APPENDIX B – PERTINENT CORRESPONDENCE

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TABLE B-1. SUMMARY OF CORRESPONDENCE PRIOR TO RELEASE OF ENVIRONMENTAL ASSESSMENT AND PROPOSED FINDING OF NO SIGNIFICANT IMPACT FOR PUBLIC REVIEW.

Correspondence		Summary of Correspondence
October 24, 2011	Seminole Tribe of Florida	Request to the Corps to perform a demonstration project related to S-190 operations and related documentation.
January 23, 2012	U.S. Army Corps of Engineers	Letter in response to Seminole Tribe of Florida correspondence dated October 24, 2011 regarding a proposed demonstration project to modify the operational schedule of the S-190 structure for a two year period. The Corps supports the request and provided to the Seminole Tribe of Florida an example of the documentation needed to support the deviation.
May 30, 2012	Seminole Tribe of Florida	Correspondence requests the Corps to process the planned deviation for the S-190 structure. January 23, 2012 correspondence requested the submittal of supporting documentation to expedite the deviation process and provided an example for a recent study for Lake Istokpoga. Letter and enclose attachments serve as the supporting documentation suggested.
April 1, 2014	Seminole Tribe of Florida	In an effort to move the S-190 operation evaluation forward, the Corps was able to allocate funds to do the evaluation the Corps needs to change the operations of the schedule back to its original purpose (prevent the over drainage of the Big Cypress Reservation) including the required National Environmental Policy Act (NEPA) analysis associated with that action. The Seminole Tribe of Florida provided correspondence with regard to the Tribe's purpose and need for the S-190 operation evaluation.
September 15, 2014	U.S. Army Corps of Engineers	Correspondence to Miccosukee Tribe of Indians of Florida inviting the Tribe to participate on the project deliver team for modifications to the current water operating schedule for the S-190 gated spillway.
October 21, 2014	U.S. Army Corps of Engineers	Correspondence to Museum Director and Tribal Historic Preservation Officer requesting concurrence on the area of potential affect to be limited to portions of the West and North Feeder Canal footprint and requesting council as to if the project will affect sites unknown to state or federal agencies.
October 21, 2014	U.S. Army Corps of Engineers	Correspondence to NAGPRA and Cultural Resources Representative requesting concurrence on the area of potential affect to be limited to portions of the West

		and North Feeder Canal footprint and requesting council as to if the project will affect sites unknown to state or federal agencies.
February 11, 2015	U.S. Army Corps of Engineers	Correspondence to U.S. Fish and Wildlife Service requesting confirmation of listed species within the project area. Confirmation was received.
June 30, 2015	Seminole Tribe of Florida	Correspondence stating that the Tribe is concerned that, although the re-evaluation of the S-190 was undertaken at the Tribe's request in order to allow a correction to the structure's operation to once again focus on the Tribe's needs, consideration of potential impacts on lands outside of the Big Cypress boundaries may carry more weight than the needs of the Tribe. The Tribe is looking for confirmation from the Corps that their concern is unwarranted and therefore request a meeting to clarify the Tribe's concern.
September 3, 2015	U.S. Army Corps of Engineers	Correspondence formally inviting the South Florida Water Management District to become a cooperating agency for the S-190 operation evaluation study in accordance with regulations pertaining to NEPA.
September 3, 2015	U.S. Army Corps of Engineers	Correspondence formally inviting the Seminole Tribe of Florida to become a cooperating agency for the S-190 operation evaluation study in accordance with regulations pertaining to NEPA.
September 3, 2015	U.S. Army Corps of Engineers	Correspondence formally inviting the Miccosukee Tribe of Florida to become a cooperating agency for the S-190 operation evaluation study in accordance with regulations pertaining to NEPA.
September 3, 2015	U.S. Army Corps of Engineers	Correspondence formally inviting the Bureau of Indian Affairs (BIA) to become a cooperating agency for the S-190 operation evaluation study in accordance with regulations pertaining to NEPA.
September 17, 2015	Bureau of Indian Affairs	Acceptance by the BIA to become a cooperating agency on the S-190 evaluation study.
March 30, 2016	Natural Resources Conservation Service	Correspondence related to request on Prime, Unique, or Locally Important Farmland within the project area. Based on correspondence there will be no anticipated conversion of important farmland within the scope of the project.
March 8, 2016	U.S. Army Corps of Engineers	Correspondence pursuant to Section 106 of the National Historic Preservation Act proposing potential effects from modifications to S-190 operations and request for continued coordination and consultation.

April 6, 2016	Seminole Tribe of Florida Tribal Historic Preservation Office	Correspondence confirming information provided by Corps on March 8, 2016 regarding the area of potential effects for both the on-reservation and off-reservation components.
May 9, 2016	U.S. Army Corps of Engineers	Correspondence to USFWS indicating species effects determinations for federally listed threatened and endangered species as a result of modifications to S-190 operations.
June 8, 2016	Seminole Tribe of Florida Tribal Historic Preservation Office	Correspondence indication that the Tribal Historic Preservation Officer has completed a Phase 1 Cultural Resources Survey and Assessment of the proposed modifications to S-190 operating criteria on the Big Cypress Seminole Indian Reservation. Concurrence with determination that no cultural resources will be affected and no historic properties will be affected by the proposed action.
June 17, 2016	U.S. Army Corps of Engineers	Correspondence to NAGPRA Representative stating no cultural resources will be affected and no historic properties will be affected by the proposed action.
June 17, 2016	U.S. Army Corps of Engineers	Correspondence to State Historic Preservation Officer stating no cultural resources will be affected and no historic properties will be affected by the proposed action.
June 17, 2016	U.S. Army Corps of Engineers	Correspondence to State Historic Preservation Officer stating no cultural resources will be affected and no historic properties will be affected by the proposed action.
June 17, 2016	U.S. Army Corps of Engineers	Correspondence to Seminole Tribe of Florida Tribal Historic Preservation Officer stating no cultural resources will be affected and no historic properties will be affected by the proposed action.
July 18, 2016	U.S. Fish and Wildlife Service	Correspondence providing concurrence on effects determinations to Federally listed threatened and endangered species as a result of the proposed action.
July 22, 2016	Seminole Tribe of Florida Tribal Historic Preservation officer	Correspondence stating that there are no current objections to the proposed action. At least three known archeological sites and portions of a historic trail fall within the off reservation area of potential effect. If the proposed action result in impacts consultation is expected to resume.
July 28, 2016	Florida Department of State	The Florida State Historic Preservation Officer has reviewed the proposed action and concurs that no historic properties will be affected by the proposed undertaking.

TABLE B-2. SUMMARY OF CORRESPONDENCE FROM STATE, AGENCY, AND PUBLIC REVIEW OF THE ENVIRONMENTAL ASSESSMENT AND PROPOSED FINDING OF NO SIGNIFICANT IMPACT.

Comment Number	Commenter	Comment	Response
1	U.S. Environmental Protection Agency (EPA) October 12, 2016	**Environmental Effects:** On page 4-3 (4.5.2), the USACE discusses Alternative 2 and states, "It is anticipated that implementation of Alternative 2 would result in minor to moderate permanent improvements in groundwater recharge to the surficial aquifer…" EPA is concerned with the qualitative conclusions of "minor to moderate" improvements. Also, the USACE does not define the meaning of "minor to moderate" nor refer to quantitative data somewhere else in the document. Recommendation: The EPA recommends the USACE define the qualitative terminology of "minor to moderate" or disclose information in quantitative terms in the Final EA.	The U.S. Army Corps of Engineers (Corps) qualitatively described the "minor to moderate" improvements based on the relative increase in stages in the wet season proposed in Alternative 2 with respect to the No Action Alternative. Within the EA, the following definitions can be used to rate the intensity of the potential environmental effect: (1) Negligible – effect to the resource or discipline is barely perceptible and not measureable and confined to a small area; (2) Minor – effect to the resource or discipline is perceptible and measurable and is localized; (3) Moderate – effect is clearly detectable and could have appreciable effect on the resource or discipline; or the effect is perceptible and measurable throughout the project area; (4) Major – effect would have a substantial, highly noticeable influence on the resource or discipline on a regional scale. A hydrologic assessment (Appendix D of the EA) was conducted to evaluate potential effects within the project area as a result of implementation of modifications to S-190 operations. The analysis focused on examining and analyzing observed

Comment Number	Commenter	Comment	Response
			canal and groundwater stage data in the Feeder Canal Basin and adjacent water level recorder data collected in groundwater monitoring wells in the recent past. Due to the paucity of reliable groundwater level data, the surface water-groundwater interaction in this area is challenging to quantify. However, higher S-190 headwater stages in normal conditions should result in proportional increases in groundwater levels, particularly in areas adjacent to the Feeder Canal Basin. The assessment of potential effects was rated or described as 'minor to moderate' based on the hydrologic assessment presented in Appendix D and best professional judgement due to the constraints mentioned. More long term monitoring data is needed to help further describe this relationship quantitatively. The Corps developed recommendations for modifications to the operating criteria for S-190 in coordination with the SFWMD and Seminole Tribe as a first step in moving toward restoration of the natural system within the Western Basins. The Seminole Tribe identified Alternative 2 as the Preferred Alternative.

Comment Number	Commenter	Comment	Response
2	EPA October 12, 2016	**Environmental Effects:** On page 4-4 (4.5.4), the USACE states, "Alternative 4 will maintain year round canal stages higher than Alternatives 2 and 3, thus the groundwater storage would be greater under Alternative 4 as compared with these alternatives and would likely show a moderate to high beneficial effect on groundwater hydrology within BCSIR." This statement appears to conclude that Alternative 4 would have more benefits to restoring groundwater storage (which is a stated project purpose) than Alternative 2 (preferred alternative). The EPA is concerned that the USACE doesn't disclose or explain how much greater the storage will be in quantitative terms. Later, the USACE makes the following statement, "However, Alternative 4 includes the potential operating range of 14.8 to 14.2 ft. NGVD to be used in anticipation of a large rainfall event, which may result in a potential loss of groundwater during pre-storm drawdowns. Preterm drawdowns are expected to be required infrequently." Again, the USACE doesn't quantitatively describe how much groundwater storage would be lost or how frequently this pre-storm drawdown would occur. Recommendation: In the Final EA, the EPA recommends the Corps quantify and better explain the addition of groundwater storage Alternative 4 has over Alternatives 2 and 3, quantify and explain the groundwater storage loss and frequency of Alternative	Please see response to Comment-1 above. The hydrologic analysis conducted for the S-190 Project focused on wet season conditions per the study goals and purposes. Conceptually, higher stages in a canal during the wet season, shall result in increased groundwater storage, relative to the No Action Alternative. In other words, groundwater level increases due to decreased seepage into the canal. Due to the lack of data available in the study area, the project delivery team agreed that the level of analysis in this study related to the alternatives was going to be qualitative in nature and not rely on a hydrologic modeling tool. A hydrologic assessment (Appendix D of the EA) was conducted to evaluate potential effects within the project area as a result of implementation of modifications to S-190 operations. However, due to the paucity of reliable groundwater level data, the surface water-groundwater interaction in this area is challenging to quantify. The Corps agrees that Alternative 4 shall have benefits to groundwater storage above what should be expected in Alternative 2, however, other constraints in the system played a role in selecting Alternative 2 versus Alternative 4. The

Comment Number	Commenter	Comment	Response
		4's pre-storm drawdowns as compared to Alternatives 2 and 3. Additionally, the EPA recommends the USACE better explain the rationale for choosing Alternative 2 over Alternative 4 since Alternative 4 is described as having greater groundwater storage (compared to Alternative 2).	qualitative analysis documented in the EA was based on best professional judgement of the PDT members. Similarly, effects of pre-storm drawdowns were evaluated qualitatively due to the lack of a hydrologic/hydraulic tool and project constraints to develop such a tool. The Corps developed recommendations for modifications to the operating criteria for S-190 in coordination with the SFWMD and Seminole Tribe as a first step in moving toward restoration of the natural system within the Western Basins. The Seminole Tribe identified Alternative 2 as the Preferred Alternative.
3	EPA October 12, 2016	**Environmental Effects:** On page 4-14 (4.18.3), the USACE states, "Alternative 3 may provide slightly increased benefits to Native Americans by resulting in improved hydrologic conditions within the natural lands as compared with Alternative 2." If Alternative 3 improves hydrologic conditions, then why was it not chosen as the preferred alternative? Recommendation: As discussed in other comments, the EPA recommends the USACE quantify the slight increases of Alternative 3 over Alternative 2 and also	Please see response to Comment-1 and Comment-2 above. Alternative 2 was selected as the Preferred Alternative as it is expected to best meet the project objectives by upholding the federal Indian trust responsibility to protect the Seminole Tribe's Tribal treaty rights, lands, assets and recourses, by reducing over drainage of BCSIR, increasing groundwater levels and water storage within the BCSIR, and restoring more natural wetland communities while minimizing any associated negative effects within the project area. The Corps developed

Comment Number	Commenter	Comment	Response
		better explain their rationale for selecting Alternative 2 over Alternative 3 in the Final EA.	recommendations for modifications to the operating criteria for S-190 in coordination with the SFWMD and Seminole Tribe as a first step in moving toward restoration of the natural system within the Western Basins. The Seminole Tribe identified Alternative 2 as the Preferred Alternative
4	EPA October 12, 2016	**Environmental Effects:** On page 4-14 (4.18.4), the USACE states, "Alternative 4 may provide slightly increased benefits to Native Americans by resulting in improved hydrologic conditions within the natural lands as compared with Alternatives 2 and 3." As previously stated in Comment 3, the EPA is concerned that the USACE has not disclosed the slight increases in hydrologic benefits as compared to Alternative 2. Also, the USACE doesn't adequately describe the hydrological benefits of Alternative 2 over Alternative 4. Recommendation: In the Final EA, the EPA recommends the USACE better explain the hydrological benefits of Alternative 2 over Alternative 4 and better explain their rationale (in terms of hydrological and Native American benefits) of Alternative 2 over Alternative 4.	Please see response to Comment-1 and Comment-2 above. Alternative 2 was selected as the Preferred Alternative as it is expected to best meet the project objectives by upholding the federal Indian trust responsibility to protect the Seminole Tribe's Tribal treaty rights, lands, assets and recourses, by reducing over drainage of BCSIR, increasing groundwater levels and water storage within the BCSIR, and restoring more natural wetland communities while minimizing any associated negative effects within the project area. The Corps developed recommendations for modifications to the operating criteria for S-190 in coordination with the SFWMD and Seminole Tribe as a first step in moving toward restoration of the natural system within the Western Basins. The Seminole Tribe identified Alternative 2 as the Preferred Alternative
5	EPA October 12, 2016	**Environmental Effects:**	Please see response to Comment-1 and Comment-2 above. Alternative 2 was selected as the Preferred Alternative as it is

Comment Number	Commenter	Comment	Response
		On page 4-16 (4.19.2), the USACE again states that Alternative 4 will provide "slightly increased benefits Native Americans by resulting in improving hydrologic conditions" as compared to Alternative 2 and 3. As with previous comments, the EPA is concerned the USACE hasn't adequately discussed the rationale for selecting Alternative 2 over Alternative 4. Recommendation: In the Final EA, the EPA recommends the USACE better explain the hydrological benefits of Alternative 2 over Alternative 4 and better explain their rationale (in terms of hydrological and Native American benefits) of Alternative 2 over Alternative 4.	expected to best meet the project objectives by upholding the federal Indian trust responsibility to protect the Seminole Tribe's Tribal treaty rights, lands, assets and recourses, by reducing over drainage of BCSIR, increasing groundwater levels and water storage within the BCSIR, and restoring more natural wetland communities while minimizing any associated negative effects within the project area. The Corps developed recommendations for modifications to the operating criteria for S-190 in coordination with the SFWMD and Seminole Tribe as a first step in moving toward restoration of the natural system within the Western Basins. The Seminole Tribe identified Alternative 2 as the Preferred Alternative
6	EPA October 12, 2016	**Water Quality:** On page 4-12 (4.12.3), the USACE, states "The SFWMD incorporated the 1996 Tribe Landowner Agreement with the upstream land owner into SFWMD Environmental Resource Permit # 26-00623 special conditions, therefore the 50 ppb TP flow weighted mean concentration water quality standard remains in effect regardless of which Alternative is selected within this process." The word "standard" is incorrect. The 50 ppb requirement is not a water quality standard under the Clean Water Act. The 1996	The suggested correction has been incorporated into the EA. Thank you for the comment.

Comment Number	Commenter	Comment	Response
		Landowner Agreement refers to 50 ppb as a "Compliance Target". Recommendation: The EPA recommends the USACE accurately describe the 50 ppb as a “Compliance Target” as outlined in the 1996 Landowner Agreement within the Final EA.	
7	EPA October 12, 2016	**Native American:** On page 4-14 (4.18), the USACE discusses impacts to Native Americans and Native American lands. It appears that the USACE considered impacts to the Seminole Tribe of Florida tribal lands, but doesn’t mention potential impacts to the Miccosukee Tribe of Indians of Florida tribal lands. The EPA notes that in Appendix B the USACE documents their correspondences to the Miccosukee Tribe of Indians of Florida inviting them to participate on the project delivery team (letters dated Sept 15, 2014 and Sept 2, 2015); however, there is no discussion of these correspondences in this section of the EA. Additionally, the EPA is concerned that the USACE limits their analysis to hydrologic impacts and doesn’t consider other impacts (such as water quality, impacts to hunting and fishing, recreation and tribal ceremonies, etc.) Recommendation: In the Final EA, the EPA recommends the USACE describe any correspondence with both tribes (Seminole Tribe of Florida and Miccosukee Tribe of Indians of Florida) in this section	The suggested recommendation has been incorporated into Section 4.18 in the EA. Effects to water quality, recreation, and cultural resources are addressed in Sections 4.12, 4.17, and 4.19 respectively.

Comment Number	Commenter	Comment	Response
		of the Final EA. Additionally, the EPA recommends the USACE expand their discussions of Native American impacts beyond just hydrologic impacts as describe above.	
8	EPA October 12, 2016	**Native American:** On page 4-15, (4.19.1), the USACE discusses consultation with the Florida State Historic Preservation Officer (SHPO) and the Seminole Tribe of Florida Tribal Historic Preservation Officer (THPO). The EPA notes that there is no discussion of coordination with the Miccosukee Tribe of Indians of Florida regarding potential impacts to cultural resources. Recommendation: The EPA acknowledges the Area of Potential Effect (APE) is limited to land within the Big Cypress Seminole Indian Reservation (BCSIR); however, the EPA recommends the USACE explain their rationale for not including the Miccosukee Tribe of Indians of Florida Tribal lands within the APE. The EPA also recommends the USACE document any discussions with the Miccosukee regarding any potential impacts to native cultural resources. Also, the EPA recommends the USACE continue to reach out to the Miccosukee Tribe of Indians of Florida to solicit their input regarding the project.	The Corps consulted with the Miccosukee Tribe and coordinated the determination of no effect to historic properties with the appropriate Tribal representative verbally and in a letter date June 17, 2016 (see Appendix B). The Corps concurs that this was not explicitly stated in Section 4.19 and language indicating this consultation was added to Section 4.19.2.
9	EPA October 12, 2016	**Environmental Justice:** On page 4-31 (4.25.26), the USACE discusses environmental justice (EJ); however, there is no	The Proposed Action does not present any environmental impacts that are high, adverse and disproportionate to low income or minority populations. Sufficient

Comment Number	Commenter	Comment	Response
		discussion of potential EJ impacts in Chapter 3 (Affected Environment) or Chapter 4 (Environmental Effects). The EPA is concerned that the USACE has not identified potential Environmental Justice (EJ) communities or disclosed potential impacts. The Council on Environmental Quality (CEQ) established guidelines for EJ analysis in NEPA document in "Environmental Justice; Guidance under the National Environmental Policy Act" (Dec 10, 1997). In this document, CEQ provides guidance on each phase of NEPA (affected environment, environmental consequences, etc.) Recommendation: The EPA recommends the USACE identify any potential EJ communities (including Native Americans) within the project area or document that no EJ communities exist near the project. The EPA notes that USACE did discuss Native American impacts, but did not explain potential impacts to Native Americans in the context of EJ. The EPA also requests this discussion be included in Chapter 4.	public participation ensured potential impacts were understood by the public. The EA and Proposed FONSI were circulated for a 60 day review period to agencies, organizations, stakeholders and members of the general public located within and adjacent to the project area. No comments were presented as possible environmental impacts that may be disproportionate to low income or minority populations. The objectives of the project are focused on environmental protection. Implementation of the project would benefit all population groups by providing restoration of wetlands and other natural resources within the project area. No home owners would be displaced by the project. Alternative 2 was selected as the Preferred Alternative as it is expected to best meet the project objectives by upholding the federal Indian trust responsibility to protect the Seminole Tribe's Tribal treaty rights, lands, assets and recourses, by reducing over drainage of BCSIR, increasing groundwater levels and water storage within the BCSIR, and restoring more natural wetland communities while minimizing any associated negative effects within the project area. The Corps developed recommendations for

Comment Number	Commenter	Comment	Response
			modifications to the operating criteria for S-190 in coordination with the SFWMD and Seminole Tribe as a first step in moving toward restoration of the natural system within the Western Basins. The Seminole Tribe identified Alternative 2 as the Preferred Alternative. Section 4.25.26 has been edited to incorporate portions of the above text.
10	EPA October 12, 2016	**Preferred Alternative:** On page 2-5 (2.4), the USACE discusses their rational for selecting Alternative 2 as the preferred alternative. However, this brief discussion doesn't explain why Alternative 2 is preferable over Alternative 3 or 4. As noted in previous comments, the EPA is concerned that the USACE makes statements throughout the EA that suggests that other alternatives might improve hydrological conditions, but doesn't elaborate on the tangible advantages and disadvantages of selecting Alternative 2 over Alternative 3 or 4. The EPA notes that the USACE does state that Alternative 3 and 4 will require pre-storm drawdowns that could negatively impact groundwater storage, but doesn't quantify or adequately explain that these drawdowns are severe enough to rule out these alternatives. Recommendation: The EPA recommends the USACE better explain their rationale for selecting Alternative 2 over Alternatives 3 and 4 within Chapter 2 (Preferred	Alternative 2 was selected as the Preferred Alternative as it is expected to best meet the project objectives by upholding the federal Indian trust responsibility to protect the Seminole Tribe's Tribal treaty rights, lands, assets and recourses, by reducing over drainage of BCSIR, increasing groundwater levels and water storage within the BCSIR, and restoring more natural wetland communities while minimizing any associated negative effects within the project area. The Corps developed recommendations for modifications to the operating criteria for S-190 in coordination with the SFWMD and Seminole Tribe as a first step in moving toward restoration of the natural system within the Western Basins. Implementation of Alternative 3, 4 and 5 would result in similar effects as discussed under Alternative 2; however Alternatives

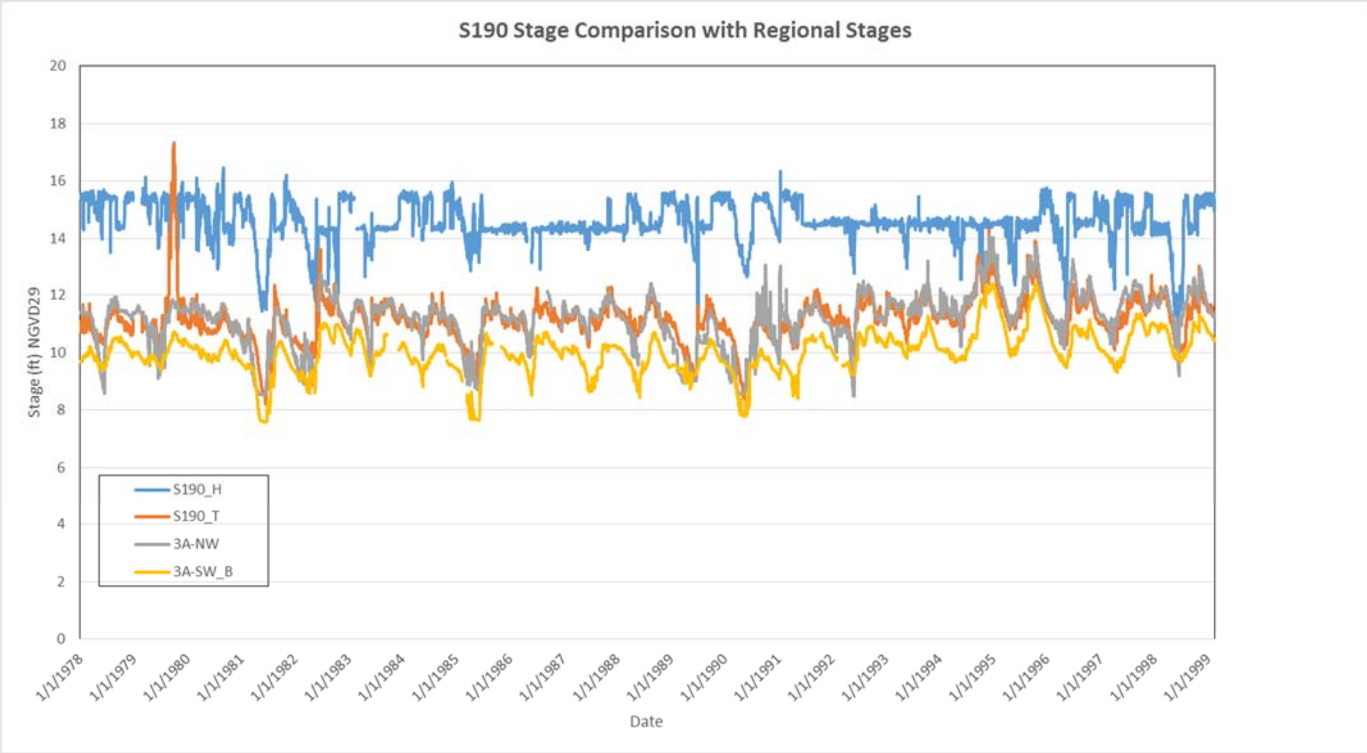
Comment Number	Commenter	Comment	Response
		Alternative) of the Final EA. The EPA recommend the USACE expand their discussion to include advantages and disadvantages of Alternative 2 (versus Alternatives 3 and 4) and quantify the disadvantages of the pre-storm drawdowns of Alternative 3 and 4.	3, 4, and 5 include the potential operating range of 14.8 to 14.2 ft NGVD to be used in anticipation of a large rainfall event, which may result in a potential loss of groundwater during pre-storm drawdowns. Text has been added to Section 2.4 to reflect the above. The Seminole Tribe identified Alternative 2 as the Preferred Alternative.
11	FWC October 14, 2016	The FWC has fish and wildlife and land management responsibilities for WCAs 2 and 3, which are managed as the Everglades and Francis S. Taylor Wildlife Management Area. Therefore, potential impacts to WCA 3A are the focus of this review. After review of the modeling documentation, it was determined that only gauges north of I-75 were used in the analysis: 3A-NW and 3AN1-GW1. Please note that this area is north of the outflow of the L-28 Interceptor Canal which receives flow from the S-190. Considering that the normal flow of water in WCA 3A is generally from northwest to southeast, an analysis using gauges south of the L-28 Interceptor Canal terminus, such as 3A-SW-B, may provide additional beneficial information. Gauge 3A-SW-B is located in an area where surface waters are more likely to be impacted by modifications of the S-190 operational schedule. FWC staff recommends that the U.S. Army Corps of Engineers considers providing additional information on the specific gauge selections in WCA 3A or considers additional analyses using gauges where surface waters	The purpose of the comparative analysis of S-190 head and tail water stage data with selected stage monitoring gauges in Big Cypress National Preserve (BCNP) and Water Conservation Area 3 (WCA 3), particularly 3A-NW, BCNPA1, BCNPA2 and BCNPA12, was to determine to what extent the proposed S-190 headwater operating criteria in the wet season might impact regional water levels in these areas. Due to the lack of an integrated hydrologic analysis tool, historical data was used to investigate what correlation exists between S-190 operations and regional water level trends. Based on the information presented in the report, it is apparent that the tail water at S-190 follows the regional water level trends observed in the monitoring gauges selected. This data set also showed that the water levels in BCNP and WCA3 A are

Comment Number	Commenter	Comment	Response
		are more likely to be affected by the proposed operational changes.	less influenced by the operations of S-190. In addition to the information provided, the FWC recommended an evaluation of the 3A-SW-B gauge. This gage was plotted along with the S-190 head and tail water stages for comparison purposes. See figure below. It can be seen from the resulting stage hydrographs that although the S-190 operations varied during this period, the tail water stage at the structure followed the regional trend observed in 3A-SW-B which in turn followed a similar trend as those monitoring gauges originally included in the report. Therefore, based on the stage hydrographs for 3A-SW-B, it can be inferred that regardless of the operation of the S-190 structure, its effect on the regional system is negligible as indicated by the similar behavior of the 3A-NW and 3A-SW-B gauges which are typical representations of the regional system.
12	FWC October 14, 2016	The FWC fully supports this operational change to reflect the original intent of the structure as it provides improved hydroperiods in natural areas and benefits to aquatic communities. We appreciate the opportunity to provide comments on this EA/Proposed Finding of No Significant Impact and we find it consistent with FWC's authorities under the Coastal Zone Management Act/Florida's Coastal Management Program.	Thank you for your review and comments.

Comment Number	Commenter	Comment	Response
13	FDEP October 28, 2016	The Florida State Clearinghouse has coordinated a review of the proposed federal action under the following authorities: Presidential Executive Order 12372; Section 403.061(42), Florida Statutes; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended. The Florida Department of Environmental Protection (Department) and the FWC has reviewed the proposed project and provided serval comments. Based on the information contained in the proposal and enclosed agency comments, the state has determined that, at this stage, the proposed federal activities are consistent with the Florida Coastal Management Program (FCMP). The state's continued concurrence will be based on the activities' compliance with FCMP authorities, including federal and state monitoring of the activities to ensure their continued conformance, and the adequate resolution of issues identified during this and any subsequent regulatory reviews. The state's final concurrence of the project's consistency with the FCMP will be determined during the environmental permitting process, in accordance with Section 373.428, Florida Statutes, if applicable.	Thank you for your review and comments.
14	FDEP October 28, 2016	The FDEP supports the findings of the Draft EA. The preferred alternative is expected to result in increased hydroperiods in the area of impact, reduced soil oxidation and increased peat accretion, a potential decrease in muck fires, increased surficial aquifer	Thank you for your review and comments.

Comment Number	Commenter	Comment	Response
		recharge, and the promotion of native wetland vegetation and macroinvertebrates.	
15	FDEP October 28, 2016	The Department notes that other alternatives afforded increased operational flexibility by allowing pre-storm draw downs and would result in greater environmental benefits than would be realized with Alternative 2. Section 4.12.2 notes that the implementation of Alternative 2 is likely to improve the quality of water discharged at S-190 as a result of enhanced retention detention of stormwater flows upstream of this structure. The most recent water quality sampling results illustrate a downward trend in nutrient loading and the concentrations at S-190 as compared with data collected prior to the District's test operations. The improvement of water quality discharges at this location is important for future restoration works. Please note that Section 4.12.3 suggests that Alternative 3 may have additional benefits due to higher stage elevations and longer detention times. Since Alternative 3 had the same stage triggers as Alternative 2, but had only added flexibility for pre-storm drawdown and emergency operations, it is not clear that this alternative would have longer detention time and water quality benefits. It may actually have slightly worse performance, at least prior to or during storm events. As such, it would be informative to add further explanation of the reasoning supporting the selection of Alternative 2 over the other Alternatives to Section 2.2 Issues and Basis for Choice.	Section 4.12.3 has been edited to read as follows: Implementation of Alternative 3 would result in similar effects as discussed under Alternative 2. Since Alternative 3 has the same operations scheme except that it allows for infrequent pre-storm drawdown while Alternative 2 does not. The effect on water quality of including pre-storm drawdown in Alternative 3 operations is not likely to significantly affect water quality since the drawdown will shorten residence time for water released in advance of the storm but allow for extended storage of storm flows within the shallow groundwater aquifer during and after the drawdown event.

Comment Number	Commenter	Comment	Response
16	FDEP October 28, 2016	The preferred alternative, Alternative 2, involves modifications to the operations of an existing surface water management system, which includes operational changes at S-190 in the L- 28 Interceptor Canal, a Class III Waterbody that discharges into the Everglades Protection Area (EPA), regulated by the Department under Chapter 373 of Florida Statutes (F.S.). The operations and maintenance of the S-190 structure is covered under FDEP File No. 0237803, an Everglades Forever Act permit issued to the District. Once finalized, any changes to the operating criteria for this structure need to be submitted to the Department for review in accordance with the permit. Please note that final water quality certification will be determined through the permitting process. Please update the text in Section 1.9 of the EA and Appendix C to reflect this.	The referenced permit will be mentioned within Section 1.9 of the EA, noting that the SFWMD is currently the permit holder.
17	FDEP October 28, 2016	Throughout the document, frequent reference is made to Figure 1-1. This figure lacks many of the features described within the narrative. Figure 4-3 appears to be more complete in that it more clearly depicts the location of S-190, PC 17A, the North and West Feeder Canals, the L-28 Interceptor Canal and the BCSIR.	Concur, references to figure numbers will be reviewed throughout the document and edited as applicable to reflect the most appropriate figure. Figure 1-1 will be reviewed and edited as appropriate to include labels for the North and West Feeder Canals at a minimum to better orient the reader.



Stage Hydrograph of S-190 Headwater and Tailwater in relation to gage 3A-NW and 3A-SW-B. Please reference comment 12 above.

SEMINOLE TRIBE OF FLORIDA

Commissioners:
Joseph Kippenberger
Chairman
Josephine Motlow North
Hollywood
Wovoka Tommie
Big Cypress
Linda Billie
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Treasurer

SEMINOLE WATER COMMISSION

October 24, 2011

Colonel Alfred A. Pantano, Jr., District Commander
U.S. Army Corps of Engineers
701 San Marco Boulevard
Jacksonville, FL 32207-8175

Dear Colonel Pantano:

Over the past several months, the staff at the Environmental Resource Management Department (ERMD) of the Seminole Tribe of Florida has been in discussions with the South Florida Water Management District regarding adaptive management options available to provide additional water storage in the West Feeder and North Feeder Canals and higher groundwater levels within the western portion of the Big Cypress Reservation. The positive benefits associated with this increased storage are many. ERMD expects that these benefits will include:

- increased storage and associated higher groundwater elevations,
- water available for purposes of drought management
- recharge for wells
- maintenance of water in ponds for wildlife and domestic animals
- fire protection
- protection of domestic drinking water
- maintenance and enhancement of wetland hydrology and habitat
- enhancement of the Native Area located south of the West Feeder Canal.

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season water shortages, to benefit ground water resources and seasonal hydroperiods of the natural systems within this region.

The demonstration project proposed would manage water levels using flexibility within existing design operating range of S-190. At no time would the level of flood protection provided by this structure be compromised. The demonstration aspect of this strategy would be to utilize the existing dry season range year round with criteria for deviation from this schedule only when climatic conditions and U.S. Army Corps of Engineers (USACE) Operations and Tribe ERMD staff determine that a deviation is warranted. Attached is a more detailed discussion of the test proposal and suggested monitoring.

Thank you for your consideration in this matter, we look forward to scheduling our first S-190 demonstration coordination meeting with you and your staff in the near future. Tribe staff looks forward to working with the USACE on this important water management opportunity for the Big Cypress Reservation. We appreciate your leadership on ensuring that the Federal trust responsibility to the Tribe's critical water supply resources is kept. Please contact Craig Tepper at (954) 965-4380, extension 10631 or email at ctepper@semtribe.com to discuss further and to schedule this meeting.

Sincerely,

Joseph S. Kippenberger,
Chairman, Seminole Water Commission
Seminole Tribe of Florida

JSK: sdm
enclosure (1)

cc: James Billie, Chairman, Seminole Tribe of Florida
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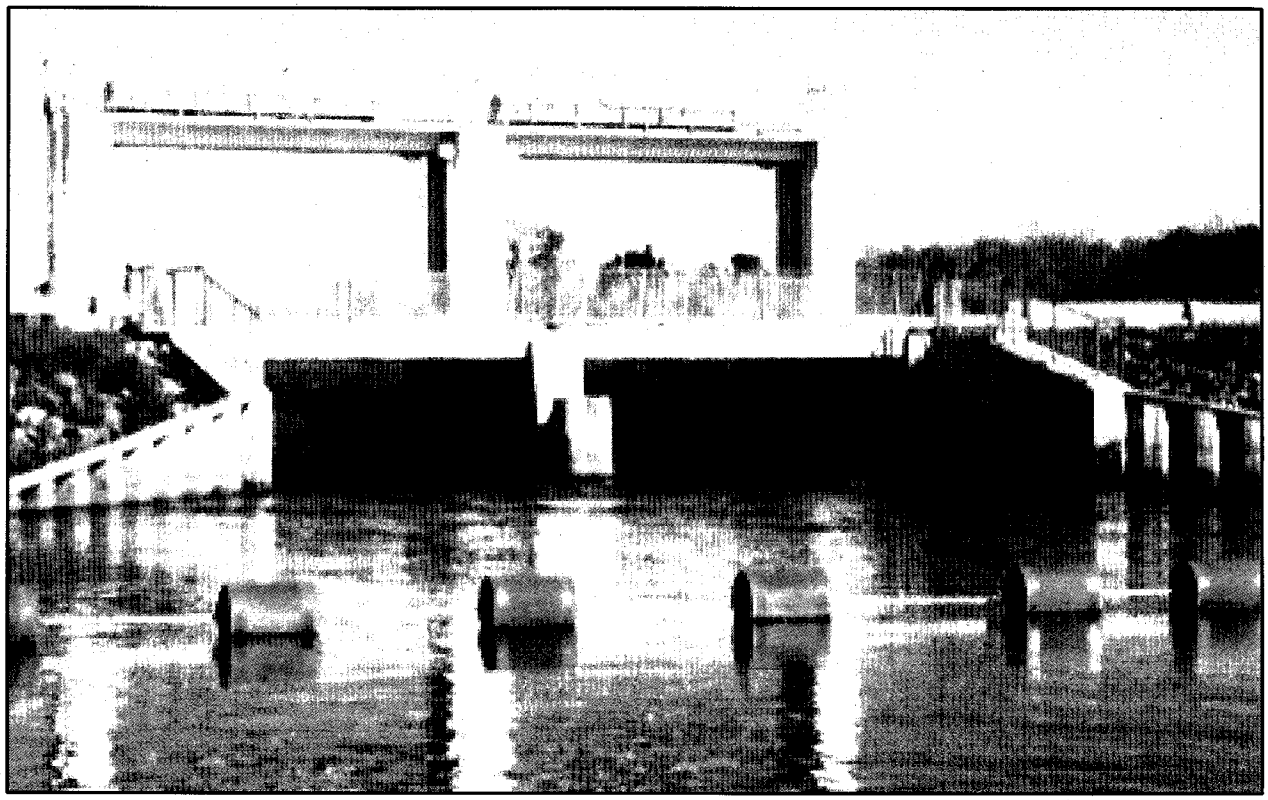

S-190 Demonstration Project

Environmental Resource Management Department
Seminole Tribe of Florida

EXECUTIVE SUMMARY

Objective of Demonstration Project

To provide additional water storage in the West Feeder and North Feeder Canals and higher groundwater levels within the western portion of the Big Cypress Reservation for purposes of drought management and enhancement of the Native Area and the Big Cypress National Preserve Addition through modification of the S-190 Operational Criteria.

Goals

To provide a two year adaptive management demonstration to investigate the effect of changing the operational criteria of the S-190 to retain seasonal rainfall and runoff to offset the scale of dry season shortages and to benefit groundwater resources and seasonal hydroperiods of the natural system within the western Big Cypress Reservation and adjacent lands.

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Modification of both the wet season and dry season schedules for operation of the S-190 gates to extend the higher stage dry season gate operations into the existing wet season gate operation schedule.

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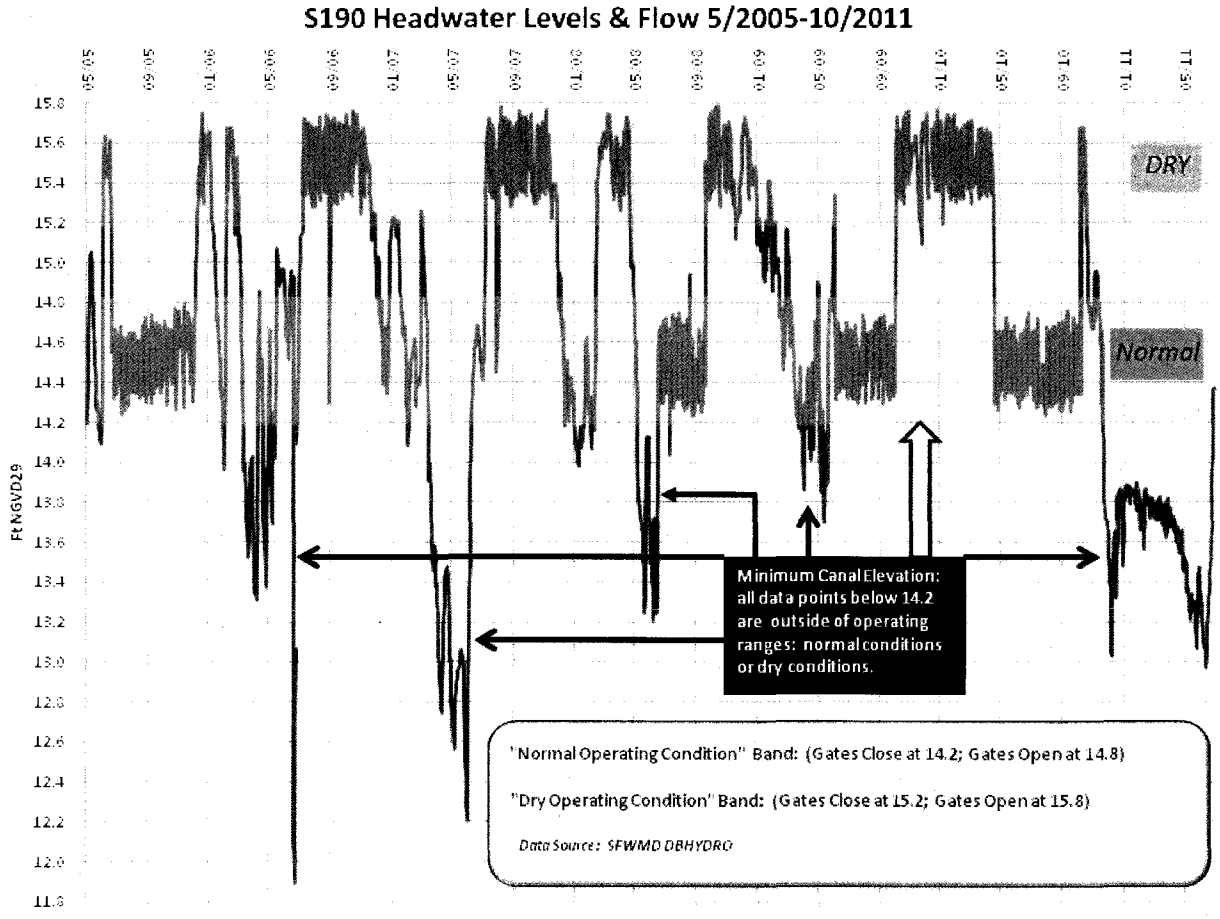
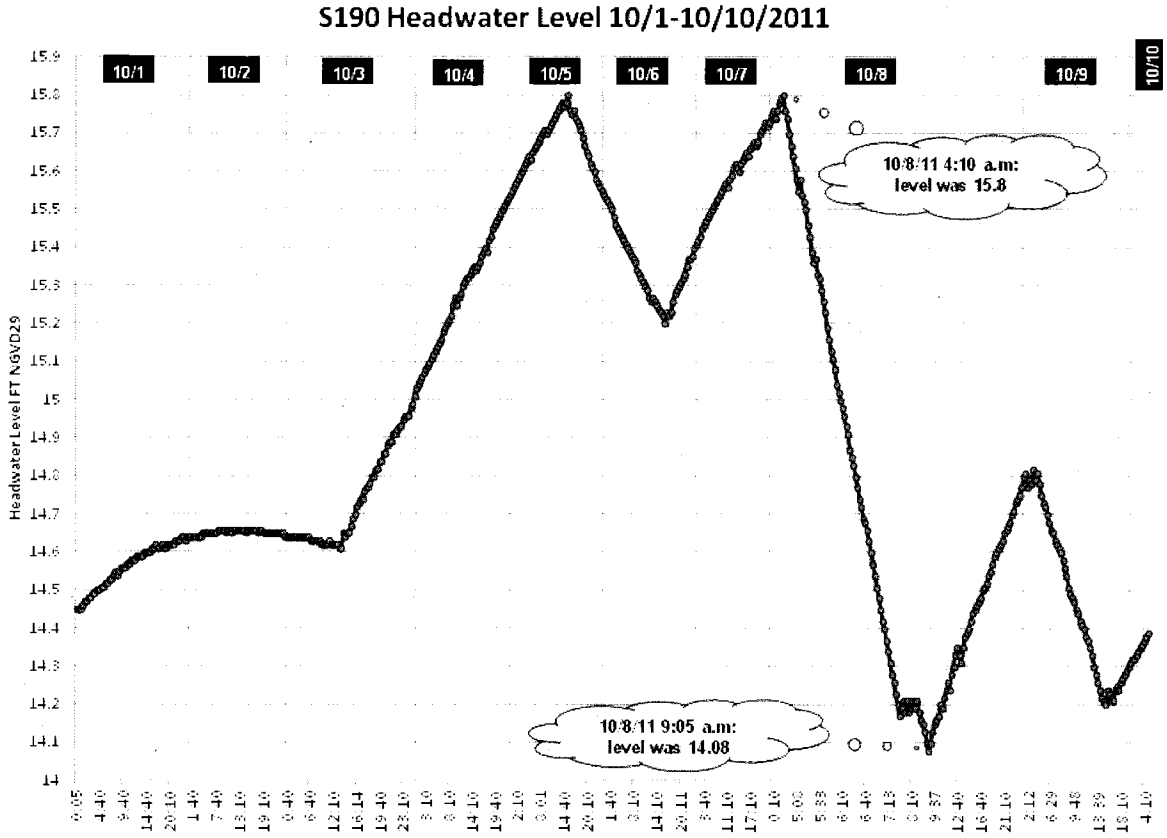
The system is operated either under dry or normal conditions; definition of "dry" and "normal" unknown. There is no flexibility to mimic the natural seasonal hydroperiods of the region. It is designed for positive drainage and not for water storage or environmental enhancement. As shown in the following hydrograph, there are several months after the wet season in which water stages are significantly lower than the intended dry season stages (particularly in 2006, 2007 and 2011). In fact, every year the stage levels at S190 are recorded outside of acceptable ranges (most recently in 2010-11 for 8 consecutive months)



This next hydrograph further demonstrates the primary intention of the S-190, which is flood control. On October 8, 2011, within a matter of a few hours, the entire West and North Feeder Canal and surrounding groundwater elevation is dropped from elevation 15.8 to 14.08. This action occurred during Phase III Water Shortage Orders declared May 10, 2011 for mandatory 45% reduction in water use for the area surrounding Big Cypress Reservation.



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As part of an initial demonstration strategy, the Tribe suggests the use of a Flood Management Strategies using the following adaptive flood management principles for modern Civil Engineering practices. These principles have been defined as follows:

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- Adaptability (change threat to opportunity)
- Flexible decision making (uncertainties) - Demonstration Project
- Monitoring and vigilance
- Learning while doing
- Application of new knowledge and technologies

Demonstration Option #1 – 2 year Demonstration Project

Manage using flexibility within existing design operating range. The demonstration aspect of this strategy would be to utilize the existing dry season range year round with criteria for deviation from this schedule only when climatic conditions and concurrence with USACE Operations and the Tribe's ERMD staff determine that a deviation is warranted.

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Monthly monitoring of canal water levels (North and West Feeder) and groundwater elevations in western section of Big Cypress Reservation. Monitoring will utilize existing data collected monthly by USGS and South Florida Water Management District. Data will be compiled and analyzed jointly by the USACE and the Tribe.

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Operations Division
Multi-Projects Branch

Honorable Joseph S. Kippenberger
Chairman, Seminole Water Commission
Seminole Tribe of Florida
6300 Stirling Road
Hollywood, Florida 33024

Dear Chairman Kippenberger:

This letter is in response to your letter dated October 24, 2011, regarding a proposed demonstration project to modify the operational schedule of S-190 structure for a two year period. The U.S. Army Corps of Engineers (Corps) supports your endeavor in studying the potential of increased water storage by modifying the operations of this structure.

The Corps will process the planned deviation, determine applicable laws and regulations such as National Environmental Policy Act, and coordinate with stakeholders including South Florida Water Management District. Any supporting document provided by you will expedite the process. The document may be an expanded proposal that will include evidence of no adverse impact on the level of flood protection currently provided by the structure, evidence of no harmful environmental impacts, a monitoring plan for the duration of the project including frequency of data collection, as well as documentation of coordination with the affected parties. Please find enclosed an example of supporting documentation.

If you have any questions or need additional information, please contact Mr. John Kilpatrick, Chief, Multi-Projects Branch, at 561-472-8884.

Sincerely,

Alfred A. Pantano, Jr.
Colonel, U.S. Army
District Commander
11/23/12

Enclosure

SEMINOLE TRIBE OF FLORIDA

Commissioners:
Joseph Kippenberger
Chairman
Josephine Motlow North
Hollywood
Wovoka Tommie
Big Cypress
Linda Billie
Big Cypress
Jack Smith, Jr.
Brighton
L.D. Baxley, Jr.
Brighton
Raymond John Garza, Sr.
Immokalee

6300 Stirling Road
Hollywood, FL 33024
PHONE (954) 965-4380
FAX: (954) 962-8727
WEBSITE: http://www.semtribe.com

Tribal Officers:

JAMES E. BILLIE
Chairman

TONY SANCHEZ, JR.
Vice Chairman

PRISCILLA D. SAYEN
Secretary

MICHAEL D. TIGER
Treasurer

SEMINOLE WATER COMMISSION

October 24, 2011

Colonel Alfred A. Pantano, Jr., District Commander
U.S. Army Corps of Engineers
701 San Marco Boulevard
Jacksonville, FL 32207-8175

Dear Colonel Pantano:

Over the past several months, the staff at the Environmental Resource Management Department (ERMD) of the Seminole Tribe of Florida has been in discussions with the South Florida Water Management District regarding adaptive management options available to provide additional water storage in the West Feeder and North Feeder Canals and higher groundwater levels within the western portion of the Big Cypress Reservation. The positive benefits associated with this increased storage are many. ERMD expects that these benefits will include:

- increased storage and associated higher groundwater elevations.
- water available for purposes of drought management
- recharge for wells
- maintenance of water in ponds for wildlife and domestic animals
- fire protection
- protection of domestic drinking water
- maintenance and enhancement of wetland hydrology and habitat
- enhancement of the Native Area located south of the West Feeder Canal.

To provide this additional storage, we propose a cooperative demonstration project to temporarily modify the operational schedule of S-190 structure for a two (2) year period. This two year adaptive management demonstration project would investigate the effect of changing the operational criteria of the S-190 to retain seasonal rainfall and runoff to offset the scale of dry

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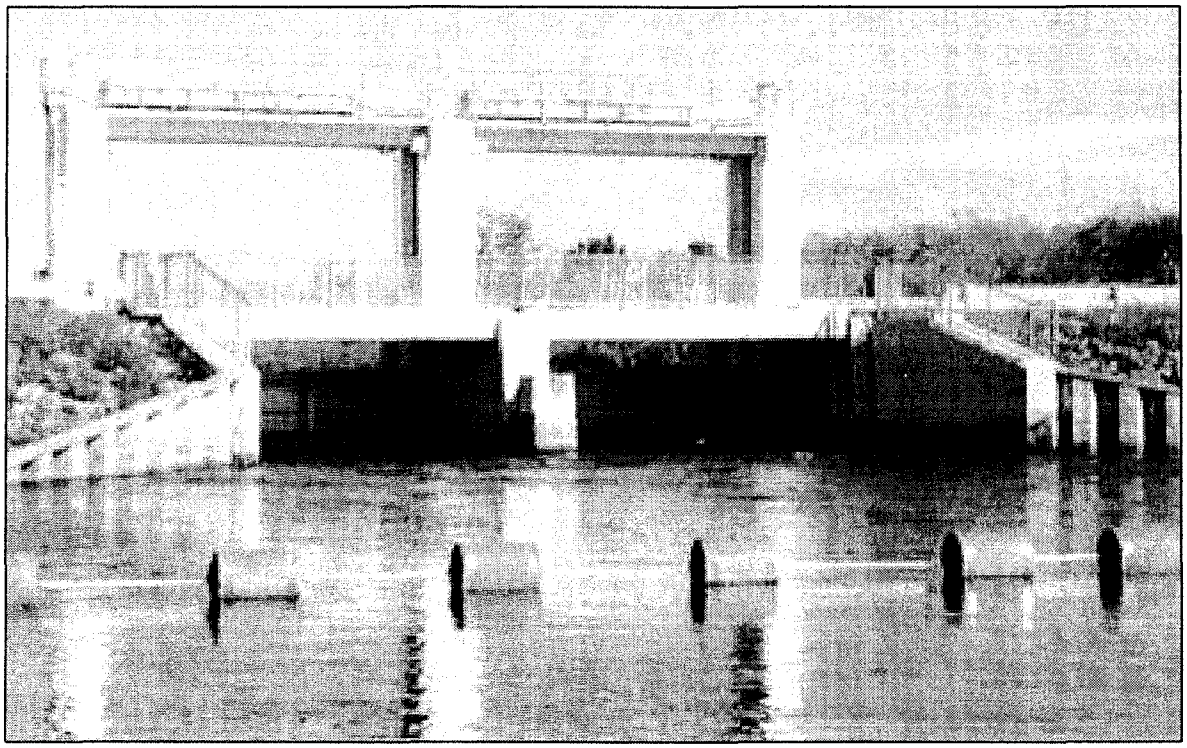

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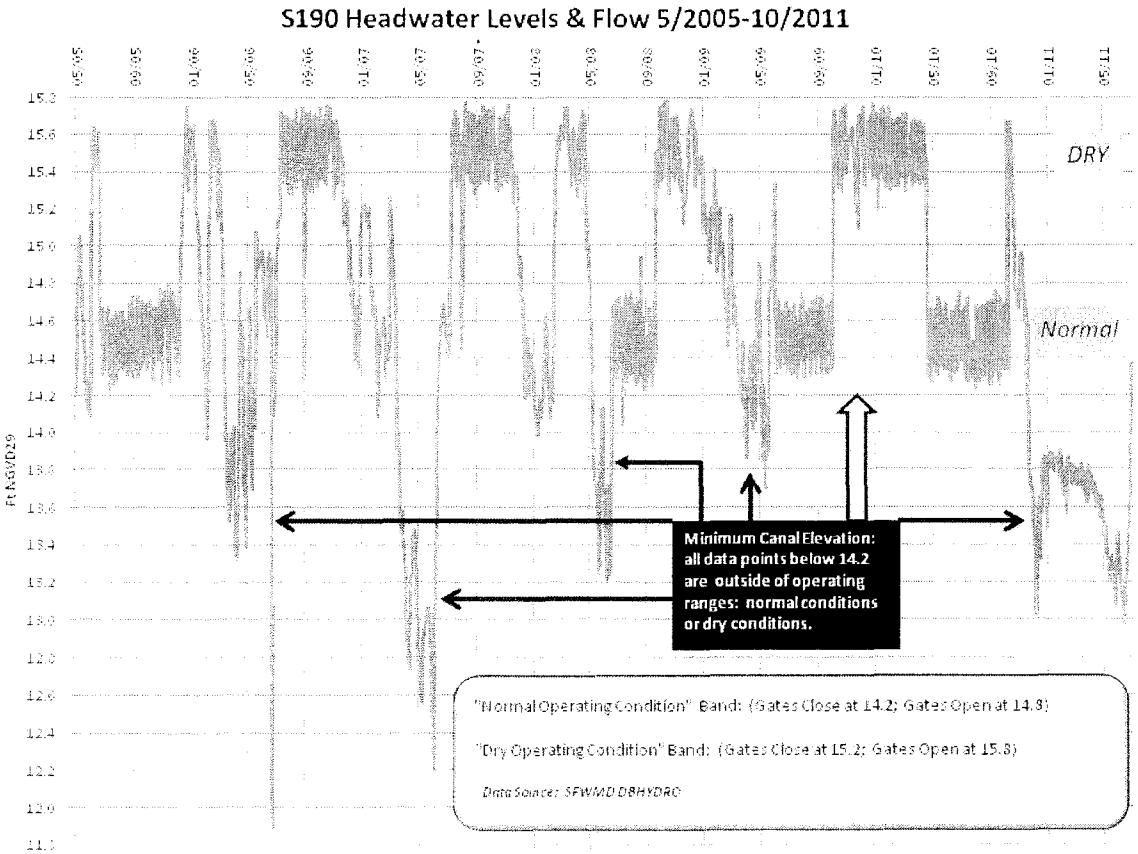

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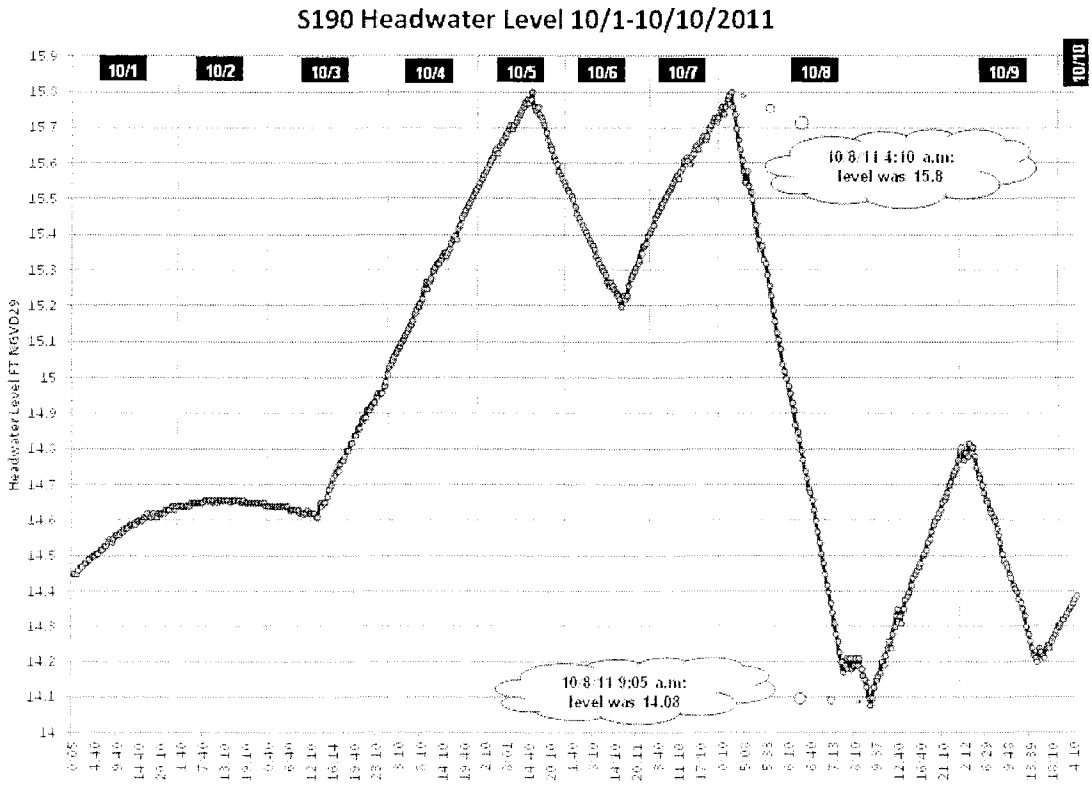

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SOUTH FLORIDA WATER MANAGEMENT DISTRICT

October 7, 2011

Sent via Electronic Mail **<<mail to: alfred.a.pantano@usace.army.mil>>**

Colonel Alfred Pantano
District Commander
Jacksonville District Corps of Engineers
United States Army Corps of Engineers
Post Office Box 4970
Jacksonville, FL 32232-0019

Dear Colonel Pantano:

Subject: Request for a Temporary Deviation to the Lake Istokpoga Regulation Schedule

This letter, enclosed graphic and attached report serve as a formal request from the South Florida Water Management District (District) to the U.S. Army Corps of Engineers (USACE) for a temporary deviation to the existing regulation schedule for Lake Istokpoga in 2012. In anticipation of continued water shortages and the inability to meet water supply demands in the Indian Prairie/Lake Okeechobee Service Area (including the Seminole Tribe of Florida), the requested deviation is intended to allow releases from Lake Istokpoga to continue when the lake stage drops below the existing Zone B. The requested deviation is shown on the enclosed graphic and is the same request that was approved by the USACE in January 2008. In 2008, the District did not need to utilize the deviation because of unanticipated rainfall. However, in light of the current storage condition of Lake Okeechobee (over two feet lower than this time in 2006 preceding the lowest lake stage in history), the long range forecasts for a strengthening La Niña condition, and the increased use of the lake for Snail Kite nesting, the District seeks to increase the use of Lake Istokpoga this dry season to reduce impacts to Lake Okeechobee. This proactive request is being made at this time to allow adequate time for review and still have tools in place for the coming dry season.

To help expedite this request, the attached report describes current conditions and climate forecasts including the most current position analysis for Lake Okeechobee. It also describes modeling and assumptions to simulate lake stages and water supply releases with and without a temporary deviation. The simulated lake stages are used in an assessment of the potential benefits and risks to flora and fauna in Lake Istokpoga and the implications for exceeding the Minimum Flows and Levels (MFL) for Lake Istokpoga. Much of this information was requested by the U.S. Fish and Wildlife Service (USFWS) during discussions of last year's request for a temporary deviation in 2011.

CURRENT CONDITIONS IN THE INDIAN PRAIRIE WATER USE BASIN AND THE LAKE OKEECHOBEE SERVICE AREA (LOSA)

The stage in Lake Istokpoga has been rising with the regulation schedule and has reached 39.24 feet NGVD (October 3, 2011). The minimum level for Lake Istokpoga is 36.5 feet NGVD, and an MFL exceedance occurs when the stage drops below 36.5 feet NGVD for more than 20 weeks within a calendar year. An MFL violation occurs when two exceedance events occur within four years of each other. Since the rule was enacted in January 2006, there have been no MFL exceedances or violations for Lake Istokpoga.

Lake Okeechobee's current stage of 11.11 feet NGVD remains well within the Water Shortage Management Band of the regulation schedule and is over three feet lower than this time last year. Long range forecasts by the Climate Prediction Center suggests below normal rainfall for the coming dry season. The minimum level for Lake Okeechobee is 11.0 feet NGVD. An MFL exceedance occurs when the lake stage drops below 11 feet NGVD for more than 80 days during an 18 month period. An MFL violation occurs when two exceedance events occur within six years. During the 2011 drought, the Lake Okeechobee stage dropped below 11.0 feet NGVD for 67 days from July 18, 2011 to September 22, 2011. Since the rule was enacted in September of 2001, the MFL has been exceeded three times and violated once. The Lake Okeechobee MFL is projected to be exceeded for a second straight year in 2012.

BACKGROUND

The need for a Lake Istokpoga temporary deviation is more acute because climatologists are predicting drier than normal conditions for the upcoming dry season due to anticipated La Niña conditions. If the remainder of the wet season does not provide significant rainfall sufficient to increase Lake Okeechobee stages by four feet, such as a well placed tropical system, the water shortage will continue through the spring. Water shortage orders restricting allocations from Lake Okeechobee by 45% remain in place due to low lake levels and the pending dry season.

In addition, based on current and forecasted Lake Istokpoga and Lake Okeechobee stages, there is a high probability that the District may be precluded from delivering water supplies, even in substantially reduced volumes, to the Seminole Tribe of Florida's (STOF) Brighton Reservation via either S-68 or the G-207 and G-208 pump stations during the 2012 dry season. The STOF has surface water entitlement rights pursuant to the 1987 Water Rights Compact between the Seminole Tribe of Florida, the State of Florida, and the District. This Compact was enacted as both State and Federal law. Additional documents addressing the Water Rights Compact entitlement provisions have since been executed. These documents include Agreements between the STOF and the District. Both the Brighton and Big Cypress Reservations of the STOF rely on Lake Okeechobee as a supplemental irrigation supply source for their surface water federal entitlement rights.

In response to the water supply shortage that occurred during the spring and early summer 2011, the District implemented modified Phase I (15% cutback) and Phase II (45% cutback) restrictions to conserve water resources and meet water supply needs in the entire District, including the Lake Istokpoga basin and Phase III restrictions (45% cutback) in the Lake Okeechobee Service Area (LOSA). These restrictions have remained in place throughout the wet season and are unlikely to be rescinded given the dry season outlook. Please, note that as a result of the low Lake Okeechobee stages, the lower east coast service areas did not receive water supply from the lake during the 2011 water shortage and based on current and forecast conditions, will not receive water from the lake during the 2012 dry season.

PROPOSED DEVIATION

The District requests that the USACE implement a temporary deviation to the Lake Istokpoga Regulation Schedule containing the following basic elements of the existing schedule, along with the proposed temporary deviation shown on Enclosure A and discussed in the attached report:

1. Zone A - No Modification

2. Zone B – Modified to allow water supply releases with the regulatory floor at 37.0 feet NGVD regardless of the operation of G-207 and G-208.

3. Zone C - The proposed deviation will lower the line defining Zone C (no releases) to create a new zone identified as "Zone 2012" on Enclosure A. The line forming the lower boundary of Zone 2012 begins on January 1 at 38.5 feet NGVD and decreases to 36 feet NGVD on May 15, where it remains until it begins to rise on July 1 and rejoin the current regulation schedule line on September 15. When lake stage is in Zone 2012, water supply releases would be allocated on a weekly basis with 45% cutbacks in demand and would continue regardless of whether G-208 or G-207 can supply water to the Indian Prairie Basin/Lake Okeechobee Service Area. The requested deviation represents a lowering of the water supply line by 1.0 feet allowing releases to meet downstream water supply demands if the level of Lake Istokpoga drops below the existing regulation floor of 37.0 feet NGVD. If the lake stage decreases below the Zone 2012 line to enter Zone C, no water supply releases will be made.

The District has simulated the stage and releases from Lake Istokpoga with and without the temporary deviation for a one year period. The simulation starts with the stage on October 1, 2011 and assumes tributary inflows, seepage, rainfall, evapotranspiration rates reflective of 1-in-10 drought conditions. It conservatively assumes that G-207 and G-208 are not operated. Consumptive use releases equal to 45% cutbacks from when the lake stage is in Zone 2012. The water supply demands simulated include the authorized direct withdrawals from Lake Istokpoga, downstream users in the upper Indian Prairie Basin and users within the lower Indian Prairie basin including the STOF.

The simulation indicates that water supply releases can be made for about six weeks without the temporary deviation and for almost six months with the temporary deviation during 2012. The simulation indicates that the lake stage will decrease to 36.5 feet NGVD without the temporary deviation and will decrease to a little less than 36 feet NGVD with the temporary deviation.

The temporary deviation would provide the following benefits:

1. Water supply releases to downstream users including the Seminole Tribe of Florida, which would otherwise be made from Lake Okeechobee during this drought.
2. Opportunities for recolonization by native species of submerged aquatic vegetation within Lake Istokpoga, which can result in increased recreational and commercial fishing and in improved public access and aesthetics.
3. Opportunities for planting cypress, pond apple, and maple trees in areas that are difficult to access in wetter years.
4. An opportunity for natural compaction and degradation of accumulated sediments in exposed areas since accumulation of organic sediments on this lake has been a recurring issue.

The temporary deviation may also result in impacts to the natural system and to users of the lakes. These impacts and possible remedies include the following:

1. Lowered water levels will decrease the availability of nesting habitat for the endangered Everglades snail kite and may result in the collapse of nests on emergent vegetation. One of the reasonable and prudent measures identified by the USFWS in their Biological Opinion for the 2008 temporary deviation request was the use of artificial nest supports as a last resort for nests that are about to collapse.
2. Lowered water levels can impact the reproduction and survival of the apple snail, the principal food item of the snail kite. The Biological Opinion for the 2008 temporary deviation request discussed the importance of keeping water levels from going below 36.0 feet NGVD to protect apple snails. To keep the stage from going below 36.0 feet NGVD, one option that can be explored involves moving water from Pool C of the Kissimmee River through the Istokpoga Canal into Lake Istokpoga. This option will likely require pumping water over S-67 (which replaced G-85). The exploration of this option should consider potential impacts to the Kissimmee River Restoration Project, especially if the drought brings an end to flow through the river. In the future, this option may not be feasible because it diverts water from the portion of the Kissimmee River Restoration Project downstream of the Istokpoga Canal. This part of the project is scheduled for completion in 2015. If the temporary deviation results in lowered water levels that reduce the size of the apple snail population, it may be possible to aid its recovery by stocking the lake with native apple snails. The District has been growing apple snails to aid the population in Lake Okeechobee.
3. Lowered water levels can also stimulate growth by the invasive plant hydrilla (*Hydrilla verticillata*). A treatment for hydrilla is being considered for Lake

Istokpoga in the coming dry season. District staff have been made aware of the proposed deviation so that it can be considered in discussions about the upcoming hydrilla treatment.

4. The District recognizes that allowing water levels to drop to the proposed deviation level may have recreational and economic impacts on the local community by temporarily limiting access to the lake at public and private boat ramps. Accordingly, we will be conducting appropriate public outreach and enforcing water restrictions.

Summary

In anticipation of a continued regional drought, we respectfully request consideration of this temporary deviation to the water supply regulation schedule for Lake Istokpoga. This approach is intended to protect water users and conserve critical water supplies in anticipation of a continued regional water shortage. If water supplies are not made available to users within the Indian Prairie Basin Water Use Basin, including the STOF surface water entitlement, substantial economic impacts could result. During this water shortage, the District will continue close coordination with the USACE and will undertake all requested actions with the appropriate environmental safeguards.

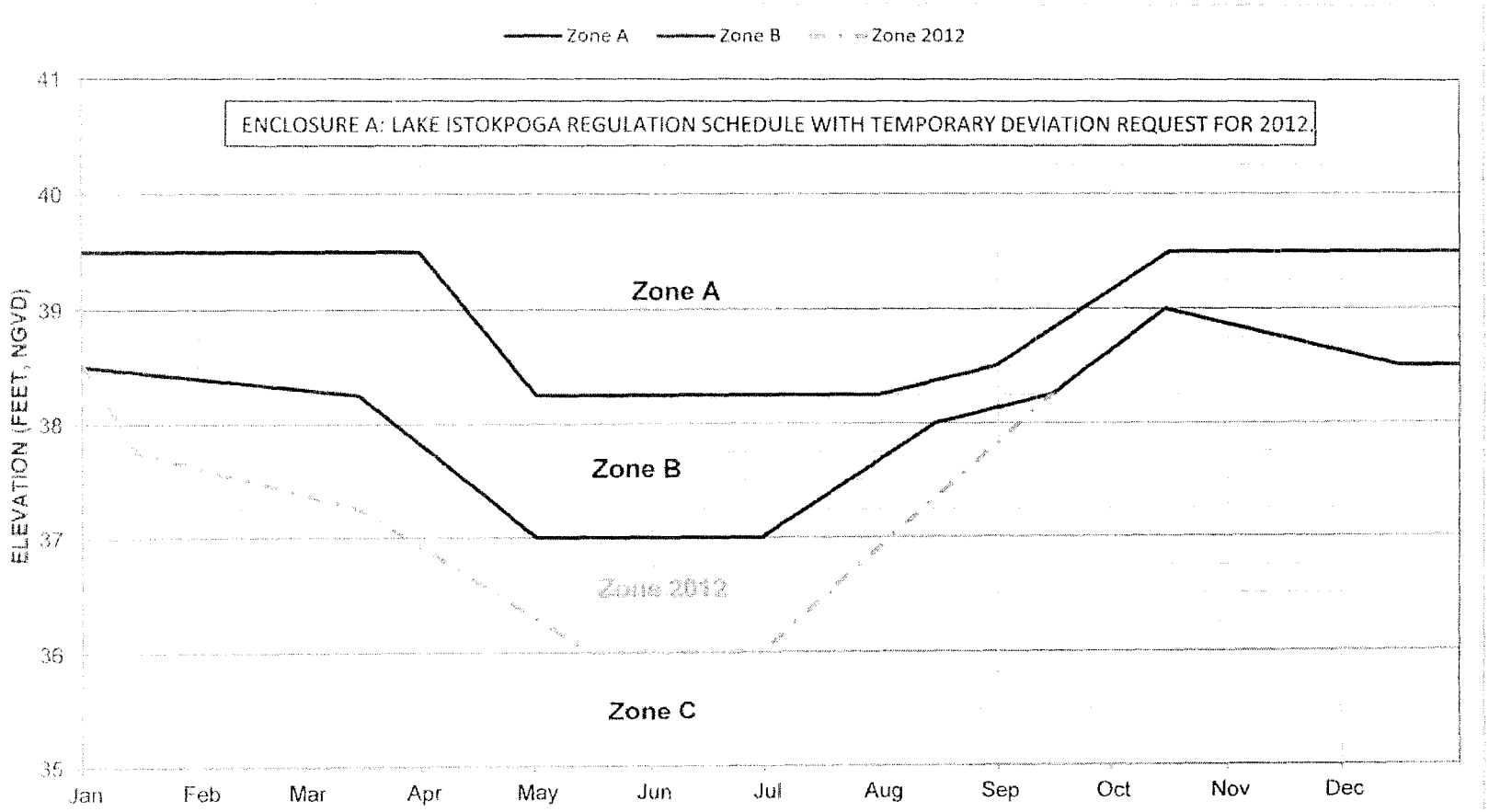
This request is being managed through the District's Water Shortage Emergency Team. If you have questions or need any additional information, please contact Sharon Trost, Director, Regulation Division at (561) 682-6814. Our staff stands ready to meet with the USACE to answer any questions as you review this request.

Sincerely,

Melissa L. Meeker
Executive Director
South Florida Water Management District

MM/da
Enclosures: Enclosure A
Attachment 1

c: Alaa Ali, SFWMD
David Anderson, SFWMD
Terrie Bates, SFWMD
Scott Burns, SFWMD
Cynthia Gefvert, SFWMD
Chuck Hanlon, SFWMD
Pete Kwiatkowski, SFWMD
Diana Martuscelli, USACE
Kim O'Dell, SFWMD



ZONE A - REGULATORY RELEASES MADE THROUGH ALL OUTLETS:

ZONE B - WATER SUPPLY RELEASES IF NEEDED (Down to 37.0 ft regardless of G207 & G208 pumping)

ZONE 2012 - WATER SUPPLY RELEASES IF NEEDED (Down to 36.0 ft with 45% Cutback, No G207 and G208)

CENTRAL AND SOUTHERN FLORIDA
KISSIMMEE RIVER BASIN

REGULATION SCHEDULE
LAKE ISTOKPOGA

US ARMY ENGINEER DISTRICT
JACKSONVILLE FL

1 January through 15 September 2012
Temporary Deviation

ATTACHEMENT 1
ASSESSMENT OF ECOLOGICAL IMPACTS ON LAKE ISTOKPOGA OF A PROPOSED DEVIATION TO THE REGULATION SCHEDULE FOR 2012

Prepared By Chuck Hanlon[1], David Anderson[1], and Alaa Ali[2]
[1]Lake and River Ecosystems Section, Applied Science Bureau,
[2]Hydrologic and Environmental Systems Modeling Section, Water Supply Bureau
South Florida Water Management District
October 5, 2011

INTRODUCTION

This report evaluates the potential impacts on Lake Istokpoga of a proposed temporary deviation to the regulation schedule for S-68, the principal outlet from the lake, for 2012. This deviation is being requested to meet the water supply needs of downstream users (primarily agriculture) in the Lake Istokpoga/Indian Prairie Basin. The proposed deviation for 2012 is the same as the one that was authorized by USACE for 2008. Because of rainfall and the District's water shortage restrictions, there was not a need to utilize the Temporary Deviation to the Lake Istokpoga regulation schedule. However, south Florida has just experienced its driest dry season on record and Lake Okeechobee continues to have a low lake stage. Because of these conditions and the likelihood that a potential water supply shortage will continue into 2012, the District is preparing to take steps to conserve water resources and meet water supply needs in the Lake Istokpoga basin.

In response to the water conditions that occurred during the spring and early summer 2011, the District implemented modified Phase 1 and Phase II restrictions to conserve water resources and meet water supply needs in the entire District, including the Lake Istokpoga basin. The intent of Phase I and Phase II restrictions is to achieve 15% and 30% cutbacks, respectively, in overall demand. The current request for a deviation would allow releases to meet downstream water supply demands if the level of the Lake Istokpoga drops below the existing regulation floor of 37.0 ft (all water level elevations are NGVD). The temporary deviation would lower the regulation floor to 36.0 ft. and include a 45% reduction in permitted withdrawals. This would allow some water to be available to the agricultural permit holders that received their supply from Lake Istokpoga.

This report updates the ecological assessment prepared for the previous deviation requests (2007 and 2008). The evaluation of ecological impacts considers the context of current conditions and the characteristics of the deviation request. The objectives of this report are to 1) summarize current conditions in the basin, 2) describe the proposed deviations to the regulation schedule, and 3) conduct analyses of potential ecological effects likely to result if the proposed deviation is implemented.

CURRENT HYDROLOGIC CONDITIONS

Water levels in Lake Istokpoga depend on rainfall and inflows from the 607 square mile (388,480 acres) basin, including groundwater and two streams, Josephine Creek and Arbuckle

Creek. During September 2011, the U. S. Geological Survey's web-site for real-time water data reported flows of 200 to 500 cfs for Arbuckle Creek (station 02270500) and 7 to 30 cfs for Josephine Creek (station 02271500). Flows in Arbuckle Creek was near but usually below the median value for the period of record and in Josephine Creek was well below the median. Monthly rainfall was below the 30-year average for 9 out of 12 months since October 2010 (Figure 1). While July and August were at or above average, the rainfall for the current wet season appears to be ending.

While much of Indian Prairie LOSA area has recovered somewhat from the Severe to Extreme drought conditions that existed at the end of the last dry season; much of this region remains abnormally dry and severe drought conditions still exist over Lake Okeechobee (US Drought Monitor September 27, 2011).

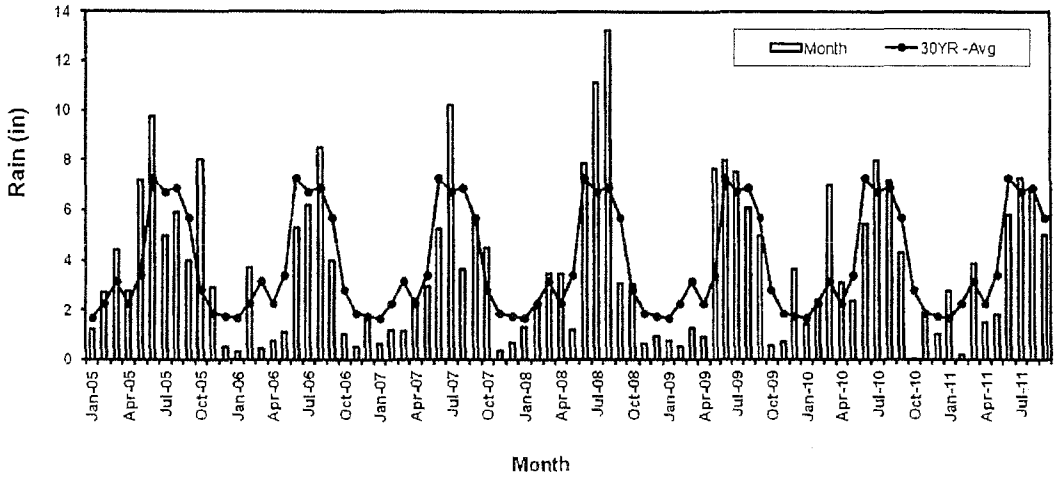


Figure 1. Monthly rainfall total (bars) for January 2005 through September 2011 and the 30 year average (1981-2010) monthly rainfall (line) for the Lower Kissimmee Basin (Source District Monthly Rainfall reports).

During 2011, the stage in Lake Istokpoga decreased to 37.64 ft on June 21 and then rose to 39.19 ft on September 30 (Figure 2). Lake stage has been rising with the regulation schedule and had reached 39.36 ft on October 5. Discharge was variable during 2011, and no releases have been made since late August. With the wet season rainfall apparently coming to an end, it is unknown whether the lake will refill to the high pool stage of 39.5 ft NGVD before the dry season begins.

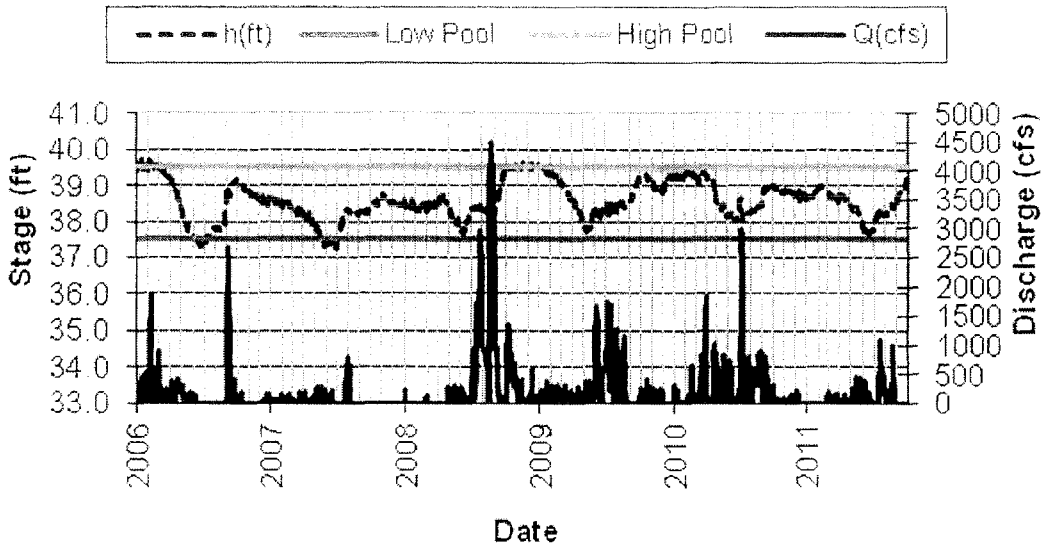


Figure 2. Mean daily stage (dbkey 15956) and discharge (dbkey 15955) for Lake Istokpoga from 2006 through September 2011. Horiziontal lines indicate the high pool stage (upper blue line) of the current regulation schedule at 39.5 ft. and the low pool stage of 37.5 ft. (lower green line).

Hydrologic conditions in Lake Okeechobee were somewhat improved last winter (2011) compared to 2007 due largely to several January 2011 rainfall events. The stage level in Lake Okeechobee was nearly 0.8 ft. greater on February 13, 2011 (12.37 ft.) compared to February 13, 2007. However, there was a nearly continuous decline in lake stage from December 2010 through June 2011, when lake stage dropped to less than 9.8 ft. Lake stage increased slightly to 10.65 on August 25, 2011 but was 3.4 ft. lower than the previous year's level. Lake Okeechobee is at 11.11 ft, which is more than 1.8 feet below the top of the Water Shortage Management Band. The most recent position analysis for Lake Okeechobee shows that nine out of twelve La Nina analog years remain in the Water Shortage Management Band throughout the 2011-2012 dry season (Figure 3). This graphic also shows the lake stage decreasing below 10 ft by mid-April in 8 years and decreasing to 8 ft by June 1 in 4 years.

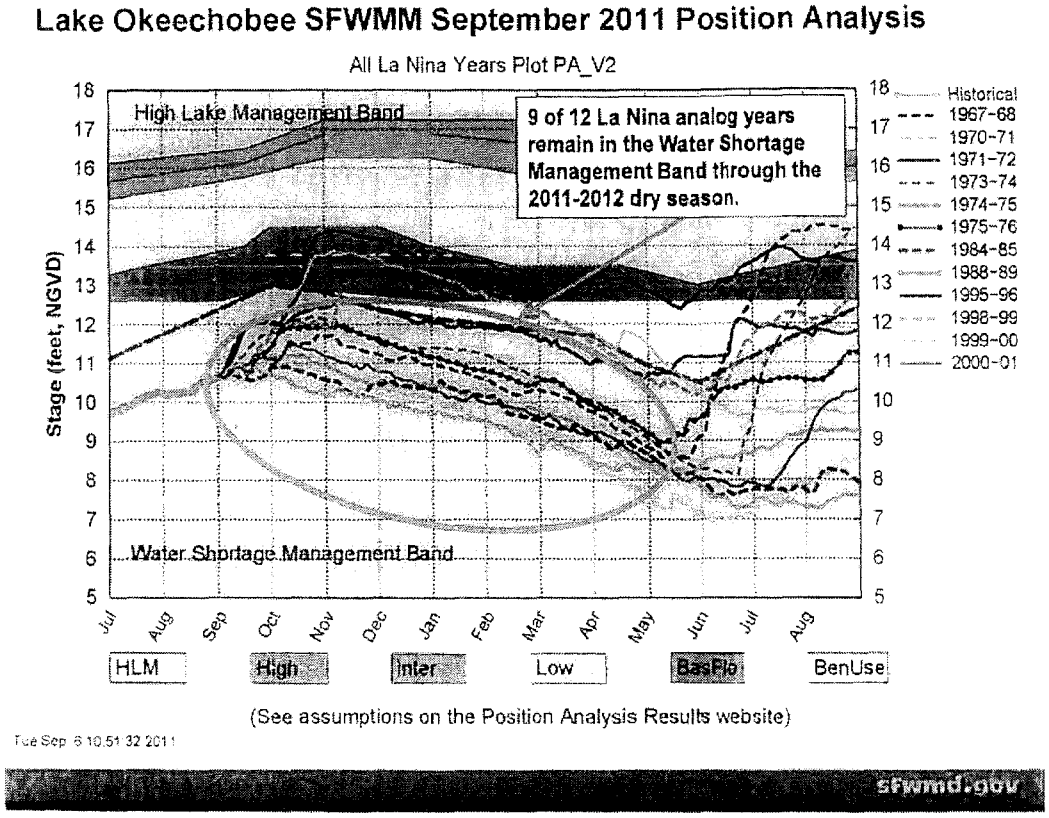


Figure 3. Lake Okeechobee stage for La Nina analog years sub-sampled from the September 2012 Position.

The latest update (October 3, 2011) from the Climate Prediction Center indicates that La Nina conditions exist across the equatorial Pacific and that La Nina conditions are expected to strengthen across the northern hemisphere during the winter of 2011-2012 (http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fests-web.pdf). La Nina is expected to bring an increase in the likelihood of below average rainfall during the coming dry season.

Indian Prairie Basin – Operations

The Indian Prairie basin is served by canals C-41 and C-40, which carry water to Lake Okeechobee. The flow of water to Lake Okeechobee is regulated by structure S-72 in the C-40 and structure S-71 in the C-41. In 2008, the S-71 and S-72 structures were enhanced by the

addition of tailwater weirs that prevent damage to the structure during periods when Lake Okeechobee is low and a large rain event occurs. Under these circumstances, the rain and runoff could result in discharges that exceed the maximum allowable gate opening (MAGO) curves. The weirs were also designed to accommodate temporary pumps to supply water to pump stations G-207 and G-208. The weir pump for G-208 can pump water from Lake Okeechobee and supply the lower Indian Prairie basin, when the water level of Lake Okeechobee is as low as 8.0 feet NVGD29. Pump G-207 can only operate when the Lake Okeechobee water elevation, measured at the intake is greater than 10.0 feet NVGD29.

The regulation schedule for Lake Istokpoga has provisions for changing the Zone C line depending on the availability of G-207 and G-208 to supply water from Lake Okeechobee as follows:

- When pumps G-207 and G-208 are both operational, the level is 37.50 feet NGVD29 during the months of May and June.
- When G-207 OR G-208 is operational, the level is 37.25 feet NGVD29 during the months of May and June.
- When neither pump G-207 nor G-208 is operational, the level is 37.0 feet NGVD29 during the months of May and June.

It should be noted that strong winds from the northwest can push water away from the pump intakes, even when the Lake Okeechobee water level is above the stated mimimums for the tailwater weir pumps.

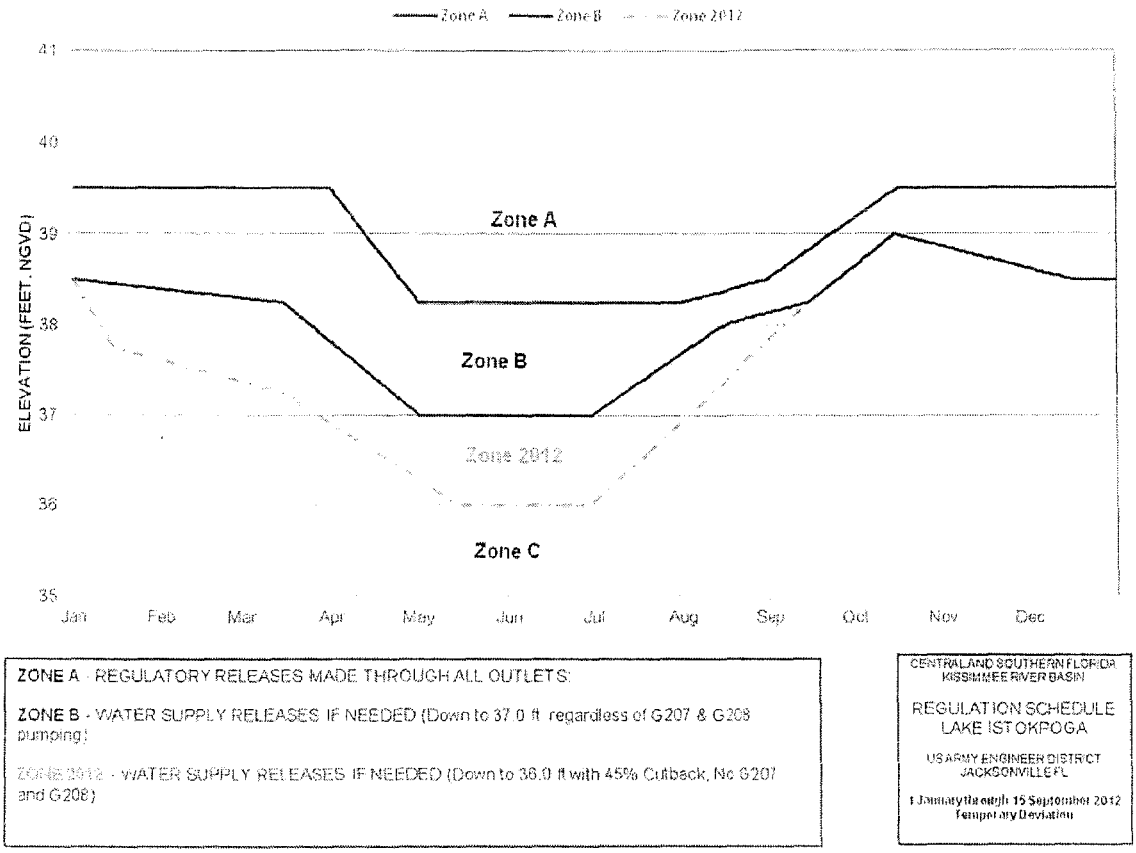


Figure 4. Regulation schedule for Lake Istokpoga with the proposed temporary deviation.

PROPOSED DEVIATION

The District requests that the USACE implement a temporary deviation to the Lake Istokpoga Regulation Schedule containing the following basic elements found in the existing schedule, along with the proposed temporary deviation shown in Figure 4:

1. Zone A - No Modification

2. Zone B - Modified to allow water supply releases with the regulatory floor at 37.0 feet NGVD regardless of the operation of G-207 and G-208.

3. Zone C - The proposed deviation will lower the line defining Zone C (no releases) to create a new zone identified as "Zone 2012" on Enclosure A. The line forming the lower boundary of Zone 2012 begins on January 1 at 38.5 feet NGVD and decreases to 36 feet NGVD on May 15, where it remains until it begins to rise on July 1 and rejoin the current regulation schedule line on September 15. When lake stage is in Zone 2012, water supply releases would be allocated on a weekly basis with 45% cutbacks in demand and would continue regardless of whether G-208 or G-207 can supply water to the Indian

Prairie Basin/Lake Okeechobee Service Area. The requested deviation represents a lowering of the water supply line by 1.0 feet allowing releases to meet downstream water supply demands if the level of Lake Istokpoga drops below the existing regulation floor of 37.0 feet NGVD. If the lake stage decreases below the Zone 2012 line to enter Zone C, no water supply releases will be made.

Lake Istokpoga stage simulation model

To evaluate the effect of the proposed deviation to the regulation schedule on water levels in Lake Istokpoga, a simple hydrologic model was constructed in a spreadsheet. The model was used to evaluate two alternatives (ALT0, ALT1). ALT0 is the current regulation schedule with the Zone B line when the pumps G207 and G208 adjacent to S-71 and S-72 are inactive because of low water levels in Lake Okeechobee. The simulation assumes that throughout the simulation period the water levels in Lake Okeechobee remain too low to use the G207 and G208 pumps. ALT1 is a combination of original ALT0 and the proposed deviation represented in Figure 4 by the dashed red line labeled Zone 2012. The simulation begins on October 1, 2011with a lake stage of 39.22 feet NGVD and continues with a daily time-step through September 30, 2012. The model increases lake stage based on 1-in-10 year dry return period monthly rainfall, 1-in-10 year tributary inflows, and seepage from the surrounding aquifer and it decreases lake stage due to evaporation from the lake surface and releases for water supply.

In the simulation, water supply deliveries are made weekly according to the proposed ALT1. When the lake stage is in Zone B, water supply deliveries are made without cutbacks. When the lake stage is in Zone 2012, water supply deliveries are reduced by 45% (Phase III water restrictions). Water supply demands also assume that none of the demand is met by using the G-207 pump station at S-71 and G-208 pump station at S-72 to pump water from Lake Okeechobee to supply the southern Indian Prairie region. The water supply demands simulated include the authorized direct withdrawals from the Lake, downstream users in the upper Indian Prairie Basin and users within the lower Indian Prairie basin including the STOF.

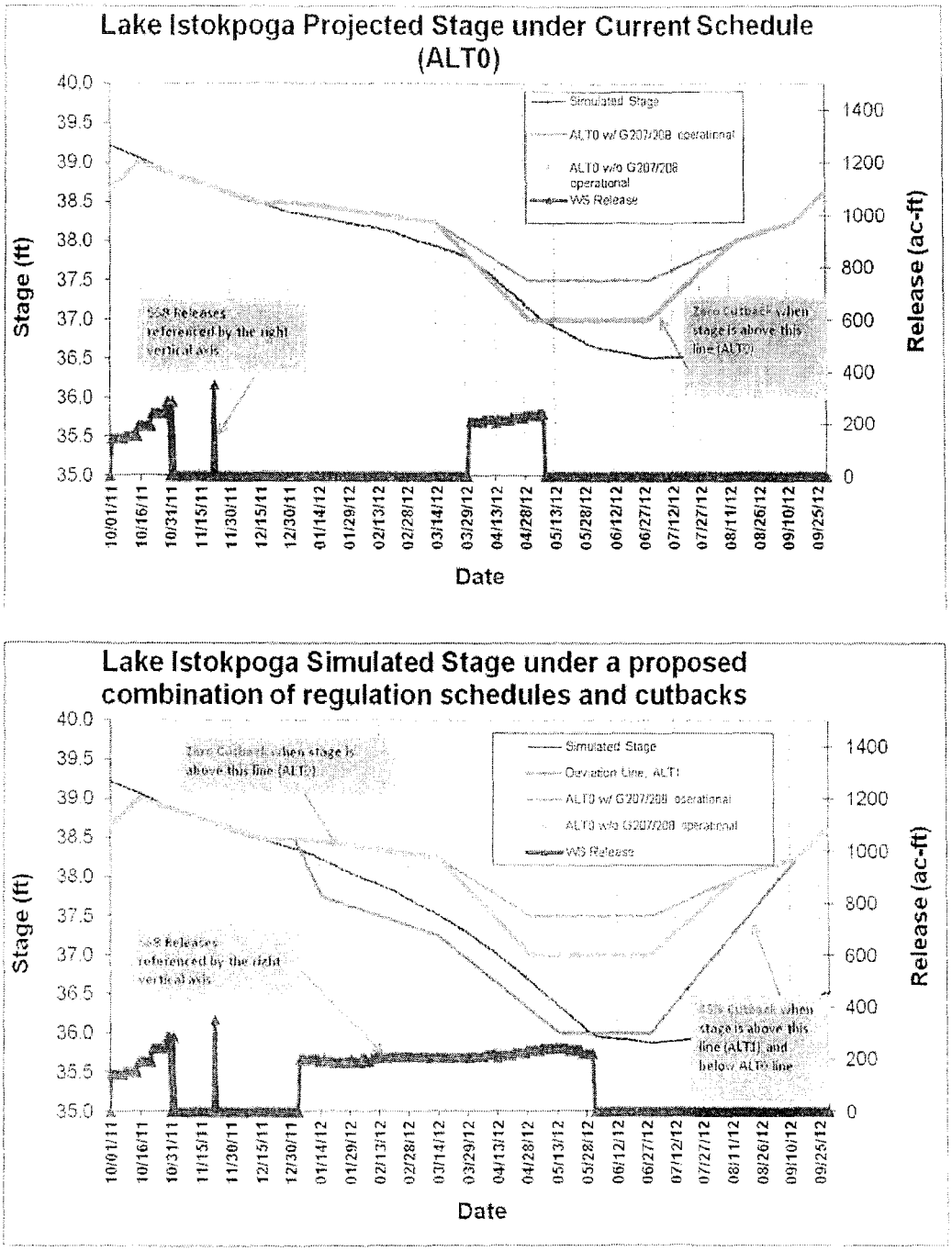


Figure 5. Simulated stage and discharge for Lake Istokpoga using the existing regulation schedule ALT0 (top) and with the temporary deviation ALT1 (bottom).

Simulation Results

The simulation of ALT0 (without the temporary deviation) shows that water supply releases can be made for about six weeks during 2012 (Figure 5 top). For ALT1 (with the temporary deviation), water supply releases can be made for almost five months during 2012 beginning in early January and continuing through the end of May (Figure 5 bottom).

For ALT0, water level decreases primarily because of evaporation. Water supply releases are made from the beginning of April through early May when the lake stage is in Zone B. For ALT0, the simulated lake stage decreases to 36.5 feet NGVD in late June before rising to 37 feet NGVD by the end of September (Figure 5 top).

The simulated lake stage decreased more rapidly for ALT1 than for ALT0. For ALT1, the simulated lake stage decreased to 35.88 feet NGVD at the end of June and increased to 36.5 feet NGVD by the end of September (Figure 5 bottom). The ALT1 stage is below 36.5 feet NGVD for more than 20 weeks.

Simulated stages for both ALT0 and ALT1 increase by about 0.5 feet between early July and the end of September. When the change in stage is considered for the same months for 48 years of measured lake stage, the increase in lake stage is about 1.25 feet (Figure 6). If the minimum simulated stage on July 1 increases by 1.25 feet by September 30, the duration that the stage is below 36.5 feet is reduced to about 18 weeks.

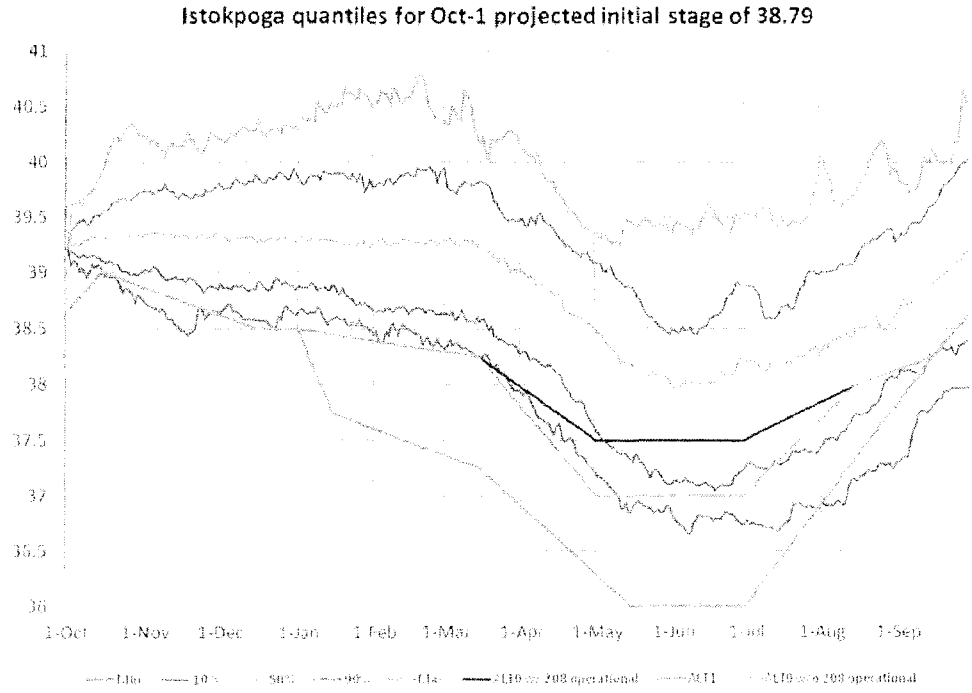


Figure 6. Percentiles for Lake Istokpoga stage for 1963-2010 (excluding 2000/2001 the year of the extreme drawdown. Stages have been standardized to an initial stage of 38.79 feet NGVD on October 1.

ECOLOGICAL ANALYSIS

The ecological analysis considered the temporary deviation request (ALT1) described in the previous section relative to another alternative - the current regulation schedule (ALT0). Under both alternatives the water level in Lake Istokpoga is likely to go below the normal, regulated lower limit of fluctuation, which may be ecologically significant. Patterns of stage fluctuation are generally accepted as critical determinants of lake ecosystem health (Karr 1991, Hill et al. 1998, Keddy and Fraser. 2000). In Lake Istokpoga, the range of water level fluctuation has been narrowed, which has contributed to environmental problems that have been recognized by stakeholders since the late 1980s (Lake Okeechobee Watershed Project Delivery Team 2004). The temporary deviation alternative lowers the schedule line for Zone C (no releases), which will allow lower lake stages and should increase the range of water level fluctuation. The ecological analysis considered both the potential for benefit and for harm of the potential decrease of lake stage.

This report draws heavily upon information compiled to support the development of a minimum flow and level (MFL) for the lake, the Lake Istokpoga Schedule Review component of the Lake Okeechobee Watershed Project for the Comprehensive Everglades Restoration Project, and the 2001 drawdown project to enhance fish habitat and provide water supply. It also draws on recent conversations with managers/scientists involved in the management of the lake, representing the U.S. Fish and Wildlife Service, the Florida Fish and Wildlife Conservation Commission, Highlands County, Audubon of Florida, and the South Florida Water Management District.

A conceptual ecological model (Figure 7) was developed for the Lake Istokpoga Schedule Review (Morales 2005). It relates the major external driving forces acting on the ecosystem to the specific stressors acting within the system to produce ecological effects that can be represented by a limited set of attributes and performance measures. The conceptual model for Lake Istokpoga represents considerable effort by a study team that included scientists and managers from the different resource agencies and stakeholder groups. The model identifies altered water level fluctuation as one of the stressors acting on the managed lake ecosystem (Figure 7). The shaded polygons in Figure 7 represent this stressor, its ecological effects, and the selected attributes. The shaded polygons cover more than half of the figure and indicate that the effects of altered water level fluctuations are far-reaching.

Based on the ecological effects associated with altered water levels in the conceptual ecological model, this ecological assessment focuses on four questions:

1. How does likely stage fluctuation with the deviation compare to the natural patterns of water level fluctuation in Lake Istokpoga?
2. How might the likely changes in water level fluctuation with the deviation affect organic material in the sediments?
3. How might the likely changes in water level fluctuation with the deviation affect plant communities?
4. How might the likely changes in water level fluctuation affect individual species and groups of species of animals in Lake Istokpoga?

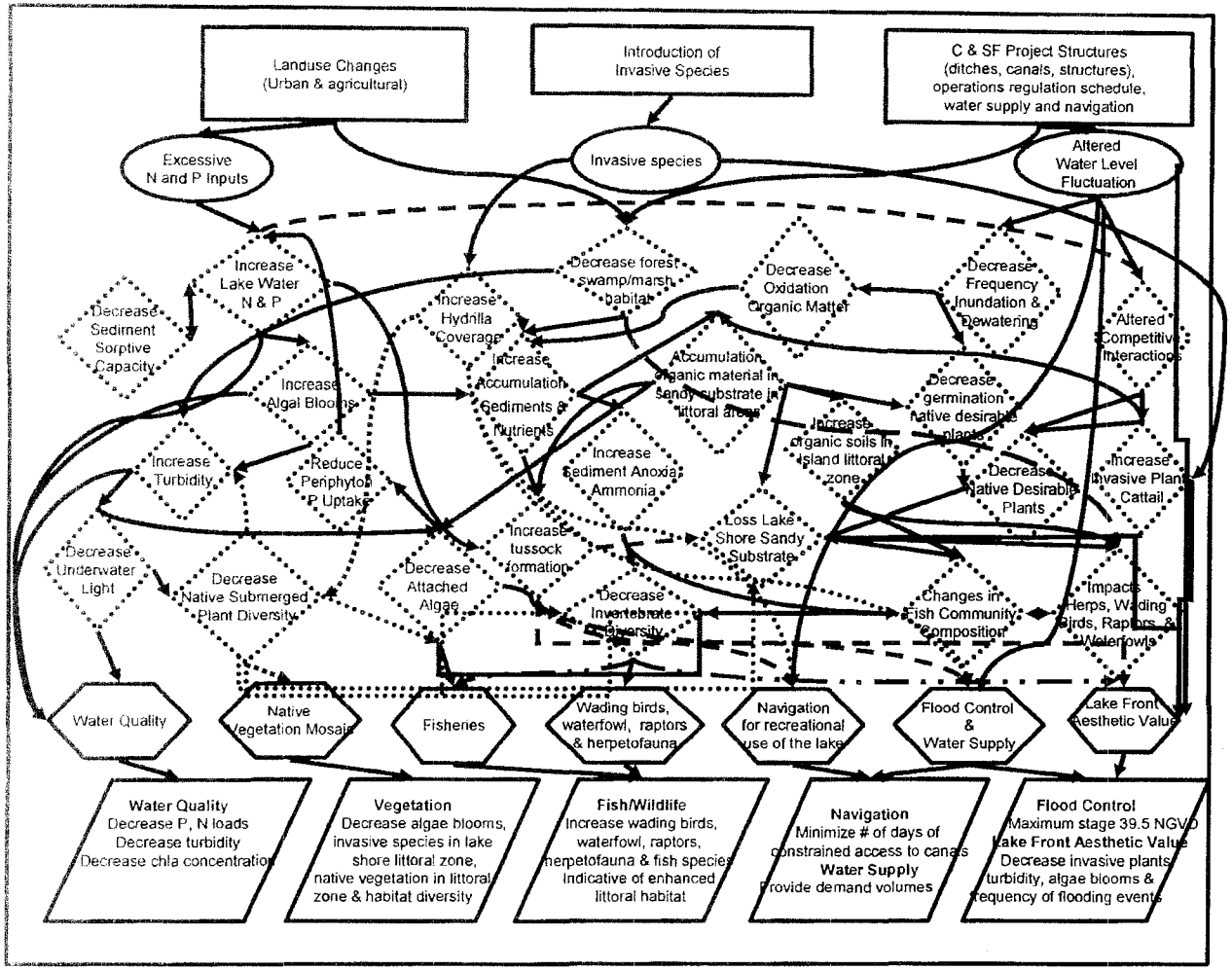


Figure 7. Conceptual ecological model for Lake Istokpoga (based on Morales 2005). Rectangles represent drivers, ovals are stressors, diamonds are ecosystem effects, hexagons are attributes, and parallelograms are performance measures. Shading identifies the altered water level fluctuation stressor and the related ecosystem effects and attributes.

Hydrology

Natural and regulated water levels

In the 26 year period before regulation, water levels in Lake Istokpoga fluctuated between 35.93 ft and 42.9 ft (Figure 9). During this time, lake stage fell to 36.5 ft or below on six occasions or with a frequency of about once every four years. These events ranged from a single day in 1939 to 139 days in 1956 (Table 1). These events occurred most often in the May-June timeframe. The events in 1955 and 1956 (events 5 and 6 in Table 1) occurred during severe droughts in the Lower Kissimmee Basin (Table 1).

Table 1. Event duration, minimum stage attained, and drought status for events, when stage dropped to 36.5 ft. or lower.

				Minimum		
Event[1]	Start	End	Duration	Stage (ft)	Date	Drought status[2]
1	6/8/1939	6/9/1939	1	36.50	6/8/1939	
2	5/19/1945	6/23/1945	35	36.03	6/20/1945	
3	5/21/1949	6/12/1949	22	36.40	5/24/1949	
4	7/31/1950	9/27/1950	58	36.22	8/25/1950	
5	5/3/1955	6/24/1955	52	36.20	6/9/1955	Severe
6	4/20/1956	9/6/1956	139	35.93	8/12/1956	Severe
7	2/10/1962	6/23/1962	133	35.40	5/30/1962	Extreme
8	5/23/1971	6/28/1971	36	36.20	6/7/1971	Severe
9	3/8/2001	7/7/2001	121	35.84	5/21/2001	Severe

[1]An event was defined as beginning the first day that mean daily stage decreased to 36.5 ft or less and as ending when it increased above 36.5 ft. The years 1950, 1955, 1956, and 1962 contained periods when stage fluctuated around 36.5 ft but did not exceed 37.0 ft. These periods of time were treated as single events.

[2]Drought status was based on Palmer Drought Severity Index for the Lower Kissimmee Basin presented in Abtew et al. (2002).

Water levels in Lake Istokpoga were regulated after the construction of S-68 between October 3, 1960 and January 10, 1962 (U.S. Army Corps of Engineers 1994). The original regulation schedule only allowed water levels to fluctuate between 37.5 ft and 39.5 ft. In March of 1990, the regulation schedule was modified to improve water supply and navigation. The result was a further narrowing of the range of water level fluctuation from 38 ft to 39.5 ft.

Since 1962, water levels have fluctuated between 35.40 ft and 40.06 ft (Figure 8). The narrowing of stage fluctuation by regulation and the change in regulation schedules is evident in Figure 6. After regulation, water levels dropped to 36.5 ft or less on three occasions (Table 1). The first occurred in 1962 just after the construction for S-68 was completed and during an extreme drought for the Lower Kissimmee Basin. The second was in 1971 when the Lower Kissimmee Basin was in a severe drought. The third occasion was in 2001, another severe drought year. In 2001, it was decided to use the low lake level for a habitat improvement project

as well as providing water supply for downstream users and the lake was lowered. The water level that year decreased to 35.84 ft.

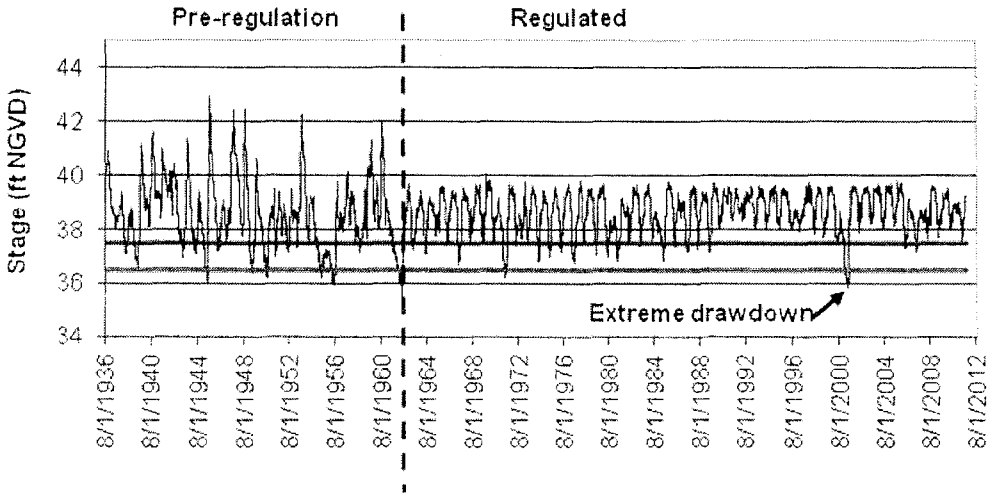


Figure 8. Mean daily stage in Lake Istokpoga from August 1, 1936 through September 30, 2011. The vertical dashed line indicates when the S-68 water control structure was completed and divides the time series into a pre-regulation period and a regulated period. Horizontal lines indicate 37.5 feet, the bottom of Zone B (blue), and 36.5 feet, the bottom of the proposed Deviated Zone (green). The arrow indicates the drawdown project in 2001. This nearly continuous time series of mean daily stage was created by combining two time series (dbkeys) from the SFWMD's hydrologic data base DBHYDRO. These time series were for August 1, 1936 through September 26, 1993 (dbkey 15956) and September 27, 1993 through September 30, 2011 (dbkey 00231).

In 10% of the pre-regulation years (10^{th} percentile line), mean daily stage drops to 36.5 ft. or below during late May and early June (Figure 9). By late June, mean daily stage begins to increase and continues over the wet seasons.

In summary, the analysis of pre- and post-regulation stage fluctuations shows that the water level in Lake Istokpoga has dropped to 36.5 ft or lower on a number of occasions but at a somewhat infrequent interval (Table 1). Prior to regulation, the lake stage dropped below 36.0 ft in 1956 during a severe drought.

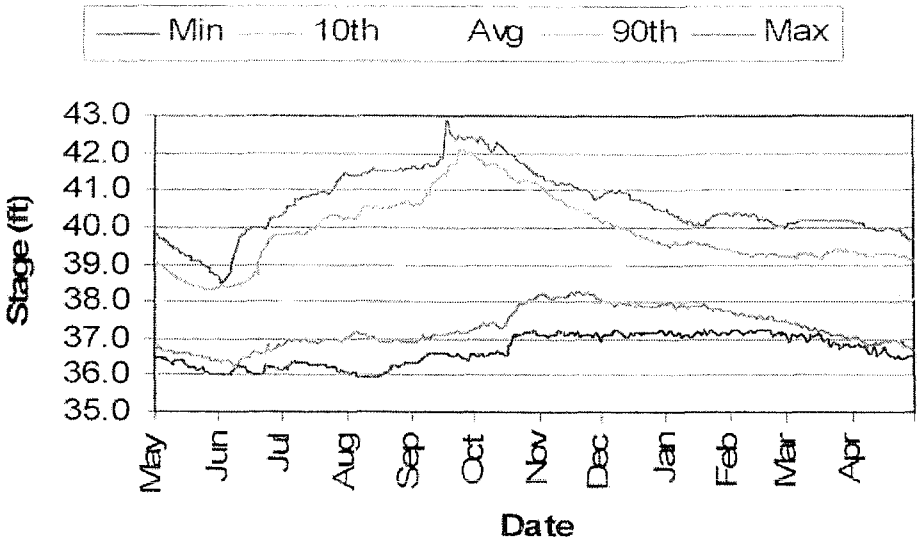


Figure 9. The minimum, 10th percentile, average, 90th percentile and maximum of mean daily stage for each day of the year based on the pre-regulation period of record (August 1, 1936 through April 30, 1961).

Regulatory Framework

Minimum Flows and Levels

A Minimum Flow and Level (MFL) for Lake Istokpoga was adopted by the South Florida Water Management District Governing Board on December 14, 2005 and subsequently published in the Florida Administrative Weekly. The rule states that "A MFL violation occurs in Lake Istokpoga when surface water levels fall below 36.5 feet NGVD for 20 or more consecutive weeks, within a calendar year, more often than once every four years". Since the rule was enacted in January 2006, there have been no MFL exceedances or violations for Lake Istokpoga.

For the proposed temporary request for 2012, the simulated lake stage goes below 36.5 feet NGVD for longer than 20 weeks, which is an exceedance of the MFL threshold. However, as discussed in the model results, the lake stage typically increases more rapidly in the late summer-early fall than indicated in the simulation, so that in fact, an exceedance is not likely to occur. If an exceedance of the MFL occurs, a violation will not occur unless there is a second exceedance in the next four years.

Lake Istokpoga Regulation Schedule Review

The Lake Istokpoga Regulation Schedule Review was added as a component to the Lake Okeechobee Watershed Project to address concerns by stakeholders of the impacts of water level fluctuation (Lake Okeechobee Watershed Project Delivery Team 2005). The purpose of the schedule review was to examine ways of modifying the regulation schedule to improve ecological conditions while maintaining flood control and water supply functions. The plan

formulation document recommends an operating strategy that uses El Nino/La Nina forecasts and the Palmer Drought Severity index to select among three rule curves. Under strong La Nina conditions a rule curve is recommended that drops the regulation schedule to 36.5 ft during May-early June. For the temporary deviation proposed for 2012, the lower limit of the proposed ALT1 schedule is 0.5 ft lower at 36.0 ft from mid-May through June.

2001 deviation for water supply and habitat enhancement

South Florida experienced a regional drought in 2000. In the spring of that year, the stage in Lake Istokpoga decreased to 37.5 ft., the minimum elevation of the regulation schedule. Rainfall during the wet season began to raise lake stage. However, it peaked at 38.69 ft. on October 9, 2000 and did not reach the maximum elevation of the regulation schedule line of 39.5 ft. In January 2001, the South Florida Water Management District requested a deviation from the U.S. Army Corps of Engineers that would take advantage of the already low water levels and continue to lower the lake level to facilitate a habitat enhancement project by the Florida Fish and Wildlife Conservation Commission. The temporary deviation permitted water releases to meet water supply demands in the Lake Istokpoga/Indian Prairie Basin.

As stated earlier, the stage regulation narrowed the range of water level fluctuation in Lake Istokpoga. The reduction of natural water level fluctuations favored the development of undesirable monocultures of cattail (*Typha* sp.) and floating vegetation mats (tussocks). This type of vegetation impacted >1,800 acres of the littoral zone and was expanding by 100 acres per year (Champeau et al. 1999). The Florida Fish and Wildlife Conservation Commission's habitat enhancement plan involved lowering the lake to 36.5 ft for an extended period of time to allow lake sediments to dewater and consolidate. As sediments dried out, earth moving equipment was used to remove unwanted vegetation and organic sediments from the littoral zone. Another key element of the plan was a coordinated large-scale hydrilla treatment that reduced hydrilla coverage from 70% to 5%. The involved agencies included FFWCC, the Florida Department of Environmental Protection and Highlands County.

In March 2001, the lake stage fell to the target of 36.5 ft. due to the managed releases (Figure 10). The stage continued to drop from evapotranspiration and eventually reached 35.88 ft. by June 19, 2001. Lake stage was at 36.5 ft or below for 121 days. After reaching the minimum elevation of the deviation schedule, water levels rose quickly to reach the maximum elevation of the regulation schedule line of 39.5 in late September, 2001.

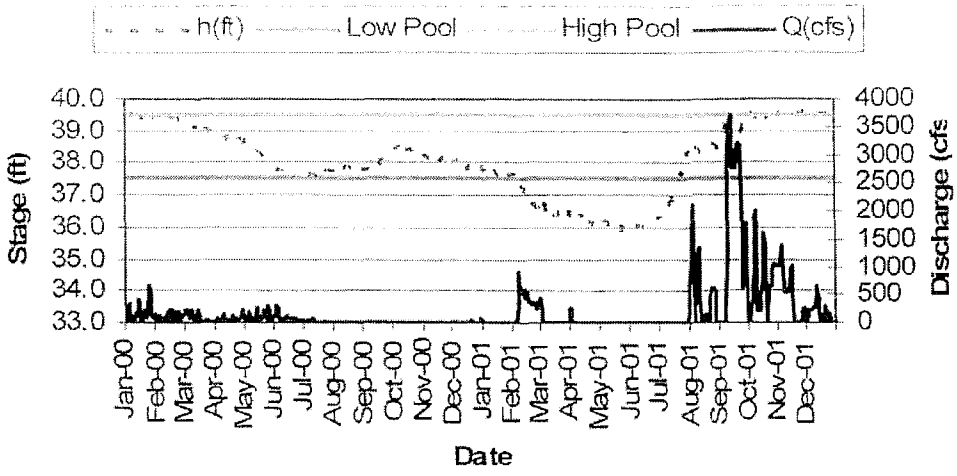


Figure 10. Mean daily stage and discharge at S-68 during 2000 and 2001. The horizontal lines represent the high pool stage of the regulation schedule at 39.5 ft. (blue) and the low pool stage of 37.5 ft. (green).

Between March and July, 2001, 1,308 acres (21 miles of shoreline) were scraped and an estimated 2,370,420 cubic yards of tussocks/muck were removed to upland disposal sites or consolidated into in-lake islands (Champeau and Furse 2002). Champeau and Furse (2002) indicated that cleared areas had improved water quality and recruitment of desirable aquatic plants, increased utilization by fish and wading bird, improved aesthetics, and had other economic / social / recreational benefits. No harmful effects from the low stage were documented. Positive responses by submersed aquatic vegetation and swamp forest are described below under Plant Responses.

In summary, the three regulatory examples (MFL, regulation schedule review, and the 2001 deviation) described above suggest that water levels in Lake Istokpoga could temporarily be lowered to 36.0 ft without negatively affecting much of the lake's flora and fauna but timing and duration are likely important.

Organic sediments

The current regulation schedule reduces the range of water level fluctuation and the opportunity for the accumulating organic material to decompose aerobically. The accumulation of organic material over a forty year period was one of the issues that the drawdown of 2001 was designed to address. During the drawdown, most of the organic material was physically moved to upland disposal sites or to in-lake spoil islands. It is not known how much decomposed in situ. Any lowering of water levels as a result of the proposed deviation is likely to allow some additional decomposition of organic material thus improving the condition of the sediments in the near shore marsh. The amount of decomposition that occurs will depend on how much the stage is lowered and for how long.

Plant responses

Lake Istokpoga supports three plant zones that are related to water depth (Milleson 1978, Water Supply Department 2005). The bald cypress/mixed hardwoods swamp is generally found at higher elevations near 39.5 ft. The littoral zone (emergent marsh) generally occurs between 36.5 and 39.5 ft. elevations. Submerged aquatic vegetation also occurs between 36.5 ft. and 39.5 ft. and also may extend into open water at elevations less than 36.5 ft. The spatial extent of these three zones can be influenced by changing water levels.

Bald cypress (Taxodium distichum)/hardwoods swamp
This swamp forest is dominated by bald cypress (*Taxodium distichum).* Cypress and other hardwoods provide important nesting habitat for several species of birds including species of special status. Since the range of water level fluctuations was reduced in 1962, minimal reproduction of these trees has occurred. During the 2001 drawdown, the lowered water levels allowed some seedlings to sprout from existing seeds. Unfortunately these seedlings were drowned during the rapid refilling of the lake from rainfall (Personal communication, John Zahina, South Florida Water Management District). ALT 1 may allow water levels to decline to a level that allows some seedlings to sprout. Low water levels may also provide an opportunity for planting cypress in areas that are difficult to access in wet years.

Emergent vegetation
Lowering of water levels should increase the area in which seeds of emergent plants can germinate. A recent description restricts the emergent plant zone to 36.5 ft or above (Water Supply Department 2005). However, Milleson (1978) reports Bulrush (*Schoenoplectus californicus*) extending down to 35.5 ft and cattail (*Typha latifolia*) extending down to 35.7 ft in Lake Istokpoga. Milleson's observations were made between August 1973 and September 1976. During the years before and during his study, lake stages dropped to low levels. Mean daily stage dropped to 36.2 ft on June 2, 1971, and dropped below 37.5 ft in 1974, 1975, and 1976. This suggests that lowering the lake may temporarily extend the area of emergent vegetation lakeward. The lower lake stage associated with ALT1, should allow increased recruitment of emergent vegetation near the lakeward edge of the marsh but upper elevation plants may be impacted by dry conditions.

Submersed aquatic vegetation (SAV)
Lower water levels should allow more light to reach the lake bottom and promote the growth of native submergent vegetation such as Illinois pondweed (*Potamogeton illinoesis*) and eelgrass (*Vallisneria americana*) and the exotic plant hydrilla (*Hydrilla verticillata* (L.F.) Royle). Most SAV in Lake Istokpoga is located near the shoreline area out to the bulrush zone, around Big Island, Bumblebee Island and Grassy Island and in open water in the mid and southern regions of the lake. Deeper water depths and muck substrate make it difficult for SAV to establish in much of the lake's northern pelagic region. The distribution and density of the two most common submersed plants (*Hydrilla* and eel-grass) is shown in Figure 11. The areal distribution of native and exotic SAV is likely to expand under low lake stage conditions.

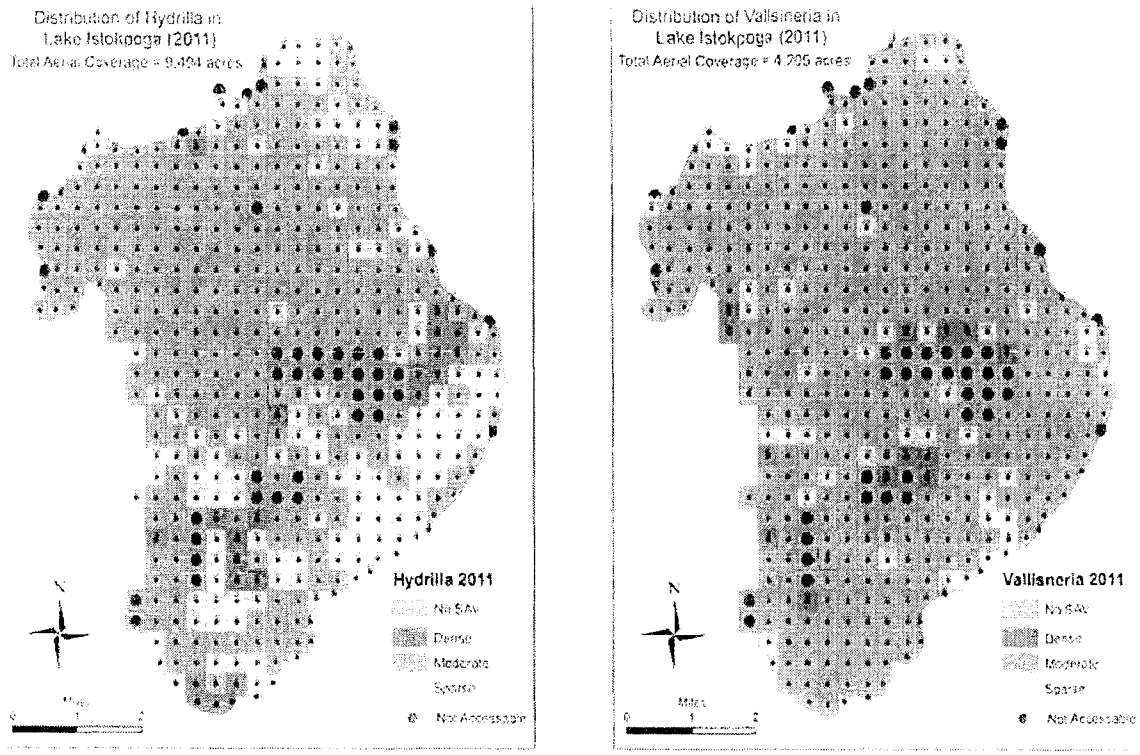


Figure 11. Distribution of *Hydrilla* and eel-grass in Lake Istokpoga (June 2011).

Hydrilla

Hydrilla (*Hydrilla verticillata* (L.F.) Royle) is a submersed, exotic plant that can grow at low light levels and may elongate as rapidly as 1 inch per day (reviewed in Langeland 1996). When hydrilla reaches the surface of the lake, it branches to form mats, which intercept the sunlight and shade other slower growing submersed plants. Hydrilla was first detected in Lake Istokpoga in 1979 when it covered less than 4 acres (O'Dell et al. 1995). Since then, it has undergone several periods of increase covering more than 70% of the lake at times. Large-scale chemical treatments with the herbicide fluridone were used to bring hydrilla under control. Because of the repeated treatments with fluridone, the strain of hydrilla in Lake Istokpoga has developed a resistance to this herbicide.

In addition to its acquired resistance to herbicide, hydrilla often is difficult to control because it reproduces vegetatively through fragmentation and it produces a reproductive structure commonly referred to as tubers. Tubers can lie dormant in the sediments for extended periods of time, where they are relatively well-protected from chemical treatments, then germinate when conditions become favorable for growth. The sprouting rate of tubers can significantly increase following a drawdown (Haller et al. 1976 cited in Netherland 2005) and promote an increase in plant coverage.

Animals

Snail Kite (Rostrhamus sociabilis Ridgway*)*

The snail kite is a federally endangered species that is vulnerable to water level management. Lake Istokpoga was not designated as critical habitat for snail kite when critical areas were identified in 1977 by USFWS. Snail kite use of Lake Istokpoga has been variable in recent years. In 2009 fledgling kites emerged from ten nests in Lake Istokpoga. In 2010 there was only one active nest on the lake and in 2011 four pairs of snail kites nested along the littoral shoreline and on several of the islands.

Snail kites typically nest in low vegetation (3-9 ft) over water, which serves as a barrier to terrestrial predators. The eggs are incubated for 24-30 days in Florida, fledging occurs in 23-34 days, and the adults continue to feed fledglings until 9-11 weeks old (Sykes et al. 1995). Low water levels can leave a nest exposed to predators and/or decrease the structural support for herbaceous vegetation, such as cattail. A loss of structural support may cause excessive bending of the plant stems and increase the chance of nest failure (Sykes et al. 1995).

For snail kites nesting on Lake Okeechobee, hatching dates range from February through June and average April 20 (Rodgers and Schwikert. 2003). This overlaps with the period of time when the temporary deviation will be lowering lake stage. If lake stage drops to 36.0 ft much of the established bulrush and cattail (nesting habitat) along the lakeward edge of the marsh and on the islands will be exposed. The low water level can make nests more vulnerable to terrestrial predators or cause them to collapse.

Florida apple snails (Pomacea paludosa)

Florida apple snails are important as the primary food source for the endangered snail kite and the limpkin, a Species of Special Concern. Apple snails tend to occur in locations with sandy substratum and emergent vegetation. Apple snails climb emergent plant stems and other structures to lay eggs. If stranded by falling water levels, apple snails usually don't move. They may survive by using the operculum to close the shell opening to prevent desiccation. Darby et al. (2004) reported that 7 of 23 stranded apple snails in Lake Kissimmee survived longer than six weeks and may have survived longer if they were not eaten. Stranded apple snails are vulnerable to predators including snail kites and limpkins.

Because the Florida apple snail has a lifespan of only 1-1.5 years, the failure of a year class can greatly reduce the number of apple snails in the population. Egg-laying peaks in April and May, when water levels are most likely to fall. Eggs take 2-3 weeks to hatch after being deposited on vegetation above the water line. If water levels remain above 37.5 ft. much of the marsh will remain flooded. There will be emergent structure for egg deposition and abundant SAV that provides foraging habitat and cover from predation. If water levels in the lake drop to 36.5 ft, most of the marsh will be exposed (dry). The ALT1 simulated lake stage goes below 36 ft (Figure 5 bottom). Thus, the potential exists for the deviation to impact apple snail recruitment during the snail's peak breeding season. If the snail population is impacted, one option to aid recovery is to stock the lake with native apple snails that have been cultivated. The District has been experimenting with the use of enclosures to establish a nursery for cultivating native apple snails (Zhang and Sharfstein in press).

Osprey (Pandion haliaetus)
The Osprey is considered a Species of Special Concern by the state of Florida (Florida Fish and Wildlife Conservation Commission 2006). Lake Istokpoga supports one of the highest concentrations of osprey nests in the world (Pranty 2002). This population has been the subject of long-term demographic study (Personal communication, Michael McMillan, Florida Fish and Wildlife Conservation Commission). Osprey feed mainly on fish that they capture near the water's surface. Lowering the water level is likely to improve foraging conditions for osprey by concentrating fish in large areas of shallow water.

Bald Eagle (*Haliaeetus leucocephalus*)
Bald eagles are no longer endangered or threatened but are protected under the Federal Migratory Bird Treaty and the Bald and Golden Eagle Protection Act. There are nesting pairs of bald eagles on and near Lake Istokpoga. Eagles are commonly seen roosting in trees along the lake's shoreline and foraging in open water. Bald eagles may benefit from lower lake levels if fish become more concentrated and easier to capture.

Sandhill Cranes (*Grus canadensis*)
Sandhill cranes commonly build their nests in emergent vegetation on the surface of shallow water. Nearly all of sand hill crane nesting habitat will be exposed (dry) if the lake stage is lowered to 36.5 ft. When the area surrounding a surface nests becomes dry, predation is more likely to occur and the chance of nest failure will increase.

Wading Birds
In Lake Istokpoga, Bumblebee Island and Big Island and their surrounding marsh complex are important locations for wading bird rookeries. These islands can support several thousand nesting pairs of birds (Audubon of Florida 2005). Several species of wading birds nest on these islands including great egret (*Ardea alba*), least bittern (*Ixobrychus exilis*), and several Species of Special Concern in Florida - limpkin (*Aramus guarauna*), white ibis (*Eudocimus albus*), snowy egret (*Egretta thula*), and little blue heron (*Egretta caerulea*) (Florida Fish and Wildlife Conservation Commission 2006).

Dropping water levels may also create new foraging opportunities around the island by stranding fish and invertebrates in the marsh as it dries out and by creating large shallow areas around the islands that may attract forage fish, especially if submersed aquatic vegetation begins growing in these areas as it did following the 2001 drawdown.

Audubon's Crested Caracara (Caracara cheriway)
This species has been assigned Threatened status by the state of Florida (Florida Fish and Wildlife Conservation Commission 2006). It prefers open grasslands but will forage in wetlands. Lowering water levels will dry out a portion of the marsh and may provide this species with increased habitat for foraging.

Fish
At least 38 species of fish occur in Lake Istokpoga (SFWMD 2005). Four species are of particular importance to fishermen: black crappie (*Pomoxis nigromaculatus*), redear sunfish

(*Lepomis microlophus*), bluegill (*Lepomis macrochirus*) and largemouth bass (*Micropterus salmoides*). The lake has been designated a Fish Management Area by the Florida Fish and Wildlife Conservation Commission and supports a fishery valued at $6 million (Champeau and Furse 2002). The largemouth bass fishery is considered one of the finest in the state (Stout 2002).

The proposed temporary deviation can affect fish directly by lowering water levels and indirectly through changes in habitat conditions. The lower water levels can improve conditions for nest-spawning fish by exposing sediments to aerobic decomposition of organic material. Lower water levels may increase germination and growth of native submersed plants, such as eelgrass and pondweed, which can provide better cover for many species of fish and support higher densities of invertebrate prey. During the 2001 drawdown, water levels decreased to 35.88 ft in mid-June for short time without harm to the fishery.

Social/Economic

Lake Istokpoga is an important component of the local economy in Highlands County. The lake is visited by approximately 60,000 recreational boaters annually (Pranty 2002). In a one year period, 190,637 people used the lake, and a little over half came from outside of Highlands County, who spent $2.3 million in the county (Bell and Bonn 2004). The lake has an excellent largemouth bass fishery (e.g. Stout 2002) that supports four fishing camps, fishing guides, and attracts several fishing tournaments a year. The diverse wildlife using the lake also creates opportunities for ecotourism.

Private access to Lake Istokpoga is severely impacted at a stage of 37 ft and public access is impaired (Table 2). If lake stage follows the simulation line and drops to less than 36 ft all private and public access to the lake will be impaired.

Table 2. Access issues related to stage for public and private boat ramps in Lake Istokpoga (based on Table 19 of Water Supply Department 2005).

Lake Stage (ft)	Private Access Status	Public Access Status[1]
≥38.0	Minimum impact	No impact.
37.5-37.99	Impaired access	Minimum (start) impact. At these stages, difficulties in getting boats into water and navigating the lake are observed.
37.0-37.49	Severely Impacted	Impaired access. Problems at public boat ramps for large boats.
36.5-36.99	No private access	Severely impaired access. All public ramps will experience impaired access for pontoon boats and for all, non-shallow-draft boats. There is approximately 50% more access impairment than at 37.0 feet. No access from RV parks. Fish camps still have limited access. Shallow depths greatly limit area of navigable water.
36.0-36.49		Limited access through fish camps. Public can access the lake through two of the fish camps for a boat ramp fee. Access at public boat ramps is limited to non-motorized /electric-motor boats (canoes etc.), small engine johnboats, that can be manually launched (carried/pushed) and airboats.
<36.0		All public access is impaired.

[1]The effect of stage on access and navigation is compounded by the presence of hydrilla in Lake Istokpoga.

CONCLUSIONS

The potential effects of the proposed deviation to the Lake Istokpoga regulation schedule (ALT1) were considered relative to the existing regulation schedule (ALT0). ALT1 has potential to provide some benefit and some harm to the lake ecosystem. The three biggest concerns identified were the potential for impacts on nesting of the endangered snail kite and the survival of its principal prey the apple snail, and the potential to exacerbate an existing chronic problem with hydrilla management. These issues are summarized below.

1) It is generally recognized that an increase in water level fluctuation in Lake Istokpoga to more closely resemble the pre-regulation pattern would be ecologically beneficial.

2) The proposed deviation alternative (ALT1) would increase the range of water level fluctuation in the lake by lowering the regulated stage to 36.0 ft. between May 15 and July 31 (Figure 5). Simulated lake stage, based on the 1-in-10 year dry return interval rainfall,

indicates that water levels would not increase as rapidly as the regulation schedule. However, as discussed in the model results, the lake stage typically increases more rapidly in the late summer-early fall than indicated in the simulation.

3) Prior to regulation, the lowest water level recorded for Lake Istokpoga was 35.93 ft during a severe drought. Shortly after regulation the water level fell to 35.40 ft during an extreme drought.

4) Depending on water levels and duration, the deviation could produce several benefits for Lake Istokpoga including:
    a. Drying of sediments to promote the germination of cypress seedlings and seeds of emergent vegetation,
    b. Create areas within the lake which are sufficiently shallow to allow adequate light penetration to support native species of submersed vegetation such as pondweed and eelgrass,
    c. Allow some decomposition of organic matter.

5) The reduced lake level of ALT1 could affect the endangered Everglades snail kite and its prey the Florida apple snail. Only a small number of snail kites have attempted to nest on Lake Istokpoga since 2007. Most of the nesting in 2010 occurred in the upper Kissimmee basin and in Lake Okeechobee.

6) Falling water levels during the peak spring apple snail egg laying season could result in a large mortality of the juvenile apple snails. Because this species has a short life cycle (< 2 years), poor year class recruitment could limit the number of forage snails available for snail kites the following year. In the proposed regulation schedule, the lowest water levels would occur during the summer and should have a limited impact on egg production. However, if the marsh is exposed during the summer due to extremely low water levels the recruitment of juvenile snails into adults may be impacted.

7) Hydrilla management has been a chronic problem in Lake Istokpoga. Lowered water levels may stimulate the growth of hydrilla, although it is difficult to predict to what extent the deviation will result in increased growth. Without proper treatment, hydrilla can expand its coverage to levels that will negatively impact the lake.

RECOMMENDATIONS

1) Quantifying benefits and impacts associated with this deviation will be helpful in making decisions about deviations during future droughts. Because this deviation will allow water levels to drop below the elevation that has been proposed for dry years in the Lake Istokpoga Schedule Review, any information from this manipulation of water level could help evaluate that schedule. Stage is already monitored by the South Florida Water Management District, water quality by Highlands County and the South Florida Water Management District, snail kites by the U.S. Fish and Wildlife Service, and fish and

wading birds by the Florida Fish and Wildlife Conservation Commission. Additional monitoring on the following topics would be especially useful:

a. Changes in sediment organic matter
b. Changes in emergent vegetation
c. Changes in submersed vegetation
d. Apple snail movement and abundance
e. Relationship of light extinction to water depth and plant growth

2) Develop and implement a strategy for aggressively managing hydrilla following implementation of the deviation.

3) Coordinate with other agencies and local governments with management responsibilities for Lake Istokpoga. The Florida Department of Environmental Protection and Highlands County are planning a hydrilla treatment in the next few weeks. The Florida Freshwater Fish and Wildlife Conservation Commission is planning habitat improvement activities in the lake, in conjunction with the South Florida Water Management District.

4) Communication with the public, businesses and local governments will be important.

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March 30, 2012

Colonel Alfred A. Pantano, Jr.,
District Commander
U.S. Army Corps of Engineers
701 San Marco Boulevard
Jacksonville, FL 32207-8175

Dear Colonel Pantano:

Subject: Request for a Temporary Deviation to the S-190 Operational Schedule

The purpose of this letter is to request the U.S. Army Corps of Engineers (Corps) to process the planned S-190 structure deviation. The Seminole Tribe of Florida Environmental Resource Management Department (ERMD) appreciates the support of the Corps to study the potential of increased water storage by modifying the operations of structure S-190.

Your January 23, 2012 correspondence requested the submittal of supporting documentation to expedite the deviation process and identified an expanded proposal (with an example provided of a recent study for Lake Istokpoga submitted to the Corps by the South Florida Water Management District (SFWMD) as an example for reference). The expanded proposal from the Seminole Tribe was identified to potentially address:

1. evidence of no adverse impact on the level of flood protection currently provided by the structure;
2. evidence of no harmful environmental impacts;
3. a monitoring plan for the duration of the project including frequency of data collection;
4. documentation of coordination with affected parties

This letter and enclosed attachments serve as the supporting documentation suggested. A report is attached which summarizes the evolution of the S-190 structure which addresses items #1 and #2 above. Item #3 is addressed by way of 3 surface water flow measurement devices installed and operated by the U.S. Geologic Survey (USGS) at the terminal points of the North Feeder, West Feeder and L-28 Interceptor Canals (diagram and coordinates provided on Figure 1). The referenced USGS meters monitor flow and stage on a continuous basis. Documentation of coordination with the affected parties is provided in Table 1.

Finally, the Seminole Tribe Environmental Resource Management Department requests clarification from the Corps regarding if this project would be considered a deviation since it was authorized under the schedule which is being proposed.

To expedite the deviation approval, please contact me if you have any questions or require any additional information.

Sincerely,

Craig Tepper
Seminole Tribe of Florida

cc: James Billie, Chairman, Seminole Tribe of Florida
Jim Shore, General Counsel
Steven Walker, Esquire
Stan Rodimon, Chief Community Planning & Development Officer

Joseph S. Kippenberger, Chairman, Seminole Water Commission
Osvaldo Collazo, USACE
Jeff Collins, USACE
File

Figure 1: Surface Water Monitoring Data Collection

Table 1: Documentation of Coordination with Affected Parties

STOF=Seminole Tribe of Florida
SFWMD = South Florida Water Management District
CORPS = U.S. Army Corps of Engineers

Seminole Tribe of Florida: Structure S-190 Stage Documentation of Correspondence		
Correspondence Follows by Item Number		
Item	Date	Description
1	Week of January 17-21 2011	Teleconference: STOF, SFWMD regarding S-190 Stage
2	1/28/2011	email-STOF to SFWMD requesting update on teleconference follow-up
3	1/28/2011	email-SFWMD to STOF received request, will respond
4	2/4/2011	email-SFWMD to STOF response teleconference follow-up
5	10/7/2011	email-STOF to SFWMD requesting S190 Operating Schedule, downstream commitments, definitions of "normal and "dry" for operations
6	10/7/2011	email-SFWMD to STOF response-provide "Structure S190" pages
7	10/7/2011	"Structure S190" Narrative provided by SFWMD to STOF
8	10/10/2011	email STOF to SFWMD request definition of "normal" and "dry" operating conditions again
9	10/19/2011	email STOF to SFWMD request downstream commitments information and definition of "normal" and "dry" operating conditions again
10	10/19/2011	email SFWMD to STOF response- inform S-190 operations based on Corps Water Control Manuals; responsive to “normal” and “dry” operating condition definitions, request clarification on term "downstream commitments"; provide “Central & Southern Florida Project for Flood Control & Other Purposes Supplement 40 Design DetailMemorandum Levee 28 Interceptor and Feeder Canals with Appendix A and Addendum 1”;
11	10/21/2011	email-STOF to SFWMD request Corps Water Control Manual for S-190; provided additional clarification for downstream commitments
No item #	10/24/2011	letter-STOF to CORPS A. Pantano, requesting cooperative demonstration project S-190
12	10/25/2011	email-SFWD to STOF provide “S190 pages from CORPS Water Control Manual”, downstream commitment information unresolved
13	10/25/2011	“S190 pages from CORPS Water Control Manual” provided by SFWMD to STOF
14	11/2/2011	email-CORPS to STOF, structure S-190 transferred to SFWMD in 1967
No item #	1/23/2012	letter-CORPS to STOF, receive STOF deviation request (cooperative project S-190), recommend supporting documentation to expedite request
No item #	3/12/12	Letter-STOF to CORPS, submit supporting documentation to expedite request

Table 1 Item 2

From: Stacy Myers [mailto:StacyMyers@semtribe.com]
Sent: Friday, January 28, 2011 3:10 PM
To: Ramirez, Armando
Subject: status on S-190 Operational Opportunities
Importance: High

Armando,

Based on our teleconference with Susan Sylvester last week, I was wondering if there has been any news or updates on our request? Please let me know. Thanks.

Stacy Myers

Stacy D. Myers
Environmental Protection Specialist III, Environmental Science Section Supervisor
Environmental Resources Management Department
Seminole Tribe of Florida
6365 Taft Road, Suite 3008

Table 1 Item 3

From: Ramirez, Armando [mailto:aramire@sfwmd.gov]
Sent: Friday, January 28, 2011 4:37 PM
To: Stacy Myers
Subject: RE: status on S-190 Operational Opportunities

Stacy,

I am scheduled to have a discussion with the individual(s) on Susan's area that will be assisting us on the subject early next week. As soon as I have any result/update, I will relate it back to you.

Thank you.

Armando Ramirez
Tribal and Federal Affairs Liaison
Regulatory and Public Affairs

Table 1 Item 4

From: Ramirez, Armando [mailto:aramire@sfwmd.gov]
Sent: Friday, February 04, 2011 5:13 PM
To: Stacy Myers
Subject: RE: status on S-190 Operational Opportunities

Stacy,

I hope all is well with you. After some discussions with several individuals in Operations here at the District, the following is a summary of findings:

- The operational ranges for S-190 call for maintaining the headwater elevation between 15.8 and 15.2 ft (NGVD) during the dry season and 14.8 to 14.2 ft (NGVD) during the wet season
- Recent removal of culvert G-108 and routing of those flows through culvert PC-17A has imposed additional capacity constraints to PC-17A. Maintaining S-190 headwater at a higher stage (during the wet season) will impose additional reduction to PC-17A hydraulic capacity, generating higher stages upstream from this culvert (operated by McDaniel Ranch).
- Even if were possible to increase the stages, the perceived benefit will be rather small due to the lack of upstream storage and the complete disconnect the canals have with other basins. The storage in the basin is completely replenished by rainfall. Once it stops raining and the canal passes the gate closing stages, flows take a natural recession.

Please let me know if you have any questions or need additional information.

Thank you.

Armando Ramirez
Tribal and Federal Affairs Liaison
Regulatory and Public Affairs

Table 1 Item 5

From: Lisa Meday [mailto:LisaMeday@semtribe.com]
Sent: Friday, October 07, 2011 1:00 PM
To: Ramirez, Armando
Cc: Craig Tepper
Subject: S190 Operating Schedule

Hi Armando,
Could you please send me the Operating Schedule for S190? I am particularly interested in anything relating to:

- Army Corps schedule/conditions for S190
- Any downstream "commitments" for water – either through DEP or ACOE
- If there are any downstream "users" relating to FWS requirements for habitat

Finally, I have seen SFWMD material relating to "normal" operating conditions for S190 and "dry" conditions with associated headwater elevations for opening and closing gates. Can you please clarify how "normal" and "dry" are defined? For example, are they based on month of the year; or variable(s) from any conditions from the above bullet list.

Thank you,
Lisa
Lisa Meday, Water Quality Specialist Phone: 954-965-4380 ext 10621 lisameday@semtribe.com
Seminole Tribe of Florida Environmental Resource Management Department 6300 Stirling Road Hollywood, FL 33024

Table 1 Item 6

From: Ramirez, Armando [aramire@sfwmd.gov]
Sent: Friday, October 07, 2011 4:59 PM
To: Lisa Meday
Cc: Craig Tepper
Subject: RE: S190 Operating Schedule
Attachments: s190.pdf

Lisa,

Attached please find relevant information on the above referenced subject for your use. I am collecting more information and will forward it as soon as possible.

Please let me know if you have any other questions.

Thank you.

Armando Ramirez
Tribal and Federal Affairs Liaison
Office of Everglades Policy & Coordination

STRUCTURE 190

This structure is a reinforced concrete, gated spillway with discharge controlled by two cable operated, vertical lift gates. Operation of the gates is automatically controlled in accordance with the established operational criteria. The structure is located on the L-28 Interceptor Canal about 32 miles south of Clewiston.

PURPOSE

This structure maintains optimum upstream water control stages in the North and West Feeder Canals; and prevents over drainage of these canals.

OPERATION

This structure will be operated on either a low or a high setting, through automatic controls as follows:

During the normal condition, the low setting is used.

When the headwater elevation rises to 14.8, the gates will open at six inches per minute but the maximum gate opening will be limited to the amounts shown on the "Limiting Gate Opening" curve.

When the headwater elevation rises or falls to 14.5, the gates will become stationary.

When the headwater elevation falls to 14.2, the gates will close at six inches per minute.

During the dry condition, the high setting is used.

When the headwater elevation rises to 15.8, the gates will open at six inches per minute.

When the headwater elevation rises or falls to 15.5, the gates will become stationary.

When the headwater elevation falls to 15.2, the gates will close at six inches per minute.

During low water periods, releases will be made to meet downstream irrigation requirements even though necessary releases will violate the optimum headwater criteria.

FLOOD DISCHARGE CHARACTERISTICS

	Design
Discharge Rate	2960 cfs

Revised 11/18/1997

Table 1 Item 7 page 2 of 3

	* % SPF
Headwater Elevation	16.6 feet
Tailwater Elevation	16.1 feet
Type Discharge	uncontrolled submerged

*Structure designed to pass the one in ten year flood.

DESCRIPTION OF STRUCTURE

Type reinforced concrete, gated spillway

Weir Crest

Net Length 48.0 feet

Elevation 3.5 feet

Service Bridge Elevation 20.5 feet

Water Level which will by-pass structure 20.5 feet

Gates

Number 2

Size 12.1 ft. high by 24.8 ft. wide

Type vertical lift

Bottom elevation of gates, full open 18.4 feet

Top elevation of gates, full closed 15.5 feet

Control Automatic, on-site control and remote computer control

Lifting Mechanism

Normal power source commercial electricity

Emergency power source LP gas engine driven generator

Type Hoist hydraulic cylinder actuated by electric motor driven pump, and connected to gates by steel cables

Date of Transfer: July 12, 1967

ACCESS: via State Road #833 and gravel road in Indian Reservation

Revised 11/18/1997

Table 1 Item 7 page 3 of 3

HYDRAULIC AND HYDROLOGIC MEASUREMENTS

Water Level Remote digital headwater and tailwater recorders

Gate Position Recorder Remote digital recorder on all gates

DEWATERING FACILITIES

Storage West Palm Beach Field Station

Type Steel needle beam and aluminum needles

Size and Number (Per bay)

Upstream needles 4 @ 5' wide, 2 @ 2' wide
beam 33WF 200, 26'-11" long

Downstream same

Revised 11/18/1997

Table 1 Item 8

From: Lisa Meday
Sent: Monday, October 10, 2011 7:56 AM
To: 'Ramirez, Armando'
Cc: Craig Tepper
Subject: RE: S190 Operating Schedule

Thank you,
Again, I am particularly interested in how the 2 conditions are defined or characterized. What defines "normal" and what defines "dry". Would it be calendar months, hydrologic conditions, or something else? I would appreciate the definitions of that very much.

Thanks,
Lisa

Table 1 Item 9

From: Lisa Meday [mailto:LisaMeday@semtribe.com]
Sent: Wednesday, October 19, 2011 2:12 PM
To: Ramirez, Armando
Cc: Craig Tepper
Subject: FW: S190 Operating Schedule

Hi Armando,
Have you been able to find the 2 definitions of "normal" and "dry" conditions and the Army Operating Schedule for S190? I also remain interested in any downstream commitments per the 10/7/11 email.

Thank you,
Lisa

Table 1 Item 10

From: Ramirez, Armando [aramire@sfwmd.gov]
Sent: Wednesday, October 19, 2011 4:27 PM
To: Lisa Meday
Cc: Craig Tepper; Ross, Elizabeth
Subject: RE: S190 Operating Schedule
Attachments: Part 1, Supp 40 Serial_24-E.PDF

Lisa,

My apologies for the delay on getting the information to you. In addition to the previously submitted information, the attachment will provide you with all the information in reference to the S-190 structure as well as any downstream analysis. Further, it is my understanding that operations by water managers are based on the USACE "schedule" as shown in their Water Control Manuals. They use the following settings at S190 that regulate head water elevations at the structure:

Low	14.2 to 14.8 ft
Normal	(same as low)
High	15.2 to 15.8 ft

They do not have defined numerical triggers for Low/Normal and High. In general, when the threat of flooding is probable, they will switch to the low/normal setting. When the forecast is for limited rainfall and there is a demand for water in the basin, they switch to the high setting.

On the '*downstream commitments*'; I am not sure I entirely understand your question, so perhaps you can provide me more specifics on your question.

Thank you.

Armando Ramirez
Tribal and Federal Affairs Liaison
Office of Everglades Policy & Coordination

Table 1 Item 11

From: Lisa Meday [mailto:LisaMeday@semtribe.com]
Sent: Friday, October 21, 2011 3:39 PM
To: Ramirez, Armando
Cc: Craig Tepper; Stacy Myers
Subject: RE: S190 Operating Schedule

Hi Armando,
Is it possible to get a copy of the S190 Section of the Water Control Manual mentioned in your email?

As to downstream commitments, I believe this would be any agreement with FWS or other party to provide water from S190, south of the Big Cypress Reservation boundary.

Thank you for sending the previous document.

Lisa

Table 1 Item 12

From: Ramirez, Armando [aramire@sfwmd.gov]
Sent: Tuesday, October 25, 2011 2:35 PM
To: Lisa Meday
Cc: Craig Tepper; Stacy Myers
Subject: RE: S190 Operating Schedule
Attachments: Pages from C&SF Master Water Control Manual WCA, ENP, and ENP-SDCS Vol .pdf - Adobe Acrobat Pro.pdf

Lisa,

Attached please find the S190 pages from the USACE's Water Control Manual as requested. I am still looking into the question of *'commitments'* south of S-190.

Please let me know if you have any other questions.

Thank you.

Armando Ramirez
Tribal and Federal Affairs Liaison
Office of Everglades Policy & Coordination

STRUCTURE 190 (S-190)

Location. S-190 is located in the L-28 Interceptor Canal about one-half mile south of the junction of the West and North Feeder Canals.

Description. Structure 190 is a reinforced concrete, U-shaped, gated, two -bay spillway with an ogee-weir with automatically controlled vertical-lift gates. The structure has an operating platform and a service bridge.

Purpose. This structure maintains optimum upstream water control stages in the North and West Feeder Canals and prevents overdrainage of these canals.

Regulation. This structure will be operated on either a low or a high setting, through automatic controls as follows:

During the normal condition, the low setting is used. When the headwater elevation rises to 14.8 ft., NGVD, the gates will open at six inches per minute but the maximum gate opening will be limited to the amounts shown on the "Limiting Gate Opening" curve. When the headwater elevation rises or falls to 14.5 ft., NGVD, the gates will become stationary. When the headwater elevation fall to 14.2 ft., NGVD, the gates will close at six inches per minute.

During the dry condition, the high setting is used. When the headwater elevation rises to 15.8 ft., NGVD, the gates will open at six inches per minute. When the headwater elevations rises or fall to 15.5 ft., NGVD, the gates will become stationary. When the headwater elevation fall to 15.2 ft., NGVD, the gates will close at six inches per minute.

During low water periods, releases will be made to meet downstream irrigation requirements even though necessary releases will violate the optimum headwater criteria.

Constraints: To meet structural and stability requirements, the maximum allowable hydrostatic head on the structure should not be allowed to exceed 7.5 ft., NGVD, with a headwater elevation of 15.5 ft., NGVD, and a tailwater elevation of 8.0 ft., NGVD.

A-S190-1

STRUCTURE 190 (S-190)

Summary of Hydraulic Design

Location	L-28
Design Conditions	
Discharge (cfs)	2,960
Type	Uncontrol submerged
Headwater Elevation (ft.)	16.6
Tailwater Elevation (ft.)	16.1
Optimum Conditions	
Headwater Elevation (ft.)	15.5
Tailwater Elevation (ft.)	10.0
Minimum Water Surface Condition, estimated	
Headwater Elevation (ft.)	8.0
Tailwater Elevation (ft.)	8.0
Crest	
Shape	Ogee
Elevation (ft.)	3.5
Net Length (ft.)	48.0
Gates	
Number	2
Type of Control	Automatic vert. lift
Width x Height (ft.)	24.0 x 12.0
Bottom Elevation, (ft.), fully open position	18.4
Top Elevation, (ft.), closed position	15.5
Clearance Elevation (ft.)	17.6
Protection Elevation (ft.)	20.4
Apron	
Elevation (ft.)	-0.1
Length (ft.)	30.0
End sill elevation (ft.)	1.0
Service Bridge Elevation (ft.)	20.5
Operating Platform Elevation (ft.)	20.5

Table 1 Item 13 page 3 of 6

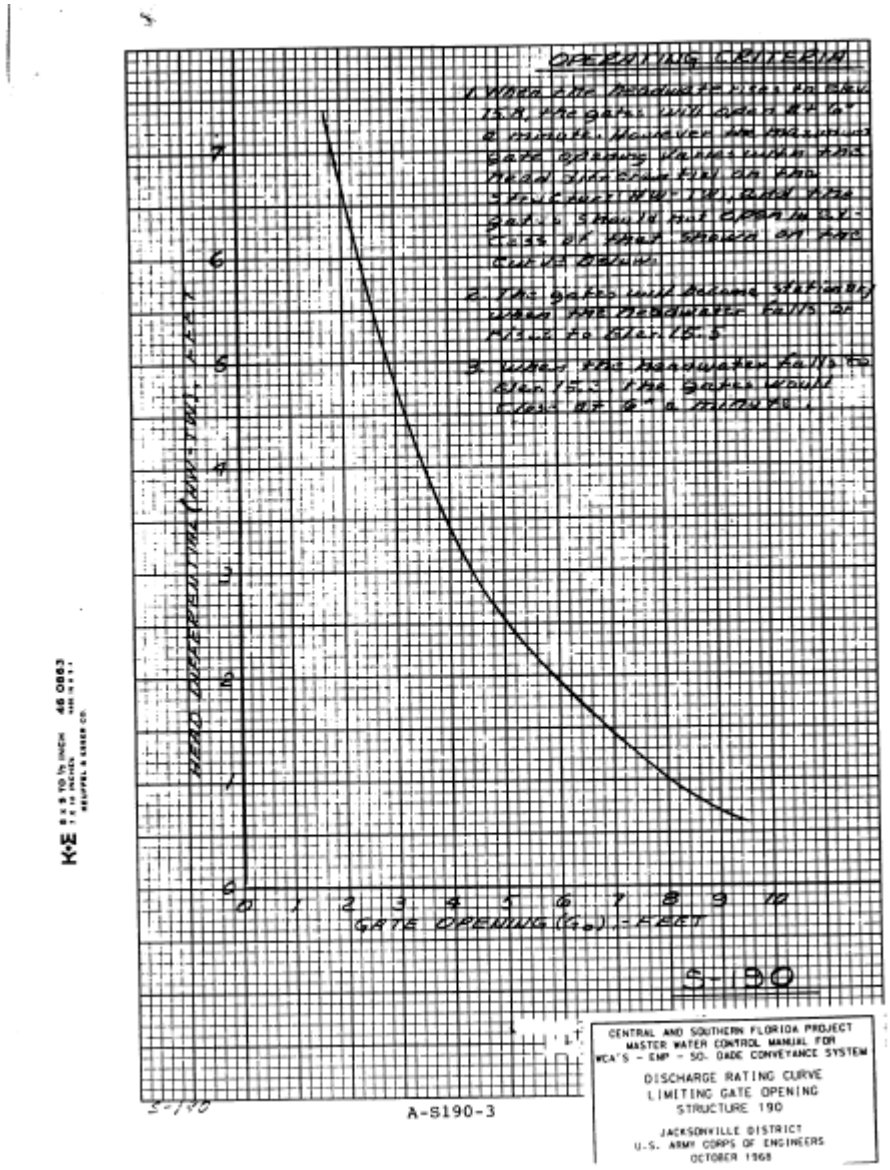
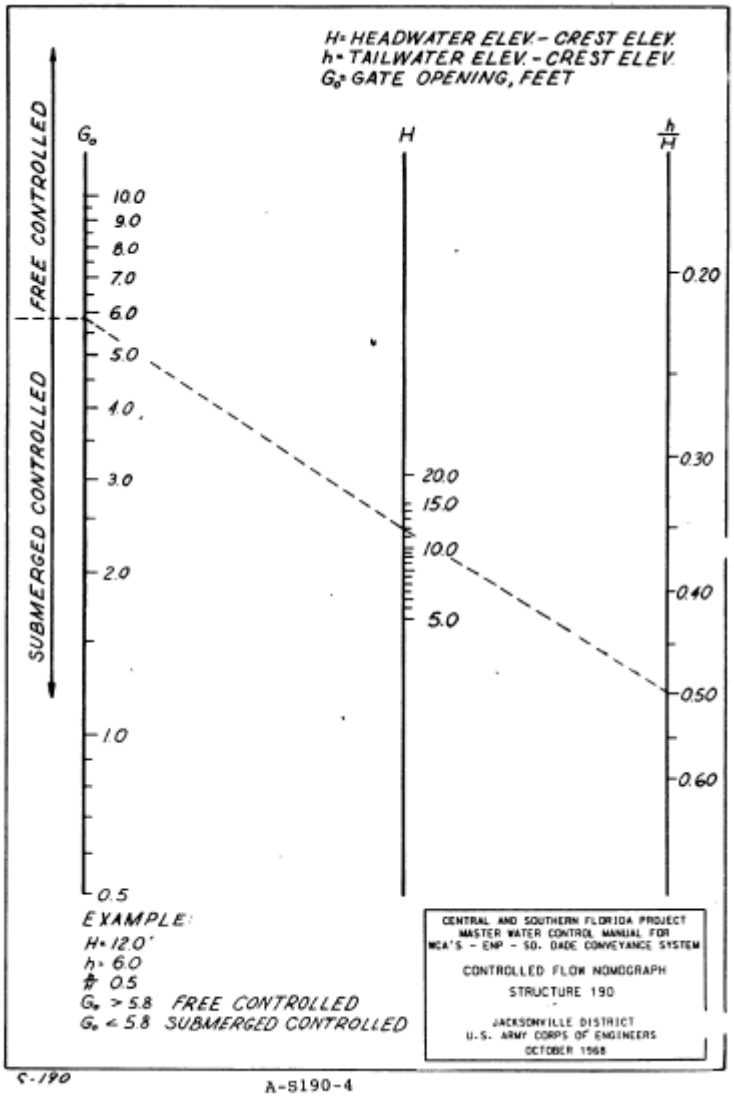


Table 1 Item 13 page 4 of 6



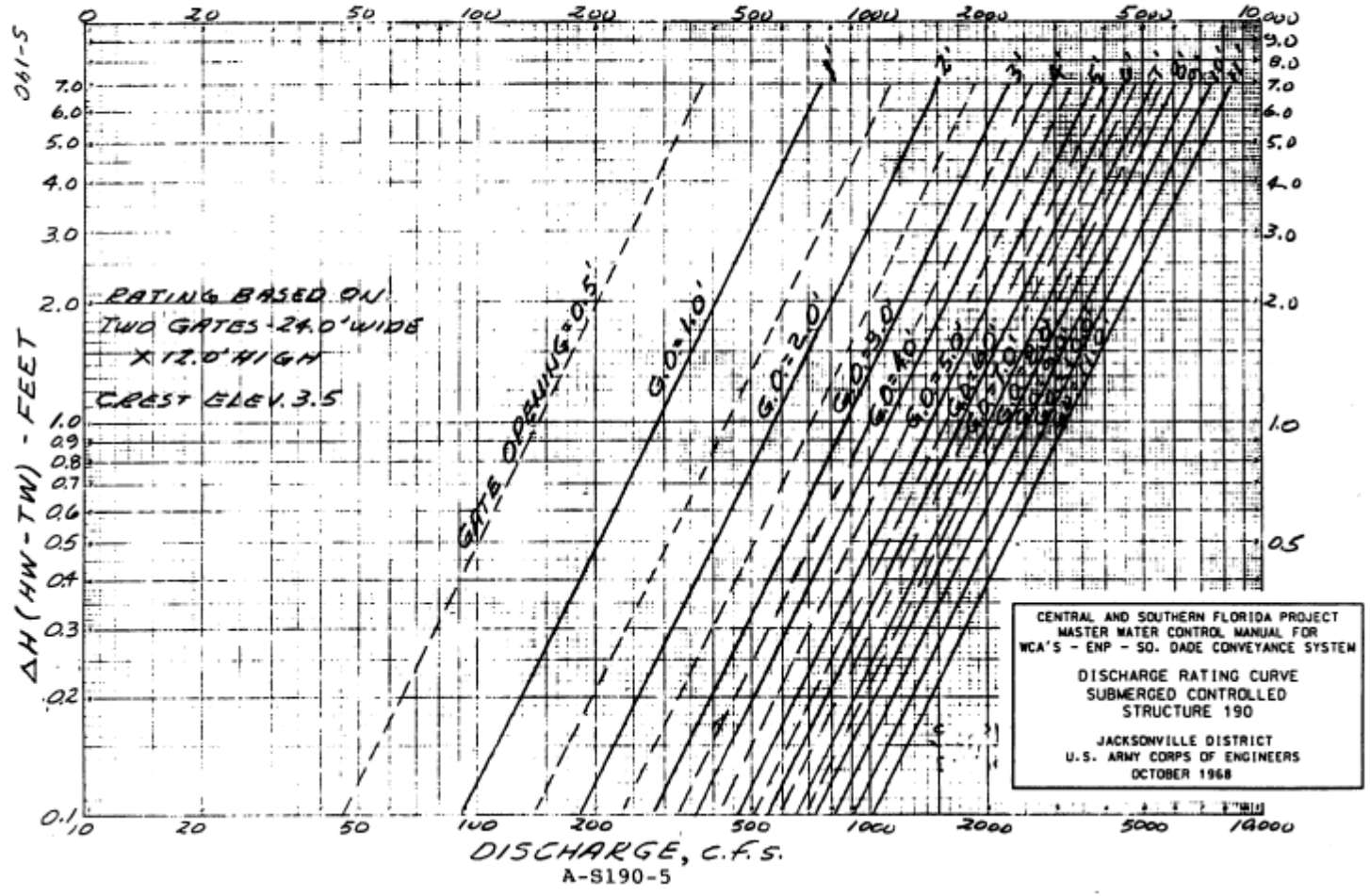

ΔH (HW - TW) - FEET
DISCHARGE, C.F.S.
RATING BASED ON
TWO GATES 24.0' WIDE
X 12.0' HIGH
CREST ELEV. 3.5
GATE OPENING = 0.5'
G.O. = 1.0'
G.O. = 2.0'
G.O. = 3.0'
G.O. = 4.0'
G.O. = 5.0'
G.O. = 6.0'
G.O. = 7.0'
G.O. = 8.0'
G.O. = 9.0'
CENTRAL AND SOUTHERN FLORIDA PROJECT
MASTER WATER CONTROL MANUAL FOR
WCA'S - ENP - SO. DADE CONVEYANCE SYSTEM
DISCHARGE RATING CURVE
SUBMERGED CONTROLLED
STRUCTURE 190
JACKSONVILLE DISTRICT
U.S. ARMY CORPS OF ENGINEERS
OCTOBER 1968
A-S190-5

Table 1 Item 13 page 6 of 6

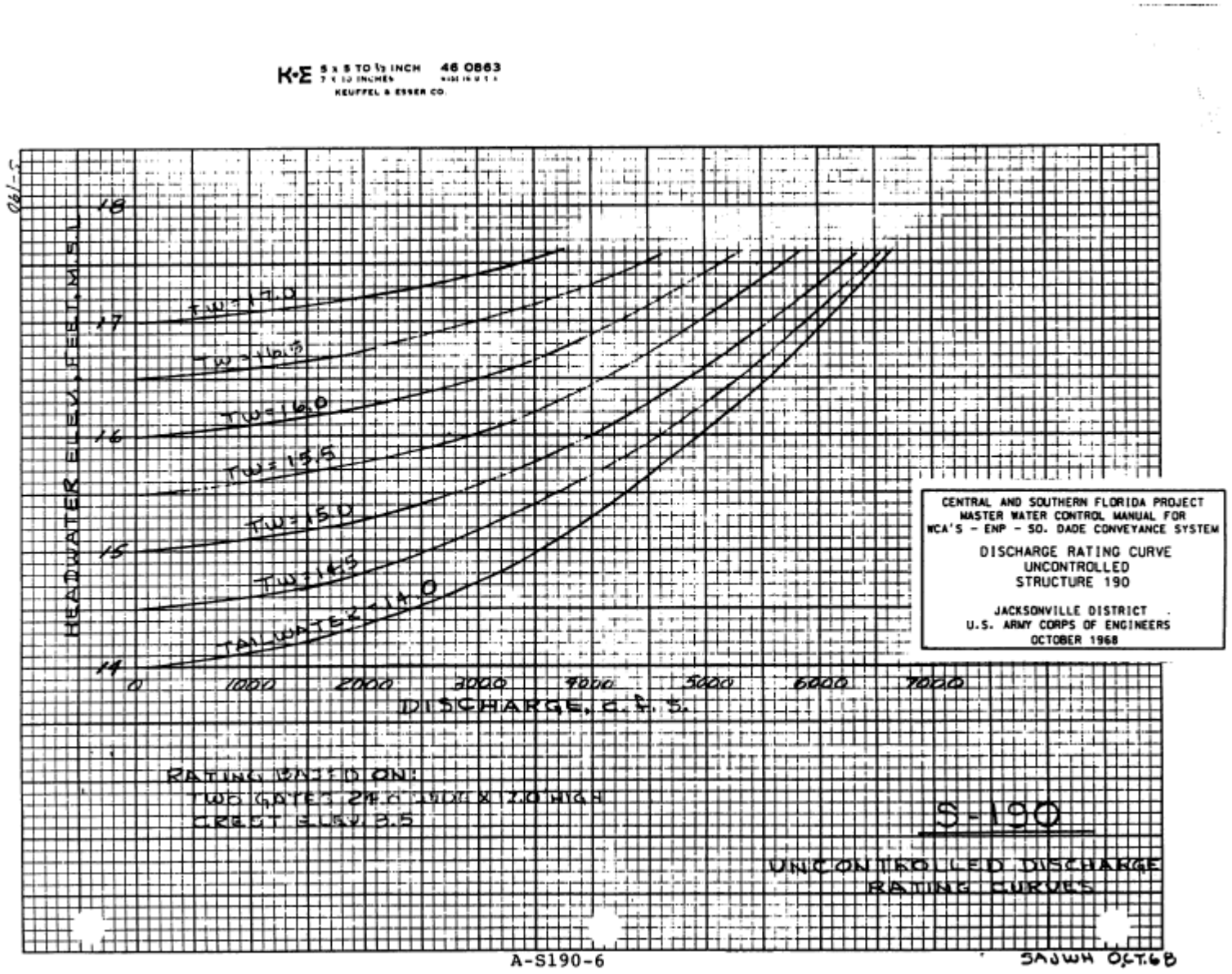


Table 1 Item 14

From: "Garrett, Natalie S SAJ" <Natalie.S.Garrett@usace.army.mil>
Date: November 2, 2011 12:47:35 PM EDT
To: Stacy Myers <stacymyers@semtribe.com>, "Collins, Jeffrey S SAJ" <Jeffrey.S.Collins@usace.army.mil>, "Ramirez, Armando" <aramire@sfwmd.gov>
Cc: "Kilpatrick, John K SAJ" <John.K.Kilpatrick@usace.army.mil>
Subject: S-190 request (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

All,

Please see attached description of the S-190. It says the structure was transferred to SFWMD on 12 July 1967. I just wanted to forward this because it was contrary to what I heard the other day.

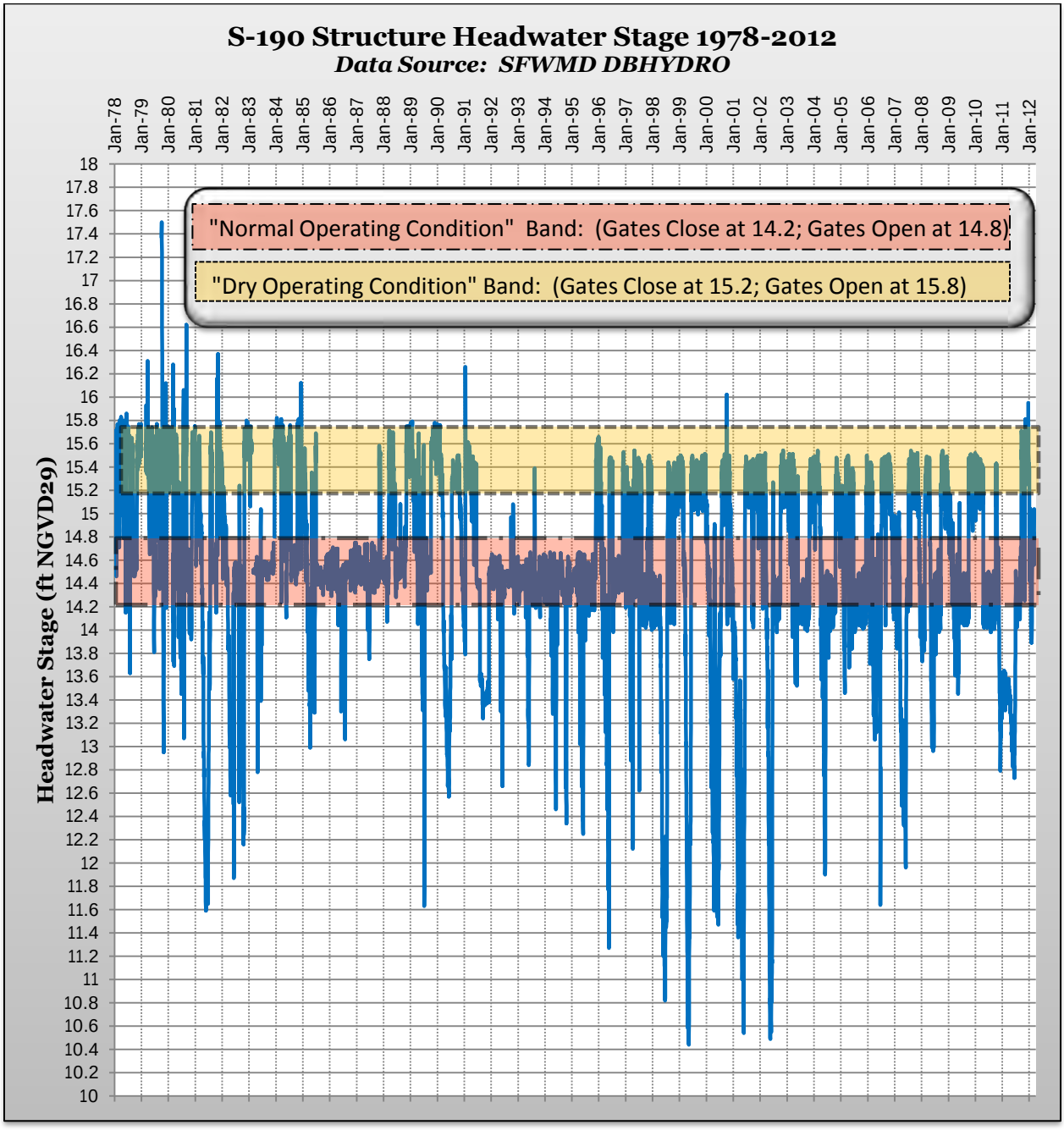
Operations is preparing a response to the request the Tribe sent to the Corps on 24 Oct requesting a temporary modification of the operation schedule.

Thank you,

Natalie S. Garrett
561-472-8878

S190 Evolution Report

Seminole Tribe of Florida
Environmental Resource Management Department
March 2012



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FIGURES

ATTACHMENTS

Attachment 1: US Department of Interior Bureau of Indian Affairs letter dated 9/18/1963 to US Army Engineer

Attachment 2: US Army Engineer District, Jacksonville Corps of Engineers letter dated 10/14/1963 to US Department of Interior Bureau of Indian Affairs

Attachment 3: Central and Southern Florida Project for Flood, Part I, Supplement 40; Addendum 1 dated 2/7/1964

Attachment 4: C&SF Addendum 1-1964 Figure 1: Structure S-190, Limiting Gate Opening Curve

Attachment 5: S-190 Operating Schedule Revised 11/18/1997

Attachment 6: 10/19/2011 Email regarding Low/Normal and High Operating Conditions & Downstream Irrigation

Attachment 7: Pages from C&SF Master Water Control Manual WCA, ENP and ENP-SDCS Vol .provided 10/28/2011

ACRONYMS

BIA	United States Department of Interior Bureau of Indian Affairs
C&SF	Central and Southern Florida Project for Flood
CORPS	United States Army Corps of Engineers
ERMD	Seminole Tribe of Florida Environmental Resource Management Department
SFWMD	South Florida Water Management District
USGS	United States Geologic Survey

LEVEE 28 INTERCEPTOR AND FEEDER CANALS-CENTRAL AND SOUTHERN FLORIDA PROJECT HISTORY

"The …L28 Interceptor and Feeder Canal…project was partially authorized by the Flood Control Act approved 6/30/1948 (Public Law 858, 80th Congress, 2d Session). The remaining works of the Comprehensive Plan as presented in House Document No. 643, 80th Congress, 2d session, were authorized by the Flood Control Act approved 9/3/1954…That authorization specifically recognized that the plan of improvement would require refinement and that modification, within the scope and purpose of the authorization, could be made at the discretion of the Chief of Engineers. The 1954 authorization included Levee 28 and its related appurtenant structures. By 2d Indorsement (sic) dated 5/4/1959 from Office, Chief of Engineers to the Division Engineer, SAD (basic letter from Jacksonville District Engineer to SAD, dated 2/17/1959), authority was given to incorporate the works found to be necessary in the area west of Levee 28 in the plan of improvement under the existing authorization as a modification that could be made within the discretion of the Chief of Engineers". *(CSF Part I, Supplement 40, Introduction, August 23, 1963)*

"When completed, the area served by the Interceptor and Feeder Canals would include most of the western portion of the Big Cypress Seminole Indian Reservation, plus privately owned agricultural land lying north and west of the Indian Reservation. The canals would be capable of removing runoff from a design storm equal to 30 percent of the standard project flood. Recent geologic information indicates that the canal design presented in the general design memorandum would not be stable. Therefore the project was redesigned to provide flatter slopes to control erosion. Levees are provided on both sides of the feeder canals to prevent inflow except at designated inflow points. This redesign increased the number of inlet structures from six to fourteen. The Bureau of Indian Affairs proposes to excavate secondary drainage canals to divert overland drainage to thirteen of these structure locations…Inlet structures would be provided at the head of each of the two feeder canals to regulate flow from the two areas served by those canals and to prevent overdrainage. *(CSF Part I, Supplement 40, D.9, Structural Design, August 23, 1963)*

"Inlet structures with flashboard risers will be provided on the north and west feeder canals to permit inflow to the canal at locations where secondary canals are proposed by local interests. As stated above, levees will be required on both sides of the canals to prevent inflow except at inlet points. At locations where multi-barrel inlet structures are specified and no secondary canal is existing at the time the work is advertised, only one pipe will be provided at that location to eliminate the accumulation of water in the undeveloped area". *(CSF Part I, Supplement 40, D. 11, Inlet Structures, August 23, 1963)*

"A terminal structure would be provided at the north end of the north feeder canal and at the west end of the west feeder canal for regulating runoff from the tributary areas and to prevent overdrainage. The structures were sized to remove the one in ten year flood with one foot of head loss". *(CSF Part I, Supplement 40, D. 12, Terminal Structures, August 23, 1963)*

BUREAU OF INDIAN AFFAIRS AND U.S. ARMY ENGINEER DISTRICT, JACKSONVILLE CORPS OF ENGINEERS CORRESPONDENCE

(US Department of Interior Bureau of Indian Affairs letter dated 9/18/1963 to US Army Engineer ***Attachment 1****)*

—..we would like to see construction begin on the Interceptor L-28 at approximately Station 706+00…We feel this would assist somewhat in relieving existing flooding conditions of the Indian homes situated along State Road #833, which is the most critical".

—In our previous discussion with your office and with the Central and Southern Florida Flood Control District, we were concerned with the aspect of over-drainage since no control is provided and there is still concern in this situation at this time".

(US Army Engineer District, Jacksonville Corps of Engineers letter dated 10/14/1963 to US Department of Interior Bureau of Indian Affairs ***Attachment 2****)*

—..If construction is scheduled as you proposed, then it is recognized that the Indian Reservation would obtain some improvement of drainage due to the construction. However, it is believed that the overall flood hazard would be increased during storm runoff periods due to the confining levees along the east bank of the canal, and to the lack of discharge conveyance through the overland area south of the reservation".

—After a more detailed study, we consider that it is possible that damage to a minor degree might occur by overdrainage in the upstream portion of the interceptor canal. Therefore, in order to eliminate the possibility of damage, we are recommending the construction of a control structure below the junction of the feeder canals. This structure would permit the maintenance of more desirable stages in the upper reaches of the canal as long as available supply of ground water will permit. Details of the siting and design of the structure will be furnished to you as soon as practicable".

(Central and Southern Florida Project for Flood, Part I, Supplement 40; Addendum 1 dated 2/7/1964 ***Attachment 3****)*

SECTION 1 PURPOSE AND SCOPE--—This addendum presents the revised design for Levee 28 Interceptor and Feeder Canals. These revisions are a result of comments made on the main report by the Division Engineer and the Chief of Engineers, the Central and Southern Florida Flood Control District, and the Bureau of Indian Affairs Seminole Indian Agency…The following departures have been made from the plan presented in the main report:

(1) Control Structure 190 has been added on the Interceptor Canal ½ mile below the junction with the feeder canals;

(2) the berms have been widened and raised…"

SECTION 6: CONTROL STRUCTURE S190- a--General –The Seminole Indian Agency of the Bureau of Indian Affairs expressed concern with the possibility of the overdrainage of the Indian Reservation due to the lack of a water control structure. A restudy was made and it was determined that damage to a minor degree from overdrainage might occur if control was not provided. A structure (designated as S-190) is therefore proposed about ½ mile below the

junction of the Feeder Canals to permit the maintenance of more desirable stages in the upper reaches of the canal as long as the available groundwater supply will permit…"

SECTION 6: CONTROL STRUCTURE S190- b.---~~H~~Hydraulic Design.—(1) General.—The structure would be located in the Interceptor Canal downstream of the junction of the North and West Feeder Canals and would serve to prevent overdrainage in the feeder canals and provide a water control elevation above the structure of 15.5 feet"…

SECTION 6: CONTROL STRUCTURE S190- b.---~~H~~Hydraulic Design.—(3) Operation.—…the automatic controls would operate as follows:

(a) When the headwater rises to elevation 15.8 feet the gates would open at 6 inches a minute. However, the maximum gate opening would be controlled by the limiting gate opening curve.

(b) When the headwater falls or rises to elevation 15.5 feet the gates would become stationary.

(c) When the headwater falls to elevation 15.2 feet the gates would close at 6 inches a minute…

C&SF ADDENDUM 1-1964 FIGURE 1: STRUCTURE S-190, LIMITING GATE OPENING CURVE (**Attachment 4**) *Operating Criteria:*

1. When the headwater rises to Elev. 15.8, the gates would open at 6" a minute. However, the maximum gate opening varies with the head differential on the structure (HW-TW), and the gates should not open in excess of that shown on the curve below.

2. The gates would become stationary when the headwater falls or rises to elev. 15.5.

3. When the headwater falls to Elev. 15.2, the gates would close at 6" a minute.

CURRENT S-190 OPERATIONS

On 10/7/2011, the Seminole Tribe Environmental Resource Management Department (ERMD) requested the S-190 Operating Criteria from the South Florida Water Management District (SFWMD). The SFWMD provided a document drafted in 1997 **(Attachment 5).** Page 2 of Attachment 5 indicates the S-190 Structure was transferred from the CORPS to the SFWMD on July 12, 1967. The 11/18/97 operating criteria for S-190 in Attachment 5 is not consistent with S-190 operating criteria set forth in the 1964 Central and Southern Florida (C&SF) Project S-190 Control Structure Criteria. The S-190 operating criteria provided by the SFWMD in 2011 summarized from Attachment 5 below is*:…"this structure will be operated on either a low or a high setting, through automatic controls as follows:*

- *During the normal condition the low setting is used*
  - *When the headwater elevation rises to 14.8, the gates will open at six inches per minute but the maximum gate opening will be limited to the amounts shown on the "Limiting Gate Opening" curve.*
  - *When the headwater elevation rises or falls to 14.5, the gates will become stationary.*
  - *When the headwater falls to 14.2, the gates will close at six inches per minute.*
- *During the dry condition, the high setting is used.*
  - *When the headwater elevation rises to 15.8, the gates will open at six inches per minute.*

    - *When the headwater elevation rises or falls to 15.5, the gates will become stationary.*
    - *When the headwater falls to 15.2, the gates will close at six inches per minute.*
- *During low water periods, releases will be made to meet downstream irrigation requirements even though necessary releases will violate the optimum headwater criteria."*

The 1997 Operating Criteria provided by the SFWMD in 2011 differs from the 1964 C&SF Operating Criteria in two different ways: the inclusion of releases to meet ―downstream irrigation requirements", and the addition of Operating Conditions (Low/Normal and Dry), with lower S-190 Headwater stages for Low/Normal Conditions. Noting the difference between the 1964 operating criteria and the 2011 SFWMD submission, on 10/10/11, ERMD requested the information on the downstream irrigation requirements and definition of ―the Low/Normal Condition" and the ―Dry Condition" from the SFWMD.

Attachment 6 provides the SFWMD response to ERMD requests with no response regarding downstream irrigation requirements, and response to the definitions as follows: *"…operations by water managers are based on the USACE schedule" as shown in their Water Control Manuals. They use the following settings at S190 that regulate head water elevations at the structure:*

Low	*14.2 to 14.8 ft*
Normal	*(same as low)*
High	*15.2 to 15.8 ft*

They do not have defined numerical triggers for Low/Normal and High. In general, when the threat of flooding is probable, they will switch to the low/normal setting. When the forecast is for limited rainfall and there is a demand for water in the basin, they switch to the high setting".

Regarding ―downstream irrigation requirements", Attachment 6 indicates *"…I am not sure I entirely understand your question, so perhaps you can provide me more specifics on your question".*

After reviewing the information provided by the SFWMD, on 10/21/11 ERMD requested the SFWMD to provide the USACE (CORPS) Schedule (referenced in Attachment 5). The SFWMD provided assorted pdf pages referenced as ―Pages from C&SF Master Water Control Manual WCA, ENP and ENP-SDCS Vol ." provided as **Attachment 7** and described below.

PAGE 1

Attachment 7 Page A-S190-1 identifies the purpose of S190 is: *"…to maintain optimum upstream water control stages in the North and West Feeder Canals and prevents overdrainage of these canals".* Page A-S190-1 also identifies the operation of a low and high setting through automatic control during ―normal condition" and ―dry condition". In addition, the reference is made that *"during low water periods, releases will be made to meet downstream irrigation requirements even though necessary releases will violate the optimum headwater criteria".* Finally, it is noted under Constraints that *"to meet structural and stability requirements, the maximum allowable hydrostatic head on the structure should not be allowed to exceed 7.5 feet NGVD, with a headwater elevation of 15.5 ft NGVD, and a tailwater elevation of 8.0 ft NGVD".*

PAGE 2
Attachment 7 Page A-S190-2 is exactly the same information as set forth on 1964 C&SF Addendum Table 10 except the maximum estimated headwater elevation of 18.0 is missing; and additional information is provided related to gate top, bottom and clearance elevations and elevations of the service bridge and operating platform.
PAGE 3
Attachment 7 Page A-S190-3 is a Discharge Rating Curve with the operating criteria identified on exactly the same graph as set forth on the 1964 C&SF Addendum Figure 1. The Operating Criteria identified on Page A-S190-3 is as follows:

Operating Criteria:

1. *When the headwater rises to Elev. 15.8, the gates will open at 6" a minute. However, the maximum gate opening varies with the head differential (HW-TW), and the gates should not open in excess of that shown on the curve below.*
2. *The gates will become stationary when the headwater falls or rises to Elev. 15.5.*
3. *When the headwater falls to Elev. 15.2, the gates would close at 6" a minute.*

PAGE 4
Attachment 7 Page A-S190-4 is the Controlled Flow Nomograph provided for Structure 190 by the Jacksonville District U.S. Army Corps of Engineers dated October 1968.

PAGE 5
Attachment 7 Page A-S190-5 is the Discharge Rating Curve for Submerged Controlled Flow provided for Structure 190 by the Jacksonville District U.S. Army Corps of Engineers dated October 1968.

PAGE 6
Attachment 7 Page A-S190-6 is the Uncontrolled Discharge Rating Curves provided for Structure 190 by the Jacksonville District U.S. Army Corps of Engineers dated October 1968.

ERMD REVIEW OF S-190 HEADWATER LEVELS 1978-2012

Figure 1 provides the average daily S-190 Headwater level from 1978-2012. This data was obtained by ERMD via the SFWMD public database, DBHYDRO. Limiting conditions with the dataset obtained included no S-190 stage data prior to 1978; therefore any potential effect from headwater stage levels from inception to 1978 is not represented. In addition, DBHYDRO does not include a single key with data for S-190 Headwater stage for the complete time period of 1978-2011. The Headwater level data for this review was compiled by assembling DBHYDRO keys for the time period and merging data from 4 keys utilizing the most current "Revision Date" field for merge guidance. Differences between DHYDRO key stage values were generally 2% or less, and it was therefore determined the merged dataset could be used for reference purposes. ERMD could repeat the review if the SFWMD were to provide a complete dataset. The S-190 Headwater data was plotted against the USGS L-28 IN meter stage to verify the relationship between S-190 Headwater levels and L-28-IN stage. USGS meter data became available in 10/1996, therefore the time period was adjusted accordingly. The plot is provided in **Figure 2** for reference, with the expected relationship evident.

As noted above, S-190 stage data is not available on DBHYDRO before January 1, 1978. Figure 1 demonstrates headwater levels at S-190 are routinely below 14.2 ft NGVD, with what appears to be a significant increase in frequency since 1982. Figure 1 may also demonstrate that opening the gates of S-190 at headwater levels of 15.8 appears to have changed to 15.5 in 1996. Further analysis of the S-190 Headwater level data included examining the distribution of data over the time period 1978-2011. Four data ranges were set to include the [14.2-14.8 level], [15.2-15.8 level], >15.8, <14.2, and [between 14.8-15.2]. The number of days S-190 Headwater levels were within each range was tabulated each year and calculated as a percentage of the total annual readings (which fluctuated due to Maintenance Coding, leap year, etc). The study period average (1978-2011) was calculated and plotted by year by range.

Figure 3 provides the four separate plots by range. Linear trend lines are provided for ranges [less than 14.2 ft], and [15.2-15.8 ft]. Figure 3 indicates, based on the data available, the number of days S-190 Headwater stages are between 15.2-15.8 averages approximately 26% of a total year, with a decreasing trend. Conversely, the number of days S-190 Headwater levels are less than 14.2 ft averages approximately 22%, with an increasing trend over time.

To further examine low S-190 Headwater levels, the ranges [less than 14.2 ft], and [14.2-14.8 level] were plotted as stacked columns to identify the ~~"t~~otal" percentage of time S-190 Headwater levels were maintained at levels of 14.8 or less. **Figure 4** graphically displays the results of the low S-190 Headwater distribution examination. Figure 4 indicates ~~"L~~ow/Normal" S-190 Headwater levels accounted for less than 20% of all levels in 1978 and 1979. In 1980, the ~~"L~~ow/Normal" S-190 Headwater levels increased to 40% and only decreased to 30% in two years of following 31 years (in 1984 and 1999). S-190 Headwater levels were 14.8 or less on average 60% of the 1978-2011 period; with a minimum of 17% in 1978 and a maximum of 100% in 1986 and 1994. S-190 Headwater levels were below 14.8 for 66% of the total days in 2009 and 2010, and were below 14.8 for 79% of the days in 2011. Total annual rainfall was included for the period available for S-190 on DBHYDRO (1997-to date) to determine if less/more rainfall had any relationship to low S-190 Headwater levels. It was concluded low S-190 Headwater level and rainfall could not be assessed to determine relationship due to variability in Headwater level distribution and rainfall totals, and an incomplete rainfall dataset.

Finally, the entire period of record was distributed into the four data ranges ([14.2-14.8 level], [15.2-15.8 level], >15.8, <14.2, and [between 14.8-15.2]). The total number of days S-190 Headwater levels were within each range was tabulated between 1978-2011 and calculated as a percentage of the total period of record readings. This information is provided in **Figure 5** and summarizes the total amount of time from 1978-2011 that S-190 Headwater Levels were within the assigned ranges as tabulated below:

S-190 Headwater Level Greater than 15.8 ft: ……...0.43%
S-190 Headwater Level Between 15.2-15.8 ft……26.48%
S-190 Headwater Level Between 14.8 -15.2 ft……10.63%
S-190 Headwater Level Between 14.2-14.8 ft……40.04%
S-190 Headwater Level Less than 14.2 ft……22.42%

ERMD SUMMARY OF ATTACHMENTS AND REQUESTS FOR ADDITIONAL INFORMATION

- Attachment 2 indicates that in 1963 it was known that the construction of Levee 28 Interceptor and Feeder Canals would increase the flood hazard in the Seminole Tribe Big Cypress Reservation during storm runoff periods due to the confining levees along the east bank of the North Feeder and Interceptor Canals, and to the lack of discharge conveyance through the overland area south of the reservation due to the confining levee of the West Feeder Canal.
- Attachment 2 indicates that in 1963 it was known that because the natural surface water flows would be blocked by the 28 Interceptor and Feeder Canal levees, that inlet structures into the canals would be needed to relieve the flooding.
- Attachment 2 indicates that in 1963 it was known that releasing the "blocked" surface waters into the canals via inlets could cause over-draining of the Big Cypress Reservation.
- Attachment 3 indicates that in 1964 Structure S-190 was added to the Levee 28 Interceptor C&SF Project in response to the U.S. Department of Interior Bureau of Indian Affairs concern that the North and West Feeder Canals, and the Interceptor Canal would over-drain the Seminole Tribe Big Cypress Reservation.
- Attachment 3 indicates that in 1964 the purpose of S-190 was to permit "more desirable stages in the upper reaches of the canal", and to "provide a water control elevation above the structure of 15.5 feet.
- Attachment 3 references the S-190 Headwater level operating criteria at 15.8 for gate opening; 15.5 for the gate to remain stationary, and 15.2 for the gate to close.
- Attachment 4 is the S-190 design gate opening curve, and S-190 design operating criteria (stated as 15.8 for gate opening; 15.5 for the gate to remain stationary, and 15.2 for the gate to close)
- Attachments 1, 2, 3, and 4 are complete documents with historical continuity.
- Attachment 5 indicates changes were made to the S-190 Operating Schedule between 1964 and 1997 which includes:
    - Addition of "Low/Normal" and "Dry" Operating Conditions (which are undefined)
    - a decrease in Headwater stage from 15.2-15.8 to for "Low/Normal" at 14.2-14.8
    - the statement that "during low water periods, releases will be made to meet downstream irrigation requirements even though necessary releases will violate the optimum headwater criteria" (optimum headwater criteria undefined).
- Attachment 6 indicates "Low/Normal" conditions are when the threat of flooding is probable; and "Dry" Conditions are when the forecast is for limited rainfall and there is a demand for water in the basin.
    - Attachment 6 indicates there are no written definitions for the "triggers" to declare conditions (i.e. what set of information is utilized to determine the threat of flooding is probable; or what constitutes demand in the basin). Attachment 6 also indicates there are no Standard Procedures for changing S-190 Headwaters due to shifts in "Low/Normal" to "Dry" Conditions.
    - ERMD believes it unlikely the CORPS would utilize terms ("Low/Normal" and "Dry" Conditions/Setting) with such importance without providing a definition.

    - **ERMD would appreciate the provision of any historic record of memorandum for our files, representing that the U.S. Department of Interior, Bureau of Indian Affairs on behalf of the Seminole Tribe of Florida Big Cypress Reservation, was noticed, and in agreement of the S190 Operating Criteria change from the 1964 C&SF Operating Criteria to the "Dry" and "Low/Normal" Condition Operating Schedule with corresponding 14.2-14.8 Headwater Stage**.
- Attachment 6 identifies that during low water periods releases may be made from S-190 to meet downstream irrigation requirements
    - Attachment 6 indicates confusion with the term ~~"d~~downstream irrigation requirements" which require releases from S-190 violating optimum headwater criteria
    - To date, ~~"d~~downstream irrigation requirements" have yet to be identified
- Attachment 7 Page A-S190-3 (Discharge Rating Curve, Limiting Gate Opening, Operating Criteria) indicates the Operating Criteria set forth on 1968 CS&F A is 15.8 to open, 15.5 to stay stationary, and 15.2 to close. There is neither reference to ~~"D~~ry" and ~~"N~~ormal" Conditions", nor numbers written as 14.2 and 14.8.
- If the optimum criteria is 15.5 as indicated in Attachment 3, Figure 5 demonstrates the optimum criteria was violated over 72% of the time between 1978-2011. If the optimum criteria is 14.2, Figure 5 demonstrates it was violated over 22% of the time between 1978-2011.
- Figure 5 indicates the S-190 Headwater level met the Operating Criteria range of 15.2-15.8 for 26% of the time between 1978-2011.

S-190 Evolution Report Relationship to S-190 Demonstration Project

On 10/24/2011, the Seminole Tribe of Florida requested the support from the U.S. Army Corps of Engineers (CORPS) for a Demonstration Project to maintain the levels of S-190 at 15.2-15.8. The CORPS replied on 1/23/2012 supporting the project; but suggested the submission of additional information to expedite the process. The additional information suggested included evidence of no harmful environmental impacts, and no adverse impact on the level of flood protection currently provided by the structure. The purpose of the S-190 Evolution Report was to identify the possible harmful environmental impacts to Big Cypress Reservation of keeping the S-190 Headwater levels significantly lower than originally designed under the context of ~~"t~~he threat of probable flooding" and to document the role and purpose of the S-190 structure; which was to prevent over-drainage; not to provide flood protection.

On June 16, 2011, the USGS gage height of 7.57 was the record low in the 15 year USGS history at the L28 Interceptor Canal.

Figure 1: S-190 Headwater Stage Levels 1978-2012

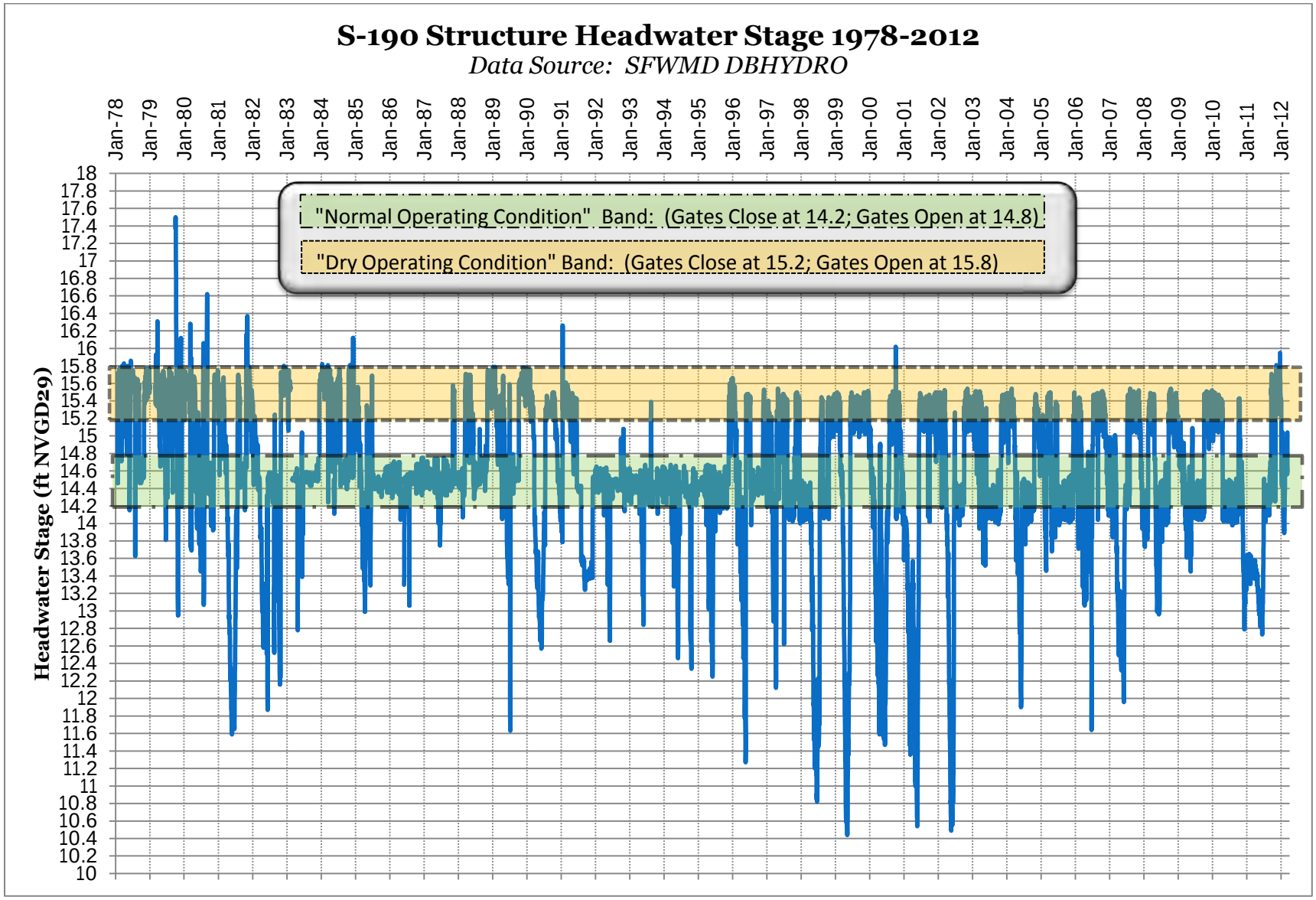


Figure 2: USGS L28-IN and S-190 Stage Comparison

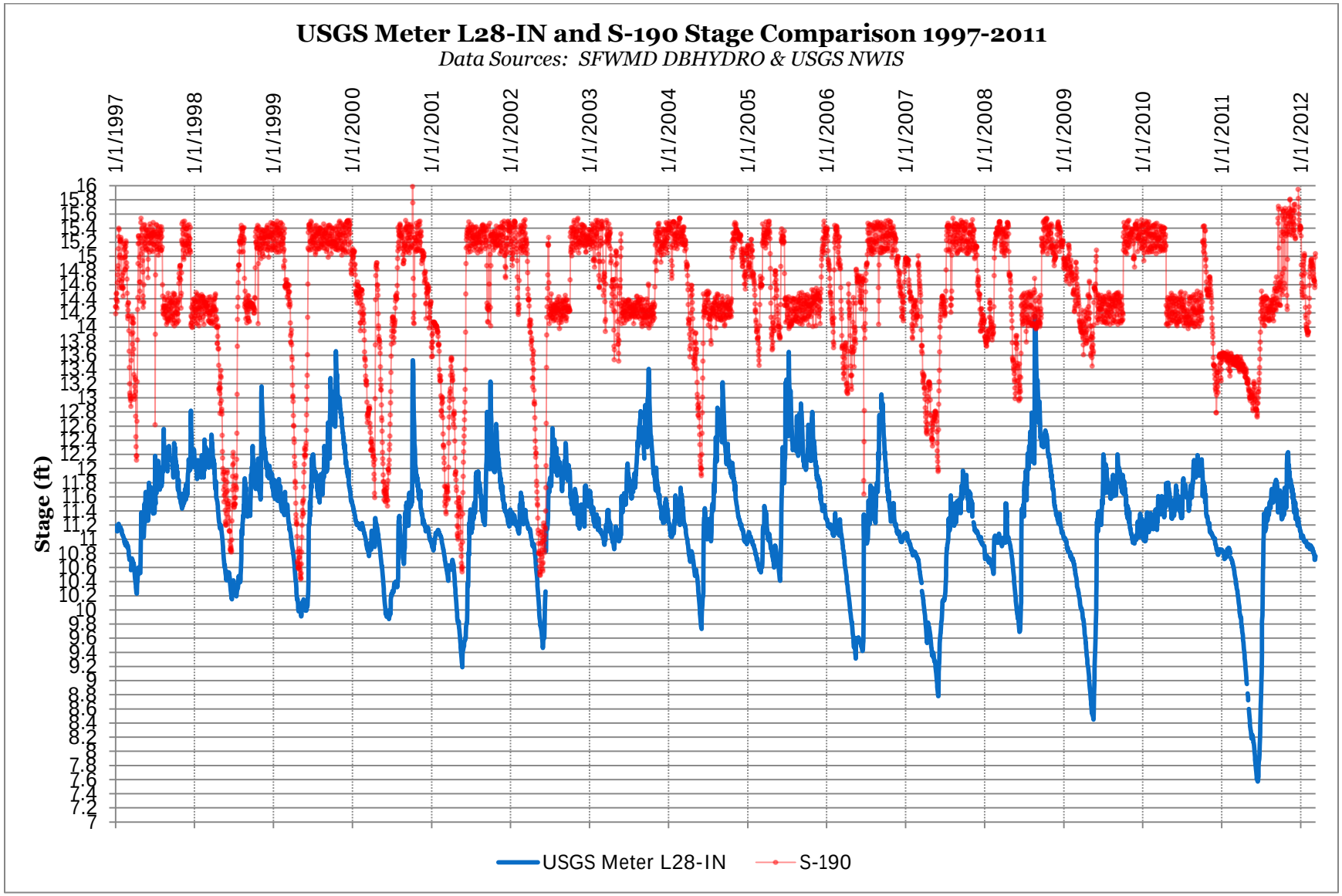
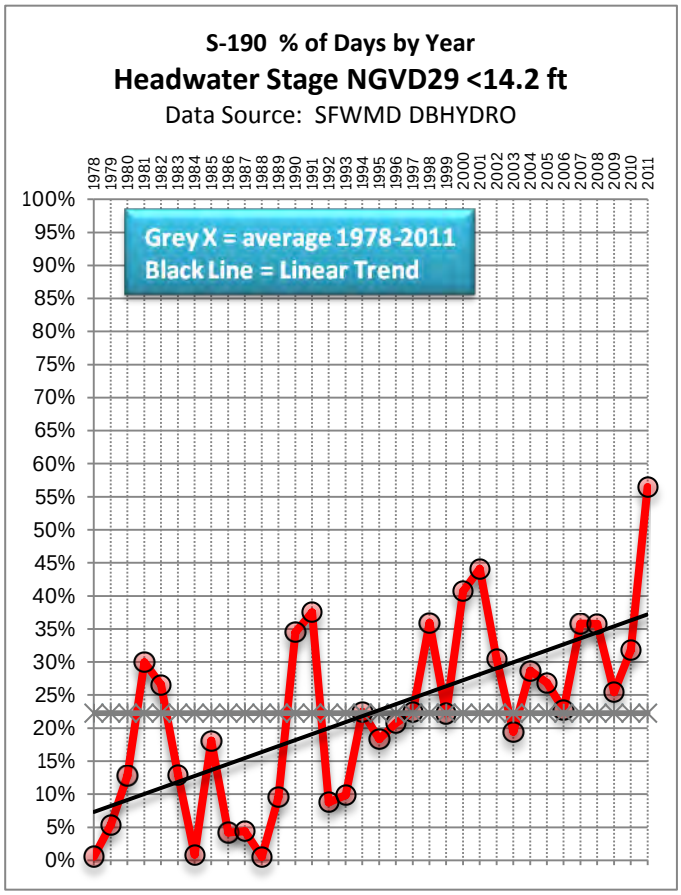
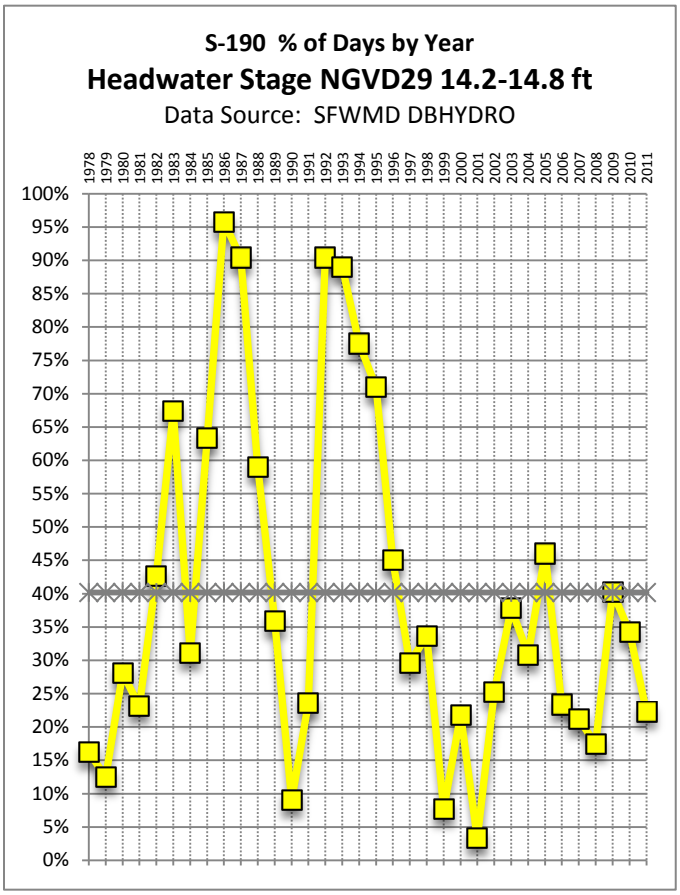
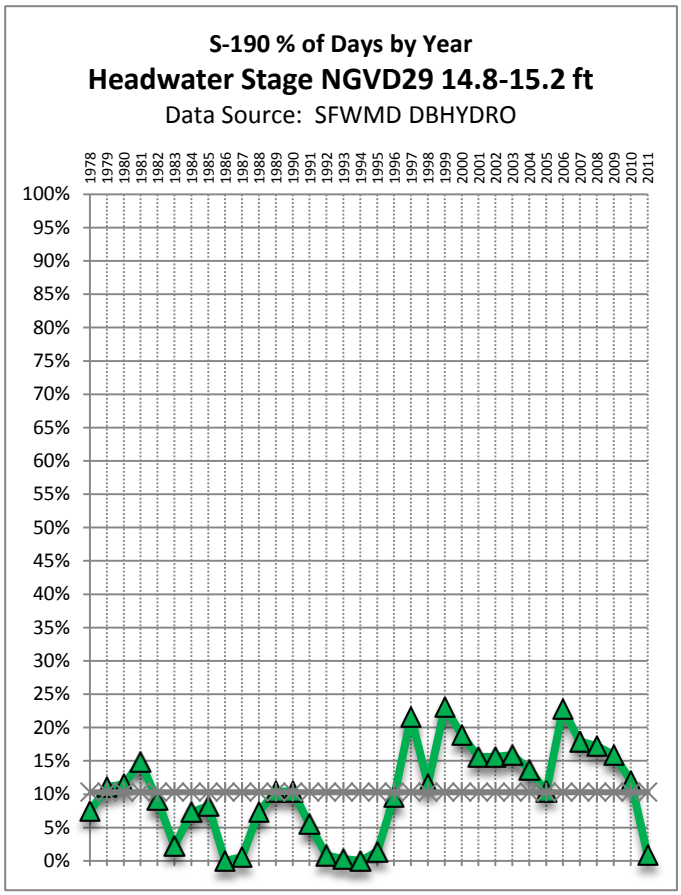


Figure 3: S-190 Headwater Stage Distribution by Range







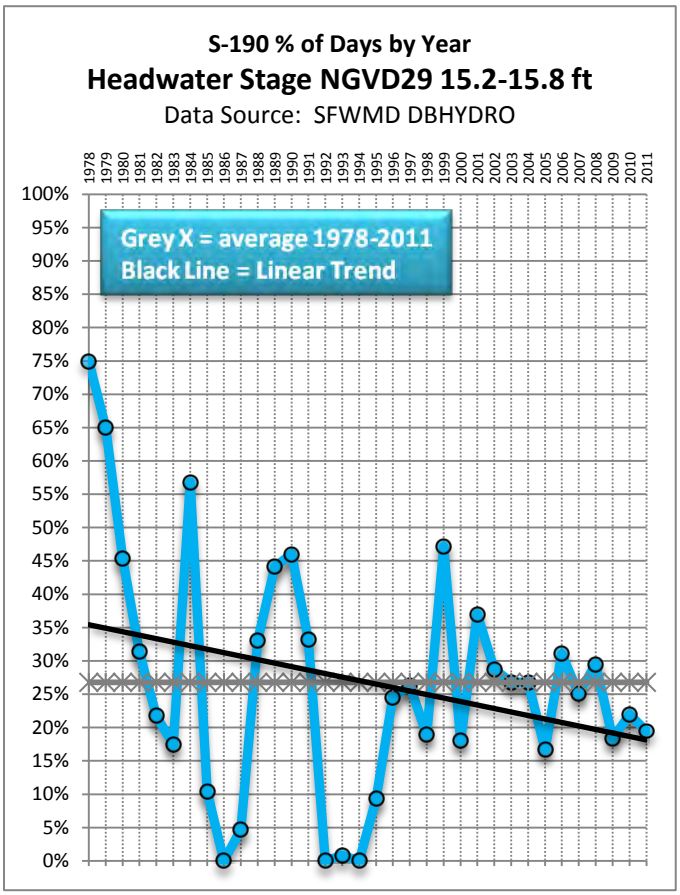


Figure 4: S-190 Headwater "Low Range" Distribution

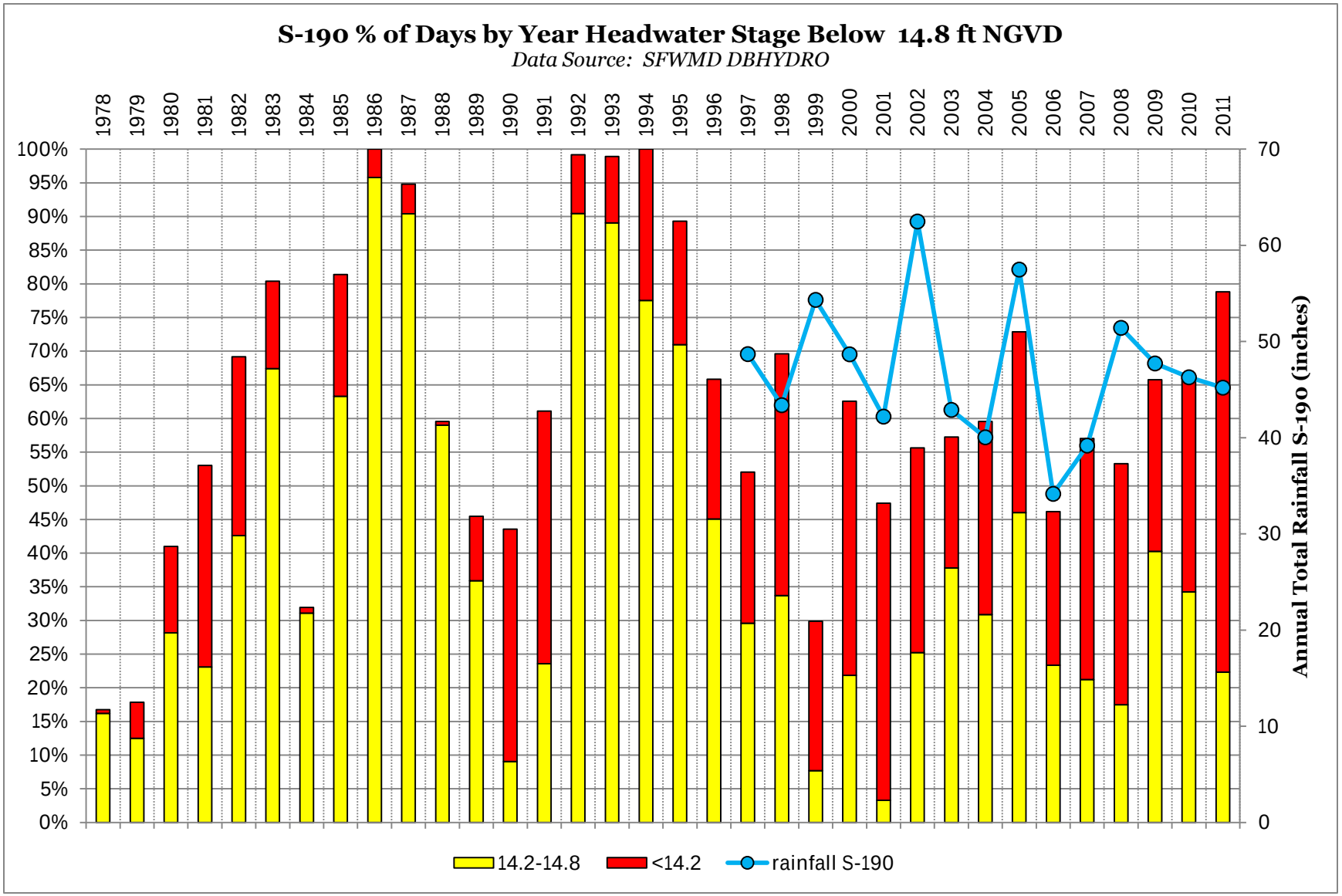
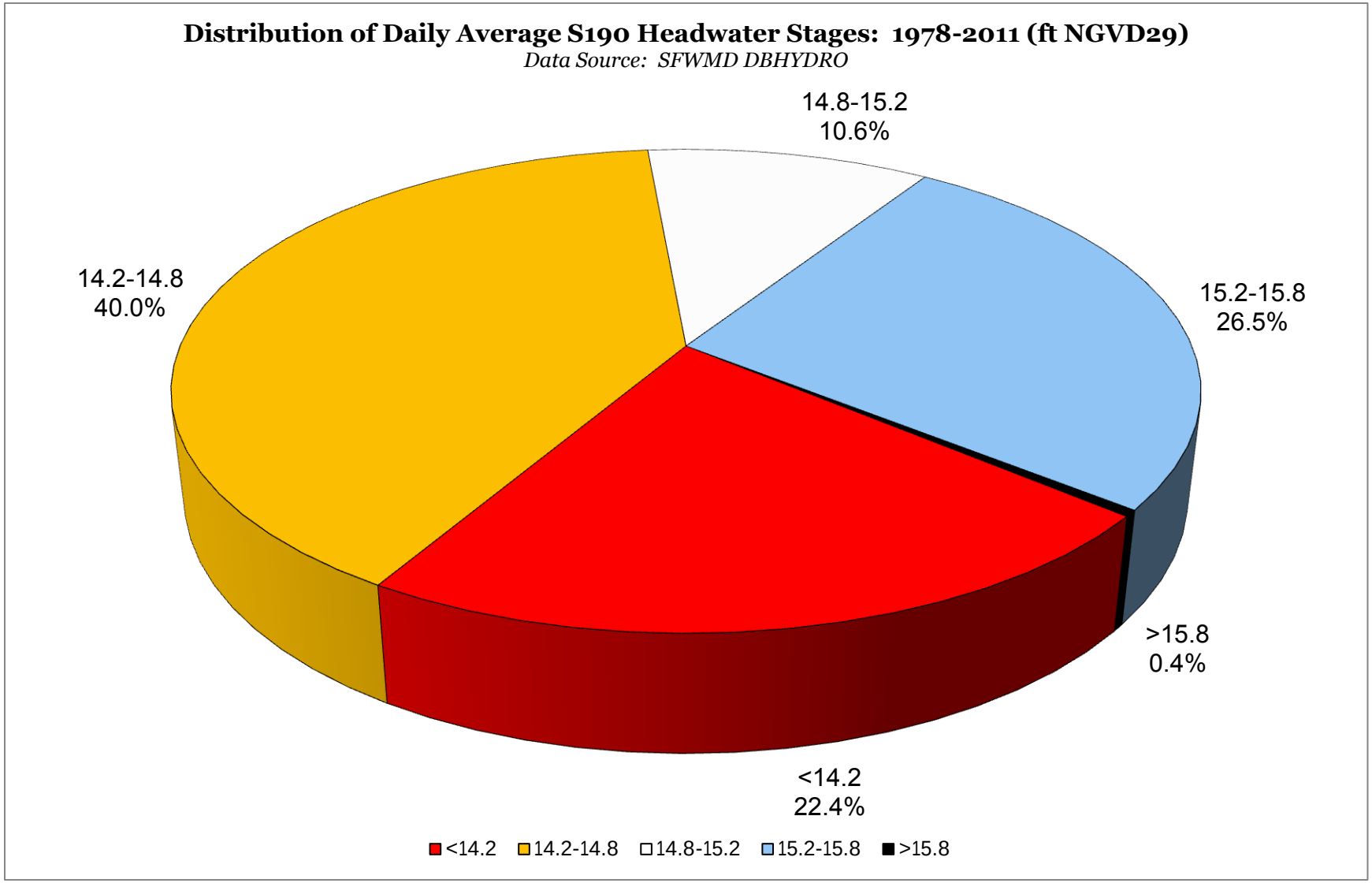


Figure 5: Period of Record Distribution S-190 Headwater Ranges



Attachment 1: US Department of Interior Bureau of Indian Affairs letter dated 9/18/1963 to US Army Engineer

IN REPLY REFER TO:
Land Operations

UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF INDIAN AFFAIRS
Seminole Indian Agency
6075 Stirling Road
Hollywood, Florida

September 18, 1963

District Engineer
U. S. Army Engineer District
P. O. Box 4970
Jacksonville 1, Florida

Attention: Mr. George F. Snodgrass, Acting Chief
Engineering Division

Re: SAJBP

Dear Sir:

We appreciate receiving your letter of August 28, 1963 with "Part I, Supplement 40, Detail Design Memorandum--Levee 28 Interceptor and Feeder Canal" for our views and comments.

In view of the fact that the schedule for advertisement is March 27, 1964 and construction time is 33 months, we would like to see construction begin on Interceptor L-28 at approximately Station 706+00 and proceed north to Station 821+91, then proceed northward on the North Feeder Canal starting at Station 0+00 to 105+00. We feel this would assist somewhat in relieving existing flooding conditions of the Indian homes situated along State Road #833, which is most critical.

After reviewing the size of culverts, Table #2, we feel that on the North Feeder Canal at Station 75+00(W) the size should be increased to a 60". Also on the West Feeder Canal at Station 10+00(N) the size should be increased to a 60" culvert.

In our previous discussion with your office and with the Central and Southern Florida Flood Control District, we were concerned with the aspect of over-drainage since no control is provided, and there is still concern in this situation at this time.

As mentioned previously the contract is planned to be advertised on March 27, 1964, therefore we would appreciate any efforts that may be made to advertise at an earlier date.

Other items pertaining to Interceptor and Feeders to be provided by Non-Federal cost will be discussed with Central and Southern Florida Flood Control District.

We appreciate receiving your information on proposed construction affecting the Seminole Lands.

Sincerely yours,

Superintendent

Attachment 2: US Army Engineer District, Jacksonville Corps of Engineers letter dated 10/14/1963 to US Department of Interior Bureau of Indian Affairs

U. S. ARMY ENGINEER DISTRICT, JACKSONVILLE
CORPS OF ENGINEERS
575 RIVERSIDE AVENUE
JACKSONVILLE 2, FLORIDA

ADDRESS REPLY TO:
DISTRICT ENGINEER
U.S. ARMY ENGINEER DISTRICT, JACKSONVILLE
P.O. BOX 4970
JACKSONVILLE 1, FLORIDA

14 October 1963

REFER TO FILE NO. SAJBP

United States Department of the Interior
Bureau of Indian Affairs
6075 Stirling Road
Hollywood, Florida

Gentlemen:

We have considered the suggestions offered in your letter of 18 September 1963, in which you commented upon our detail design memorandum on Levee 28 Interceptor and Feeder Canals.

If construction is scheduled as you propose, then it is recognized that the Indian Reservation would obtain some improvement of drainage due to the construction. However, it is believed that the overall flood hazard would be increased during storm runoff periods due to the confining levees along the east bank of the canal, and to the lack of discharge conveyance through the overland area south of the reservation. Also, if the contractor was required to perform this operation as you suggest, an increase in construction costs would probably result due to additional mobilization cost.

With regard to size of culverts for the north feeder canal at station 75+00(w) and on the west feeder canal at station 10-00 (n). The size of inlet structures at these and other locations in this area have been based upon removal of the 10-year gravity runoff from the contributing areas. The design rate is in accordance with the standard criteria used with agricultural areas throughout the project. The drainage area to define the size was based upon the drainage proposal submitted with your letter dated 14 May 1963. The size of those outlets is dependent upon the estimated contributing area.

After a more detailed study we consider that it is possible that damage to a minor degree might occur by overdrainage in the upstream portion of the interceptor canal. Therefore, in order to eliminate the possibility of damage, we are recommending the construction of a control

structure below the junction of the feeder canals. This structure would permit the maintenance of more desirable stages in the upper reaches of the canal as long as available supply of ground water will permit, Details of the siting and design of the structure will be furnished you as soon as practicable.

At present we see no possibility of advancing the presently scheduled advertising date of 27 March 1964 because, as you know, funds for construction are dependent upon appropriations by the Congress.

Sincerely yours,

JOE J. KOPERSKI
Chief, Engineering Division

Attachment 3: Central and Southern Florida Project for Flood, Part I, Supplement 40; Addendum 1 dated 2/7/1964

CENTRAL AND SOUTHERN FLORIDA PROJECT
FOR FLOOD CONTROL AND OTHER PURPOSES
PART I -- SUPPLEMENT 40

SAJBP 7 February 1964

ADDENDUM 1

Design Revisions - Levee 28
Interceptor and Feeder Canals

PERTINENT DATA - ADDENDUM 1

LEVEE 28 INTERCEPTOR AND FEEDER CANALS

NOTE: For pertinent data on canal designs see page i of main report

CONTROL STRUCTURE 190

Type-gated spillway with Ogee weir	
Design discharge (c.f.s.)	2,960
Control gates:	
Number	2
Size-width by height (ft.)	24.0x 12.0
Crest elevation (ft., m.s.l.)	3.5
Design headwater elevation (ft., m.s.l.)	16.6
Apron elevation (ft., m.s.l.)	-0.1

COST ESTIMATES (REV.)
(Total initial Federal and non-Federal costs)

INTERCEPTOR CANAL

Excavations unclassified	$1,833,000
Grassing	22,000
Control Structure 190	313,000
Lands:*	
Rights-of-way	69,200
Spoil areas	2,800
Relocations:	
Private relocations	200
Public relocations	60,000
Total initial costs (rounded)	$2,300,000

NORTH FEEDER CANAL

Excavations, unclassified	$650,000
Inlet structures	28,000
Terminal structure	58,000
Grassing	8,000
Lands *	
Rights-of-way	14,600
Spoil area	700
Relocations:	
Private relocations	8,400
Public relocations	57,000
Total initial costs (rounded)	$ 825,000

* Includes acquistion costs

PERTINENT DATA--Continued

COST ESTIMATES (REV.)

(Total initial Federal and non-Federal costs)

WEST FEEDER CANAL

Excavation, unclassified	$885,000
Inlet structures	64,000
Terminal structure	90,200
Grassing	9,000
Lands:*	
Rights-of-way	30,400
Spoil area	1,600
Relocations:	
Private relocations	500
Public relocations	50,000
Total initial costs (rounded)	$1,131,000

*Includes acquistion costs

CENTRAL AND SOUTHERN FLORIDA PROJECT
FOR FLOOD CONTROL AND OTHER PURPOSES

ADDENDUM 1 TO PART I -- SUPPLEMENT 40

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(Tables follow text)

NOTE: Only tables revised from main report and added tables contained in this addendum.

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LIST OF TABLES--Continued
(Tables follow text)

LIST OF FIGURES
(Figures follow tables)

LIST OF PLATES
(Plates follow figures)

NOTE: Only plates revised from main report and added plates contained in this addendum.

U. S. ARMY ENGINEER DISTRICT, JACKSONVILLE
CORPS OF ENGINEERS
575 RIVERSIDE AVENUE
JACKSONVILLE, FL 32202

SAJBP 7 February 1964

CENTRAL AND SOUTHERN FLORIDA PROJECT FOR FLOOD CONTROL AND OTHER PURPOSES

PART I

AGRICULTURAL AND CONSERVATION AREAS

ADDENDUM 1 TO SUPPLEMENT 40

DESIGN REVISIONS - LEVEE 28

INTERCEPTOR AND FEEDER CANALS

A. INTRODUCTION

1. Purpose and scope.--This addendum presents the revised design for Levee 28 Interceptor and Feeder Canals. These revisions are a result of comments made on the main report by the Division Engineer and the Chief of Engineers, the Central and Southern Florida Flood Control District, and the Bureau of Indian Affairs Seminole Indian Agency. Local interests comments are contained in Appendix A to the main report. The following departures have been made from the plan presented in the main report:

(1) Control Structure 190 has been added on the Interceptor Canal 1/2 mile below the junction with the feeder canals;

(2) The berms have been widened and raised;

(3) Dressing requirements of the spoil banks have been eliminated;

(4) Grassing requirements have been revised;

(5) Seepage rings are proposed for all culvert pipes;

(6) An inlet structure has been added on the North Feeder Canal;

(7) The riprap limits at the North Feeder Canal terminal structure have been revised;

(8) The sheet pile crest elevation of the west Feeder Canal terminal structure has been raised;

(9) The order of work and acceptance plan have been revised;

(10) Recraation fills have been added; and

(11) The construction schedule has been revised.

Details of these revisions are discussed below. Revised and additional tables and plates are included in this addendum.

B. STRUCTURAL DESIGN

2. Proposed canal improvement--There has been no change in the canal design or the required levees. Sixty-foot wide berms would be provided between the canal and spoil banks. This will allow for some reduction in width resulting from material washing down the ungrassed spoil bank will be providing adequate width for access and maintenance. The berms will be raised as shown on addendum plate 3 and sloped to drain away from the canal. Berm drainage culverts would be provided by the local sponsor as outside project scope work, details of which will be resolved prior to preparation of contract plans. Spoil would be placed on natural slopes but not steeper than 1 vertical on 1-1/2 horizontal. The turnouts and ramps called for in the main report would not be required since continual access will be available along the berms.

3. Inlet structures.--In addition to the inlet structures given in table 2 of the main report, an inlet structure will be provided at sta. 204+00 on the North Feeder Canal to serve a three square mile area north of the Indian Reservation boundary. Design data for this culvert have been added to addendum table 2.

4. Terminal structures.--The riprap limits proposed for the North Feeder Canal terminal structure were determined to be inadequate. The limits have been extended on the downstream side and riprap has been added to the upstream side all as shown on addendum plate 9. At the request of the Flood Control District, the crest elevation of the West Feeder Canal terminal structure has been raised from elevation 15.0 feet* to 17.0 feet as shown on plate 11.

5. Erosion control.--In addition to grassing at the inlet and terminal structures, the 30-foot strip of the raised berm adjacent to the canal would be fertilized and seeded. Mulch at the rate of 2-tons per acre will be applied to the embankment and ramps at the culvert sites and the contractor will be required to maintain these areas for 45 days unless a turf is established sooner. Grassing limits are shown on addendum plates 3, 8, and 9.

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* All elevations throughout this addendum refer to mean sea level datum.

6. Control structure 190.--a. General.--The Seminole Indian Agency of the Bureau of Indian Affairs expressed concern with the possibility of overdrainage of the Indian Reservation due to the lack of a water control structure. A restudy was made and it was determined that damage to a minor degree from overdrainage might occur if control was not provided. A structure (designated as S-190) is therefore proposed about 1/2-mile below the junction of the Feeder Canals to permit the maintenance of more desirable stages in the upper reaches of the canal as long as the available ground water supply will permit. In addition, the structure would facilitate division of the canal system into acceptance sections (see paragraphs 7 and 8 below).

b. Hydraulic design.--(1). General.--The structure would be located in the Interceptor Canal downstream of the junction of the North and West Feeder Canals and would serve to prevent overdrainage in the feeder canals and provide a water control elevation above the structure of 15.5 feet.

(2) Hydraulic design.--The structure was sized to pass the ten-year flood from the drainage area with 0.5 foot of head loss and a tailwater elevation of 16.1 feet. The size of the opening was based on D'Aubuissons formula for channel contraction with a coefficient K equal to 0.90. The crest would be ogee-shaped. The apron was designed to contain a hydraulic jump when stages in Conservation Area No. 3 are low. Hydraulic-design data are given in table 10.

(3) Operation.--Due to the remote location of the structure and the need for quick response during flood runoff, the structure would be operated by automatic controls. The controls would be equipped with a limiting gate opening mechanism which would prevent the gates from opening more than that required for passing design discharge when the tailwater is above elevation 12.7 feet and, to prevent scour in the downstream canal, would reduce the discharge below design discharge when the tailwater is below elevation 12.7 feet. The maximum allowable gate openings are shown on the limiting gate opening curve (figure 1). Figure 2 shows the discharge rating for partial gate openings. The automatic controls would operate as follows:

(a) When the headwater rises to elevation 15.0 feet the gates would open at 6 inches a minute. However, the maximum gate opening would be controlled by the limiting gate opening curve.

(b) When the headwater falls or rises to elevation 15.5 feet the gates would become stationary.

(c) When the headwater falls to elevation 15.2 feet the gates would close at 6 inches a minute.

c. Geology and soils.--(1) Subsurface investigation.--Inasmuch as the need for Structure 190 was not contemplated at the time the canal boring program was carried out, no borings were taken there. However, they will be obtained later - see paragraph 6.c.(4). Shallow borings were taken at about one-half mile intervals along the Levee 28 Interceptor Canal alinement.

(2) Foundations conditions.--Probable subsurface conditions at the structure site are based on the Levee 28 Interceptor Canal borings. The area is underlain by clean, rather dense and from the ground surface to about elevation minus 1.0 foot. Thin lenses or beds of limestone appear within this clean sand stratum. A very loose silty sand extends from about elevation minus 1.0 foot to about elevation minus 7.0 feet. A soft fat clay lies beneath the silty sand and extends to an undertermined depth. The structure would be founded on timber piles.

(3) Dewatering.--Sheet piles would be required to intercept seepage from the limestone. The sheet piles should penetrate several feet into the clay. The dewatering could be accomplished by pumping from a sump with a collector ditch.

(4) Contract plans.--Core borings will be taken at the structure site prior to final plans. Undisturbed samples of all compressible material will be obtained for laboratory testing.

d. Structural design.--(1) General.--Structure 190 would be a two-bay, gatea-1 ogee-weir type control structure provided with automatically controlled vertical-lift gates which would be operated by individual hydraulically powered gate hoists (cable lift) mounted on the operating platform. Typical details of the structure are shown on plate 14.

(2) Location and access.--Structure 190 would be located in Levee 28 Interceptor Canal (approximate Station 795+00) about one-half mile south of the junction of the West and North Feeder Canals. Access for construction and for operation and maintenance would be from the adjacent county road on the east side of the structure.

(3) Type of Structure.--Structure 190 would be a reinforced concrete, U-shaped, gated, two-bay spillway with a ogee-weir (crest elevation 3.5 feet). Each bay would be provided with a 24.0-foot wide by 12.0-foot high vertical-lift gate to be installed on the crest of the weir. The gates would be automatically controlled by motor-operated gate hoists mounted on a reinforced concrete operating platform at elevation 35.0 feet. The structure would also contain a reinforced-concrete service bridge at elevation 20.5 feet, steel-sheet-pile wingwalls and a concrete block control house. A steel-sheet-pile cutoff would be provided under the upstream and downstream edge of the structure. The steel-sheet-pile wingwalls would extend the cutoff wall beyond the structure abutments. Riprap would be provided upstream and downstream

of the structure to protect against eroding velocities. The structure would be founded on timber piles. Sump pumps would be used for dewatering during construction. Provisions would be made for dewatering each structure bay separately by use of timber needles and structural steel needle beams upstream and downstream of the vertical-lift gates. Such a closure would serve not only for maintenance, but also as an emergency temporary closure if a gate needed to be removed.

(4) Gates.--The gates would be wheeled vertical-lift gates of welded construction consisting of structural carbon steel members and skinplate and would be designed for the maximum head differential. Rubber side seals seating against corrosion-resisting steel side angles would be provided, with the bottom rubber seal of the gate resting on a corrosion-resisting steel plate.

(5) Control house.-A control house would be provided on the east side of the structure to contain the automatic controls, including the electrical works and stilling wells.

e. Design analysis.--(1) Stability analysis.--The critical loading conditions for the spillway are shown on plate 15. The bearing piles are battered to resist horizontal water loads. The resultant of loads is kept within the third point. The loading cases shown on the stability analysis plate are the critical cases for bearing pile loads, floatation, overturning, and sliding. A two-foot extension of the base slab under the backfill is required to provide weight to obtain structural stability under the dewatered condition.

(2) Structure analysis - Structure 190.--The spillway is a double U reinforced concrete rigid frame. In the design of the walls and base slab, the loading assumptions producing the largest moments, shears, etc., will be used.

(3) Soil properties.--The unit values of the soil to be used in the design of the structures are listed below:

Wt. of moist earth = 110#/C.F.
Wt. of submerged earth = 62.5#/C.F.
Active lateral pressure (moist earth) = 37#/SF/F
Active lateral pressure (submerged earth) = 21#/SF/F
At Rest lateral pressure (moist earth) = 53#/SF/F
At Rest lateral pressure (submerged earth) = 28#/SF/F
Passive lateral pressure (moist earth) = 330#/SF/F
Passive lateral pressure (submerged earth) = 188#/SF/F

(4) Service bridges.--The service bridge is located on the downstream side of the gates and is a simple span reinforced-concrete slab. The slabs are designed for dead load plus an H-20-44 truck loading as presented in the AASHO specifications.

(5) Gate hoist platform.--The gate hoist platform is made up of two L-beams spanning each gate bay. The beams are simply supported at the top of the vertical gate guides, one on each side of the gate recess for support of the gate operating machinery. The platform is designed for two conditions, one using the normal gate hoist load and the other using a 300-percent overload capacity of the hoisting machinery. The normal gate hoist load is in conjunction with dead load and a uniform live load of 50 pounds per square foot.

f. Mechanical design.--The gate operating machinery would be essentially as shown on plate 16. Each of the two gates would be raised and lowered simultaneously with a hydraulic cylinder operating a two-part sheave block over which the hoist cables run, one end of each cable being fastened to the gate and the other dead ending to the base of the hoist unit. A motor-driven hydraulic power unit common to both hoists and with all control valves mounted thereon would be located in the control house adjacent to the spillway.

The hoist capacity estimated at 30,000 pounds would utilize an 8-inch hydraulic cylinder with 3-1/2 inch rod and stroke of 1/2 gate travel or 90 inches. The operating pressure would be about 1500 p.s.i. and for simultaneous gate operation at 6 inches a minute would use a pump of 1.05 G.P.M. capacity driven by a 1200 R.P.M., 3 horsepower motor. The gates would be automatically controlled based on the difference in pool elevations as shown on plate 14 and as outlined in subparagraph b.(3) above. Upstreams, downstreaing and gate position recorders would be provided for proper gauging of the spillway discharge.

Two 18 and two 10 stilling wells for differential head control as well as headwater and tailwater elevation recording would be located in the control house as shown on plate 14. Gate opening position would also be recorded. A standby 15 k.w. engine generator set for use during commercial power failure would also be located in the control house.

g. Electrical Design.--(1) General.--This section presents the design critera and basic data used in the electrieal design of the control structure. The design of the power distribution system, lighting arrangement and miscellaneous details are outlined below.

(2) Source of power.--(a) The power supply would be 120/240 volt, single phase, three wire, 60 cycle from the local power company.

(b) Emergency power. An engine generator will be provided for operation of the spillway.

(3) Power requirements.--A summary of power requirements is given below for each structure. The demand is based on simultaneous operation of load that could be logically expected to occur during a normal operation.

Item	No. Reqd	H.P. KW	Load in KW Conn.	Demand
Hoist Motor	1	3	2.50	2.50
Lighting				
Spillway	2	.10	.20	.70
Control Hse	3	.15	.45	.15
Control	1	1.00	1.00	1.00
Heating	1	.05	.05	.05
Total			4.20	3.90

The generator will be a 15 KW, 3 wire, 120/240 volt, single phase, 60 cycle unit.

(4) Switch gear and control.--(a) A motor control center will be provided for distribution of power control and lighting circuits.

(b) All circuit breakers would be molded case type rated 600 volts, with an interrupting capacity of 20,000 amperes on 240-volt operation. Unless otherwise specified, they would be provided with thermal and/or magnetic trips for overload and short-circuit protection.

(c) In addition to the breakers the control center would contain a 3-pole, double-throw nonfused safety switch, a motor starter, relays and other devices for proper operation.

(5) An electrical motor would be provided to drive a hydraulic pump for gate operations. The motor would be a 230 volt, single phase, 60 cycle, capacitor start-induction run, continuous duty motor.

(6) Gate control.--Both manual and automatic controls would be provided as shown on plate 17.

(a) A "manual-off-automatic" selector switch would be provided for selection and isolation of the manual and automatic control circuits.

(b) Control relays would be provided for gate raise and gate lower control and for paralleling gate control circuits while under automatic control. A time delay relay would be provided to permit the motor to start under a no load condition.

(c) Manual controls would be provided by a "raise-lower-stop" pushbutton station for each gate.

(d) Automatic control would be provided by two headwater float operated mercury switches. One switch would close the gates when the headwater level falls below 15.2 feet. The other switch would energize a wheatstone bridge circuit when the headwater level raises above 15.8 feet. Headwater and tailwater float controlled potentiometers would be balanced against a gate position controlled potentiometer to position the gates according to the "Differential Head vs Gate Position Curve" as shown on figure 1

(e) When a gate raise control relay is energized, the corresponding gate raise and gate hold solenoid operated hydraulic valves and the motor and time delay control relays would be energized. After a 5-second time delay, a solenoid operated hydraulic dumping valve would be energized and the gate would be raised hydraulically

(f) When a gate lower control relay is energized, the corresponding gate lower and gate hold solenoid operated hydraulic valves would be energized. The gate would then be gravity lowered with a hydraulic speed control.

(g) Gate position limit switches would be provided to deenergize the gate raise or gate lower control circuit when a gate is either fully raised or fully lowered.

(7) Recording instruments would be provided to record the gate position and to record the headwater and tailwater elevations

(8) Space heaters would be provided in the motor control center in the motor frame and in automatic control equipment.

(9) Lighting.--(a) The control house would be lighted with two 150-watt lamps mounted in porcelain ceiling fixtures and controlled from a switch at the door.

(b) The roadway on the structure would be lighted with vaportight bracket fixture complete with clear glass, guard and 30 degree angle reflectors, one unit mounted on each abutment pier and one on the control house. The fixtures would be provided with 100-watt lamps and controlled by a solar relay.

(c) A weatherproof receptacle would be provided on the control structure and a duplex receptacle would be mounted in the control house. The receptacles would be 120-volt, 15-ampere, 2-wire, 3-pole type.

(10) Wire and cable.--(a) Wire and cable would be rubber-insulated, neoprene-jacketed, in accordance with IPCEA-NEMA Standard Publication dated March 1959.

(b) Power cable, size no. 10 and 12, would be single conductor, stranded, and insulated for 1000 volts. Size No. 8 and smaller would be insulated for 600 volts. Cable would be selected for current carrying capacities and voltage drop.

(c) Lighting cable would be single conductor, solid, insulated for 1000 volts.

(d) Control cable would be single-conductor, standard, sized for no. 12 and/or 14 and insulated for 1,000 volts.

(11) Conduit. All cable would be carried in conduit.

(a) Asbestos-cement or plastic type PVC would be laid in the earth without concrete encasement, and would be used between the meter board and control house and between control house and the structure.

(b) Rigid metal conduit would be of steel, galvanized.

(c) Flexible steel conduit with polyvinyl chloride jacket would be provided to connect electrical equipment subject to vibration.

(d) Junction boxes would be cast aluminum alloy, cast iron or welded steel plate, galvanized after fabrication. Boxes would be the equivalent of NEMA Type IV.

(12) Control center. The control center would be a free standing, dead front unit conforming to the requirements specified in Part 22 of NEMA Standard 1C-1-1954.

(13) Grounding. A bare, stranded copper cable would be connected to each sheet -steel-pile cutoff wall. The piles would be electrically tied together by spot welding a 1/2 inch reinforcing rod to each pile. The ground cable would be tied together through the structure. Tapes would ground the gate guides and rails. The ground loop in the control house and the utilities ground system would tie to this ground cable.

7. Order of work.--The contractor would be required to complete the canal segments in the following order: (1) The portion of the Interceptor Canal below Control Structure 190; (2) the portion of the Interceptor Canal upstream of the structure and the North Feeder Canal; and (3) the West Feeder Canal. These segments will be called acceptance sections. Construction of Control Structure 190 would begin simultaneously with work in the downstream Interceptor Canal and be completed prior to the start on the West Feeder Canal. If the downstream Interceptor Canal is completed before the structure is operative, an unexcavated reach

would be left upstream of the structure until it is operative. No specific order of work within the three acceptance sections would be required nor would the contractor be prohibited from starting at more than one point. However, the contractor would be required to excavate in a continuous manner and to complete an acceptance section before beginning another.

8. Acceptance.--The acceptance sections as listed above, immediately upon completion, would be inspected for acceptance by the Flood Control District for maintenance and operations as a completed segment of the project work. Control Structure 190 would be a separate item of acceptance upon completion. Some alterations in the acceptance plan may be necessary through discussions with the Flood Control District.

9. Recreation fills.--It is proposed to constructed four three-acre fill sites for recreational development alongside the canals at the locations shown on addendum plate 2. These areas would be 150 feet wide and about 900 feet long parallel to the canal and would be raised about four or five feet above ground dependent on the amount of fill available from canal excavation. The Flood Control District in their right-of-way agreement with the Seminole Tribe will make adequate provisions to insure that public use of the fill areas will be permitted.

10. Construction schedule.--Funds have not been appropriated to start construction of the works covered herein during this fiscal year. Pending the receipt of funds and the availability of lands, it is expected that a construction start will be made early in Fiscal Year 1965. The contractor will be required to complete all work in 18 months.

E. QUANTITIES AND COST ESTIMATES

11. Canals and terminal and inlet structures.--Tables 6, 7, and 8 have been revised to reflect the changes in the proposed plan outlined in this addendum. It will be noted that the costs have not been significantly affected by the proposed revisions.

12. Control Structure 190.--Quantities and cost estimates for Control Structure 190 are given in table 11. Estimated costs and Federal and non-Federal costs are given in table 12.

13. Cost cpmparison.--Table 9 has been revised to reflect the new cost estimates resulting from the revised plan of improvement presented herein.

D. RECOMMENDATIONS

14. Recommendations.--It is recommended that the revisions to the plan of improvement for Levee 28 Inte rceptor and Feeder Canals as presented in this addendum be approved.

ADDENDUM TABLE 2

LEVEE 28 INTERCEPTOR AND FEEDER CANALS

Summary of Inlet Structures

Station and bank	Drainage area No.	Drainage area Sq. miles	Design Q 10-yr. storm (cfs)	Canal water-surface elev. Des. (ft.)	Canal water-surface elev. water Opt. Contrd (ft.)	Canal water-surface elev. Min. (ft.)	Pipe No. and diam. (in.)	Pipe Invert elev. (ft.)	Pipe Length (ft.)	Riser Diam. (in.)	Riser Top elev. (ft.)	Control Type	Control * Elev. (ft.)	Required embankment Crown width (ft.)	Required embankment Crown elev. (ft.)	Average ground elev. at station (ft.)	Est. contract price
						NORTH	FEEDER	CANAL									
75+00 (W)	a	.5	15	16.5	10.0	8.0	1-36"	8.0	70	48	4' above ground at station	Flashbd	14.5	10	4' above ground at station	16.5	
150+00 (W)	b	1.4	42	16.5	10.0	8.0	1-48"	8.0	74	72		Flashbd	13.5	10		17.4	
	c	1.5	45	16.6	10.0	8.0	1-48"	8.0	72	72		Flashbd	13.6	10		17.0	
285+72 (E)	d	14.0		16.9	10.0	8.0	1-72"	8.0	80			Flapgate		10		19.0	
						WEST	FEEDER	CANAL									
10+00 (N)	e	1.3	39	16.4	10.0	8.0	1-48"	8.0	70	72		Flashbd	13.4	10		16.4	
25+90 (S)	f	7.8	234	16.5	10.0	8.0	(1) 3-66"	8.0	70	96		Flashbd	12.0	10		16.4	
77+00 (N)	g	2.4	72	16.6	10.0	8.0	1-60"	8.0	70	84		Flashbd	12.6	10		16.6	
134+21 (S)	h	5.8	174	16.7	10.0	8.0	(1) 2-66"	8.0	72	96		Flashbd	12.2	10		16.0	
134+21 (N)	i	2.5	75	16.7	10.0	8.0	1-60"	8.0	72	84		Flashbd	12.7	10		16.0	
187+71 (N)	j	2.5	75	16.8	10.0	8.0	1-60"	8.0	72	84		Flashbd	12.8	10		17.0	
241+71 (S)	k	3.8	114	16.9	10.0	8.0	1-72"	8.0	74	96		Flashbd	11.9	10		16.6	
241+71 (N)	l	2.1	63	16.9	10.0	8.0	1-60"	8.0	74	84		Flashbd	12.9	10		16.6	
295+21 (N)	m	1.4	42	17.1	10.0	8.0	1-48"	8.0	74	72		Flashbd	14.1	10		16.6	
344+56 (N)	n	4.5	135	17.3	10.0	8.0	(1) 2-60"	8.0	74	84		Flashbd	13.3	10		17.4	

NOTES:

(1) Only one pipe would be installed at each location where no ditches exist at time of construction

* Control elevation would be set initially about 1 foot below ground elevation where no canals exist at time of construction.

ADDENDUM TABLE 6

Levee 28, Interceptor Canal

Quantities and cost estimates

(Date of estimate: February 1964)

Item	Amount	Total
CONSTRUCTION COSTS		
L-28 Interceptor Canal:		
Excavation, unclassified:		
4,742,000 Cu. yds. @ $0.30	$1,423,000	
Grassing 113 A. @ $150.	17,000	
Subtotal	1,440,000	
Contingencies (12 pct.)	173,000	
Contract price		1,613,000
Government's supervision and inspection including overhead and retirement		129,000
Construction costs		1,742,000
FEDERAL COSTS		
Initial		
80 pct. of construction costs	1,394,000	
Engineering and design, including overhead and retirement	113,000	
Initial Federal costs		1,507,000
Annual		
Federal investment subject to interest and amortization		(1,507,000)
Interest at 2-1/2 pct.	38,000	
Amortization at 2-1/2 pct. for 50 years	15,000	
Annual Federal costs		$53,000

(continued)

ADDENDUM TABLE 6--Continued

Item	Amount	Total
NON-FEDERAL COSTS		
Initial		
20 pct. of construction costs	$348,000	
Lands:		
Rights-of-way	65,800	
Spoil areas	2,700	
Land acquisition cost (5 pct.)	1,500	
Private relocations	200	
Public relocations	--	
County road bridge	60,000	
Initial non-Federal costs --(rounded)		$480,000
Annual		
Non-Federal investment subject to interest and amortization @ 6 pct.		(68,500)
Interest at 6 pct.	4,100	
Amortization at 6 pct. for 50 years	200	
Non-Federal investment subject to interest and amortization at 3-1/2 pct.		(411,500)
Interest at 3-1/2 pct.	14,400	
Amortization at 3-1/2 pct. for 50 years	3,100	
Maintenance	3,200	
Annual non-Federal costs		25,000
Grand total--initial Federal and non-Federal costs		$1,987,000
Grand total--annual Federal and non-Federal costs		$78,000

ADDENDUM TABLE 7

North Feeder Canal

Quantities and cost estimates

(Date of estimate: February 1964)

Item	Amount	Total
CONSTRUCTION COSTS		
Excavation, unclassified:		
1,486,000 cu. yds @ $0.34	$505,000	
Inlet structures	22,000	
Terminal structure	45,000	
Grassing 40 A. @ $150.00	6,000	
Subtotal	578,000	
Contingencies (12 pct.)	69,000	
Contract price		$647,000
Government supervision and inspection including overhead and retirement		52,000
Construction costs		699,000
FEDERAL COSTS		
Initial		
80 pct. of construction costs	559,000	
Engineering and design, including overhead and retirement	45,000	
Initial Federal costs		604,000
Annual		
Federal investment subject to interest and amortization		(604,000)
Interest at 2-1/2 pct.	15,000	
Amortization at 2-1/2 pct. for 50 years	6,000	
Annual Federal costs		21,000

(Continued)

ADDENDUM TABLE 7--Continued

Item	Amount	Total
NON-FEDERAL COSTS		
Initial		
20 pct. of construction costs	$140,000	
Lands:		
Rights-of-way	14,000	
Spoil areas	700	
Land acquisition cost	600	
Private relocations	8,400	
Public relocations	2,000	
State Road 833 bridge	55,000	
Initial non-Federal costs (rounded)		$221,000
Annual		
Non-Federal investment subject to interest and amortization @ 6 pct.		(14,700)
Interest at 6 pct.	900	
Amortization at 6 pct. for 50 years	100	
Non-Federal investment subject to interest and amortization at 3-1/2 pct.		(206,300)
Interest at 3-1/2 pct.	7,200	
Amortization at 3-1/2 pct. for 50 years	1,600	
Maintenance	1,200	
Annual non-Federal costs		11,000
Grand total -- initial Federal and non-Federal costs		$825,000
Grand total--annual Federal and non-Federal costs		$32,000

ADDENDUM TABLE 8

WEST FEEDER CANAL

Quantities and cost estimates

(Date of estimate: February 1964)

Item	Amount	Total
CONSTRUCTION COSTS		
Excavation, unclassified:		
2,081,000 cu. yds. @ $0.33	$687,000	
Inlet structures	50,000	
Terminal structure	70,000	
Grassing 48 A. @ $150.00	7,000	
Subtotal	814,000	
Contingencies (12 pct.)	98,000	
Contract price		$912,000
Government supervision and inspection, including overhead and retirement		73,000
Construction costs		985,000
FEDERAL COSTS		
Initial		
80 pct. of construction costs	788,000	
Engineering and design, including overhead and retirement	64,000	
Initial Federal costs		852,000
Annual		
Federal investment subject to interest and amortization		(852,000)
Interest at 2-1/2 pct.	21,000	
Amortization at 2-1/2 pct. for 50 years	9,000	
Annual Federal costs		30,000

(Continued)

ADDENDUM TABLE 8-Continued

Item	Amount	Total
NON-FEDERAL COSTS		
Initial		
20 pct. of construction costs	$197,000	
Lands:		
Rights-of-way	29,000	
Spoil areas	1,500	
Land acquisition cost (5 pct.)	1,500	
Private relocations	500	
Public relocations	---	
County road bridge	50,000	
Initial non-Federal costs (rounded)		$279,000
Annual		
Non-Federal investment subject to interest and amortization @ 6 pct.		(30,500)
Interest at 6 pct.	1,800	
Amortization at 6 pct. for 50 years	100	
Non-Federal investment subject to interest and amortization	(248,500)	
Interest at 3-1/2 pct.	8,700	
Amortization at 3-1/2 pct. for 50 years	1,900	
Maintenance	1,500	
Annual non-Federal-costs		14,000
Grand total--initial Federal and non-Federal costs		$1,131,000
Grand total--annual Federal and non-Federal costs		$ 44,000

ADDENDUM TABLE 8

ADDENDUM TABLE 9

Comparison of costs with previously approved estimates

Item	COSTS (1)		
	Design Memo est. presented herein (Feb, 1964)	Current approved PB-3 est. (Dec.1962) (2)	Project document estimate (Dec, 1947)
Levee 28 Interceptor Canal	$1,613,000	$1,970,000	(3)
Control Structure 190	273,000	(4)	(3)
North Feeder canal incl. inlet structures	647,000	350,000	(3)
West Feeder canal incl. inlet structures	912,000	1,000,000	(3)
Subtotal	3,445,000 (5)	3,320,000	(3)
Engineering and design	241,000	232,400	(3)
Supervision and administration	275,000	265,600	(3)
Total	$3,961,000	$3,818,000	(3)

NOTES: (1) All costs in this table exclude rights-of-way and relocations.

(2) Current approved estimates taken directly from PB-3 dated 1 December 1962, and includes 12 pct. for contingencies.

(3) New features not included in project document.

(4) New feature not included in previously approved plan.

(5) Includes 12 pct. for contingencies.

ADDENDUM TABLE 10

Control Structure 190

Summary of hydraulic-design data

Item	Design
Approximate station	795+00
Design condition	
Discharge (c.f.s.)	2,960
Headwater elevation*	16.6
Tailwater elevation	16.1
Minimum condition	
Headwater elevation	8.0
Tailwater elevation	8.0
Optimum condition	
Headwater elevation	15.5
Tailwater elevation	10.0
Maximum estimated headwater elevation	18.0
Crest	
Shape	Ogee
Elevation	3.5
Net length (ft.)	48.0
Gates	
Number	2
Size - width by height (ft.)	24.0 x 12.0
Clearance elevation	17.6
Apron	
Elevation	-0.1
Length (ft.)	30.0
End sill elevation	1.0
Riprap requirements	
Length upstream (ft.)	40.0
Elevation upstream	19.0
Length downstream (ft.)	100.0
Elevation downstream	19.0
Protection grade elevation	20.4

NOTE: All elevations are in feet and refer to mean sea level.

ADDENDUM TABLE 11

Control Structure 190

Quantities and cost estimate

(Date of estimate: February 1964)

Item	Unit	Unit Price	Quantity	Total
Dewatering	Job	L.S.	1	20,000
Excavation	Cu.yd.	$0.75	14,300	10,725
Backfill and fill	Cu.yd.	0.50	5,700	2,850
Riprap	Cu.yd.	20.00	1,620	32,400
Bedding	Cu.yd.	15.00	810	12,150
Concrete	Cu.yd.	60.00	700	42,000
Cement	Bbl.	5.00	875	4,375
Reinforcing steel	Lb.	0.15	88,000	13,200
Structural steel	Lb.	0.35	8,000	2,800
Misc. metal	Lb	0.40	6,000	2,400
Steel sheet piling	Sq.ft.	5.00	7,000	35,000
Structural timber	M.F.B.M.	450.00	8.0.	3,600
Timber piling	Lin.ft.	2.50	4,200	10,500
Pipe handrail	Lin.ft.	6.00	260	1,560
Guardrail	Lin.ft.	6.00	300	1,800
Safety barrier	Job	L.S.	1	5,000
Staff gage	Job	L.S.	1	500
Control house	Job	L.S.	1	2,000
Electrical work	Job	L.S.	1	13,500
Subtotal Structure				216,360
Adjusted subtotal, structure				216,000
Vertical-lift gates	Job	L.S.	1	20,000
Gate operating machinery	Job	L.S.	1	8,000
Subtotal operating equipment				28,000
Total				244,000
Contingencies (12 pct.+)				29,000
Contract Price				$273,000

ADDENDUM TABLE 12

Control Structure 190

Cost estimates

(Date of estimate: February 1964)

Item	Amount	Total
CONSTRUCTION COSTS		
Structure	$216,000	
Contingencies (12 pct. ±)	26,000	
Contract price, structure	242,000	
Supervision and administration	19,000	
Subtotal, structure		$261,000
Operating equipment	28,000	
Contingencies (12 pct. +)	3,000	
Contract price, operating equipment	31,000	
Supervision and administration	2,000	
Subtotal, operating equipment		33,000
Construction costs		294,000
FEDERAL COSTS		
Initial		
Contract price		
80 pct. of structure contract price	194,000	
80 pct. of operating equipment contract price	25,000	
Supervision and administration on		
80 pct. of structure contract price	16,000	
80 pct. of operating equipment contract price	1,500	
Engineering and design on total contract price		
Structure	17,000	
Operating equipment	2,000	
Initial Federal costs		255,500
Annual		
Initial Federal costs		(255,500)
Interest at 2.5 pct.	6,400	
Amortization at 2.5 pct. for 50 years	2,600	
Annual Federal costs		9,000

(Continued)

ADDENDUM TABLE 12

ADDENDUM TABLE 12--Continued

Item	Amount	Total
NON-FEDERAL COSTS		
Initial		
Contract price		
20 pct. of structure contract price	$48,000	
20 pct. of operating equipment contract price	6,000	
Supervision and administration on		
20 pct. of structure contract price	3,000	
20 pct. of operating equipment contract price	500	
Initial non-Federal costs		$ 57,500
Annual		
Initial non-Federal costs		(57,500)
Interest at 3.5 pct.	2,000	
Amortization at 3.5 pct. for 50 years	400	
Operation and maintenance:		
Operation and care	2,000	
Replacement of operating equipment after 25 years	600	
Annual non-Federal costs		5,000
Grand total--Initial Federal and non-Federal costs		$313,000
Grand total--Annual Federal and non-Federal costs		$14,000

*NOTE: Replacement costs including contingencies, engineering, and overhead is $35,000. Present worth in 25 years at 3.5 pct. equals $14,800. Interest and amortization at 3.5 pct. for 50 years equals $600.

Attachment 4: C&SF Addendum 1-1964_Figure 1: Structure S-190, Limiting Gate Opening Curve

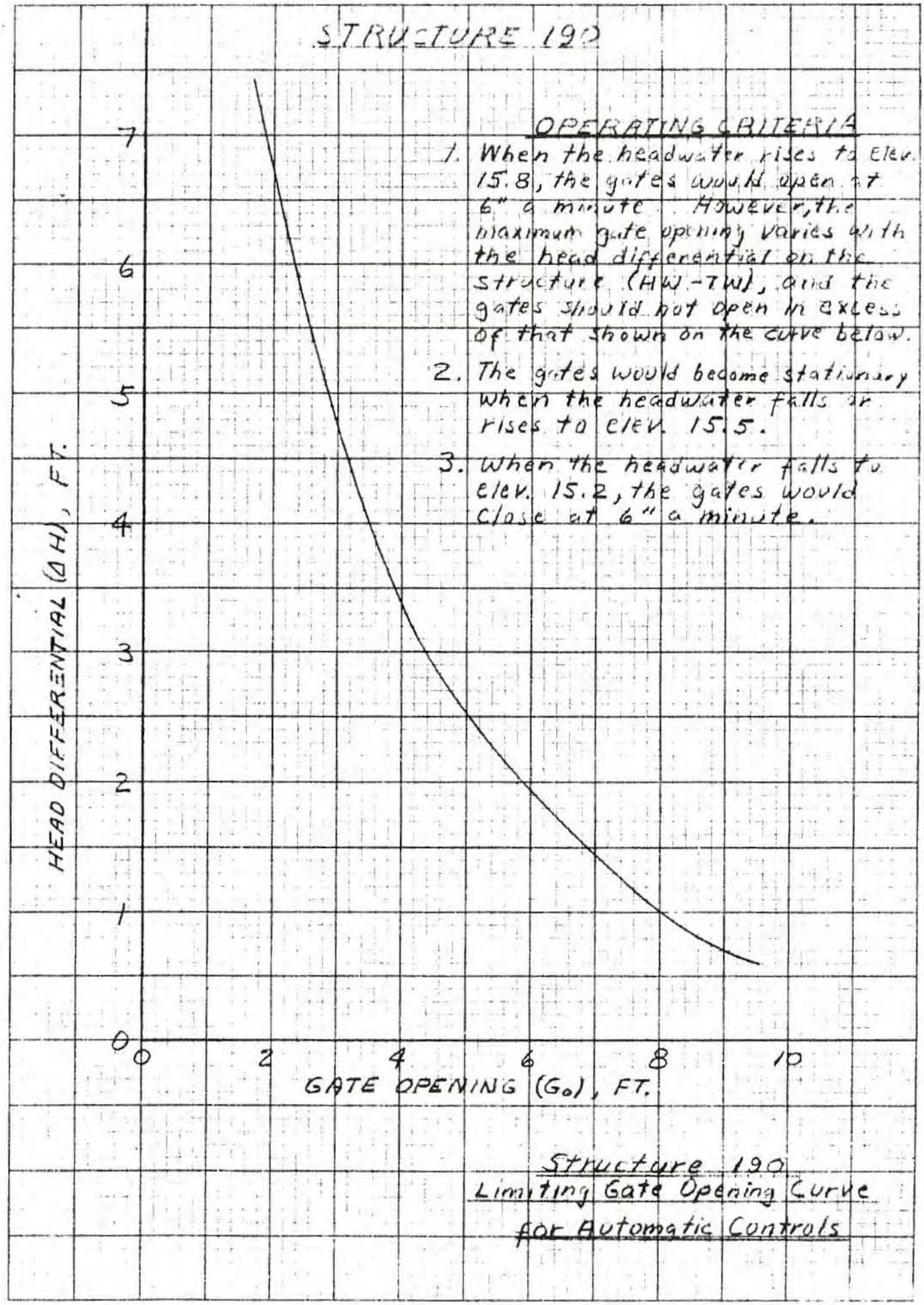

STRUCTURE 190
OPERATING CRITERIA
1. When the headwater rises to Elev. 15.8, the gates would open at 6" a minute. However, the maximum gate opening varies with the head differential on the structure (HW-TW), and the gates should not open in excess of that shown on the curve below.
2. The gates would become stationary when the headwater falls or rises to elev. 15.5.
3. When the headwater falls to elev. 15.2, the gates would close at 6" a minute.
HEAD DIFFERENTIAL (ΔH), FT.
0
1
2
3
4
5
6
7
0
2
4
6
8
10
GATE OPENING (Go), FT.
Structure 190
Limiting Gate Opening Curve
for Automatic Controls

FIGURE 1

Attachment 5: S-190 Operating Schedule Revised 11/18/1997

STRUCTURE 190

This structure is a reinforced concrete, gated spillway with discharge controlled by two cable operated, vertical lift gates. Operation of the gates is automatically controlled in accordance with the established operational criteria. The structure is located on the L-28 Interceptor Canal about 32 miles south of Clewiston.

PURPOSE

This structure maintains optimum upstream water control stages in the North and West Feeder Canals; and prevents over drainage of these canals.

OPERATION

This structure will be operated on either a low or a high setting, through automatic controls as follows:

During the normal condition, the low setting is used.

When the headwater elevation rises to 14.8, the gates will open at six inches per minute but the maximum gate opening will be limited to the amounts shown on the "Limiting Gate Opening" curve.

When the headwater elevation rises or falls to 14.5, the gates will become stationary.

When the headwater elevation falls to 14.2, the gates will close at six inches per minute.

During the dry condition, the high setting is used.

When the headwater elevation rises to 15.8, the gates will open at six inches per minute.

When the headwater elevation rises or falls to 15.5, the gates will become stationary.

When the headwater elevation falls to 15.2, the gates will close at six inches per minute.

During low water periods, releases will be made to meet downstream irrigation requirements even though necessary releases will violate the optimum headwater criteria.

FLOOD DISCHARGE CHARACTERISTICS

	Design
Discharge Rate	2960 cfs

	* % SPF
Headwater Elevation	16.6 feet
Tailwater Elevation	16.1 feet
Type Discharge	uncontrolled submerged

*Structure designed to pass the one in ten year flood.

DESCRIPTION OF STRUCTURE

Type reinforced concrete, gated spillway

Weir Crest

Net Length 48.0 feet

Elevation 3.5 feet

Service Bridge Elevation 20.5 feet

Water Level which will by-pass structure 20.5 feet

Gates

Number 2

Size 12.1 ft. high by 24.8 ft. wide

Type vertical lift

Bottom elevation of gates, full open 18.4 feet

Top elevation of gates, full closed 15.5 feet

Control Automatic, on-site control and remote computer control

Lifting Mechanism

Normal power source commercial electricity

Emergency power source LP gas engine driven generator

Type Hoist hydraulic cylinder actuated by electric motor driven pump, and connected to gates by steel cables

Date of Transfer: July 12, 1967

ACCESS: via State Road #833 and gravel road in Indian Reservation

HYDRAULIC AND HYDROLOGIC MEASUREMENTS

Water Level Remote digital headwater and tailwater recorders

Gate Position Recorder Remote digital recorder on all gates

DEWATERING FACILITIES

Storage West Palm Beach Field Station

Type Steel needle beam and aluminum needles

Size and Number (Per bay)

Upstream needles 4 @ 5' wide, 2 @ 2' wide
beam 33WF 200, 26'-11" long

Downstream same

Attachment 6: 10/19/2011 Email regarding Low/Normal and High Operating Conditions & Downstream Irrigation

Lisa Meday

From: Ramirez, Armando [aramire@sfwmd.gov]
Sent: Wednesday, October 19, 2011 4:27 PM
To: Lisa Meday
Cc: Craig Tepper; Ross, Elizabeth
Subject: RE: S190 Operating Schedule
Attachments: Part 1, Supp 40 Serial_24-E.PDF

Lisa,

My apologies for the delay on getting the information to you. In addition to the previously submitted information, the attachment will provide you with all the information in reference to the S-190 structure as well as any downstream analysis. Further, it is my understanding that operations by water managers are based on the USACE "schedule" as shown in their Water Control Manuals. They use the following settings at S190 that regulate head water elevations at the structure:

Low	14.2 to 14.8 ft
Normal	(same as low)
High	15.2 to 15.8 ft

They do not have defined numerical triggers for Low/Normal and High. In general, when the threat of flooding is probable, they will switch to the low/normal setting. When the forecast is for limited rainfall and there is a demand for water in the basin, they switch to the high setting.

On the '*downstream commitments*'; I am not sure I entirely understand your question, so perhaps you can provide me more specifics on your question.

Thank you.

Armando Ramirez
Tribal and Federal Affairs Liaison
Office of Everglades Policy & Coordination

Attachment 7: Pages from C&SF Master Water Control Manual WCA, ENP and ENP-SDCS Vol .provided 10/28/2011

STRUCTURE 190 (S-190)

Location. S-190 is located in the L-28 Interceptor Canal about one-half mile south of the junction of the West and North Feeder Canals.

Description. Structure 190 is a reinforced concrete, U-shaped, gated, two -bay spillway with an ogee-weir with automatically controlled vertical-lift gates. The structure has an operating platform and a service bridge.

Purpose. This structure maintains optimum upstream water control stages in the North and West Feeder Canals and prevents overdrainage of these canals.

Regulation. This structure will be operated on either a low or a high setting, through automatic controls as follows:

During the normal condition, the low setting is used. When the headwater elevation rises to 14.8 ft., NGVD, the gates will open at six inches per minute but the maximum gate opening will be limited to the amounts shown on the "Limiting Gate Opening" curve. When the headwater elevation rises or falls to 14.5 ft., NGVD, the gates will become stationary. When the headwater elevation fall to 14.2 ft., NGVD, the gates will close at six inches per minute.

During the dry condition, the high setting is used. When the headwater elevation rises to 15.8 ft., NGVD, the gates will open at six inches per minute. When the headwater elevations rises or fall to 15.5 ft., NGVD, the gates will become stationary. When the headwater elevation fall to 15.2 ft., NGVD, the gates will close at six inches per minute.

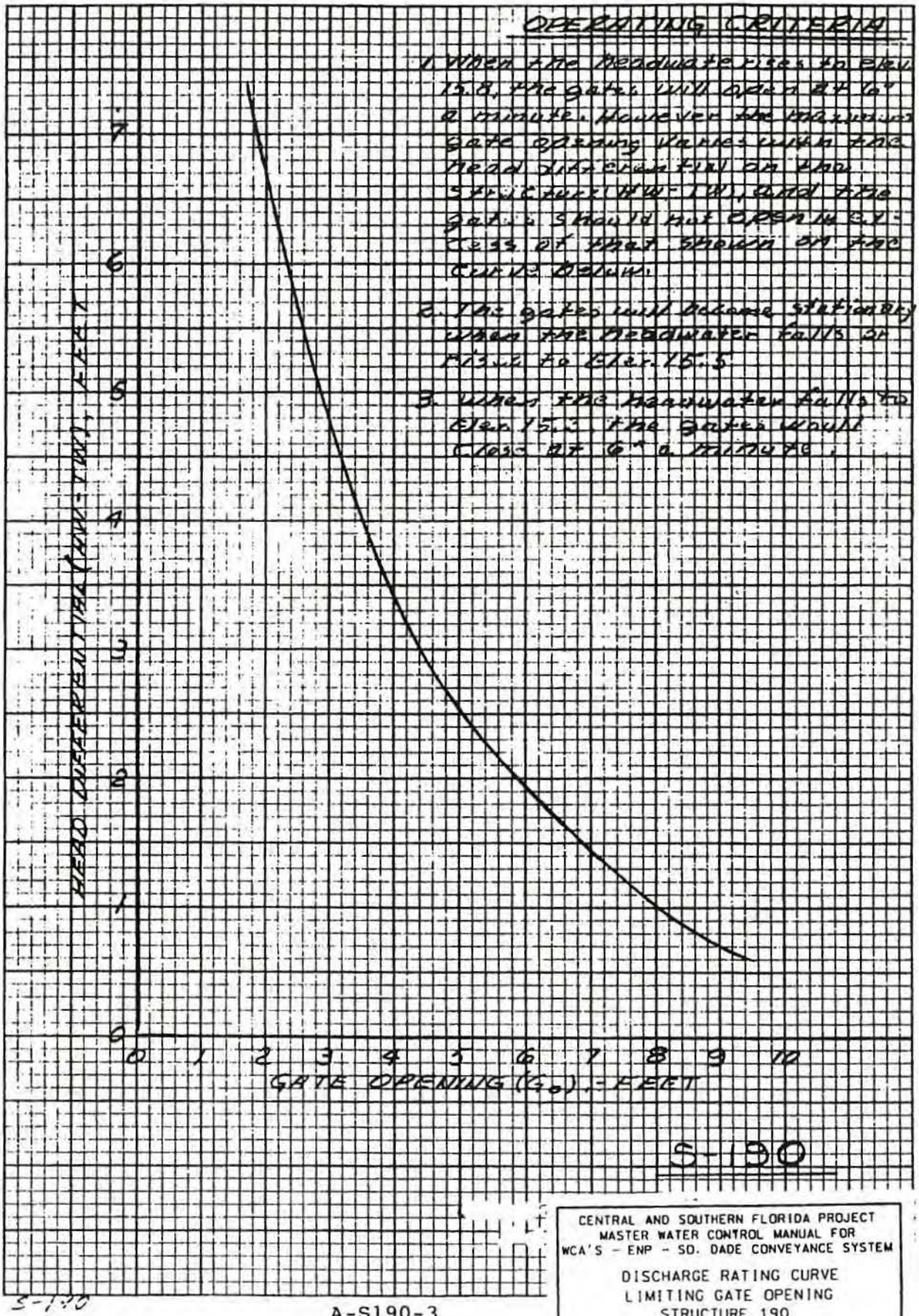
During low water periods, releases will be made to meet downstream irrigation requirements even though necessary releases will violate the optimum headwater criteria.

Constraints: To meet structural and stability requirements, the maximum allowable hydrostatic head on the structure should not be allowed to exceed 7.5 ft., NGVD, with a headwater elevation of 15.5 ft., NGVD, and a tailwater elevation of 8.0 ft., NGVD.

STRUCTURE 190 (S-190)

Summary of Hydraulic Design

Location	L-28
Design Conditions	
Discharge (cfs)	2,960
Type	Uncontrol submerged
Headwater Elevation (ft.)	16.6
Tailwater Elevation (ft.)	16.1
Optimum Conditions	
Headwater Elevation (ft.)	15.5
Tailwater Elevation (ft.)	10.0
Minimum Water Surface Condition, estimated	
Headwater Elevation (ft.)	8.0
Tailwater Elevation (ft.)	8.0
Crest	
Shape	Ogee
Elevation (ft.)	3.5
Net Length (ft.)	48.0
Gates	
Number	2
Type of Control	Automatic vert. lift
Width x Height (ft.)	24.0 x 12.0
Bottom Elevation, (ft.), fully open position	18.4
Top Elevation, (ft.), closed position	15.5
Clearance Elevation (ft.)	17.6
Protection Elevation (ft.)	20.4
Apron	
Elevation (ft.)	-0.1
Length (ft.)	30.0
End sill elevation (ft.)	1.0
Service Bridge Elevation (ft.)	20.5
Operating Platform Elevation (ft.)	20.5



CENTRAL AND SOUTHERN FLORIDA PROJECT
MASTER WATER CONTROL MANUAL FOR
WCA'S - ENP - SO. DADE CONVEYANCE SYSTEM

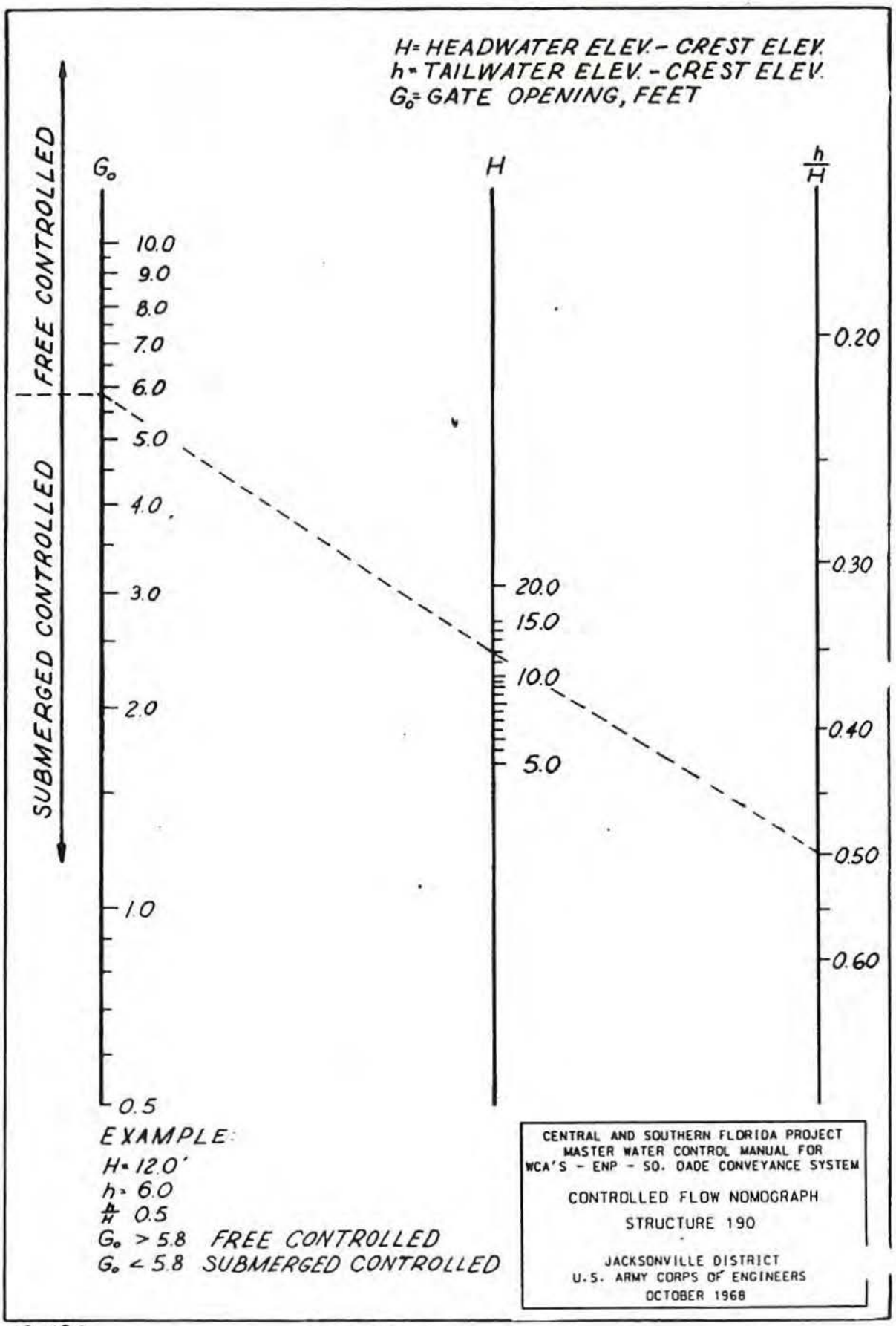
DISCHARGE RATING CURVE
LIMITING GATE OPENING
STRUCTURE 190

JACKSONVILLE DISTRICT
U.S. ARMY CORPS OF ENGINEERS
OCTOBER 1968

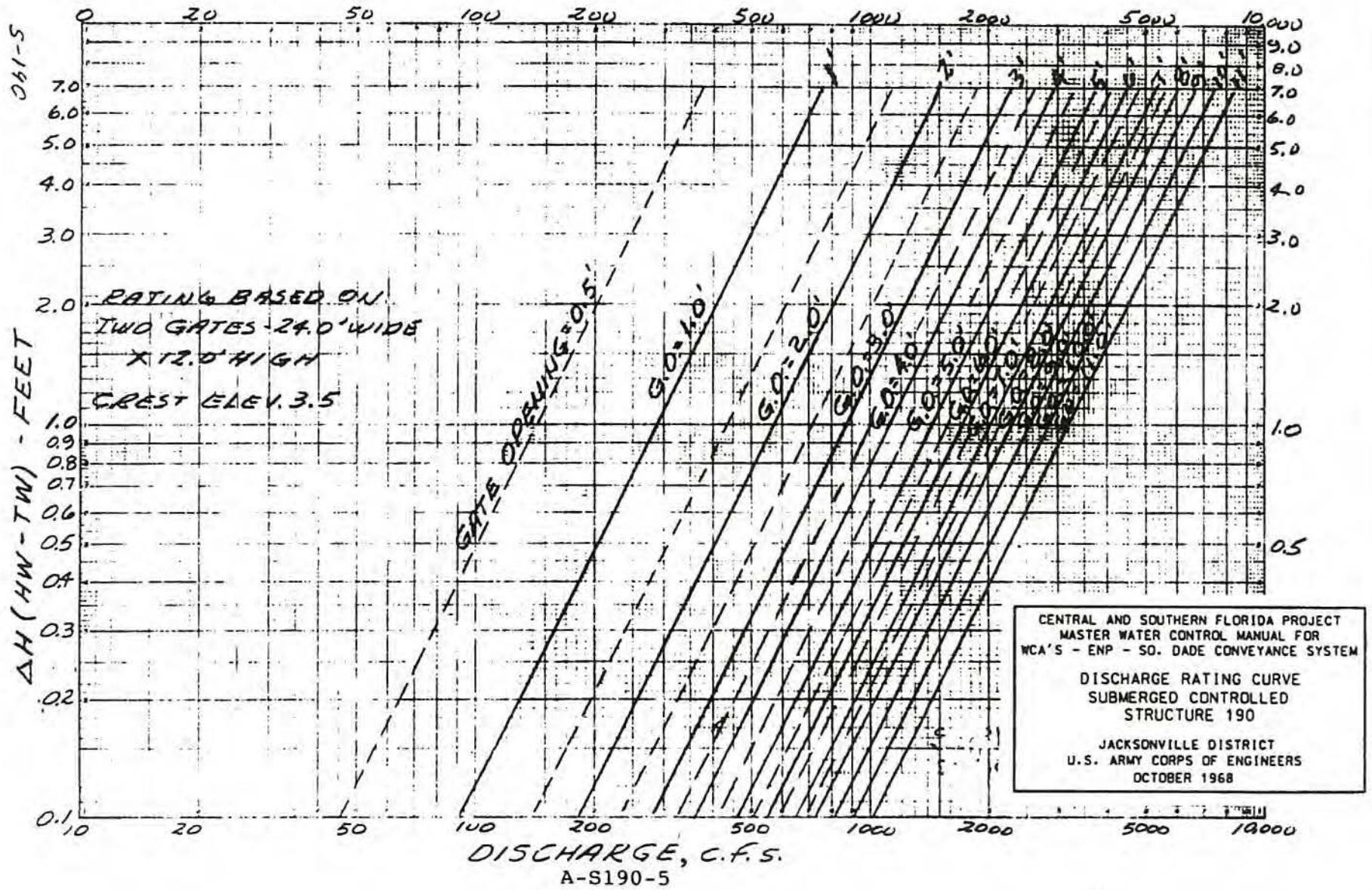
S-190

A-S190-3

K•E 5 X 5 TO ½ INCH 46 0863
7 X 10 INCHES
KEUFFEL & ESSER CO


H= HEADWATER ELEV. - CREST ELEV.
h= TAILWATER ELEV. - CREST ELEV.
G_o= GATE OPENING, FEET
FREE CONTROLLED
SUBMERGED CONTROLLED
G_o
H
$\frac{h}{H}$
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.5
20.0
15.0
10.0
5.0
0.20
0.30
0.40
0.50
0.60
EXAMPLE:
H= 12.0'
h= 6.0
$\frac{h}{H}$ 0.5
G_o > 5.8 FREE CONTROLLED
G_o < 5.8 SUBMERGED CONTROLLED
CENTRAL AND SOUTHERN FLORIDA PROJECT
MASTER WATER CONTROL MANUAL FOR
WCA'S - ENP - SO. DADE CONVEYANCE SYSTEM
CONTROLLED FLOW NOMOGRAPH
STRUCTURE 190
JACKSONVILLE DISTRICT
U.S. ARMY CORPS OF ENGINEERS
OCTOBER 1968

S-190


061-5
ΔH (HW - TW) - FEET
DISCHARGE, C.F.S.
RATING BASED ON
TWO GATES - 24.0' WIDE
X 12.0' HIGH
CREST ELEV. 3.5
GATE OPENING = 0.5'
G.O. = 1.0'
G.O. = 2.0'
G.O. = 3.0'
G.O. = 4.0'
G.O. = 5.0'
G.O. = 6.0'
G.O. = 7.0'
G.O. = 8.0'
G.O. = 9.0'
G.O. = 10.0'
0
20
50
100
200
500
1000
2000
5000
10000
0.1
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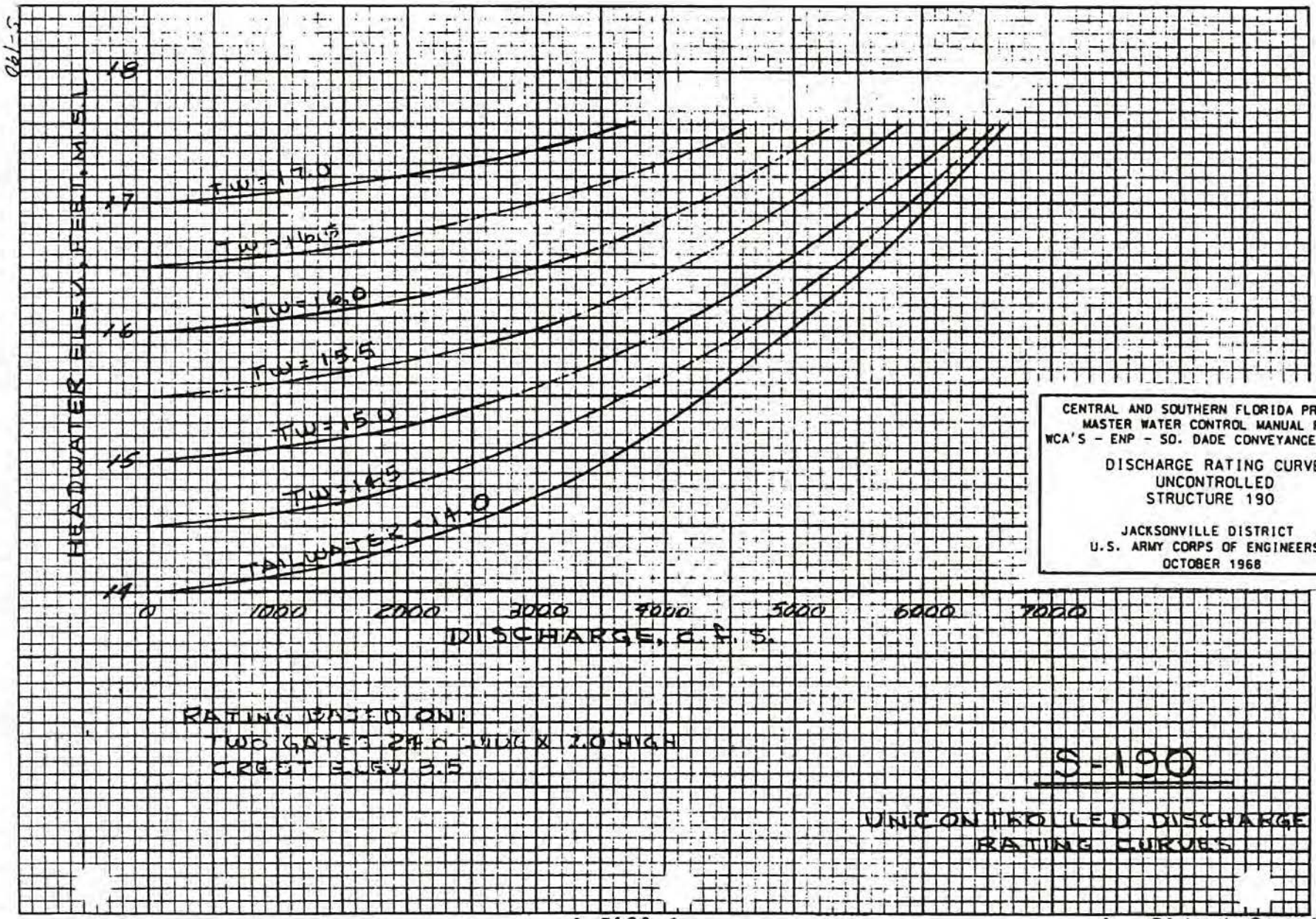
10
CENTRAL AND SOUTHERN FLORIDA PROJECT
MASTER WATER CONTROL MANUAL FOR
WCA'S - ENP - SO. DADE CONVEYANCE SYSTEM
DISCHARGE RATING CURVE
SUBMERGED CONTROLLED
STRUCTURE 190
JACKSONVILLE DISTRICT
U.S. ARMY CORPS OF ENGINEERS
OCTOBER 1968

A-S190-5

K·E 5 x 5 TO ½ INCH 46 0863
7 x 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



CENTRAL AND SOUTHERN FLORIDA PROJECT
MASTER WATER CONTROL MANUAL FOR
WCA'S - ENP - SO. DADE CONVEYANCE SYSTEM

DISCHARGE RATING CURVE
UNCONTROLLED
STRUCTURE 190

JACKSONVILLE DISTRICT
U.S. ARMY CORPS OF ENGINEERS
OCTOBER 1968

RATING BASED ON:
TWO GATES 24.0 WIDE X 12.0 HIGH
CREST ELEV. 8.5

S-190

UNCONTROLLED DISCHARGE
RATING CURVES

SAJWH OCT.68

SEMINOLE TRIBE OF FLORIDA

TRIBAL COMMUNITY DEVELOPMENT

6365 Taft Street, Suite 3005
Hollywood, Florida 33024
T: (954) 966-6300
www.tcd.semtribe.com

ADAM NELSON
Executive Director
Ext 11367

JAMES E. BILLIE
Chairman

TONY SANCHEZ, JR.
Vice Chairman

PETER A. HAHN
Acting Treasurer

LAVONNE KIPPENBERGER
Acting Secretary

August 1, 2014

Colonel Dodd, District Commander
U.S. Army Corps of Engineers
701 San Marco Boulevard
Jacksonville, FL
32207-8175

Dear Colonel Dodd:

On October 24, 2011, the Seminole Tribe of Florida Water Commission Chairman proposed a demonstration project to temporarily modify the operation schedule of the S-190 structure for a two-year period. The adaptive management request was to utilize the original operating criteria year-round; or, to use the "high" range of the 1997 revised operating criteria year round.

A response to the demonstration project request was provided on January 23, 2012, noting the Corps would process the planned deviation, determine applicable laws and regulations (such as National Environmental Policy Act-NEPA), and coordinate with stakeholders including the South Florida Water Management District. Additionally, a request was made for any supporting documentation from the Tribe to demonstrate evidence of no harmful environmental impacts, no adverse impacts on flood protection, a monitoring plan for the project duration, and documentation of coordination with affected parties.

Since 2012, the representatives of the Seminole Tribe of Florida (STOF) Environmental Resource Management Department (ERMD), legal counsel for the Seminole Tribe, U.S. Army Corps of Engineers (USACE), and South Florida Water Management District (SFWMD) have met at Task Force meetings and discussed issues related to the operation of structure S-190 as part of more comprehensive discussions on Western Basins issues and the STOF's request for greater water availability and deliveries to the Big Cypress Reservation.

In an effort to move the S-190 operation evaluation forward, the USACE was able to allocate funds to do the evaluation that USACE needs to change the operations of the schedule back to its original purpose (prevent the over-drainage of the Big Cypress Reservation) including the required NEPA analysis associated with that action. The Tribe appreciates this commitment from the USACE and is willing to participate in such an evaluation with the understanding that the S-190 operational changes requested are but one part of an overall solution for the issues the Tribe has identified in this basin. Returning S-190 to its original operating criteria is a necessary first step in the overall process, as S-190 operations can protect, or over-drain Big Cypress Reservation surface water and ground water.

To that end on August 5, 2014, USACE, STOF ERMD, STOF legal counsel and SFWMD representatives will meet for an initial S-190 Operation Evaluation Project Delivery Team (PDT) Kick-Off Meeting to discuss among other things the Tribe's purpose and need for the request. For the purpose of clarity and preparation, the Seminole Tribe submits the attached information in advance of the August 5, 2014 meeting with regard to the Tribe's purpose and need for the S-190 Operation Evaluation.

Please feel free to contact me if you have any questions or require any additional information.

Sincerely,

Adam Nelson, Executive Director
Tribal Community Development

AN/lm
Attachment (1)

Cc; James E. Billie, Chairman, Seminole Tribe of Florida
Jim Shore, General Counsel
Adam Nelson, Executive Director Tribal Community Development
Cherise Maples, Director ERMD
Stephen Walker, Esquire
Armando Ramirez, SFWMD
Tiphanie Jinks, USACE

2014 Seminole Tribe of Florida S-190 Operation Evaluation PURPOSE

1. *Return the S-190 operating schedule to its intended and constructed purpose: to protect the Big Cypress Seminole Indian Reservation from over-drainage with the original operating criteria at all times of 15.2'-15.8' NGVD, and to maintain the optimum upstream level of 15.5' NGVD (as a minimum) (see Figure 1).*

2. *Determine the effects of the Seminole Tribe's requested schedule change on the Big Cypress Reservation.*

3. *Evaluate the impact of the Seminole Tribe's requested schedule change in terms of protecting Big Cypress Reservation from damage resulting from over-drainage.*

4. *Identify the impact of the Seminole Tribe's requested schedule change on Big Cypress Reservation groundwater levels.*

5. *Identify direct environmental and ecological impacts to Big Cypress Reservation from operating the S-190 structure at the Seminole Tribe's requested schedule change .*

6. *Estimate wet season water gains to the Big Cypress Reservation due to the the Seminole Tribe's requested schedule change , and estimate the changes to annual Total Phosphorus loading associated with this proposed range.*

7. *Identify the impact of the the Seminole Tribe's requested schedule change on protecting and preserving the Tribe's Water Supply Entitlement.*

8. *Consider SFWMD data collected at S-190 since 2012 as well as limitations relating to historical data gaps and S-190 flow and stage data (whereby decreasing headwater stages may be caused by structure issues, leaking gates, stretched cables, incorrect datums, etc) in addition to evapotranspiration).*

9. *Include in the NEPA documentation:*
   a. *The genesis and original design purpose of S-190, including the BIA request for the structure due to concerns of over drainage of the Reservation caused by the USACE project.*
   b. *The sequence of events and involved interests resulting in the 1982 operational changes (see Figure 2)and then the 1997 revisions to the S-190 operating criteria and schedule. Why were they made, by who, and at whose request?*
   c. *Document what consultation occurred with the Seminole Tribe and/or BIA for the review, comment or consideration of the 1982 operational change and the later 1997 schedule change.*
   d. *Document why the 1997 operational criteria includes withdrawals for "downstream irrigation requirements."*
   e. *Document what NEPA actions or environmental considerations for Big Cypress Reservation were taken prior to the revised S-190 operation criteria.*

2014 Seminole Tribe of Florida S-190 Operation Evaluation NEED

1. *The Tribe needs the S-190 structure to be returned to its original design criteria to protect the natural areas, wildlife and cultural elements within Big Cypress Reservation from over-drainage.*

2. *The Tribe needs the surface water and ground water levels on the western side of the Reservation to be protected and not decreased; the original operational criteria for a higher S-190 operating regime is needed to do this.*

3. *S-190 operations need to be changed to operate at the higher level in order to prevent the over drainage of the Tribe's large native area which is bordered on the east by the L28 Interceptor Canal and to the north by the West Feeder Canal. Seasonal wetland hydro-periods have been impacted in the Native Area likely resulting in the current shift in vegetative communities in this area.*

4. *S-190 operational change is needed to further enhance operations of the Tribe's Critical Restoration Project. Basins 1, 2 and 4 are impacted by groundwater levels controlled by operations of the S-190.*

5. *The 1997 revised schedule operations of the S-190 at the low level as "normal" releases restorative seasonal rainfall which prevents storage and groundwater replenishment. The Seminole Tribe needs operational change to address this.*

6. *Big Cypress Reservation has Water Entitlement Rights. Before the Tribe can utilize the water in the western reaches of the Reservation, the 1997 S-190 operational criteria causes release of this water to the south before it can be stored and utilized by the Tribe. An operational change is needed.*

7. *Big Cypress Reservation soil types and vegetation indicate effects from over-drainage.*

8. *Big Cypress Reservation is home to several endangered and threatened species which rely on native/natural conditions; which have and continue to change as a result of over-drainage caused by S-190.*

9. *Big Cypress Reservation is accountable for phosphorus loading into the L28 Interceptor Canal caused by upstream interests. S-190 releases surface water and the Tribe is deemed responsible for net pollutant loading. The more water that is released from the S-190 under low level operating criteria, the more loading the Tribe may be deemed responsible for treating.*

10. *The Tribe needs the S-190 structure to be returned to its original purpose (protection from over-drainage). The S-190 structure has been operated since 1982(for over 30 years) inconsistently with its original protective purpose of protecting the Tribe's Reservation from over drainage.*

Figure 1: S190 Headwater Levels 1978-2014

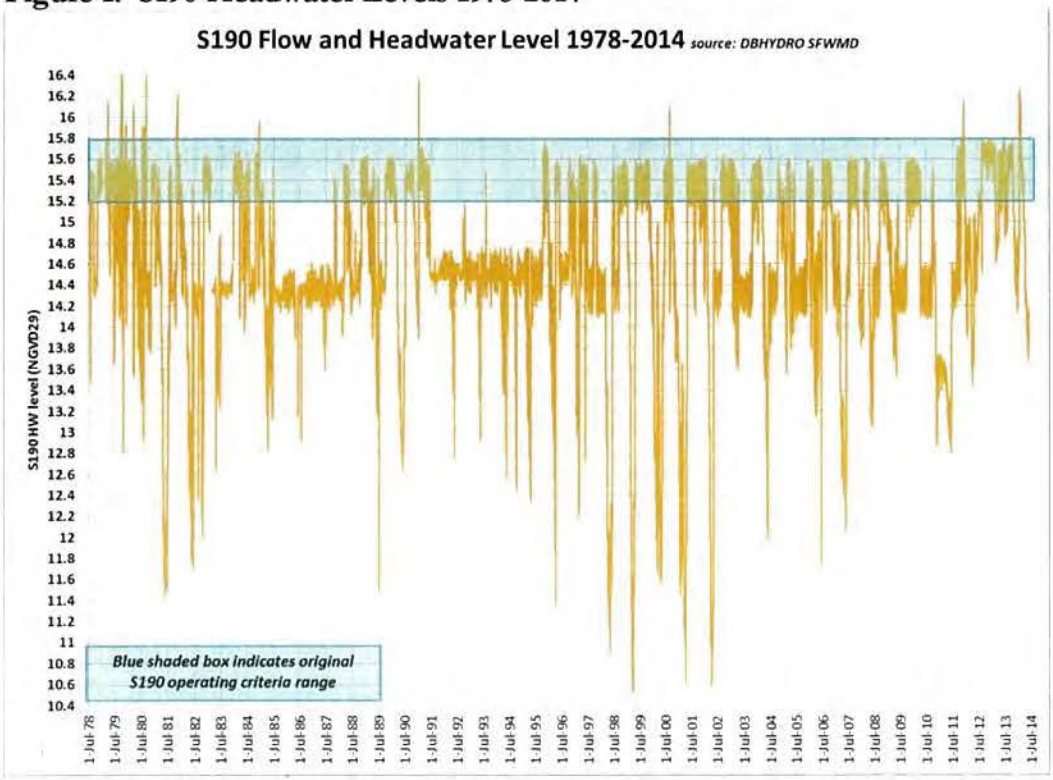
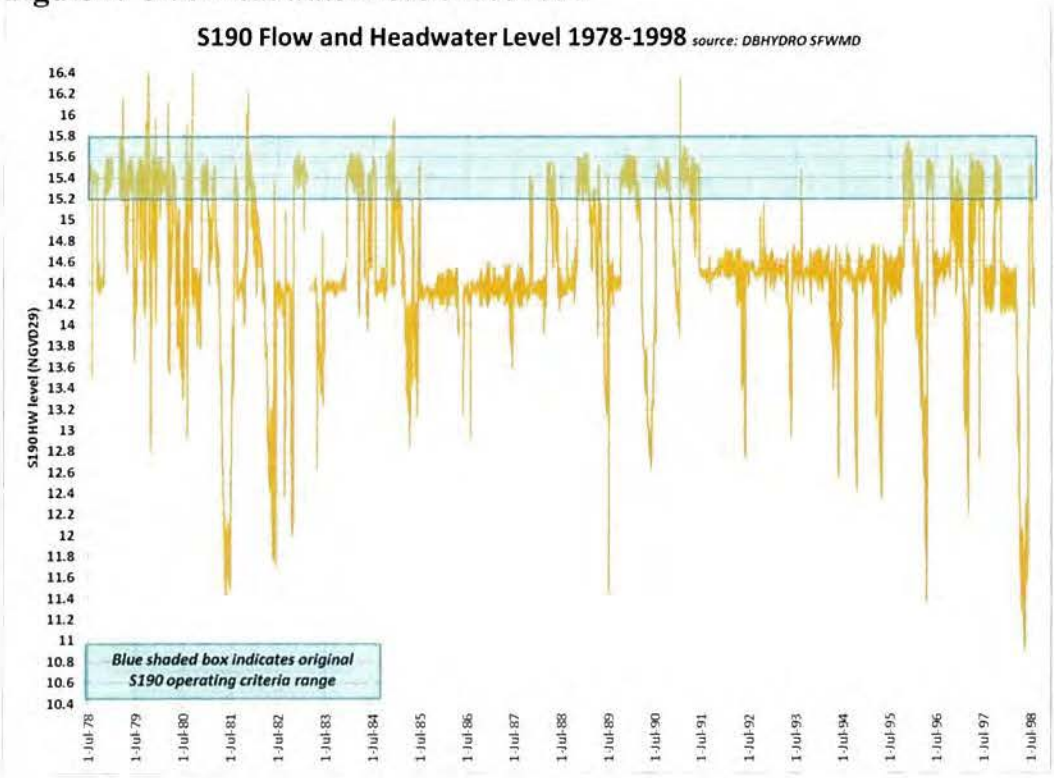


Figure 2: S190 Headwater Levels 1978-1998



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

SEP 15 2014

Planning and Policy Division
Environmental Branch

Honorable Colley Billie
Miccosukee Tribe of Indians of Florida
Post Office Box 440021, Tamiami Station
Miami, FL 33144

Dear Chairman Billie:

The purpose of this letter is to invite you and/or your representative to participate on the Project Delivery Team (PDT) for modifications to the current water operating schedule for the S-190 gated spillway. The U.S. Army Corps of Engineers (Corps), South Florida Water Management District, and Seminole Tribe of Florida, in coordination with other interested stakeholders, are developing recommendations for modifications to the current water operating schedule of the S-190 for purposes of providing additional water storage in the North and West Feeder Canals and higher groundwater levels within the western portion of Big Cypress Reservation. The Corps is beginning the National Environmental Policy Act process that will include an Environmental Assessment (EA). The EA will examine potential effects that changes to the current water operations schedule may have on natural and cultural resources.

Enclosure 1 shows the location of the S-190, which acts as the primary water discharge structure in the Feeder Canal Basin located in southeastern Hendry County. The two major canals associated with the Feeder Canal Basin are the North Feeder Canal, and the West Feeder Canal. These two canals merge in the lower southeastern corner of the basin and discharge south through the S-190 structure and into the L-28 Interceptor Canal, and eventually Water Conservation Area 3A. S-190 maintains water control stages north of the structure in the North and West Feeder Canals

Please identify the appropriate Tribal member(s) or person(s) who could represent the Tribe on the PDT. I would also like to extend the opportunity to have the Corps come down and consult with you or your representatives directly, as part of our obligation for continued Government-to-Government consultation. As the PDT continues to move forward on this project, the Corps will be available to consult with you regarding any concerns that the Tribe may have. The next PDT meeting is currently scheduled for September 17, 2014, at the Seminole Big Cypress Reservation Environmental Resource Management Department, 31004 County Road 833, Clewiston, Florida, 33440.

If you have any questions, please contact Tiphanie Jinks, Corps Senior Project Manager, at 904-232-1548, Tiphanie.C.Jinks@usace.army.mil, or Eric Summa, Corps Tribal Liaison and Environmental Branch Chief, at -904-232-1665, Eric.P.Summa@usace.army.mil.

Sincerely,

Alan M. Dodd
Colonel, Corps of Engineers
District Commander

Enclosure

Copies Furnished

James Erskine, Water Quality Manager, Miccosukee Tribe of Indians of Florida, Post Office Box 440021, Tamiami Station, Miami, FL 33144
Rory Feeney, Tribal Wildlife Director, Miccosukee Tribe of Indians of Florida, Post Office Box 440021, Tamiami Station, Miami, FL 33144

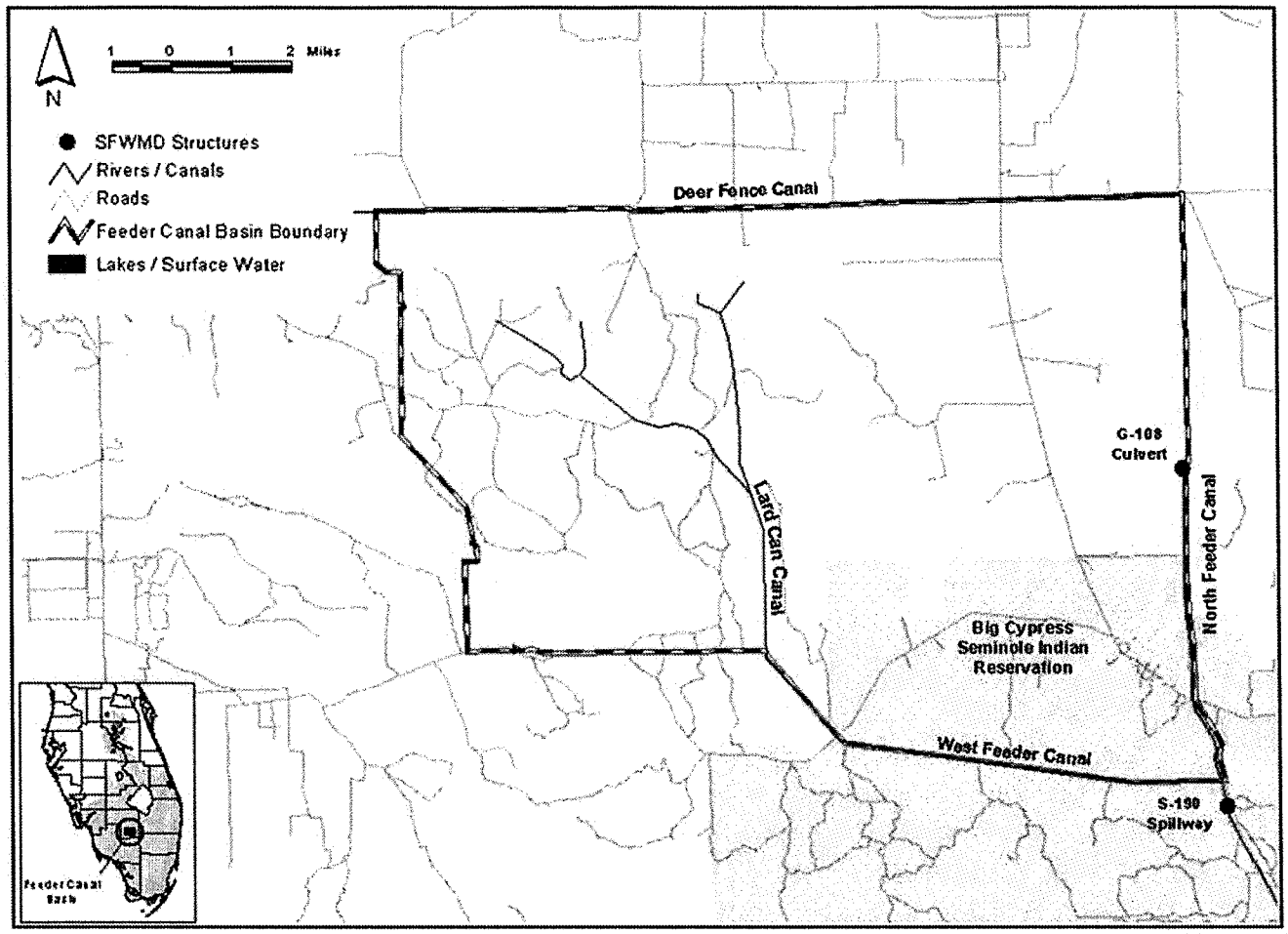


Figure 1. Location of S-190 Gated Spillway

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

October 21, 2014

SUBJECT: S-190 Gated Structure Operations Modification Project Cultural Resources Consultation

Paul Backhouse, Ph.D., RPA
Museum Director and Tribal Historic Preservation Officer
30290 Josie Billie Hwy, PMB 1004
Clewiston, Florida 33440

Dear Dr. Backhouse:

At the request of the Seminole Tribe of Florida, the U.S. Army Corps of Engineers (Corps), Jacksonville District, in partnership with the South Florida Water Management District (SFWMD), are studying the environmental effects of the proposed S-190 Gated Structure (S-190) Operations Modification Project.

The S-190 is located in the L-28 Interceptor Canal downstream of the junction of the West Feeder Canal in Hendry County, Florida in Township 48S, Range 33E, and Section 19 Southeast quadrant (Enclosure 1). The undertaking consists of operational changes to the existing S-190 structure, which would result in water within the North and West Feeder Canals to be held at stages similar to those seen as a result of the original 1964 operations schedule for the structure. The overall goal of the proposed project is to provide benefits to the Seminole Tribe of Florida lands through increased water stage, increased groundwater levels, increased well recharge, enhancement of wetlands, and native areas south of the West Feeder Canal.

Under the National Environmental Policy Act (NEPA), Section 106 of the National Historic Preservation Act of 1966, as amended and implementing regulations 36 CFR Part 800, as amended, we are assessing our needs for information regarding historic properties, properties that are culturally sensitive to the Seminole Tribe of Florida or undocumented traditional cultural properties that might be affected by the undertaking. The Corps seeks your concurrence that the Area of Potential Effect (APE) is confined to portions of the West and North Feeder Canal footprint. Enclosure 2 shows results of the Corps' review of the Florida Master Site File (FMSF) to identify previously recorded cultural resource sites within the APE. Considering the project is located on Reservation lands, we understand that there may be other unreported cultural resources within the APE that must be considered, therefore we respectfully request your council as to if the project will affect sites unknown to state or federal agencies.

Ms. Cindy Thomas has been designated as Corps Staff Archaeologist for the S-190 Gated Structure Operations Modification Project. Please provide a respond to this letter within 30-days of receipt. Any questions or concerns that you may have at this time can be addressed by Ms. Thomas by contacting her at (904) 232-1180 or via email: Cynthia.G.Thomas@usace.army.mil. We look forward to working with you on this effort.

Sincerely,

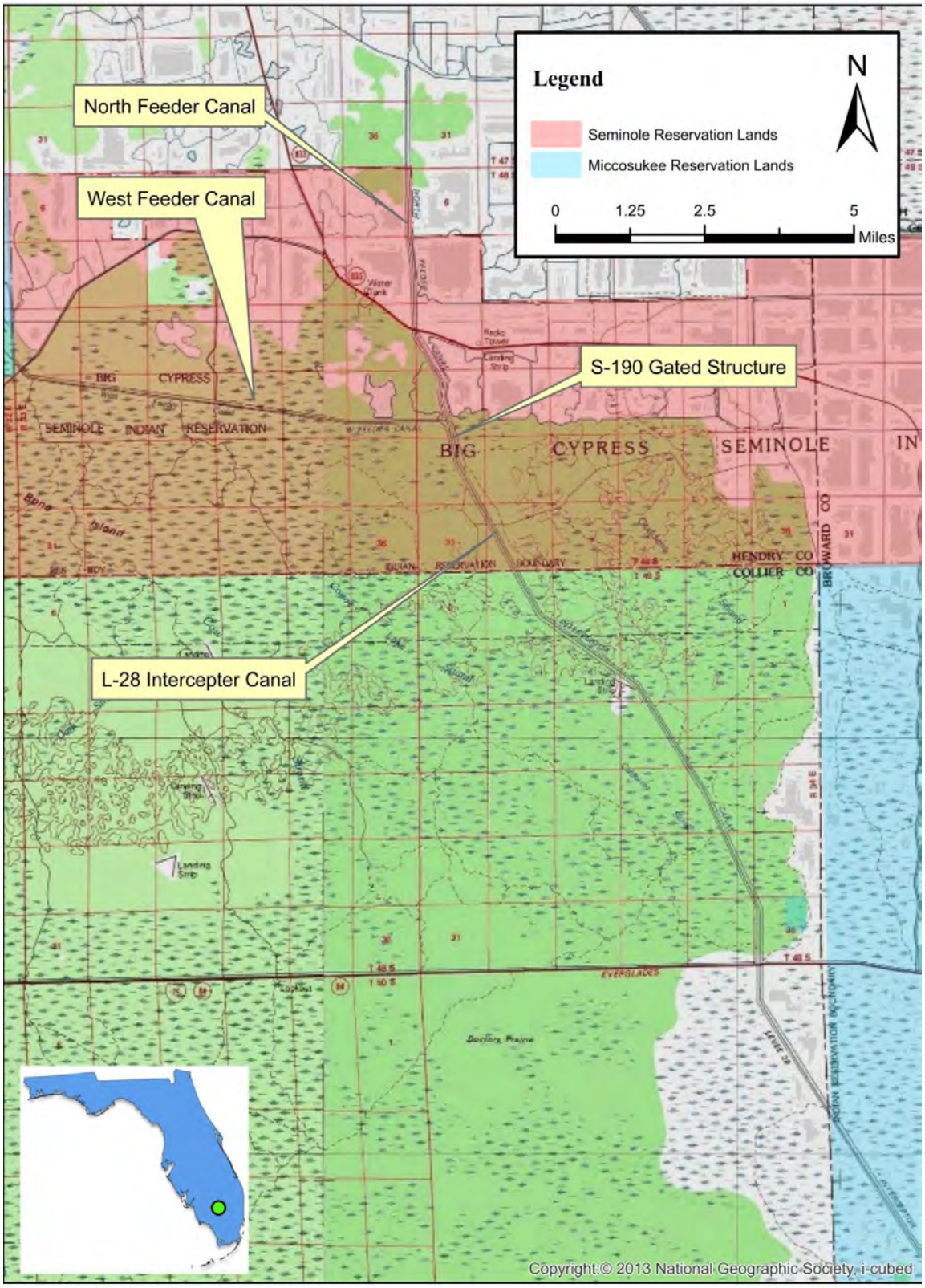
Eric P. Summa
Chief, Environmental Branch

Enclosures

Copies Furnished:
Honorable James Billie, Seminole Tribe of Florida, Chairman, 6300 Stirling Road, Hollywood, Florida 33024
Ms. Anne Mullins, Seminole Tribe of Florida, Deputy Tribal Historic Preservation Officer, 30290 Josie Billie Highway, PMB 1004, Clewiston, FL 33440
Mr. Bradley Mueller, Seminole Tribe of Florida, Supervisor – Compliance Section, 30290 Josie Billie Highway, PMB 1004, Clewiston, FL 33440
Mr. David Saunders, Bureau of Indian Affairs, Eastern Regional Office, 545 Marriott Drive, Suite 700, Nashville, Tennessee 37214
Dr. Christina Stringer, Bureau of Indian Affairs, Natural Resources Officer, 545 Marriott Drive, Suite 700, Nashville, Tennessee 37214
Mr. Robert F. Bendus, Division of Historical Resources, State Historic Preservation Officer, 500 South Bronough Street, Tallahassee, Florida 32399-0250
Mr. Armando Ramirez, Tribal and Federal Affairs Liaison, South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, FL 33406

ENCLOSURE 1

Change in Operations Criteria for S-190



Source: ESRI ArcMap 10 Resource Data

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

October 21, 2014

SUBJECT: S-190 Gated Structure Operations Modification Project Cultural Resources Consultation

Mr. Fred Dayhoff
NAGPRA and Cultural Resources Representative
HC 61 Box 68 Old Loop Road
Ochopee, Florida 34141

Dear Mr. Dayhoff:

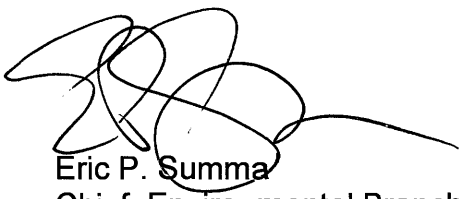
At the request of the Seminole Tribe of Florida, the U.S. Army Corps of Engineers (Corps), Jacksonville District, in partnership with the South Florida Water Management District (SFWMD), are studying the environmental effects of the proposed S-190 Gated Structure (S-190) Operations Modification Project.

The S-190 is located in the L-28 Interceptor Canal downstream of the junction of the West Feeder Canal in Hendry County, Florida in Township 48S, Range 33E, and Section 19 Southeast quadrant. The undertaking consists of operational changes to the existing S-190 structure, which would result in water within the North and West Feeder Canals to be held at stages similar to those seen as a result of the original 1964 operations schedule for the structure. The overall goal of the proposed project is to provide benefits to the Seminole Tribe of Florida lands through increased water stage, increased groundwater levels, increased well recharge, enhancement of wetlands, and native areas south of the West Feeder Canal.

Under the National Environmental Policy Act (NEPA), Section 106 of the National Historic Preservation Act of 1966, as amended and implementing regulations 36 CFR Part 800, as amended, we are assessing our needs for information regarding historic properties, properties that are culturally sensitive to the Miccosukee Tribe of Florida or undocumented traditional cultural properties that might be affected by the undertaking. The Corps seeks your concurrence that the Area of Potential Effect (APE) is confined to portions of the West and North Feeder Canal footprint. Enclosure 2 shows results of the Corps' review of the Florida Master Site File (FMSF) to identify previously recorded cultural resource sites within the APE. Considering the project location, we understand that there may be other unreported cultural resources within the APE that must be considered, therefore we respectfully request your council as to if the project will potentially affect any historic properties or culturally sensitive sites unknown to state or federal agencies.

Ms. Cindy Thomas has been designated as Corps Staff Archaeologist for the S-190 Gated Structure Operations Modification Project. Please provide a respond to this letter within 30-days of receipt. Any questions or concerns that you may have at this time can be addressed by Ms. Thomas by contacting her at (904) 232-1180 or via email: Cynthia.G.Thomas@usace.army.mil. We look forward to working with you on this effort.

Sincerely,



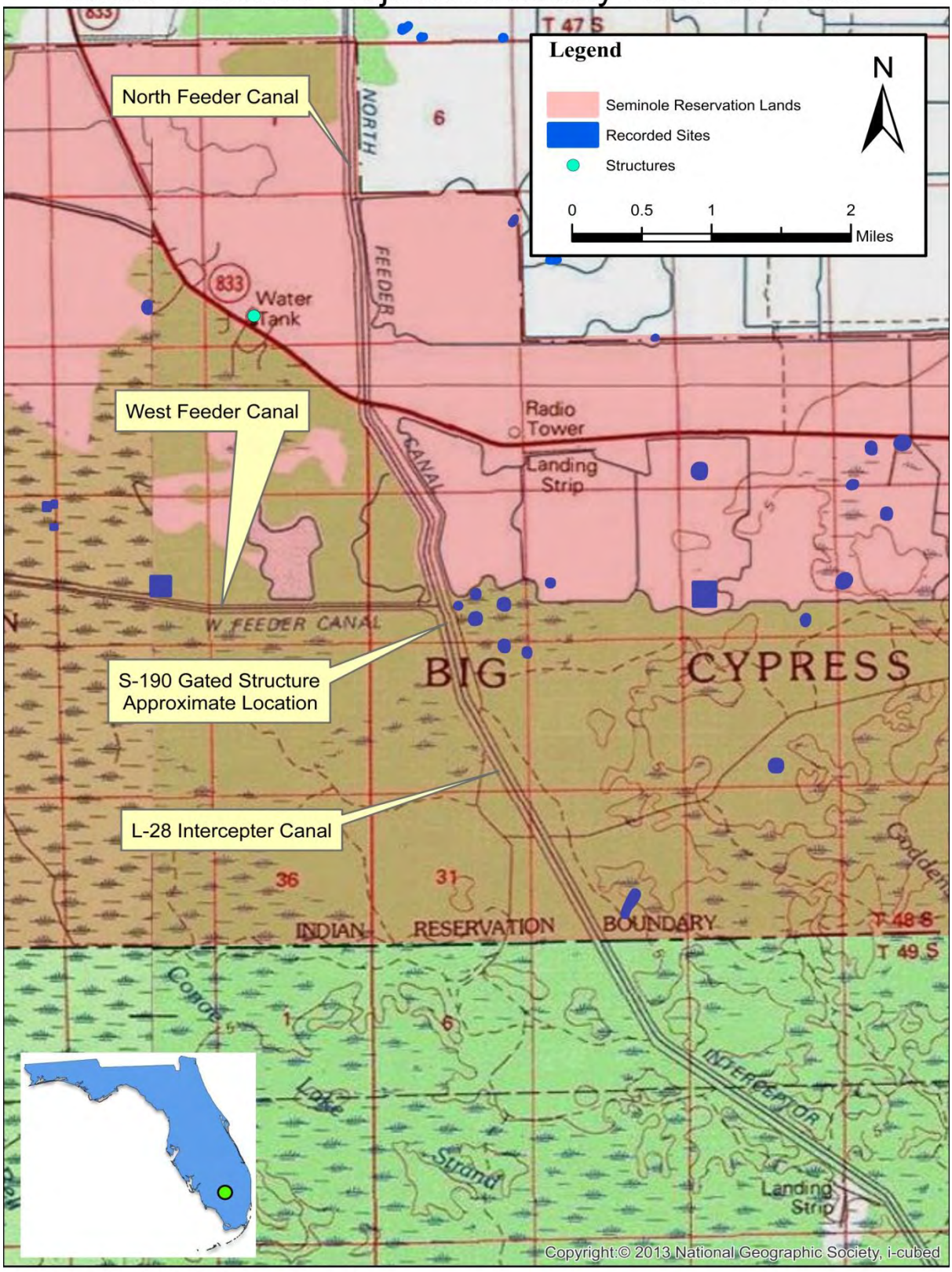
Eric P. Summa
Chief, Environmental Branch

Enclosures

Copies Furnished:
Honorable Colley Billie, Miccosukee Tribe of Indians of Florida, Chairman, P.O. Box 440021, Miami, Florida 33144
Mr. David Saunders, Bureau of Indian Affairs, Eastern Regional Office, 545 Marriott Drive, Suite 700, Nashville, Tennessee 37214
Dr. Christina Stringer, Bureau of Indian Affairs, Natural Resources Officer, 545 Marriott Drive, Suite 700, Nashville, Tennessee 37214
Mr. Robert F. Bendus, Division of Historical Resources, State Historic Preservation Officer, 500 South Bronough Street, Tallahassee, Florida 32399-0250
Mr. Armando Ramirez, Tribal and Federal Affairs Liaison, South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, FL 33406

ENCLOSURE 2

Change in Operations Criteria for S-190 Gated Structure Project Previously Recorded Sites



Source: ESRI ArcMap 10 Resource Data

Nasuti, Melissa A SAJ

From: Scofield, Brian [brian_scofield@fws.gov]
Sent: Wednesday, February 11, 2015 1:46 PM
To: Nasuti, Melissa A SAJ
Subject: Re: [EXTERNAL] Re: S-190 Operations Evaluation (UNCLASSIFIED)

The designations below are correct.

-Brian

On Wed, Feb 11, 2015 at 12:39 PM, Nasuti, Melissa A SAJ <Melissa.A.Nasuti@usace.army.mil <mailto:Melissa.A.Nasuti@usace.army.mil> > wrote:

> Classification: UNCLASSIFIED
> Caveats: NONE
>
> Brian,
>
> Could you quickly confirm the designations.
>
> Audubon's crested caracara (Polyborus plancus audubonii) - Threatened
>
> Florida bonneted bat (Eumops floridanus) - Endangered
>
> Manatee (Trichechus manatus latirostris) - Endangered, Critical Habitat
>
> Florida panther (Puma [=Felis] concolor coryi) - Endangered
>
> Eastern indigo snake (Drymarchon corais couperi) - Threatened
>
> Everglade snail kite (Rostrhamus sociabilis plumbeus) - Endangered, Critical Habitat
>
> Gopher tortoise (Gopherus Polyphemus) - Candidate Species
>
> Wood stork (Mycteria americana) - Threatened
>
> Melissa
>
> -----Original Message-----
> From: Scofield, Brian [mailto:brian_scofield@fws.gov]
> Sent: Wednesday, February 11, 2015 12:13 PM
> To: Nasuti, Melissa A SAJ
> Subject: Re: [EXTERNAL] Re: S-190 Operations Evaluation (UNCLASSIFIED)
>
> Melissa,
>
> Please use this email for your record and it is good for 90 days. I will not be sending out a formal letter for a species list unless you have to have one.
>
> Please let me know.

-Brian

On Wed, Feb 11, 2015 at 11:07 AM, Nasuti, Melissa A SAJ <Melissa.A.Nasuti@usace.army.mil> wrote:

Classification: UNCLASSIFIED
Caveats: NONE

Brian,

Thank you for the quick reply. Will you be drafting a formal letter? In the past I have received a formal concurrence letter from USFWS stating that the species list is good for 90 days.

Melissa

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From: Scofield, Brian [mailto:brian_scofield@fws.gov]
Sent: Wednesday, February 11, 2015 10:58 AM
To: Nasuti, Melissa A SAJ
Subject: Re: [EXTERNAL] Re: S-190 Operations Evaluation (UNCLASSIFIED)

Hi Melissa,

Please see the list below:

Audubon's crested caracara (Polyborus plancus audubonii)

Florida bonneted bat (Eumops floridanus)

Manatee (Trichechus manatus latirostris)

Florida panther (Puma [=Felis] concolor coryi)

Eastern indigo snake (Drymarchon corais couperi)

Everglade snail kite (Rostrhamus sociabilis plumbeus)

Gopher tortoise (Gopherus Polyphemus)

Wood stork (Mycteria americana)

-Brian

Brian Scofield
Wildlife Biologist
U.S. Fish and Wildlife Service
29 South Blvd
APAFR, FL 33825-9381
Office# 863-452-4213

On Wed, Feb 11, 2015 at 8:09 AM, Nasuti, Melissa A SAJ <Melissa.A.Nasuti@usace.army.mil> wrote:

Classification: UNCLASSIFIED
Caveats: NONE

Brian,

Please see attached request for written confirmation of species either listed or proposed for listing that may be present in the project area for potential modifications to the operating criteria for S-190. A hard copy has been placed in the mail as well.

If you have any further questions please let me know.

Thank you,

Melissa

-----Original Message-----
From: Scofield, Brian [mailto:brian_scofield@fws.gov]
Sent: Thursday, August 28, 2014 1:45 PM
To: Nasuti, Melissa A SAJ
Cc: Constance Cassler
Subject: [EXTERNAL] Re: S-190 Operations Evaluation (UNCLASSIFIED)

Hi Melissa,

I will be the FWS POC for this project and thank you for including us in the planning phase. Please let me know how I can help.

Thanks,
Brian

Brian Scofield
Wildlife Biologist
U.S. Fish and Wildlife Service
29 South Blvd
APAFR, FL 33825-9381
Office# 863-452-4213

---------- Forwarded message ----------
From: Nasuti, Melissa A SAJ <Melissa.A.Nasuti@usace.army.mil>
Date: Mon, Aug 11, 2014 at 9:06 AM
Subject: S-190 Operations Evaluation (UNCLASSIFIED)
To: "Roybal, Art" <art_roybal@fws.gov>

Classification: UNCLASSIFIED
Caveats: NONE

Nasuti, Melissa A SAJ

From: Scofield, Brian [brian_scofield@fws.gov]
Sent: Wednesday, June 03, 2015 3:11 PM
To: Nasuti, Melissa A SAJ
Subject: Re: [EXTERNAL] Re: S-190 Operations Evaluation (UNCLASSIFIED)

Hi Melissa,

The list I provided you on February 11, 2015, is still valid.

-Brian

Brian Scofield
Fish & Wildlife Biologist
U.S. Fish and Wildlife Service
29 South Blvd
APAFR, FL 33825-9381
(o) 863-452-4213
(c) 772-532-8961

On Wed, Jun 3, 2015 at 3:06 PM, Nasuti, Melissa A SAJ <Melissa.A.Nasuti@usace.army.mil> wrote:

> Classification: UNCLASSIFIED
> Caveats: NONE
>
> Brian,
>
> I am following up on the correspondence in the emails below. On February 11th, 2015, I sent USFWS a request for written confirmation of species either listed or proposed for listing that may be present in the project area for potential modifications to the operating criteria for S-190. You had provided confirmation of the list of species below stating that below list was good for 90 days. We are beyond the 90 day mark. Could you please re-confirm the list of species provided below?
>
> Audubon’s crested caracara (Polyborus plancus audubonii) - Threatened
>
> Florida bonneted bat (Eumops floridanus) - Endangered
>
> Manatee (Trichechus manatus latirostris) - Endangered, Critical Habitat
>
> Florida panther (Puma [=Felis] concolor coryi) - Endangered
>
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>
> Everglade snail kite (Rostrhamus sociabilis plumbeus) - Endangered, Critical Habitat
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> Gopher tortoise (Gopherus Polyphemus) - Candidate Species
>
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>
> Thanks,

Melissa
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-Brian

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Melissa

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Melissa,

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Please let me know.

-Brian

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Hi Melissa,

Please see the list below:

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Gopher tortoise (Gopherus Polyphemus)

Wood stork (Mycteria americana)

-Brian

Brian Scofield
Wildlife Biologist
U.S. Fish and Wildlife Service
29 South Blvd
APAFR, FL 33825-9381
Office# 863-452-4213

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If you have any further questions please let me know.

Thank you,

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Hi Melissa,

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Thanks,
Brian

Brian Scofield
Wildlife Biologist
U.S. Fish and Wildlife Service
29 South Blvd
APAFR, FL 33825-9381
Office# 863-452-4213

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Date: Mon, Aug 11, 2014 at 9:06 AM
Subject: S-190 Operations Evaluation (UNCLASSIFIED)
To: "Roybal, Art" <art_roybal@fws.gov>

Classification: UNCLASSIFIED

Caveats: NONE

Art,

The Corps met with the Seminole Tribe of Florida on Tuesday August 5th to kick of the S-190 effort. The Seminole Tribe of Florida has requested changes to the current operating criteria for S-190 which is located on the L-28 Interceptor Canal, directly south of the confluence of the North Feeder Canal and West Feeder Canal. The Seminole Tribe of Florida has requested S-190 to be operated on a higher setting year round. Potential benefits of maintaining higher stages within the North and West Feeder Canals, as described by the Tribe, include increased groundwater recharge for wells and increased water availability for purposes of agricultural use, domestic water supply, drought management, and improvement to native vegetation.

USACE will be putting together a project schedule. It is anticipated that we will be drafting an environmental assessment. Once we have a project schedule I will pass that along to you.

Quick question for you - Will you be the appropriate point of contact in terms of T&E consultation? At the kick off meeting, Stacey Myers from the Seminole Tribe mentioned that a Tori Foster might be the appropriate POC. I assume that she might be the POC for Regulatory permitting?

I have indicated to the Tribe that I would like to extend the PDT invitations to the FWS - so that your agency is aware of the ongoing discussions prior to receiving an effects determination from the Corps. If you can attend, great. If not, that's ok. Just wanted you to be aware.

Thanks,

Melissa Nasuti
U.S. Army Corps of Engineers
Planning Division - Jacksonville District
701 San Marco Boulevard
Jacksonville, FL 32207
Office Phone: 904-232-1368

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

SEMINOLE TRIBE OF FLORIDA

CHERISE MAPLES
Environmental Resource Management Department Director

6365 Taft Street, Suite 3008
HOLLYWOOD, FLORIDA 33024
PHONE (954) 965-4380
FAX (954) 962-8727
E-MAIL: cmaples@semtribe.com

WEBSITE:
http://www.semtribe.com

Tribal Officers:

JAMES E. BILLIE
Chairman

MITCHELL CYPRESS
Vice Chairman

LAVONNE M. KIPPENBERGER
Secretary

PETER A. HAHN
Treasurer

June 30, 2015

Mr. Tim Murphy
Deputy District Engineer for Programs and Project Management
U.S. Army Corps of Engineers
Jacksonville District
701 San Marco Boulevard
Jacksonville, FL

Re: S-190 PDT Operation Evaluation

Dear Mr. Murphy:

The purpose of this letter is to introduce you to an issue the U.S. Army Corps of Engineers (Corps) and the Seminole Tribe of Florida (Tribe) have been working to resolve for the last several years.

Historical Background

After years of experiencing reduced groundwater levels and seemingly related surface water problems, the Tribe looked into the current operation of the S-190 structure on the Big Cypress Reservation (Big Cypress). What we found was concerning – it appeared that the structure was not being managed according to its original design purpose, which was to prevent over drainage of the Big Cypress Reservation. Rather, S-190's operation schedule was changed at some point in the late 1980's to early 1990's to prevent flooding. The records we have been able to review are incomplete, thus we have been unable to determine who requested this operational change. Further, neither we nor the Corps can find any evidence that the Tribe or BIA were ever consulted about the change, that any analysis of the impacts to ground or surface water resources on Big Cypress was conducted, that NEPA was followed, or that any public notice or review of the change was provided.

In October 2011, the Tribe made a formal request to the Corps to return the operations of S-190 to its original design for a period of two years as a "Demonstration Project." After several years of discussions between the Tribe, the Corps and the South Florida Water Management District (SFWMD), the Corps agreed to consider the Tribe's request. A Project Delivery Team (PDT) was created by the Corps in July 2014. A plan to evaluate the Tribe's request was developed by December 2014 ("Review Plan-Changes to Structure S-190 Operational Criteria In the Central

South Florida Project Master Water Control Manual Water Conservation Areas, Everglades National Park, and ENP-South Dade Conveyance System" (Review Plan)), and approved by C. David Turner on February 4, 2015. This plan includes compliance with National Environmental Policy Act (NEPA).

The project objective as stated in the Review Plan is to change the Operations Criteria of the S-190 Structure as described in the current Master Water Control Manual (1996) to that described in the Operations and Maintenance Manual (1968). The intent of the operational change is to limit the amount of over drainage to the Seminole Big Cypress Indian Reservation (Figure 1). In accordance with NEPA, an Environmental Assessment (EA) will be completed to document potential environmental effects of an operational change at S-190. The EA will be prepared under NEPA to provide sufficient evidence and analysis to determine whether the proposed action would require the preparation of an environmental impact statement, or a finding of no significant impact. The Tribe has participated in all S-190 PDT meetings and has provided comment and input on all issues.

Issues and Concerns

The Tribe is concerned that, although the re-evaluation of the S-190 was undertaken at the Tribe's request in order to allow a correction to the structure's operation to once again focus on the Tribe's needs, consideration of potential impacts on lands outside of the Big Cypress boundaries may carry more weight than the needs of the Tribe. We are looking for confirmation from the Corps that our concern is unwarranted.

Therefore, we request a meeting in Jacksonville with your senior staff to clarify the Tribe's concerns and to hear from the Corps a clear explanation of how the agency plans to balance these competing interests in your ultimate decision on the Tribe's request and the supporting NEPA documents. We believe that it is critically important that the Tribe be well informed of the overall direction the Corps plans to take in advance of reviewing a completed draft of the EA.

The supplemental purpose of this letter is to document the Tribe's concerns. Given the paucity of information as to the operation change made for the S-190 structure over 20 years ago, we want to be sure that the Tribe's concerns will be addressed and included in the forthcoming EA, which was initially projected to be provided in Draft for comment by July 2015.

Please feel free to contact me at 954-965-4380 if you have any questions or require any additional information.

We appreciate the attention of the Corps to this matter.

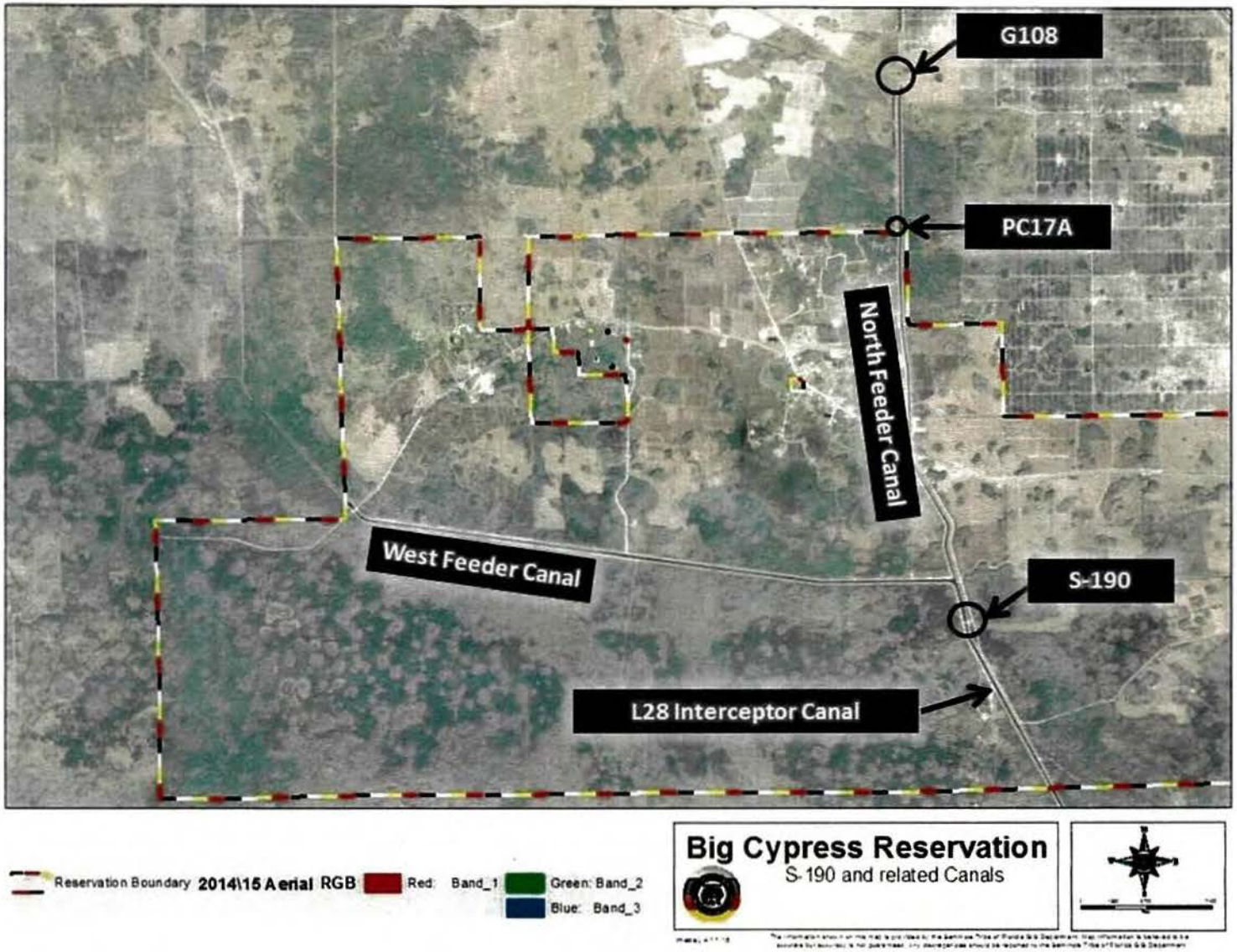
Sincerely,

Cherise Maples, Director
Environmental Resource Management Department
Seminole Tribe of Florida

c:

Jeff Couch, Chief Okeechobee Section, Programs and Project Management
Tiphanie Jinks, Project Manager
Leonard Rawlings, BIA
Adam Nelson
Jim Shore
Steve Walker
Patricia Power

Figure 1 Seminole Tribe of Florida Big Cypress Reservation



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 San Marco Boulevard
JACKSONVILLE, FLORIDA 32207-8175

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

SEP 0 3 2015

Blake Guillory, Executive Director
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406

Dear Mr. Guillory,

In accordance with regulations pertaining to the National Environmental Policy Act (NEPA) (Title 40 of the Code of Federal Regulations, part 1501.6), I am formally inviting the South Florida Water Management District to become a cooperating agency for the S-190 Operation Evaluation Study. The purpose of the project is to evaluate recommendations for modifications to the current water operating schedule of the S-190 for purposes of providing additional water storage in the North and West Feeder Canals and higher groundwater levels within the western portion of Big Cypress Reservation. The U.S. Army Corps of Engineers (Corps) is beginning the NEPA process that will include an Environmental Assessment. The Environmental Assessment will examine potential effects that changes to the current water operations schedule may have on natural and cultural resources.

Enclosure 1 shows the location of the S-190, which acts as the primary water discharge structure in the Feeder Canal Basin located in southeastern Hendry County. The two major canals associated with the Feeder Canal Basin are the North Feeder Canal, and the West Feeder Canal. These two canals merge in the lower southeastern corner of the basin and discharge south through the S-190 structure and into the L-28 Interceptor Canal, and eventually Water Conservation Area 3A. S-190 maintains water control stages north of the structure in the North and West Feeder Canals.

Cooperating agency status involves actions and responsibilities that are more involved than a commenting or permitting agency. In the case of the S-190 Operations Evaluation, we believe that cooperating agencies shall assist Corps authors in developing language for the Environmental Assessment, reviewing and providing edits to draft language and providing comments on those sections of the document where an agency has either regulatory authority or specialized expertise (CEQ Regulations §1051.6(a)2). This review and editing process will take place earlier than the typical review and comment associated with an Environmental Assessment.

As part of the S-190 Operations Evaluation external Project Delivery Team, your staff has been providing expert information on the existing data and environmental studies that the Corps is using to develop the environmental effects assessment. We are now taking this opportunity to formalize your participation in the NEPA process as a cooperating agency. If you choose not to become a cooperating agency, we will continue to coordinate as we have done in the past.

The formulation of the project alternatives will be in accordance with Engineer Regulation ER 1105-2-100 and will fully consider a range of environmental, economic and social factors. Your participation as a cooperating agency will help us fully consider the views, needs and benefits of competing interests. For additional information on becoming a cooperating agency, please see the enclosed "Rights and Responsibilities of Lead and Cooperating Agencies" (Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, Council on Environmental Quality, 1981). The complete list of Forty FAQs can be found at http://www.nepa.gov/nepa/regs/40/40p3.htm.

We would appreciate a response to this invitation to become a cooperating agency (as described above) within 30 days of the date of this letter. If you have any questions, please contact Dr. Gina Ralph at (904) 232-2336 or via email at Gina.P.Ralph@usace.army.mil.

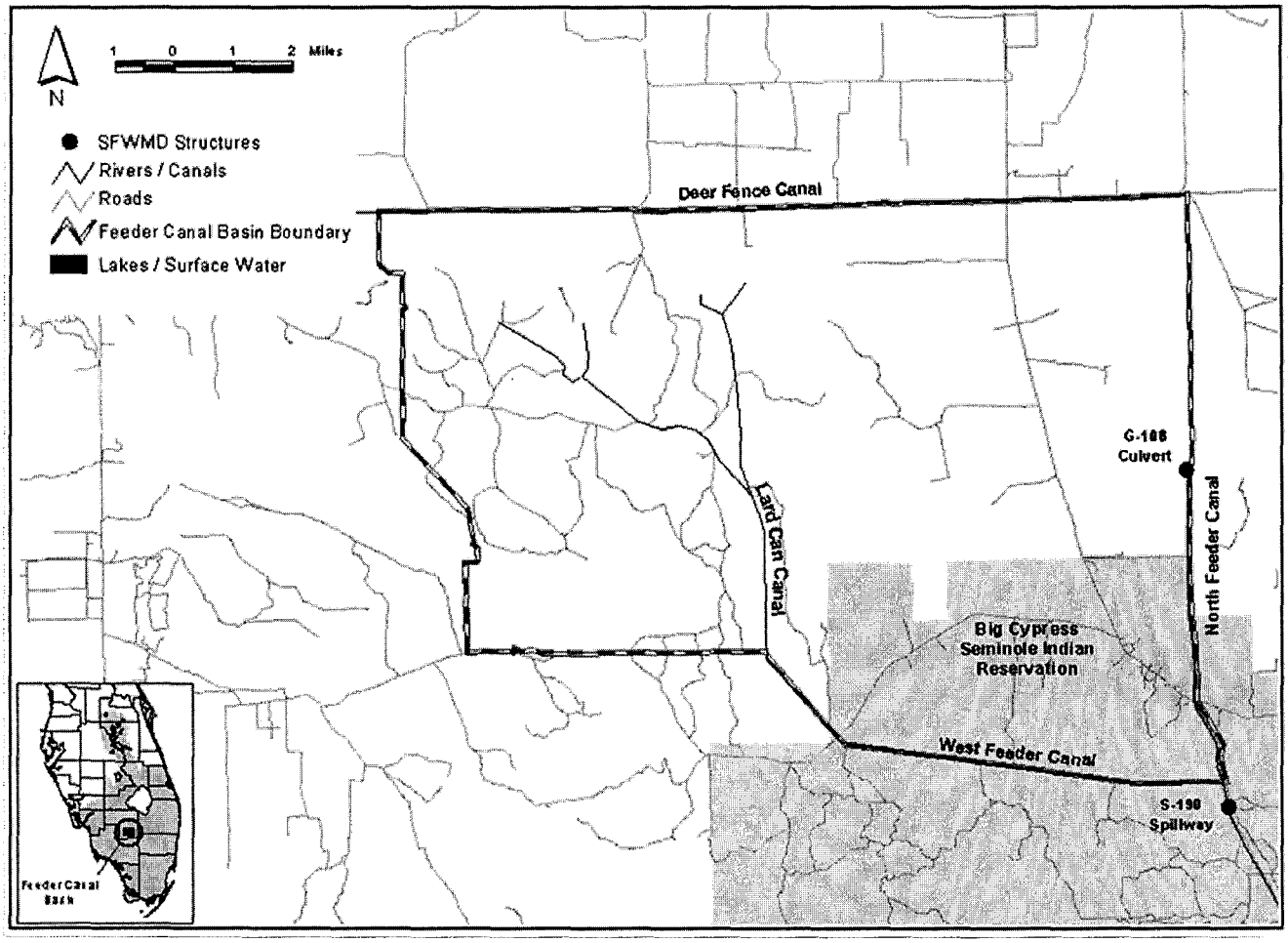
Sincerely,

Eric L Bush
Chief, Planning and Policy Division

Enclosure

Copies Furnished:

Chairman James Billie, Seminole Tribe of Florida, 6300 Stirling Road, Hollywood, Florida 33024
Cherise Maples, Environmental Resource Management Department Director, Seminole Tribe of Florida, 6365 Taft Street, Suite 3008, Hollywood, Florida 33024


N
1 0 1 2 Miles
SFWMD Structures
Rivers / Canals
Roads
Feeder Canal Basin Boundary
Lakes / Surface Water
Deer Fence Canal
G-136
Culvert
North Feeder Canal
Lard Can Canal
Big Cypress
Seminole Indian
Reservation
West Feeder Canal
S-190
Spillway
Feeder Canal
Basin

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 San Marco Boulevard
JACKSONVILLE, FLORIDA 32207-8175

REPLY TO
ATTENTION OF

SEP 3 2015

Executive Office

Honorable Chairman James Billie
Seminole Tribe of Florida
6300 Stirling Road
Hollywood, Florida 33024

Dear Chairman Billie,

In accordance with regulations pertaining to the National Environmental Policy Act (NEPA) (Title 40 of the Code of Federal Regulations, part 1501.6), I am formally inviting the Seminole Tribe of Florida to become a cooperating entity for the S-190 Operation Evaluation Study. The purpose of the project is to evaluate recommendations for modifications to the current water operating schedule of the S-190 for purposes of providing additional water storage in the North and West Feeder Canals and higher groundwater levels within the western portion of Big Cypress Reservation. The U.S. Army Corps of Engineers (Corps) is beginning the NEPA process that will include an Environmental Assessment. The Environmental Assessment will examine potential effects that changes to the current water operations schedule may have on natural and cultural resources.

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Cooperating entity status involves actions and responsibilities that are more involved than a commenting or permitting entity. In the case of the S-190 Operations Evaluation, we believe that cooperating entities can assist Corps authors in developing language for the Environmental Assessment, reviewing and providing edits to draft language and providing comments on those sections of the document where an entity (such as a sovereign Tribe) has either regulatory authority or specialized expertise (CEQ Regulations §1051.6(a)2); or when the effects are on a reservation, an Indian Tribe, may by agreement with the lead agency, become a cooperating entity (40 CFR 1508.5).

This review and editing process will take place earlier than the typical review and comment associated with an Environmental Assessment. As part of the S-190 Operations Evaluation external Project Delivery Team, your staff has been providing expert information on the existing data and environmental studies that the Corps is using to develop the environmental effects assessment. We are now taking this opportunity to formalize your participation in the NEPA process as a cooperating entity. If you choose not to become a cooperating agency, we will continue to coordinate as the proposed action has a direct effect on Tribal lands.

The formulation of the project alternatives will be in accordance with Engineer Regulation ER 1105-2-100 and will fully consider a range of environmental, economic and social factors. Your participation as a cooperating agency will help us fully consider the views, needs and benefits of competing interests. For additional information on becoming a cooperating entity, please see the enclosed "Rights and Responsibilities of Lead and Cooperating Agencies" (Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, Council on Environmental Quality, 1981). The complete list of Forty FAQs can be found at http://www.nepa.gov/nepa/regs/40/40p3.htm.

We would appreciate a response to this invitation to become a cooperating entity (as described above) within 30 days of the date of this letter. If you have any questions, please contact Dr. Gina Ralph at (904) 232-2336 or via email at Gina.P.Ralph@usace.army.mil.

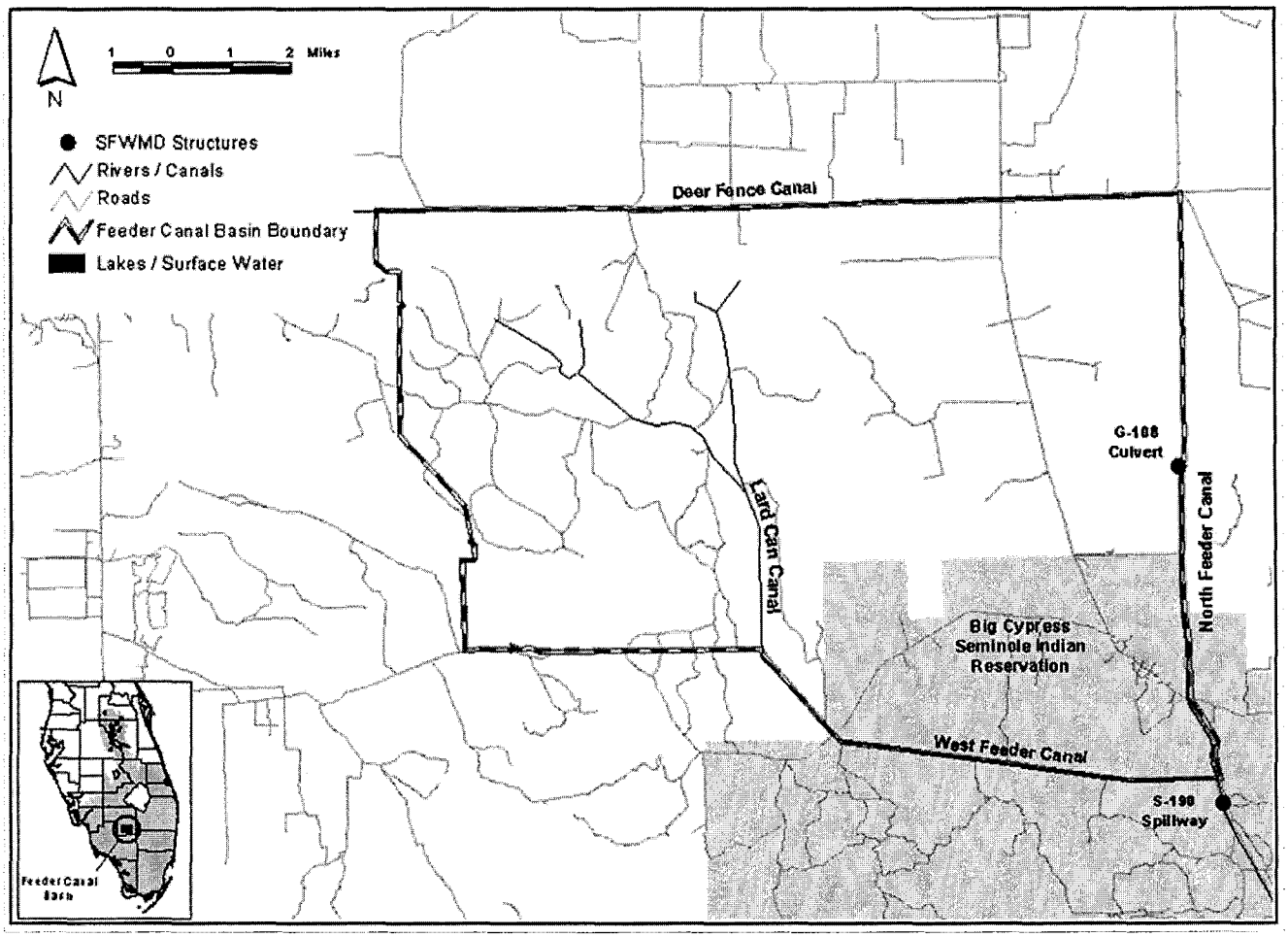
Sincerely,

Jason A. Kirk, P.E.
Colonel, U. S. Army
District Commander

Enclosure

Copies Furnished:

Cherise Maples, Environmental Resource Management Department Director, Seminole Tribe of Florida, 6365 Taft Street, Suite 3008, Hollywood, Florida 33024
Blake Guillory, Executive Director, South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, Florida 33406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Lard Can Canal
Big Cypress
Seminole Indian
Reservation
West Feeder Canal
S-190
Spillway
Feeder Canal
Basin

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

SEP 2 2 2015

Executive Office

The Honorable Colley Billie
Chairman, Miccosukee Tribe of Indians of Florida
P.O. Box 440021
Tamiami Station
Miami, Florida 33144

Dear Chairman Billie,

In accordance with regulations pertaining to the National Environmental Policy Act (NEPA) (Title 40 of the Code of Federal Regulations, part 1501.6), I am formally inviting the Miccosukee Indian Tribe to become a cooperating entity for the S-190 Operation Evaluation Study. The purpose of the project is to evaluate recommendations for modifications to the current water operating schedule of the S-190 for purposes of providing additional water storage in the North and West Feeder Canals and higher groundwater levels within the western portion of Seminole Big Cypress Reservation. The U.S. Army Corps of Engineers (Corps) is beginning the NEPA process that will include an Environmental Assessment. The Environmental Assessment will examine potential effects that changes to the current water operations schedule may have on natural and cultural resources.

Enclosure 1 shows the location of the S-190, which acts as the primary water discharge structure in the Feeder Canal Basin located in southeastern Hendry County. The two major canals associated with the Feeder Canal Basin are the North Feeder Canal, and the West Feeder Canal. These two canals merge in the lower southeastern corner of the basin and discharge south through the S-190 structure and into the L-28 Interceptor Canal, and eventually Water Conservation Area 3A. S-190 maintains water control stages north of the structure in the North and West Feeder Canals.

Cooperating entity status involves actions and responsibilities that are more involved than a commenting or permitting entity. In the case of the S-190 Operations Evaluation, we believe that cooperating entities can assist Corps authors in developing language for the Environmental Assessment, reviewing and providing edits to draft language and providing comments on those sections of the document where an entity (such as a sovereign Tribe) has either regulatory authority or specialized expertise (CEQ Regulations §1051.6(a)2); or when the effects are on a reservation, an Indian Tribe, may by agreement with the lead agency, become a cooperating entity (40 CFR 1508.5).

This review and editing process will take place earlier than the typical review and comment associated with an Environmental Assessment. As part of the S-190 Operations Evaluation external Project Delivery Team, your staff has been providing expert information on the existing data and environmental studies that the Corps is using to develop the environmental effects assessment. We are now taking this opportunity to formalize your participation in the NEPA process as a cooperating entity. If you choose not to become a cooperating entity, we will continue to coordinate as the proposed action may affect Tribal lands.

The formulation of the project alternatives will be in accordance with Engineer Regulation ER 1105-2-100 and will fully consider a range of environmental, economic and social factors. Your participation as a cooperating agency will help us fully consider the views, needs and benefits of competing interests. For additional information on becoming a cooperating entity, please see the enclosed "Rights and Responsibilities of Lead and Cooperating Agencies" (Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, Council on Environmental Quality, 1981). The complete list of Forty FAQs can be found at http://www.nepa.gov/nepa/regs/40/40p3.htm.

We would appreciate a response to this invitation to become a cooperating entity (as described above) within 30 days of the date of this letter. If you have any questions, please contact Dr. Gina Ralph at (904) 232-2336 or via email at Gina.P.Ralph@usace.army.mil.

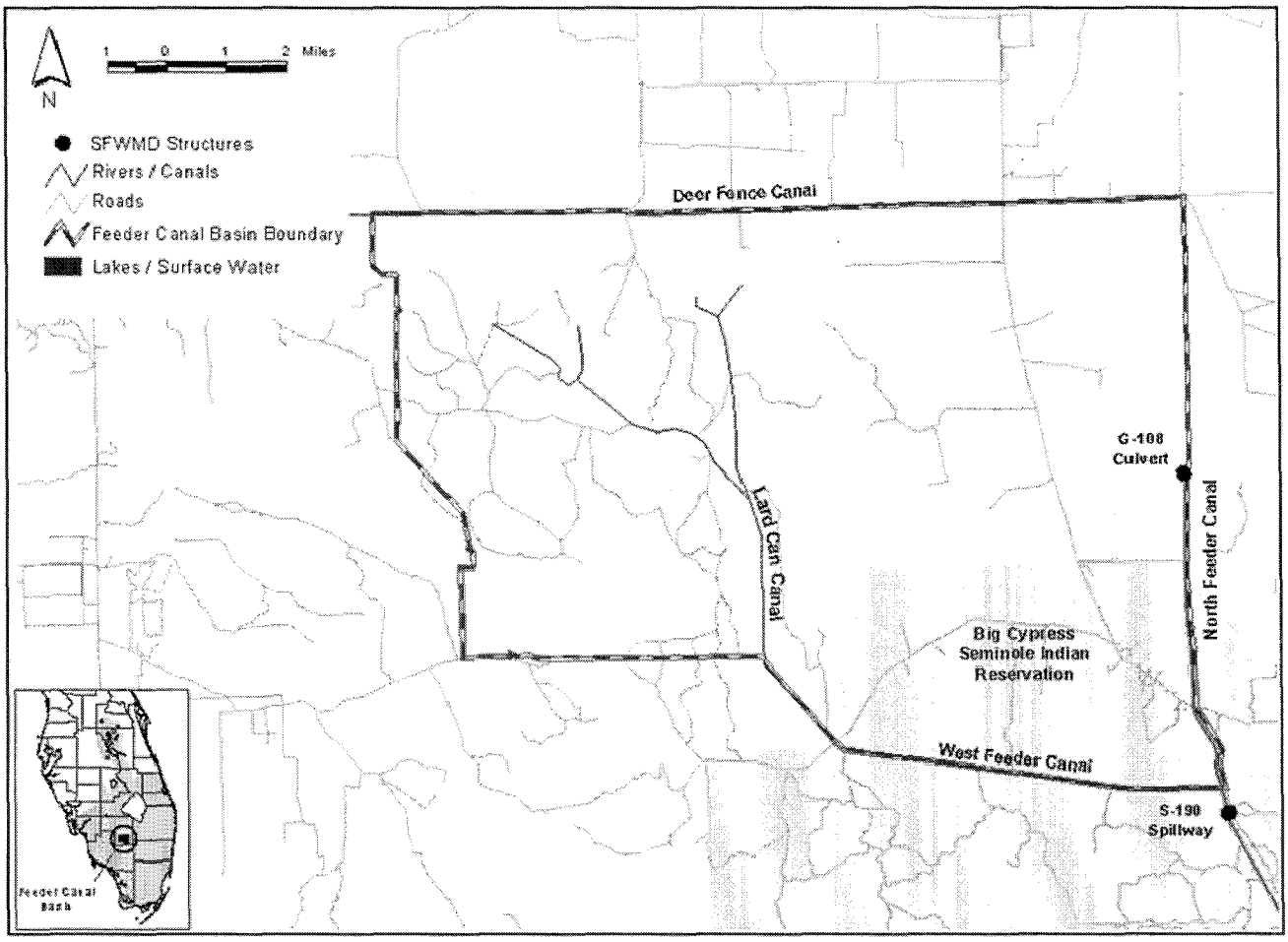
Sincerely,

Jason A. Kirk, P.E.
Colonel, U. S. Army
District Commander

Enclosure

Copies Furnished:

James Erskine, Miccosukee Indian Tribe, Tamiami Station, P.O. Box 440021 Miami, Florida 33144
Cherise Maples, Environmental Resource Management Department Director, Seminole Tribe of Florida, 6365 Taft Street, Suite 3008, Hollywood, Florida 33024
Blake Guillory, Executive Director, South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, Florida 33406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Roads
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S-190
Spillway
Feeder Canal
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DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 San Marco Boulevard
JACKSONVILLE, FLORIDA 32207-8175

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

SEP 0 9 2016

Bruce W. Maytubby, Regional Director
Eastern Regional Office
545 Marriott Drive, Suite 700
Nashville, TN 37214

Dear Mr. Maytubby,

In accordance with regulations pertaining to the National Environmental Policy Act (NEPA) (Title 40 of the Code of Federal Regulations, part 1501.6), I am formally inviting the Bureau of Indian Affairs to become a cooperating agency for the S-190 Operation Evaluation Study. The purpose of the project is to evaluate recommendations for modifications to the current water operating schedule of the S-190 for purposes of providing additional water storage in the North and West Feeder Canals and higher groundwater levels within the western portion of Big Cypress Reservation. The U.S. Army Corps of Engineers (Corps) is beginning the NEPA process that will include an Environmental Assessment. The Environmental Assessment will examine potential effects that changes to the current water operations schedule may have on natural and cultural resources.

Enclosure 1 shows the location of the S-190, which acts as the primary water discharge structure in the Feeder Canal Basin located in southeastern Hendry County. The two major canals associated with the Feeder Canal Basin are the North Feeder Canal, and the West Feeder Canal. These two canals merge in the lower southeastern corner of the basin and discharge south through the S-190 structure and into the L-28 Interceptor Canal, and eventually Water Conservation Area 3A. S-190 maintains water control stages north of the structure in the North and West Feeder Canals.

Cooperating agency status involves actions and responsibilities that are more involved than a commenting or permitting agency. In the case of the S-190 Operations Evaluation, we believe that cooperating agencies shall assist Corps authors in developing language for the Environmental Assessment, reviewing and providing edits to draft language and providing comments on those sections of the document where an agency has either regulatory authority or specialized expertise (CEQ Regulations §1051.6(a)2). This review and editing process will take place earlier than the typical review and comment associated with an Environmental Assessment. As part of the S-190 Operations Evaluation external Project Delivery Team, your staff has been providing expert information on the existing data and environmental studies that the Corps is using to develop the environmental effects assessment.

We are now taking this opportunity to formalize your participation in the NEPA process as a cooperating agency. If you choose not to become a cooperating agency, we will continue to coordinate as we have done in the past.

The formulation of the project alternatives will be in accordance with Engineer Regulation ER 1105-2-100 and will fully consider a range of environmental, economic and social factors. Your participation as a cooperating agency will help us fully consider the views, needs and benefits of competing interests. For additional information on becoming a cooperating agency, please see the enclosed "Rights and Responsibilities of Lead and Cooperating Agencies" (Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, Council on Environmental Quality, 1981). The complete list of Forty FAQs can be found at http://www.nepa.gov/nepa/regs/40/40p3.htm.

We would appreciate a response to this invitation to become a cooperating agency (as described above) within 30 days of the date of this letter. If you have any questions, please contact Dr. Gina Ralph at (904) 232-2336 or via email at Gina.P.Ralph@usace.army.mil.

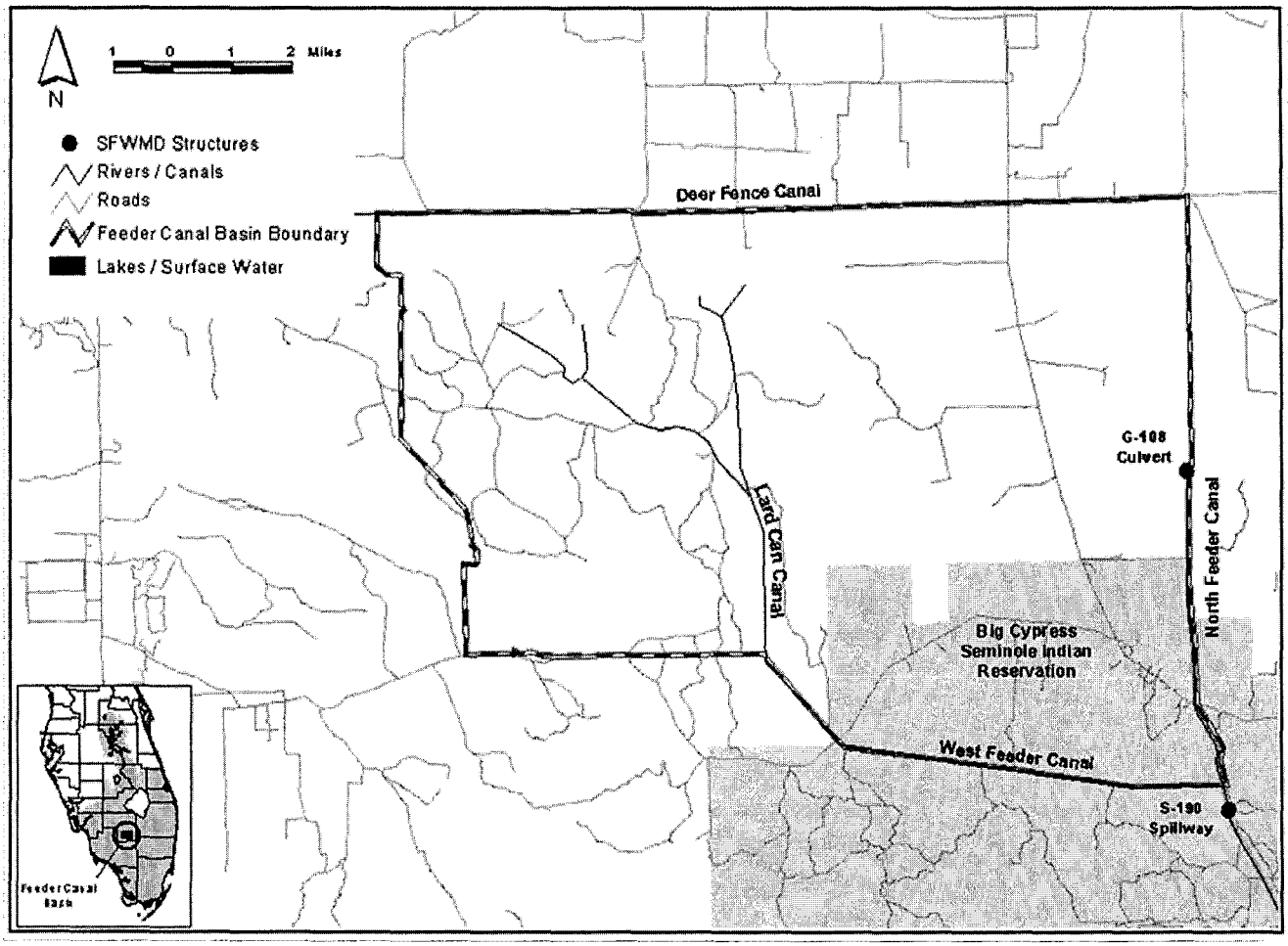
Sincerely,

David A Tipple
Deputy Chief, Planning and Policy Division

Enclosure

Copies Furnished:

Chairman James Billie, Seminole Tribe of Florida, 6300 Stirling Road, Hollywood, Florida 33024
Cherise Maples, Environmental Resource Management Department Director, Seminole Tribe of Florida, 6365 Taft Street, Suite 3008, Hollywood, Florida 33024
Armando Ramirez, South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, Florida 33406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Basin

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS

Eastern Regional Office
545 Marriott Drive, Suite 700
Nashville, TN 37214

Trust Services
Natural Resources

SEP 17 2015

Mr. David A. Tipple
Deputy Chief, Planning and Policy Division
Department of the Army
Jacksonville District Corps of Engineers
701 San Marco Boulevard
Jacksonville, Florida 32207-8175

Dear Mr. Tipple:

We are in receipt of your request for the Eastern Regional Office of the Bureau of Indian Affairs to serve as a cooperating agency for the Environmental Assessment of the S-190 Operation Evaluation Study. The BIA accepts your request to serve as a cooperating agency for the Environmental Assessment of the S-190 Operation Evaluation Study. Since the S-190 structure is located within the sovereign boundaries of the Seminole Nation of Indian's Big Cypress Reservation, the BIA looks forward to assisting the USACE in assessing potential environmental impacts from the project on tribal resources.

Please coordinate with the Region's Hydrologist, Mr. Leonard Rawlings, P.G., at (615) 564-6832 or leonard.rawlings@bia.gov.

Sincerely,

Regional Director
Eastern Region

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
Florida State Office
2614 NW 43rd Street
Gainesville, FL 32606

PH 352-338-9500
FX 352-338-9574
www.fl.nrcs.usda.gov

March 30, 2016

Melissa Nasuti
U.S. Army corps of Engineers
Planning Division - Jacksonville District
701 San Marco Boulevard
Jacksonville, FL 32207

Important Farmland Assessment for the Big Cypress Indian Reservation project in Hendry County, Florida

This letter is in response to your request on the Prime, Unique, or Locally Important Farmland assessment as part of the FPPA requirements for the Big Cypress Rehydration project in Hendry County, Florida. Enclosed are the Important Farmlands map and Farmland Conversion Impact Rating forms (AD-1006) for the project area.

Briefly, the USDA-NRCS is responsible for monitoring the conversion of Prime, Unique, or Locally Important Farmland to urban uses. We have determined that there are delineations of Important Farmland soils within the scope of this project.

However, based on correspondence there will be no anticipated conversion of Important Farmland within the scope of this project. Therefore, we only completed the Part 1 of the AD-1006. If additional impacts are anticipated, please provide notification and we will re-assess the impacts to Important Farmland.

If you have any questions, please feel free to contact me.

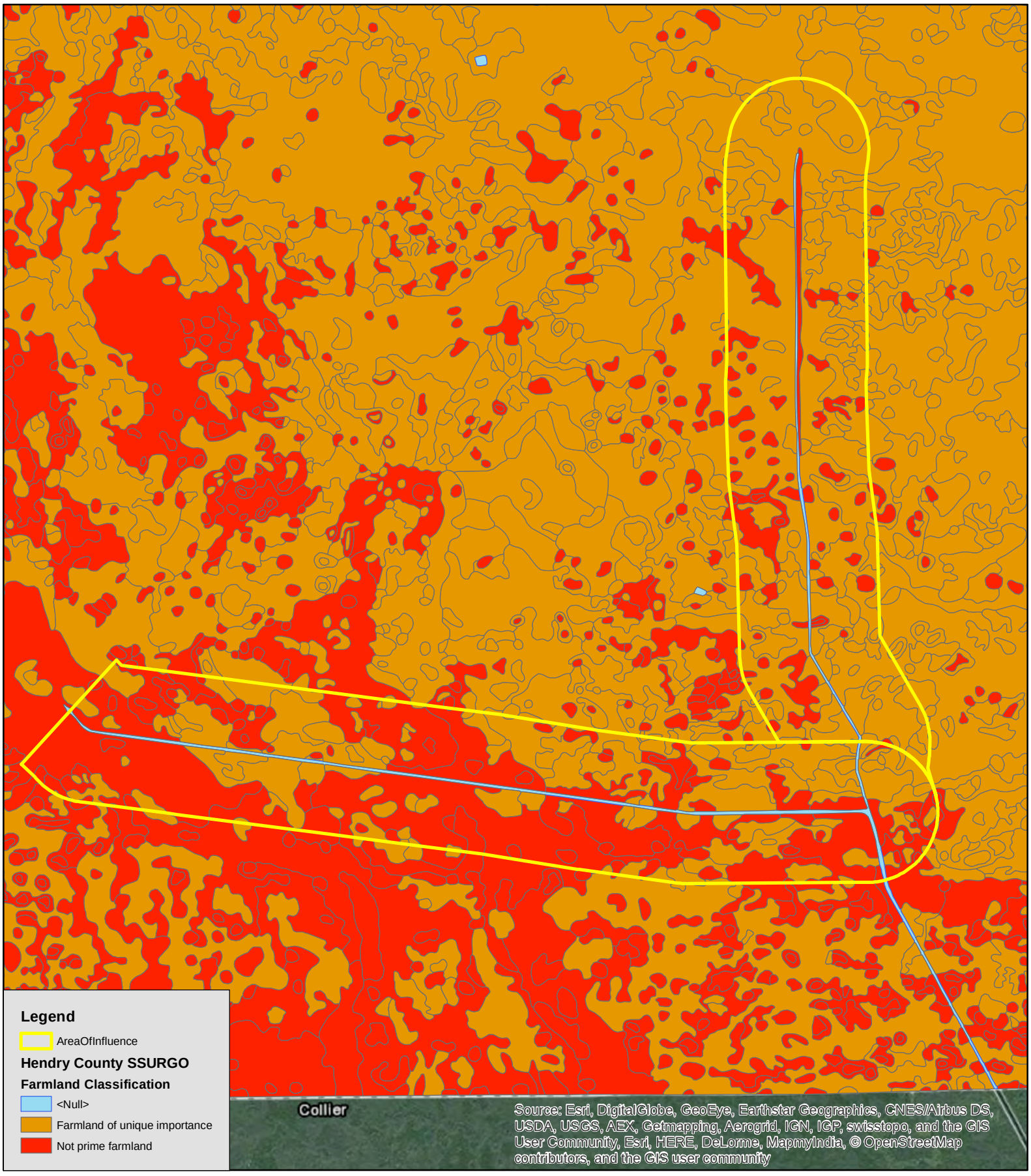
Regards,

Rick

Rick Robbins
USDA-NRCS
Soil Scientist
Gainesville, Florida

w/ AD-1006, and map attachments

FPPA - Big Cypress Seminole Indian Reservation



U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 3/16/16
Name Of Project S-190 Operational Modifications	Federal Agency Involved U.S. Army Corps of Engineers
Proposed Land Use Rehydration of Seminole Indian Reservation	County And State Hendry County, Florida
PART II *(To be completed by NRCS)*	Date Request Received By NRCS

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply -- do not complete additional parts of this form).*	Yes ☑	No ☐	Acres Irrigated	Average Farm Size
Major Crop*(s)*	Farmable Land In Govt. Jurisdiction Acres: %		Amount Of Farmland As Defined in FPPA Acres: %	
Name Of Land Evaluation System Used	Name Of Local Site Assessment System None		Date Land Evaluation Returned By NRCS 3/30/16	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	0.0	0.0	0.0	0.0
B. Total Acres To Be Converted Indirectly	0.0	0.0	0.0	0.0
C. Total Acres In Site	0.0	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*				

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use					
2. Perimeter In Nonurban Use					
3. Percent Of Site Being Farmed					
4. Protection Provided By State And Local Government					
5. Distance From Urban Builtup Area					
6. Distance To Urban Support Services					
7. Size Of Present Farm Unit Compared To Average					
8. Creation Of Nonfarmable Farmland					
9. Availability Of Farm Support Services					
10. On-Farm Investments					
11. Effects Of Conversion On Farm Support Services					
12. Compatibility With Existing Agricultural Use					
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100				
Total Site Assessment *(From Part VI above or a local site assessment)*	160	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	0	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

(See Instructions on reverse side)

This form was electronically produced by National Production Services Staff

Clear Form

Form AD-1006 (10-83)

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 San Marco Boulevard
JACKSONVILLE, FLORIDA 32207-8175

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

MAR 0 8 2016

Dr. Paul Backhouse, THPO
Seminole Tribe of Florida
Tribal Historic Preservation Office
30290 Josie Billie Highway
PMP 1004
Clewiston, Florida 33440

Re: Proposed Modification to Operating Criteria for S-190.

Dear Dr. Backhouse:

The U.S. Army Corps of Engineers (Corps), Jacksonville District would like to extend our appreciation to the Seminole Tribe of Florida's Tribal Historic Preservation Office (STOF – THPO) for meeting with the Corps on February 25, 2016 to discuss the area of potential effects (APE) concerning cultural resources for the Structure S-190 (S-190) Operations Study. At the STOF's request, the Corps is studying potential environmental effects associated with modifications to the current water operating schedule of S-190 for purposes of maintaining higher groundwater elevations and increased water storage within the Big Cypress Seminole Indian Reservation. The Corps, in partnership with the STOF and South Florida Water Management District, is currently drafting an Environmental Assessment to evaluate recommendations for modifications to the S-190 operating criteria. The preferred alternative consists of maintaining an optimum canal stage of 15.5 feet National Geodetic Vertical Datum (NGVD) year round. The preferred alternative would specify an open/close criteria between 15.8 and 15.2 feet NGVD year-round as opposed to the current operations which maintains the canal stage at 14.5 feet NGVD during the wet-season (open/close criteria of 14.8 to 14.2 feet NGVD).

Based on a hydraulic evaluation of the preferred alternative, the APE includes approximately 3,000 feet on either side of the canal (Figure 1). Groundwater levels will be highest adjacent to the canal and rapidly recede (such that most effects will be with the first 1500 feet) as the groundwater propagates through the surficial aquifer away from the canal (Figure 2). Therefore, sites closest to the canal may experience higher groundwater table levels during the dry season. Since this operational change is a return to a previously utilized operational setting, groundwater levels resulting from the change are conditions that the area have been subject to in the past (i.e. 1967-1996 and 2012-2016). Ponding or an increase in surface water as a result of the operational change is not anticipated.

Pursuant to Section 106 of the National Historic Preservation Act (16 USC 470) and it's implementing regulations (36 CFR 800), and in consideration of the Corps' Trust Responsibilities and the Burial Resources Agreement between the Corps and STOF, the Corps kindly requests continued coordination and consultation on the proposed modification to operating criteria for S-190. The Corps will remain in contact with Ms. Anne Mullins to determine effects for those portions of the project that are located on reservation and Mr. Bradley Mueller and Mr. Andrew Weidman for off-reservation effects. If there are any questions, please contact Ms. Meredith Moreno at 904-232-1577 or e-mail at meredith.a.moreno@usace.army.mil.

Sincerely,

Jason Spinning
Acting Chief, Environmental Branch

Enclosure

Cc:
Anne Mullins, Deputy Tribal Historic Preservation Officer, Seminole Tribe of Florida, 30290 Josie Billie Highway, PMP 1004, Clewiston, Florida 33440
Bradley Mueller, Compliance Review, Seminole Tribe of Florida, 30290 Josie Billie Highway, PMP 1004, Clewiston, Florida 33440
Andrew Weidman, Compliance Review, Seminole Tribe of Florida, 30290 Josie Billie Highway, PMP 1004, Clewiston, Florida 33440

SEMINOLE TRIBE OF FLORIDA
TRIBAL HISTORIC PRESERVATION OFFICE
AH-TAH-THI-KI MUSEUM

TRIBAL HISTORIC
PRESERVATION OFFICE

SEMINOLE TRIBE OF FLORIDA
AH-TAH-THI-KI MUSEUM

30290 JOSIE BILLIE HWY
PMB 1004
CLEWISTON, FL 33440

PHONE: (863) 983-6549
FAX: (863) 902-1117

SEMINOLE TRIBE OF FLORIDA
AH-TAH-THI-KI
MUSEUM
A PLACE TO LEARN. A PLACE TO REMEMBER.

TRIBAL OFFICERS

CHAIRMAN
JAMES E. BILLIE

VICE CHAIRMAN
MITCHELL CYPRESS

SECRETARY
LAVONNE ROSE

TREASURER
PETER HAHN

April 6, 2016

Ms. Meredith Moreno
Archaeologist
Planning Division, Environmental Branch
USACE, Jacksonville District
701 San Marco Boulevard
Jacksonville, Florida 32207-8175
Phone: (904) 232-1577
Email: meredith.a.moreno@usace.army.mil

Subject: Proposed Modifications to Operating Criteria for S-190
THPO#: 0028257

Dear Ms. Moreno,

Thank you for your continued consultation with the Seminole Tribe of Florida's Tribal Historic Preservation Office (STOF-THPO) regarding the proposed modifications to operating criteria for S-190 structure. This letter is to acknowledge that we have received your March 8, 2016 letter specifying the Area of Potential Effects for the project for both the on-reservation and off-reservation components. Thank you again for contacting us regarding this project and we look forward to working with you throughout the planning process.

Respectfully,

Andrew J. Weidman, MA, RPA
STOF-THPO, Compliance Review Section
30290 Josie Billie Hwy, PMB 1004
Clewiston, FL 33440
Office: 863-983-6549 x12216
Email: andrewweidman@semtribe.com

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 San Marco Boulevard
JACKSONVILLE, FLORIDA 32207-8175

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

MAY 0 9 2016

Mr. Larry Williams, Field Supervisor
U.S. Fish and Wildlife Service
1339 20th Street
Vero Beach, FL 32960

Dear Mr. Williams:

In accordance with provisions of Section 7 of the Endangered Species Act, as amended, the U.S. Army Corps of Engineers (Corps) is hereby initiating informal consultation with the U.S. Fish and Wildlife Service (USFWS) for modifications to the current water operating schedule of S-190 for purposes of providing additional water storage in the North and West Feeder Canals and higher groundwater levels within the western portion of the Big Cypress Seminole Indian Reservation. The Corps is preparing an Environmental Assessment (EA) to evaluate alternatives for the proposed action. The attached initiation package describes the proposed action and the Corps effects determinations on listed species and designated critical habitat.

S-190 acts as the primary water discharge structure in the Feeder Canal Basin located in southeastern Hendry County. The two major canals associated with the Feeder Canal Basin are the North Feeder Canal, and the West Feeder Canal. These two canals merge in the lower southeastern corner of the basin and discharge south through the S-190 structure and into the L-28 Interceptor Canal, and eventually Water Conservation Area 3A. S-190 maintains water stages in the North and West Feeder Canals.

Pursuant to the Endangered Species Act, the Corps has determined that the proposed action will have the following effects on federally listed species and designated critical habitat as illustrated in Table 1. Within 45 days of receipt of this letter, we request your written concurrence with our determinations.

If you have any questions concerning this project or our determinations, please contact Melissa Nasuti by email Melissa.a.nasuti@usace.army.mil or by telephone 904-232-1368. Thank you for your assistance in this matter.

Sincerely,

Jason Spinning
Acting Chief, Environmental Branch

Enclosure

cc:
Ms. Victoria Foster, U.S. Fish and Wildlife Service, 1339 20th Street,
Vero Beach, Florida 32960.

TABLE 1. FEDERALLY THREATENED AND ENDANGERED SPECIES WITHIN THE PROJECT AREA AND SPECIES DETERMINATION FOR THE PROPOSED ACTION

Common Name	Scientific Name	Federal Status	May Affect, Likely to Adversely Effect	May Affect, Not Likely to Adversely Effect	No Effect
Mammals					
Florida panther	*Puma concolor coryi*	E		X	
Florida manatee	*Trichechus manatus latirostris*	E, CH			X
Florida bonneted bat	*Eumops floridanus*	E		X	
Birds					
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	E		X	
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	CH			X
Audubon's Crested Caracara	*Polyborus plancus audubonii*	T			X
Wood stork	*Mycteria americana*	T		X	
Reptiles					
Eastern indigo snake	*Drymarchon corais couperi*	T			X
Gopher tortoise	*Gopherus polyphemus*	C			X

E = Endangered; CH= Critical Habitat; T= Threatened; C = Candidate

PROPOSED MODIFICATIONS TO OPERATING CRITERIA FOR S-190

COMPLETE INITIATION PACKAGE

U.S. FISH AND WILDLIFE SERVICE

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1.0 PROJECT AUTHORITY

The Central and Southern Florida (C&SF) Project was initially authorized by the Flood Control Act of 1948, Public Law 80-858, approved June 30, 1948. The remaining works of the Comprehensive Plan were authorized by the Flood Control Act of 1954, Public Law 83-780, approved September 3, 1954. The Flood Control Act of 1948 and 1954 specifically recognized that the plan of improvement would require refinement and that modifications within the scope and purpose of the authorization, could be made at the discretion of the Chief of Engineers. The 1954 authorization included the L-28 Levee and its related appurtenant structures (*i.e.* S-190).

2.0 LOCATION

S-190 is the primary discharge structure in the Feeder Canal Basin located in southeastern Hendry County. The Feeder Canal Basin is located west of Water Conservation Area (WCA) 3A, southwest of the Everglades Agricultural Area (EAA), and north of Big Cypress National Preserve (BCNP) (**FIGURE 1**). The northwest section of BCSIR is situated within the Feeder Canal Basin (**FIGURE 2**) and accounts for approximately 77% of the Basin. The BCSIR includes approximately 53,266 acres located in Hendry and Broward Counties. The southern boundary of BCSIR is formed by the Hendry-Collier County line and BCNP. The eastern boundary of BCSIR is the L-28 Borrow Canal which connects directly to WCA 3A via the S-140 pump station. The southeastern boundary of BCSIR is formed by the lands of the Miccosukee Tribe and includes state managed lands. The western and northern boundaries are private lands managed for agriculture and recreation. An extensive drainage canal system operated by South Florida Water Management District (SFWMD) impacts the eastern side of BCSIR and runs directly through BCSIR in an east-west and north-south orientation in the western-central section of the Reservation. S-190 is located in the L-28 Interceptor Canal, directly south of the junction of the North Feeder Canal and West Feeder Canal.

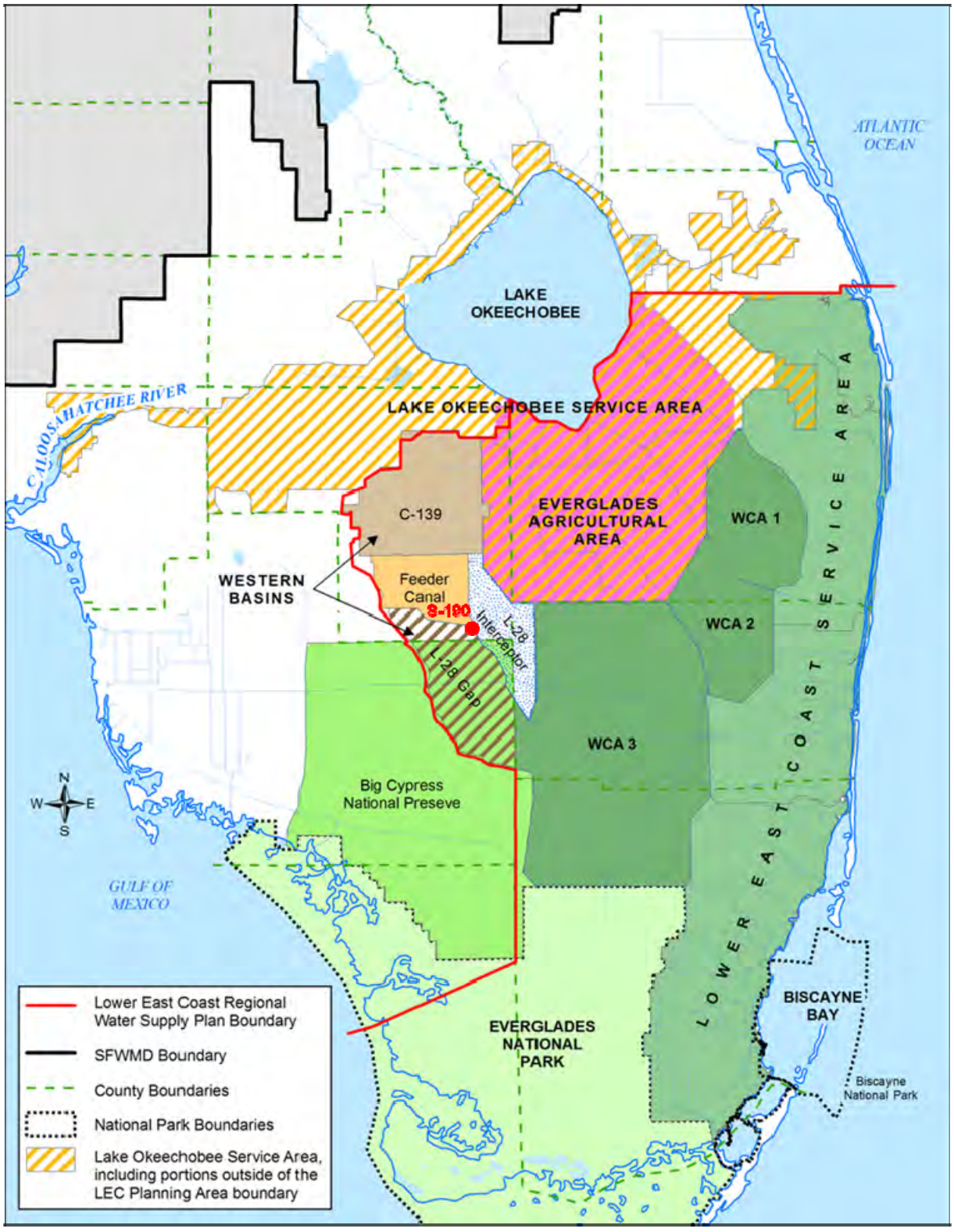

FIGURE 1. EVERGLADES AGRICULTURAL AREA, WESTERN BASINS, AND SURROUNDING BASINS

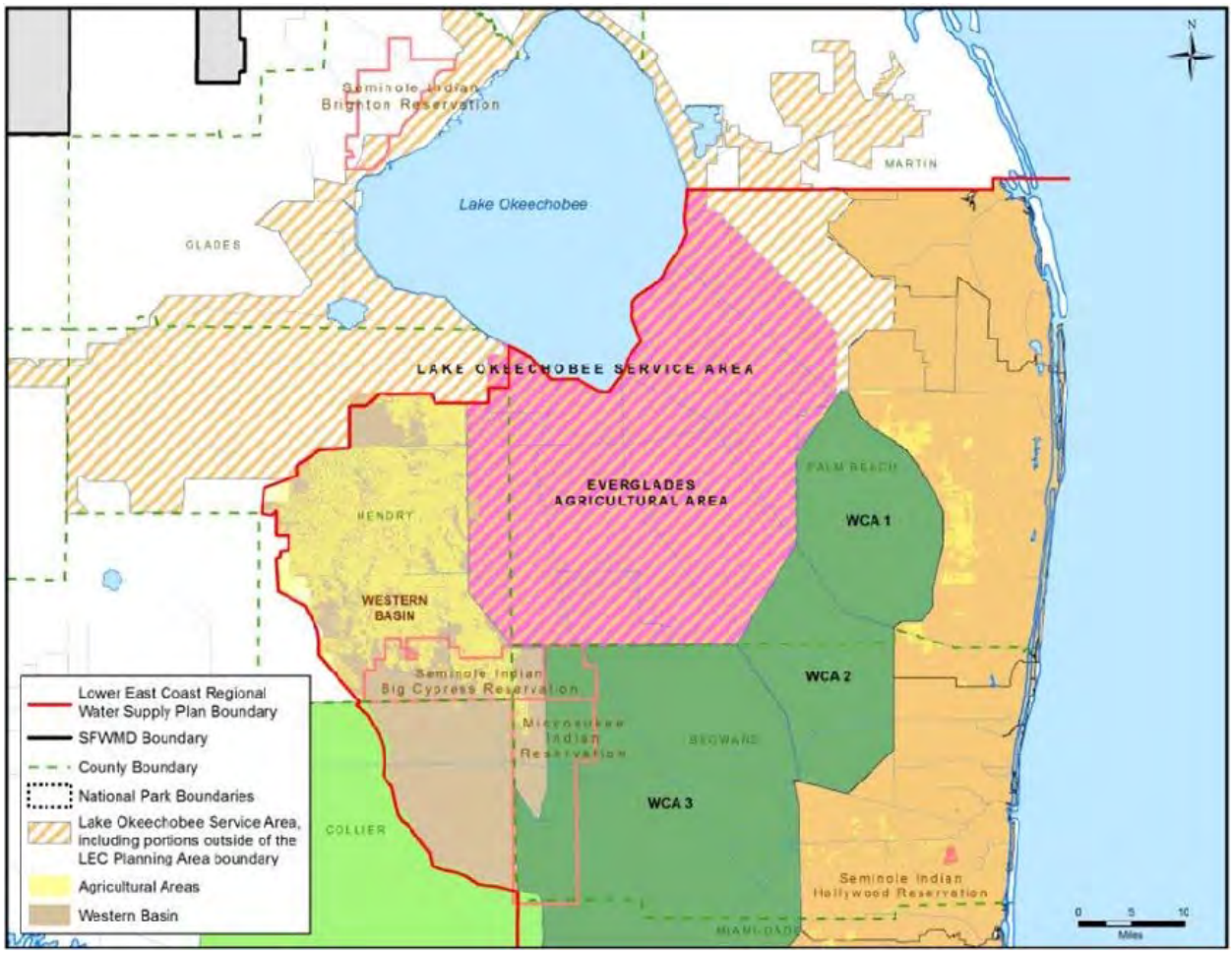

FIGURE 2. WESTERN BASINS MAP SHOWING THE SEMINOLE TRIBE OF FLORIDA RESERVATION

3.0 PROJECT BACKGROUND

The Seminole Tribe of Florida is a federally recognized tribe with several reservations in Florida. The Federal Indian trust responsibility is a legally enforceable obligation on the part of the United States to protect Tribal treaty rights, lands, assessts, and resources. The Big Cypress Seminole Indian Reservation (BCSIR) located in southeastern Hendry County and northwestern Broward County is a federal indian reservation reserved for the Seminole Tribe as permanent tribal homelands, and where the federal government holds title to the land in trust on behalf of the Tribe. During droughts in the western U.S. during the 1890s, the U.S. governemnt shipped cattle to Seminole Reservations, including BCSIR. This generated a need for pasture and quality forage. The Seminole Tribe cleared, drained, and planted pasture within portions of BCSIR. Typical water control systems were designed to pump water from rim ditches around pastures and fields to undeveloped native lands. To irrigate, water was pumped from the ground water to fill the rim ditches. In addition, the U.S. Department of Interior Bureua of Indian Affairs (BIA) constructed roads within BCSIR which required drainage access and outlets. The drainage and

irrigation features added by BIA and the Seminole Tribe prior to 1964 allowed for small scale flood control efforts, with all water staying on BCSIR.

In 1964, the U.S. Army Corps of Engineers (Corps) and BIA communicated regarding the construction of the Central and Southern Florida (C&SF) Flood Control Project. The BIA expressed concern regarding overdrainage to the Corps. The Corps noted that the overall flood hazard would be increased in BCSIR as a result of the construction of the L-28 Interceptor Canal and North and West Feeder Canals due to the confining levees along the eask bank of the canals (*US Department of Interior Bureau of Indian Affairs letter dated September 18, 1963; US Army Engineer District, Jacksonville, Corps of Engineers dated October 14, 1963*). As a result of the C&SF Project the natural sheetflow has been greatly disrupted and seasonal wetland hydroperiods have been adversely impacted. Drainage of flood waters via canals during the wet season results in drier conditions (deeper water table) during the subsequent dry season. These conditions are worsened during years with below average rainfall. Low dry season water levels are exacerbated by the absence of connections to upstream water reserves and a lack of storage on BCSIR (Sobczak 2002).

In a letter dated October 24, 2011, the Corps received a request from the Seminole Tribe Water Commission Chairman regarding a proposed demonstration project to temporarily modify the operational schedule of Structure 190 (S-190) for a two year period. S-190 acts as the primary water discharge structure in the Feeder Canal Basin. The three major canals associated with the Feeder Canal Basin are the North Feeder Canal, West Feeder Canal and the L-28 Interceptor Canal. The North Feeder Canal and West Feeder Canal merge in the lower southeastern corner of the basin into the L-28 Interceptor Canal and discharge south through the S-190 structure into Water Conservation Area (WCA) 3A. The proposed two year demonstration project would investigate the effect of changing the S-190 operational criteria by utilizing the existing "high setting" operating range year round (*i.e.* water control elevation of 15.5 National Geodetic Vertical Datum of 1929 [NGVD]), consistent with the C&SF Project for Flood Control and Other Purposes, Part I, Supplement 40, Addendum 1 dated 7 February 1964 (Corps 1964).

Operations for S-190 are currently described in Volume 4 of the C&SF Project for Flood Control and Other Purposes, Master Water Control Manual for the WCAs, Everglades National Park (ENP), and ENP-South Dade Conveyance System (ENP-SDCS) (Corps 1996). Current operating criteria for S-190 differ from that identified within the C&SF Project for Flood Control and Other Purposes, Part I, Supplement 40, Addendum 1 dated February 7, 1964. S-190 is currently operated on either a "high setting" (*i.e.* dry condition: water control elevation of 15.5 ft NGVD) or "low setting" (*i.e.* normal condition: water control elevation of 14.5 ft NGVD) throughout the year (Corps 1996). In general, when there is a threat of flooding, the "low setting" is used; otherwise the gate is set at the "high setting". Modifications to the operating criteria for S-190 were proposed as part of the two year demonstration project for purposes of maintaining higher groundwater elevations and increased water storage within the western portion of BCSIR and protection of natural areas directly south of the West Feeder Canal.

Representatives of the Corps, South Florida Water Management District (SFWMD) and Seminole Tribe have met at South Florida Ecosystem Restoration Task Force meetings since 2012 to discuss issues related to the operation of S-190 as part of more comprehensive

discussions related to the restoration of the Western Basins and the Seminole Tribe's request for greater availability and delivery of water to BCSIR. The Draft Mission Statement for the South Florida Ecosystem Restoration Task Force Restoration of the BCSIR Natural Areas and Adjacent Portions of the Big Cypress National Preserve (BCNP) Work Group or "Western Basins Task Force" is:

> *"to identify and recommend to the South Florida Ecosystem Restoration Task Force opportunities to restore ecological and cultural natural areas within the Big Cypress Reservation and adjacent portions of the Big Cypress National Preserve to support the designated uses of water bodies including wetlands [to achieve the goals and objectives of the Seminole Big Cypress Critical Project; and to meet State and Federal permit conditions] (or) [while meeting Tribal Water Quality Standards]."*

The WCA 3 tributary basins include the C-139, Feeder Canal, L-28 Interceptor and L-28 Gap (located within BCNP) basins, which encompass approximately 440,000 acres located primarily in eastern Hendry County (**FIGURE 1**). These basins are collectively called the Western Basins because they are along the western edge of the Everglades and were historic flow ways to the Everglades. A portion of BCSIR (~ 11%) is located within the Western Basins (**FIGURE 2**) with water supply needs for its residents, agriculture and wetlands. Both water supply and water quality of stormwater runoff are challenges facing the development of the Western Basins.

The Corps developed recommendations for modifications to the operating criteria for S-190 in coordination with the SFWMD and Seminole Tribe as a first step in moving toward restoration of the natural system within the Western Basins. The Proposed Action would assist in attaining the Draft Mission Statement of the "Western Basins Task Force" as it would provide action to support the designated uses of wetlands on BCSIR; and would assist in restoration of ecological and cultural natural areas which have been negatively impacted by cumulative effects of past actions that increased drainage of the western section of BCSIR during the wet season. Operational modifications to S-190 would result in a permanent change to the Master Water Control Manual for the WCAs, ENP, and ENP-SDCS, Volume 4 (Corps 1996).

4.0 PROJECT NEED OR OPPORTUNITY

The Corps developed recommendations for modifications to the operating criteria for S-190 in coordination with SFWMD and the Seminole Tribe. The overarching project need is to decrease restorative wet season surface water losses from BCSIR by returning S-190 to its original authorized design criteria. The Seminole Tribe identified the need for an evaluation of the current S-190 operating criteria by letter dated August 1, 2014. Comments from the August 1, 2014 letter are briefly summarized below:

- Current S-190 operations have resulted in releases of restorative seasonal rainfall, which prevents aquifer recharge, and disrupts the natural wetland hydroperiod within BCSIR. Modifications to the current operating criteria are needed to protect surface water and groundwater levels on the western side of BCSIR. The BCSIR has Water Entitlement Rights. Before the Seminole Tribe can utilize the water in the western reaches of BCSIR, current S-190 operations cause the release of this water to the south before it can be stored and utilized by the Seminole Tribe.

- Modifications to the current operating criteria for S-190 are needed to further enhance operations of the Seminole Tribe Critical Restoration Project. The Critical Restoration Project currently is impacted by over-drainage of the western basins when S-190 is maintained at a lower stage.
- Over-drainage resulting from current S-190 operations has resulted in effects to fish and wildlife resources and shifts in vegetation communities within BCSIR and the native area which is bordered on the east by the L-28 Interceptor Canal and to the north by the West Feeder Canal. Wetland hydroperiods have been altered from a natural timing and duration of inundation

5.0 PROPOSED ACTION

S-190 would be operated to maintain optimum upstream water control stages in the North and West Feeder Canals. S-190 would be operated to maintain an optimum canal elevation of 15.5 feet NGVD.

6.0 EFFECT DETERMINATIONS TO FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES

The Corps requested written confirmation of federally listed threatened and endangered species that are either known to occur or are likely to occur within the project area from the U.S Fish and Wildlife Service (USFWS) by letter dated February 9, 2015. USFWS provided a revised list of listed species on February 11, 2015. Confirmation of listed species occurred on June 3, 2015. The Corps has determined that the proposed action may affect, but is not likely to adversely affect, Florida panther (*Puma concolor coryi*), Florida bonneted bat (*Eumops floridanus*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*) and wood stork (*Mycteria americana*); and will have no effect on Florida manatee (*Trichechus manatus latirostris*) and its associated critical habitat, Audubon's crested caracara (*Polyborus plancus audubonii*), Eastern indigo snake (*Drymarchon corais couperi*) or Everglade snail kite critical habitat. Effect determinations for federally threatened and endangered species within the project area are listed within **TABLE 1**.

TABLE 1. FEDERALLY THREATENED AND ENDANGERED SPECIES WITHIN THE PROJECT AREA AND EFFECTS DETERMINATION OF THE PROPOSED ACTION

E=Endangered; T=Threatened; CH=Critical Habitat; C=Candidate Species

Common Name	Scientific Name	Federal Status	May Affect, Likely to Adversely Effect	May Affect, Not Likely to Adversely Effect	No Effect
Mammals					
Florida panther	*Puma concolor coryi*	E		X	
Florida manatee	*Trichechus manatus latirostris*	E, CH			X
Florida bonneted bat	*Eumops floridanus*	E		X	
Birds					
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	E		X	
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	CH			X
Audubon's Crested Caracara	*Polyborus plancus audubonii*	T			X
Wood stork	*Mycteria americana*	T		X	
Reptiles					
Eastern indigo snake	*Drymarchon corais couperi*	T			X
Gopher tortoise	*Gopherus polyphemus*	C			X

6.1 Florida Panther and "May Affect, Not Likely to Adversely Affect Determination"

One of 30 cougar subspecies, the Florida panther is tawny brown on the back and pale gray underneath, with white flecks on the head, neck and shoulder. Male panthers weigh up to 130 pounds and females reach 70 pounds. Preferred habitat consists of cypress swamps, pine and hardwood hammock forests. The main diet of the Florida panther consists of white-tailed deer, wild hog, rabbit, raccoon, armadillo and birds. Present population estimations range from 80 to 100 individuals. Florida panthers are solitary, territorial and often travel at night. Males have a home range of up to 400 square miles and females about 50 to 100 square miles. Female panthers reach sexual maturity at about three years of age. Mating season is December through February. Gestation lasts about 90 days and females bear two to six kittens. Juvenile panthers stay with their mother for about two years. Females do not mate again until their young have dispersed. The main survival threats to Florida panther include habitat loss due to human development and population growth, collision with vehicles, parasites, feline distemper, feline alicivirus (an upper respiratory infection) and other diseases. Habitat loss has driven the subspecies into a small area, where the few remaining animals are highly inbred, causing such genetic flaws as heart defects and sterility.

Implementation of the proposed action would not result in significant effects to Florida panther. Lands have been designated for panther conservation (**FIGURE 3**). These lands include the Panther Focus Area located in central and southern Florida. Florida panthers presently inhabit lands within BCSIR and surrounding areas. **FIGURE 4** depicts the location of recently observed sightings, telemetry points collected from radio tracking studies and the location of recorded panther dens and deaths.

The proposed action is expected to benefit BCSIR by maintaining higher groundwater elevations within the western portion of BCSIR. The proposed action is also expected to enhance wetlands on BCSIR, including the Native Area located south of the West Feeder Canal and north of BCNP. A potential increase in hydroperiod within the project area has the potential to affect Florida panther habitat. However, due to the limited extent of operational changes being considered, elimination or modification to panther habitat within the action area is not expected. Conversion of upland habitat is not proposed. The Florida panther is a wide-ranging species. Based on this information, the Corps has determined that implementation of the proposed action may affect, but is not likely to adversely affect, this species.

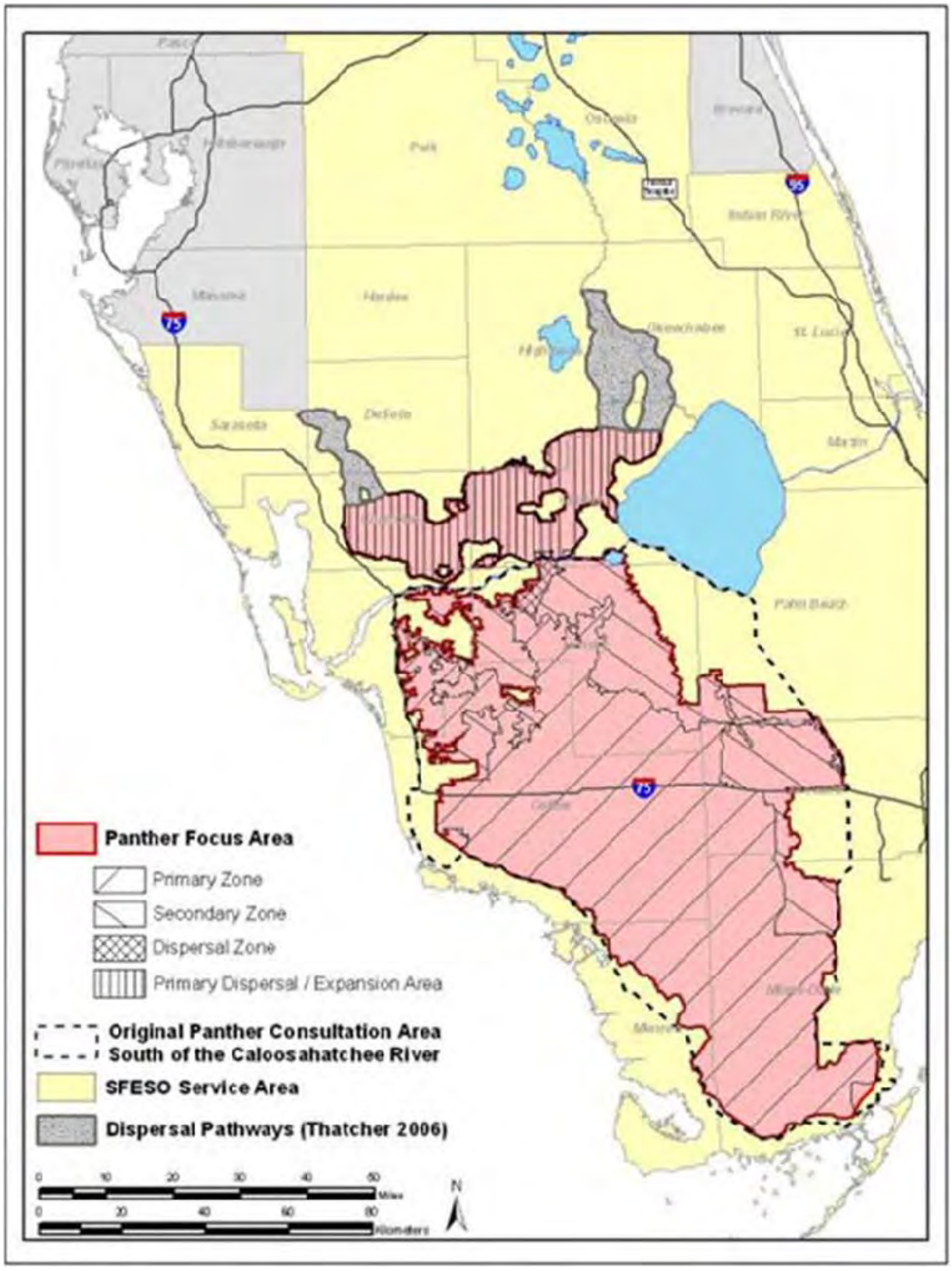

FIGURE 3. FLORIDA PANTHER ZONES IN SOUTH FLORIDA

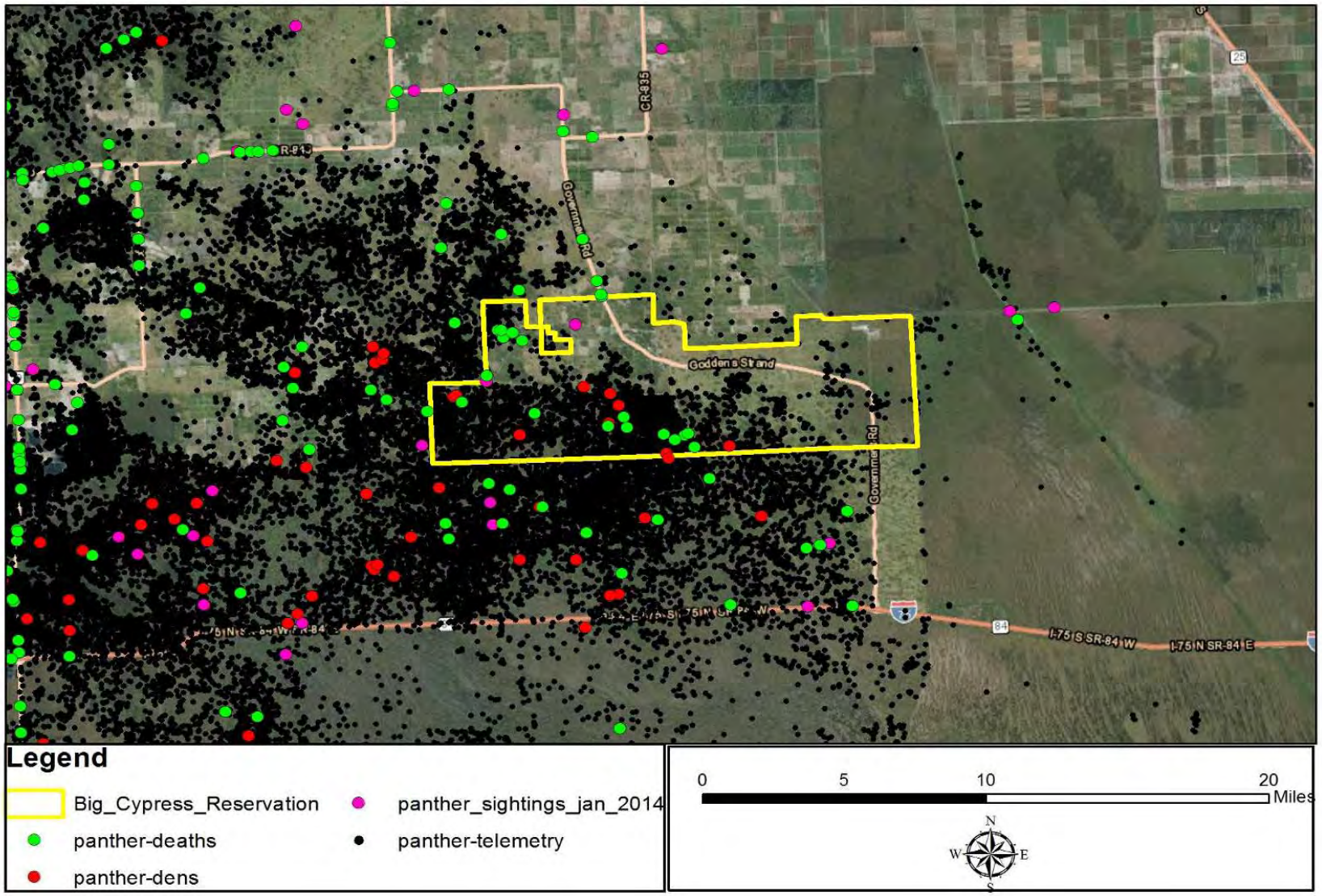

FIGURE 4. FLORIDA PANTHER TELEMETRY (1981 TO 2013), RECORDED DEATHS (1972 TO 2015) AND SIGHTINGS (2014)

6.2 Florida Manatee and Critical Habitat and "No Effect Determination"

The Florida manatee is a large, plant-eating aquatic mammal with a fusiform body that is compressed dorsoventrally and is grey to grey-brown in color. Florida manatees live in freshwater, brackish and marine habitats; can move freely between salinity extremes; and are found throughout the southeastern United States. Because they are a subtropical species with little tolerance for cold, they remain near warm water sites in peninsular Florida during the winter. During periods of intense cold, Florida manatees will remain at these sites and will tend to congregate in warm springs and outfall canals associated with electric generation facilities. During warm interludes, Florida manatees move throughout the coastal waters, estuaries, bays, and rivers of both coasts of Florida and are usually found in small groups. During warmer months, Florida manatees may disperse great distances. Florida manatees have been sighted as far north as Massachusetts and as far west as Texas and in all states in between (Rathbun et al. 1982, Fertl et al. 2005). Water depths of at least three to seven feet (one to two meters) are preferred and flats and shallows are avoided unless adjacent to deeper water.

Over the past centuries, the principal sources of Florida manatee mortality have been opportunistic hunting by man and deaths associated with unusually cold winters. Today, poaching is rare, but high mortality rates from human-related sources threaten the future of the species. In general, the largest single mortality factor is collision with boats and barges. Florida manatees also are killed in flood gates and canal locks, by entanglement or ingestion of fishing gear and through loss of habitat and pollution.

Florida manatees have been not been observed in conveyance canals within the project area. **FIGURE 5** illustrates canals that Florida manatees have access to within south Florida. The Florida manatee's critical habitat includes all waters of Card, Barnes, Blackwater, Little Blackwater, Manatee and Buttonwood sounds between Key Largo, Monroe County and mainland Miami-Dade County (**FIGURE 6**). Another component of designated critical habitat is defined as Biscayne Bay and all adjoining and connected lakes, rivers, canals, and waterways from the southern tip of Key Biscayne northward to and including Maule Lake, Dade County. This was one of the first designations of critical habitat for an endangered species and the first for an endangered marine mammal. No specific primary or secondary constituent elements were included in the critical habitat designation. However, researchers agree that essential habitat features for Florida manatee include seagrasses for foraging, shallow areas for resting and calving, channels for travel and migration, warm water refuges during cold weather and freshwater for drinking. Critical habitat for the Florida manatee is not located within the project area.

Water bodies within the project area are not accessible to the Florida manatee; therefore, the Corps has determined that there would be no effect on this species and its designated critical habitat from implementation of the proposed action.

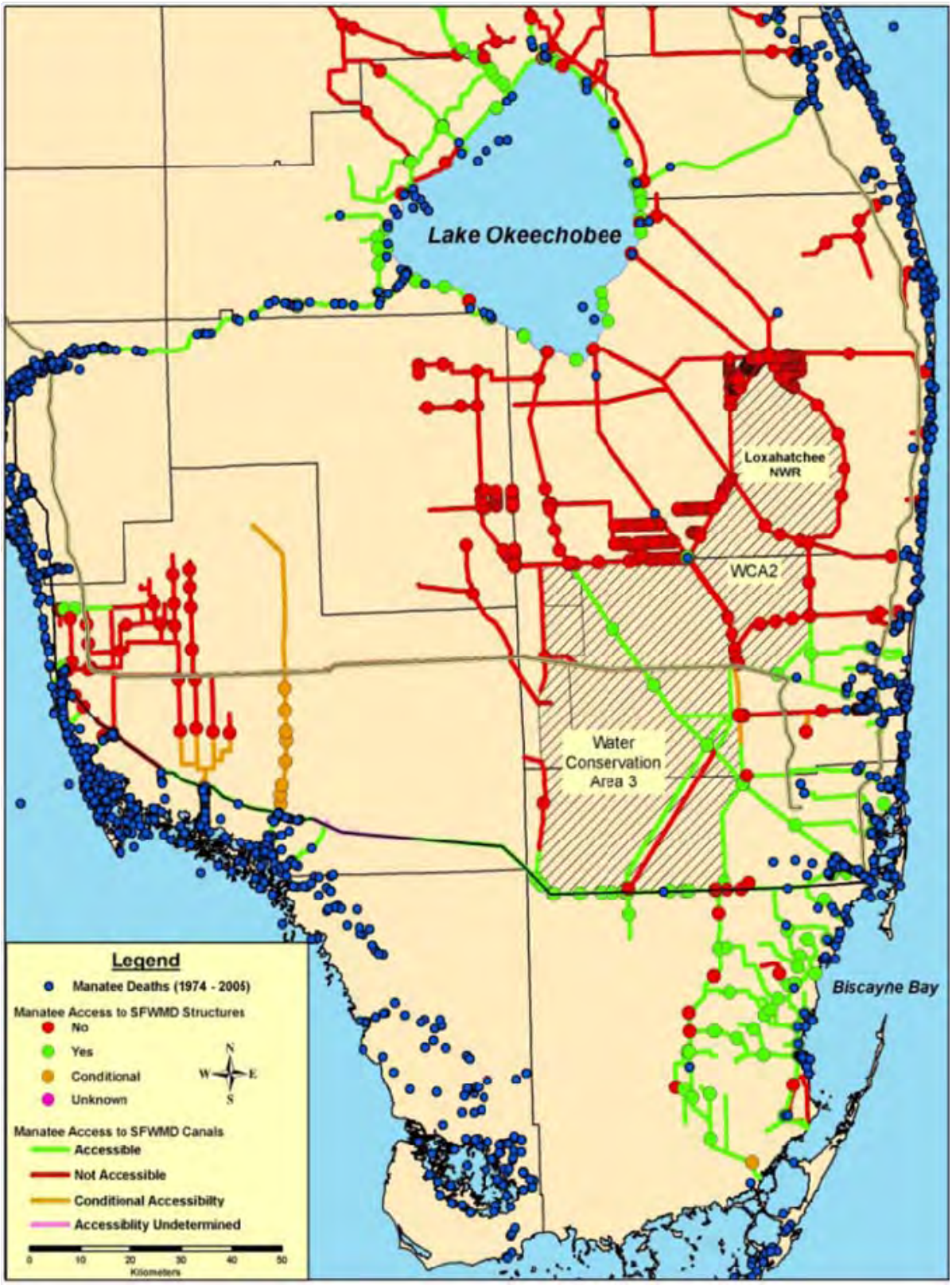

FIGURE 5. CANALS THAT FLORIDA MANATEES HAVE ACCESS TO WITHIN SOUTH FLORIDA

FIGURE 6. FLORIDA MANATEE CRITICAL HABITAT

6.3 Florida Bonneted Bat and "May Affect Not Likely to Adversely Affect Determination"

The Florida bonneted bat is Florida's largest bat, weighing approximately 1.1 to 1.6 ounces on average (Owre 1978; Belwood 1981; Belwood 1992; Timm and Genoways 2004), with a body length of 5.1 to 6.5 inches (Timm and Genoways 2004). The Florida bonneted bat's fur is short and glossy, with hairs sharply bicolored with a white base (Belwood 1992; Timm and Genoways 2004). Color varies from black to brown to brownish-gray or cinnamon brown. The common name of "bonneted bat" originates from characteristic large broad ears, which project forward over the eyes.

The Florida bonneted bat is a non-migratory species. The species is active year-round and does not have periods of hibernation or torpor. Relatively little is known regarding the ecology and habitat requirements of the species. In general, open, fresh water and wetlands provide prime foraging areas for bats (Marks and Marks 2008a). The bat is a nocturnal insectivore and relies upon echolocation to navigate and detect prey. The presence of roosting habitat is critical for day roosts, protection from predators and the rearing of young (Marks and Marks 2008a). Bats in south Florida roost primarily in trees and manmade structures (Marks and Marks 2008b). Available information on roosting sites is extremely limited. Roosting and foraging areas appear varied, with the species occurring in forested, suburban and urban areas (Timm and Arroyo-Cabrales 2008). The species roosts singly or in colonies consisting of a male and several females (Belwood 1992).

The Florida bonneted bat has a fairly extensive breeding season during summer months (Timm and Genoways 2004). Pregnant females have been found in June through September (Marks and Marks 2008a) and limited data suggest that the species may have more than one period of estrous in a year, with a second birthing season in January through February (Timm and Genoways 2004). The Florida bonneted bat has low fecundity; litter size is one (Timm and Arroyo-Cabrales 2008).

Based upon available data and information, Florida bonnet bat occurs within a restricted range and is in low abundance (Marks and Marks 2008b). The Florida bonneted bat appears to be restricted to south and southwest Florida. The core range primarily consists of habitat within Charlotte, Lee, Collier, Monroe, and Miami-Dade Counties. Recent data also suggest use of portions of Okeechobee and Polk Counties and possible use of areas within Glades County. The BCSIR lies within Broward and Hendry County.

The USFWS has defined consultation areas and focal areas for the Florida bonneted bat in south Florida (**FIGURE 7**). The project area falls within the Florida bonneted bat consultation area.
The Florida bonneted bat may be found in semitropical hardwood forest, pine flatwoods and man-made habitats. The bat has been documented nesting in building attics and rocks. Nesting cavities of woodpeckers may also be used and nests may also be found within the palm fronds of palm trees. On BCSIR, this bat may potentially inhabit the pine flatwoods on the southern boundary of BCSIR, the rock mine on the northeastern boundary or the homes and buildings within the community (Seminole Tribe of Florida 2012). No roosting sites or sightings have been documented on BCSIR (Seminole Tribe of Florida 2012).

While habitat loss, degradation and modification of suitable habitat due to development and agriculture have impacted Florida bonneted bat, the proposed action does not include tree canopy removal, vertical construction or expansion of agriculture. Impacts to potential roost sites are not anticipated under the proposed action. The Seminole Tribe of Florida is currently conducting ultrasonic acoustical surveys and on the ground transect surveys to determine if Florida bonneted bat is utilizing BCSIR in association with permit actions not directly related to this project. In accordance with the 2013 Florida Bonneted Bat USFWS Consultation guidelines, the Corps has determined that implementation of the proposed action may affect, but is not likely to adversely affect, this species.

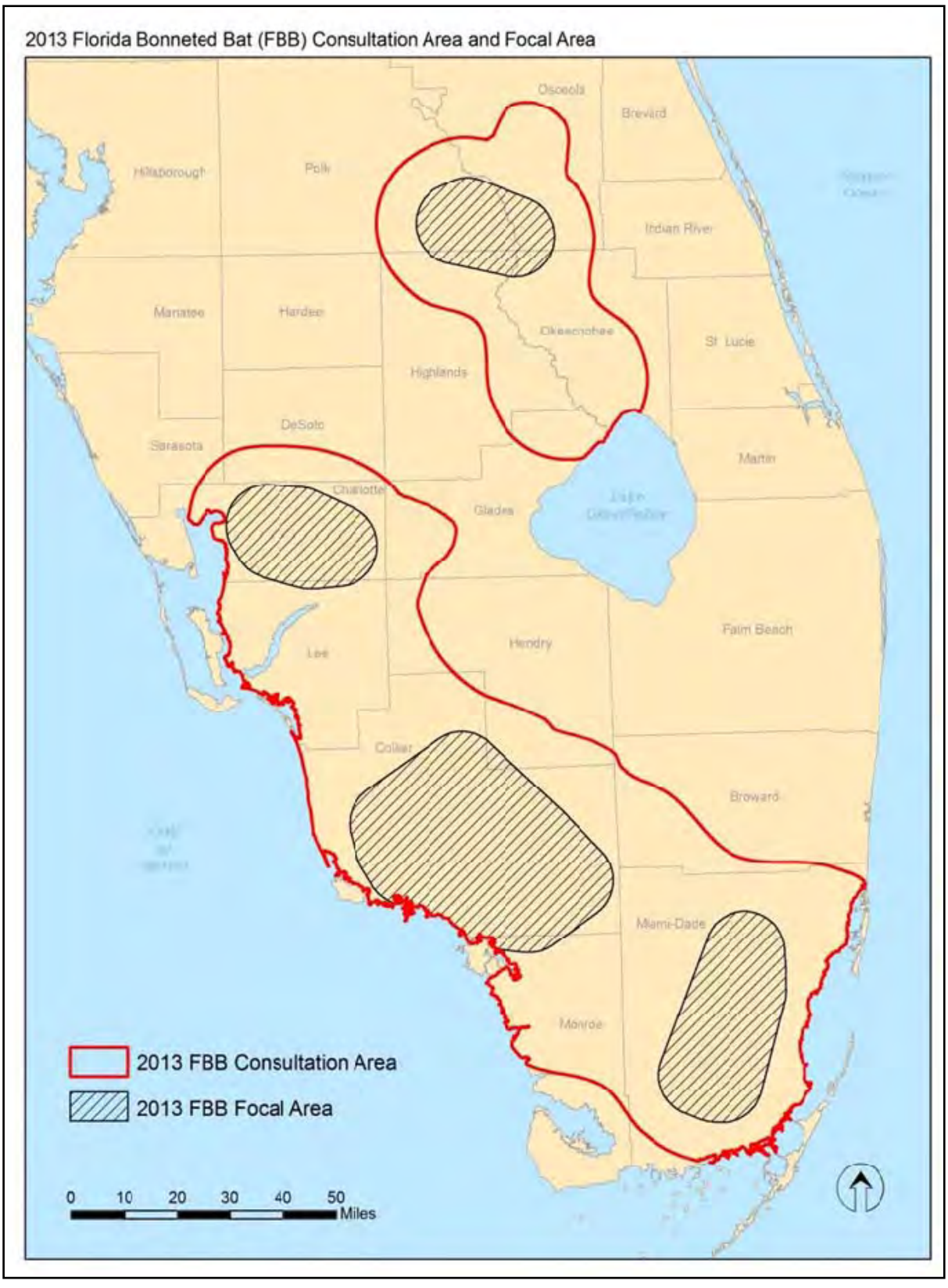

FIGURE 7. FLORIDA BONNETED BAT CONSULTATION AREA

6.4 Everglade Snail Kite and "May Affect, Not Likely to Adversely Affect Determination" and Everglade Snail Kite Critical Habitat "No Effect Determination"

A wide-ranging, New World raptor, the snail kite is found primarily in lowland freshwater marshes in tropical and subtropical America from Florida, Cuba, and Mexico, and south to Argentina and Peru (USFWS 1999). The Florida and Cuban subspecies, the Everglade snail kite, was initially listed as endangered in 1967 due to its restricted range and highly specific diet (USFWS 1999). Its survival is directly tied to the hydrology, water quality, vegetation composition and structure within the freshwater marshes that it inhabits (Martin et al. 2008, Cattau et al. 2008).

The persistence of Everglade snail kite in Florida depends upon maintaining hydrologic conditions that support the specific vegetative communities that compose their habitat along with sufficient apple snail availability across their range each year (Martin et al. 2008). Everglade snail kite habitat consists of freshwater marshes and the shallow vegetated edges of lakes where the apple snail (*Pomacea paludosa*), the Everglade snail kite's main food source, can be found. Snail kite populations in Florida are highly nomadic and mobile; tracking favorable hydrologic conditions and food supplies and thus avoiding local droughts. Everglade snail kites move widely throughout the primary wetlands of the central and southern portions of Florida. The Everglade snail kite is threatened primarily by habitat loss and destruction. Widespread drainage has permanently lowered the water table in some areas. This drainage permitted development in areas that were once Everglade snail kite habitat. In addition to loss of habitat through drainage, large areas of marsh are heavily infested with water hyacinth, which inhibits the Everglade snail kite's ability to see its prey.

The Everglade snail kite has a highly specialized diet typically composed of apple snails, which are found in palustrine, emergent, long-hydroperiod wetlands. As a result, the Everglade snail kite's survival is directly dependent on the hydrology and water quality of its habitat (USFWS 1999). Snail kites require foraging areas that are relatively clear and open in order to visually search for apple snails. Suitable foraging habitat for Everglade snail kite is typically a combination of low profile marsh and a mix of shallow open water. Shallow wetlands with emergent vegetation such as spike rush (*Eleocharis* spp.), maidencane, sawgrass and other native emergent wetland plant species provide good foraging habitat as long as the vegetation is not too dense to locate apple snails. Dense growth of plants reduces the ability of Everglade snail kite to locate apple snails and their use of these areas is limited even when snails are in relatively high abundance (Bennetts et al. 2006). Areas of sparse emergent vegetation enable apple snails to climb near the surface to feed, breathe and lay eggs and thus they are easily seen from the air by foraging Everglade snail kites. Suitable foraging habitats are often interspersed with tree islands or small groups of scattered shrubs and trees which serve as perching and nesting sites.

Snail kite nesting primarily occurs from December to July, with a peak in February-June, but can occur year-round. Nesting substrates include small trees such as willow, cypress (*Taxodium* spp.), and pond apple; and herbaceous vegetation such as sawgrass, cattail, bulrush (*Scirpus validus*) and reed (*Phragmites australis*). Everglade snail kites appear to prefer woody vegetation for nesting when water levels are adequate to inundate the site (USFWS 1999). Nests are more frequently placed in herbaceous vegetation during periods of low water when dry conditions beneath willow stands (which tend to grow to at higher elevations) prevent Everglade

snail kites from nesting in woody vegetation (USFWS 1999). Nest collapse is rare in woody vegetation but common in non-woody vegetation, especially on lake margins (USFWS 1999). In order to deter predators, nesting almost always occurs over water (Sykes et al. 1995).

Snail kites construct nests using dry plant material and dry sticks, primarily from willow and wax myrtle (Sykes 1987), with a lining of green plant material that aids in incubation (USFWS 1999). Courtship includes male displays to attract mates and pair bonds form from late November through early June (USFWS 1999). Everglade snail kites will lay between one and five eggs with an average of about three eggs per nest (Sykes et al. 1995, Beissinger 1988). Each egg is laid at about a two-day interval with incubation generally commencing after the second egg is laid (Sykes 1987). Both parents incubate the eggs for a period of 24 to 30 days (Beissinger 1983). Hatching success is variable between years and between watersheds, but averages 2.3 chicks/nest (USFWS 1999, Cattau et al. 2008). February, March, and April have been identified as the most successful months for hatching (Sykes 1987). Snail kites may nest more than once within a breeding season and have been documented to renest after both failed and successful nesting attempts (Sykes 1987, Beissinger 1988). Chicks are fed by both parents through the nestling period although ambisexual mate desertion has been documented (USFWS 1999). Young fledge at approximately 9 to 11 weeks of age (Beissinger 1988). Adults forage no more than 6 kilometers from the nest, and generally less than a few hundred meters (Beissinger 1988, USFWS 1999). When food is scarce or ecological and hydrologic conditions are unfavorable, adults may abandon the nest altogether (Sykes et al. 1995).

The proposed action is expected to benefit BCSIR by maintaining higher groundwater elevations within the western portion of BCSIR. The proposed action is also expected to enhance wetlands within BCSIR, including the Native Area located south of the West Feeder Canal and north of BCNP. **FIGURE 8** depicts the location of Everglade snail kite nests from 1996 to 2013 within the project area. Nests are generally located both north and south of BCSIR and east of BCSIR within WCA 3A; however, suitable habitat potentially exists within the project area. A potential increase in hydroperiod may provide an overall net benefit for Everglade snail kite, apple snails and their habitat. Increased duration of surface water elevations within the project area may provide an opportunity for improved foraging conditions and suitable vegetation. However, due to the limited extent of operational changes being considered, implementation of the proposed action would not result in significant effects to Everglade snail kite. Based on this information, the Corps has determined that implementation of the proposed action may affect, but is not likely to adversely affect, this species. In addition, since Everglade snail kite critical habitat does not occur within the project area, the Corps has determined that there would be no effect on designated critical habitat.

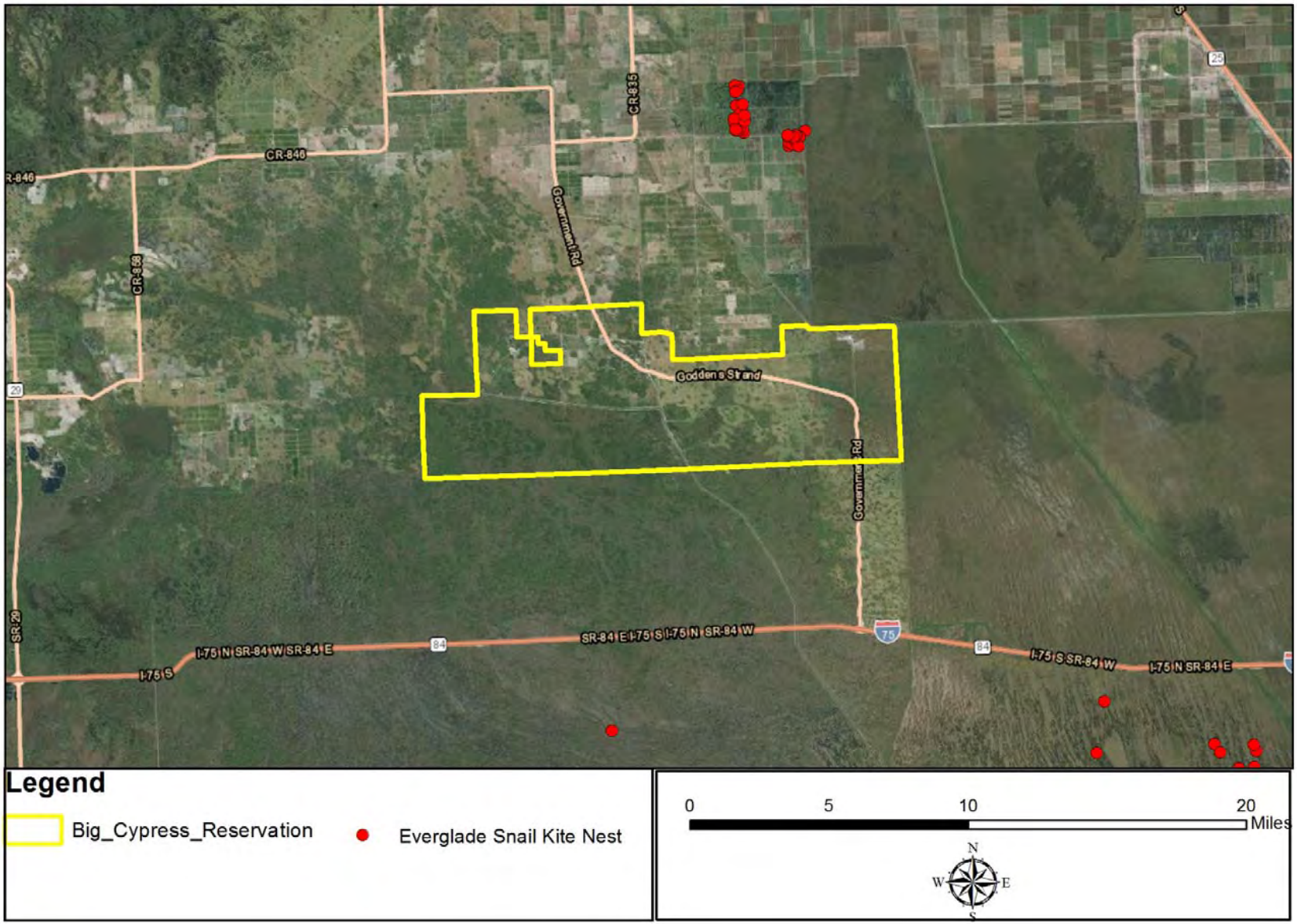

FIGURE 8. SNAIL KITE NESTING LOCATIONS BETWEEN 1996 AND 2013

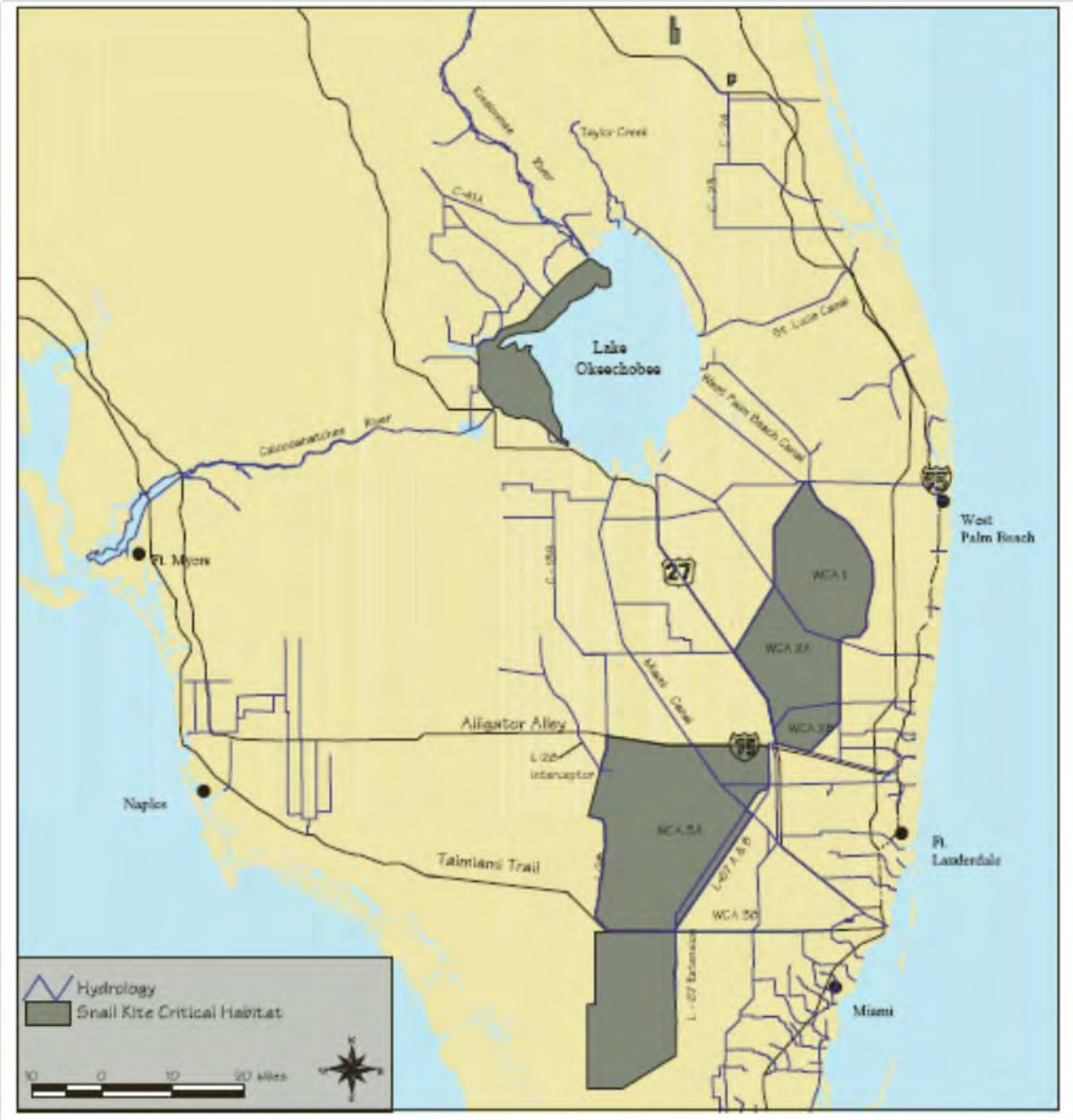

FIGURE 9. CRITICAL HABITAT FOR THE EVERGLADES SNAIL KITE

6.5 Audubon's Crested Caracara and "No Effect Determination"

Audubon's crested caracara is a large raptor with a crest, naked face, heavy bill, elongated neck, and unusually long legs. The total length of the caracara ranges from about 19.7 to 25.2 inches with a maximum wingspan of 47.2 inches. The adult is dark brownish black on the crown, wings, neck and lower abdomen. The lower part of the head, throat, upper abdomen and under tail coverts are white, and the breast and upper back are whitish, heavily barred with black. The tail is white with narrow, dark crossbars and a broad, dark terminal band. Adults have yellow-orange facial skin and yellow legs. Juveniles have a similar color pattern but are brownish and buffy, with the breast and upper back streaked instead of barred. Sexes are similar in color and size.

Caracaras are diurnal and non-migratory. Adult caracaras may be found in their territory year round. Territories average approximately 3,000 acres, corresponding to a radius of 1.2 to 1.5 miles surrounding the nest site (Morrison and Humphrey 2001). Foraging occurs throughout the territory. Caracaras often forage by walking for extended periods on the ground and are highly opportunistic in their feeding habits, eating carrion and capturing live prey. Prey species include insects and other invertebrates, fish, snakes, turtles, birds and mammals (Layne 1978). Within native habitats, caracaras regularly scavenge in recently burned areas and forage along the margins of wetlands within dry prairie communities.

Breeding pairs of caracaras seem to be monogamous, highly territorial and exhibit fidelity to both their mate and the site. Age at first breeding has been documented at 3 years (Nemeth and Morrison 2002). Although breeding activity can occur from September through June, the primary breeding season is considered November through April. Nest initiation and egg-laying peak from December through February. Caracaras construct new nests each nesting season, often in the same tree as the previous year. Nests are constructed of woven vines (Bent 1938; Sprunt 1954; Humphrey and Morrison 1997) 4 to 18 meters above the ground and are most often found in the tops of cabbage palms (Morrison and Humphrey 2001). Clutch size is two to three eggs, but most often two. Incubation lasts for 31 to 33 days (Morrison 1996, 1999) and is shared by both sexes. One brood is typically raised per nesting season and the young fledge at 7 to 8 weeks of age. Post-fledgling dependency lasts approximately 8 weeks.

Florida's population of caracara is found in the prairie area of the south-central region of the state, from Polk and Osceola Counties southward to Collier and Broward Counties. The caracara is most abundant in a five-county area that includes Glades, Desoto, Highlands, Okeechobee and Osceola counties (USFWS 1999). The caracara historically occupied native dry or wet prairies containing scattered cabbage palms, their preferred nesting tree. Scattered saw palmetto, low-growing oaks and cypress also occur within these native communities. Many of the native prairies have been converted to agricultural land uses and have been frequently replaced by improved and unimproved pasture dominated by short-stature, non-native sod-forming grasses. This loss has accelerated in the past few decades (Morrison and Humphrey 2001). The caracaras perceived decline, as described in historic literature, is attributed primarily to habitat loss. Road mortalities may also be a significant cause of caracara decline.

FIGURE 10 depicts caracara observations and nesting locations within the project area from the 2012 nesting season. The proposed action is expected to benefit BCSIR by maintaining higher groundwater elevations within the western portion of BCSIR, resulting in the enhancement of existing wetlands. A potential increase in hydroperiod within the project area is not anticipated to result in significant land use changes within and adjacent to BCSIR. Caracaras forage within a variety of habitats including improved pastures, adjacent to dwellings and farm buildings, newly plowed or burned fields, agricultural lands and wetland habitats. Elimination or modification of potential caracara habitat for foraging and breeding is not anticipated due to the limited extent of operational changes being considered. The Seminole Tribe of Florida will continue to conduct annual caracara surveys in accordance with associated permits not directly related to this project. Based on this information, the Corps has determined that there would be no effect on this species from implementation of the proposed action.

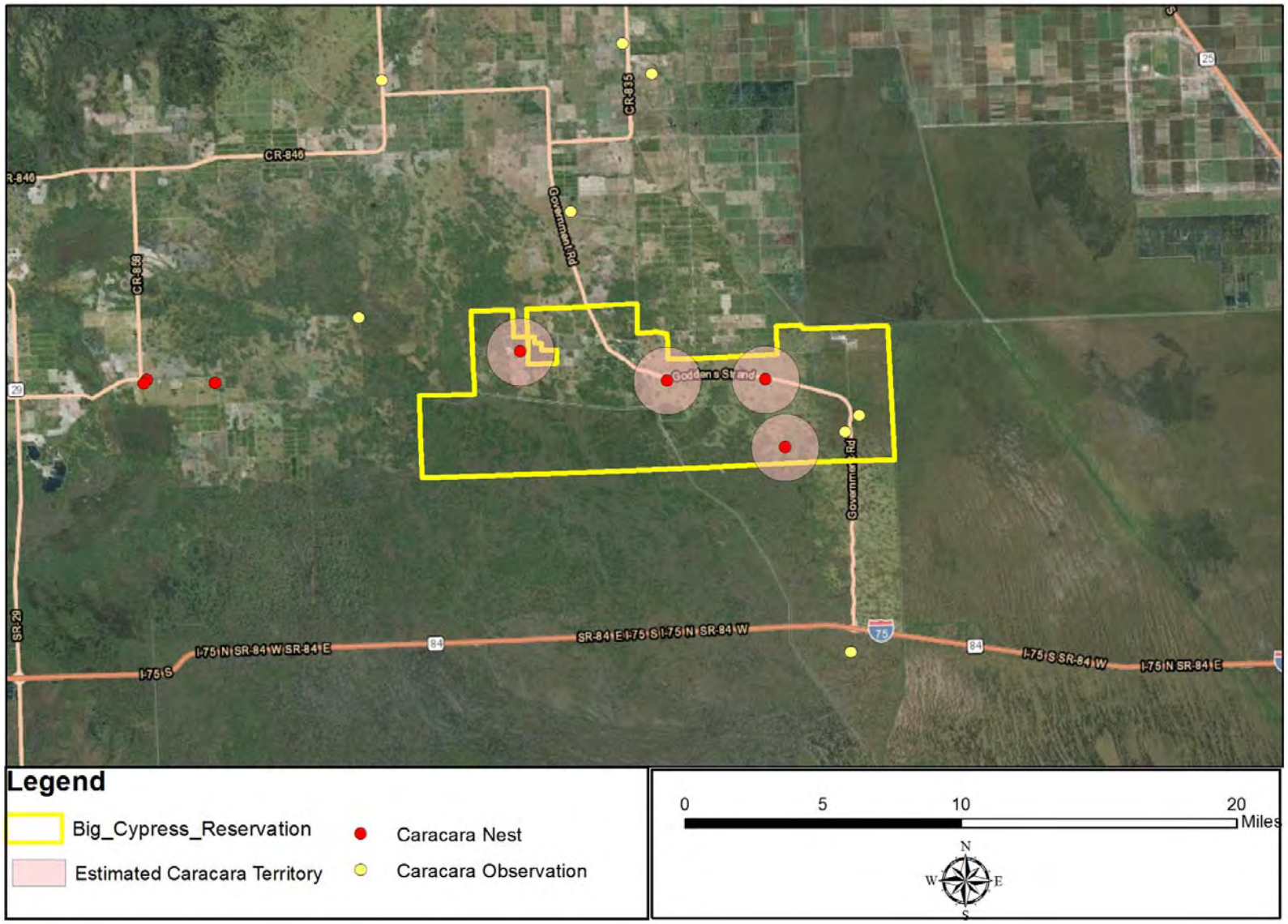

FIGURE 10. CARACARA OBSERVATIONS AND NESTING LOCATIONS FROM 2012 NESTING SEASON

6.6 Wood Stork and "May Affect Not Likely to Adversely Affect Determination"

The wood stork is a large, white, long-legged wading bird that relies upon shallow, freshwater wetlands for foraging. The wood stork is found from northern Argentina, eastern Peru and western Ecuador north to Central America, Mexico, Cuba, Hispaniola, and the southeastern United States (AOU 1983). Only the population segment that breeds in the southeastern United States is listed and on July 20, 2014 was upgraded from endangered to threatened status under ESA of 1973, as amended. In the United States, wood storks were historically known to nest in all coastal states from Texas to South Carolina (Wayne 1910, Bent 1926, Howell 1932, Oberholser 1938, Cone and Hall 1970). The primary cause of the wood stork population decline in the United States is loss of wetland habitats or loss of wetland function resulting in reduced prey availability. Almost any shallow wetland depression where fish become concentrated, either through local reproduction or receding water levels, may be used as feeding habitat by the wood stork during some portion of the year, but only a small portion of the available wetlands support foraging conditions (high prey density and favorable vegetation structure) that wood storks need to maintain growing nestlings.

Wood storks forage primarily within freshwater marsh and wet prairie vegetation types, but can be found in a wide variety of wetland types, as long as prey are available and the water is shallow and open enough to hunt successfully (Ogden et al. 1978, Coulter 1987, Gawlik and Crozier 2007, Herring and Gawlik 2007). Calm water, about 5 to 25 centimeters in depth, and free of dense aquatic vegetation is ideal, however, wood storks have been observed foraging in ponds up to 40 centimeters in depth (Coulter and Bryan 1993, Gawlik 2002). Typical foraging sites include freshwater marshes, ponds, hardwood and cypress swamps, narrow tidal creeks or shallow tidal pools; and artificial wetlands such as stock ponds, shallow, seasonally flooded roadside or agricultural ditches, and managed impoundments (Coulter et al. 1999, Coulter and Bryan 1993, Herring and Gawlik 2007). During nesting, these areas must also be sufficiently close to the colony to allow wood storks to efficiently deliver prey to nestlings.

Hydrologic and environmental characteristics have strong effects on fish density, and these factors may be some of the most significant in determining foraging habitat suitability, particularly in southern Florida. Within the wetland systems of southern Florida, the annual hydrologic pattern is very consistent, with water levels rising over three feet during the wet season (June-September), and then receding gradually during the dry season (October-May). Wood storks nest during the dry season, and rely on the drying wetlands to concentrate prey items in the ever-narrowing wetlands (Kahl 1964). Because of the continual change in water levels during the wood stork nesting period, any one site may only be suitable for wood stork foraging for a narrow window of time when wetlands have sufficiently dried to begin concentrating prey and making water depths suitable for storks to access the wetlands (Gawlik 2002, Gawlik et al. 2004). Once the wetland has dried to where water levels are near the ground surface, the area is no longer suitable for wood stork foraging, and will not be suitable until water levels rise and the area is again repopulated with fish. Consequently, there is a general progression in the suitability of wetlands for foraging based on their hydroperiods, with the short hydroperiod wetlands being used early in the season, the mid-range hydroperiod sites being used during the middle of the nesting season, and the longest hydroperiod areas being used later in the season (Kahl 1964, Gawlik 2002).

Wood storks generally forage in wetlands between 0.5 kilometer and 74.5 kilometer away from the colony site (Herring and Gawlik 2007), but forage most frequently within 10-20 kilometer (12 miles) of the colony (Coulter and Bryan 1993, Herring and Gawlik 2007). Maintaining this wide range of feeding site options ensures sufficient wetlands of all sizes and varying hydroperiods are available, during shifts in seasonal and annual rainfall and surface water patterns, to support wood storks. Adults feed farthest from the nesting site prior to laying eggs, forage in wetlands closer to the colony site during incubation and early stages of raising the young, and then farther away again when the young are able to fly.

Wood stork nesting habitat consists of mangroves as low as 1 meter (3 feet), cypress as tall as 30.5 meters (100 feet), and various other live or dead shrubs or trees located in standing water (swamps) or on islands surrounded by relatively broad expanses of open water (Rodgers et al. 1997, Coulter et al. 1999). Wood storks nest colonially, often in conjunction with other wading bird species, and generally occupy the large-diameter trees at a colony site (Rodgers et al. 1995). The same colony site will be used for many years as long as the colony is undisturbed and sufficient foraging habitat remains in the surrounding wetlands. However, not all wood storks nesting in a colony will return to the same site in subsequent years (Kushlan and Frohring 1986). Natural wetland nesting sites may be abandoned if surface water is removed from beneath the trees during the nesting season (Rodgers et al. 1995). Wood storks that abandon a colony early in the nesting season due to unsuitable hydrologic conditions may re-nest in other nearby areas (Crozier and Cook 2004).

Breeding wood storks are believed to form new pair bonds every season. First age of breeding has been documented in 3 to 4-year-old birds but the average first age of breeding is unknown. Eggs are laid as early as October in south Florida and as late as June in north Florida (USFWS 1999). A single clutch of two to five (average three) eggs is laid per breeding season but a second clutch may be laid if a nest failure occurs early in the breeding season (Coulter et al. 1999). There is variation among years in the clutch sizes, and clutch size does not appear to be related to longitude, nest data, nesting density, or nesting numbers, and may be related to habitat conditions at the time of laying (Frederick 2009, Frederick et al. 2009). Egg laying is staggered and incubation, which lasts approximately 30 days, begins after the first egg is laid. Therefore, the eggs hatch at different times and the nestlings vary in size (Coulter et al. 1999). In the event of diminished foraging conditions, the youngest birds generally do not survive.

The young fledge in approximately eight weeks but will stay at the nest for three to four more weeks to be fed. Adults feed the young by regurgitating whole fish into the bottom of the nest about three to ten times per day. Feedings are more frequent when the birds are young (Coulter et al. 1999). When wood storks are forced to fly great distances to locate food, feedings are less frequent. The total nesting period from courtship and nest-building through independence of young, lasts approximately 100 to 120 days (Coulter et al. 1999). Within a colony, nest initiation may be asynchronous, and consequently, a colony may contain active breeding wood storks for a period significantly longer than the 120 days required for a pair to raise young to independence. Adults and independent young may continue to forage around the colony site for a relatively short period following the completion of breeding. Appropriate water depths for successful foraging are particularly important for newly fledged juveniles.

Receding water levels are necessary in south Florida to concentrate suitable densities of forage fish (Kahl 1964, Kushlan et al. 1975) to sustain successful wood stork nesting. During the period when a nesting colony is active, wood storks are dependent on consistent foraging opportunities in wetlands within their core foraging area (30 kilometer radius, USFWS 2010) surrounding a nest site. The annual climatological pattern that appears to stimulate the heaviest nesting efforts by wood storks is a combination of the average or above-average rainfall during the summer rainy season prior to colony formation and an absence of unusually rainy or cold weather during the following winter-spring nesting season. This pattern produces widespread and prolonged flooding of summer marshes that maximizes production of freshwater fishes, followed by steady drying that concentrates fish during the dry season when storks nest (Kahl 1964, Frederick et al. 2009). However, frequent heavy rains during nesting can cause water levels to increase rapidly. The abrupt increases in water levels during nesting, termed reversals (Crozier and Gawlik 2003), may cause nest abandonment, re-nesting, late nest initiation, and poor fledging success. Abandonment and poor fledging success was reported to have affected most wading bird colonies in southern Florida during 2004, 2005 and 2008 (Crozier and Cook 2004, Cook and Call 2005, SFWMD 2008).

The proposed action is expected to benefit BCSIR by maintaining higher groundwater elevations within the western portion of BCSIR. The proposed action is also expected to enhance wetlands within BCSIR, including the Native Area located south of the West Feeder Canal and north of BCNP. **FIGURE 8** depicts the location of wood stork nest colonies and associated core foraging areas from 2001-2012 within the project area. Nests are generally located both north and west of BCSIR and southeast of BCSIR within WCA 3A and ENP; however, suitable habitat potentially exists within the project area. A potential increase in hydroperiod may provide an overall net benefit for wood stork and other wading birds within BCSIR. Increased duration of surface water elevations within the project area may provide an opportunity for improved foraging and nesting conditions. However, due to the limited extent of operational changes being considered, implementation of the proposed action would not result in significant effects to wood stork. Based on this information, the Corps has determined that implementation of the proposed action may affect, but is not likely to adversely affect, this species.

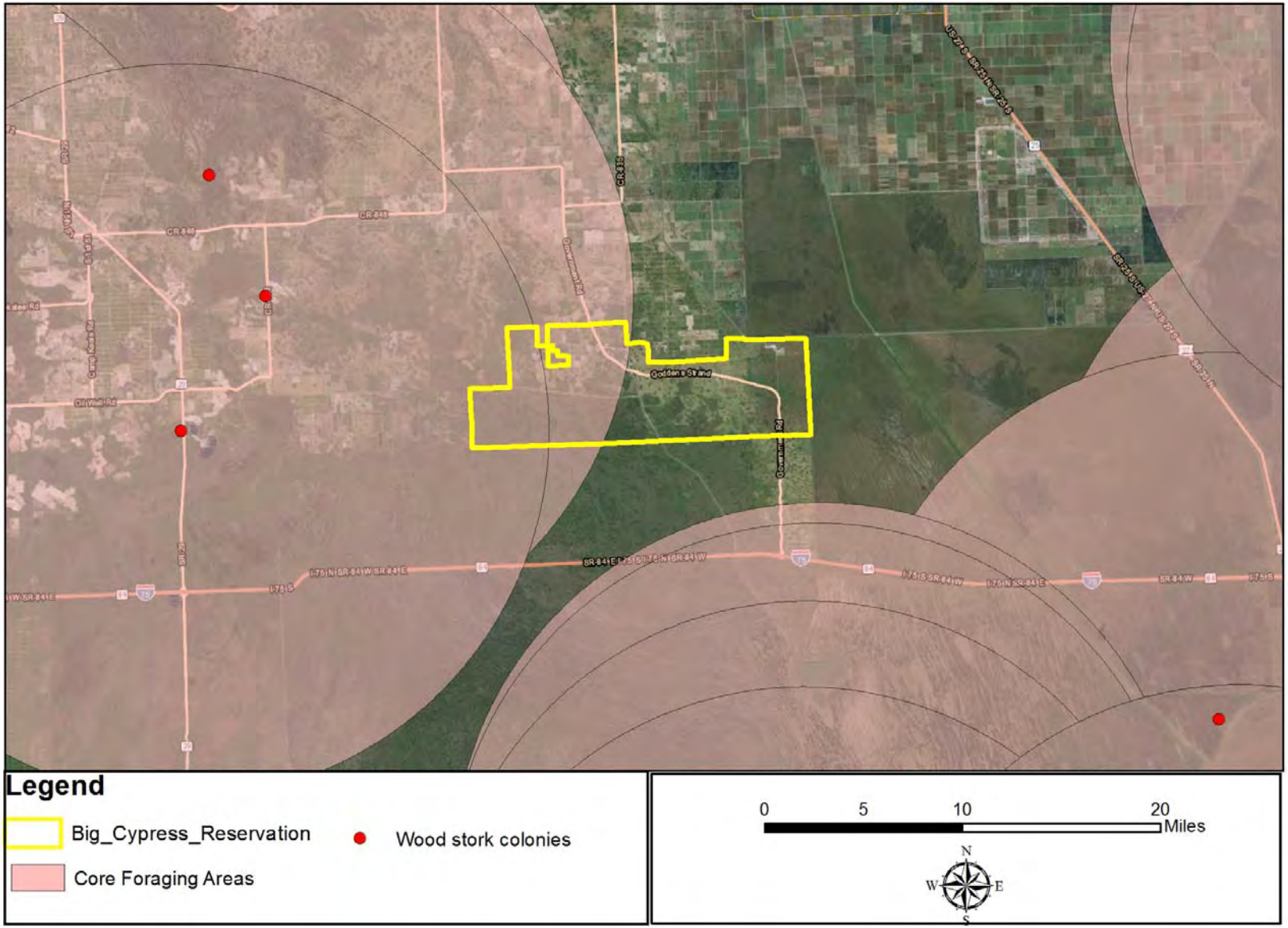

FIGURE 11. LOCATION OF WOODSTORK COLONIES BETWEEN 2001 AND 2012

6.7 Eastern Indigo Snake and "No Effect Determination"

The Eastern indigo snake was listed as threatened in 1978 due primarily to habitat loss due to development. Further, as habitats become fragmented by roads, Eastern indigo snakes become increasingly vulnerable to highway mortality as they travel through their large territories. Declines in Eastern indigo snake populations were also due to over-collection by the pet trade and mortality caused by rattlesnake collectors who gas gopher tortoise burrows to collect snakes.

The Eastern indigo snake is the largest native non-venomous snake in North America, reaching lengths of up to 8.5 feet (Moler 1992). Its color is uniformly lustrous-black, dorsally and ventrally, except for a red or cream-colored suffusion of the chin, throat, and sometimes cheeks. Its scales are large and smooth. In south-central Florida, limited information on the reproductive cycle suggests Eastern indigo snake breeding extends from June to January, egg laying occurs from April to July, and hatching occurs during mid-summer to early fall (Layne and Steiner 1996). Young hatch at approximately 3 months after egg-laying and there is no evidence of prenatal care. Eastern indigo snakes are active and spend a great deal of time foraging for food and searching for mates. They are primarily active during the day and rest at night. The Eastern indigo snake is a generalized predator, swallowing their prey alive. Food consists of fish, frogs, toads, snakes, lizards, turtles and turtle eggs, small alligators, birds and small mammals (Keegan 1944; Babis 1949; Kochman 1978; Steiner et. al. 1983).

Over most of its range in Florida, Eastern indigo snakes may be found in a variety of habitats including pine flatwoods, scrubby flatwoods, floodplain edges, sand ridges, dry glades, tropical hammocks, edges of freshwater marshes, muckland fields, coastal dunes and xeric sandhill communities (USFWS 1999). Eastern indigo snakes also use agricultural lands and various types of wetlands, with higher population concentrations occurring in sandhill and pineland regions of northern and central Florida. Observations over the last 50 years made by maintenance workers in citrus groves in east-central Florida indicate that Eastern indigo snakes are most frequently observed near the canals, roads and wet ditches (Zeigler 2006). Eastern indigo snakes shelter in gopher tortoise burrows, hollowed root channels, hollow logs, or the burrows of rodents, armadillos, or land crabs (Lawler 1977; Moler 1985; Layne and Steiner 1996). Eastern indigo snakes need relatively large areas of undeveloped land to maintain their population. In general, adult males have larger home ranges than females or juveniles. In Florida, Smith (2003) indicated that female and male home ranges extend from 5 to 371 acres and 4 to 805 acres, respectively.

Within BCSIR, only two sightings of Eastern indigo snakes have been recorded as noted within the Seminole Tribe of Florida Wildlife Conservation Plan (Seminole Tribe of Florida 2012). These sightings occurred within agricultural fields during construction of Basin 1 of the Seminole Big Cypress Water Conservation Project in 2007 and 2008. The proposed action is not expected to have significant effects on the upland habitats preferred by this species. No construction is proposed nor is upland habitat conversion anticipated. Therefore, the Corps has determined that there would be no effect on this species from the implementation of the proposed action.

7.0 EFFORTS TO ELIMINATE POTENTIAL IMPACTS ON LISTED SPECIES

All practicable means to avoid or minimize environmental effects were incorporated into the proposed action. The Corps will continue to maintain ongoing communications with the USFWS to resolve any issues that arise as a result of modifications to the operating criteria at S-190.

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To: Paul Backhouse, Tribal Historic Preservation Office
Meredith Moreno, United States Army Corps of Engineers

From: Maureen Mahoney, Tribal Archaeologist

Re: A Cultural Resource Assessment of the Proposed Modifications to S-190 Operating Criteria Project, Big Cypress Reservation. Project Number 2016-100.

Date: June 8, 2016

STOF CULTURAL RESOURCE ORDINANCE RECOMMENDATION

Based on the results of the cultural resource survey, the Proposed Modifications to S-190 Operating Criteria APE does contain properties eligible for listing on the Tribal Register of Historic Places. However, the proposed undertaking does not contain any ground disturbing activity. The proposed project will affect the groundwater levels only, resulting in conditions that the sites have been subject to in the past (i.e. 1967-1996 and 2012-2016). Therefore, the TAS recommends a finding of no cultural resources affected under the STOF Cultural Resource Ordinance.

SECTION 106 RECOMMENDATION

Based on the results of the cultural resource survey, the Proposed Modifications to S-190 Operating Criteria APE contains one property that is eligible for listing on the National Register of Historic Places. However, the proposed undertaking does not contain any ground disturbing activity. The proposed project will only affect groundwater levels below surface, causing higher groundwater levels during the winter in areas closest to the canal, and will not affect surface water levels. This operational change will be a return to a previously utilized operational setting, resulting in conditions that the areas affected have been subject to in the past (i.e. 1967-1996 and 2012-2016). Therefore, the TAS recommends a finding of no historic properties affected under Sec106 of the National Historic Preservation Act.

The TAS finds no other issues of concern regarding cultural resources and recommends that the undertaking, as originally proposed in the THPO Project Request Number 2016-100, be permitted to proceed.

If there are any questions with regard to this report or the field work associated with this project, please feel free to contact me at maureenmahoney@semtribe.com or at (863) 983-6549, Ext. 12248.

Sincerely,
Maureen Mahoney
Tribal Archaeologist

Project Determinations

Cultural Resource Ordinance Determination

- [ ] Cultural Resources Affected
- [ ] Adverse Effect
- [x] No Cultural Resources Affected
- [ ] No Adverse Effect

Section 106 Determination

- [ ] Not a Federal Undertaking (No Section 106 Determination)
- [ ] Historic Properties Affected
- [ ] Adverse Effect
- [x] No Historic Properties Affected
- [ ] No Adverse Effect
- [ ] No Potential for Effect

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TRIBAL HISTORIC PRESERVATION OFFICE
AH-TAH-THI-KI MUSEUM

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LAVONNE ROSE
SECRETARY

PETER A. HAHN
TREASURER

June 9, 2016

Re: A Phase I Cultural Resources Survey and Assessment of the Proposed Modifications to S-190 Operating Criteria

Dear Ms. Moreno:

The Seminole Tribe of Florida, Tribal Historic Preservation Office has completed a Phase I Cultural Resources Survey and Assessment of the Proposed Modifications to S-190 Operating Criteria, on the Big Cypress Seminole Indian Reservation. A copy of the report is attached for your reference. After reviewing the resultant report for compliance with the Cultural Resource Ordinance (C-01-16) and Section 106 of the National Historic Preservation Act I concur with the determination that 'No Cultural Resources will be Affected' and 'No Historic Properties will be Affected' by the proposed action. Per the March 2016 Agreement with the Advisory Council on Historic Preservation and the Seminole Tribe of Florida pursuant to the National Historic Preservation Act, Act 54 U.S.C. § 300101 et seq. we believe the above report and findings are sufficient to document your compliance with provisions of the National Historic Preservation Act and that no further action is required at this time on your behalf.

Please let me know if you have any questions in due course.

Sincerely,

Paul N. Backhouse, Ph.D.
Tribal Historic Preservation Officer
Seminole Tribe of Florida

00065950-1

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 San Marco Boulevard
JACKSONVILLE, FLORIDA 32207-8175

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

JUN 17 2016

Mr. Fred Dayhoff, Tribal Representative
NAGPRA, Section 106
Miccosukee Tribe of Indians of Florida
HC 61 SR 68
Ochopee, Florida 34141

Re: Proposed Modification to Operating Criteria for S-190

Dear Mr. Dayhoff,

The U.S. Army Corps of Engineers (Corps), Jacksonville District, in partnership with the Seminole Tribe of Florida (STOF) and the South Florida Water Management District, is studying the environmental effects of modifying the current water operating schedule of Structure 190 (S-190) with an Environmental Assessment. The purpose of this modification is to maintain higher groundwater elevation and increase water storage within the Big Cypress Seminole Indian Reservation (BCSIR) at the request of the STOF in a letter dated October 24, 2011.

S-190 is a gated spillway and the primary water discharge structure in the Feeder Canal Basin located in southeastern Hendry County. The Feeder Canal Basin is an area of approximately 113 square miles containing canals and structures which provide flood protection and drainage, in addition to conveying excess runoff to Water Conservation Area 3A (WCA 3A) for water supply and environmental use (Figure 1). The two major canals associated with the Feeder Canal Basin are the North Feeder Canal and the West Feeder Canal. These two canals merge on the BCSIR in the lower southeastern corner of the basin and discharge south through the S-190 structure into the L-28 Interceptor Canal and eventually into WCA 3A. Since 1996, S-190 has been operated on either a "high setting" [i.e. dry condition: water control elevation of 15.5 feet National Geodetic Vertical Datum of 1929 (NGVD)] or "low setting" (i.e. normal condition: water control elevation of 14.5 feet NGVD) throughout the year. In general, when there is a threat of flooding, the "low setting" is used; otherwise the gate is set at the "high setting." Prior to 1996, S-190 utilized an operating criteria as defined in Central and Southern Florida Project for Flood Control and Other Purposes, Part I, Supplement 40, Addendum 1, dated 7 February 1964, wherein the S-190 headwater elevation is held at 15.5 feet NGVD.

As a result of the Environmental Assessment, the preferred alternative consists of modifying the current water operating schedule of S-190 to maintain an optimum year-round canal stage of 15.5 feet NGVD, as opposed to the current operations which maintains the canal stage at 14.5 feet NGVD ("low setting") when there is a threat of flooding. The preferred alternative specifies that when the S-190 headwater elevation reaches 15.8 feet NGVD the gates will open, and when the headwater elevation falls to 15.2 feet NGVD the gates will close. This returns the operation of S-190 to the original authorized purpose and operating criteria dated 1964.

Based on a hydraulic evaluation of the preferred alternative, the area of potential effects (APE) for the modification of the S-190 water operating schedule includes approximately 3,000 feet on either side of the North and West Feeder Canals (Figure 2). Ponding or an increase in surface water as a result of the operational change is not anticipated within the APE. Groundwater levels may increase adjacent to the canals; however, the groundwater elevation will rapidly recede (such that the majority of influence will be within the first 1,500 feet) as it propagates through the surficial aquifer and away from the canals (Figure 3). Therefore, cultural resources closest to the canal may experience higher groundwater table levels during the winter months; however, as the proposed operational change is a return to a previously utilized operational setting, groundwater levels resulting from the change are conditions that the area have been subject to in the past (i.e. 1967-1996).

The APE includes 9,010 acres, of which approximately 7,160 acres are located within the boundary of the BCSIR. In Accordance with Section 101(d)(5) of the National Historic Preservation Act (NHPA), 54 U.S.C. § 302705, the Advisory Council on Historic Preservation (ACHP) entered into an agreement with the STOF to substitute the STOF's Cultural Resource Ordinance, C01-16, for the ACHP's regulations for the review of undertakings on their tribal lands under Section 106 of the NHPA. As such, for those portions of the APE within the boundary of the BCSIR, the STOF Tribal Historic Preservation Office has determined that "No Cultural Resources will be Affected" and "No Historic Properties will be Affected" by the proposed modifications to the S-190 Operating Criteria in a letter to the Corps dated June 9, 2016.

The portion of the APE located outside of the BCSIR boundary has been subject to two cultural resource surveys (DHR Manuscript Nos. 2551 and 2662) resulting in the identification of three archaeological sites. Sites 8HN067, 8HN068, and 8HN075 consist of prehistoric middens dating from the general Glades period. These sites are situated over 1,700 feet east of the North Feeder Canal and have not been evaluated regarding eligibility for listing in the National Register of Historic Places.

Based on the hydraulic evaluation of the proposed operational modification there will be little to no changes in groundwater elevation at these sites and the proposed project will not result in ground-disturbing activities or an increase in surface water throughout the APE. Additionally, the change in groundwater levels are conditions that these sites has been subject to in the past. Therefore, the Corps has determined that the proposed modification to operational criteria for S-190 poses no effect to historic properties.

Pursuant to Section 106 of the National Historic Preservation Act (16 USC 470) and it's implementing regulations (36 CFR 800), and in consideration of the Corps' Trust Responsibilities, the Corps kindly requests your comments on the determination of no effect for portions of the APE which fall outside of the BCSIR. If there are any questions or comments, please contact Ms. Meredith Moreno at (904) 232-1577, or by e-mail at Meredith.A.Moreno@usace.army.mil.

Sincerely,

Gina Paduano Ralph, Ph.D.
Chief, Environmental Branch

Enclosure

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 San Marco Boulevard
JACKSONVILLE, FLORIDA 32207-8175

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

JUN 17 2016

Tim Parsons, Ph.D.
State Historic Preservation Officer
Division of Historical Resources
500 South Bronough Street
Tallahassee, Florida 32399-0250

Re: Proposed Modification to Operating Criteria for S-190

Dear Dr. Parsons,

The U.S. Army Corps of Engineers (Corps), Jacksonville District, in partnership with the Seminole Tribe of Florida (STOF) and the South Florida Water Management District, is studying the environmental effects of modifying the current water operating schedule of Structure 190 (S-190) with an Environmental Assessment. The purpose of this modification is to maintain higher groundwater elevation and increase water storage within the Big Cypress Seminole Indian Reservation (BCSIR) at the request of the STOF in a letter dated October 24, 2011.

S-190 is a gated spillway and the primary water discharge structure in the Feeder Canal Basin located in southeastern Hendry County. The Feeder Canal Basin is an area of approximately 113 square miles containing canals and structures which provide flood protection and drainage, in addition to conveying excess runoff to Water Conservation Area 3A (WCA 3A) for water supply and environmental use (Figure 1). The two major canals associated with the Feeder Canal Basin are the North Feeder Canal and the West Feeder Canal. These two canals merge on the BCSIR in the lower southeastern corner of the basin and discharge south through the S-190 structure into the L-28 Interceptor Canal and eventually into WCA 3A. Since 1996, S-190 has been operated on either a "high setting" [i.e. dry condition: water control elevation of 15.5 feet National Geodetic Vertical Datum of 1929 (NGVD)] or "low setting" (i.e. normal condition: water control elevation of 14.5 feet NGVD) throughout the year. In general, when there is a threat of flooding, the "low setting" is used; otherwise the gate is set at the "high setting." Prior to 1996, S-190 utilized an operating criteria as defined in Central and Southern Florida Project for Flood Control and Other Purposes, Part I, Supplement 40, Addendum 1, dated 7 February 1964, wherein the S-190 headwater elevation is held at 15.5 feet NGVD.

As a result of the Environmental Assessment, the preferred alternative consists of modifying the current water operating schedule of S-190 to maintain an optimum year-round canal stage of 15.5 feet NGVD, as opposed to the current operations which maintains the canal stage at 14.5 feet NGVD ("low setting") when there is a threat of flooding. The preferred alternative specifies that when the S-190 headwater elevation reaches 15.8 feet NGVD the gates will open, and when the headwater elevation falls to 15.2 feet NGVD the gates will close. This returns the operation of S-190 to the original authorized purpose and operating criteria dated 1964.

Based on a hydraulic evaluation of the preferred alternative, the area of potential effects (APE) for the modification of the S-190 water operating schedule includes approximately 3,000 feet on either side of the North and West Feeder Canals (Figure 2). Ponding or an increase in surface water as a result of the operational change is not anticipated within the APE. Groundwater levels may increase adjacent to the canals; however, the groundwater elevation will rapidly recede (such that the majority of influence will be within the first 1,500 feet) as it propagates through the surficial aquifer and away from the canals (Figure 3). Therefore, cultural resources closest to the canal may experience higher groundwater table levels during the winter months; however, as the proposed operational change is a return to a previously utilized operational setting, groundwater levels resulting from the change are conditions that the area have been subject to in the past (i.e. 1967-1996).

The APE includes 9,010 acres, of which approximately 7,160 acres are located within the boundary of the BCSIR. In Accordance with Section 101(d)(5) of the National Historic Preservation Act (NHPA), 54 U.S.C. § 302705, the Advisory Council on Historic Preservation (ACHP) entered into an agreement with the STOF to substitute the STOF's Cultural Resource Ordinance, C01-16, for the ACHP's regulations for the review of undertakings on their tribal lands under Section 106 of the NHPA. As such, for those portions of the APE within the boundary of the BCSIR, the STOF Tribal Historic Preservation Office has determined that "No Cultural Resources will be Affected" and "No Historic Properties will be Affected" by the proposed modifications to the S-190 Operating Criteria in a letter to the Corps dated June 9, 2016.

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Based on the hydraulic evaluation of the proposed operational modification there will be little to no changes in groundwater elevation at these sites and the proposed project will not result in ground-disturbing activities or an increase in surface water throughout the APE. Additionally, the change in groundwater levels are conditions that these sites has been subject to in the past. Therefore, the Corps has determined that the proposed modification to operational criteria for S-190 poses no effect to historic properties.

Pursuant to Section 106 of the National Historic Preservation Act (16 USC 470) and it's implementing regulations (36 CFR 800), the Corps kindly requests your comments on the determination of no effect for portions of the APE which fall outside of the BCSIR. If there are any questions or comments, please contact Ms. Meredith Moreno at (904) 232-1577 or by e-mail at Meredith.A.Moreno@usace.army.mil.

Sincerely,

Gina Paduano Ralph, Ph.D.
Chief, Environmental Branch

Enclosure

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 San Marco Boulevard
JACKSONVILLE, FLORIDA 32207-8175

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

JUN 17 2016

Dr. Paul Backhouse, THPO
Seminole Tribe of Florida
Tribal Historic Preservation Office
30290 Josie Billie Highway
PMP 1004
Clewiston, Florida 33440

Re: Proposed Modification to Operating Criteria for S-190, STOF-THPO Project Number 2016-100.

Dear Dr. Backhouse:

The U.S. Army Corps of Engineers (Corps), Jacksonville District, in partnership with the Seminole Tribe of Florida (STOF) and the South Florida Water Management District, is studying the environmental effects of modifying the current water operating schedule of Structure 190 (S-190) with an Environmental Assessment. The purpose of this modification is to maintain higher groundwater elevation and increase water storage within the Big Cypress Seminole Indian Reservation (BCSIR) at the request of the STOF in a letter dated October 24, 2011.

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Based on the hydraulic evaluation of the proposed operational modification there will be little to no changes in groundwater elevation at these sites and the proposed project will not result in ground-disturbing activities or an increase in surface water throughout the APE. Additionally, the change in groundwater levels are conditions that these sites has been subject to in the past. Therefore, the Corps has determined that the proposed modification to operational criteria for S-190 poses no effect to historic properties.

Pursuant to Section 106 of the National Historic Preservation Act (16 USC 470) and it's implementing regulations (36 CFR 800), and in consideration of the Corps' Trust Responsibilities, the Corps kindly requests your comments on the determination of no effect for portions of the APE which fall outside of the BCSIR. If there are any questions or comments, please contact Ms. Meredith Moreno at (904) 232-1577, or by e-mail at Meredith.A.Moreno@usace.army.mil.

Sincerely,

Gina Paduano Ralph, Ph.D.
Chief, Environmental Branch

Enclosure

DEPARTMENT OF T
JACKSONVILLE DISTRICT COR
701 San Marco Bo
JACKSONVILLE, FLORI

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

RECEIVED
MAY 11 2016
South Florida ES Offi
Vero Beach, FL
MAY 0

2014-CPA-0362 (E)

U.S. Fish and Wildlife Service
1339 20th Street
Vero Beach, Florida 32960
772-562-3909 Fax 772-562-4288

FWS Log No. 2014-CPA-0362

The U.S. Fish and Wildlife Service has reviewed the information provided and finds that the proposed action is not likely to adversely affect any federally listed species or designated critical habitat protected by the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 et. seq.). A record of this consultation is on file at the South Florida Ecological Service Office.

This fulfills the requirements of section 7 of the Act and further action is not required. If modifications are made to the project, if additional information involving potential effects to listed species becomes available, or if a new species i listed, reinitiation of consultation may be necessary.

for Roxanna Hinzman, Field Supervisor — 7/18/16 Date

Mr. Larry Williams, Field Supervisor
U.S. Fish and Wildlife Service
1339 20th Street
Vero Beach, FL 32960

Dear Mr. Williams:

In accordance with provisions of Section 7 of the Endangered Species Act, as amended, the U.S. Army Corps of Engineers (Corps) is hereby initiating informal consultation with the U.S. Fish and Wildlife Service (USFWS) for modifications to the current water operating schedule of S-190 for purposes of providing additional water storage in the North and West Feeder Canals and higher groundwater levels within the western portion of the Big Cypress Seminole Indian Reservation. The Corps is preparing an Environmental Assessment (EA) to evaluate alternatives for the proposed action. The attached initiation package describes the proposed action and the Corps effects determinations on listed species and designated critical habitat.

S-190 acts as the primary water discharge structure in the Feeder Canal Basin located in southeastern Hendry County. The two major canals associated with the Feeder Canal Basin are the North Feeder Canal, and the West Feeder Canal. These two canals merge in the lower southeastern corner of the basin and discharge south through the S-190 structure and into the L-28 Interceptor Canal, and eventually Water Conservation Area 3A. S-190 maintains water stages in the North and West Feeder Canals.

Pursuant to the Endangered Species Act, the Corps has determined that the proposed action will have the following effects on federally listed species and designated critical habitat as illustrated in Table 1. Within 45 days of receipt of this letter, we request your written concurrence with our determinations.

SEMINOLE TRIBE OF FLORIDA
TRIBAL HISTORIC PRESERVATION OFFICE
AH-TAH-THI-KI MUSEUM

TRIBAL HISTORIC
PRESERVATION OFFICE

SEMINOLE TRIBE OF FLORIDA
AH-TAH-THI-KI MUSEUM

30290 JOSIE BILLIE HWY
PMB 1004
CLEWISTON, FL 33440

PHONE: (863) 983-6549
FAX: (863) 902-1117

SEMINOLE TRIBE OF FLORIDA
AH-TAH-THI-KI
MUSEUM
A PLACE TO LEARN. A PLACE TO REMEMBER.

TRIBAL OFFICERS

CHAIRMAN
JAMES E. BILLIE

VICE CHAIRMAN
MITCHELL CYPRESS

SECRETARY
LAVONNE ROSE

TREASURER
PETER HAHN

July 22, 2016

Ms. Tiphanie C. Jinks, Senior Project Manager
USACE Jacksonville District
701 San Marco Blvd.
Jacksonville, FL 32207
Office Phone: 904-232-1548
Email: tiphanie.c.jinks@usace.army.mil

Subject: Proposed Modifications to Operating Criteria For S-190
THPO #: 0028257

Dear Ms. Jinks:

Thank you for contacting the Seminole Tribe of Florida – Tribal Historic Preservation Office (STOF-THPO) regarding the *Environmental Assessment and Proposed Finding of No Significant Impact Proposed Modifications to Operating Criteria for S-190 Hendry County, Florida* ("EA"). The proposed undertaking does fall within the STOF Area of Interest. We have reviewed the documents you provided and completed our project assessment in order to determine if the undertaking would affect any areas important to the Tribe. Based on the limited projected impacts to the off-reservation component of the S-190 undertaking, as presented in Section 4.19.2 (p 4-15) and in Figure 4.1 (p 4-16) of the EA, we have determined that we have no objections to the project at this time. We would like to emphasis however that at least three known archaeological sites and portions of an historic trail fall within the off-reservation APE. If the proposed operating criteria modifications should result in impacts to these sites the THPO would expect consultation to resume with the USACE in order to address those impacts. Thank you and feel free to contact us with any questions or concerns.

Respectfully,

Bradley M. Mueller

Bradley M. Mueller, MA, Compliance Supervisor
STOF-THPO, Compliance Review Section
30290 Josie Billie Hwy, PMB 1004
Clewiston, FL 33440

Office: 863-983-6549 ext 12245
Email: bradleymueller@semtribe.com
Web: www.stofthpo.com

FLORIDA DEPARTMENT of STATE

RICK SCOTT
Governor

KEN DETZNER
Secretary of State

July 28, 2016

Gina Ralph
Chief, Environmental Branch
Department of the Army
Jacksonville District Corps of Engineers
701 San Marco Boulevard
Jacksonville, FL 32207-8175

RE: DHR Project File No.: 2016-2642, Received by DHR: June 21, 2016
Project: *Proposed Modification to Operating Criteria for S-190*
County: Hendry

Dear Dr. Ralph:

The Florida State Historic Preservation Officer reviewed the referenced project for possible effects on historic properties listed, or eligible for listing, on the *National Register of Historic Places.* The review was conducted in accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended, and its implementing regulations in *36 CFR Part 800: Protection of Historic Properties.*

Based on the information provided and the scope of work described, our office concurs that no historic properties will be affected by the proposed undertaking.

If you have any questions, please contact me at *Jason.Aldridge@dos.myflorida.com*, or by telephone at 850.245.6344 or 800.847.7278.

Sincerely,

Jason Aldridge
Deputy State Historic Preservation Officer
for Compliance and Review

Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Jonathan P. Steverson
Secretary

October 28, 2016

Sent by Electronic Mail – Document Access Verification Requested

Ms. Gina Paduano Ralph
U.S. Army Corps of Engineers
Jacksonville District, Planning Division
P. O. BOX 4970
Jacksonville, Florida 32232-0019

RE: US Army Corps of Engineers - Environmental Assessment and Proposed Finding of No Significant Impact for the Modifications to Operating Criteria for S-190 Structure to Add Water Storage, Hendry County Florida
SAI # FL201609157757C

Dear Ms. Ralph:

The Florida State Clearinghouse has coordinated a review of the proposed federal action under the following authorities: Presidential Executive Order 12372; Section 403.061(42), *Florida Statutes*; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended.

The Florida Department of Environmental Protection and the Florida Fish and Wildlife Conservation Commission has reviewed the proposed project and provided serval comments. Please see the attachments for these comments.

Based on the information contained in the proposal and enclosed agency comments, the state has determined that, at this stage, the proposed federal activities are consistent with the Florida Coastal Management Program (FCMP). The state's continued concurrence will be based on the activities' compliance with FCMP authorities, including federal and state monitoring of the activities to ensure their continued conformance, and the adequate resolution of issues identified during this and any subsequent regulatory reviews. The state's final concurrence of the project's consistency with the FCMP will be determined

during the environmental permitting process, in accordance with Section 373.428, *Florida Statutes*, if applicable.

Should you have any questions regarding this letter, please don't hesitate to contact me at 850/717-9076.

Sincerely,

Chris Stahl

Chris Stahl, Coordinator
Florida State Clearinghouse
Office of Intergovernmental Programs

Enclosures

cc: James Erskine – FWC
Ed Smith – Ecosystems Projects

Florida Fish and Wildlife Conservation Commission

Commissioners
Brian S. Yablonski
Chairman
Tallahassee

Aliese P. "Liesa" Priddy
Vice Chairman
Immokalee

Ronald M. Bergeron
Fort Lauderdale

Richard Hanas
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Panama City

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Tallahassee

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Key West

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Nick Wiley
Executive Director

Eric Sutton
Assistant Executive Director

Jennifer Fitzwater
Chief of Staff

South Region
Thomas R. Reinert, Ph.D.
Regional Director

(561) 625-5122
(561) 625-5129 FAX

Managing fish and wildlife resources for their long-term well-being and the benefit of people.

8535 Northlake Boulevard
West Palm Beach, FL
33412-3303

Hearing/speech-impaired:
(800) 955-8771 (T)
(800) 955-8770 (V)

MyFWC.com

October 14, 2016

Chris Stahl
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, M.S. 47
Tallahassee, FL 32399-3000
Chris.Stahl@dep.state.fl.us

RE: SAI #201609157757C, U.S. Army Corps of Engineers–Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) for the Modifications to Operating Criteria for S-190 Structure to Add Water Storage, Hendry County

Dear Mr. Stahl:

The Florida Fish and Wildlife Conservation Commission (FWC) has reviewed the above-referenced assessment, and provides the following comments in accordance with FWC's authorities under Chapter 379, Florida Statutes; Chapter 68, Florida Administrative Code; and Article 4, Section 9, of the Florida Constitution.

Project Description

The U.S. Army Corps of Engineers (USACE) has proposed modifications to the operational schedule of the S-190 Structure in order to maintain groundwater in the Big Cypress Seminole Indian Reservation (BCSIR), which was the original purpose of the structure. The S-190 acts as the primary water discharge structure in the Feeder Canal Basin located in southeast Hendry County just south of the C-139 Basin. There are two major canals associated with this structure: the North Feeder Canal and the West Feeder Canal. These two canals merge together and discharge through the S-190 and the into the L-28 Interceptor Canal and eventually into Water Conservation Area (WCA) 3A, south of I-75. Current operations maintain an operational head water elevation between 14.2 and 14.8 feet National Geodetic Vertical Datum (NGVD) and have resulted in releases of restorative seasonal rainfall, which prevents aquifer recharge and disrupts the natural wetland hydroperiods within the BCSIR and BCSIR Critical Restoration Project. The current S-190 operations have resulted in effects to fish and wildlife resources and shifts in vegetation communities within BCSIR and the surrounding native areas. The proposed modification will return the operation of the S-190 to its original purpose as authorized in 1964.

There are 5 alternatives proposed in this Environmental Assessment (EA): Alternative 1, No Action Alternative; Alternative 2, Maintain Optimum Canal Stages of 15.5 feet NGVD; Alternative 3, Maintain Optimum Canal Stages of 15.5 feet NGVD and includes Special Conditions; Alternative 4, Maintain Optimum Canal Stages of 15.8 feet NGVD and includes Special Conditions; and Alternative 5, Maintain Optimum Canal Stages of 16.0 feet NGVD and includes Special Conditions. Alternative 2 is the preferred alternative as it modifies the current S-190 operating criteria to be consistent with the original purpose as authorized in 1964. This alternative has been determined to best protect the Seminole Tribe's Tribal treaty rights, lands, assets, and resources within the BCSIR. It has been determined that Alternative 2 provides optimum upstream water control stages and will maintain an optimum year-round canal stage elevation of 15.5 feet NGVD.

The operational strategy for Alternative 2, as described in the EA, is to open the structure when the headwater elevation reaches 15.8 feet NGVD and allows the elevation to drop to 15.2 feet NGVD at which time the structure would be closed. The intent of this operational schedule is to maintain the headwater elevation at 15.5 feet NGVD and to allow some limited flexibility in gate operations to achieve this goal.

Comments and Recommendations

The FWC has fish and wildlife and land management responsibilities for WCAs 2 and 3, which are managed as the Everglades and Francis S. Taylor Wildlife Management Area. Therefore, potential impacts to WCA 3A are the focus of this review. After review of the modeling documentation, it was determined that only gauges north of I-75 were used in the analysis: 3A-NW and 3AN1-GW1. Please note that this area is north of the outflow of the L-28 Interceptor Canal which receives flow from the S-190. Considering that the normal flow of water in WCA 3A is generally from northwest to southeast, an analysis using gauges south of the L-28 Interceptor Canal terminus, such as 3A-SW-B, may provide additional beneficial information. Gauge 3A-SW-B is located in an area where surface waters are more likely to be impacted by modifications of the S-190 operational schedule. FWC staff recommends that the U.S. Army Corps of Engineers considers providing additional information on the specific gauge selections in WCA 3A or considers additional analyses using gauges where surface waters are more likely to be affected by the proposed operational changes.

The FWC fully supports this operational change to reflect the original intent of the structure as it provides improved hydroperiods in natural areas and benefits to aquatic communities. We appreciate the opportunity to provide comments on this EA/Proposed Finding of No Significant Impact and we find it consistent with FWC's authorities under the Coastal Zone Management Act/Florida's Coastal Management Program. If you need further assistance, please do not hesitate to contact Jane Chabre by phone at (850) 410-5367 or by email at FWCConservationPlanningServices@myfwc.com. If you have specific technical questions regarding the content of this letter, please contact Mr. Michael Anderson in our West Palm Beach office at (561) 625-5122 or by email at michael.anderson@myfwc.com.

Sincerely,

James Erskine, Everglades Coordinator
Office of Executive Director

je/ma
ENV 1-3-2
S-190 Operating Criteria Modifications_31577_101416

cc: Melissa Nasuti, U.S. Army Corps of Engineers,
Melissa.A.Nasuti@usace.army.mil

Memorandum

TO: Chris Stahl, Florida State Clearinghouse

THROUGH: Ed Smith, Director
Office of Ecosystem Projects

FROM: Inger Hansen and Shannan Bogdanov
Office of Ecosystem Projects

DATE: October 20, 2016

SAI#: FL201609157757C

SUBJECT: Department of the Army, Jacksonville District Corps of Engineers – Environmental Assessment and Proposed Finding of No Significant Impact for the Modifications to Operating Criteria for S-190 Structure to add Water Storage, Hendry County, Florida.

Background:

This Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluates alternatives for modifications to the current water operating schedule of Structure 190 (S-190) for purposes of providing additional water storage in the North and West Feeder Canals and higher groundwater levels within the Big Cypress Seminole Indian Reservation. The S-190 was installed to protect the Big Cypress Seminole Indian Reservation (BCSIR) from over drainage and acts as the primary water discharge structure in the Feeder Canal Basin. Current operations of S-190 include a "high setting" used during dry conditions that maintains a water control elevation of 15.5 ft. National Geodetic Vertical Datum (NGVD) or a "low setting" used during "normal" conditions that maintains a water control elevation of 14.5 ft. NGVD. This operating regime has resulted in over drainage within the BCSIR and the Feeder Canal Basin leading to the release of seasonal rainfall prior to its capture for aquifer recharge or maintenance of wetland hydroperiods. In addition, impacts to fish and wildlife resources and shifts in vegetative communities have been observed within BCSIR and the native area bordering the L-28 Interceptor Canal to the east and the West Feeder Canal.

Several alternatives to the operating criteria that would maintain higher groundwater elevations and increased water storage within the western portion of BCSIR were evaluated in the EA/FONSI. The preferred alternative is Alternative 2 which would operate the S-190 to maintain an optimum year-round canal stage elevation of 15.5 ft. NGVD. This alternative does not include operating criteria for pre-storm drawdown. Lowering the range would require an Emergency Deviation request to the U.S. Army Corps of Engineers. The EA/FONSI stress that both the South Florida Water Management District (District) and the Seminole Tribe are aware of the this and understand the process to request an Emergency Deviation should one be required. A "No Action Alternative" was also evaluated.

Comments:

The Florida Department of Environmental Protection (Department) supports the findings of the Draft EA. The preferred alternative is expected to result in increased hydroperiods in the area of impact, reduced soil oxidation and increased peat accretion, a potential decrease in muck fires, increased surficial aquifer recharge, and the promotion of native wetland vegetation and macroinvertebrates.

The Department notes that other alternatives afforded increased operational flexibility by allowing pre-storm draw downs and would result in greater environmental benefits than would be realized with Alternative 2. Section 4.12.2 notes that the implementation of Alternative 2 is likely to improve the quality of water discharged at S-190 as a result of enhanced retention detention of stormwater flows upstream of this structure. The most recent water quality sampling results ilustrate a downward trend in nutrient loading and the concentrations at S-190 as compared with data collected prior to the District's test operations. The improvement of water quality discharges at this location is important for future restoration works. Please note that Section 4.12.3 suggests that Alternative 3 may have additional benefits due to higher stage elevations and longer detention times. Since Alternative 3 had the same stage triggers as Alternative 2, but had only added flexibility for pre-storm drawdown and emergency operations, it is not clear that this alternative would have longer detention time and water quality benefits. It may actually have slightly worse performance, at least prior to or during storm events. As such, it would be informative to add further explanation of the reasoning supporting the selection of Alternative 2 over the other Alternatives to Section 2.2 *Issues and Basis for Choice.*

The preferred alternative, Alternative 2, involves modifications to the operations of an existing surface water management system, which includes operational changes at S-190 in the L-28 Interceptor Canal, a Class III Waterbody that discharges into the Everglades Protection Area (EPA), regulated by the Department under Chapter 373 of Florida Statutes (F.S.). The operations and maintenance of the S-190 structure is covered under FDEP File No. 0237803, an Everglades Forever Act permit issued to the District. Once finalized, any changes to the operating criteria for this structure need to be submitted to the Department for review in accordance with the permit. Please note that final water quality certification will be determined through the permitting process. Please update the text in Section 1.9 of the EA and Appendix C to reflect this.

Specific Comments:

Throughout the document, frequent reference is made to Figure 1-1. This figure lacks many of the features described within the narrative. Figure 4-3 appears to be more complete in that it more clearly depicts the location of S-190, PC17A, the North and West Feeder Canals, the L-28 Interceptor Canal and the BCSIR.

The Department appreciates the opportunity to comment. Should you have any questions regarding our comments, please contact Natalie Barfield at 850-245-3197.

ec: Ed Smith, Frank Powell, Chad Kennedy, Deinna Nicholson, Jordan Pugh, Kelli Edson, Inger Hansen, and Shannan Bogdanov

Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI)

For

Proposed Modifications to Operating Criteria for S-190

US Environmental Protection Agency Comments

October 12, 2016

Environmental Effects:

- On page 4-3 (4.5.2), the USACE discusses Alternative 2 and states, "It is anticipated that implementation of Alternative 2 would result in minor to moderate permanent improvements in groundwater recharge to the surficial aquifer…" EPA is concerned with the qualitative conclusions of "minor to moderate" improvements. Also, the USACE does not define the meaning of "minor to moderate" nor refer to quantitative data somewhere else in the document.

  Recommendation: The EPA recommends the USACE define the qualitative terminology of "minor to moderate" or disclose information in quantitative terms in the Final EA.

- On page 4-4 (4.5.4), the USACE states, "Alternative 4 will maintain year round canal stages higher than Alternatives 2 and 3, thus the groundwater storage would be greater under Alternative 4 as compared with these alternatives and would likely show a moderate to high beneficial effect on groundwater hydrology within BCSIR." This statement appears to conclude that Alternative 4 would have more benefits to restoring groundwater storage (which is a stated project purpose) than Alternative 2 (preferred alternative). The EPA is concerned that the USACE doesn't disclose or explain how much greater the storage will be in quantitative terms. Later, the USACE makes the following statement, "However, Alternative 4 includes the potential operating range of 14.8 to 14.2 ft. NGVD to be used in anticipation of a large rainfall event, which may result in a potential loss of groundwater during pre-storm drawdowns. Preterm drawdowns are expected to be required infrequently." Again, the USACE doesn't quantitatively describe how much groundwater storage would be lost or how frequently this pre-storm drawdown would occur.

  Recommendation: In the Final EA, the EPA recommends the Corps quantify and better explain the addition of groundwater storage Alternative 4 has over Alternatives 2 and 3, quantify and explain the groundwater storage loss and frequency of Alternative 4's pre-storm drawdowns as compared to Alternatives 2 and 3. Additionally, the EPA recommends the USACE better explain the rationale for choosing Alternative 2 over Alternative 4 since Alternative 4 is described as having greater groundwater storage (compared to Alternative 2).

- On page 4-14 (4.18.3), the USACE states, "Alternative 3 may provide slightly increased benefits to Native Americans by resulting in improved hydrologic conditions within the natural lands as compared with Alternative 2." If Alternative 3 improves hydrologic conditions, then why was it not chosen as the preferred alternative?

Recommendation: As discussed in other comments, the EPA recommends the USACE quantify the slight increases of Alternative 3 over Alternative 2 and also better explain their rationale for selecting Alternative 2 over Alternative 3 in the Final EA.

- On page 4-14 (4.18.4), the USACE states, "Alternative 4 may provide slightly increased benefits to Native Americans by resulting in improved hydrologic conditions within the natural lands as compared with Alternatives 2 and 3." As previously stated in Comment 3, the EPA is concerned that the USACE has not disclosed the slight increases in hydrologic benefits as compared to Alternative 2. Also, the USACE doesn't adequately describe the hydrological benefits of Alternative 2 over Alternative 4.

  Recommendation: In the Final EA, the EPA recommends the USACE better explain the hydrological benefits of Alternative 2 over Alternative 4 and better explain their rationale (in terms of hydrological and Native American benefits) of Alternative 2 over Alternative 4.

- On page 4-16 (4.19.2), the USACE again states that Alternative 4 will provide "slightly increased benefits Native Americans by resulting in improving hydrologic conditions" as compared to Alternative 2 and 3. As with previous comments, the EPA is concerned the USACE hasn't adequately discussed the rationale for selecting Alternative 2 over Alternative 4.

  Recommendation: In the Final EA, the EPA recommends the USACE better explain the hydrological benefits of Alternative 2 over Alternative 4 and better explain their rationale (in terms of hydrological and Native American benefits) of Alternative 2 over Alternative 4.

Water Quality:

- On page 4-12 (4.12.3), the USACE , states "The SFWMD incorporated the 1996 Tribe Landowner Agreement with the upstream land owner into SFWMD Environmental Resource Permit # 26-00623 special conditions, therefore the 50 ppb TP flow weighted mean concentration water quality standard remains in effect regardless of which Alternative is selected within this process." The word "standard" is incorrect. The 50 ppb requirement is not a water quality standard under the Clean Water Act. The 1996 Landowner Agreement refers to 50 ppb as a "Compliance Target".

  Recommendation: The EPA recommends the USACE accurately describe the 50 ppb as a "Compliance Target" as outlined in the 1996 Landowner Agreement within the Final EA.

Native American:

- On page 4-14 (4.18), the USACE discusses impacts to Native Americans and Native American lands. It appears that the USACE considered impacts to the Seminole Tribe of Florida tribal lands, but doesn't mention potential impacts to the Miccosukee Tribe of Indians of Florida tribal lands. The EPA notes that in Appendix B the USACE

documents their correspondences to the Miccosukee Tribe of Indians of Florida inviting them to participate on the project delivery team (letters dated Sept 15, 2014 and Sept 2, 2015); however, there is no discussion of these correspondences in this section of the EA. Additionally, the EPA is concerned that the USACE limits their analysis to hydrologic impacts and doesn't consider other impacts (such as water quality, impacts to hunting and fishing, recreation and tribal ceremonies, etc.)

Recommendation: In the Final EA, the EPA recommends the USACE describe any correspondence with both tribes (Seminole Tribe of Florida and Miccosukee Tribe of Indians of Florida) in this section of the Final EA. Additionally, the EPA recommends the USACE expand their discussions of Native American impacts beyond just hydrologic impacts as describe above.

- On page 4-15, (4.19.1), the USACE discusses consultation with the Florida State Historic Preservation Officer (SHPO) and the Seminole Tribe of Florida Tribal Historic Preservation Officer (THPO). The EPA notes that there is no discussion of coordination with the Miccosukee Tribe of Indians of Florida regarding potential impacts to cultural resources.

  Recommendation: The EPA acknowledges the Area of Potential Effect (APE) is limited to land within the Big Cypress Seminole Indian Reservation (BCSIR); however, the EPA recommends the USACE explain their rationale for not including the Miccosukee Tribe of Indians of Florida Tribal lands within the APE. The EPA also recommends the USACE document any discussions with the Miccosukee regarding any potential impacts to native cultural resources. Also, the EPA recommends the USACE continue to reach out to the Miccosukee Tribe of Indians of Florida to solicit their input regarding the project.

Environmental Justice:

- On page 4-31 (4.25.26), the USACE discusses environmental justice (EJ); however, there is no discussion of potential EJ impacts in Chapter 3 (Affected Environment) or Chapter 4 (Environmental Effects). The EPA is concerned that the USACE has not identified potential Environmental Justice (EJ) communities or disclosed potential impacts. The Council on Environmental Quality (CEQ) established guidelines for EJ analysis in NEPA document in "Environmental Justice; Guidance under the National Environmental Policy Act" (Dec 10, 1997). In this document, CEQ provides guidance on each phase of NEPA (affected environment, environmental consequences, etc.)

  Recommendation: The EPA recommends the USACE identify any potential EJ communities (including Native Americans) within the project area or document that no EJ communities exist near the project. The EPA notes that USACE did discuss Native American impacts, but did not explain potential impacts to Native Americans in the context of EJ. The EPA also requests this discussion be included in Chapter 4.

Preferred Alternative:

- On page 2-5 (2.4), the USACE discusses their rational for selecting Alternative 2 as the preferred alternative. However, this brief discussion doesn't explain why Alternative 2 is preferable over Alternative 3 or 4. As noted in previous comments, the EPA is concerned that the USACE makes statements throughout the EA that suggests that other alternatives might improve hydrological conditions, but doesn't elaborate on the tangible advantages and disadvantages of selecting Alternative 2 over Alternative 3 or 4. The EPA notes that the USACE does state that Alternative 3 and 4 will require pre-storm drawdowns that could negatively impact groundwater storage, but doesn't quantify or adequately explain that these drawdowns are severe enough to rule out these alternatives.

  Recommendation: The EPA recommends the USACE better explain their rationale for selecting Alternative 2 over Alternatives 3 and 4 within Chapter 2 (Preferred Alternative) of the Final EA. The EPA recommend the USACE expand their discussion to include advantages and disadvantages of Alternative 2 (versus Alternatives 3 and 4) and quantify the disadvantages of the pre-storm drawdowns of Alternative 3 and 4.

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