA was completed on 16 March 2020. The EA was posted on the Jacksonville District website at https://www.saj.usace.army.mil/About/Divisions-Offices/Planning/Environmental-Branch/Environmental-Documents/ under multiple counties. All comments submitted during the public comment period are contained in Section 6.4 of Final EA in Appendix B.

Technical and environmental criteria used in the formulation of alternative plans were those specified in the Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on this report, the reviews by other Federal, State and local agencies, Tribes, input of the public, and the review by my staff, it is my determination that the recommended plan would not significantly affect the human environment; therefore, preparation of an Environmental Impact Statement is not required.

KELLY.ANDREW.DONALD.JR.1025510875

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Date: 2020.04.07 13:04:41 -04'00'

Date

Andrew D. Kelly, Jr.
Colonel, U.S. Army
District Commander

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ENVIRONMENTAL ASSESSMENT
PLANNED TEMPORARY DEVIATION 1981 LAKE KISSIMMEE, HATCHINEHA AND CYPRESS INTERIM REGULATION SCHEDULE
OSCEOLA AND POLK COUNTIES

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1 PROJECT PURPOSE AND NEED

1.1 Project Authority

The authority for the Lake Kissimmee, Cypress and Hatchineha (KCH) water management operations is the Flood Control Act of 1948 (Public Law 90-483), approved by Congress on June 30, 1948) and other subsequent acts listed in **Section 1.7**. It authorized the Central and Southern Flood Control Project (C&SF), a multipurpose project that provides flood control; supplies water for municipal, industrial, and agricultural uses; prevents salt water intrusion; supplies water for Everglades National Park (ENP); and protects fish and wildlife resources. The Kissimmee River Basin Flood Control Project was authorized as an addition to the C&SF Project by the Flood Control Act of 1954 (Public Law 83-780). The C&SF project resulted in unintended environmental consequences in the Kissimmee River upper and lower basins. Section 101(8), of the 1992 Water Resources Development Act (WRDA) (Public Law 102-580) authorized ecosystem restoration for both the Kissimmee River and Headwaters region (refer to 2016 Kissimmee River Restoration Post Authorization Change Report for an authorization history) and in 1996, the Kissimmee River Headwaters Revitalization Project (HRP), Integrated Project Modification Report and Supplement to the Final EIS. Several changes to the Kissimmee River Restoration (KRR) Project were authorized in the Post-Authorization Change Report, in 2016 which authorized work performed by the South Florida Water Management District (SFWMD), the non-federal sponsor, for both the Lower and Upper Basins as eligible for credit towards SFWMD's share of the KRR Project.

The Corps is responsible for the development of regulation schedules for operation of C&SF Project water management structures to ensure that Congressionally-authorized project purposes are met. Current Lake KCH operations are managed under the 1981 Lakes KCH Interim Regulation Schedule and the Central and South Florida Project Master Water Control Manual for Kissimmee River – Lake Istokpoga Water Control Manual (August 1994). Chapter 7 of this manual includes the regulation schedules for the upper basin lakes including the 1981 Lakes Kissimmee, Hatchineha, and Cypress Interim Regulation Schedule. As a result of the KRR construction in the lower basin, the WCP for S-67, S-67X, S-68X, S-83X, S-84X. S-65DX1, and S-85DX2 was incorporated in the Master Water Control Manual (March 2012). This WCP was updated again in September 2016 to include Structure 65EX1(S-65EX1). In the 1992 WRDA, Congress jointly authorized the ecosystem restoration of the Kissimmee River and the Kissimmee River HRP. Modifications in the Kissimmee Upper Basin were deemed necessary for the successful restoration of the Lower Basin ecosystem. Objectives of the study were established to: (a) develop a plan which provides the necessary storage and regulation schedule modifications to approximate historical flow characteristics to achieve or exceed the benefits ascribed to Kissimmee River Restoration, and (b) increase the quantity and quality of the wetland habitat in the Upper Basin lake littoral zones to benefit fish and wildlife (KRR Headwaters EIS, USACE 1996). The final headwaters regulation schedule changes have not yet been updated as construction is not yet complete for the KRR. However, recent events require changes to Lake KCH operations in the dry season to avoid continued effects to remaining KRR construction downstream. Therefore, a deviation from the current 1981 KCH schedule is necessary t to avoid negative effects to remaining KRR construction downstream of KCH.

The SFWMD was established by Chapter 373, Florida Statutes (F.S.), 1972. SFWMD is the non-federal sponsor of the C&SF Project. All project lands and works including water control structures located within the Kissimmee watershed and River are owned, maintained, and operated by SFWMD in accordance with 33 CFR 208.10 and approved Corps' water control plans, as part of the C&SF Project for flood protection and other authorized purposes. The regulation schedule represents the seasonal and monthly lake levels

which guides the regulation of the project for flood control, navigation, enhancement of fish and wildlife and water supply purposes. The deviation will provide flexibility for managing releases out of Lake Kissimmee to meet multiple project purposes, while allowing for continued KRR construction.

1.2 Project Location

The Kissimmee River Upper Basin is located in central Florida, and falls within Orange, Polk and Osceola counties (**Figure 1-1**). The Cities of Kissimmee and Orlando are located north of the Upper Basin. The Upper Basin also referred to as the Headwaters, is bounded on the South by State Road 60 (SR-60). SR-60 is the point where Lake Kissimmee releases through water management structure, S-65 (**Figure 1-2**), into Pool A of the Kissimmee River Lower Basin. The Kissimmee Chain of Lakes is divided into two regions the upper region reaching Orange County and the lower region in Osceola and Polk Counties and consists of 10 lakes. The focus of this EA is three lakes in the Upper Kissimmee Basin, Lakes Kissimmee, Hatchineha, and Cypress. Within the cumulative effects evaluation, the Corps will include downstream effects of the releases through S-65 associated with the deviation. These releases through the Kissimmee River eventually reach Lake Okeechobee.

General Location Map

Figure 1-1: Kissimmee Headwaters Location Map.

Figure 1-2: Kissimmee Watershed Highlighting Headwaters and Kissimmee River Floodplain.

The KRR Project is composed of two sub-basins. The upper basin includes the Kissimmee Chain of Lakes and forms the Kissimmee River's headwaters (**Figure 1-3**). The restoration effort in upper basin of the project area is referred to as the Headwaters Revitalization Project (HRP). The restoration effort in the lower basin is referred to as the KRR Project (KRR) which begins at the outlet of Lake Kissimmee and extends south to structure S-65E and S-65EX1 (S-65 and S-65EX1, respectively (See **Section 2**, **Figure 2-1**). However, both restoration components were jointly authorized and are referred to collectively as the KRR Project (KRR) throughout this report.

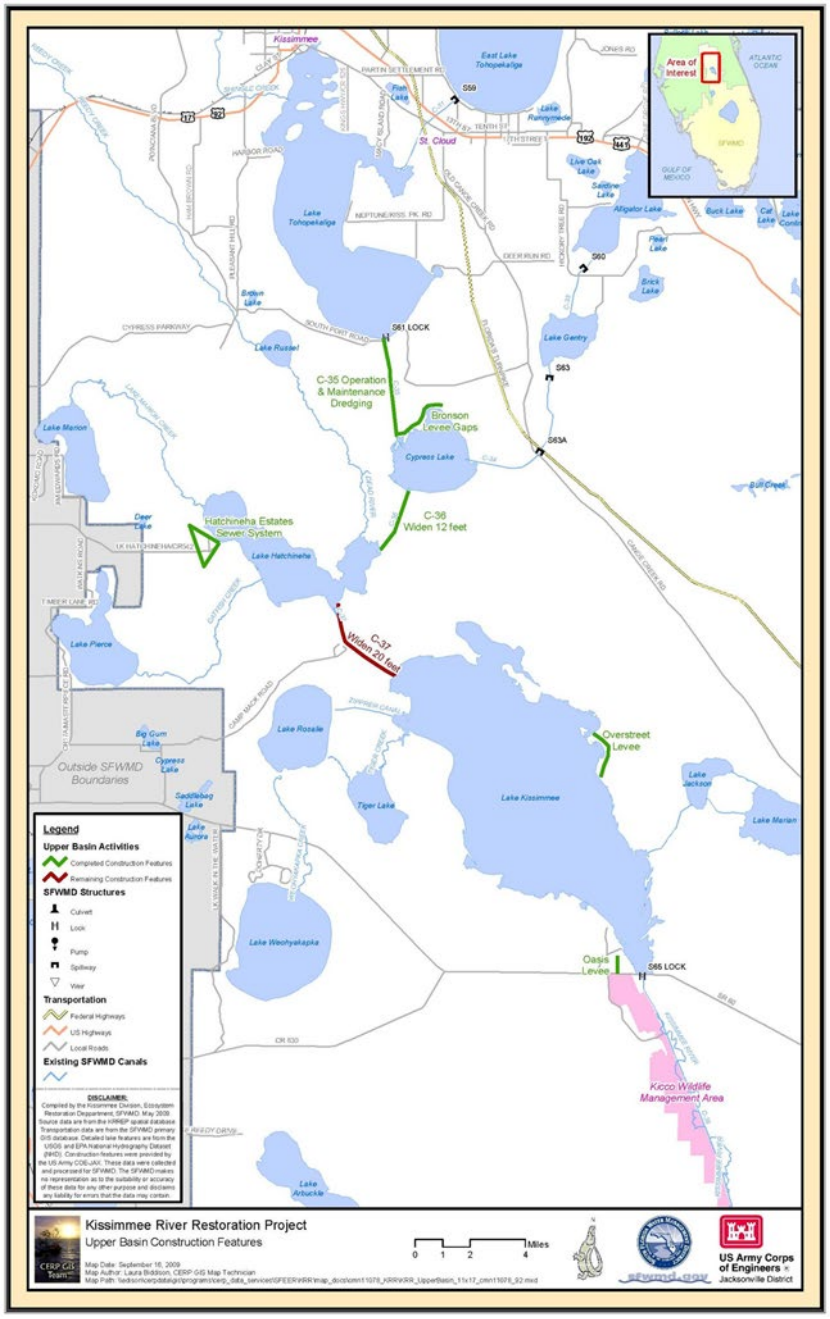


Figure 1-3: KRR Project Map, Upper Basin.

1.3 Project Background

The HRP was justified as being necessary for successful restoration of the Kissimmee River ecosystem from its previous channelized condition. Increased seasonal water storage in the headwaters of the Kissimmee River (**Figure 1-2**) is essential to restoring the natural seasonality of flow, and allows the floodplains to be inundated long enough to meet restoration goals. The HRP is required to provide the necessary storage and regulation schedule modifications to approximate historical flow characteristics required for river restoration and to increase the quantity and quality of lake littoral zone habitat to benefit fish and wildlife.

The HRP includes both structural and non-structural modifications to attain restoration goals. Structural modifications included improving three canals (maintenance dredging of C-35 and widening of C-36 and C 37) between the lakes in the Upper Basin and increasing the release capacity of structure S-65 at the Lake Kissimmee outlet (**Figure 1-3**). Non-structural components consisted of modifying the S-65 regulation schedule and increasing the regulation schedules of Lakes Kissimmee, Hatchineha, Cypress, and Tiger. With the exception of implementing the new S-65 regulation schedule, the remainder of the HRP is complete. In the lower Kissimmee River Basin, Reach 1 construction was completed in 2001 and Reach 4 was completed in 2010, restoring continuous water flows to approximately 19 of 44 miles of the Kissimmee River. Reaches 2 and 3 are nearing completion and include backfilling the C-38 canal, and restoring flow to 9 miles of the historic river. The construction of the S-69 u-shaped weir at the downstream terminus of Reach 3 backfill is scheduled for completion in summer 2020. Construction contract locations are shown in **Figure 1-4**. Lake Kissimmee, Hatchineha, and Cypress are regulated by a single structure, S-65, located at the outlet of Lake Kissimmee. S-65 is a spillway located at the head of the C-38 canal (i.e. the Kissimmee River). The lakes are currently regulated between elevations 48.5 and 52.5 feet NGVD according to the seasonally varying schedule, as shown in **Figure 1-5**. The HRP project described in the 1996 study and EIS covered changes to increase greater storage capacity by re-establishing the historic frequency of lake stage fluctuations above 52.5 feet National Geodetic Vertical Datum (NGVD) (the current maximum regulated stage in the four lakes controlled by S-65) and allowing these lakes to rise to 54.0 feet NGVD. In addition to permitting a more natural flow regime for the river, this change in high pool elevation would increase wetlands around these lakes to approximately 34,000 acres and would improve the quality of littoral zone habitat.

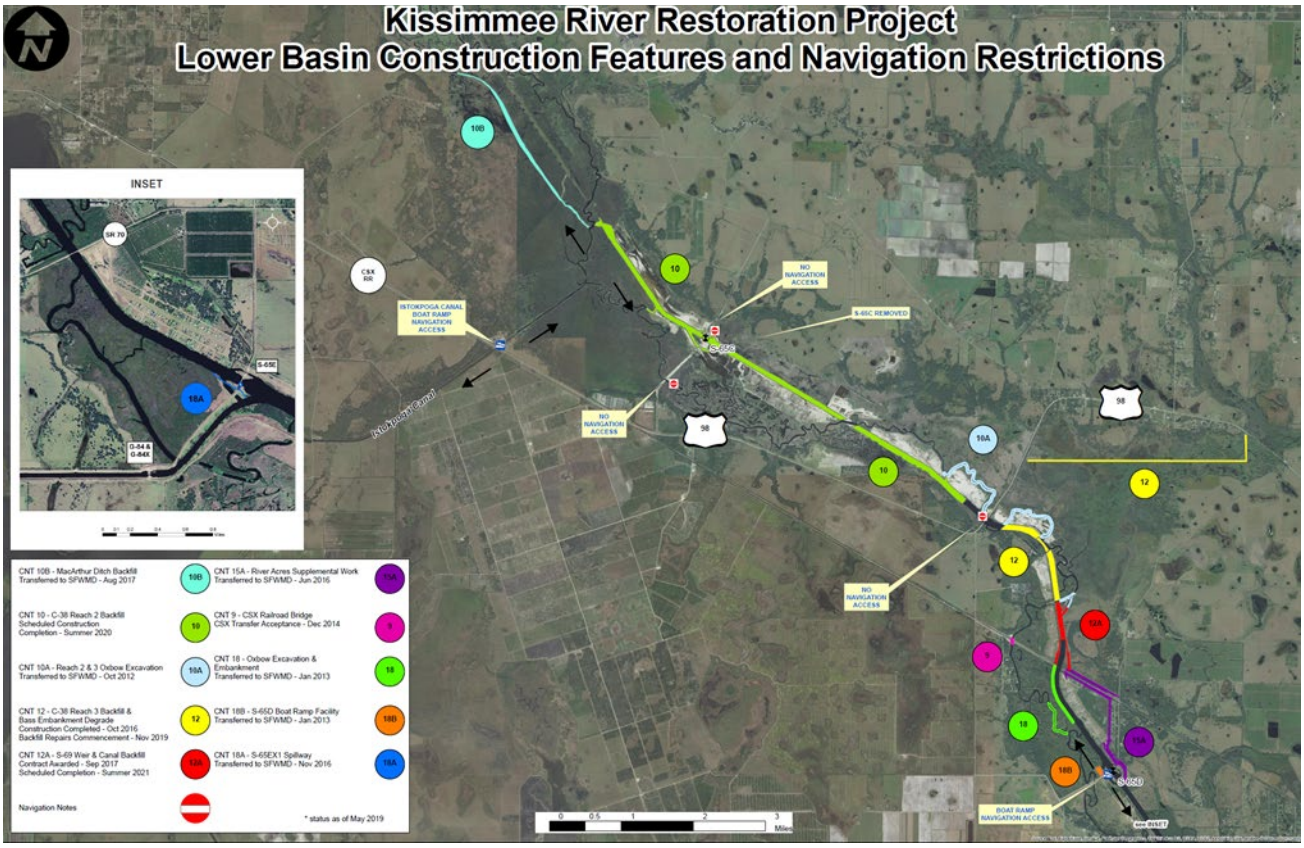
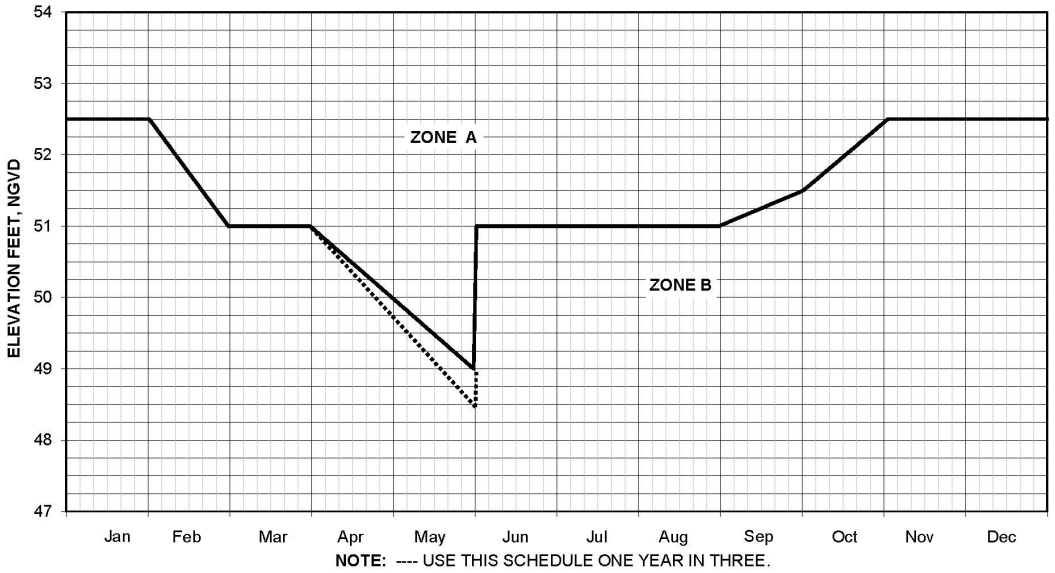


Figure 1-4: Kissimmee River Restoration Project lower basin construction features and navigation restrictions.



ZONE	RELEASES S-65
A	3,000 CFS UP TO DESIGN CAPACITY (11,000 CFS) WITHOUT EXCEEDING DESIGN CONDITIONS DOWNSTREAM. WHEN THE LAKE IS WITHIN 0.5 FT. OF DESIRED STAGE, FORECASTS WILL THEN BE MADE AND RELEASES STARTED TO BRING THE LAKE BACK DOWN TO SCHEDULE WITHIN 15 DAYS.
B	TO MAINTAIN MINIMUM FLOWS

CENTRAL AND SOUTHERN FLORIDA
KISSIMMEE RIVER BASIN

LAKE KISSIMMEE,
HATCHINEHA & CYPRESS
INTERIM REGULATION SCHEDULE

US ARMY ENGINEER DISTRICT
JACKSONVILLE FL

DATED: 1 DECEMBER 1981

Figure 1-5: Existing regulation schedule for Lakes Kissimmee, Cypress and Hatchineha for 2020 (SFWMD).

1.4 Project Need or Opportunity

Currently KRR construction is ongoing within the floodplain of Reach 2 (downstream of S-65A) and is expected to continue through the spring of 2021. The KRR project, a corner stone project for restoring Florida's greater Everglades, is nearing completion. The construction activity in Reach 2 is critical to completing this historic project. Construction activity is dependent upon the floodplain being dry enough for machinery to work on. Flows in the Kissimmee River over 900 cfs adjacent to the construction site can cause water to flow out of the river banks and into the floodplain, impacting construction activities. There is a need to minimize the likelihood of flows over 900 cfs occurring within this reach of the Kissimmee River.

The current KCH schedule requires lowering lake stages during the dry season in order to create storage for wet season rains and maintain flood risk reduction, which is achieved by making releases from S-65. These releases out of S-65 are often up to 2000 cfs in order to follow the regulation schedules. Recent experience by water managers, scientists, and construction crews have identified that flows above 900 cfs can cause water to rise above the Kissimmee River banks and into the flood plain, where the KRR reach

2 construction activities are occurring. Increased water levels along the river banks and into the adjacent riverine floodplain affects the ability for construction equipment to move fill into the C-38 channel. The HRP project included real estate acquisition along Lake KCH shore in order to accommodate the increase in the top of the lake regulation schedule up to elevation 54 ft. NGVD and to ensure that any increase in flood stages resulting from the HRP were limited to lands in which a real state interest had been obtained. This will allow for more storage and flexibility in Lake KCH without impacting flood control objectives. Additional storage allowed during the deviation will provide flexibility to keep flows at or below 900 cfs and therefore increase the time available for KRR construction to continue.

In order to follow the 1981 Lakes Kissimmee, Hatchineha, and Cypress Interim Regulation Schedule, the weather in the Upper Kissimmee Basin is a primary consideration for water management operations. January 2020 rainfall was below SFWMD's district-wide average (approximately 30% of the average) as shown in **Figure 1-6**. Thus far, February rainfall is just above SFWMD's average (**Figure 1-7**). The National Oceanographic and Atmospheric Administration's Climate Prediction Center's latest Three-Month Precipitation Outlook is forecasting above average rainfall, as shown in **Figure 1-8**. Average (1989-2018) February rainfall for the Kissimmee region is between 2 and 2.15 inches total and March is usually wetter between 2.6 and 2.9 inches total. South Florida rainy season typically begins mid-May to mid-June where monthly rainfall averages up to 8 inches.

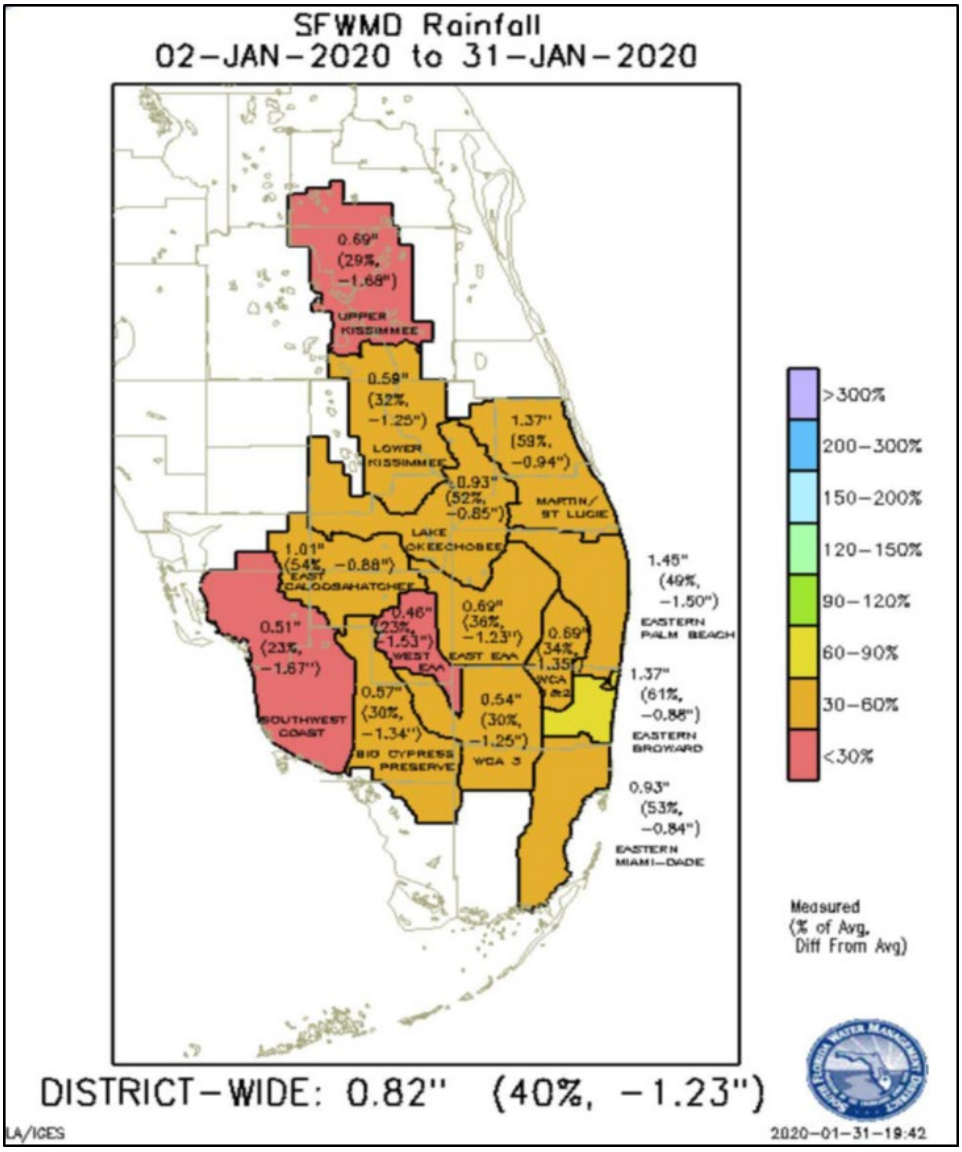


Figure 1-6: January 2020 rainfall in South Florida (SFWMD).

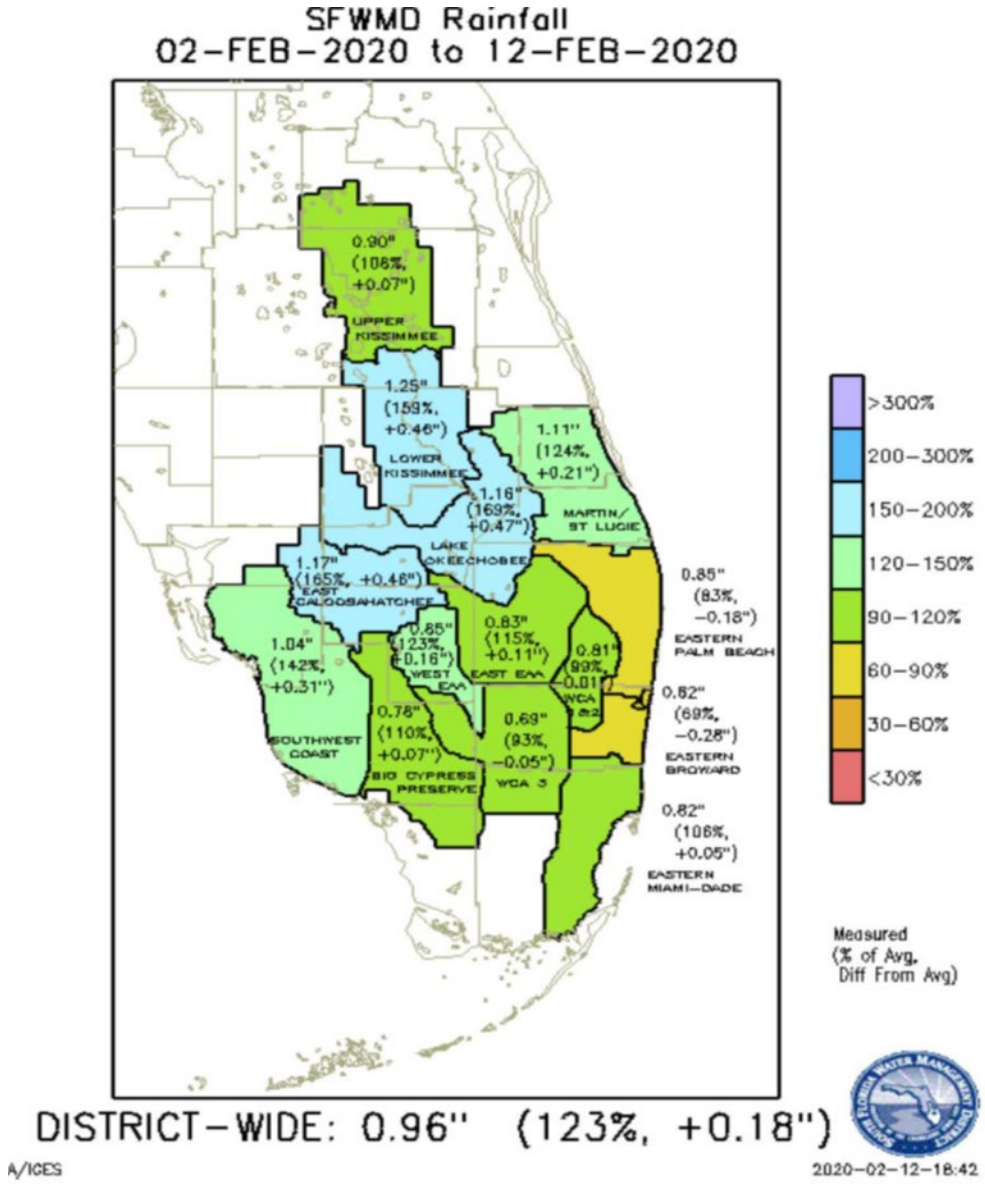


Figure 1-7: Latest February rainfall in South Florida (SFWMD).

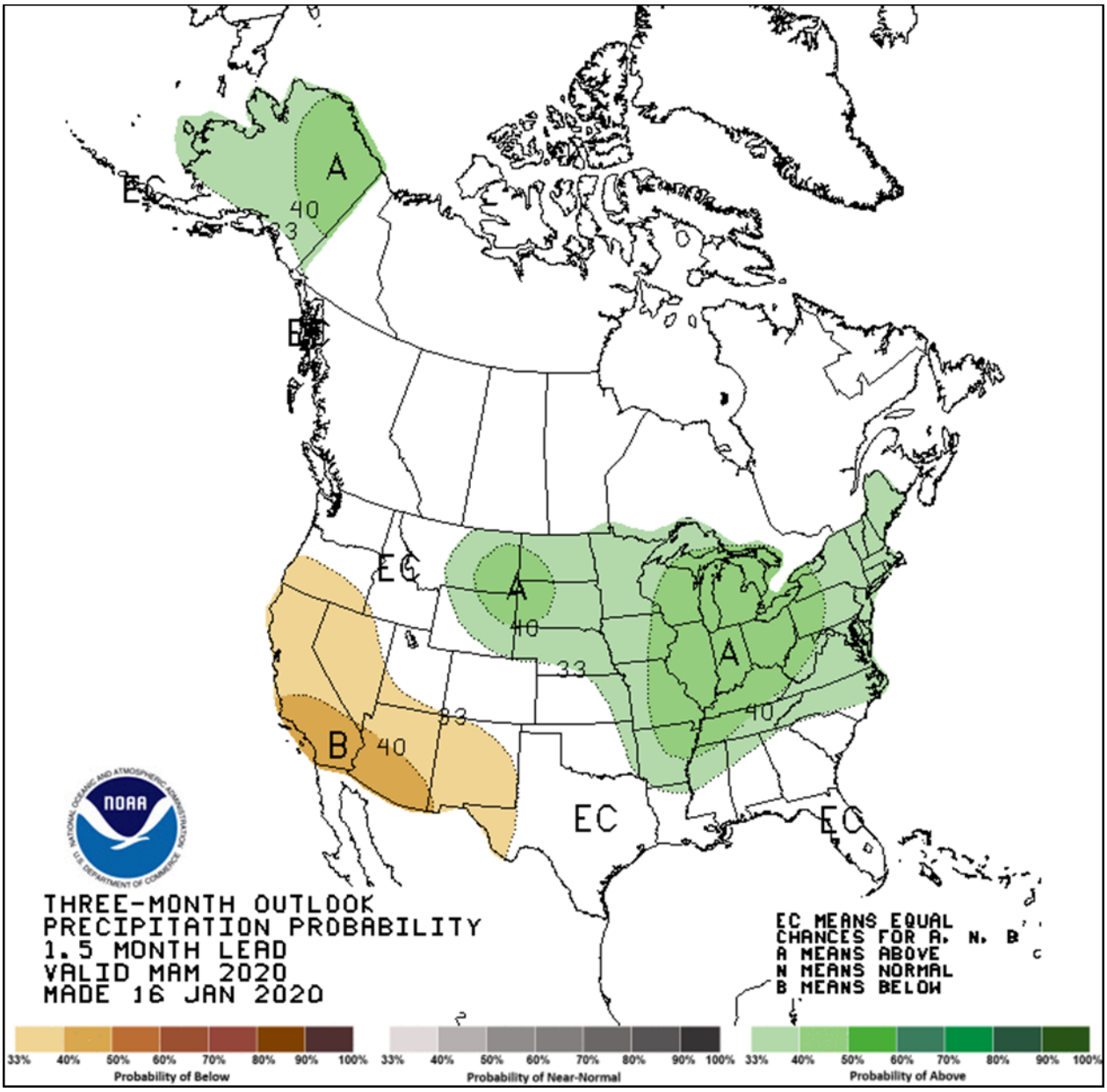


Figure 1-8: Three Month Precipitation Probability Outlook (NOAA Climate Prediction Center).

Over the past three years, construction has been halted each year when flows from Lake Kissimmee through S-65 are increased when drawing down Lake Kissimmee to its June 1st low summer pool. This planned deviation is necessary because flows greater than 900 cfs during the dry season as measured at S-65A cause water to rise out of the Kissimmee River bank and inundate the adjacent riverine floodplain, and may have a higher likelihood of effects to the construction site at the Reach 2 and Reach 3 sites. Effects to the productivity of the construction effort could delay the completion of the KRR Project which in turn increase costs and the time to realize the full benefits of the Project. Explained in **Section 2-2**, the proposed temporary deviation would have the recession to the summer low pool entirely in the new Zone B1, which provides SFWMD the flexibility to begin the recession at any elevation below 52.5 and increase the likelihood of maintaining releases from Lake Kissimmee at or less than 900 cfs. There will be no change

to the Structure 65 (S-65) Zone release guidance. Lake Kissimmee levels rising into Zone A, will still trigger S-65 releases above 900 cfs in order to provide the authorized flood risk reduction. Rainfall between S-65 and S-65A may cause flows at S-65A (the structure immediately upstream of the construction site) to go above 900 cfs. Flood risk reduction will still be provided within Lake Kissimmee and between S-65 and S-65E as needed.

1.5 Agency Goals and Objectives

The agency established goal for the KRR Project is to provide the necessary storage and regulation schedule modifications to approximate historical flow characteristics to achieve or exceed the benefits ascribed to Kissimmee River Restoration, and to increase the quantity and quality of the wetland habitat in the Upper Basin lake littoral zones to benefit fish and wildlife (KRR Headwaters EIS, USACE 1996). The Corps' intent with the proposed temporary deviation, consistent with increasing Lake KCH storage, is to balance project purposes while limiting Lake Kissimmee releases until 1 June 2021 in order to facilitate KRR construction in Reach 2. The proposed temporary deviation to raise the summer (June 1) low pool elevation will enhance the ability of the Corps and SFWMD to respond to changes in precipitation and increase the likelihood of providing flows within the desirable range for construction.

1.6 Constraints

The planned deviation would be implemented as soon as possible. This deviation will be in effect from approval of the deviation in 2020 through 1 June 2021, or until KRR construction is complete. The Corps Water Management Section's assessment of conditions and stakeholder or agency input may suspend or discontinue the planned deviation due to impacts greater than expected/discussed within this EA. This deviation may be terminated at any time. The decision making process would include frequent coordination calls with resource agencies about Lake KCH management to avoid impacts to protected species.

1.7 Related Environmental Documents

The Corps has completed a number of environmental documents relevant to the proposed action. Information contained within the previous NEPA documents listed below is incorporated by reference into this EA and proposed FONSI.

- *Environmental Restoration of the Kissimmee River, Florida Final Integrated Feasibility Report and Environmental Impact Statement,* U.S. Army Corps of Engineers, Jacksonville District, December 1991.
- *Fish and Wildlife Coordination Act Report, Kissimmee River Restoration Project,* U.S. Fish and Wildlife Service, Vero Beach, Florida, October, 1991.
- *Kissimmee River Headwaters Revitalization Project: Final Integrated Project Modification Report and Supplement to the Final Environmental Impact Statement,* U.S. Army Corps of Engineers, Jacksonville District, December 1996.
- *Fish and Wildlife Coordination Act Report for the Kissimmee Headwater Lakes Revitalization Project,* U.S. Fish and Wildlife Service, Vero Beach, Florida, June 1996.
- *Department of the Army Environmental Assessment and Statement of Findings: Packingham and Buttermilk Sloughs, SAJ-2006-4466 (IP-MFN).* U.S. Army Corps of Engineers, Jacksonville District, January 23, 2007.

- *Central and South Florida Water Control Plan for S-67, S-67X, S-68X, S-83X, S-84X, S-65DX1, and S-65DX2.* U.S. Army Corps of Engineers, Jacksonville District, March 2012.
- *Kissimmee River Restoration Project Post-Authorization Change Report,* U.S. Army Corps of Engineers, Jacksonville District, May 2015.
- *Kissimmee River Restoration Project General Reevaluation Report: Packingham Slough, Memorandum for the Record on National Environmental Policy Act Compliance* U.S. Army Corps of Engineers, Jacksonville District, March 2016.
- *Central and South Florida Updated Water Control Plan for S-67, S-67X, S-68X, S-83X, S-84X, S 65DX1, and S-65DX2 and S-65EX1.* U.S. Army Corps of Engineers, Jacksonville District, 20 September 2016. The March 2012 water control plan was updated to include S-65EX1 September 2016.

1.8 Decisions to be Made

This EA will evaluate whether to initiate a planned temporary deviation to the 1981 Lake Kissimmee, Cypress, and Hatchineha Interim Regulation Schedule. This EA will also document and evaluate different alternatives to accomplish the objective of facilitating KRR construction in Reach 2. The No Action Alternative and other reasonable alternatives will be studied in detail to identify the Preferred Alternative.

1.9 Scoping and Issues

Reference **Appendix B** for pertinent correspondence related to the proposed action. During coordination, the Florida Department of Environmental Protection (FDEP) noted that the proposed temporary deviation may result in less lake storage for flood purposes depending on rainfall, but that flood risk is minimized due to no change to S-65 Zone release guidance water levels above Zone A. The deviation can be terminated at any time if hydrometerological conditions cause greater impacts than expected and discussed within this EA. The Corps and SFWMD have taken flood risk reduction into account while developing and evaluating alternatives.

1.10 Permits, Licenses and Entitlements

The Corps has determined the proposed action is consistent to the maximum extent practicable with the enforceable policies of Florida's approved Coastal Zone Management Program. The Corps contacted FDEP on February 7, 2020 for the purpose of notification of the proposed action. In an email dated February 14, 2020, FDEP concurred that minimizing Lake Kissimmee releases at S-65A is necessary for the Corps to complete KRR Project construction to backfill C-38 in Reach 2 in 2020, and concurred that overall flood risk is managed by no change to S-65 Zone release guidance above Zone A. The Corps will continue to coordinate with the State of Florida and if applicable, will comply with conditions imposed to the maximum extent practicable.

2 ALTERNATIVES

Each of the following alternatives described below were considered and evaluated against the project purposes and deviation goals, and associated environmental impacts were considered.

2.1 Alternative A: No Action Alternative

The No Action Alternative would continue current water management operations as defined in the 1981 Lake Kissimmee, Cypress, and Hatchineha (KCH) Interim Regulation Schedule discussed and evaluated in the 1996 NEPA (USACE 1996). This would require discharges over 2000 cfs to lower lake stages according to the current regulation schedule. This would flood the Kissimmee River Restoration (KRR) construction site, and also cause a fast recession on Lakes KCH and impact potential nesting for the endangered Everglade snail kite and foraging for the threatened wood stork. Continued delay of KRR restoration postpones achieving full restoration benefits from the KRR project. The rest of the south Florida Everglades ecosystem is dry for this time of year and Lakes KCH represent one potential area of suitable nesting for the Everglade snail kite that would be impacted with this action.

2.2 Alternative B: Raise the KHC regulation schedule low summer pool elevation from 49.0 to 51.0 feet, NGVD29 on 1-June.

The S-65 spillway is located at the outlet of Lake Kissimmee at the head of Canal 38 (C-38). Alternative B is a Planned Deviation Lake Kissimmee, Hatchineha and Cypress Interim Regulation Schedule that would raise the low summer pool elevation from 49.0 to 51.0 feet, NGVD29 in order to better facilitate construction along the Kissimmee River this spring. The intent of the deviation is to increase operational flexibility to limit Lake Kissimmee releases at or below 900 cfs until at least 1 June in order to facilitate Kissimmee River Restoration (KRR) construction in Reach 2. The Alternative B temporary deviation to raise the summer (June 1) pool elevation will provide greater operational flexibility to SFWMD and increase the likelihood of providing flows within the desirable range for the Corps' on-going construction. In order to facilitate KRR construction, this proposed deviation would extend from approval of the deviation in 2020 through 1 June 2021 or until KRR construction is complete. As shown in **Figure 2-1**, the Proposed Lake Kissimmee, Hatchineha & Cypress Regulation Schedule during the Planned Temporary Deviation would have the recession to the summer low pool entirely in Zone B1, which provides SFWMD the flexibility to begin the recession at any elevation below 52.5 and increase the likelihood of maintaining releases from Lake Kissimmee at or below 900 cfs. There will be no changes to the Structure 65 (S-65) Zone A and B Zone release guidance; however, guidance for Zone B1 has been included for consideration of environmental recommendations during the deviation. USACE will continue to provide operational input to SFWMD in real time on the implementation of the deviation and operations throughout the Kissimmee basin. The operational strategy for Alternative B can be found in **Appendix A**.

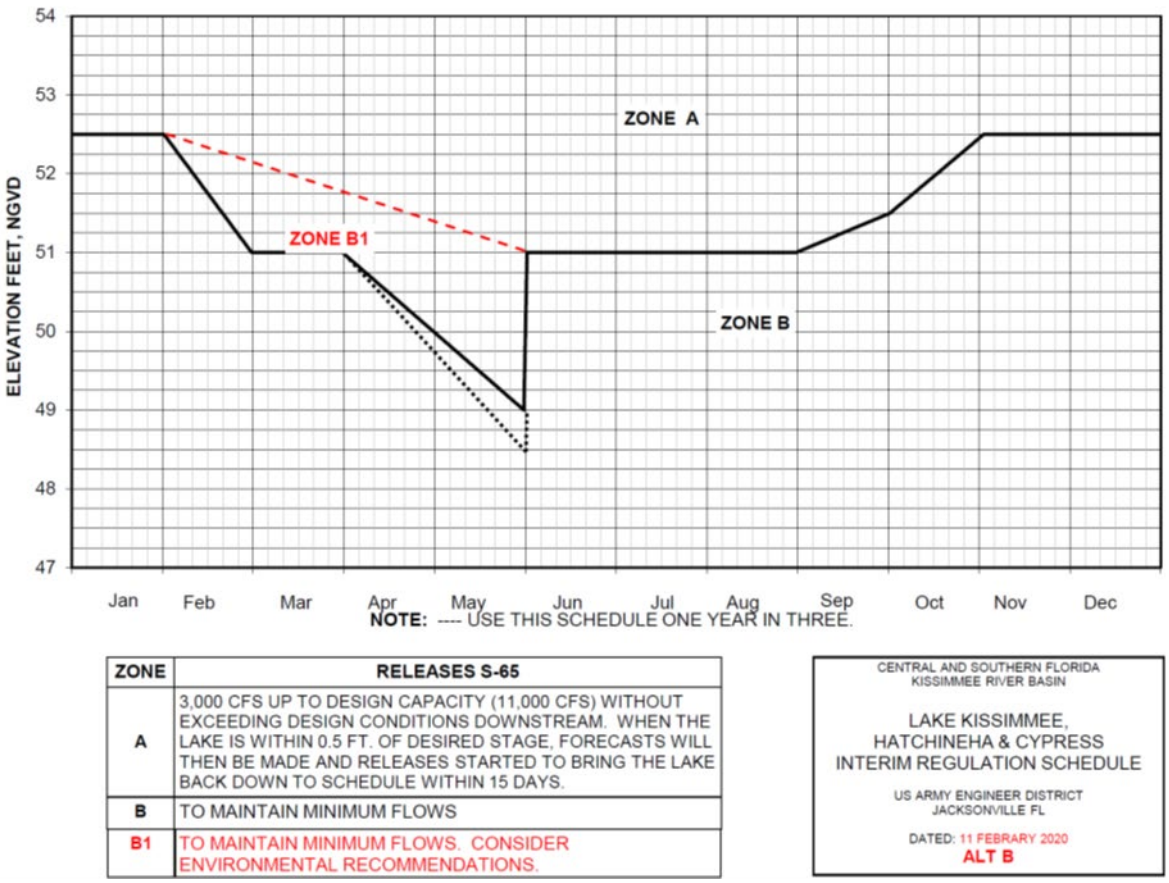
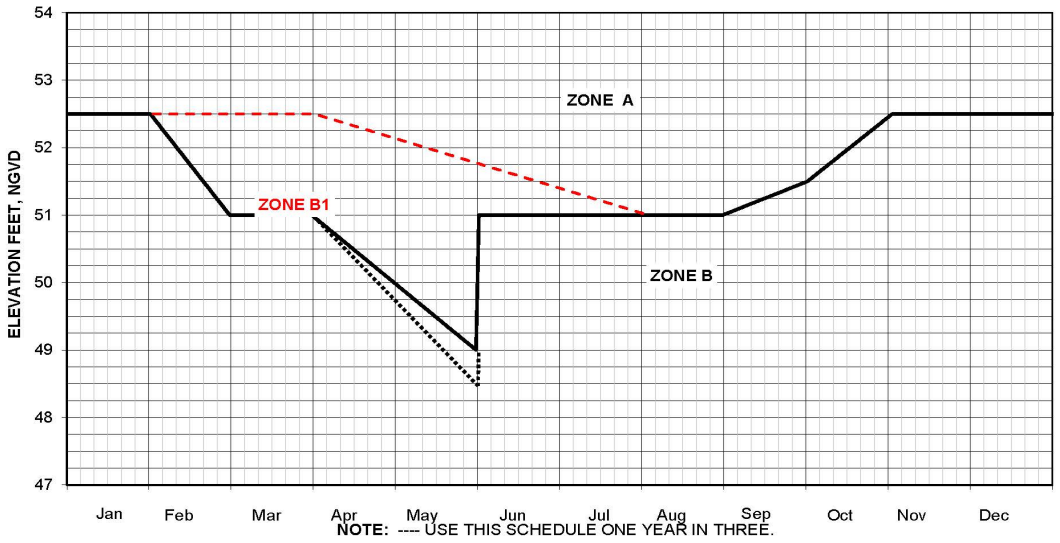


Figure 2-1: Proposed Lake Kissimmee, Hatchineha & Cypress Regulation Schedule during the Planned Temporary Deviation under Alternative B.

2.3 Alternative C: Raise the KHC regulation schedule low summer pool elevation from 49.0 to 51.75 feet, NGVD29 on 1-June and continue to recede to 51.0 until 1-August.

Alternative C is a Planned Deviation Lake Kissimmee, Hatchineha and Cypress Interim Regulation Schedule that would raise the low summer pool elevation from 49.0 to 51.75 feet, NGVD29 on June 1 and continue to recede to 51.0 until 1 August in order to better facilitate construction along the Kissimmee River this spring. The intent of the deviation is to limit Lake Kissimmee releases at or below 900 cfs until 1 August in order to facilitate Kissimmee River Restoration (KRR) construction in Reach 2. The Alternative C temporary deviation to raise the summer (June 1) pool elevation will provide greater operational flexibility to SFWMD and increase the likelihood of providing flows within the desirable range for the Corps' on-going construction. In order to facilitate KRR construction, this proposed deviation would extend from 1 February 2020 through 1 June 2021 or until KRR construction is complete. As shown in **Figure 2-2**, the Proposed Lake Kissimmee, Hatchineha & Cypress Regulation Schedule during the Planned Temporary Deviation would have the recession to the summer low pool entirely in Zone B1, which provides SFWMD the flexibility to begin the recession at any elevation below 52.5 and increase the likelihood of maintaining releases from Lake Kissimmee at or below 900 cfs. There will be no changes to the Structure 65 (S-65) Zone A and B Zone release guidance; however, guidance for Zone B1 has been included for consideration of environmental recommendations during the deviation. USACE will continue to provide operational input to SFWMD in real time on implementation of the deviation and operations throughout the

Kissimmee basin. The operational strategy for Alternative C and related modelling can be found in **Appendix C (Preliminary Analysis of Alternatives)**.



ZONE	RELEASES S-65
A	3,000 CFS UP TO DESIGN CAPACITY (11,000 CFS) WITHOUT EXCEEDING DESIGN CONDITIONS DOWNSTREAM. WHEN THE LAKE IS WITHIN 0.5 FT. OF DESIRED STAGE, FORECASTS WILL THEN BE MADE AND RELEASES STARTED TO BRING THE LAKE BACK DOWN TO SCHEDULE WITHIN 15 DAYS.
B	TO MAINTAIN MINIMUM FLOWS
B1	TO MAINTAIN MINIMUM FLOWS. CONSIDER ENVIRONMENTAL RECOMMENDATIONS.

CENTRAL AND SOUTHERN FLORIDA
KISSIMMEE RIVER BASIN

LAKE KISSIMMEE,
HATCHINEHA & CYPRESS
INTERIM REGULATION SCHEDULE

US ARMY ENGINEER DISTRICT
JACKSONVILLE FL

DATED: 11 FEBRARY 2020
ALT C

Figure 2-2: Proposed Lake Kissimmee, Hatchineha & Cypress Regulation Schedule during the Planned Temporary Deviation under Alternative C.

2.4 Alternative D: Raise the KHC regulation schedule low summer pool elevation from 49.0 to 52.50 feet, NGVD29 on 1-June and continue to recede to 51.0 until 1-August.

Alternative D is a Planned Deviation Lake Kissimmee, Hatchineha and Cypress Interim Regulation Schedule that would raise the low summer pool elevation from 49.0 to 52.0 feet, NGVD29 on June 1 and continue to recede to 51.0 until 1 August in order to better facilitate construction along the Kissimmee River this spring. The intent of the deviation is to limit Lake Kissimmee releases at or below 900 cfs until 1 August in order to facilitate Kissimmee River Restoration (KRR) construction in Reach 2 by. The Alternative D temporary deviation to raise the summer (June 1) pool elevation would provide greater operational flexibility to SFWMD and increase the likelihood of providing flows within the desirable range for the Corps' on-going construction. In order to facilitate KRR construction, this proposed deviation would extend from 1 February 2020 through 1 June 2021 or until KRR construction is complete As shown in **Figure 2-3**, the Proposed Lake Kissimmee, Hatchineha & Cypress Regulation Schedule during the Planned Temporary Deviation would have the recession to the summer low pool entirely in Zone B1, which provides SFWMD the flexibility to begin the recession at any elevation below 52.5 and increase the

likelihood of maintaining releases from Lake Kissimmee at or below 900 cfs. There will be no changes to the Structure 65 (S-65) Zone A and B Zone release guidance; however, guidance for Zone B1 has been included for consideration of environmental recommendations during the deviation. USACE will continue to provide operational input to SFWMD in real time on the implementation of the deviation and operations throughout the Kissimmee basin. The operational strategy for Alternative D and related modelling can be found in **Appendix C (Preliminary Analysis of Alternatives)**.

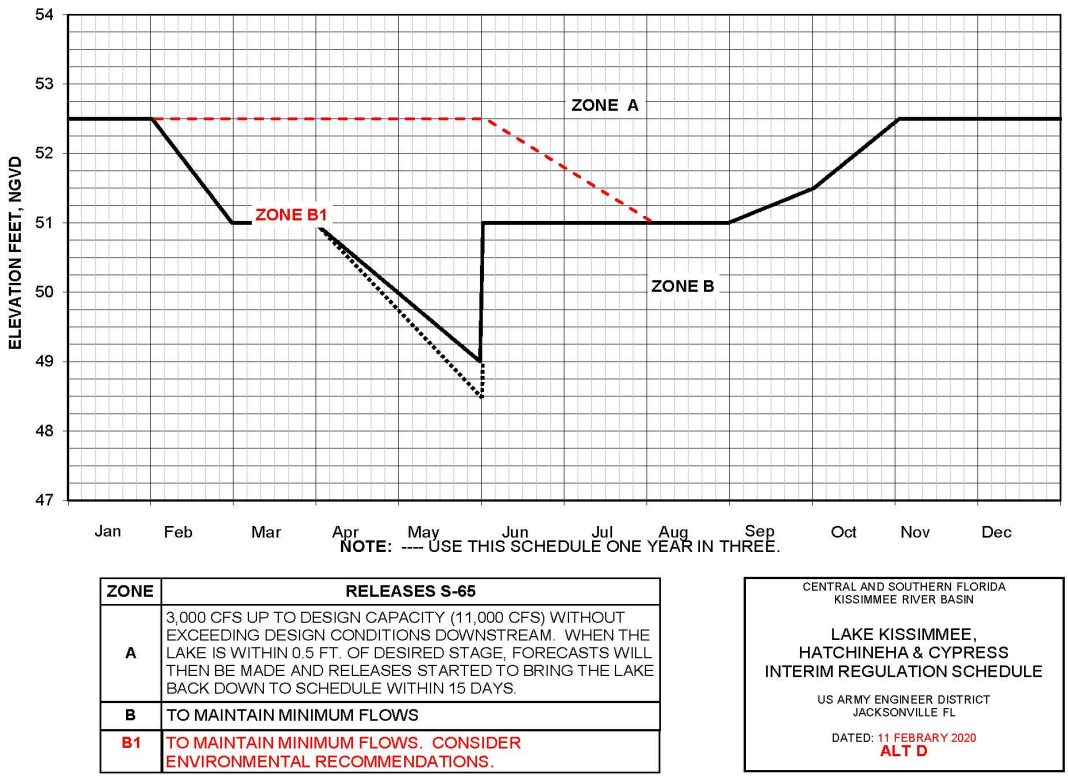


Figure 2-3: Proposed Lake Kissimmee, Hatchineha & Cypress Regulation Schedule during the Planned Temporary Deviation under Alternative D.

2.5 Issues and Basis for Choice

The alternatives described in **Section 2.1** through **2.3** were formulated, considered, and evaluated based on achievement of project objectives (**Section 1.5** (**Agency Goals and Objectives**) and compliance with project constraint (**Section 1.6** (**Constraints**). Potential environmental effects were also considered [**Section 4** (**Environmental Effects**)]. Flows less than 900 cfs are necessary to facilitate continued construction of KRR Reach 2 Backfill. Effects to wildlife habitat, flood risk management, and flow exceedence were key factors evaluated for each alternative.

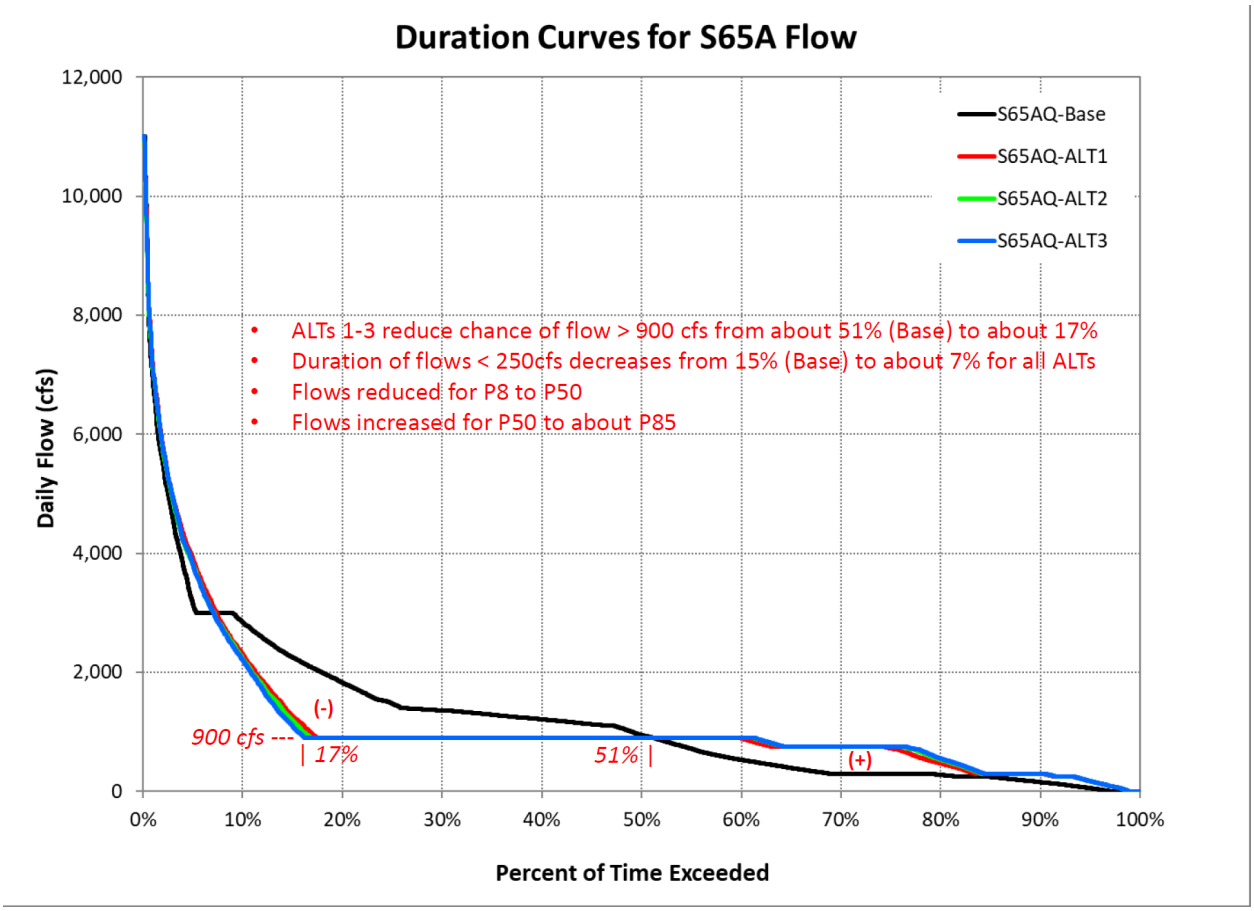


Figure 2-4: S-65A flow exceedence duration curves for all alternatives compared to existing operations.

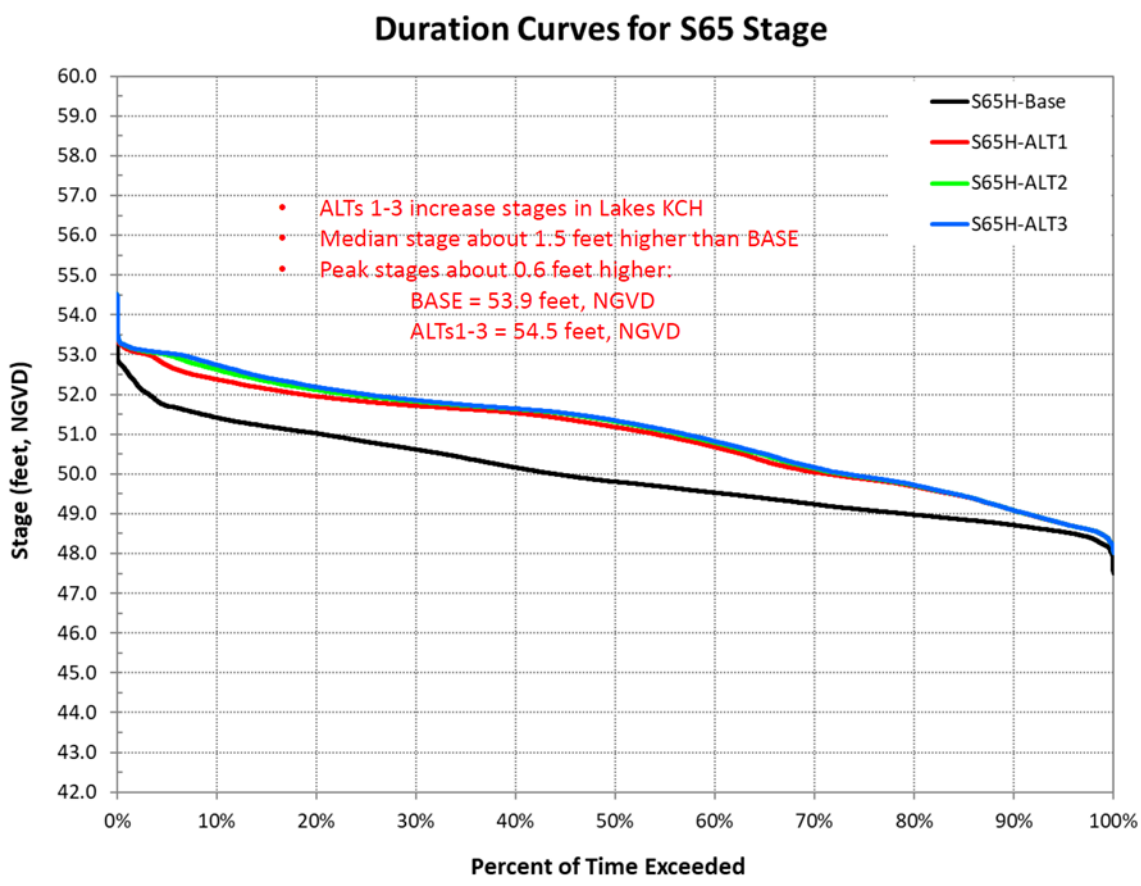


Figure 2-5: Duration curves of S-65 stage exceedence for all alternatives compared to existing operations.

2.6 Preferred Alternative: Alternative B

Based upon modeling analysis, Alternatives B, C and D reduce the probability of S-65A flows exceeding 900 cfs from 51% of the time under the existing KCH Regulation Schedule down to approximately 17% for each of the alternatives. S-65A is where SFWMD measures flows from Lake Kissimmee to the river. The flow exceedence curves for all alternatives compared to the existing schedule are shown in **Figure 2-4**. Exceedence curves illustrate the line above which that percentage of the S-65A flows were above. For example the 90 percent exceedence line means that 90 percent of the S-65A flows were above that line. From a flood risk perspective, while each of the alternatives increases the median KCH stage by about 1.5 feet relative to the no action alternative (BASE) for the 1 June date, Alternative B performs better than Alternatives C and D in the wet season months of June, July, and August, and performs about the same in September. The flood risk associated with Alternative B (6% of time with KCH stage greater than el. 52.5 feet) is 50% less than the flood risk associated with Alternatives C and D (12% of time with KCH stage greater than el. 52.5 feet).). As shown in Figure 2-5, under all of the alternatives, the S-65 stage is above the base, (existing operations); however under alternatives C and D, the S-65 stage clearly breaks away from Alternatives B and the Base, rising above 54.0. Under a more extreme flood event, such the October 2011 flood event, the maximum KCH stage is projected to increase by 0.6 feet (53.9 to 54.5 NGVD) for each of the three alternatives relative to the Existing KCH Regulation Schedule (**Figure 2-5**).

Summary details of the Preferred Alternative (Alternative B) are detailed in **Section** 2.**6** and the Operational Strategy in **Appendix A**.

2.7 Alternatives Eliminated from Detailed Evaluation

All of the alternatives considered in **Section 2** were evaluated in detail through the remainder of the EA.

3 AFFECTED ENVIRONMENT

The following provides a brief description of the affected environment within the study area. More information documenting the affected environment and baseline conditions with the Kissimmee River basin can be found at https://www.sfwmd.gov/documents-by-tag/kissdoc and information contained in these documents is incorporated by reference into this EA.

3.1 General Environmental Setting

The Kissimmee River Basin is the largest watershed providing surface water delivery to Lake Okeechobee. The major lakes within the 1,633 square-mile Upper Basin are Lakes Tohopekaliga and East Tohopekaliga in the upper chain of lakes, and Lakes Marion, Hatchineha, Pierce, Rosalie, Cypress, Weohyakapka, Tiger, Marian, Jackson, and Kissimmee in the lower chain of lakes. The Lower Basin includes the Kissimmee River and tributary watersheds. The Upper Basin is the more heavily populated and intensively developed part of the watershed Principal municipalities within the Upper Basin are the southern half of Orlando, Kissimmee, which is the hub of the cattle industry in central Florida, St. Cloud, and Haines City.

3.2 Climate

Climate of the project area in south Florida is semi-tropical, with a hot and humid rainy season that normally occurs between June and October and a dry season that normally occurs between November and April. The rainy season has three characteristic phases; the season starts with early intense rainfalls in mid-May or June extending into the first or second week of July, followed by lighter rain, then by the last phase in mid-July through October that has more rainfall variability as it is affected by tropical events and cold fronts.

3.3 Geology and Soils

Soils found throughout the Kissimmee River Basin are sandy with poor to moderate drainage due to organic hardpans found 1 to 2 feet below the surface. The majority of soil types found in the Upper and Lower Basins are classified under the Smyrna-Myakka-Basinger soil association. Other predominant classifications are the Myakka-Basinger category and the Myakka-Immokalee-Basinger category. Weathering erosion, climatic conditions, vegetation effects, and topographical locations of resident soils have resulted in the numerous differences in soil characteristics. These characteristics are undergoing continual alteration dye to normal seasonal climatic conditions and longer term climate changes.

Over the long period of natural evolution of these soils, organic and mineral materials leached downward and accumulated at the top of the locally prevailing water table. In the early history of the Kissimmee River Basin, there were extensive areas of wetlands. Agriculture and other land use activities over the past 120 years have drained these wetlands by surface drainage systems and by breaking up the original hardpan. As a result of this process, the high organic fraction of these original soils has been rapidly oxidized by exposure to the air. Soils now act as well-drained soils, creating better drainage during periods of high rainfall but a need for more irrigation during periods of lesser rainfall. The fresh water swamps, where groundwater is 15 inches or less beneath the surface, were at one time under water 9 to 12 months of the year.

3.4 Study Area Land Use

The general area immediately surrounding the Kissimmee, Cypress, Hatchineha lake areas is agricultural and primarily cattle ranch lands with row crops on the southeast side of Lake Kissimmee. Small residential communities exist along northwest Lake Hatchineha, to the west of the canal connection between Lake Hatchineha and Kissimmee, and on the west and southwest sides of Lake Kissimmee. The rest of the land use is considered upland with small areas of wetlands, marshes near the lakes.

3.5 Hydrology

Prior to regulation, the Kissimmee River received continuous inflows from the Upper Basin, with releases that were lower during the winter and dry season and steadily increased to a November peak. Much earlier than the 1930s, the outlets of major lakes like Tohopekaliga and Kissimmee were dredged, and there were no gated structures to hold water back during droughts. Historical lake conditions in the Kissimmee River Basin from 1929-1960 were driven by natural rainfall and affected by dredging of the outlets of lakes Toho and Kissimmee. Historic records describe that during this period all of the lakes within the watershed fluctuated seasonally through a range in stage varying from about 2 to 10 feet. The unnatural drainage likely exacerbated the low stages, resulting in natural highs, due to limited outlets, but unnatural lows, due to the dredging, and thus resulted in the 10+ ft. variation. Outlet capacities were limited and the lakes functioned as natural detention basins, storing large quantities of water during the rainy season with occasional flooding.

The Central and Southern Florida (C&SF) Flood Control District, created in 1949, has managed the watershed according to various regulation schedules with a maximum flood stage. During the 1960s, the Kissimmee Basin became an integrated system of structures that provided water storage capabilities and outlets to control flood waters. In 1972, structure ownership and maintenance responsibilities were transferred to the SFWMD, following the establishment of Florida's statewide Water Management Districts. Past and current regulation schedules of Lakes Kissimmee, Cypress, and Hatchineha with the highest elevation of the Zone A line at 52.5 feet NGVD 29 did not have enough seasonal fluctuation in water levels to maintain healthy lacustrine littoral marsh in the lakes. In 2001, the Corps authorized an interim water regulation schedule for KCH that includes S-65 release guidance for Zone A for flood control, Zone B, to maintain minimum flows that allow releases for environmental purposes when its headwater stage is below the maximum regulated stage to address environmental considerations to establish flow regimes to the KRRP. Under the current "Interim" schedule, water levels in Lakes KCH are managed through a single structure S-65 located at the southern outlet of Lake Kissimmee to Canal 38 (C-38). Lakes KCH are held normally between elevations 49.0 feet and 52.5 feet NGVD 29 according to seasonally varying schedules. Water managers strive to maintain lake elevations within Zone B. In general, the Lake KHC regulation schedule elevations are maintained at a peak of elevation 52.5 from 1 November until 1 February for storage of water during the dry season to meet water supply needs in the basin from seasonal From 1-February lake elevations begin to recede to 49.0 feet NGVD on 1-June, the low summer pool store to create water storage for rainy season flood protection. Reference the regulation schedule (**Figure 2-2**).

3.6 Regional Water Management Operations

The Upper Kissimmee Basin structures are operated according to the seven lake regulation schedules and water control plans. The lake regulation schedules define the seasonal and monthly limits of storage that guides the management of the lakes and basin for the multiple project purposes. The lake regulation schedules generally vary from high stages in the late fall and winter to low stages in the beginning of the

wet season. The lakes are drawn down in the spring to provide for sufficient storage for flood risk management and fish and wildlife enhancement. The minimum levels (low summer pool elevations) are set to provide for sufficient flood control storage and navigation depths. The East Lake Tohopekaliga Regulation Temporary Planned Deviation for Fish and Wildlife Enhancement began mid-October 2019. Early recession was implemented on Feb 7 2020 for fish and wildlife enhancement purposes. The East Lake Tohopekaliga outlet structure, S-59, was opened to follow the temporary deviation regulation schedule and the deviation has achieved the recommended elevation for Lake Tohopekaliga. East Lake Tohoipekaliga will reach its target elevation by early March, with the temporary deviation running through the end of 2020 to allow time for lake levels to rise to desirable elevations. Regional modeling can be found in **Appendix C**.

3.7 Flood Control

All lakes in the Kissimmee chain are drawn down to their lowest pools around 1 June of each year to provide flood storage for the rainy season based on their respective regulation schedules. When the Lake Kissimmee elevation is within Zone A (above the regulation schedule), S-65 releases must be made in order to bring levels back below Zone A. These releases can range from a minimum of 3,000 cfs up to the original design capacity of 11,000 cfs without exceeding downstream design conditions. When the lake is within 0.5 feet of the Zone A regulation line, forecasts will be made and releases started to bring the lake back to the schedule within 15 days. Two spillway bays were added to increase S-65 releases if needed, with the increase in witner pool elevation. Downstream release capacities were increased at structures S-65 D and E). The Kissimmee River Headwaters Revitalization regulation schedule as proposed in 1996 would increase the S-65 release capacity to 18,000 cfs if implemented; however, until it is implemented or until a new Lake Kissimmee, Hatchineha and Cypress regulation schedule is adopted, it is anticipated that S-65 releases will continue be limited to 11,000 cfs as in the existing water control plan.

3.8 Vegetative Communities

Historically, habitat types found within the general area included uplands, basin swamp, prairie hammock, wet flatwoods, mesic flatwoods, wet prairie, scrubby flatwoods, and floodplain marsh. The project area itself consists of disturbed habitat with some more pristine areas in the lake littoral zone. There are a few cabbage palm trees and oak trees hammocks and marsh in the littoral zones of KCH.

3.9 Fish and Wildlife Communities

Wildlife in the area consists of deer, small mammals, alligators and small reptiles, wading birds and ducks. Coot, Florida ducks, blue-winged teal, and ring-necked ducks constitute the bulk of the basin's waterfowl.

Prior to channelization, over 39 species of fish could be found in the Kissimmee River. However, due to channelization, low-and no-flow regimes in the C-38 Canal, and remnant river channels, chronically low dissolved oxygen levels resulted and sport fish species like largemouth bass were being replaced by species tolerant of low dissolved oxygen regimes, such as Florida gar and bowfin. With Kissimmee River restoration, it is anticipated that sport fish will once again thrive in the restored portions of the river channel. Everglade snail kite nesting populations are increasing along Lake Kissimmee and Lake Tohopekaliga (Fletcher et al. 2017; Fletcher et al. 2018; Fletcher et al. 2019) due to wildlife habitat enhancement from the KRR.

3.10 Threatened and Endangered Species

Federally-listed threatened and endangered species that could potentially be found in the project area are listed in **Table 3-1.**

Table 3-1. Federally-listed threatened (Th), endangered (E), and candidate species (C) known to occur in Osceola and Polk Counties, Florida. * Denotes species with higher probability to be present within the project area.

Scientific Name	Common Name	Federal Status
Amphibians		
Notophthalmus perstriatus	Striped newt	C
Reptiles		
Drymarchon couperi	Eastern indigo snake	Th
Eumeces egregius lividus	Bluetail mole skink	Th
Gopherus polyphemus	Gopher tortoise	C
Neoseps reynoldsi	Sand skink	Th
Birds		
Ammodramus savannarum floridanus	Florida grasshopper sparrow	E
Aphelocoma coerulescens	Florida scrub-jay	Th
Grus americana	Whooping crane	E *
Mycteria americana	Wood stork	Th
Picoides borealis	Red-cockaded woodpecker	E
Caracara cheriway	Crested caracara	Th
Rostrhamus sociabilis plumbeus	Everglade snail kite	E
Insects		
Cicindela highlandensis	Highlands tiger beetle	C
Mammals		
Eumops floridanus	Florida bonneted bat	E
Puma concolor coryi	Florida panther	E
Trichechus manatus	West Indian manatee	Th
Plants		
Conradina brevi/olia	Short-leaved rosemary	E
Dicerandra frutescens	Scrub mint	E
Hypericum cumulicola	Highlands scrub hypericum	E
Liatris ohliiwerae	Scrub blazingstar	E
Paronychia chartacea	Papery whitlow-wort	Th
Folwala lewtonii	Lewton's polygala	E
Polygonella basiramia	Wireweed	E
Polygonella myriophylla	Sandlace	E
Prunus geniculate	Scrub plum	E
Bonamia grandiflora	Florida bonamia	Th

Chionanthus pygmaeus	Pygmy fringe-tree	E
Clitoria fragrans	Pigeon wings	Th
Deeringothamnus	Beautifual pawpaw	E
Eriogonum longifolium var.	Scrub buckwheat	Th
Eryngium cuneifolium	Snakeroot	E
Nolina brittoniana	Britton's beargrass	E
Warea amplexifolia	Wide-leaf warea	E
Warea carteri	Carter's mustard	E
Lupinus aridorum	Scrub lupine	E
Dicerandra christmanii	Garrett's mint	E
Ziziphus celata	Florida ziziphus	E
Crotalaria avonensis	Avon Park harebells	E
Cladonia perforate	Fl. perorate cladonia lichen	E

3.11 Essential Fish Habitat

No Essential Fish Habitat (EFH) has been identified in the KRR project area, which is upstream of federally managed fishery habitat.

3.12 Water Quality

Section 303(d) of the federal Clean Water Act (Public Law 107-303) requires states to submit to the EPA a list of surface waters that do not meet applicable water quality standards (impaired waters) and establish a Total Maximum Daily Load (TMDL) for each pollutant causing the impairment of the listed waters on a schedule. The FDEP has developed such lists, commonly referred to as 303(d) lists, since 1992. The list of impaired waters in each basin, referred to as the Verified List, is also required by the Florida Water Restoration Act (Subsection 403.067[4], Florida Statutes [F.S.]), and the state's 303(d) list is amended annually to include basin updates.

The FDEP completed a TMDL to establish a target phosphorus load to Lake Okeechobee to achieve an in-lake target phosphorus concentration of 40 parts per billion (ppb) in the pelagic zone of the lake. The state of Florida established this restoration target intended to support a healthy lake system, restore the designated uses of Lake Okeechobee and allow the lake to meet the applicable water quality standards. While fair quality water enters C-38 from Lake Kissimmee, progressive water quality degradation in C-38, resulting from nutrient loading from local inflows, becomes apparent at the downstream end of the canal. Lower Basin water quality concerns initially focused on the level of nutrients within the channelized Kissimmee River following construction of C-38, and the effect of possible nutrient-laden flow being delivered to Lake Okeechobee. The highly eutrophic condition of Lake Okeechobee is expected to persist for the foreseeable future due to past and future nutrient loading. Another water quality concern is the low dissolved oxygen levels found within both C-38 and remaining Kissimmee River oxbows. Monitoring since completion of projects at the Kissimmee River headwaters has documented promising increases in dissolved oxygen levels (essential for aquatic life), reductions in river channel floating plant cover and accumulated sediments on the river bottom, recovery of wetlands, and increased populations of waterfowl, wading birds, and bass and other sunfishes. While the canal delivers a significant phosphorous

load, ortho and total phosphorous concentrations are among the lowest of any inflow to Lake Okeechobee.

Following the adoption of the TMDL by rule, the FDEP has been working with stakeholders to cooperatively develop plans to restore the water body. This has been accomplished by creating Basin Management Action Plans (BMAP), which are adopted by Secretarial order, are enforceable and were most recently updated in 2020. BMAPs are the primary mechanism through which TMDLs are implemented in Florida (see Subsection 403.067[7], F.S.). The FDEP has been working with federal agencies, water management districts, local governments, as well as regional industries, such as agricultural and farming interests, in order to improve water quality. The Corps and SFWMD have been extensively planning and constructing restoration projects within the Kissimmee River Basin since 1999. Additionally, best management practices, both structural and non-structural, such as public education and outreach, are expected also to address the source of local water quality concerns and improve basin water quality.

3.13 Hazardous, Toxic or Radioactive Waste

A search of the FDEP petroleum spill and storage sites database identified no known petroleum spill or storage sites. In addition, a search of FDEP's databases of contamination sites and petroleum storage facilities identified no known contamination sites or petroleum storage facilities.

3.14 Air Quality

The Clean Air Act requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS 40 CFR part 50) for six common air pollutants (also known as "criteria air pollutants"). Air monitoring reports are also prepared annually by FDEP to inform the public of the air pollution levels throughout the State of Florida. All areas within the state are designated with respect to each of the criteria air pollutants carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO2), ozone (O3), particle pollution (10 microns or less in diameter (PM10), and 2.5 microns or less in diameter (PM2.5), and sulfur dioxide (SO2) 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). Each State has the primary responsibility for assuring air quality within the entire geographic area comprising such State by submitting an implementation plan for such State which will specify the manner in which national primary and secondary ambient air quality standards will be achieved and maintained within each air quality control region in such State.

Air quality attainment areas can be further classified as maintenance areas. Maintenance areas are areas previously classified as non-attainment which have successfully reduced air pollution concentrations to below the standard. Central Florida, including Okeechobee and Polk counties within the airshed, continues to be classified by the U.S. Environmental Protection Agency (EPA) as being in attainment for all criteria air pollutants.

3.15 Noise

Noise levels in the project area are associated with surrounding land use. Within the major natural areas of Central Florida, external sources of noise are limited and of low occurrence. Existing sources of noise are limited to 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 air traffic. A grass runway, operated by River Acres residents, borders the rear property line of several interior lots, some of which have airplane hangars. Sources of noise in rural areas include noise associated with agricultural production such as the processing and transportation of produce. 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, operations at commercial and industrial facilities etc., inherent in areas of higher population would be significant and probably override those sounds associated with natural emissions.

3.16 Aesthetics

The visual characteristics of Central 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 subtropical and tropical hardwoods do occur. 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. Generally, urban development is concentrated along the Upper Kissimmee chain of lakes and Orlando. Development is typically immediately adjacent to, or nearby, protected natural areas. Much of the area surround Lakes KCH is agricultural, including cattle ranch lands with row crops on the southeast side of Lake Kissimmee. There are small residential communities along the northwest of Lake Hatchineha, to the west of the canal connection between Lake Hatchineha and Kissimmee, and on the west and southwest sides of Lake Kissimmee.

3.17 Socioeconomics

The Kissimmee River basin traverses four counties in Central Florida: Highlands, Okeechobee, Polk, and Osceola, which represent a diverse and varied socioeconomic environment. Basic demographic and economic characteristics of these counties are summarized in **Table 3-2**.

Table 3-2. Demographic and Economic Overview of the Kissimmee River Basin

County	Total Population	Approximate Population per Square Mile	Median Household Income	% of persons below Federal poverty Line
Osceola	370,990	202.4	$50,063	13.40%
Polk	708,009	334.9	$48,500	15.70%
Okeechobee	41,537	52	$40,367	21.50%
Highlands	105,424	97.2	$37,314	20.08%
Total	**1,225,960**			

*Data in table comes from the US Census bureau (estimated as of July 2019) and the NASS Cropland Data layer (estimates current as of January, 2019)

As shown in **Table 3-2**, more than 1.2 million people live in areas that are within or adjacent to the Kissimmee River Basin. The entire affected area has a population that is relatively low-income, with median household incomes that are below the state and national average ($53,267 and $60,293, respectively) as well as a % of people below the poverty line that is higher than state and national averages

(13.6% and 11.8% respectively). This is particularly true for Okeechobee and Highlands County in the southern part of the Kissimmee River Basin; both of these counties have poverty rates above 20%. Population density throughout the basin is lower than the state of Florida average, particularly in Okeechobee and Highlands Counties, which are rural counties and have less than 100 people per square mile.

The primary economic activities throughout the Kissimmee basin are agriculture, tourism related industries such as hospitality (hotels, restaurants, etc.), the health and medical industry, and other services (banking, insurance, etc.). According the USDA National Agricultural Statistics Service (NASS), the primary crops grown in these areas are citrus crops (oranges, grapefruit, etc.) and sugarcane. Oranges are by the far the largest individual crop grown in this area. There are also several thousand acres of pasture land throughout the Kissimmee basin for cattle and other livestock. Development through the area of affect is primarily sub-urban or rural, including several state parks and undeveloped wetlands. Areas that are developed are primarily residential in nature with some commercial and public property intermixed.

3.18 Cultural Resources

The affected project area is comprised of lands that were formerly natural, river floodplain prior to rechanneling of the Kissimmee River and that constitute low probability locations for archaeological resources. Historic aerials and LiDAR data confirm the floodplain nature of the project location, and confirm the ground alteration that has occurred in the project area since creation of the C-38 canal. The existing residential development footprint, and any affected elevated areas within the project area, are comprised of dredge spoil from the creation of the C-38 canal and from the 1970's excavation of flood control canals that surround the project area. . One cultural resource, the CSX Railroad, is recorded as part of Resource Group 8OB0271 within the project area. The Florida State Historic Preservation Officer (SHPO) found that this state-wide resource group appears to meet the criteria for National Register of Historic Places (NRHP) listing in 2010; however, the segment of rail line existing within the area of potential effects is not eligible for listing in the NRHP as an individual resource. No known cultural resource sites or historical structures eligible for listing on the NRHP are located within the affected project area.

3.19 Native Americans

No portion of the project area exists within, or adjacent to, known Native American-owned lands, reservation lands, or Traditional Cultural Properties. However, Native American groups have lived throughout the region in the past and their descendants continue to live within the State of Florida and throughout the United States. There are two federally recognized tribes (Miccosukee Tribe of Indians of Florida and the Seminole Tribe of Florida) that are located within the region of the project area. Both tribes maintain a strong connection to the project area through continued use and regard the indigenous populations of Florida as their ancestors. Currently no portion of the project exists within, or adjacent to, any known Native American properties.

3.20 Recreation

Recreation is an authorized project purpose for both the Lake Kissimmee and the C&SF Project. There are abundant recreational facilities within the project area, both private and public. For example, boat launching ramps, pleasure crafts, sightseeing vessels, bank, and small boat fishing are all influenced by lake levels. Hunting and fishing are also popular recreational sports along the Kissimmee River, within the

Kissimmee chain of lakes, and Lake Okeechobee. Navigation will not be effected by this operational change because it will maintain water levels higher than normal, thus not reducing navigable lake area.

4 ENVIRONMENTAL EFFECTS

Potential environmental effects of current water management operations (No Action Alternative) are thoroughly evaluated within the KRR 1996 SEIS and are hereby incorporated by reference (USACE 1996).

The following includes anticipated changes to the existing environment including direct, indirect, and cumulative effects. This assessment of environmental effects evaluates the anticipated environmental effects of the alternatives described in **Section 3** (**Affected Environment**), relative to the No Action Alternative. These potential effects are described within this section and are broadly summarized in **Table 4-1**. Reference **Section 2** (**Alternatives**) for a description of each alternative.

Table 4-1. Potential environmental effects.

Resource	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Climate	No effect.	Same as Alternative A. No effect. Alternative B would not result in significant impacts to the climate of South Florida. The influence of climate change is not anticipated to alter the severity or nature of impacts resulting from Alternative B.	Same as Alternative A. No effect. Alternative C would not result in significant impacts to the climate of South Florida. The influence of climate change is not anticipated to alter the severity or nature of impacts resulting from Alternative C.	Same as Alternative A. No effect. Alternative D would not result in significant impacts to the climate of South Florida. The influence of climate change is not anticipated to alter the severity or nature of impacts resulting from Alternative D.
Geology and Soils	No effect. Geology and soils would not be expected to change from current conditions.	Same as Alternative A. No effect. Reference *Hydrology* in above table for effects on lake stages.	Same as Alternative A. No effect. Reference *Hydrology* in above table for effects on lake stages.	Same as Alternative A. No effect. Reference *Hydrology* in above table for effects on lake stages.
Study Area Land Use	No effect. Study area land use within the project area would not be expected to change from current conditions.	Same as Alternative A. Study area land use within the project area would not be expected to change from current conditions.	Same as Alternative A. Study area land use within the project area would not be expected to change from current conditions.	Same as Alternative A. Study area land use within the project area would not be expected to change from current conditions.
Hydrology		Releases from the lake will be limited to no more than 900 cfs. This flow will be less than	Releases from the lake will be limited to no more than 900 cfs. This flow will be less than	Releases from the lake will be limited to no more than 900 cfs. This flow will be less

Resource	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
		what is normally released to the river for the time of the year; however, direct rainfall and basin runoff will still contribute to the river flow. Alternative B would raise the summer pool elevation from 49.0 to 51.0 ft., NGVD29 on 1 June.	what is normally released to the river for the time of the year; however, this is during the wet season, direct rainfall and basin runoff can be significant and will still contribute to the river flow. Alternative C would raise the summer pool elevation from 49.0 to 51.75 ft., NGVD29 on 1 June and continue to recede to 51.0 ft., NGVD29 by 1 August.	than what is normally released to the river for the time of the year; however, this is during the wet season, direct rainfall and basin runoff can be significant and will still contribute to the river flow. Alternative D would raise the summer pool elevation from 49.0 to 52.5 ft., NGVD29 on 1 June, and continue to recede to 51.0 ft., NGVD29 by 1 August.
Regional Water Management Operations (Water Supply and Flood Control)	No effect. Regional water management operations to include water supply and flood control would not be expected to change from current conditions.	This will increase the elevation of the summer pool from 49.0 to 51.0 ft., NGVD29 until 1 June. Thus, there will be more water in the lake for water supply. SFWMD has purchased land up to elevation 54.0 ft., NGVD29. Therefore risk to flood control is minimal. Alternative B would result in a 6% chance of lake stage greater than 52.5 ft., NGVD19.	This will increase the elevation of the summer pool from 49.0 to 51.75 ft. NGVD29 on June 1. Thus, there will be more water in the lake for water supply. SFWMD has purchased land up to elevation 54.0 ft., NGVD29. Therefore, risk to flood control is minimal. Alternative C would result in a 12% chance of lake stage greater than 52.5 ft., NGVD29.	This will increase the elevation of the summer pool from 49.0 to 52.50 ft., NGVD29 on June 1. Thus, there will be more water in the lake for water supply. SFWMD has purchased land up to elevation 54.0 ft., NGVD29. Therefore risk to flood control is minimal. Alternative D would result in a 12% chance of lake stage greater than 52.5 ft., NGVD29, the same as Alternative C.
Vegetative Communities	No effect. Maintaining current operations would not affect vegetative communities.	Potential negligible effects to minor benefits. Changes in lake stage and volume of releases during the wet season may result in negligible impacts to	Potential negligible effects to minor benefits. Changes in lake stage and volume of releases during the wet season may result in negligible impacts to	Potential negligible effects to minor benefits. Changes in lake stage and volume of releases during the wet season may result in negligible impacts to

Resource	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
		vegetative communities in the littoral zone of Lakes KCH, but are not expected to negatively affect vegetation. Attenuating the rate of rise lake stage from abnormal rainfall can be beneficial to lake ecology. Reference *Hydrology* in above table for effects on lake stages.	vegetative communities in the littoral zone of Lakes KCH, but are not expected to negatively affect vegetation. Attenuating the rate of rise lake stage from abnormal rainfall can be beneficial to lake ecology. Reference *Hydrology* in above table for effects on lake stages.	vegetative communities in the littoral zone of Lakes KCH, but are not expected to negatively affect vegetation. Attenuating the rate of rise lake stage from abnormal rainfall can be beneficial to lake ecology. Reference *Hydrology* in above table for effects on lake stages.
Fish and Wildlife Communities	Potential negligible effects. If abnormal rainfall patterns persist throughout the wet season, flooding along S-65A may result in inundation that available foraging substrate in the littoral zone of Lakes KCH.	Potential negligible effects. Recession rates to meet fish and wildlife needs would be below the maximum rates of 0.5 feet per month and approximately be lower than 0.25 feet per month. Standard fish and wildlife recommendations for dry season operations dated 2015 (**Appendix D**) would be followed to provide guidance on how to minimize adverse effects of reversals on Everglade snail kite nesting and wading bird foraging.	Same as Alternative B. Potential negligible effects. Recession rates to meet fish and wildlife needs would be below the maximum rates of 0.5 feet per month and approximately be lower than 0.25 feet per month. Standard fish and wildlife recommendations for dry season operations dated 2015 (**Appendix D**) would be followed to provide guidance on how to minimize adverse effects of reversals on Everglade snail kite nesting and wading bird foraging.	Same as Alternative B. Potential negligible effects. Recession rates to meet fish and wildlife needs would be below the maximum rates of 0.5 feet per month and approximately be lower than 0.25 feet per month. Standard fish and wildlife recommendations for dry season operations dated 2015 (**Appendix D**) would be followed to provide guidance on how to minimize adverse effects of reversals on Everglade snail kite nesting and wading bird foraging.
Threatened and Endangered Species	Potential negligible effects. If abnormal rainfall patterns persist throughout the wet season, flooding along S-65A may result in inundation that negatively affects wood stork foraging and Everglade	The Corps acknowledges the potential usage and occurrence of threatened and endangered species and/or critical habitat within the study area. Correspondence dated February 7, 2020 was	The Corps acknowledges the potential usage and occurrence of threatened and endangered species and/or critical habitat within the study area. Correspondence dated February 7, 2020 was	The Corps acknowledges the potential usage and occurrence of threatened and endangered species and/or critical habitat within the study area. Correspondence dated

Resource	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
	snail kite nesting in the littoral zone of Lakes KCH.	provided to USFWS requesting concurrence on species determinations as a result of the proposed action. USFWS concurred with the effects determinations on February 14, 2020. Reference **Appendix B**. The Corps has made a determination of May Affect, Not Likely To Adversely Affect (MALNAA) for the Everglades snail kite and word stork, and No Effect determinations for all other listed species (**Table 4-2**). Reference **Section 4.1** for full explanation of effects to listed species.	provided to USFWS requesting concurrence on species determinations as a result of the proposed action. USFWS concurred with the effects determinations on February 14, 2020. Reference **Appendix B**. The Corps has made a determination of May Affect, Not Likely To Adversely Affect (MALNAA) for the Everglades snail kite and word stork, and No Effect determinations for all other listed species (**Table 4-2**). Reference **Section 4.1** for full explanation of effects to listed species.	February 7, 2020 was provided to USFWS requesting concurrence on species determinations as a result of the proposed action. USFWS concurred with the effects determinations on February 14, 2020. Reference **Appendix B**. The Corps has made a determination of May Affect, Not Likely To Adversely Affect (MALNAA) for the Everglades snail kite and word stork, and No Effect determinations for all other listed species (**Table 4-2**). Reference **Section 4.1** for full explanation of effects to listed species.
Essential Fish Habitat	No effect.	Same as Alternative A. Changes in lake stage and release volume will not impact Essential Fish Habitat.	Same as Alternative A. Changes in lake stage and release volume will not impact Essential Fish Habitat.	Same as Alternative A. Changes in lake stage and release volume will not impact Essential Fish Habitat.
Socioeconomics	No effect.	Same as Alternative A. As this is a temporary operational change, there are no expected effects to regional socioeconomics. Alternative B would provide operational flexibility to reduce flood risk to 6% along S-65A—half of the risk of Alternatives C and D.	Same as Alternative A. As this is a temporary operational change, there are no expected effects to regional socioeconomics. Alternative C would provide operational flexibility to reduce flood risk along S-65A, but would have twice the flood risk (12%) as Alternative B.	Same as Alternative A. As this is a temporary operational change, there are no expected effects to regional socioeconomics. Alternative D would provide operational flexibility to reduce flood risk along S-65A, but would have twice

Resource	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
				the flood risk (12%) as Alternative B.
Native Americans	No effect.	Same as Alternative A. No effect. The Corps recognizes that the Seminole Tribe of Florida has federally protected water entitlement rights, and that KHC, or other water control structures and pumps, may provide water to the Big Cypress and Brighton Seminole Indian Reservations. Alternative B is anticipated to have no effect on the Water Rights Compact (25 USC Section 1722e) as changes to the operational strategy would have a net zero effect on lake stage and would no effect downstream water supply.	Same as Alternative A. No effect. The Corps recognizes that the Seminole Tribe of Florida has federally protected water entitlement rights, and that KHC, or other water control structures and pumps, may provide water to the Big Cypress and Brighton Seminole Indian Reservations. Alternative C is anticipated to have no effect on the Water Rights Compact (25 USC Section 1722e) as changes to the operational strategy would have a net zero effect on lake stage and would no effect downstream water supply.	Same as Alternative A. No effect. The Corps recognizes that the Seminole Tribe of Florida has federally protected water entitlement rights, and that KHC, or other water control structures and pumps, may provide water to the Big Cypress and Brighton Seminole Indian Reservations. Alternative D is anticipated to have no effect on the Water Rights Compact (25 USC Section 1722e) as changes to the operational strategy would have a net zero effect on lake stage and would no effect downstream water supply.
Cultural Resources	No effect.	Same as Alternative A. There would be would be no change from the existing condition for purposes of considering effects to cultural resources or historic properties. Therefore, the Corps has determined the proposed deviation has no potential to effect historic properties pursuant to 36 CFR §	Same as Alternative A. There would be would be no change from the existing condition for purposes of considering effects to cultural resources or historic properties. Therefore, the Corps has determined the proposed deviation has no potential to effect historic properties pursuant to 36 CFR §	Same as Alternative A. There would be would be no change from the existing condition for purposes of considering effects to cultural resources or historic properties. Therefore, the Corps has determined the proposed deviation has no potential to effect historic properties pursuant to 36 CFR § 800.3(a)(1) and

Resource	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
		800.3(a)(1) and consideration given under the NEPA.	800.3(a)(1) and consideration given under the NEPA.	consideration given under the NEPA.
Water Quality	No change from current conditions.	Potential negligible effects. Changes in lake stage and volume of releases during the wet season may result in negligible impacts to lake stratification, but is not expected to negatively affect water quality. Reference *Hydrology* in above table for effects on lake stages.	Potential negligible effects. Changes in lake stage and volume of releases during the wet season may result in negligible impacts to lake stratification, but is not expected to negatively affect water quality. Reference Hydrology in above table for effects on lake stages.	Potential negligible effects. Changes in lake stage and volume of releases during the wet season may result in negligible impacts to lake stratification, but is not expected to negatively affect water quality. Reference Hydrology in above table for effects on lake stages.
Hazardous, Toxic, and Radioactive Waste	No effect.	No effect. Alternative B would not result in the discovery or mobilization of HTRW, as this is an operational change and there is no excavation or other construction activities being considered.	No effect. Alternative C would not result in the discovery or mobilization of HTRW, as this is an operational change and there is no excavation or other construction activities being considered.	No effect. Alternative D would not result in the discovery or mobilization of HTRW, as this is an operational change and there is no excavation or other construction activities being considered.
Air Quality	No effect. Air quality within the project area would not be expected to change from current conditions.	Same as Alternative A. No effect.	Same as Alternative A. No effect.	Same as Alternative A. No effect.
Noise	No effect. Noise levels within the project area would not be expected to change from current conditions.	Same as Alternative A. No effect.	Same as Alternative A. No effect.	Same as Alternative A. No effect.
Aesthetics	No effect.	Same as Alternative A. No effect.	Same as Alternative A. No effect.	Same as Alternative A. No effect.
Recreation	No effect. Recreation within the project area would not	Potential negligible effects.	Potential negligible effects.	Potential negligible effects.

Resource	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
	be expected to change from current conditions.	Recreation is an authorized project purpose for both the Lake Kissimmee and the C&SF Project. There are abundant recreational facilities within the project area, both private and public; however, no specific water management operations are required for this purpose. Lake stages under the 1996 HRP are not specifically managed for recreation, although lake levels do affect recreation facilities. For example, boat launching ramps, pleasure crafts, sightseeing vessels, bank, and small boat fishing are all influenced by lake levels. Occurrence of low water events that may impact recreational boat users navigating Lake Kissimmee and accessing the lake from local boat ramps are not anticipated under Alternative B. Reference *Hydrology* in above table for effects on lake stages.	Recreation is an authorized project purpose for both the Lake Kissimmee and the C&SF Project. There are abundant recreational facilities within the project area, both private and public; however, no specific water management operations are required for this purpose. Lake stages under the 1996 HRP are not specifically managed for recreation, although lake levels do affect recreation facilities. For example, boat launching ramps, pleasure crafts, sightseeing vessels, bank, and small boat fishing are all influenced by lake levels. Occurrence of low water events that may impact recreational boat users navigating Lake Kissimmee and accessing the lake from local boat ramps are not anticipated under Alternative C. Reference *Hydrology* in above table for effects on lake stages.	Recreation is an authorized project purpose for both the Lake Kissimmee and the C&SF Project. There are abundant recreational facilities within the project area, both private and public; however, no specific water management operations are required for this purpose. Lake stages under the 1996 HRP are not specifically managed for recreation, although lake levels do affect recreation facilities. For example, boat launching ramps, pleasure crafts, sightseeing vessels, bank, and small boat fishing are all influenced by lake levels. Occurrence of low water events that may impact recreational boat users navigating Lake Kissimmee and accessing the lake from local boat ramps are not anticipated under Alternative D. Reference *Hydrology* in above table for effects on lake stages.

4.1 Threatened and Endangered Species

Recession rates to meet fish and wildlife needs would be below the maximum rates of 0.5 feet per month and approximately be lower than 0.25 feet per month. Standard fish and wildlife recommendations for dry season operations dated 2015 would be followed to provide guidance on how to minimize adverse effects of reversals on Everglade snail kite nesting and wading bird foraging. The USFWS provided the Corps with a list of ESA listed species potentially occurring in the project area, from which the Corps made species effects determinations for the 2020 KRR HW SOM Biological Assessment (**Table 4-2**). The USFWS concurred with species effects determinations via email on 12 February 2020. All correspondence can be found in **Appendix B**.

Wood storks are known to forage within the KCOL Upper Basin and the Kissimmee River floodplain habitat downstream in the littoral zone, which is their preferred foraging habitat (Havens and Gawlik 2005). Wood storks forage most efficiently in shallow depths where prey are more accessible and vulnerable (Ogden et al. 1978; Browder 1984; Coulter 1987; Gawlik 2002). Lakes Kissimmee, Hatchineha, Cypress and Tiger are within the core foraging areas of several known wood stork nesting colonies. Everglade snail kites are known to nest along the Kissimmee Chain of Lakes. While their population is increasing regionally (Fletcher et al. 2017; Fletcher et al. 2018; Fletcher et al. 2019), maintaining desirable lake stages is important to maintaining population recovery. Recession rates to meet fish and wildlife needs would be below the maximum rates of 0.5 feet per month and approximately be lower than 0.25 feet per month. Standard fish and wildlife recommendations for dry season operations dated 2015 would be followed to provide guidance on how to minimize adverse effects of reversals on Everglade snail kite nesting and wading bird foraging (reference **Appendix D**). The deviation would still allow for a recession to the summer low pool entirely in Zone B, but reduce the low stage requirement to 51 feet NGVD instead of 49 feet NGVD. This stage change is not likely to adversely affect snail kites or wood storks, and may benefit snail kite nesting by increasing nesting availability in the littoral zone. Increased inundation may also provide greater foraging opportunities to both species. However. Reversals have the potential to affect nesting kites depending on the nesting substrate and height of the nest above water.. The Corps is committed to frequent coordination with USFWS to ensure operations do not adversely affect listed species.

Table 4-2. Federally listed threatened (Th), endangered (E), and candidate species (C) known to occur in Osceola and Polk Counties, Florida and species effect determinations. * Denotes species with higher probability to be present within the project area.

Scientific Name	Common Name	Federal Status	May Affect Not Likely to Adversely Affect	No Effect
Amphibians				
Notophthalmus perstriatus	Striped newt	C		X
Reptiles				
Drymarchon couperi	Eastern indigo snake	Th		X
Eumeces egregius lividus	Bluetail mole skink	Th		X
Gopherus polyphemus	Gopher tortoise	C		X
Neoseps reynoldsi	Sand skink	Th		X
Birds				
Ammodramus savannarum floridanus	Florida grasshopper sparrow	E		X

Scientific Name	Common Name	Federal Status	May Affect Not Likely to Adversely Affect	No Effect
Aphelocoma coerulescens	Florida scrub-jay	Th		X
Grus americana	Whooping crane	E *		X
Mycteria americana	Wood stork	Th	X	
Picoides borealis	Red-cockaded woodpecker	E		X
Caracara cheriway	Crested caracara	Th		X
Rostrhamus sociabilis plumbeus	Everglade snail kite	E	X	
Insects				
Cicindela highlandensis	Highlands tiger beetle	C		X
Mammals				
Eumops floridanus	Florida bonneted bat	E		X
Puma concolor coryi	Florida panther	E		X
Trichechus manatus	West Indian manatee	Th		X
Plants				
Conradina brevi/olia	Short-leaved rosemary	E		X
Dicerandra frutescens	Scrub mint	E		X
Hypericum cumulicola	Highlands scrub hypericum	E		X
Liatris ohliiwerae	Scrub blazingstar	E		X
Paronychia chartacea	Papery whitlow-wort	Th		X
Folwala lewtonii	Lewton's polygala	E		X
Polygonella basiramia	Wireweed	E		X
Polygonella myriophylla	Sandlace	E		X
Prunus geniculate	Scrub plum	E		X
Bonamia grandiflora	Florida bonamia	Th		X
Chionanthus pygmaeus	Pygmy fringe-tree	E		X
Clitoria fragrans	Pigeon wings	Th		X
Deeringothamnus	Beautifual pawpaw	E		X
Eriogonum longifolium var.	Scrub buckwheat	Th		X
Eryngium cuneifolium	Snakeroot	E		X
Nolina brittoniana	Britton's beargrass	E		X
Warea amplexifolia	Wide-leaf warea	E		X
Warea carteri	Carter's mustard	E		X
Lupinus aridorum	Scrub lupine	E		X
Dicerandra christmanii	Garrett's mint	E		X
Ziziphus celata	Florida ziziphus	E		X
Crotalaria avonensis	Avon Park harebells	E		X
Cladonia perforate	Fl. perorate cladonia lichen	E		X

4.2 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. The following summarizes past, present, and projected Corps efforts that cumulatively affect the regional environment of south Florida (**Table 4-3**). The East Lake Tohopekaliga Regulation Schedule Temporary Planned Deviation (approved 17 October 2019) for Fish and Wildlife Enhancement began mid-October 2019. Structure 59 (S-59), East Lake Tohopekaliga's outlet structure, was opened to begin following the temporary deviation line shown in Figure 6.A target elevation was also established for Lake Tohopekaliga to facilitate the drawdown of East Lake Tohopekaliga. Despite heavy rainfall in late October/early November 2019, the recommended elevation in Lake Tohopekaliga has been achieved.

The Proposed Action is expected to allow construction for the KRR Project in Reach 2 to remain on schedule, thus facilitating the implementation of project components including backfilling of the C-38 canal and restoring nine miles of miles of historic river. Completion of these construction components, in addition to completion of Reach 1 and Reach 4 construction activities such as restoring continuous flow to 19 miles of the Kissimmee River, are intended to help the KRR Project achieve restoration goals. The KRR Project in combination with the East Lake Tohopekaliga Regulation Schedule Temporary Planned Deviation aim to enhance wildlife habitat and restore a more natural flow regime. The Proposed Action, as a temporary deviation and change to operational strategy of KCH, would allow the Corps and SFWMD to inform water management decisions to allow for the continuation construction meet the KRR Project schedule.

Table 4-3. Past, present, and reasonably foreseeable actions and plans affecting the KRR Project area.

-	Past Actions and Authorized Plans	Current Actions and Operating Plans	Reasonably Foreseeable Future Actions and Plans
Status of Non-CERP Projects	- C&SF Project (1948) - Lakes KCH Interim Regulation Schedule, 1981	- - Kissimmee River Restoration (KRR) - KRR Headwaters Revitalization, 1996 - East Lake Tohopekaliga Temporary Planned Deviation, 2019 Regulation Schedule - - - SFWMD Lake Okeechobee Watershed Protection Plan, 2019	- SFWMD Restoration Strategies Project - DEP Lake Okeechobee Basin Management Action Plan, 2020 - DEP St. Lucie Estuary and River Basin Management Action Plan, 2020 - DEP Caloosahatchee River Basin Management Plan, 2020
Operations Plan for Lake Okeechobee, WCA 3A, ENP and the SDCS	- Water Supply and Environment (WSE) Lake Okeechobee Regulation Schedule (2000)	- Lake Okeechobee Regulation Schedule (LORS 2008)	- LORS 2008 to be replaced by revised Lake Okeechobee Regulation Schedule by 2022

	- IOP 2002 to Present	- SFWMD LEC Regional Water Supply Plan	- SFWMD periodically revises the LEC Regional Water Supply Interim Plan
CERP Projects			- Future CERP Projects (Lake Okeechobee Watershed Restoration Project) -

4.3 Irreversible and Irretrievable Commitment of Resources

An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost forever. An irretrievable commitment of resources is one in which, due to decisions to manage the resource for another purpose, opportunities to use or enjoy the resource as they presently exist are lost for a period of time. The proposed action consists of a temporary operational change to current water management operations and does not include construction of permanent structures or modifications to existing water management features. The proposed action would not cause permanent removal or consumption of any natural resources.

4.4 Unavoidable Adverse Environmental Effects

Environmental effects for reach resource are discussed above in **Table 4-1**. The proposed action is not anticipated to result in unavoidable and significant adverse environmental effects. The Corps' assessment if hydrometerological conditions in conjunction with stakeholder or agency input may suspend or discontinue the planned deviation due to impacts greater than expected/discussed within this EA.

4.5 Conflicts and Controversy

Over the lifetime of the C&SF Project, considerable interest has been generated among local and regional stakeholders. The Corps continually strives to include all interested parties in its decision making process and will continue to consider all issues that arise. Reference **Section 6** for a description of coordination with Federal and state agencies regarding the proposed action. Areas of potential concern include: (1) potential impacts of reversals on Everglades snail kite, wood stork, and other wading bird foraging habitat and nesting area, such as during or after storm surge if S-65 flows are restricted below 900 cfs; (2) changes in hydrometerological conditions resulting in greater impacts to resources than expected; (3) if lake stages fall below the temporary deviation regulation there will be increased lake storage for flood control purposes.

4.6 Environmental Commitments

The Corps commits to avoiding, minimizing or mitigating for adverse effects. All practicable means to avoid or minimize environmental effects were incorporated into the Preferred Alternative (Alternative B). The Corps' assessment of hydrometerological conditions in conjunction with stakeholder or agency input may suspend or discontinue the deviation due to impacts greater than expected/discussed within the EA. Termination of the deviation may be implemented at any time as a result of changed hydrometerological conditions. The water management decision making process would include frequent coordination calls

with trust resource agencies to inform changes in Lake KCH management, including but not limited to: C&SF Project conditions, historical lake levels, estuary conditions/needs, lake ecology conditions/needs, current climate conditions, climate forecasts, hydrologic outlooks, projected lake level rise/recession, and water supply conditions/needs. Reference **Appendix A** for the operational strategy of the Proposed Action.

4.7 Compliance with Environmental Requirements

The following sub-sections document compliance of the Proposed Action with environmental requirements.

4.7.1 National Environmental Policy Act of 1969 (Public Law 91-190)

Environmental information on the project has been compiled and the EA and Proposed FONSI were coordinated for public, state, and Federal agency review. Comments received during the review of the EA and Proposed FONSI are incorporated in this document. The Proposed Action is in compliance with NEPA.

4.7.2 Endangered Species Act of 1973 (Public Law 93-205)

Correspondence dated February 7, 2020 was provided to USFWS requesting concurrence to species determinations as a result of the Proposed Action. The USFWS provided the Corps with a list of ESA listed species potentially occurring in the project area, from which the Corps made species effects determinations for the 2020 KRR HW SOM Biological Assessment (**Table 4-2**). The Biological Assessment is currently being prepared for the KRR HW SOM but has not yet been submitted and covers the same species as the current Proposed Action. The USFWS concurred with species effects determinations for this Proposed Action via email on 12 February 2020. The Corps agrees to maintain open and cooperative communication with USFWS during the planned deviation. Upon completion of assessment review for species under National Marine Fisheries Service (NMFS) purview it was determined that the Proposed Action would have no effect on these species; therefore, consultation with NMFS was not necessary. Reference **Section 6.2** and **Appendix B** for pertinent correspondence. The Proposed Action has been fully coordinated under the Endangered Species Act and is in full compliance with the Act.

4.7.3 Fish and Wildlife Coordination Act of 1958 (Public Law 85-624), as amended

The Proposed Action has been fully coordinated with USFWS and FWC. In response to the requirement of this Act, the Corps has and will continue to maintain continuous coordination with USFWS and FWC. The Corps initiated coordination with USFWS and FWC via emails dated February 7, 2020 and is continuing coordination. All correspondence is documented in **Appendix B**. The proposed action is in full compliance with the Act.

4.7.4 National Historic Preservation Act of 1966 (Public Law 89-665)

The Proposed Action is in compliance with Section 106 of the National Historic Preservation Act (Section 106), as amended (Public Law 89-665). The Corps has determined the proposed action has no potential to affect historic properties, in accordance with 36 CFR 800.3(a)(1).

4.7.5 Clean Water Act of 1972 (Public Law 107-303)

The proposed action will not adversely affect water quality. As the proposed action is strictly of an operational nature, and does not involve any new releases or construction activity, water quality certification from the State of Florida is not required. Furthermore, as there are no structural components contained in the proposed action and no dredge and fill operations being considered, a Section 404(b) Evaluation is not required. The Proposed Action is in compliance with this Act.

4.7.6 Clean Air Act of 1972 (Public Law 88-206)

No air quality permits will be acquired for the Proposed Action as the Proposed Action is operational in nature does not require such permits. Section 176(c) is not applicable because the proposed action in within attainment areas for all criteria pollutants.

4.7.7 Coastal Zone Management Act of 1972 (Public Law 92-583)

The Corps has determined that the Proposed Action is consistent to the maximum extent practicable with the enforceable policies of Florida's approved Coastal Zone Management Program. The Proposed Action falls within the bounds of the Federal Consistency Determination included in the *Kissimmee River Headwaters Revitalization Project: Final Integrated Project Modification Report and Supplement to the Final Environmental Impact Statement* (USACE 1996).

4.7.8 Farmland Protection Policy Act of 1981 (Public Law 97-98)

No prime or unique farmland would be impacted by implementation of the Proposed Action. This Act is not applicable.

4.7.9 Wild and Scenic River Act of 1968 (Public Law 90-582)

No designated Wild and Scenic river reaches would be affected by project related activities. This Act is not applicable.

4.7.10 Marine Mammal Protection Act of 1972 (Public Law 92-522)

No marine mammals would be harmed, harassed, injured or killed as a result of the proposed action. Therefore, the Proposed Action is in compliance with this Act.

4.7.11 Estuary Protection Act of 1968 (Public Law 90-454)

No designated estuary would be affected by the Proposed Action. This Act is not applicable.

4.7.12 Federal Water Project Recreation Act of 1965 (Public Law 89-72), as amended

Recreation and fish and wildlife enhancement have been given full consideration in the Proposed Action. The Proposed Action is in compliance with this Act.

4.7.13 Submerged Lands Act of 1953 (Public Law 83-31)

The Proposed Action is an operational change to existing infrastructure; therefore, no construction is proposed on submerged lands. The Proposed Action is in compliance with the Act.

4.7.14 Coastal Barrier Resources Act and Coastal Barrier Improvement Act of 1990 (Public Law 92-583)

There are no designated coastal barrier resources in the project area that would be affected by the Proposed Action. These Acts are not applicable.

4.7.15 Resource Conservation and Recovery Act (RCRA) (Public Law 94-580), As Amended by the Hazardous and Solid Waste Amendments (HSWA) of 1984 (Public Law 98-616), Comprehensive Environmental Response Compensation and Liability Act (CERCLA), Toxic Substances Control Act (TSCA) of 1976 (Public Law 96-510)

Implementation of the Proposed Action is not expected to result in the discovery of HTRW since there is no excavation or other construction activities associated with this project. The Proposed Action has a very low risk for increased mobilization of existing HTRW where it might exist within the study area. The Proposed Action is in compliance with these Acts.

4.7.16 Rivers and Harbors Act of 1899 (33 U.S.C. 403)

The Proposed Action would not obstruct navigable waters of the United States. The Proposed Action is in full compliance.

4.7.17 Safe Drinking Water Act of 1974 (Public Law 93-523), as amended

The Proposed Action would not impact safe drinking water standards. The Proposed Action is in full compliance.

4.7.18 Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646)

Acquisition of real estate is not required for the Proposed Action. The Proposed Action is in compliance with this Act.

4.7.19 Anadromous Fish Conservation Act (Public Law 89-304)

Anadromous fish species will not be affected by this action. The Proposed Action has been coordinated with the NMFS and is in compliance with the Act.

4.7.20 Migratory Bird Treaty Act and Migratory Bird Conservation Act (16 U.S.C. 703-712)

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 Action is not expected to destroy migratory birds, their active nests, their eggs, or their hatchlings. The Proposed Action will not pursue, hunt, take, capture, kill or sell migratory birds. The Proposed Action is in compliance with these Acts.

4.7.21 Marine Protection, Research and Sanctuaries Act (Public Law 92-532)

Ocean disposal of dredge material is not proposed as part of the Proposed Action. This Act is not applicable.

4.7.22 Magnuson-Stevens Fishery Conservation and Management Act of 1976 (Public Law 94-265)

No fisheries or other areas under the purview of NMFS would be affected by the Proposed Action. The Proposed Action is in compliance with the Act.

4.7.23 Executive. Order (E.O.). 11990, Protection of Wetlands

This E.O. instructs Federal agencies to avoid development in wetlands to the maximum extent possible. The proposed action is an operational change to existing infrastructure; therefore, no construction is proposed and no wetlands effect are expected. The Proposed Action is consistent with the intent of this E.O. and is in compliance.

4.7.24 E.O. 11988, Floodplain Management

This E.O. instructs Federal agencies to avoid development in floodplains to the maximum extent possible. The Proposed Action is an operational change to existing infrastructure; therefore, no construction is proposed and wetlands will not be affected. The Proposed Action is consistent with the intent of this E.O. and is in compliance based on the 1996 NEPA (USACE 1996) that led to acquisition of lands for KRR Project purposes.

4.7.25 E.O. 12898, Environmental Justice

E.O. 12989 provides that each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority or low income populations. The Proposed Action would not result in disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. The Proposed Action is in compliance with this E.O.

4.7.26 E.O. 13089, Coral Reef Protection

The Proposed Action would not result in adverse impacts to coral reef ecosystems. No coral reef habitats exist within or near the project area. This Act is not applicable.

4.7.27 E.O. 13112, Invasive Species

The Proposed Action is operational in nature and should not promote the growth or spread of invasive species. The Proposed Action will be in compliance with the goals of this E.O.

4.7.28 E.O. 13045, Protection of Children

E.O. 13045, requires each Federal agency to "identify and assess environmental risk and safety risks [that] may disproportionately affect children" and ensure that its "policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks." This action has no environmental safety risks that may disproportionately affect children. The Proposed Action is in compliance.

4.7.29 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 in the project area for foraging, nesting, and breeding. The Proposed Action is not expected to destroy migratory birds, their active nests, their eggs, or their hatchlings. The Proposed Action is in compliance with the goals of this E.O.

5 PREPARERS

Table 5-1 provides a list of the persons involved in the preparation and review of this document.

Table 5-1. List of report preparers and reviewers.

Name	Organization	Discipline/Expertise	Role in Document Preparation
Luis Alejandro	USACE	Engineering Division	Reviewer
Russ Weeks	USACE	Hydrologic Modeling	Reviewer
Laureen Borochaner	USACE	Engineering Division	Reviewer
Angie Dunn	USACE	Planning Division	Reviewer
Meredith Moreno	USACE	Archaeologist	Reviewer
Chris Altes	USACE	Archaeologist	Reviewer
Jason Engle	USACE	Engineering Division	Reviewer
Eva Velez	USACE	Project Management	Reviewer
Timothy Gysan	USACE	Project Management	Reviewer
Andrew LoSchiavo	USACE	Planning Division	Reviewer
Melissa Nasuti	USACE	Biologist	Environmental Effects Analyses
Madeline Piscetta	USACE	Biologist	Environmental Effects Analyses
Stephanie Raulerson	USACE	Hydrologist	Hydrologic Analyses/Operations
Eric Summa	USACE	Planning Division	Reviewer

6 PUBLIC INVOLVEMENT

The following details public involvement during development of the proposed action.

6.1 Scoping and EA

A NEPA scoping letter was not mailed to interested stakeholders during the development of the planned temporary deviation. Reference **Section 6.2** below for a description of coordination with other Federal and state agencies, and tribal representatives regarding the proposed action and **Section 6.3** for a list of statement recipients to which the EA and proposed FONSI was mailed to.

6.2 Agency Coordination

The Corps has been in coordination with other Federal and state agencies, and tribal representatives regarding the proposed action. Parties included the Seminole Tribe of Florida, Miccosukee Indian Tribe of Florida, Department of the Interior (DOI), the FDEP, the Florida Department of Agriculture and Consumer Services (FDACS), the Florida Fish and Wildlife Conservation Commission (FWC), the SFWMD, the U.S. Environmental Protection Agency (USEPA), and the USFWS. Comments from FDEP and USFWS have been incorporated in this EA. Each of the respective agencies and tribal representatives were contacted February 7, 2020. All coordination letters related to the proposed action are included in **Appendix B**.

6.3 List of Recipients

A Notice of Availability (NOA) for the EA and proposed FONSI was mailed to interested stakeholders to begin a 15 day review period. Recipients included Federal, state and local agencies, tribal representatives and other interested private members of the public. A complete mailing list is available upon request. The EA and Proposed FONSI were also posted to the internet at the following address under Multiple Counties:

http://www.saj.usace.army.mil/About/DivisionsOffices/Planning/EnvironmentalBranch/EnvironmentalDocuments.aspx#

6.4 Public and Agency Review

Comments received during the review period from February 28, 2020 to March 16, 2020 are contained in Appendix B. The Environmental Protection Agency did not have any comments. Florida Department of Agricultural and Consumer Services and Florida Department of Environmental Protection indicated the scope of the action would not impact resources of concern. Audubon of Florida, a non-governmental organization advocating for conservation of avian species, indicated a concern regarding potential effects on the endangered Florida Grasshopper Sparrow and its habitat. The Corps made a no effect determination and coordinated with U.S. Fish and Wildlife Service, because the maximum Lake KCH stage will be 54.5 ft., NGVD29 in a heavy rainfall scenario (as experienced during October 2011), when localized rainfall amounts near Lake Kissimmee exceeded a 100-yr return frequency. The governing flood control criteria for design of the Headwaters lake regulation schedule and accompanying infrastructure (enlarged C-36/C-37 canals and additional S-65 discharge capacity) was to ensure that the frequency of flooding above elevation 54.0 ft, NGVD29 on the KCH lakes was not increased in comparison to the authorized C&SF base condition flood performance for the lakes. Given that Grasshopper Sparrow habitat exists at

elevations 57 ft. NGVD and above, it is unlikely that Alternative B would create stages near that elevation and would not have an effect on the species' habitat.

7 REFERENCES

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