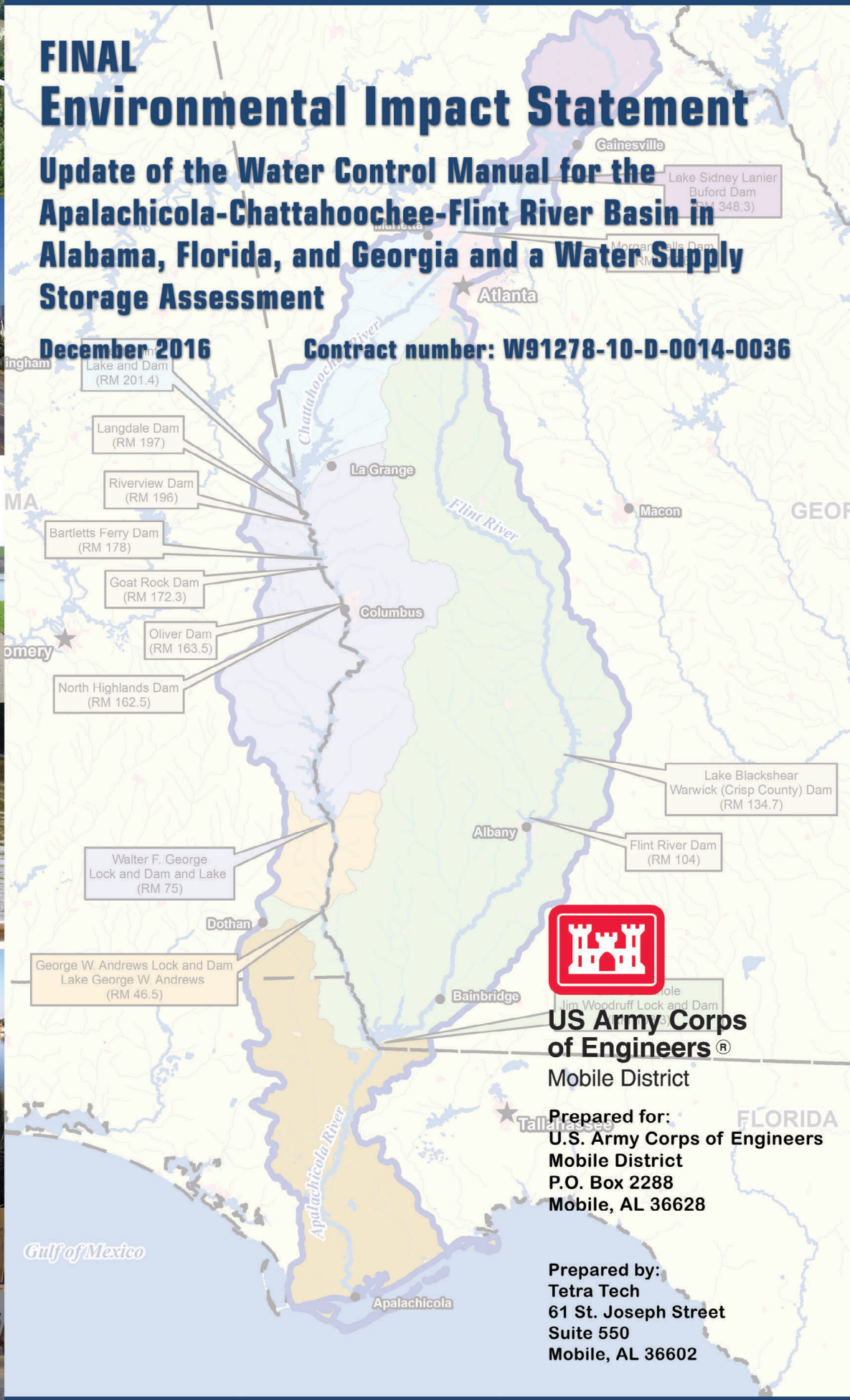
FINAL
Environmental Impact Statement

Update of the Water Control Manual for the Apalachicola-Chattahoochee-Flint River Basin in Alabama, Florida, and Georgia and a Water Supply Storage Assessment

December 2016 **Contract number: W91278-10-D-0014-0036**



US Army Corps of Engineers®
Mobile District

Prepared for:
U.S. Army Corps of Engineers
Mobile District
P.O. Box 2288
Mobile, AL 36628

Prepared by:
Tetra Tech
61 St. Joseph Street
Suite 550
Mobile, AL 36602

From: Tom Wenning
Sent: Wednesday, January 27, 2016 9:47 AM
To: ACF-WCM
Subject: [EXTERNAL] Apalachicola River & Bay Study

- *Please, the Army Corps of Engineers represent the health, productivity and sustainability of the Apalachicola River and Bay and appreciate it is critical to the economy and cultural heritage of Florida and the entire Gulf Coast. The Corps of Engineers must give the same fair and equal consideration to fish and wildlife conservation in the Apalachicola River ecosystem as they do the other authorized purposes of the ACF river system.* A

- *It is imperative that the Corps' rewrite of its manual revises the way it manages the flow of freshwater needed to maintain the extraordinary richness and productivity of the Apalachicola River, Floodplain and Bay ecosystem.* B

As a frequent visitor to the area from OHIO I have gained a significant appreciation of the need to protect the bay and it's resources, please include protection for the bay in your final document.

Tom Wenning

"It's not the Bay that turned on them. It's just, man kept on intervening until Mother Nature couldn't overcome. That's what's happening,"

Response to ACF126 – Tom Wenning

A. The PAA includes fish and wildlife conservation operations throughout the basin (e.g., the reservoir fish spawn operations, minimum flow provisions in the Apalachicola River, and fish passage at Jim Woodruff Lock and Dam). Section 5 of the EIS provides additional information on the PAA. The EIS considered and disclosed the expected impacts that the PAA could have on fish and wildlife resources in the Apalachicola River and Bay (or elsewhere in the system). If expected impacts to significant resources would be adverse as a result of revised operations, USACE must consider potential measures to mitigate those effects. The analysis presented in section 6 of the EIS indicates that the PAA would have a minimal effect on flow conditions in the Apalachicola River and into the Bay, compared to current reservoir operations under the NAA. Because flow and water quality changes in the Apalachicola River and Bay are not expected under the PAA, no anticipated incremental effect would be expected on fish and wildlife resources in the bay.

B. The authorized purposes of the federal ACF system do not include a specific directive to provide freshwater inflows to Apalachicola Bay to sustain the resources of the Bay. USACE does make releases to limit adverse effects to threatened and endangered species downstream of Jim Woodruff Lock and Dam, including Apalachicola Bay. USACE consulted on the PAA and the results are presented in appendix J of the final EIS. In the biological opinion the USFWS concluded that effects to estuarine invertebrate production are insignificant because the PAA provides slightly beneficial effects from increasing the number of freshwater pulses and increasing the number of days greater than or equal to 16,200 cfs in the winter. USFWS also anticipate only minor changes in salinity regimes and estuarine habitat due to the WCM.

Response to ACF127 – City of Smiths Station

From: Andy Morris
Sent: Wednesday, January 27, 2016 3:22 PM
To: ACF-WCM
Cc: 'Jamen'
Subject: [EXTERNAL] Resolution2016-235
Attachments: Resolution 2016-235 Flow Targets city ss.pdf

Dear Sir/Madam:

I am forwarding the resolution adopted by the City of Smiths Station concerning flow rates for the Appalachicola – Chattahoochee Flint River Basin. Thank you for your consideration.

Andy Morris, Utilities Director
Smiths Water & Sewer Authority
P.O. Box 727
Smiths Station, AL 36877

Toll Free 800.298.6342
Fax 334.298.6412
Blockedwww.smithswater.com

Response to ACF127 – City of Smiths Station

RESOLUTION 2016-235

A RESOLUTION FOR THE CITY OF SMITHS STATION, ALABAMA ENCOURAGING AND REQUESTING THAT THE U.S. ARMY CORPS OF ENGINEERS ESTABLISH FLOW TARGETS FOR THE MIDDLE AND LOWER CHATTAHOOCHEE RIVER.

WHEREAS, Congress authorized the construction of locks and dams in the Apalachicola-Chattahoochee-Flint River Basin, which serve multiple purposes including flood control, hydropower production, water quality, recreation, and navigation from Columbus, Georgia, and Phenix City, Alabama, to and from the Gulf of Mexico; and

WHEREAS, flows from Corps of Engineers reservoirs on the Chattahoochee River provide important and necessary water resources for downstream municipalities and industries; and

WHEREAS, cities and businesses on both sides of the Chattahoochee River, in reliance and anticipation of flows from Corps of Engineers reservoirs, have made substantial investments in water infrastructure, industrial facilities, and steam-driven electrical generation; and

WHEREAS, the continued and future social, economic, and ecological vitality of communities along the Middle and Lower Chattahoochee River depends on the Corps of Engineers providing a steady and reliable source of flow; and

WHEREAS, the Corps of Engineers has accorded special legal status to flow targets at Peachtree Creek and the Jim Woodruff Dam; and

WHEREAS, from time to time, the Corps of Engineers is able to rely on uncontrolled flows from the Flint River to satisfy Jim Woodruff requirements without augmenting flows from its Chattahoochee River reservoirs; and

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WHEREAS, the Corps of Engineers has allowed flows in the middle and lower sections of the Chattahoochee River to fall to dangerously low levels while flows from Lake Lanier, the largest storage reservoir on the system, were controlled so as to allow reservoir elevation levels to maintain and even increase; and

WHEREAS, the Corps of Engineers justifies operating in that manner by citing a lack of a binding flow target in the Middle and Lower Chattahoochee River; and

WHEREAS, as a consequence, the Corps of Engineers favors one region at the direct expense of another, through water management decisions that allow one region to improve through the refilling of water storage while another region worsens due to diminished flow; and

WHEREAS, it is inconceivable that Congress, in authorizing the construction and operation of projects in the Apalachicola-Chattahoochee-Flint River Basin, intended for reservoir operations to favor one region over another; and

WHEREAS, despite protracted conflict and controversy over the management of Chattahoochee River reservoirs of the Corps of Engineers, the Governors of the States of Alabama, Florida, and Georgia in 2003 reached an agreement that set forth principles to allocate water flow among the three states; and

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A. Comment noted.

RESOLUTION 2016-235

WHEREAS, those principles included flow requirements to be included in a water allocation among the states, to be met in part by state action and in part through operation of Corps of Engineers reservoirs; and

WHEREAS, those targets included a flow of 1350 cubic feet per second (cfs) daily average and 1850 cfs weekly average at Columbus, Georgia, and 2000 cfs weekly average at Columbia, Alabama; and

WHEREAS, current operational guidelines of the Corps of Engineers and the draft Water Control Manual, are, therefore, inconsistent with both statutory requirements and flows agreed upon by the three states;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY OF Smiths Station, Alabama that the U.S. Army Corps of Engineers is encouraged and requested:

(1) to establish and honor the flow requirements identified by the Governors of Alabama, Florida, and Georgia, namely, 1350 cubic feet per second (cfs) daily average and 1850 cfs weekly average at Columbus, Georgia, and 2000 cfs weekly average at Columbia, Alabama; and B

(2) to operate the Chattahoochee River reservoirs as an integrated system in the service of all the populations along the full extent of the river, without reliance on uncontrolled flows from the Flint River as a basis to reduce support for certain Chattahoochee River communities. C

APPROVED AND ADOPTED, this 26th day of January, 2016, by the City Council of the City of Smiths Station, Alabama, by unanimous vote.

Mayor LaFaye Dellinger

Council Member George Stringer, Jr.

Council Member Morris Jackson

Council Member James Moody

Council Member Richard A. Cooley

Council Member Richard Key

ATTESTED:

Jerry Bentley, City Clerk

(SEAL)

CITY OF SMITHS STATION, ALABAMA
CITY SEAL
Est. 2001

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Response to ACF127 – City of Smiths Station

B. The authorized purposes of the federal ACF system do not include a specific directive to provide freshwater inflows to Apalachicola Bay to sustain the resources of the Bay.

C. One of the key objectives of the Master WCM update process has been to develop a plan to operate the USACE reservoir projects more effectively as an integrated system in accordance with authorized project purposes. Even with an updated WCM, there will be a greater dependence on releases from the USACE Chattahoochee River reservoirs to meet minimum flow requirements for endangered species conservation below Jim Woodruff Lock and Dam under drought conditions, when uncontrolled flows from the Flint River could be abnormally low. Conversely, abnormally high Flint River flow conditions would not necessarily trigger a corresponding reduction in releases from the Chattahoochee River reservoirs, which would adversely affect middle and lower Chattahoochee River communities. Releases from the USACE Chattahoochee River reservoirs under normal or abnormally high flow conditions in the ACF Basin are governed by project guide curves, action zones, hydropower needs, and other considerations associated directly with each individual reservoir. The rules contain provisions for opportunities to refill the federal storage reservoirs on the Chattahoochee River during periods when endangered species flow requirements can be met primarily by Flint River flows. Refilling the reservoirs is a critical component of managing the system to fulfill authorized project purposes under various hydrologic conditions. During the refill period, USACE continues to manage releases from its reservoirs to fulfill authorized purposes throughout the system.

Response to ACF128 – Alabama Department of Conservation and Natural Resources

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From: Goar, Taconya
Sent: Wednesday, January 27, 2016 3:03 PM
To: ACF-WCM
Subject: [EXTERNAL] Comments on the Draft EIS and WCM for the ACF River Basin
Attachments: ADCNR ACF DEIS and WCM_2016.pdf

Colonel Chytka:
Attached please find comments from the Division of Wildlife and Freshwater Fisheries, Alabama Department of Conservation and Natural Resources regarding the Draft EIS and Water Control Manual for the Apalachicola-Chattahoochee-Flint River Basin. We appreciate the opportunity to comment on the Draft EIS. If you have any questions or concerns regarding our comments, please feel free to contact me at the information listed below. Thank you,

Sincerely,

Taconya D. Goar, PhD
Environmental Affairs Supervisor
Alabama Wildlife and Freshwater Fisheries Division
64 N. Union Street, Suite 546
Montgomery, AL 36130
Fax: 334-242-2061

STATE OF ALABAMA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
WILDLIFE AND FRESHWATER FISHERIES DIVISION

64 North Union Street, Ste. 567
P. O. Box 301456
Montgomery, AL 36130-1456
Phone: (334) 242-3465 Fax: (334) 242-3032
www.outdooralabama.com

ROBERT BENTLEY
GOVERNOR

N. GUNTER GUY, JR.
COMMISSIONER

CURTIS JONES
DEPUTY COMMISSIONER

The mission of the Wildlife and Freshwater Fisheries Division is to manage, protect, conserve, and enhance the wildlife and aquatic resources of Alabama for the sustainable benefit of the people of Alabama.

CHARLES F. "CHUCK" SYKES
DIRECTOR

FRED R. HARDERS
ASSISTANT DIRECTOR

January 30, 2016

Colonel Jon J. Chytka
Commanding Officer
US Army Corps of Engineers, Mobile District
ATTN: PD-EI (ACF-DEIS)
P.O. Box 2288
Mobile, AL 36628

RE: Comments on the Draft Environmental Impact Statement and Water Control Manual for the Apalachicola-Chattahoochee-Flint (ACF) River Basin in Georgia, Alabama, and Florida

Dear Colonel Chytka:

The Alabama Department of Conservation and Natural Resources (ADCNR), Division of Wildlife and Freshwater Fisheries has reviewed the Draft Environmental Impact Statement (DEIS) and Water Control Manual (WCM) for the Apalachicola-Chattahoochee-Flint (ACF) River Basin in Georgia, Alabama, and Florida and provides the following comments. We encourage the U. S. Army Corps of Engineers (USACE) to fully develop, analyze, and consider alternatives or suites of alternatives that will maximize and benefit fish and wildlife resources of the State of Alabama. We also encourage continued incorporation of decision support models, in an adaptive management framework, to evaluate these alternatives. Consideration of additional alternatives for analysis will address specific concerns highlighted in this letter and include: state-protected aquatic and wildlife species, recreational opportunities, instream flow, water quality, drought conditions and impacts, and increasing consumptive demand. These specific areas are priorities for ADCNR for the protection and management of state-trust resources, and are as follows: A

- *State-protected species* Impacts to state-protected species by operations at USACE dams should be avoided and minimized. Several species of high conservation concern (Priority 2; *Alabama's Comprehensive Wildlife Conservation Strategy)* occur below projects whose waters flow through Alabama. In Alabama this designation indicates that conservation action is needed to protect the species. These species have had significant reductions in their populations and of usable habitat. These impacts have made their occurrence rare and/or limited. Impacts to these species resulting from operating under the Proposed Action Alternative (PAA) should not be greater than operating under the No Action Alternative (NAA). Additionally, mitigation of impacts to state-protected species is expected and plans should be fully developed. B

- *Recreational opportunities* Water from the USACE's impoundments at Lake G. W. Andrews, Lake Walter F. George, and West Point Lake flow into Alabama borders, and provide significant recreational opportunities and social benefits to the people of the Alabama. Recreation at these impoundments has been estimated as having a multimillion dollar economic impact within the state. These opportunities include: boating, fishing, camping, picnicking, swimming, hunting, and sightseeing. Lakepoint Resort State Park was constructed on Lake Walter F. George, and these recreational opportunities depend on C

Response to ACF128 – Alabama Department of Conservation and Natural Resources

A. Additional analyses are provided in section 6.4 of the final EIS to address comments received during the draft EIS regarding effects to fish and wildlife resources.

B. As described in section 6.1.1.3 of the EIS, little change to the current operating conditions (the NAA) would be expected from operating under the PAA. Updates to the EIS have been made to address draft EIS comments regarding fish and wildlife conservation to include an evaluation of habitat suitability indices when available.

C. Impacts to fish and wildlife and water quality are discussed in sections 6.4.3 and 6.1.2 of the EIS, respectively. USACE, South Atlantic District Regulation 1130-2-16 (2001) and Mobile District Draft Standard Operating Procedure 1130-2-9 (2005) were developed to address reservoir regulation and coordination for fish management purposes. Current operations for fish spawning, which also are included in the PAA, are discussed in section 2.1.1.2.4.4 of the EIS. Current operations for recreational uses, including management of drawdown levels and rates, are discussed in section 2.1.1.2.4.5 of the EIS.

water quantity and quality from upstream projects. Lowered and/or highly fluctuating pool levels would have a significant negative impact on access to and the economic benefits of these recreational opportunities.

ADCNR operates four state boat landings (Halawakee Creek, Po' Boy's Landing, Thomas Mill Creek, and Gordon Landing) along the Chattahoochee River that rely on adequate water levels for navigation. These landings were constructed to provide recreation access to the people of Alabama and significant investments have been made at each of these locations. However, lack of adequate water quantity for navigation will render these facilities useless during certain times of the year.

West Point Lake and Lake Walter F. George support recreational sport fisheries (largemouth bass, Alabama bass, bluegill, and crappie). Highly fluctuating and varied instream flows, which do not reflect natural patterns, can be detrimental to their populations and alter ecosystem function. Fluctuations in water level can adversely affect the availability of shallow-water habitats these sport fish depend on for spawning and rearing. Highly fluctuating water levels can also affect reproductive success and subsequent recruitment of these species.

- *Instream Flow* Project operations must include a flow regime that maintains ecological integrity to protect the physical, chemical, and biological functions of waters flowing through the State of Alabama. Natural flow regimes in a stream or river channel adequately support the full suite of ecological functions (biodiversity, channel maintenance, floodplain operation) through factors such as timing (seasonal), frequency (how often), magnitude (size of water events), rate of change (how quickly water is delivered), and duration (how long do the events last) to ensure complete ecosystem functions. Deviations from the natural flow regime of rivers and streams affect their physical, chemical, and biological functions. Whether there is a significant impact on ecological integrity depends on the magnitude of deviation. The PAA does not include a flow regime that is protective of state-trust resources. ADCNR implemented an Instream Flow Policy in 2012 which explains our position on protective flow standards. The following are excerpts from that policy:

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Instream flows are incorrectly thought of as minimum flows by many. Minimum flows are just that, minimal, and do not fully protect stream functions. The whole concept of a minimum flow had led to many rivers and streams becoming depleted and damaged with respect to their hydrological and ecosystem function. Minimum flows actually become maximum flows in highly used and altered systems since managed flows are rarely allowed to exceed this "minimum" limit. "Conservation Flow" is defined as the minimum continuous water flow requirement as determined by ADCNR that is necessary to maintain the biological, physical, and chemical integrity of a waterway using generally accepted scientific methodologies. Conservation flow for regulated waterways shall be as follows: 1) for waterways regulated for hydropower production the requirement shall be determined through the Federal Energy Regulatory Commission licensing process; 2) for waterways regulated for other purposes (such as drinking water impoundments) the recommended seasonal requirement is 30% of Mean Annual Flow (MAF) for July through November, 60% MAF for January through April, and 40% MAF for May, June, and December or will be based on accepted instream flow methodology such as the Instream Flow Incremental Methodology (IFIM).

"Subsistence Flow" is the minimum water flow requirement as determined by ADCNR that must remain in a waterway in order to avoid serious or long-term adverse effects on the biological integrity of the waterway. Subsistence flow shall be determined as follows: 1) for waterways regulated for hydropower production the requirement shall be determined through the Federal Energy Regulatory Commission licensing process; 2) for waterways regulated for other purposes (such as drinking water impoundments) and for unregulated waterways the requirement is 10% of Mean Annual Flow (MAF) or will be based on an accepted instream flow methodology such as the Instream Flow Incremental Methodology (IFIM).

Response to ACF128 – Alabama Department of Conservation and Natural Resources

D. USACE authorities to manage projects in the ACF Basin limit the Agency's ability to mimic natural flows. Those authorities include responsibilities to produce peaking hydropower, to operate for flood risk management, to release minimum flows from Jim Woodruff Dam for mussels, and to time releases from Jim Woodruff Dam for threatened and endangered species to comply with the terms and conditions in the biological opinion. USACE authorities are described in section 2.1.1.2.1 of the EIS.

It is the policy of ADCNR to advocate for the protection of instream flow requirements in all water allocation decisions.

- *Water Quality* Water releases from the five USACE operated dams should meet or exceed state water quality standards. We are particularly concerned about potential negative impacts of "periods of low dissolved oxygen" downstream of Walter F. George Dam on aquatic resources of Alabama. We agree with U. S. Fish and Wildlife Service recommendations that water quality issues should be a priority for the protection of these aquatic resources. The USACE has only minimally detailed their assessment and monitoring activities to address these "periods". We recommend that alternative water quality assessment methods be fully detailed in the DEIS, and that the Corps fully evaluate potential impacts to aquatic resources. Additionally, in order to fully address water quality issues within the PAA, ADCNR believes that structural and physical improvements to current facilities should also be addressed and are within the scope of the DEIS and WCM update process. E

- *Drought conditions and impacts* We are concerned that minimum flows during drought conditions, under the PAA, would have significant negative impacts on state-trust resources. Inadequate flows to the Middle Chattahoochee region potentially reduce water quantity and result in diminished water quality that may not meet state standards. Sufficient instream flows should provide water quality that meets state standards, and allows for the management and protection of state-trust resources. A full analysis of alternative instream flow regimes should be conducted such that minimum flows during drought conditions under the PAA are not lower than minimum flows under the NAA. F

- *Increasing Consumptive Demands* Increased consumptive demands in the basin will likely have negative impacts on the state-trust resources of Alabama. Increased demands including: increased water supply withdrawals, increased volume storage, and changes in industrial, municipal, and agriculture practices could change and impact hydrologic conditions throughout the basin. Hydrologic conditions and flow regimes below USACE projects should be designed to restore and/or maintain the ecological integrity of the system. G

In conclusion, we appreciate the opportunity to comment on the Draft Environmental Impact Statement and Water Control Manual for the Apalachicola-Chattahoochee-Flint (ACF) River Basin in Georgia, Alabama, and Florida. ADCNR stands ready to work with the USACE to protect and conserve the fish and wildlife resources of the State of Alabama. We encourage the USACE to work alongside State and Federal agencies, and with stakeholders to provide comprehensive analysis of all alternatives for the ACF Basin.

Sincerely,

Taconya D. Goar

Taconya D. Goar
Environmental Affairs Supervisor

The Department of Conservation and Natural Resources does not discriminate on the basis of race, color, religion, age, gender, national origin, or disability in its hiring or employment practices nor in admission to, access to, or operations of its programs, services, or activities.

Response to ACF128 – Alabama Department of Conservation and Natural Resources

E. Updates to the EIS were made to address comments received on the draft EIS regarding effects on aquatic resources. The Master WCM update is not a study and is only a change to operation of existing constructed projects. The operations described in the WCM are based on balancing all authorized purposes throughout the system. USACE authorities are described in section 2.1.1.2.1 of the EIS. Examination of any potential structural modifications to projects that might be made to provide for additional project purposes is outside the scope of this WCM update.

F. The Master WCM update is not a study and is only a change to operation of existing constructed projects. The operations described in the WCM are based on balancing all authorized purposes throughout the system. The authorized purposes of the federal ACF system do not include a specific directive to meet flow targets at Columbus, Georgia. Daily and weekly average flow targets at Columbus are established in the 2004 Federal Energy Regulatory Commission (FERC) license for Georgia Power Company projects downstream of West Point Lake (see section 6.1.1.2.1 of the EIS). Each of the FERC target flows include an important qualifier (e.g., "a daily average target minimum flow of 1,350 cfs, or inflow, whichever is less" [emphasis added]). Model results over the 73-year hydrologic period of record indicate that a daily average flow of 1,350 cfs at Columbus would be achieved on 94 percent of the days for the PAA compared to 95 percent under the NAA (see section 6.1.1.2.3.9 of the EIS).

G. The purpose and need of the proposed federal action is to update the WCM to determine how the federal projects in the ACF Basin should be operated for their congressionally authorized purposes, in light of current conditions and applicable laws, rather than to restore the ACF Basin to preproject conditions. Any reasonable alternative must satisfy that purpose and need. The PAA strives to balance the needs of the system. Regulation of consumptive demands for water are a responsibility of the states, not of USACE.

Response to ACF129 – Franklin County Commission, Alan Pierce

From: Alan Pierce
Sent: Wednesday, January 27, 2016 12:17 PM
To: ACF-WCM
Cc:

Subject: [EXTERNAL] Franklin County ACF Resolution
Attachments: ACF Resolution and Cover letter 1-27-16.pdf

Dear Sirs:

Please find enclosed a Resolution unanimously adopted by the Franklin County Commission regarding the ACF and the updated Water Control Manual.

We submit these documents as part of the comment period of the ACF Water Control Manual. If there are any questions, please feel free to contact me, or Michael Moron, at michael@franklincountyflorida.com.

*****PLEASE NOTE THAT MY EMAIL ADDRESS HAS CHANGED SO PLEASE USE THE FOLLOWING******

Sincerely,
Alan C. Pierce
Director of Administrative Services
34 Forbes Street, Suite 1
Apalachicola, FL 32320

850-653-9799

1

Response to ACF129 – Franklin County Commission, Alan Pierce

REPLY TO: □
BOARD OF COUNTY COMMISSIONERS
33 MARKET STREET, SUITE 203
APALACHICOLA, FL 32320
(850) 653-8861, EXT. 100
(850) 653-4795 FAX

FRANKLIN COUNTY

REPLY TO: □
PLANNING & BUILDING DEPARTMENT
34 FORBES STREET, SUITE 1
APALACHICOLA, FL 32320
(850) 653-9783
(850) 653-9799 FAX

January 27, 2016

Commander
USACOE
Mobile District
PO Box 2288
Mobile, AL 36628

ATTN: PD-EI (ACF-DEIS)

Dear Sir:

Please find enclosed a Resolution adopted by the Franklin County Board of County Commissioners supporting the efforts of the Corps to provide for commercial navigation on the ACF, including both increased flow and such channel dredging and desnagging as may be necessary to support regular traffic and to regularize and enhance the necessary flow of fresh water into the Apalachicola Bay.

If there are any questions, please feel free to contact Michael Moron, County Coordinator, at 850-653-9783, ext. 155, or his email at michael@franklincountyflorida.com

Sincerely,

Alan C. Pierce, Director
Administrative Services

Cc: FCBCC
Michael Moron, County Coordinator

FRANKLIN COUNTY, FLORIDA
RESOLUTION NO. 2016

A RESOLUTION BY THE COUNTY OF FRANKLIN COUNTY, FLORIDA IN SUPPORT OF A COMPLETE PROGRAM, INCLUDING FLOWS AND CHANNEL MAINTENANCE, FOR COMMERCIAL NAVIGATION ON THE APALACHICOLA RIVER.

WHEREAS, flows in the Apalachicola River are essential for the environmental health of the river and the economic well-being of communities located along the river and Apalachicola Bay; and

WHEREAS, the seafood industry in Apalachicola Bay, which provides one tenth of the nation's oyster supply and is an important source of other seafood, depends on bay and estuary conditions that require adequate fresh water supplies from the Apalachicola River; and

WHEREAS, citizens and businesses in and around Franklin County, Florida, are working to revive river-borne transportation for purposes of commerce, entertainment and tourism; and

WHEREAS, the U.S. Army Corps of Engineers operates a series of reservoirs in Apalachicola-Chattahoochee-Flint River Basin; and

WHEREAS, Congress authorized the construction and operation of these reservoirs in support of commercial navigation, among other purposes, which the Corps has recognized since enactment of the authorizing legislation in 1945 and continuously ever since; and

A

WHEREAS, in furtherance of Congressional intent, the Corps is authorized to operate its reservoirs to provide navigation flows and to maintain the navigation channel at a depth of 9 feet and a width of 100 feet, which requires dredging and desnagging in the Apalachicola River from time to time; and

WHEREAS, the Corps in recent years has failed to provide flow and channel maintenance sufficient to support commercial navigation; and

WHEREAS, over the same time period, Apalachicola flows have been too low, with negative impacts on the health of the river and bay, which in turn impacts the seafood industry; and

WHEREAS, historically, flows in the Apalachicola River were healthier at times when the Corps implemented an active program of navigation support; and

Response to ACF129 – Franklin County Commission, Alan Pierce

A. Comment noted.

WHEREAS, the Corps has proposed operations under which it reserves storage and maintains water in its upstream Chattahoochee River reservoirs at critical times of year, which necessarily reduces downstream flows in the Chattahoochee and Apalachicola Rivers; and

WHEREAS, by failing to propose operations that will provide sufficient navigation flow and to maintain the Apalachicola River, the Corps has abandoned a program of navigation support that is consistent with Congressional intent, which has negative effects on both the environment and economy in the region served by the Apalachicola River; and

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WHEREAS, past failures to desnag and otherwise maintain the Apalachicola River have led to unsafe boating conditions for Florida's citizens; and

WHEREAS, in the past, the Corps' practices for the disposal of material from the dredging of the Apalachicola River have caused negative and unnecessary environmental impacts, including blockages of sloughs that are important for the life cycle of local biota; and

WHEREAS, techniques are available today to conduct channel maintenance in a manner that reduces adverse environmental impacts; and

WHEREAS, sand and other dredged material can be reused locally for construction and other purposes;

NOW, THEREFORE, BE IT RESOLVED BY THE COUNTY OF FRANKLIN COUNTY, FLORIDA, that:

(1) the County of Franklin County, Florida supports efforts of the Corps to provide for commercial navigation, including both increased flow and such channel dredging and desnagging as may be necessary to support regular barge traffic and to regularize and enhance the necessary flow of fresh water into Apalachicola Bay; and

B

(2) the County will be pleased to work with the Corps and other stakeholders to identify methods of channel maintenance that respond to environmental concerns and that allow for the beneficial use of dredged sand and other material, including the procurement of appropriate sites to dispose of dredged material and to stage it for beneficial uses.

C

AND BE IT FURTHER RESOLVED, that:

the U.S. Army Corps of Engineers is encouraged and requested:

(1) to provide such flows as are necessary to support commercial navigation at the authorized channel depths in the Apalachicola and Chattahoochee Rivers;

D

(2) to supplement such flows as may be required for the environmental and economic

Response to ACF129 – Franklin County Commission, Alan Pierce

B. The PAA includes provisions for increased flows when sufficient water is available within the basin to support the availability of a 7-ft navigation depth in the Apalachicola River each year between January and May. Increased flows beyond that level to provide opportunity for navigation use of the Apalachicola River would have adverse effects on other authorized purposes of the ACF Basin projects. USACE, Mobile District received a 10-year permit from the Florida Department of Environmental Protection (DEP) on November 27, 2013, to conduct snagging operations on the river to maintain navigability depending on annual availability of operation and maintenance funds. Dredging of the navigation channel in the Apalachicola River has not been conducted since the Florida DEP denied USACE a permit for the work in 2005. Additionally, because the ACF navigation project is considered a low use waterway from a commercial navigation standpoint, USACE has been unable to budget for operation and maintenance funds to conduct maintenance dredging on the river. These constraints will likely continue to exist for the foreseeable future.

C. Current constraints associated with navigation channel maintenance in the Apalachicola River, which are likely to continue for the foreseeable future, are described in detail in section 2.1.1.2.4.3 of the EIS. Accordingly, USACE is unable to pursue alternative methods of channel maintenance, beneficial uses of dredged material, and procurement of new disposal sites at this time.

D. Slightly increased releases each year between January and May to support navigation channel depths when sufficient water is available in the basin, as included in the PAA, would provide opportunity for limited navigation use of the project. These slight seasonal increases potentially could provide a collateral incidental benefit to natural resources downstream of Jim Woodruff Lock and Dam. Limited snagging under the current Florida Department of Environmental Protection snagging permit to USACE could provide some relief to users of the navigation channel. Resumption of maintenance dredging in the river is unlikely, as described in section 2.1.1.2.4.3 of the EIS

health of the Apalachicola River and Bay; and

(3) to undertake such dredging and desnagging as may be required to implement and maintain a complete program of navigation support.

ADOPTED, this 19th day of January, 2016, by the County Commission of the County of Franklin County, Florida, by unanimous vote.

Franklin County, a political subdivision of the State of Florida

William Massey, COMMISSIONER

ATTEST:

Marcia Johnson, Clerk of Courts

SEAL

Response to ACF130 –Gadsen County Board of County Commissioners

From: Laurel Bradley
Sent: Thursday, January 28, 2016 8:40 AM
To: ACF-WCM
Cc: George.Floyd@RiverEcoLogic.com; Robert Presnell
Subject: [EXTERNAL] Resolution No 2016-004
Attachments: 201601280927.pdf

Good morning. Please find attached a copy of Resolution 2016-004 by the Gadsden County Board of County Commissioners in support of a complete program, including flows and channel maintenance, for the commercial navigation on the Apalachicola River. I have placed the original via overnight mail to the below address:

(Commander, U.S. Army Corps of Engineers, Mobile District, Attn: PD-EI (ACF-DEIS), P.O. Box 2288, Mobile, AL 36628)

If you should need additional information, please feel free to contact me.

Thanks,

Laurel Bradley
Executive Assistant
County Administrator's Office
9-B East Jefferson Street
P. O. Box 1799
Quincy, Florida 32351

F: 850-875-8655

COUNTY OF GADSDEN
RESOLUTION NO. 2016-004

A RESOLUTION BY THE COUNTY OF GADSDEN IN SUPPORT OF A COMPLETE PROGRAM, INCLUDING FLOWS AND CHANNEL MAINTENANCE, FOR COMMERCIAL NAVIGATION ON THE APALACHICOLA RIVER.

WHEREAS, flows in the Apalachicola River are essential for the environmental health of the river and the economic well-being of communities located along the river and Apalachicola Bay; and

WHEREAS, the seafood industry in Apalachicola Bay, which provides one tenth of the nation's oyster supply and is an important source of other seafood, depends on bay and estuary conditions that require adequate fresh water supplies from the Apalachicola River; and

WHEREAS, citizens and businesses in and around Apalachicola, Florida, are working to revive river-borne transportation for purposes of entertainment and tourism; and

WHEREAS, the U.S. Army Corps of Engineers operates a series of reservoirs in Apalachicola-Chattahoochee-Flint River Basin; and

WHEREAS, Congress authorized the construction and operation of these reservoirs in support of commercial navigation, among other purposes, which the Corps has recognized since enactment of the authorizing legislation in 1945 and continuously ever since; and

WHEREAS, in furtherance of Congressional intent, the Corps is authorized to operate its reservoirs to provide navigation flows and to maintain the navigation channel at a depth of 9 feet and a width of 100 feet, which requires dredging and de-snagging in the Apalachicola River from time to time; and

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WHEREAS, the Corps in recent years has failed to provide flow and channel maintenance sufficient to support commercial navigation; and

WHEREAS, over the same time period, Apalachicola flows have been too low, with negative impacts on the health of the river and bay, which in turn impacts the seafood industry; and

WHEREAS, historically, flows in the Apalachicola River were healthier at times when the Corps implemented an active program of navigation support; and

WHEREAS, the Corps has proposed operations under which it reserves storage and maintains water in its upstream Chattahoochee River reservoirs at critical times of year, which necessarily reduces downstream flows in the Chattahoochee and Apalachicola Rivers; and

WHEREAS, by failing to propose operations that will provide sufficient navigation flow and to maintain the Apalachicola River, the Corps has abandoned a program of navigation support that is consistent with Congressional intent, which has negative effects on both the environment and economy in the region served by the Apalachicola River; and

WHEREAS, past failures to de-snag and otherwise maintain the Apalachicola River

Response to ACF130 –Gadsen County Board of County Commissioners

A. Comment noted.

have led to unsafe boating conditions for Florida's citizens; and

WHEREAS, in the past, the Corps' practices for the disposal of material from the dredging of the Apalachicola River have caused negative and unnecessary environmental impacts, including blockages of sloughs that are important for the life cycle of local biota; and

A

WHEREAS, techniques are available today to conduct channel maintenance in a manner that reduces adverse environmental impacts; and

WHEREAS, sand and other dredged material can be reused locally for construction and other purposes;

NOW, THEREFORE, BE IT RESOLVED BY THE COUNTY OF GADSDEN, that:

(1) the County of Gadsden supports efforts of the Corps to provide for commercial navigation, including both increased flow and such channel dredging and de-snagging as may be necessary to support regular barge traffic; and

B

(2) the County will be pleased to work with the Corps and other stakeholders to identify methods of channel maintenance that respond to environmental concerns and that allow for the beneficial use of dredged sand and other material, including the procurement of appropriate sites to dispose of dredged material and to stage it for beneficial uses.

C

AND BE IT FURTHER RESOLVED, that:

the U.S. Army Corps of Engineers is encouraged and requested:

(1) to provide such flows as are necessary to support commercial navigation at the authorized channel depths in the Apalachicola and Chattahoochee Rivers;

D

(2) to supplement such flows as may be required for the environmental and economic health of the Apalachicola River and Bay; and

(3) to undertake such dredging and de-snagging as may be required to implement and maintain a complete program of navigation support.

ADOPTED, this 19th day of January 2016, by the County Commission of the County of Gadsden.

FOR THE COUNTY COMMISSION OF THE COUNTY OF GADSDEN:

NICHOLAS THOMAS GADSDEN COUNTY FLORIDA CLERK OF CIRCUIT COURT

BRENDA A. HOLT, CHAIRPERSON

ATTEST:

NICHOLAS THOMAS, CLERK

Response to ACF130 –Gadsen County Board of County Commissioners

B. The PAA includes provisions for increased flows when sufficient water is available within the basin to support the availability of a 7-ft navigation depth in the Apalachicola River each year between January and May. Increased flows beyond that level to provide opportunity for navigation use of the Apalachicola River would have adverse effects on other authorized purposes of the ACF Basin projects. USACE, Mobile District received a 10-year permit from the Florida Department of Environmental Protection (DEP) on November 27, 2013, to conduct snagging operations on the river to maintain navigability depending on annual availability of operation and maintenance funds. Dredging of the navigation channel in the Apalachicola River has not been conducted since the Florida DEP denied USACE a permit for the work in 2005. Additionally, because the ACF navigation project is considered a low use water-way from a commercial navigation standpoint, USACE has been unable to budget for operation and maintenance funds to conduct maintenance dredging on the river. These constraints will likely continue to exist for the foreseeable future.

C. Current constraints associated with navigation channel maintenance in the Apalachicola River, which are likely to continue for the foreseeable future, are described in detail in section 2.1.1.2.4.3 of the EIS. Accordingly, USACE is unable to pursue alternative methods of channel maintenance, beneficial uses of dredged material, and procurement of new disposal sites at this time.

D. Slightly increased releases each year between January and May to support navigation channel depths when sufficient water is available in the basin, as included in the PAA, would provide opportunity for limited navigation use of the project. These slight seasonal increases potentially could provide a collateral incidental benefit to natural resources downstream of Jim Woodruff Lock and Dam. Limited snagging under the current Florida Department of Environmental Protection snagging permit to USACE could provide some relief to users of the navigation channel. Resumption of maintenance dredging in the river is unlikely, as described in section 2.1.1.2.4.3 of the EIS

From: Ted Tripp
Sent: Thursday, January 28, 2016 8:06 AM
To: ACF-WCM
Subject: [EXTERNAL] Apalachicola River

I work as a river tour guide for the Apalachicola Maritime Museum. I also have many friends working in the seafood industry. All of us depend on the health of the river and the Apalachicola Bay. When the work of the Army Corps of Engineers reduces the quality of the River, we suffer economically. Furthermore, thousands of tourists visit Apalachicola because of the beauty of the river and bay. Again, when the river suffers, these people do not come.

I would ask that the Corps cease all operations on the river. It is plenty deep, and dredging activity degrades its environment and harms plants and animals, either on the shore with spoils or in the channel. I believe the river is mostly deep enough for all transport normally using it, with perhaps the exception of barge traffic; however, the only barges I have ever seen using the river belong to the dredgers. Of course, the section of the ICW between the river's mouth and the St. George Island Bridge might use an occasional dredging (on the other hand, you all never dredge the Government Cut (Bob Sykes), which failing is a mystery to me as you all spend so much resource with unnecessary dredging). A

If I had my way, you would remove those nasty dams you built on the Chattahoochee River, which only serve to inhibit river flow. You must need to know that the health of the entire estuary depends on strong fresh water flow, and that the seafood industry depends on a healthy estuary. Please assist that health, not degrade it. B

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Ted Tripp

Response to ACF131-Ted Tripp

A. Current constraints associated with navigation channel maintenance in the Apalachicola River, which are likely to continue for the foreseeable future, are described in detail in section 2.1.1.2.4.3 of the EIS. As a result, USACE is unlikely to pursue maintenance dredging of the navigation channel because of the environmental permitting issues with Florida Department of Environmental Protection (DEP), budgetary constraints, and other factors. Limited snagging under a 10-year Florida DEP snagging permit issued November 27, 2013, could provide some relief to users of the navigation channel. Maintenance dredging might occur in the future for other federally authorized navigation projects in the Apalachicola Bay area, subject to environmental permitting and budget considerations.

B. The authorized purposes of the federal ACF system do not include a specific directive to provide freshwater inflows to Apalachicola Bay to sustain the resources of the Bay. USACE does make releases to limit adverse effects to threatened and endangered species downstream of Jim Woodruff Lock and Dam, including Apalachicola Bay. USACE consulted on the PAA and the results are presented in appendix J of the final EIS. In the biological opinion the USFWS concluded that effects to estuarine invertebrate production are insignificant because the PAA provides slightly beneficial effects from increasing the number of freshwater pulses and increasing the number of days greater than or equal to 16,200 cfs in the winter. USFWS also anticipate only minor changes in salinity regimes and estuarine habitat due to the WCM.

From: Lee Tonsmeire
Sent: Thursday, January 28, 2016 5:49 AM
To: ACF-WCM
Subject: [EXTERNAL] Apalachicola River

The United States CORPS of Engineers must understand your responsibility to protect the nations resources. Once lost it can not be regained. Current management practices cost our country the loss of some species and caused great negative economic impact. That sounds like mission failure.
T*he health, productivity and sustainability of the Apalachicola River and Bay are critical to the economy and cultural heritage of Florida, the entire Gulf Coast and our nation. The seafood produced there is famous across the world. The Corps of Engineers must PROVIDE GREATER THAN fair and equal consideration to fish and wildlife conservation in the Apalachicola River ecosystem as they do the other authorized purposes of the ACF river system to MAKE UP FOR PAST DAMAGED CAUSED BY THE CORPS mismanagement. The CORPS rewrite of its manual MUST revise the way it manages the flow of freshwater needed to maintain the ECONOMIC and extraordinary ECOLOGICAL richness and productivity of the Apalachicola River and associated ecosystem.*

A

B

V/R Mac Tonsmeire

Response to ACF132-Mac Tonsmeire

A. The PAA includes fish and wildlife conservation operations throughout the basin (e.g., the reservoir fish spawn operations, minimum flow provisions in the Apalachicola River, and fish passage at Jim Woodruff Lock and Dam). Section 5 of the EIS provides additional information on the PAA. The EIS considered and disclosed the expected impacts that the PAA could have on fish and wildlife resources in the Apalachicola River and Bay (or elsewhere in the system). If expected impacts to significant resources would be adverse as a result of revised operations, USACE must consider potential measures to mitigate those effects. The analysis presented in section 6 of the EIS indicates that the PAA would have a minimal effect on flow conditions in the Apalachicola River and into the Bay, compared to current reservoir operations under the NAA. Because flow and water quality changes in the Apalachicola River and Bay are not expected under the PAA, no anticipated incremental effect would be expected on fish and wildlife resources in the bay.

   The purpose of the Master WCM update and EIS is to evaluate and compare alternative plans to update project operations in the ACF Basin to improve upon current operations (i.e., the NAA). The NAA reflects current reservoir operations as they have evolved over time in response to laws, regulations, policy, and new technical information. Basing the NAA for the ACF Basin on a pre-NEPA 1958 WCM or a predam condition to assess the effects of alternative WCM update plans would neither accurately reflect current baseline operations nor be consistent with "no action" as defined in the Council on Environmental Quality's memorandum of March 23, 1981, *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*. The EIS considered direct, secondary, and cumulative impacts and indicates that there would be essentially no incremental effect on the Apalachicola River and Bay as a result of the PAA as compared to the NAA

B. The authorized purposes of the federal ACF system do not include a specific directive to provide freshwater inflows to Apalachicola Bay to sustain the resources of the Bay. USACE does make releases to limit adverse effects to threatened and endangered species downstream of Jim Woodruff Lock and Dam, including Apalachicola Bay. USACE consulted on the PAA and the results are presented in appendix J of the final EIS. In the biological opinion the USFWS concluded that effects to estuarine invertebrate production are insignificant because the PAA provides slightly beneficial effects from increasing the number of freshwater pulses and increasing the number of days greater than or equal to 16,200 cfs in the winter. USFWS also anticipate only minor changes in salinity regimes and estuarine habitat due to the WCM.

Response to ACF133-River Valley Regional Commission, Patricia Cullen

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From: Lance Renfrow
Sent: Friday, January 29, 2016 8:43 AM
To: ACF-WCM
Subject: [EXTERNAL] RVRC comments for DEIS and WCM
Attachments: ASACORPSE Water Control Manual Comment.pdf

Colonel Jon Chytka,

Attached are the comments and resolution from the River Valley Regional Commission regarding the Draft Environmental Impact Statement and updated Water Control Manual. I thank you for the opportunity to provide our comments. Please feel free to contact me if you have any questions.

Sincerely,

Lance Renfrow | Environmental Planner
River Valley Regional Commission
710 Front Avenue, Suite A
P.O. Box 1908
Columbus, Georgia 31902-1908

Fax 706-256-2061
Blockedwww.rivervalleyrc.org
Blockedwww.facebook.com/rivervalleyrc
Blockedwww.activevalley.org

RVRC
RIVER VALLEY REGIONAL COMMISSION
www.rivervalleyrc.org

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Toll Free (877)819-6348

January 27, 2016

Colonel Jon J. Chytka
Commander, Mobile District
U.S. Army Corps of Engineers
ATTN: PD-EI (ACF-DEIS)
P.O. Box 2288, Mobile, AL 36628

Re: Apalachicola-Chattahoochee-Flint River Basin Water Control Manual and Draft Environmental Impact Statement

Dear Colonel Chytka:

The purpose of this letter is to relay the comments from the River Valley Regional Commission (RVRC) to the U.S. Army Corp of Engineers regarding the Draft Environmental Impact Statement (DEIS) for an updated Water Control Manual (WCM) for the Apalachicola-Chattahoochee-Flint River Basin.

The RVRC serves sixteen counties and thirty-five (35) municipalities within the River Valley region. The mission of the RVRC is to create, promote and foster the orderly growth and economic prosperity for our region. Both the Chattahoochee and Flint Rivers flow through this region and the environmental and socioeconomic impacts of the DEIS and the updated WCM are of interest of the RVRC. The greater success and identity of our people and local governments are tied to the Chattahoochee and Flint Rivers, and the RVRC thanks you for this opportunity to provide our comments.

Our comments include:

- We recommend that the U.S. Army Corps of Engineers establish and honor the flow requirement of 1,350 cubic feet per second (cfs) daily average and 1,850 cfs weekly average at Columbus, Georgia, and 2,000 cfs weekly average at Columbia, Alabama identified by the Governors of Alabama, Florida, and Georgia in 2003. A
- We recommend that the Chattahoochee River receive a flow control node in Columbus with minimum flows to protect the interest of the cities, communities, businesses, industries, etc. from below West Point dam to Bainbridge along both sides of the river. B
- We request that the U.S. Army Corp of Engineers develop a comprehensive assessment of impacts based on an appropriate baseline. Using 2007 data as the baseline year may skew the data as that year represents one of the most severe droughts our region has experienced. C

Chattahoochee | Clay | Crisp | Dooly | Harris | Macon | Marion | Muscogee
Quitman | Randolph | Schley | Stewart | Sumter | Talbot | Taylor | Webster

Response to ACF133-River Valley Regional Commission, Patricia Cullen

A. Whatever purported agreements were made between the governors of the states of Alabama, Georgia, and Florida in 2003 were never approved by the United States Congress; therefore, USACE has no authority to operate for these flow targets. The stated daily and weekly average flow targets at Columbus, Georgia, are established in the Federal Energy Regulatory Commission (FERC) license for Georgia Power Company projects downstream of West Point Lake (refer to section 6.1.1.2.1). Each of the FERC target flows include an important qualifier, e.g., "a daily average target minimum flow of 1,350 cfs, or inflow, whichever is less" (emphasis added). Model results over the 73-year hydrologic period of record indicate that a daily average flow of 1,350 cfs at Columbus would be achieved on 94 percent of the days for the PAA compared to 95 percent under the NAA (refer to section 6.1.1.2.3.9). The Alabama Office of Water Resources and the Southern Nuclear Operating Company have identified a daily average flow need of 2,000 cfs at Columbia, Alabama, to support continued operation of the Farley Nuclear Plant. Model results indicate that the daily average flow need at Columbia would be met 95 percent of the days over the period of record compared to 96 percent under the NAA.

B. A node for Columbus, Georgia, was included in the HEC-ResSim model (see Figure 2 of appendix E) and HEC-5Q model (See Figure 2.1 of appendix K) of the draft EIS. The authorized purposes of the federal ACF system do not include a specific directive to meet flow targets at Columbus. Nonetheless, USACE's modelling of the PAA over the 73-year hydrologic period of record indicate that a daily average flow of 1,350 cfs at Columbus would be achieved on 94 percent of the days for the PAA compared to 95 percent under the NAA (refer to section 6.1.1.2.3.9). . Flows at Columbus for the various alternative considered are discussed in section 6.1.1.2.3 of the draft EIS and water quality is discussed in various portions of section 6.1.2 of the draft EIS.

C. Council on Environmental Quality (CEQ) regulations for implementing NEPA require consideration of the NAA (section 1502.14). In the CEQ's memorandum of March 23, 1981, *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*, question no. 3 addresses the NAA. The response to question no. 3 states, in part:

> The first situation might involve an action ... where ongoing programs initiated under existing legislation and regulations will continue, even as new plans are developed. In these cases, "no action" is "no change" from the current management direction or level of management intensity. To construct an alternative that is based on no management at all would be a useless academic exercise. Therefore, the "no action" alternative may be thought of in terms of continuing with the present course of action until that action is changed.

Consequently, for purposes of the Master WCM update process, the NAA reflects current reservoir operations as they have evolved over time in response to laws, regulations, policy, and new technical information. The only information included in the NAA reflecting 2007 was water withdrawals. The rationale for using 2007 withdrawals is explained in section 4.1.2.9 of the draft EIS as follows:

> Water supply withdrawals vary on both an average daily and annual basis, but for modeling purposes, a fixed demand was identified to allow for effective comparison of alternatives. The highest levels of basinwide water supply withdrawals occurred in 2007, during the 2006-2008 drought. Although basinwide withdrawals since 2007 have been lower overall, 2007 was selected as representative of "current" demand because using the highest recent figure provides the most conservative estimate of the storage available for all purposes, assuming the greatest amount of reasonably forecasted water supply demand, including during times of drought.

- The Proposed Action Alternative (PAA) will have adverse effects on the reservoirs downstream from Metro Atlanta under the PAA; lake levels at West Point Lake will fall below the Initial Impact Level an additional 6 years during peak recreational time over the modeled period. Under the PAA, lake levels at Walter F. George Lake would fall below the Initial Impact Level an additional 15 years during peak recreational time over the modeled period, creating much more unpredictability for tourism and economic sustainability. These downstream communities rely heavily on recreation and tourism as a means of economic development, with an internationally recognized whitewater course in Columbus, numerous fishing tournaments and recreation opportunities on the river and lakes, and proposed river cruises upstream from Apalachicola, FL to Columbus, GA. These activities, which have all been considered or executed in previous regional plans will become financially impracticable with the PAA. Any changes to the lake levels will have drastic impacts on the region's economic development and sustainability. D

- Lack of specified target flows from upstream pose a concern for the Chattahoochee River watershed from West Point, GA to Ft. Gaines, GA (as well as other downstream communities). The communities in our region on the Georgia side of Walter F. George reservoir, Clay County, Georgetown-Quitman County, and Stewart County, are some of the poorest and most disenfranchised communities in Georgia. Lessened return rates affect the ability for public works departments to ensure good water quality and would require public works departments to install tertiary treatment facilities on their wastewater treatment plants in order to remain in compliance with their NPDES permits. This will result in an environmental injustice on the residents of these counties through increased rates for wastewater treatment. E

The RVRC acknowledges the Corps of Engineer's difficult task of allocating water throughout such a vast region. We encourage the Corps to recognize and respond to flows as established by our tri-state area in 2003. On January 27, 2016, our Council unanimously passed a resolution requesting that the U.S. Army Corps of Engineers establish flow targets for the Middle and Lower Chattahoochee River. We have attached the Resolution to this letter for your consideration.

Please feel free to contact me if you have any questions.

Sincerely,

Patricia P. Cullen

Patricia P. Cullen, Executive Director
River Valley Regional Commission

(1) Attachment

Chattahoochee | Clay | Crisp | Dooly | Harris | Macon | Marion | Muscogee
Quitman | Randolph | Schley | Stewart | Sumter | Talbot | Taylor | Webster

Response to ACF133-River Valley Regional Commission, Patricia Cullen

D. The frequency of the lower reservoir levels at West Point Lake decreases in the PAA as compared to the NAA. The number of years that the water access limited level and recreation impact level are crossed decreases under the PAA as compared to the NAA (see section 6.1.1.1.2 in the EIS). While there appears to be an increase in the initial impact level (IIL), the conclusion is that the PAA actually is providing for higher pool levels over the period of record. That conclusion also is demonstrated in Figure 6.1-12 in the EIS.
For the Walter F. George Lock and Dam, Table 6.1-5 in the EIS displays impact levels. During peak recreation season, the PAA reaches the IIL 6 years and the NAA reaches the IIL 3 years over the 73-year period of record. Those changes are not likely to drastically impact the region's economy. A full discussion of the PAA with respect to the Walter F. George project is provided in section 6.1.1.1.3.9 of the final EIS.

E. The congressionally authorized purposes of the federal ACF system do not include a specific directive to meet flow targets at Columbus, Georgia. Daily and weekly average flow targets at Columbus are established in the 2004 Federal Energy Regulatory Commission (FERC) license for Georgia Power Company projects downstream of West Point Lake (refer to section 6.1.1.2.1). Each of the FERC target flows include an important qualifier (e.g., "a daily average target minimum flow of 1,350 cfs, *or inflow, whichever is less"* [emphasis added]). Model results over the 73-year hydrologic period of record indicate that a daily average flow of 1,350 cfs at Columbus would be achieved on 94 percent of the days for the PAA compared to 95 percent under the NAA (refer to section 6.1.1.2.3.9).

A RESOLUTION

A Resolution encouraging and requesting that the U.S. Army Corps of Engineers establish flow targets for the Middle and Lower Chattahoochee River

WHEREAS, Congress authorized the construction of locks and dams in the Apalachicola-Chattahoochee-Flint River Basin for purposes including flood control, recreation, water quality, hydropower production, and navigation from Columbus, Georgia, and Phenix City, Alabama, to and from the Gulf of Mexico; and

WHEREAS, flows from Corps of Engineers reservoirs on the Chattahoochee River provide important and necessary water resources for downstream municipalities and industries; and

WHEREAS, cities and businesses on both sides of the Chattahoochee River, in reliance and anticipation of flows from Corps of Engineers reservoirs, have made substantial investments in water infrastructure, industrial facilities, and steam-driven electrical generation; and

WHEREAS, the continued and future social, economic, and ecological vitality of communities along the Middle and Lower Chattahoochee River depends on the Corps of Engineers providing a steady and reliable source of flow; and

F

WHEREAS, the Corps of Engineers has accorded special legal status to flow targets at Peachtree Creek and the Jim Woodruff Dam; and

WHEREAS, from time to time, the Corps of Engineers is able to rely on uncontrolled flows from the Flint River to satisfy Jim Woodruff requirements without augmenting flows from its Chattahoochee River reservoirs; and

WHEREAS, the Corps of Engineers has allowed flows in the middle and lower sections of the Chattahoochee River to fall to dangerously low levels while flows from Lake Lanier, the largest storage reservoir on the system, were controlled so as to allow reservoir elevation levels to maintain and even increase; and

WHEREAS, the Corps of Engineers justifies operating in that manner by citing a lack of a binding flow target in the Middle and Lower Chattahoochee River; and

WHEREAS, as a consequence, the Corps of Engineers favors one region at the direct expense of another, through water management decisions that allow one region to improve through the refilling of water storage while another region worsens due to diminished flow; and

WHEREAS, it is inconceivable that Congress, in authorizing the construction and operation of projects in the Apalachicola-Chattahoochee-Flint River Basin, intended for reservoir operations to favor one region over another; and

Response to ACF133-River Valley Regional Commission, Patricia Cullen

F. Comment noted.

WHEREAS, despite protracted conflict and controversy over the management of Chattahoochee River reservoirs of the Corps of Engineers, the Governors of the States of Alabama, Florida, and Georgia in 2003 reached an agreement that set forth principles to allocate water flow among the three states; and

WHEREAS, those principles included flow requirements to be included in a water allocation among the states, to be met in part by state action and in part through operation of Corps of Engineers reservoirs; and

WHEREAS, those targets included a minimum flow of 1350 cubic feet per second (cfs) daily average and 1850 cfs weekly average at Columbus, Georgia, and 2000 cfs weekly average at Columbia, Alabama; and

WHEREAS, current operational guidelines of the Corps of Engineers and the draft Water Control Manual are, therefore, inconsistent with both statutory requirements and flows agreed upon by the three states;

NOW, THEREFORE, BE IT RESOLVED BY THE RIVER VALLEY REGIONAL COUNCIL that the U.S. Army Corps of Engineers is encouraged and requested:

(1) to establish and honor the flow requirements identified by the Governors of Alabama, Florida, and Georgia, namely, 1350 cubic feet per second (cfs) daily average and 1850 cfs weekly average at Columbus, Georgia, and 2000 cfs weekly average at Columbia, Alabama; and

G

(2) to operate the Chattahoochee River reservoirs as an integrated system in the service of all the populations along the full extent of the river, without reliance on uncontrolled flows from the Flint River as a basis to reduce support for certain Chattahoochee River communities.

H

SO RESOLVED THIS JANUARY 27, 2016

Vice Chair, Richard Morris

ATTEST:

Secretary, Mike Speight

Response to ACF133-River Valley Regional Commission, Patricia Cullen

G. See response to comment A above.

H. One of the key objectives of the Master WCM update process has been to develop a plan to operate the USACE reservoir projects more effectively as an integrated system in accordance with authorized project purposes. Even with an updated WCM, there will be a greater dependence on releases from the USACE Chattahoochee River reservoirs to meet minimum flow requirements for endangered species conservation below Jim Woodruff Lock and Dam under drought conditions, when uncontrolled flows from the Flint River could be abnormally low. Conversely, abnormally high Flint River flow conditions would not necessarily trigger a corresponding reduction in releases from the Chattahoochee River reservoirs, which would adversely affect middle and lower Chattahoochee River communities. Releases from the USACE Chattahoochee River reservoirs under normal or abnormally high flow conditions in the ACF Basin are governed by project guide curves, action zones, hydropower needs, and other considerations associated directly with each individual reservoir. The rules contain provisions for opportunities to refill the federal storage reservoirs on the Chattahoochee River during periods when endangered species flow requirements can be met primarily by Flint River flows. Refilling the reservoirs is a critical component of managing the system to fulfill authorized project purposes under various hydrologic conditions. During the refill period, USACE continues to manage releases from its reservoirs to fulfill authorized purposes throughout the system.

Response to ACF134-Alabama Pulp and Paper Council, Roy McAuley

From: Roy McAuley
Sent: Thursday, January 28, 2016 9:35 AM
To: ACF-WCM
Subject: [EXTERNAL] Alabama Pulp & Paper Council Comments on ACF WCM
Attachments: ACF comments.doc

To: Commander, U. S. Army Corps of Engineers

Alabama Pulp & Paper Council comments on the proposed Apalachicola-Chattahoochee-Flint River Basin Water Control Manual and Draft Environmental Impact Statement are attached.

Roy McAuley
Executive Director
Alabama Pulp & Paper Council
401 Adams Ave., Suite 710,
Montgomery, AL 36104

28 January, 2016

Commander
U. S. Corps of Engineers, Mobile District
P. O. Box 2288
Mobile, AL 36628

Attn: PD-EI (ACF-DEIS)

The Alabama Pulp & Paper Council (APPCO) represents 12 pulp and paper mills in Alabama, including WestRock located on the Chattahoochee River and a sister mill to one of our companies (Georgia Pacific's Cedar Springs, Georgia mill). We appreciate the opportunity to comment on the proposed Environmental Impact Statement and Water Control Manual for the ACF basins.

We, APPCO, remain concerned that the COE maintains its bias toward providing water for Atlanta growth needs over downstream needs. We saw this with the ACT Water Control Manual and it continues with the ACF WCM. This bias leads to use of poorly calibrated modeling, incorrect use of data, not addressing Alabama, Georgia, and EPA water quality standards, and continuing to ignore Congressional intent in establishing the purposes of the projects on the ACF system. These shortcomings, as well as other concerns are pointed out in detailed comments from others (Alabama Office of Water Resources, Alabama Department of Environmental Management, Alabama Power, WestRock, Tri-Rivers Waterway Development Association, and others). A

The operating plan needs tweaking in many ways – such as correctly calibrating the models, using correct data, acknowledging all those who are affected and their needs, water quality standards, and the list goes on. Based on all the shortcomings, it should be withdrawn for further review. B

We strongly recommend that at least, the EIS/WCM be amended to institute mandatory minimum flows at Columbus, Georgia, and Columbia, Alabama = 1,350 cfs daily and 1,850 cfs weekly at Columbus, and 2,000 cfs daily at Columbia. Such a simple action would eliminate many of the concerns on the ACF. C

Submitted by:

Roy McAuley
Executive Director
Alabama Pulp & Paper Council
401 Adams Ave., Suite 710,
Montgomery, AL 36104
334 -386-3000 office
334-313-3893 cell
roy@manufacturealabama.org

Response to ACF134-Alabama Pulp and Paper Council, Roy McAuley

A. USACE does not prioritize project purposes. Instead, USACE has evaluated and proposed water management measures and alternatives that balance operations across all authorized project purposes throughout the basin while considering Georgia's water supply storage request, as directed by the 11th Circuit Court of Appeals.

B. USACE received numerous constructive comments and updated information from agencies and stakeholders on the draft EIS, including revised water supply demand projections from the State of Georgia. Consistent with the parameters established for the update of the Master WCM, pertinent input from public review of the draft EIS has been incorporated into the alternative formulation and evaluation process (sections 4 and 5 of the EIS), including the environmental impact analysis (section 6 of the EIS). A revised PAA also has been incorporated into sections 5 and 6 of the final EIS.

C. The authorized purposes of the federal ACF system do not include a specific directive to meet flow targets at Columbus, Georgia, or Columbia, Alabama. The stated daily and weekly average flow targets at Columbus, Georgia, are established in the Federal Energy Regulatory Commission (FERC) license for Georgia Power Company projects downstream of West Point Lake (see section 6.1.1.2.1 of the EIS). Each of the FERC target flows include an important qualifier (e.g., "a daily average target minimum flow of 1,350 cfs, *or inflow, whichever is less"* [emphasis added]). Model results over the 73-year hydrologic period of record indicate that a daily average flow of 1,350 cfs at Columbus would be achieved on 94 percent of the days for the PAA compared to 95 percent for the NAA (see section 6.1.1.2.3.9 of the EIS). The Alabama Office of Water Resources and the Southern Nuclear Operating Company have identified a daily average flow need of 2,000 cfs at Columbia, Alabama, to support continued operation of the Farley Nuclear Plant. Model results indicate that the daily average flow need at Columbia would be met 95 percent of the days over the period of record for the PAA compared to 96 percent for the NAA.

Response to ACF135-Manufacture Alabama– George Clark

From: Roy McAuley <roy@manufacturealabama.org>
Sent: Thursday, January 28, 2016 9:30 AM
To: ACF-WCM
Subject: [EXTERNAL] Manufacture Alabama Comments on ACF WCM
Attachments: ACF commentsMA.doc

To: Commander, U. S. Army Corps of Engineers

Manufacture Alabama comments on the proposed Apalachicola-Chattahoochee-Flint River Basin Water Control Manual and Draft Environmental Impact Statement are attached.

George Clark
President
Manufacture Alabama
401 Adams Ave., Suite 710,
Montgomery, AL 36104
334 -386-3000 office
334-313-3893 cell
george@manufacturealabama.org

28 January, 2016

Commander
U. S. Corps of Engineers, Mobile District
P. O. Box 2288
Mobile, AL 36628

Attn: PD-EI (ACF-DEIS)

Manufacture Alabama (MA), representing over 100 manufacturers in Alabama appreciates the opportunity to comment on the proposed Environmental Impact Statement and Water Control Manual for the ACF basins.

We, MA, remain concerned that the COE maintains its bias toward providing water for Atlanta growth needs over downstream needs. We saw this with the ACT Water Control Manual and it continues with the ACF WCM. This bias leads to use of poorly calibrated modeling, incorrect use of data, not addressing Alabama, Georgia, and EPA water quality standards, and continuing to ignore Congressional intent in establishing the purposes of the projects on the ACF system. These shortcomings, as well as other concerns are pointed out in detailed comments from others (Alabama Office of Water Resources, Alabama Department of Environmental Management, Alabama Power, WestRock, Tri-Rivers Waterway Development Association, and others). A

The operating plan needs tweaking in many ways – such as correctly calibrating the models, using correct data, acknowledging all those who are affected and their needs, water quality standards, and the list goes on. Based on all the shortcomings, it should be withdrawn for further review. B

We strongly recommend that at the very least, the EIS/WCM be amended to institute mandatory minimum flows at Columbus, Georgia, and Columbia, Alabama = 1,350 cfs daily and 1,850 cfs weekly at Columbus, and 2,000 cfs daily at Columbia. Such a simple action would eliminate many of the concerns on the ACF. C

Submitted by:

George Clark
President
Manufacture Alabama
401 Adams Ave., Suite 710,
Montgomery, AL 36104
334 -386-3000 office
334-313-3893 cell
george@manufacturealabama.org

Response to ACF135-Manufacture Alabama– George Clark

A. USACE does not prioritize project purposes. Instead, USACE has evaluated and proposed water management measures and alternatives that balance operations across all authorized project purposes throughout the basin while considering Georgia's water supply storage request, as directed by the 11th Circuit Court of Appeals.

B. USACE received numerous constructive comments and updated information from agencies and stakeholders on the draft EIS, including revised water supply demand projections from the State of Georgia. Consistent with the parameters established for the update of the Master WCM, pertinent input from public review of the draft EIS has been incorporated into the alternative formulation and evaluation process (sections 4 and 5 of the EIS), including the environmental impact analysis (section 6 of the EIS). A revised PAA also has been incorporated into sections 5 and 6 of the final EIS.

C. The authorized purposes of the federal ACF system do not include a specific directive to meet flow targets at Columbus, Georgia, or Columbia, Alabama. The stated daily and weekly average flow targets at Columbus, Georgia, are established in the Federal Energy Regulatory Commission (FERC) license for Georgia Power Company projects downstream of West Point Lake (see section 6.1.1.2.1 of the EIS). Each of the FERC target flows include an important qualifier (e.g., "a daily average target minimum flow of 1,350 cfs, *or inflow, whichever is less"* [emphasis added]). Model results over the 73-year hydrologic period of record indicate that a daily average flow of 1,350 cfs at Columbus would be achieved on 94 percent of the days for the PAA compared to 95 percent for the NAA (see section 6.1.1.2.3.9 of the EIS). The Alabama Office of Water Resources and the Southern Nuclear Operating Company have identified a daily average flow need of 2,000 cfs at Columbia, Alabama, to support continued operation of the Farley Nuclear Plant. Model results indicate that the daily average flow need at Columbia would be met 95 percent of the days over the period of record for the PAA compared to 96 percent for the NAA.

LAW OFFICES
J. PATRICK FLOYD
CHARTERED

REPLY TO:
408 LONG AVENUE
POST OFFICE DRAWER 950
PORT ST. JOE, FLORIDA 32457-0950
(850) 227-7413

20 AVENUE D, SUITE 208
POST OFFICE BUILDING
APALACHICOLA, FLORIDA 32320
(850) 653-2709

January 28, 2016

U.S. Army Corps of Engineers
Mobile District
Attention: PD-EI (ACF-DEIS
109 St. Joseph Street
Mobile, AL 36602-3630

Re: City of Apalachicola, Florida

Gentlemen:

Please find attached a Resolution unanimously adopted by the City Commission of the City of Apalachicola regarding the ACF and the updated Water Control Manual.

We submit these documents as a part of the comment period of the ACF Water Control Manual.

If you have any questions, please do not hesitate to call me.

Sincerely,

Law Offices J. Patrick Floyd, Chtd.

J. Patrick Floyd

JPF/pb

Enclosure: as stated

Response to ACF136-City of Apalachicola, Patrick Floyd

CITY OF APALACHICOLA, FLORIDA
RESOLUTION NO. 2016-01

A RESOLUTION BY THE CITY COMMISSION OF THE CITY OF APALACHICOLA IN SUPPORT OF A COMPLETE PROGRAM, INCLUDING FLOWS AND CHANNEL MAINTENANCE, FOR COMMERCIAL NAVIGATION ON THE APALACHICOLA RIVER.

WHEREAS, flows in the Apalachicola River are essential for the environmental health of the river and the economic well-being of communities located along the river and Apalachicola Bay; and

WHEREAS, the seafood industry in Apalachicola Bay, which provides one tenth of the nation's oyster supply and is an important source of other seafood, depends on bay and estuary conditions that require adequate fresh water supplies from the Apalachicola River; and

WHEREAS, citizens and businesses in and around Apalachicola, Florida, are working to revive river-borne transportation for purposes of commerce, entertainment and tourism; and

A

WHEREAS, the U.S. Army Corps of Engineers operates a series of reservoirs in Apalachicola-Chattahoochee-Flint River Basin; and

WHEREAS, Congress authorized the construction and operation of these reservoirs in support of commercial navigation, among other purposes, which the Corps has recognized since enactment of the authorizing legislation in 1945 and continuously ever since; and

WHEREAS, in furtherance of Congressional intent, the Corps is authorized to operate its reservoirs to provide navigation flows and to maintain the navigation channel at a depth of 9 feet and a width of 100 feet, which requires dredging and desnagging in the Apalachicola River from time to time; and

WHEREAS, the Corps in recent years has failed to provide flow and channel maintenance sufficient to support commercial navigation; and

WHEREAS, over the same time period, Apalachicola flows have been too low, with negative impacts on the health of the river and bay, which in turn impacts the seafood industry as well as commercial navigation which was explicitly warranted and intended in the Congressional Act authorizing the reservoir system on the River Basin.

Response to ACF136-City of Apalachicola, Patrick Floyd

A. Comment noted.

WHEREAS, historically, flows in the Apalachicola River were healthier at times when the Corps implemented an active program of navigation support as required and mandated by Congress; and

WHEREAS, the Corps has proposed operations under which it reserves storage and maintains water in its upstream Chattahoochee River reservoirs at critical times of year, which necessarily reduces downstream flows in the Chattahoochee and Apalachicola Rivers; and

WHEREAS, by failing to propose or provide operations that will provide sufficient navigation flow and to maintain the Apalachicola River, the Corps has abandoned a program of navigation support that is consistent with Congressional intent, which has negative effects on both the environment and economy in the region served by the Apalachicola River; and A

WHEREAS, past failures to desnag and otherwise maintain the Apalachicola River have led to unsafe boating conditions for Florida's citizens; and

WHEREAS, in the past, the Corps' practices for the disposal of material from the dredging of the Apalachicola River have been viewed as causing negative and unnecessary environmental impacts, including blockages of sloughs that are important for the life cycle of local biota; and

WHEREAS, techniques and technology are available today to conduct channel maintenance in a manner that reduces any such adverse environmental impacts; and

WHEREAS, sand and other dredged material can be reused locally for many needed purposes;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF APALACHICOLA THAT:

(1) the City of Apalachicola supports efforts of the Corps to provide for commercial navigation, including both increased flow and such channel dredging and desnagging as may be necessary to support regular commercial traffic as was expressly stated and intended by Congress; and B

(2) the City will be pleased to work with the Corps and other stakeholders to identify methods of channel maintenance that respond to environmental concerns and that allow for the beneficial use of dredged sand and other material, including the procurement of appropriate sites to dispose of dredged material and to stage it for beneficial uses. C

AND BE IT FURTHER RESOLVED, that the U.S. Army Corps of Engineers is encouraged and requested:

Response to ACF136-City of Apalachicola, Patrick Floyd

B. The PAA includes provisions for increased flows when sufficient water is available within the basin to support the availability of a 7-ft navigation depth in the Apalachicola River each year between January and May. Increased flows beyond that level to provide opportunity for navigation use of the Apalachicola River would have adverse effects on other authorized purposes of the ACF Basin projects. USACE, Mobile District received a 10-year permit from the Florida Department of Environmental Protection (DEP) on November 27, 2013, to conduct snagging operations on the river to maintain navigability depending on annual availability of operation and maintenance funds. Dredging of the navigation channel in the Apalachicola River has not been conducted since the Florida DEP denied USACE a permit for the work in 2005. Additionally, because the ACF navigation project is considered a low use waterway from a commercial navigation standpoint, USACE has been unable to budget for operation and maintenance funds to conduct maintenance dredging on the river. These constraints will likely continue to exist for the foreseeable future.

C. Current constraints associated with navigation channel maintenance in the Apalachicola River, which are likely to continue for the foreseeable future, are described in detail in section 2.1.1.2.4.3 of the EIS. Accordingly, USACE is unable to pursue alternative methods of channel maintenance, beneficial uses of dredged material, and procurement of new disposal sites at this time.

(1) to provide such flows as are necessary to support commercial navigation at the authorized channel depths in the Apalachicola and Chattahoochee Rivers;

D

(2) to supplement such flows as may be required for the environmental and economic health of the Apalachicola River and Bay; and

(3) to undertake such dredging and desnagging as may be required to implement and maintain a complete program of navigation support.

ADOPTED, this 26th day of January, 2016, by the City Commission of the City of Apalachicola by unanimous vote.

FOR THE CITY COMMISSION OF THE CITY OF APALACHICOLA

VAN W. JOHNSON, SR., MAYOR

ATTEST:

LEE H. MATHES, CITY CLERK

Response to ACF136-City of Apalachicola, Patrick Floyd

D. Slightly increased releases each year between January and May to support navigation channel depths when sufficient water is available in the basin, as included in the PAA, would provide opportunity for limited navigation use of the project. These slight seasonal increases potentially could provide a collateral incidental benefit to natural resources downstream of Jim Woodruff Lock and Dam. Limited snagging under the current Florida Department of Environmental Protection snagging permit to USACE could provide some relief to users of the navigation channel. Resumption of maintenance dredging in the river is unlikely, as described in section 2.1.1.2.4.3 of the EIS.

Response to ACF137-George Floyd

From: George Kirvin Floyd
Sent: Thursday, January 28, 2016 10:06 AM
To: 'Laurel Bradley'; ACF-WCM
Cc: 'Robert Presnell'; 'Gene Morgan'; 'David Gardner'; 'Lee Garner'
Subject: [EXTERNAL] RE: Resolution No 2016-004
Attachments: 201601280927.pdf

Good morning and thankyou !!!!

These resolutions are helping to ensure that Gadsden and the other riparian counties along the Apalachicola River are heard in furtherance of our shared health, safety, welfare, economic, environmental and heritage concerns. This is a grass roots ground swell that has nearly 30 organizations from Columbus executing resolutions with essentially the same goals.

A

Respectfully, **George K. Floyd**c

Find the best of life is free; Sun, Stars, Sky and Sea.

Visit the Apalachicola Maritime Museum ~~*Web Site*~~, ~~*Facebook Page*~~ and ~~*YouTube Channel*~~

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·.¸¸.•´¯`•.¸¸><((((º>·.¸¸.•´¯`•.¸¸><((((º>·.¸¸.•´¯`•.¸¸><((((º>·.¸¸.

A. Comment noted.

From: Laurel Bradley [mailto:lbradley@gadsdencountyfl.gov]
Sent: Thursday, January 28, 2016 9:40 AM
To: ACF-WCM@usace.army.mil
Cc: George.Floyd@RiverEcoLogic.com; Robert Presnell <rpresnell@gadsdencountyfl.gov>
Subject: Resolution No 2016-004

Good morning. Please find attached a copy of Resolution 2016-004 by the Gadsden County Board of County Commissioners in support of a complete program, including flows and channel maintenance, for the commercial navigation on the Apalachicola River. I have placed the original via overnight mail to the below address:

(Commander, U.S. Army Corps of Engineers, Mobile District, Attn: PD-EI (ACF-DEIS), P.O. Box 2288, Mobile, AL 36628)

If you should need additional information, please feel free to contact me.

Response to ACF137-George Floyd

Thanks,

Laurel Bradley
Executive Assistant
County Administrator's Office
9-B East Jefferson Street
P. O. Box 1799
Quincy, Florida 32351
T: 850-875-8656
F: 850-875-8655
lbradley@gadsdencountyfl.gov

Response to ACF137-George Floyd

COUNTY OF GADSDEN
RESOLUTION NO. 2016-004

A RESOLUTION BY THE COUNTY OF GADSDEN IN SUPPORT OF A COMPLETE PROGRAM, INCLUDING FLOWS AND CHANNEL MAINTENANCE, FOR COMMERCIAL NAVIGATION ON THE APALACHICOLA RIVER.

WHEREAS, flows in the Apalachicola River are essential for the environmental health of the river and the economic well-being of communities located along the river and Apalachicola Bay; and

WHEREAS, the seafood industry in Apalachicola Bay, which provides one tenth of the nation's oyster supply and is an important source of other seafood, depends on bay and estuary conditions that require adequate fresh water supplies from the Apalachicola River; and

WHEREAS, citizens and businesses in and around Apalachicola, Florida, are working to revive river-borne transportation for purposes of entertainment and tourism; and

WHEREAS, the U.S. Army Corps of Engineers operates a series of reservoirs in Apalachicola-Chattahoochee-Flint River Basin; and

WHEREAS, Congress authorized the construction and operation of these reservoirs in support of commercial navigation, among other purposes, which the Corps has recognized since enactment of the authorizing legislation in 1945 and continuously ever since; and

B

WHEREAS, in furtherance of Congressional intent, the Corps is authorized to operate its reservoirs to provide navigation flows and to maintain the navigation channel at a depth of 9 feet and a width of 100 feet, which requires dredging and de-snagging in the Apalachicola River from time to time; and

WHEREAS, the Corps in recent years has failed to provide flow and channel maintenance sufficient to support commercial navigation; and

WHEREAS, over the same time period, Apalachicola flows have been too low, with negative impacts on the health of the river and bay, which in turn impacts the seafood industry; and

WHEREAS, historically, flows in the Apalachicola River were healthier at times when the Corps implemented an active program of navigation support; and

WHEREAS, the Corps has proposed operations under which it reserves storage and maintains water in its upstream Chattahoochee River reservoirs at critical times of year, which necessarily reduces downstream flows in the Chattahoochee and Apalachicola Rivers; and

WHEREAS, by failing to propose operations that will provide sufficient navigation flow and to maintain the Apalachicola River, the Corps has abandoned a program of navigation support that is consistent with Congressional intent, which has negative effects on both the environment and economy in the region served by the Apalachicola River; and

WHEREAS, past failures to de-snag and otherwise maintain the Apalachicola River

B. Comment noted.

have led to unsafe boating conditions for Florida's citizens; and

WHEREAS, in the past, the Corps' practices for the disposal of material from the dredging of the Apalachicola River have caused negative and unnecessary environmental impacts, including blockages of sloughs that are important for the life cycle of local biota; and

WHEREAS, techniques are available today to conduct channel maintenance in a manner that reduces adverse environmental impacts; and

WHEREAS, sand and other dredged material can be reused locally for construction and other purposes;

NOW, THEREFORE, BE IT RESOLVED BY THE COUNTY OF GADSDEN, that:

(1) the County of Gadsden supports efforts of the Corps to provide for commercial navigation, including both increased flow and such channel dredging and de-snagging as may be necessary to support regular barge traffic; and C

(2) the County will be pleased to work with the Corps and other stakeholders to identify methods of channel maintenance that respond to environmental concerns and that allow for the beneficial use of dredged sand and other material, including the procurement of appropriate sites to dispose of dredged material and to stage it for beneficial uses. D

AND BE IT FURTHER RESOLVED, that:

the U.S. Army Corps of Engineers is encouraged and requested:

(1) to provide such flows as are necessary to support commercial navigation at the authorized channel depths in the Apalachicola and Chattahoochee Rivers;

(2) to supplement such flows as may be required for the environmental and economic health of the Apalachicola River and Bay; and E

(3) to undertake such dredging and de-snagging as may be required to implement and maintain a complete program of navigation support.

ADOPTED, this 19th day of January 2016, by the County Commission of the County of Gadsden.

FOR THE COUNTY COMMISSION OF THE COUNTY OF GADSDEN:

NICHOLAS THOMAS GADSDEN COUNTY FLORIDA CLERK OF CIRCUIT COURT

BRENDA A. HOLT, CHAIRPERSON

ATTEST:

NICHOLAS THOMAS, CLERK

Response to ACF137-George Floyd

C. The PAA includes provisions for increased flows when sufficient water is available within the basin to support the availability of a 7-ft navigation depth in the Apalachicola River each year between January and May. Increased flows beyond that level to provide opportunity for navigation use of the Apalachicola River would have adverse effects on other authorized purposes of the ACF Basin projects. USACE, Mobile District received a 10-year permit from the Florida Department of Environmental Protection (DEP) on November 27, 2013, to conduct snagging operations on the river to maintain navigability depending on annual availability of operation and maintenance funds. Dredging of the navigation channel in the Apalachicola River has not been conducted since the Florida DEP denied USACE a permit for the work in 2005. Additionally, because the ACF navigation project is considered a low use waterway from a commercial navigation standpoint, USACE has been unable to budget for operation and maintenance funds to conduct maintenance dredging on the river. These constraints will likely continue to exist for the foreseeable future.

D. Current constraints associated with navigation channel maintenance in the Apalachicola River, which are likely to continue for the foreseeable future, are described in detail in section 2.1.1.2.4.3 of the EIS. Accordingly, USACE is unable to pursue alternative methods of channel maintenance, beneficial uses of dredged material, and procurement of new disposal sites at this time.

E. Slightly increased releases each year between January and May to support navigation channel depths when sufficient water is available in the basin, as included in the PAA, would provide opportunity for limited navigation use of the project. These slight seasonal increases potentially could provide a collateral incidental benefit to natural resources downstream of Jim Woodruff Lock and Dam. Limited snagging under the current Florida Department of Environmental Protection snagging permit to USACE could provide some relief to users of the navigation channel. Resumption of maintenance dredging in the river is unlikely, as described in section 2.1.1.2.4.3 of the EIS.

Response to ACF138 – National Park Service

From: Wright, Steven
Sent: Thursday, January 28, 2016 10:07 AM
To: ACF-WCM
Cc: Joyce Stanley
Subject: [EXTERNAL] Draft Environmental Impact Statement and Water Control Manual for the Apalachicola-Chattahoochee-Flint River Basin - NPS Comments
Attachments: ER-15-0552 - ACF Water Control Manual - Draft EIS - NPS Comments - 01-28-16.pdf

Dear Sirs or Madam:

Attached are the National Park Service's comments regarding the Draft Environmental Impact Statement and Water Control Manual for the Apalachicola-Chattahoochee-Flint River Basin. Original will be mailed to your Mobile District office.

Steven M. Wright
National Park Service
Southeast Regional Office
Planning & Compliance Division

(404) 562-3257 fax

United States Department of the Interior

NATIONAL PARK SERVICE
Southeast Regional Office
Atlanta Federal Center
1924 Building
100 Alabama St., SW.
Atlanta, Georgia 30303

IN REPLY REFER TO:
ER-15/0552

JAN 2 8 2016

Colonel Jon J. Chytka
Commander, Mobile District
U.S. Army Corps of Engineers
P.O. Box 2288
Mobile, Alabama 36628-0001

Dear Colonel Chytka:

The National Park Service (NPS) welcomes the opportunity to submit comments regarding the Draft Environmental Impact Statement (DEIS) for Updating the Water Control Manual (WCM) for the Apalachicola-Chattahoochee-Flint (ACF) River Basin, for all phases of the study which have the potential to affect the Chattahoochee River National Recreation Area (CRNRA). We offer the following comments, which provide relevant background on the CRNRA and highlight specific issues that should be evaluated and considered in the Draft EIS and WCM update. These comments are consistent with and are intended to supplement comments submitted by NPS during previous scoping periods in 2008, 2009, and 2013.

We understand the purpose of the WCM updates is to identify operating criteria and guidelines for managing water storage and release of water from United States Army Corps of Engineers (USACE) reservoirs within the ACF Basin. The scope of the WCM includes Lake Lanier and the operation of Buford Dam, which forms the upper boundary of CRNRA. The NPS has special expertise regarding the resources and values of the CRNRA and its surrounding areas, which would aid the USACE in its environmental impact analysis and ultimate decision regarding the update of the WCM for the ACF River Basin.

The NPS has had long standing concerns with the current impacts of Buford Dam operations on park resources. Under the USACE's Preferred Action Alternative (PAA), we anticipate these impacts will actually increase in severity based on USACE's impact analysis, which ranges from "slightly adverse" to "adverse"; however, the significance of this increase on park resources is unclear in the DEIS as the modeling information and impact analysis does not provide specific information to allow a thorough understanding of what may occur under the PAA. Specific

A

Response to ACF138 – National Park Service

A. The EIS has a robust discussion of the modeling used to formulate the alternatives and the impacts associated with the PAA. USACE also included additional discussion in the EIS of both the modeling and, to the extent available, information regarding the impacts to the Chattahoochee Reach below the Buford project.

comments regarding the PAA and its potential effects to park resources and values are provided in the attachment to this letter.

Additionally, the NPS wants to ensure that the USACE is aware of aspects of CRNRA legislation that will impact the USACE process for this project. A 1984 Amendment to CRNRA's enabling legislation (Public Law 98-568) outlines a process which must be followed if the USACE, or any Federal agency, proposes to undertake any action which may have a direct and adverse effect on the natural or cultural resources of CRNRA. Specific wording is provided in our attached comments, but the general requirements of the Amendment include:

- Pursuant to the National Environmental Policy Act of 1969, agencies will notify the Secretary of Interior (Secretary) that an action is planned, provide an opportunity to comment, and notify the Secretary of the decisions made related to the action.
- The Secretary will provide comments and recommendations on the proposed action to the notifying agency.
- The notifying agency will provide their decision to the Secretary who will then submit the decision along with the Secretary's comments and recommendations to the appropriate committees of Congress.
- The Secretary must concur with any proposed action prior to the action commencing.

B

The NPS recommends that an interagency workgroup be established to better understand alternatives and the science behind achieving a more sustainable dam operation and natural hydrograph for Buford Dam to avoid direct or adverse impacts to CRNRA. This workgroup would evaluate operational and environmental conditions which will change over time, and create a framework to recommend adjustments to the dam's operation that helps ensure impacts to CRNRA are reduced. These adjustments should be anticipated and allowed for within the WCM process.

C

The NPS also recommends that a long-term management and monitoring program be established with the key agencies involved in managing the river system through the park, and that this commitment be recorded in the Record of Decision. It will be necessary to monitor and evaluate implementation of the PAA over time and provide for the implementation of measures that can reduce impacts within CRNRA.

D

As a result of our review of the DEIS, we respectfully request that the USACE revise the DEIS or draft a Supplemental EIS to address the issues outlined in this letter and its attachment. An update to the DEIS analysis should more fully evaluate potential impacts on NPS resources and values. The development of this additional information would better inform USACE's permitting decisions. Specifically, additional analysis of the outstanding issues we have identified may assist USACE in determining the Least Environmentally Damaging Practicable Alternative and consideration of the public interest. Moreover, this information would better inform the public regarding the extent of potential impacts and the decision-making process. The NPS remains eager to collaborate with the USACE to achieve an operational outcome below Buford Dam that is mutually beneficial and in keeping with each agency's missions and legal authorities.

E

Response to ACF138 – National Park Service

B. Public Law 98-568 does not apply to the current federal action to update the WCMs.

C. Updating WCMs for projects is an inherent USACE function. A WCM update is only a change to operation of existing constructed projects and not a study. During the past 26 years USACE has participated in interagency working groups, comprehensive studies, interstate compacts, settlement discussions, meetings between state governors, litigation, and negotiations led by the U.S. Secretary of the Interior. The National Park Service (NPS) and the Department of the Interior were involved in several of those cooperative efforts. NPS's comments and input have been addressed along with the comments of other agencies and stakeholders in an effort to update the WCMs.

D. USACE will continue to monitor its operations in the ACF Basin and perform any data collection as required by laws and regulations (as described in chapter 5 of the WCMs). Other state and federal agencies also could monitor conditions in the basin. The final EIS includes a more robust discussion of impacts to the NPS area. Furthermore, the record of decision document will satisfy all requirements of the NEPA. USACE does not anticipate that a commitment to a specific monitoring program will be necessary as a result of the impacts from the proposed action.

E. USACE considered all of the issues and comments raised in the NPS comment cover letter and attachments. USACE included additional information regarding potential impacts to the NPS recreation area in the final EIS. The update of the WCMs does not require any permitting by USACE; therefore, it is unclear how additional information could inform USACE regulatory permitting. Optimum flow regimes for the Chattahoochee River National Recreation Area are displayed in Table 6.1-7 of the final EIS. These flow regimes were developed as part of the MAAWRS in the 1980s. In 2000, CH2M Hill developed a recreational flow preference for the NPS that was similar to the previous effort. Riverine flows were evaluated in various reaches between Buford Dam and West Point Dam and also in the middle and lower Chattahoochee River. Figure 6.1-24 in the EIS displays flows of the NAA and PAA below Buford Dam. Flows exceeded 1,000 cfs approximately 75 percent of the time under the NAA compared to 73 percent of the time under the PAA. For higher flows that would support kayaking (6,000 cfs), there was a negligible difference between the NAA and the PAA over the period of record.

Response to ACF138 – National Park Service

Thank you for considering our comments and taking our views into careful consideration. We are available to meet and discuss these concerns. Should you have any questions or need additional information regarding our comments, please contact Mr. Bill Cox, Chattahoochee River National Recreation Area Superintendent, at Bill_Cox@nps.gov or (678) 538-1211.

Sincerely,

for Stan Austin
Regional Director

Enclosure

Response to ACF138 – National Park Service

National Park Service
Comments

Draft Environmental Impact Statement (EIS): Update of the Water Control Manual for the Apalachicola-Chattahoochee-Flint River Basin in Alabama, Florida, and Georgia and a Water Supply Storage Assessment. October 2015

January 2016

The National Park Service (NPS) has reviewed the Draft Environmental Impact Statement (DEIS) for the updated Water Control Manual (WCM) and provides the following comments. It should be noted that in addition to these comments, NPS previously provided comments on the Notice of Intent (comments dated January 14, 2013). At that time, NPS requested and justified cooperator status in the development of the DEIS. This request was denied by the United States Army Corps of Engineers (USACE). As a result, many environmental concerns and statutory requirements under the purview of the NPS have not been adequately addressed within the DEIS. Chief among these are 1) wide-ranging effects associated with decreasing minimum flows below Buford Dam, 2) effects of the rapid rate of discharge change below Buford Dam, and 3) the statutory requirement that the Department of the Army must formally coordinate with the Secretary of the Interior in accordance with PL 98-568, Section d(1-6). These concerns are further described below. The NPS remains eager to collaborate with the USACE to achieve an operational outcome below Buford Dam that is mutually beneficial and in keeping with each agency's missions and legal authorities.

Background and General Comments

Chattahoochee River National Recreation Area (CRNRA) is a unit of the National Park System managed by the NPS and consisting of 48-river miles from Buford Dam to Peachtree Creek. CRNRA was established in 1978 when Congress determined that the "natural, scenic, recreation, historic, and other values the Chattahoochee River … are of special national significance, and that such values should be preserved and protected from developments and uses which would substantially impair or destroy them" (PL 95-344). In addition to the river itself, CRNRA is comprised a series of 16 land-based park units located between Buford Dam and Peachtree Creek, just north of Atlanta, Georgia. The park provides over 70% of the public green space in the greater Atlanta area and outdoor recreation activities for over three million visitors per year. It is estimated that CRNRA provides an economic benefit to the local economy in excess of $128 million/year. The Chattahoochee River forms the backbone of the park, and CRNRA has a vested interest in the operations of Buford Dam, as the timing of water releases and related flows in the river directly impact the ability of park managers to preserve the "natural, scenic, recreation, historic, and other values" of the park, as mandated by Congress.

Although the CRNRA enabling legislation does not specifically define the "natural, scenic, recreation, historic, and other values" that render the 48-mile segment of the river and adjoining lands of "special national significance," it gives park managers the obligation and authority to protect these values from adverse effects caused by "water resource projects" within the

boundary of the park. In 2013, the NPS initiated a multi-stakeholder process to clearly identify and describe these "values of special national significance" and to establish a logical, defensible, and consistent framework for evaluating projects that could adversely affect these values (NPS 2013). The process was adapted to meet the specific circumstances of the national recreation area's unique legislation. The NPS and its stakeholders concluded that the following were values of special significance: ecological, cultural and historic, recreational, scenic, geologic, water quality, and water quantity.

The enabling legislation for CRNRA states in part that:

> *"No department or agency of the United States shall recommend authorization of any water resources project that would have a direct and adverse effect on the values for which such area is established, as determined by the Secretary nor shall such department or agency request appropriations to begin construction of any such project, whether heretofore or hereafter authorized, without at least sixty days in advance, (1) advising the Secretary in writing of its intention to do so and (2) reporting to the Committee on Interior and Insular Affairs of the United States House of Representatives and to the Committee on Energy and Natural Resources of the United States Senate the nature of the project involved and the manner in which such project would conflict with the purposes of this Act or would affect the recreation area and the values to be protected by it under this Act, I t is not the intention of Congress by this Act to require the manipulation or reduction of lake water levels in Lake Sidney Lanier. Nothing in this Act shall be construed in any way to restrict, prohibit, or affect any recommendation of the Metropolitan Atlanta Water Resources Study as authorized by the Public Works Committee of the United States Senate on March 2, 1972."* PL95-344, sec 104(b).

The DEIS concludes that the Preferred Action Alternative (PAA) will have "slightly adverse" to "adverse" effects on resources within CRNRA, specifically flow condition, dissolved oxygen, total phosphorus, total nitrogen, riverine fish and aquatic resources, and land use (riverine shoreline). The DEIS defines "slightly adverse" as an impact that is "perceptible and measurable, but will not have an appreciable effect." The DEIS makes no attempt to define "appreciable effect." Further, it should be noted, that the CRNRA legislation makes no distinction between "slightly adverse" and "adverse." Thus, based on the USACE's determination that the PAA will have adverse effects to park resources, these proposed impacts could be considered significant and requiring avoidance and/or mitigation. This may be especially true given the baseline conditions associated with existing operations of Buford Dam. The DEIS does not identify current and ongoing adverse effects of dam operation, nor does the modeling information or analysis related to potential effects of the PAA on park resources provide enough detail to ascertain what the effects could be.

F

Further analysis of the cumulative impacts should be included in the DEIS along with additional alternatives to reduce the level of impacts on values established by Congress for CRNRA. The NPS recommends that an interagency workgroup comprised of resource agencies and academia be established to better understand the alternatives and science behind achieving a more sustainable dam operation and natural hydrograph for Buford Dam. A long-term monitoring and management program is also needed between the USACE and NPS to evaluate conditions which

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F. The Chattahoochee River National Recreation Area was established in the 1970s, several decades after the Buford project's authorization and construction as a peaking hydropower plant. The NAA reflects what currently is occurring in the system. NAA operations are detailed in the affected environment section of the final EIS. USACE has reexamined that section to determine the amount of erosion currently occurring and the potential increase in bank erosion that could be caused by the PAA.

will change over time, and establish a framework to identify changes to the dam's operations that helps ensure impacts to CRNRA are reduced. These adjustments should be anticipated and allowed for within the WCM.

We recommend these requests be included in an updated DEIS or Supplemental EIS prior to the USACE issuing a Record of Decision.

Specific Comments

- 33 CFR § 222.5 requires the USACE develop water control plans in concert with all basin interests which are or could be impacted by or have an influence on project regulation. It states in Section f(9) that "close coordination will be maintained with all appropriate international, Federal, State, regional and local agencies in the development and execution of the water control plans." The NPS does not believe this coordination has occurred as part of the development of this DEIS since cooperator status was denied, NPS concerns expressed in previous comments were not addressed in the DEIS, and the DEIS does not adequately define or assess impacts to park resources and values. Therefore, we recommend that coordination with appropriate agencies be initiated through the interagency workgroup recommended above. G

- The values for which the park was established are currently being impacted by operations at Buford Dam. These impacts were described in the NPS's scoping letter to the USACE in January 2013, but were not been addressed in the DEIS. In fact, the PAA will create additional impacts for which the level of significance is difficult to determine, and for which no mitigation is offered. These impacts range from "slightly adverse" to "adverse" in the DEIS.

  The 1984 Amendment to CRNRA's enabling legislation (Public Law 98-568) outlines the process which must be followed if the USACE or any Federal agency proposes to undertake any action which may have a direct and adverse effect on the natural or cultural resources of CRNRA. Public Law 98-568, Section d(1-6) states the following:

  "(d)(1) Whenever any Federal department, agency, or instrumentality proposes to undertake any action, or provide Federal assistance for any action, or issue any license or permit for an action within the corridor referred to in section 101 which may have a direct and adverse effect on the natural or cultural resources of the recreation area, the head of such department, agency, or instrumentality shall--

  (A) promptly notify the Secretary of the action at the time it is planning the action, or preparing an environmental assessment regarding the action, or preparing and environmental impact statement under the National Environmental Policy Act of 1969 for the action;

  (B) provide the Secretary a reasonable opportunity to comment and make recommendations regarding the effect of the Federal action on the natural and cultural resources of the recreation area; and

  (C) notify the Secretary of the specific decisions made in respect to the comments and recommendations of the Secretary.

  The requirements of this subsection shall be carried out in accordance with procedures H

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G. USACE complied with its legal requirements to coordinate with other agencies as appropriate and involve the public throughout the Master WCM update process. USACE has interacted with the public on the update process since 2009 through several rounds of scoping and public meetings following release of the draft EIS, and considered scoping comments and comments on the draft EIS. USACE has telephonically met with EPA several times during scoping and after the release of the draft EIS, coordinated with resource agencies pursuant to the Fish and Wildlife Coordination Act, and consulted with USFWS pursuant to the Endangered Species Act. USACE coordinated with the State of Florida under the Coastal Zone Management Act and consulted with state historic preservation officers. USACE met with the NPS and coordinated with the National Marines Fisheries Service under the Magnuson Stevenson Act. These are just a few examples of USACE's coordination and involving the public in this process. The update of WCMs is an inherently USACE action, but USACE has complied with all applicable laws and regulations to ensure appropriate agency and public involvement.

H. As noted in earlier comment responses, Public Law 98-568 does not apply to the update of the WCMs. USACE has included a more robust discussion of impacts to the NPS area under the PAA in the final EIS.

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established by the Federal agency responsible for undertaking or approving the Federal action. These procedures may utilize the procedures developed by such Agency pursuant to the National Environmental Policy Act.

(2) Following receipt of notification pursuant to paragraph (1)(A), the Secretary, after consultation with the Governor of Georgia, shall make such comments and recommendations as the Secretary deems appropriate pursuant to paragraph (1)(B) as promptly as practicable in accordance with the notifying agency's procedures established pursuant to paragraph (1)(A). In any instance in which the Secretary does not provide comments and recommendations under paragraph (1)(B), the Secretary shall notify in writing, the appropriate committees of Congress.

(3) Following receipt of the notifying agency's decisions pursuant to paragraph (1)(C), the Secretary shall submit to the appropriate committees of Congress, including the authorizing committees with primary jurisdiction for the program under which the proposed action is being taken, a copy of the notifying agency's specific decisions made pursuant to paragraph (1)(C), along with a copy of the comments and recommendations made pursuant to paragraph (1)(B).

(4) In any instance in which the Secretary has not been notified of a Federal agency's proposed action within the corridor, and on his or her own determination finds that such action may have significant adverse effects on the natural or cultural resources of the recreation area, the Secretary shall notify the head of such Federal agency in writing. Upon such notification by the Secretary, such agency shall promptly comply with the provisions of subparagraphs (A), (B), and (c) of paragraph (1) of this subsection.

(5) Each agency or instrumentality of the United States conducting Federal action upon federally owned lands or waters which are administered by the Secretary and which are located within the authorized boundary of the recreation area shall not commence such action until such time as the Secretary has concurred in such action.

(6) The following Federal actions which constitute a major and necessary component of an emergency action shall be exempt from the provisions from this subsection--

(A) those necessary for safeguarding of life and property;
(B) those necessary to respond to a declared state of disaster;
(C) those necessary to respond to an imminent threat to national security; and
(D) those that the Secretary has determined to be not inconsistent with the general management plan for the recreation area.

Actions which are part of a project recommended in the study entitled "Metropolitan Atlanta Water Resources Management Study, Georgia: Report of Chief of Engineers", dated June 1, 1982, and any Federal action which pertains to the control of air space, which is regulated under the Clean Air Act, or which is required for maintenance or rehabilitation of existing structures or facilities shall also be exempt from the provisions of this subsection.

(f) Title I of such Act is amended by adding the following at the end thereof:"

Please note that in section (5) above, the Secretary of the Interior is required to concur with any Federal action upon federally owned lands or waters, which are administered by the Secretary, before the action is commenced. As Bureaus within the Department of Interior, comments from both the NPS and the U.S. Fish and Wildlife Service as they relate to CRNRA must be addressed in the development of the WCM.

Safety

- The CRNRA is a heavily used recreational resource that attracts over 3 million visitors a year, approximately a third of whom engage in some form of water-based recreation, including boating, fishing, canoeing, kayaking, rowing, tubing, and swimming. The USACE and the NPS' fundamental concern are ensuring public safety. Current and proposed future operations under the PAA create an unsafe environment for recreational users in CRNRA by operating the dam in a manner that creates significant river flows (10000 cfs). While safety improvements for visitors engaged in park water-based recreation have focused on raising public awareness of the hazards associated with water releases from Buford Dam, visitor deaths have occurred. Deaths attributed to the rapid rise of waters below Buford Dam have been recorded as recently as 2009. During any given year, the park and local municipalities receive numerous reports of individuals who become stranded due to rapidly rising waters. Greater efforts should be made to mitigate public safety risks associated with operation of the dam. The NPS recommends that the DEIS evaluate alternatives that consider other opportunities to ensure or enhance public safety such as modifying dam operations to release water at times of less use or that mimic a natural hydrograph that minimizes instances of extremely high flows. I

Water Quantity

- Historically, the operation of Buford Dam has resulted in extreme fluctuations in daily and/or hourly flows that represent an extreme deviation from the natural hydrograph. The NPS recommends that operational alternatives be evaluated that mitigate the extreme nature of short-term (daily/hourly) flow fluctuations while at the same time ensuring ample minimum flows to maintain water quality and waste assimilation, and improving conditions for aquatic resources.

- The DEIS states on page 3-5, lines 9-14, that during the colder months (November-April) minimum flows at Peachtree Creek will be reduced to 650 cubic feet per second (cfs) and during warmer months (May-October) the minimum flow will be 750 cfs. When Congress established CRNRA in 1978, there was an assumption that water needed to support the values for which the park was established would be available. Historically, the State of Georgia established the minimum flow requirement of 750 cfs; however, the State has proposed to eliminate this flow requirement and not establish a substitute.

  In recent years, historically unprecedented and sometimes dramatic reductions in flow have occurred within the central reach of the park, most notably in the area upstream of Morgan Falls Dam. This suggests that the minimum flow standard of 750 cfs was not protective of flows required to support recreational uses and ecological needs throughout CRNRA. J

  The NPS is concerned that the PAA reduces flow rates, which could cause significant negative effects on water quality and aquatic species. Proposed flow rates of 650 or 750 cfs lack rigorous scientific analysis to support their use and could lead to an impairment of the values for which the park was established. Impacts from continued use of 750 cfs or from a further reduction of river flow to 650 cfs need to be evaluated and appropriate modeling results provided, which would demonstrate that Buford Dam could be operated in a manner that maintains sufficient flows throughout the recreation area. The previously requested

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I. The Buford Dam project in the ACF Basin was authorized in 1946 and became operational in 1958. Since that time, the dam has been operated as a hydropower facility to provide peaking power generation (section 5.5.4 of the EIS). The NPS area was authorized in 1978 for recreation downstream of Buford Dam, but at no time did Congress deauthorize or limit peaking power generation at Buford Dam to facilitate recreation downstream. At Buford Dam, the USACE warning system to notify the public of releases is one of the best notification systems—if not the best notification system—in the entire country. USACE is, however, willing to work with the NPS to further educate the public of the dangers of rapidly rising water and the timing of peaking releases.

J. The Georgia Environmental Protection Division (GAEPD) is the designated authority responsible for overseeing water quality standards in Georgia under the Clean Water Act. Under the 11th Circuit Court of Appeals decision in 2011, USACE must assure water for Metro Atlanta. This decision has been interpreted to include both water quality flows and water supply flows. USACE currently operates to maintain a minimum flow of 750 cubic feet per second (cfs) at Peachtree Creek for water quality control and 277 mgd for water supply. GAEPD requested that the minimum flow at Peachtree Creek be reduced to 650 cfs during drought periods. In response to that request, USACE investigated reducing the minimum flow value to 650 cfs from November through April. USACE conducted an environmental assessment in 2008 and concluded that reducing the minimum flow requirement at Peachtree Creek to 650 cfs during that period would not have significant adverse effects on water quality. Over the past decade, USACE has reduced the minimum flow seasonally at Peachtree Creek several times. Monitoring data is available from GAEPD during those periods. The State of Georgia has the responsibility for establishing and regulating water quality standards and should conduct any further analysis that might be required. NEPA requires that USACE capture the impacts to the human environment of any change from the NAA. USACE captured the impacts from the change to a seasonally varying flow at Peachtree Creek.

   Additional information regarding impacts to dissolved oxygen and other water quality parameters also is included in the final EIS. GAEPD has indicated its intention to ensure that water quality standards are met at all flows based on revisions in its 2013 triennial review, as stated in the EIS (GAEPD 2014).

   Congress intended and authorized the ACF Basin to be a regulated system; to this end, it authorized the construction of multipurpose USACE reservoirs for the authorized purposes of flood control, navigation, hydropower, recreation, water quality, water supply, and fish and wildlife conservation. USACE makes continuous releases from the Buford, West Point, and Jim Woodruff projects for water quality control and to support aquatic conditions for fish and wildlife and endangered species in the basin. Those constant releases were designed to be made through hydropower generators (house units); the other releases from the reservoirs were designed to be made through peaking generation units for hydropower production. Attempts at a natural flow regime or run of the river operations as suggested by NPS would nullify the flood control and hydropower authorization and increase the likelihood of downstream flooding throughout the system.

interagency workgroup could help identify and validate an appropriate flow regime through CRNRA, and provide valuable information that could be incorporated into the DEIS and subsequent Record of Decision.

- The DEIS does not evaluate a range of alternatives that consider how the Buford Dam can be operated in a way that that more closely mimics natural flow regimes through the park. Seasonal changes should be considered and appropriate science needs to be provided to support actions identified in the PAA. We recommend that consideration of a more natural flow regime be included and believe there is opportunity to work together on an interagency basis to establish a more sustainable flow regime that balances the missions of the agencies involved.

Water Quality

- Water releases from Buford Dam play an important role in supporting water quality within CRNRA for a number of parameters, including temperature, dissolved oxygen, bacterial levels, and turbidity. Any reduction, even seasonally, of the minimum flow of 750 cfs at Peachtree Creek should clearly and credibly evaluate the effects on water quality within CRNRA. As noted in background material provided by the USACE, Buford Dam has historically been managed to release base flows of up to 1500 cfs to meet water supply needs and downstream water quality standards. If dam operations are modified to accommodate lower base flows, water quality within CRNRA would likely deteriorate due to the reduction in the positive influence of clean water released from Buford Dam. This information is not provided in the DEIS.

- Currently, over half of the 48-mile CRNRA is 303d-listed for not meeting fecal coliform standards under the state designation as a recreational water body. A U.S. Geological Survey (USGS) study in 1995-96 showed that the density of fecal coliform bacteria, the recognized indicator bacteria in Georgia, regularly exceeded the U.S. Environmental Protection Agency guidelines for recreational waters. Because of the large number of people who use the river for water-based recreation and the historically high levels of indicator bacteria in the Chattahoochee River, the USGS, in partnership with several federal, state, and local agencies, began the BacteriALERT monitoring program in October 2000. The BacteriALERT program has documented widespread variability in water quality within the Chattahoochee River. Bacterial spikes occur during rain events and during peak power generation discharges from the Buford Dam. In 2015, instances of high *E. Coli* estimates occurred during 15 weeks at Paces Ferry Road and 7 weeks at Medlock Bridge Road (USGS 2016). These results highlight the importance of a thorough analysis of the impacts of releases in protection of water quality in CRNRA, which are lacking in the DEIS.

- Georgia's Environmental Protection Division has used historic flow regimes to model the river's capacity to assimilate wastewater discharges. Lower baseline releases should be evaluated for the potential negative effects of wastewater discharges on water quality within CRNRA. Since past studies on the assimilative capacity of the river would be invalidated by changes to the flow regime, the DEIS should clearly evaluate water quality impacts due to wastewater discharges.

K

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K. The GAEPD is the designated authority responsible for overseeing water quality standards in Georgia under the Clean Water Act. Under the 11th Circuit Court of Appeals decision in 2011, USACE must assure water for Metro Atlanta. This decision has been interpreted to include both water quality flows and water supply flows. USACE currently operates to maintain a minimum flow of 750 cfs at Peachtree Creek for water quality control and 277 mgd for water sup-ply. GAEPD requested that the minimum flow at Peachtree Creek be reduced to 650 cfs during drought periods. In response to this request, USACE investigated reducing the minimum flow value to 650 cfs from November through April. USACE conducted an environmental assessment in 2008 and concluded that reducing the minimum flow requirement at Peachtree Creek to 650 cfs during that period would not have significant adverse effects on water quality. Over the past decade, USACE has reduced the minimum flow seasonally at Peachtree Creek several times. Monitoring data is available from GAEPD during those periods. The State of Georgia has the responsibility for establishing and regulating water quality standards and should conduct any further analysis that might be required. NEPA requires that USACE capture the impacts to the human environment of any change from the NAA. USACE captured any impacts from the change to a season-varying flow at Peachtree Creek.
Additional information regarding impacts to dissolved oxygen and other water quality parameters is included in the final EIS. GAEPD has indicated its intension to ensure that water quality standards are met at all flows based on revisions in their 2013 triennial review (GAEPD 2014).

- The segment of the Chattahoochee River below Buford Dam is classified as a secondary trout stream. The state water quality standard for Dissolved Oxygen (DO) is a minimum daily average of 6.0 mg/l and an instantaneous minimum of 5.0 mg/l. The Georgia Department of Natural Resources operates a trout hatchery a few miles downstream of the dam and regularly monitors DO levels in the tailrace. They have found that in the fall during periods of low/minimum flows, DO levels have been below 5.0 mg/l for extended periods of time and have fallen and remained below 3.0 mg/l at times. These low levels of DO negatively impact the health of fish and other aquatic organisms, which causes secondary impacts on recreational users and local economies. According to the DEIS, implementation of the PAA will adversely affect DO in the river. The NPS recommends that the effects of implementing the PAA be considered for DO and appropriately mitigated.

Ecology

- Neither modeling results nor data related to impacts within the park are included in the DEIS that allows the NPS to determine if the actions identified in the PAA will have a negative impact on the resources and values of the CRNRA. The NPS requests that modeling results of an appropriate scale be provided for the areas that reside within the CRNRA to support the conclusions outlined in the DEIS.

- The DEIS fails to adequately describe existing conditions at CRNRA. Baseline conditions on current impacts on water quality, fish and aquatic species, recreation, or safety caused by ongoing dam operations are included. Specific information or data is not provided regarding existing water quality impairments, existing fisheries data, and recreational information including any existing socioeconomic or current safety data. Therefore, the DEIS fails to provide an adequate assessment of the impacts of the PAA and does not establish measurable impacts to determine whether the impacts are significant or not. Additionally, the DEIS does not include enough detail in the analysis of cumulative impacts to determine how the PAA relates to ongoing or future actions affecting the park.

L

- The DEIS states that adverse impacts to water quality, water quantity, and fish and aquatic species can be anticipated under the PAA. The DEIS defines "slightly adverse impacts" as those that are perceptible and measureable. However, how these impacts will be perceived and to what degree they can be measured is not provided. The document also indicates that below Buford Dam, the impacts to fish and aquatic resources will result in "adverse impacts," although that duration is not well defined. The DEIS also fails to identify or suggest any measures that could eliminate or mitigate these adverse impacts. The NPS recommends that adverse impacts for this and other resource topics be described in a way that allows an understanding of what the impacts will be, how the impacts will affect park resources and values, and how the impacts relate to the current baseline conditions of the park. Based on this detail, the USACE should identify and suggest mitigation measures that would significantly reduce or eliminate adverse impacts.

- Table 2.5-1, Page 2-197 and in Section 2.5.3.1.3, lines 37-39, page 2-200: Please note that brown trout (*Salmo trutta*) found within the park are not stocked and the river supports a naturally reproducing population. There is also an isolated population of shoal bass

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L. The effects to flow conditions of the Chattahoochee River National Recreation Area are discussed in section 6.1.1.2 of the EIS and the effects of those flow conditions on land use for each alternative is discussed in section 6.3. The streamflow conditions are based on HEC-ResSim outputs over the modeled period of record. Appendix E (the HEC-ResSim Modeling Report) presents further information on model assumptions and other applicable information on the HEC-ResSim model for the ACF Basin. Additional analyses are provided section 6.4 of the final EIS to address comments received during the draft EIS comment period regarding effects ono fish and wildlife resources.

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(*Micropterus cataractae*), a species endemic to the greater Chattahoochee basin, in the lower reaches of Big Creek. We recommend correcting this information in the DEIS.

- Section 6.4.3.3.3: This section suggests that the PAA will have a beneficial effect on shoal bass recruitment. This seems to be a sweeping statement regarding a newly described species of which reproduction and life history remains an ongoing endeavor of science. Before such a broad statement can be made, additional location-specific analysis should be conducted. For example, the isolated shoal bass population in Big Creek is currently being studied. The degree to which this population uses the main stem of the Chattahoochee is currently unknown.

- The Chattahoochee River supports many fish species, including both rainbow and brown trout. Past scientific studies examined the effects of varying flow regimes on fish species. Some studies suggest that extreme flow rates are detrimental to fish (Porta, 2006) (Peterson and Craven, 2007), while others identified optimal flows as being between 1000 - 1500 cfs (Nestler, 1986), and others suggest that current conditions suggest that certain fish species are at risk of extinction due to low flows (Sammons and Maceina, 2009). Flow rates identified in the PAA are 650-750 cfs, which will have a negative impact on the fishery in the recreation area. The area between Buford and Morgan Falls dams is a significant fishery within CRNRA. The Georgia Department of Natural Resources estimates approximately 90,000 annual fishing hours occur on this area of the Chattahoochee River, which contributes substantially to the local economy. Impacts of the PAA need to be better understood and mitigated for in the DEIS.

- Flow rates play an important role in supporting the river ecosystem within CRNRA for a number of parameters, including temperature, dissolved oxygen, bacterial levels, and turbidity. With the current target minimum flow of 750 cfs at Peachtree Creek being abandoned and a proposed reduction to 650 cfs, there could be significant effects on water quality from the number and capacity of wastewater treatment plants operating within the boundaries of park. Four wastewater facilities currently exist. These plants have used historic flow regimes to model the assimilation of wastewater discharge into the river. If a baseline release level is lowered, there could be an immediate change in the impact of wastewater on water quality in the river, and past studies on the assimilative capacity of the river would be invalidated. These permits would likely need to be updated and mitigated for, which would be a cost factor that should be addressed in the socio-economic impacts of the PAA.

- The NPS maintains a "no net loss" policy for wetlands. Although the DEIS does discuss wetlands associated with Bull Sluice Lake, it makes no mention of the effects to wetlands within CRNRA. The NPS recommends including additional information and analysis of how lowering minimum flows will affect functions and processes for wetlands within CRNRA (i.e., Bull Sluice Lake, riparian wetlands, wetlands associated with tributary deltas, etc.). The impacts should be described in sufficient detail that allows an understanding of what the impacts will be, how the impacts will affect wetlands, how the impacts relate to current baseline conditions of the park, and what mitigation measures are identified that eliminate or reduce identified wetland impacts and to what degree these impacts are reduced.

Recreation

- Chapter 2, page 2-74 and 75, Section 2.1.1.2.4.5 *Recreation,* lines 38, 39 and 40: This section states "The CRNRA was established in 1978, about 20 years after Buford Dam construction was completed. The operation of Buford Dam to meet authorized project purposes is generally compatible with recreational uses of the river and adjacent lands in the CRNRA". The NPS does not agree with this assessment and requests that additional information be provided to support this statement.

- Table 2.4-2: The CRNRA acreage is listed at 714 acres. This statement is incorrect and should be corrected. The park currently manages 6,548 acres within an authorized boundary of 10,000 acres.

- Chapter 2, page 2-235, Section 2.6.6, line32-33: The CRNRA receives over 3.2 million visitors a year with over 1 million of those recreating on the Chattahoochee River itself.

- Evidence suggests that recreation and navigational uses of the river benefit from moderate and more consistent flows. A Recreation Flow Preference Report completed by CH2M Hill (2000), found the preferred recreation flows for wade/float fishing, rowing, and power boating is between 1000 – 1200 cfs. Nestler (1986) identified optimal canoeing conditions for all user levels as occurring between 1250 cfs – 7000 cfs. Both of these studies provide strong support for base level flows above 1000 cfs as being crucial to support the recreational uses envisioned by Congress when the CRNRA was established. The NPS recommends that any preferred alternative include a sustainable flow regime that meets these flow rates through the park and accounts for seasonal variation. As stated earlier, the flow rate identified in the PAA should mimic a more natural hydrograph through the park.

M

Geology

- The results of abrupt and dramatic changes in water levels as dictated by hydropower generation have resulted in severe bank erosion and collapse; not only along the main stem of the Chattahoochee River, but within tributary confluences as well. The DEIS fails to evaluate the geomorphologic impact of frequent peak discharges, with particular emphasis on the accelerated erosion of river and tributary banks. It is important to quantify the expected loss of stream banks in order to accurately analyze the environmental, social, and economic effects of accelerated erosion. This information should be included in the DEIS.

N

Culture and History

- The CRNRA contains cultural resources such as historic structures and archeological sites that are impacted by water releases from Buford Dam. For example, the Ivy Mill ruins in Roswell dates back to the 1830's and are on the National Register of Historic Places. Ivy Mill is prone to flooding during protracted high water releases from Buford dam. In addition, a number of archaeological sites occur adjacent to the Chattahoochee River and its tributaries. These archaeological sites are at high risk of damage and/or loss from accelerated erosion caused by the fluctuating releases from Buford Dam. These cultural resources could be better protected by reducing the causes of significant erosion. The NPS recommends that the DEIS evaluate ways that water releases can be managed to reduce peaking (i.e., ramping up to discharges of 10,000 cfs) in order to generate maximum revenue,

O

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M. The Buford Dam provides a well-regulated flow through the NPS area year-round, allowing for fishing, water-based recreation, swimming, picnicking, and other recreational activities. Additional information has been included in section 6 of the final EIS regarding the benefits to recreation in the NPS area from the presence and operation of Buford Dam. Errors in numbers also have been revised and corrected in the final EIS. The studies cited by the NPS appear to have been conducted after Congress authorized the NPS area for recreation and do not appear to have been included in the information presented to Congress for the authorization for the recreation area. This information, however, is included in the final EIS.
Regarding a natural flow regime, Congress intended and authorized the ACF Basin to be a regulated system. Accordingly, it authorized the construction of multipurpose USACE reservoirs for the purposes of flood control (flood risk management), navigation, hydropower, recreation, water quality, water supply, and fish and wildlife conservation. USACE makes continuous releases from the Buford, West Point, and Jim Woodruff projects for water quality control and to support aquatic conditions for fish and wildlife and endangered species in the basin. Those constant releases were designed to be made through hydropower generators (house units); the other releases from the reservoir were designed to be made through peaking generation units for hydropower production.

N. The Chattahoochee River National Recreation Area was established in the 1970s, several decades after the Buford project's authorization and construction as a peaking hydropower plant. The NAA reflects what currently is occurring in the system. NAA operations are detailed in the affected environment section of the final EIS. USACE has reexamined that section to determine the amount of erosion currently occurring and the potential increase in bank erosion that could be caused by the PAA.

O. USACE coordinated with the state historic preservation office regarding historical and cultural resources throughout the ACF Basin. The impacts to these resources as a result of implementing the PAA were captured and discussed in the final EIS

and suggests that USACE consider implementing a more sustainable, science based approached to achieving a flow regime that meets the mission needs of the USACE, NPS, and the Southeastern Power Administration (SEPA).

Economic

- Based on the 2014 SEPA Annual Report, total revenue from the Jim Woodruff System, of which Buford Dam is 1 of 9 USACE projects, generated $11 million in Fiscal Year 2014. Of this amount, $10.9 million was derived from the sale of 222,255 megawatt-hours of energy. As a matter of comparison, CRNRA generated over $128 million in visitor spending during 2014 with a total economic impact of over $167 million. When comparing economic benefits, protection of CRNRA and more specifically, its river resources, potentially has a far greater economic impact and benefit to the region, and thereby deserves protection. As stated earlier, the NPS recommends that peaking releases be gradually phased in order to achieve peak power pricing. We believe this could be done without a loss of energy production, but not without a reduced financial benefit from hydropower. A comparison of the cost-benefit of Buford Dam power generation and the economic benefit of CRNRA should be included and analyzed in the DEIS.

P

Citations

CH2M Hill. 2000. Recreation Flow Preference Report, Chattahoochee River National Recreation Area. Prepared for the National Park Service, Atlanta, Georgia.

National Park Service. 2013. Chattahoochee River National Recreation Area Values of Special Significance Workshop Report. U.S. Department of the Interior, Chattahoochee River National Recreation Area, Georgia.

Nestler, J.M., et al. 1986. Effects of flow alterations on trout, angling, and recreation in the Chattahoochee River between Buford Dam and Peachtree Creek. Technical Report E-86-10, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Peterson, J.T. and S. W. Craven. 2007. The development of a quantitative decision models for evaluating the effects of river regulation and water use on native fishes in the Chattahoochee River National Recreation Area. Report to the National Park Service, Atlanta, Georgia.

Porta, M.J .. 2006. Effects of Environmental Variation on Conservation-Stocking Success of an Endemic Black Bass Species in the Chattahoochee River, Georgia. Thesis. Frostburg State University.

Sammons, S.M. and Maceina M.J. 2009. Conservation status of shoal bass in Alabama: distribution, abundance, stocking efficiency, and possible effects of sympatric congeneric black bass in selected tributaries of the Chattahoochee River, Alabama. Alabama Division of Wildlife and Freshwater Fisheries. Montgomery, AL.

Southeastern Power Administration. Annual Report 2014. Elberton GA.

Response to ACF138 – National Park Service

P. Economic impacts to the NPS area as a result of the PAA to the extent that they were quantifiable with existing data are included in sections 2 and 6 of the final EIS. The update to WCMs, however, is not a study. The Buford peaking generation is an existing federal project. Therefore, its continued peaking generation does not need to be justified by a benefit-to-cost ratio.

USGS Georgia Water Science Center: Chattahoochee River BacteriAlert. U.S. Geological Survey. Web. 26 Jan. 2016.

Response to ACF139 – ACFS

From: ACF Stakeholders Administrator <admin@acfstakeholders.org>
Sent: Thursday, January 28, 2016 11:51 AM
To: ACF-WCM
Cc: 'Betty Webb'
Subject: [EXTERNAL] ACF Stakeholders, Inc ACF Master Water Control Manual Update Comments
Attachments: ACF Stakeholders USACE WCM EIS Comment Cover Letter.pdf; ACFS Sustainable Water Management Plan - For Release.pdf

Please find attached comment letter and referenced material on behalf of ACF Stakeholders, Inc related to the ACF Master Water Control Manual Update.

Response to ACF139 – ACFS

October 26, 2015

Colonel Jon J. Chytka
Commander
U.S. Army Corps of Engineers
Mobile District, Attn: PD-EI (ACF-DEIS)
P.O. Box 2288
Mobile, AL 36628

Working together to share a common resource.

Re: Apalachicola-Chattahoochee-Flint Basin Draft Water Control Manual and EIS Comments

Colonel Chytka:

ACF Stakeholders, Inc. (ACFS) formally submits the comments contained in this letter, as well as the enclosed Sustainable Water Management Plan, in response to the October 2, 2015, Notice of Availability of the Draft Environmental Impact Statement for the update of the Apalachicola-Chattahoochee-Flint (ACF) Basin Water Control Master Manual (Master Manual).

ACFS is a diverse group of individuals, corporations, and non-profit organizations throughout Alabama, Florida, and Georgia that represent the water resource related interests within the ACF Basin.

ACFS believes we must act with common purpose to manage the shared resources in the ACF Basin sustainably. It is in this vein that five years ago, ACFS undertook development of a Sustainable Water Management Plan (SWMP). Hydrologic modeling of the ACF Basin and hydrodynamic modeling of Apalachicola Bay were utilized to support development of the Plan. Our modelers used RES-SIM and a model developed by the Georgia Water Resources Institute (GWRI) called ACF-DSS to simulate the river and reservoir response under different hydrologic, development, and management scenarios. The Basin flow model was tailored to provide outputs to enable results to be compared to the stakeholder developed performance metrics for the main stem flows to the extent possible with limited funding and time available. GWRI also conducted hydrodynamic modeling of Apalachicola Bay to investigate the effects of variable river discharge on Bay salinity. Atkins Global then utilized the outputs of the hydrodynamic model to help ACFS compare different water management scenarios. Insights gained from the model runs allowed ACFS to develop the recommendations contained in the SWMP.

A complete list of recommendations is contained in Chapters 6 and 7 of the enclosed SWMP. The recommendations are organized into the following themes:

- Achieve Sustainable Use and Return
- Improve Water Storage and Control Operations
- Target Dry and Drought Years
- Advance Scientific and Technical Knowledge for Future Decisions
- Strengthen Basin Coordination

A

These five themes do not stand alone. Implementation of the recommendations from each individual theme, accomplished in concert with recommendations contained in all other themes, is needed for Basin sustainability. Ensuring reliable and sustainable water resources requires a combination of actions that, taken together, achieve greater benefits for the Basin. As noted in our SWMP, the Stakeholders believe

B

A. The plan submitted by the ACF Stakeholders was considered and is discussed in section 4.1.4 of the final EIS.

B. Thank you for your input and recommendations. The plan submitted by the ACF Stakeholders was considered and is discussed in section 4.1.4 of the final EIS.

Response to ACF139 – ACFS

that an adaptive management policy that incorporates frequent monitoring, assessments and updating must be a significant component in the policy and control operations for our Basin. A consensus recommendation from ACFS as to the "starting point" for such an adaptive management strategy, as well as the "scientific and technical knowledge" needed to support adaptive management, is discussed in Chapters 5 and 6 of the SWMP. We appreciate your consideration of our comments.

Should you have any questions or need additional information concerning our recommendations, please contact Mark Masters, ACFS Executive Manager. He can be reached at 229-894-0168 or admin@acfstakeholders.org.

Sincerely,

Betty Webb, Chair
ACF Stakeholders, Inc.

Enclosure

C

Sustainable Water Management Plan

Working together to share a common resource.

MAY 13, 2015

Approved for general release by the Governing Board of ACF Stakeholders, Inc.

Response to ACF139 – ACFS

C. Refer to the Sustainable Water Management Plan (SWMP) recommendations and implementation actions pertinent to USACE in Chapters 6 and 7 (pages 62 – 95). Response to comments begins on page 71 of the SWMP.

Acknowledgements

This Sustainable Water Management Plan would not have been possible without the commitment and contributions of many individuals and the financial contributions of generous donors. ACFS members volunteered their time, expertise, and talents over the past five years.

ACFS Governing Board members recognize Brad Currey for leading the fundraising effort, the multiple organizations and individuals who contributed to the development of this Plan and the current and former individual ACFS members whose efforts laid the groundwork for success.

Special thanks to Brad Moore, Chair, and Gordon Rogers, Vice Chair, of the Technical Oversight and Coordination Work Group (TOCWG) who helped guide the development of this Plan.

Special thanks also go to Mark Masters for keeping ACFS on a steady course.

Executive Committee Members (May 2015)

Apalachicola	*Flint*	*Middle Chattahoochee*	*Upper Chattahoochee*
Dan Tonsmeire	Woody Hicks	Billy Turner	Jim McClatchey
Bill McCartney	Charles Stripling	Greg Elmore	Wilton Rooks

TOCWG Members (May 2015)

Apalachicola	*Flint*	*Middle Chattahoochee*	*Upper Chattahoochee*
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Chad Taylor	Gordon Rogers	Brad Moore	Danny Johnson
Dave McLain	Woody Hicks	James Emery	Jerri Russell

ACFS Governing Board Members (May 2015)

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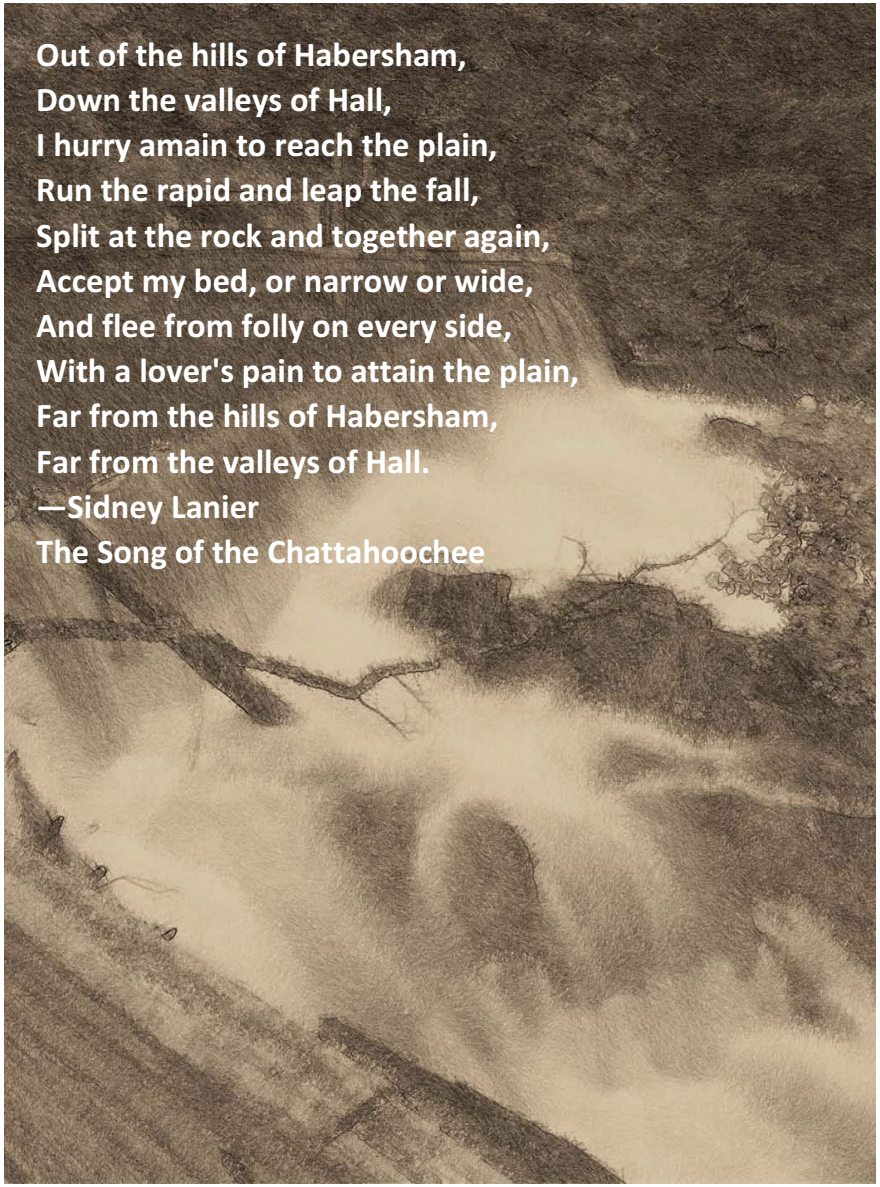

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FIGURES

Acronyms and Definitions

7Q10 – A low stream flow that statistically occurs for seven consecutive days once every ten years. One of the measures used for setting effluent limits and minimum releases from impoundments.

ACF Basin – The watershed of the Apalachicola, Chattahoochee and Flint Rivers, their tributaries and the Apalachicola Bay.

ACFS – ACF Stakeholders, Inc., a non-profit corporation with a Governing Board of 56 stakeholder members representing interests from all areas of the Basin extending through Alabama, Florida and Georgia.

ANERR – Apalachicola National Estuarine Research Reserve

AWEP – Agricultural Water Enhancement Program

AWWA – American Water Works Association

Basin – The watershed of the Apalachicola, Chattahoochee and Flint Rivers, their tributaries and the Apalachicola Bay.

BI – Basin Inflows

DSS – Decision Support System

BMP(s) – Best Management Practice(s)

CFS – Cubic feet per second. Measurement typically used for river flows (1 CFS = 0.646 MGD)

EPA – Environmental Protection Agency

ESA – Endangered Species Act

FEMA – Federal Emergency Management Agency

FERC – Federal Energy Regulatory Commission

GAEPD – Georgia Environmental Protection Division

GEFA – Georgia Environmental Finance Authority

GWRI – Georgia Water Resources Institute

IBT – Interbasin Transfer

IOP – Interim Operation Plan

IWA – International Water Association

LAS – Land Application System

MSL – Mean sea level, datum for the measure of topographic elevation

MGD – Million Gallons per Day (1 MGD = 1.547 CFS)

MNGWPD – Metropolitan North Georgia Water Planning District

NEPA – National Environmental Policy Act

NIDIS – National Integrated Drought Information System

NOAA – National Oceanographic and Atmospheric Administration

NPDES – National Pollutant Discharge Elimination System

NPS – National Park Service

NRCS – Natural Resource Conservation Service

NWFWMD – Northwest Florida Water Management District

PDSI – Palmer Drought Severity Index

PHDI – Palmer Hydrologic Drought Index

PPM - Parts Per Million

RES-SIM – The U.S. Army Corps of Engineers Hydrologic Engineering Center's Reservoir System Simulation is a computer program used to simulate reservoir facilities, operations, releases and reservoir levels.

RIOP – Revised Interim Operating Plan

QA/QC – Quality Assurance/Quality Control

SWMP – ACFS' Sustainable Water Management Plan

TMDL – Total Maximum Daily Load. TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards.

TUC – The University Collaborative (a collaborative group of universities established by ACFS)

UIF – Unimpaired Flow. Unimpaired flows (UIFs) are a modeled data set that adds an estimate of human uses to historical stream flows in an effort to calculate what the natural flows would have been absent human influences. UIFs are commonly used in water resources assessments to evaluate the effects of alternative development and management plans on a comparative basis. Specific numeric values should not be assumed to be accurate on an absolute basis, due to modeling errors.

USGS – United States Geological Survey

USACE – United States Army Corps of Engineers

USDA – United States Department of Agriculture

USFWS – United States Fish and Wildlife Service

WCM – Water Control Manual

WMA – Water Management Alternative

Executive Summary

The ACFS Vision

The waters of the Apalachicola, Chattahoochee and Flint (ACF) Rivers and the Apalachicola Bay bind and divide both the geography of Alabama, Florida, and Georgia and the users of the water.

This Basin is a water-rich region, yet one where attention to sustainable water resource management has become imperative. Although most needs are met in normal and wet years, the limits of the Basin's capacity to support competing water needs are being experienced under dry and drought conditions and more often in some locations and for some water uses. Improvements to the current conditions in the Basin are possible, however; and planning for dry and drought years is critical.

The economic well-being of the southern U.S. and the sustainability of the waters in the ACF Basin are intertwined. However, decades of conflict have set the stage for deeply held positions over the future of the region. The regulatory arena is in flux, and litigation casts a shadow of uncertainty. It is time to turn this around.

The ACFS mission is to change the operation and management of the ACF Basin to achieve equitable and viable solutions among stakeholders that balance economic, ecological, and social values and ensure that the entire ACF Basin is a sustainable resource for current and future generations.

ACF Stakeholders, Inc. (ACFS) urges the citizens of this Basin to focus on that which unites, rather than divides, us. We can and must act with common purpose to manage our shared water resources sustainably. Water efficiency and conservation measures, creative alternatives to water control operations, predictive drought management, investment in scientific knowledge for future decisions, and transboundary coordination and cooperation offer real ways to improve environmental, social and economic conditions in this Basin.

ACFS began in August 2008 as a small group of people who live and work in the Basin. Soon after, ACF Stakeholders, Inc. was operating as a non-profit corporation with a Governing Board of 56 stakeholder members representing interests from all areas of the Basin extending through Alabama, Florida and Georgia. The ACFS mission is to change the operation and management of the ACF Basin to achieve equitable and viable solutions among stakeholders that balance economic, ecological, and social values and ensure that the entire ACF Basin is a sustainable resource for current and future generations.

ACFS members have sought to develop a mutual understanding of the diverse interests in the Basin, to explore how the Basin operates, and to reach consensus on recommendations that, taken as a whole, would improve conditions in the Basin. This Sustainable Water Management Plan (SWMP) incorporates what ACFS has learned so far about positive choices that can start now. It also lays the groundwork for the studies and dialogue needed to enhance water management in the future.

The Audience

This SWMP recommends actions for the U.S. Army Corps of Engineers (USACE), other federal agencies, and the states of Alabama, Florida and Georgia, along with all public and private water users in the Basin.

USACE has a large influence in how water moves within the ACF Basin. The Master Water Control Manual, last updated in 1958, guides decisions regarding the ACF Basin operations for the five federal reservoir projects on the Chattahoochee and at its confluence with the Flint. A Revised Interim Operation Plan (RIOP) also sets release rules that specifically provide minimum flow guidance to the USACE based on Basin Inflow, time of year, and the amount of storage available in the federal projects to meet the various authorized purposes. While the USACE' influence is large, it is limited to the operation of federal reservoirs. The States of Alabama, Florida and Georgia also play critical roles in water resources management throughout the Basin. State permitting programs for wastewater discharges and water withdrawals affect most water users. Alabama, Florida and Georgia each have similar wastewater discharge permitting programs delegated from the federal Environmental Protection Agency (EPA). Water withdrawal permitting and regulation varies between the states.

Development of the Plan

ACFS worked closely with state and federal agencies to compile the best available water withdrawals and returns data in the ACF Basin and used this in modeling current and possible future conditions. ACFS also documented needs and concerns for different stakeholder groups and geographic areas of the Basin and incorporated these concerns in the Plan by developing performance metrics, linked in Appendix A, which were used in the modeling to assess Water Management Alternatives (WMAs).

Modelers used RES-SIM, developed by the USACE, and a river and reservoir model developed by the Georgia Water Resources Institute (GWRI) at the Georgia Institute of Technology called the ACF-DSS model to simulate the river and reservoir response under different hydrologic, development, and management scenarios. The Basin flow model was tailored to provide the outputs to enable results to be compared to the stakeholder developed performance metrics for the main stem flows. GWRI also conducted hydrodynamic modeling of the Apalachicola Bay to investigate the effects of river discharge on bay salinity. Atkins Global then utilized the outputs of the hydrodynamic model to help ACFS compare different water management alternatives on the Eastern oyster.

ACFS also worked with a consortium of universities in the region to assess transboundary water resource management institutions in the United States and around the world and to consider options appropriate for the ACFS Basin.

Recommendations

People benefit from healthy aquatic ecosystems, drawing on water resources for many needs. Sustainable water management requires attention to the challenges of maintaining a healthy aquatic ecosystem, particularly as the capacity of the system to meet all stakeholder needs becomes strained. ACFS members have concluded that improvements in meeting stakeholder needs and concerns in the ACF Basin, as compared to current conditions, are possible and that planning for dry and drought years has become critical.

The plan recommendations are grouped into five themes:

- Achieve Sustainable Use and Return
- Improve Water Storage and Control Operations
- Target Dry and Drought Years
- Advance Scientific and Technical Knowledge for Future Decisions
- Strengthen Basin Coordination

Ensuring reliable and sustainable water resources requires a combination of actions that, taken together, achieve greater benefits for the amount of water used. ACFS recommends that all water users contribute to this by identifying and implementing conservation measures and more efficient use of water. Recognizing that "what gets measured gets done," tracking and reporting progress over time also must be a priority.

Given the complexity of water resource management under changing conditions, it is important to make adaptive management – or learning about what actions achieve desired results and why, and making adjustments based on lessons learned – a priority. Adaptive management does not mean creating additional conditions of uncertainty for stakeholders who depend on the results of management decisions. Rather, adaptive management, by definition, is a structured iterative process of robust decision-making in the face of uncertainty, with the aim of reducing uncertainty over time via system monitoring. Water managers in the ACF Basin are urged to track the results of their efforts, assess whether those results accomplish what Basin stakeholders are seeking to achieve, and consult stakeholders when considering changes in management decisions based on new information.

Ultimately, actions that result in increased water returns generally benefit all users of the system. While setting quantitative conservation and efficiency targets will require more analysis, in part because circumstances vary, this plan identifies numerous opportunities for more sustainable use and return, and ACFS urges each water user, and managers of water users, to take action.

Modeling done for this plan also demonstrates how changes in the storage and operations of the current federal reservoirs, in combination with water efficiency and conservation measures, could simultaneously improve the instream flows that sustain aquatic habitats in the Basin, Apalachicola Bay and

other instream uses, while providing for both current and future consumptive uses. These operational changes also result in improvements to instream uses in the Basin and the Bay at current consumptive uses.

Thus, based on the modeling conducted for this Plan, ACFS recommends that USACE adopt a policy of adaptive management in the revisions to the Water Control Manual, with the involvement of the states and stakeholders in the ACF Basin, implementing the following suite of actions taken together as a starting point to improve operations of the federal reservoirs on the Chattahoochee River:

- Raise the winter pool rule curve at West Point Lake from 628 ft to 632.5 ft.
- Define new zones to coincide with the USACE reservoir recreational impact zones and then only release water from an upstream reservoir when the downstream reservoir is in a lower zone.
- Adjust hydropower requirements to achieve more flexibility.
- Provide two pulsed water releases to achieve 9,000 cfs at Chattahoochee, FL for two weeks each, one in May and one in July.[1]

It is important to consider this suite of actions as a package. Using a banking analogy, some of the changes add to system "savings" and others "spend" those savings on priorities for restoring instream flows and levels and for consumptive uses during droughts. Thus, each is interdependent on the other to achieve the intended results.

The sustainability of the package of recommendations, particularly under drought conditions, is based on technical modeling performed by ACFS consultants. Their adoption was predicated on three conditions: 1) the system storage during drier years is not worse than storage associated with conditions experienced currently under drier years, 2) instream flows during drier years do not become target flows in normal and wetter years, and 3) the assumption (not modeled) that flood control will not be adversely affected. The sustainability of the package of recommendations and consistency with these conditions should be confirmed by the Corps prior to implementation.

This adaptive management approach also should include a regular assessment of the effects of this package of operational rules and adjustments, as frequently as advances in science and the results of data collection to monitor desired outcomes warrant, but no less often than every five years and more often in the first years after this approach is adopted. Such assessments should consider increases and decreases in water use over time and should seek to achieve conjunctive instream flow benefits to the environment, navigation, hydropower, and recreation through pulse magnitudes and durations under dry conditions

[1] Pulses were modeled as 9000 cfs flows at Chattahoochee, FL (not as an additional 9,000 cfs) – as well as 14,000 cfs – and only during periods when flows fell below 9,000 cfs (thus not reducing flows to 9,000 cfs when flows otherwise would have been higher).

consistent with the conditions identified above. USACE should utilize the expertise of one or more of its centers of excellence in implementing this adaptive management approach to draw on lessons learned across the country and to enable lessons learned in this Basin to be shared more widely.

In addition, ACFS recommends that USACE study and implement, if feasible, an increase in the rule curve at Lake Lanier by two feet. Over time, this would add about 78,000 acre-feet of storage capacity to the system, or about seven percent of the original Lanier active storage, which is needed now during drought years and will be needed as conditions and needs change in the future. This SWMP does not address allocation of this capacity; however, ACFS members concur that the increased storage resulting from operational changes should be shared equitably and used in a manner that relieves the adverse impacts of drought conditions.

Further, ACFS also recommends that USACE add a flow control node in the WCM at Columbus. This recommendation is contingent on the implementation of the adaptive management recommendation package above and is not a standalone recommendation. The minimum flows for the proposed node should be developed to retain an approximation of the historical flow frequency while still achieving the benefits to upstream and downstream interests sought in that adaptive management recommendation package.

Clearly, the amount of water available to meet stakeholder interests is less during droughts. Given the adverse impacts in the Basin of recent droughts, ACFS urges local, state and federal decision makers to establish consistent drought management plans that trigger incremental and equitable actions as early as possible to avoid the more dramatic reductions that might be necessary if actions are taken later. Water users and water managers need to be more proactive and less reactive if we are going to manage the system sustainably.

Specifically, ACFS urges USACE to utilize predictive drought indicators in the revised Water Control Manual. Various combinations of predictive drought indicators can be used that allow operation decisions to be made in drought years that enhance system flows while still preserving adequate reservoir storage during the drought. As a starting point for discussion, drought management planning discussions should consider:

- Triggers based on drought conditions (antecedent inflow, areal precipitation, and soil moisture), streamflows, time of year, and remaining storage in federal reservoirs.
- The RIOP uses composite storage alone as a drought trigger. USACE should also consider the state of the Basin (how dry or wet) in triggering drought operations. A drought index should be developed to guide the decision based on the predictive drought indicators selected (e.g. antecedent Mean Areal Precipitation and/or soil moisture). In addition, USACE should use regional sub-basin drought indicators (e.g. for the Apalachicola River, Apalachicola Bay, the middle Chattahoochee or the Flint) to consider changes in operations rather than waiting for designation of drought in the entire ACF Basin.

Developing a common, scientifically valid understanding of the ACF Basin is an essential foundation for sustainable water resource management in this Basin. In the development of this SWMP, ACFS members gained a better understanding of the Basin, including the Apalachicola Bay, but also encountered challenging gaps in scientific and technical knowledge both for near term decisions and for future adaptive management. ACFS members recommend that investments in knowledge about the Basin be made in the following areas, with suggested specific studies listed in Chapter 6:

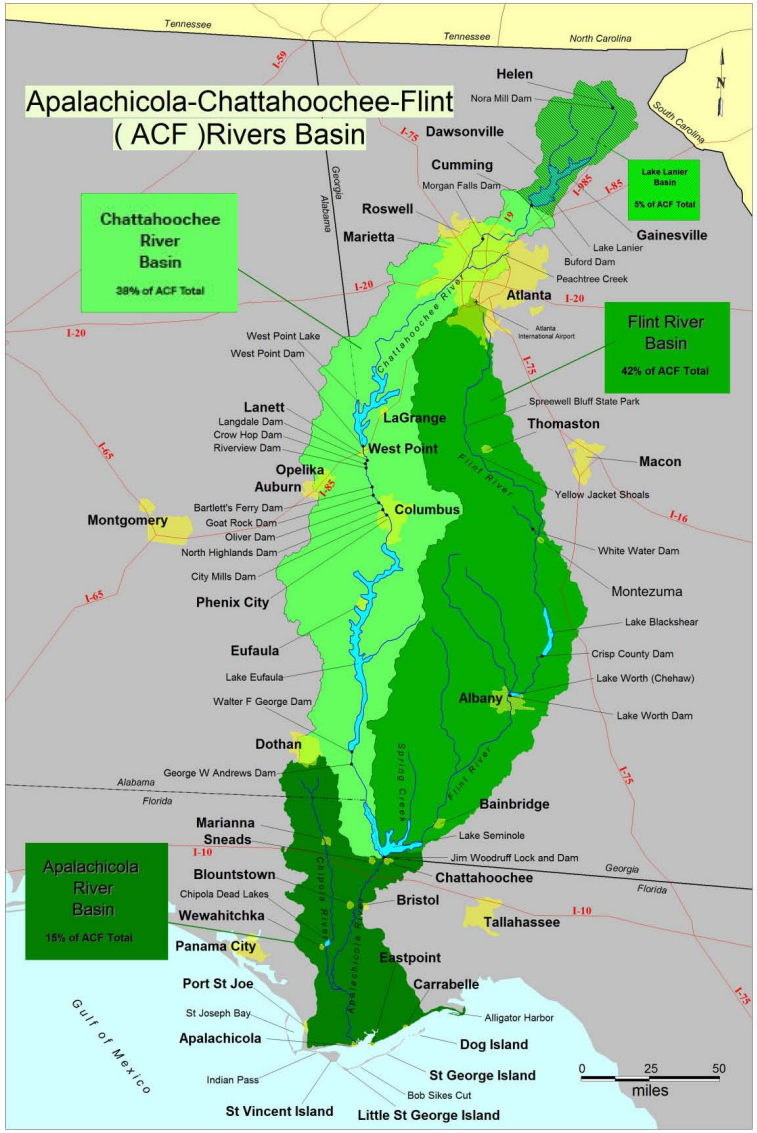
- Environmental and ecological studies
- Climate variability studies
- Shared real-time water use/return/storage/flow information
- Improvements in modeling

Finally, collaborative efforts are essential to finding sustainable water management solutions. We must sustain and enhance communication among stakeholders. Further, ACFS urges the states of Alabama, Florida and Georgia to participate in efforts to establish a transboundary water management institution for the ACF Basin. Such efforts could begin with a transitional entity, designed to provide a forum for discussing how best to structure a permanent transboundary water management institution. ACFS stands ready to assist in the formation of such a transitional process or entity.

These recommendations are detailed in the Plan, and ACFS urges decision makers and citizens in this Basin to take action to implement them.

Basin stakeholders' perspectives are presented in Appendix B. Stakeholders have described in their own words the interests and concerns that they are seeking to achieve. The consensus of ACFS is that stakeholders' diverse perspectives are important to understand. However, the perspectives expressed in Appendix B are not a consensus statement of ACFS as a whole nor are they necessarily a consensus of all the members associated with the various sub-basin or stakeholder interest group perspectives represented.

Figure 1-1 ACF Basin Map (Credit: Roy Ogles)



CHAPTER 1.

Introduction: A Vision of Sustainable Water Resources Management in the ACF Basin

Loggers made a remarkable discovery in the Apalachicola River in May 2006. The loggers found a 50-foot long canoe carved from a single cypress tree. This 19th century canoe was unique in shape and designed for the transport of cargo like cotton and honey. It was designed and built by hand for the task at hand.

If this Sustainable Water Management Plan were an object, it would be a hand-hewn canoe. ACF Stakeholders has carved this Plan from countless conversations since 2009.

ACFS members actively sought a mutual understanding of the diverse interests in the Basin, explored current science together, and reached consensus on recommendations that, taken as a whole, would improve conditions in the Basin for all. This Plan navigated the rapids and obstacles throughout the Basin with the support of engineering and environmental consultants, a professional facilitator, an executive manager, and tens of thousands of volunteer hours and other in-kind contributions from stakeholders around the Basin. In making a commitment to consensus solutions, ACFS members hope to divert the history of litigation in the Basin to a more collaborative approach to water management.

The ACFS mission is to change the operation and management of the ACF Basin to achieve equitable and viable solutions among stakeholders that balance economic, ecological, and social values and ensure that the entire ACF Basin is a sustainable resource for current and future generations.

The Challenges

The rivers of the ACF Basin bind and divide the geography of Alabama, Florida and Georgia and the users of this water.

The economic well-being of the southern U.S. and the sustainability of the waters in the ACF Basin are intertwined. However, decades of conflict have set the stage for deeply held positions over the future of the region. The three states have been in the courts and in various stages of negotiation to arrive at a water sharing agreement with no success. The regulatory arena is in flux, and litigation casts a shadow of uncertainty. It is time to turn this around.

The mission and the challenge taken on by ACFS has been and is to change the operation and management of the ACF Basin to achieve equitable solutions among stakeholders that balance economic, ecological, and social values and viable solutions that ensure that the entire ACF Basin is a sustainable resource for current and future generations.

Key interests of water resource users in the Basin now and in the future include:

- Sustainable water supply for Basin population.
- Dependable navigation on the congressionally authorized inland waterway system.
- Dependable hydropower production at the reservoirs congressionally authorized for hydropower.
- Attractive recreation and ecotourism opportunities and lake levels.
- Increased agricultural productivity.
- Shellfish and marine productivity in the Apalachicola Bay estuary and Eastern Gulf of Mexico.
- Instream flows or other measures that maintain ecological flows for floodplains, rivers, tributaries, and estuaries.
- Water quality and natural ecological functions of the entire ACF Basin.
- Freshwater availability for additional investment in both industry and power generation facilities in the Basin.

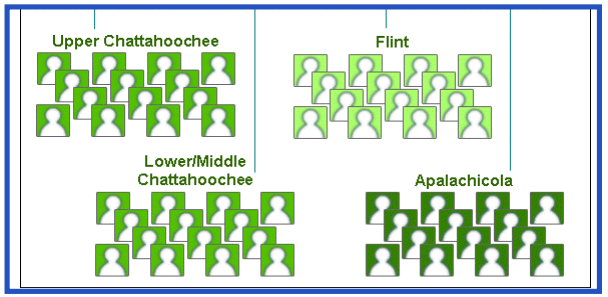
Because these interests had not been resolved, a group of individuals developed a new approach.

ACF Stakeholders - A New Approach

The ACFS began as a small group of people who live and work in the Basin. They met in August 2008 to discuss whether users in the Basin could act cooperatively and regionally; leaving the meeting with hope and the beginnings of a new partnership.

The stakeholders received encouragement to form a stakeholder group from USACE and in early 2009, 35 volunteers from throughout the ACF Basin, representing municipal, industrial, environmental, recreational, navigation and agricultural interests met as a steering committee to develop a mission statement, goals, an executive committee and workgroups. ACFS is a non-profit corporation with a Governing Board of 56 stakeholder members representing interests from all areas of the Basin extending through Alabama, Florida and Georgia as shown in Figure 1-2.

Figure 1-2 ACFS Organizational Structure

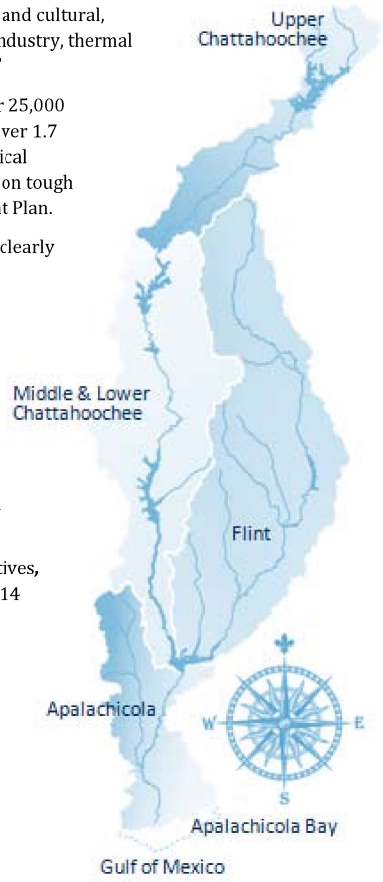


56 Members – 14 Interest Representatives per sub-basin

The Governing Board Members represent 14 different interest groups: water supply, farm and urban agriculture, recreation, local government, water quality, industry and manufacturing, navigation, historic and cultural, hydropower, environmental and conservation, seafood industry, thermal power, business and economic development and "other."

Since its founding, ACFS members have volunteered over 25,000 hours, established numerous active committees, raised over 1.7 million dollars of private financial support, funded technical analyses to inform its deliberations, engaged in dialogue on tough issues, and produced this Sustainable Water Management Plan.

Consensus didn't come easily. Differences of views were clearly expressed, but people also listened and learned. They established performance metrics and directed technical analyses to answer shared questions about current conditions and the effects of water management alternatives. They evaluated alternatives that achieved gains against stakeholder performance metrics, compromised, recognized the importance of adaptive management over the long term, and affirmed the imperative need to continue the dialogue on unresolved issues supported by additional research and information collection.



The Plan is intended to achieve six major planning objectives, which ACFS adopted early in the process integrating the 14 categories of stakeholder interests:

- Ensure and/or maintain adequate water supplies for public supply/municipal uses including wastewater assimilation needs of current and projected future populations.
- Maintain existing and promote future water availability and access for water dependent industries, power generation and recreational interests.
- Promote the optimization of the use of water for agricultural irrigation including: types of irrigation technology, selection of crops, sustainable and resource-based permitting, and water withdrawal monitoring.
- Determine the nature and extent of commercial navigation that the ACF Basin can effectively support.
- Protect the natural systems and ecology of the ACF Basin by defining and implementing desired flow regimes and lake levels, water quality enhancements to maintain a healthy natural system and support a productive aquatic ecosystem in the Basin and the estuary.
- Create and support relationships with local governmental institutions and other public bodies within the ACF Basin to promote sustainability of water resources and to address concerns associated with the historical and cultural resources of the Basin as they relate to the management of the Basin's water resources.

ACFS established the following two major initiatives to meet these objectives -- a Sustainable Water Management Plan to develop solutions that will meet the region's needs now and in the future and a Transboundary Water Management Institutional Options Study.

Black & Veatch, the Georgia Water Resources Institute at the Georgia Institute of Technology, and Atkins Global provided technical support for the SWMP. Mark Masters and Gail Bingham provided management and facilitation support.

Transboundary Water Management Institutional Options Study

Implementation of sustainable water management solutions will require the coordination and cooperation of many in the private and public sectors and among the three states through which these three rivers flow. Competing interests are understandable, but the absence of a mechanism to work through differences must not continue. Thus, ACFS members have felt it important to investigate institutional models from other multi-state or transboundary river systems that might offer useful concepts and strategies for effective multi-state planning and management of the ACF Basin.

ACFS engaged the services of a partnership of universities in the area (University of Georgia, University of Florida, Auburn University, Albany State University and Florida State University), known as The University Collaborative (TUC), to describe existing and emerging institutional models.

This effort produced a report describing transboundary water institutions in the United States and internationally, an analysis of what functions are filled in the ACFS Basin and where any gaps may exist, and a set of recommendations for the future. The key findings are incorporated in the Basin Coordination theme of the Recommendations Chapter.

CHAPTER 2.

Plan Purpose, Methodology and Organization

Purpose

Sustainable management of water resources in the ACF Basin is needed, particularly during times of drought. The purpose of this Plan is to contribute to widespread public understanding of the ACF Basin, define the water quantity and water quality needs of the Basin stakeholders, evaluate alternative water management scenarios, improve conditions throughout the Basin, and urge action on Basin-wide management recommendations.

This is the first effort by a diverse consortium of grassroots stakeholders in the three states to arrive at a technically sound solution to the problem. It is specifically recognized that this Plan will need to be adapted in the future as additional information becomes known and conditions in the Basin change.

Sustainability means different things to different people. ACFS defined sustainable water management as the conditions when "the full array of benefits associated with water is met to an acceptable level for the needs of society, while maintaining the ecological integrity of its water and land resources now and in the future."

Process and Methodology

In 2011, ACFS selected Black & Veatch, in cooperation with the Georgia Water Resources Institute (GWRI) at Georgia Tech, and Atkins Global to develop the Plan.

ACFS members provided input, debated, and discussed all Plan inputs, including hydrologic model input data, performance metrics, technical memorandums and modeling results. Complex technical tasks were aligned with consensus building needs. This allowed ACFS members to actively engage in the process, test different options, and explore trade-offs.

The approach and methods used are summarized below. The tasks described were interrelated, so were not necessarily conducted sequentially.

Performance Metrics and Water Management Alternatives

ACFS stakeholders identified water management alternatives to consider and defined performance metrics for evaluating those alternatives, with assistance from the technical experts. These were submitted by stakeholders and discussed in sub-basin caucus meetings.

Data and Information Gathering

Technical experts from Atkins Global, Black & Veatch, and GWRI discussed information availability and data/science needs and gaps with the stakeholders.

These experts produced memos, reports and presentations on the following topics:

- available literature on natural resources of interest for environmental flows *[Atkins Global]*
- relationship of flows to inundation levels *[Atkins Global]*
- water demands and returns *[Black & Veatch]*
- review of unimpaired flow data sets *[GWRI]*
- assessment of conditions in Apalachicola Bay *[Atkins Global]*

Environmental Literature Review

Atkins Global identified and reviewed 185 GIS data sources and 233 literature sources. A list of these sources was developed and annotated. The results of this literature review were used to assess whether existing data are adequate for completion of an instream flow assessment. Critical data gaps were identified.

Relationships of Flows to Inundation Levels for Environmental Flow Performance Measures for the Apalachicola River

Atkins Global evaluated existing information and data pertaining to flows, elevations, biological resources, and hydrodynamic and statistical models to identify potential approaches stakeholders might choose to use in developing their environmental flow performance metrics for the ACF rivers. A habitat-based approach was used and water levels necessary to inundate floodplain habitat were identified. This approach also recognized the importance of seasonal variations in the system, i.e., lower flows for the drier seasons of the year and higher flows during the wet season.

A conceptual approach was selected given information and funding constraints. For the Apalachicola River, this conceptual approach was based primarily on the work of: 1) Light et al. 1998 who examined acres of connected aquatic and floodplain habitat as a function of flow for the Apalachicola River at the Chattahoochee gage, and 2) the USFWS biological opinion prepared for USACE on the RIOP (2012)[2] regarding whether proposed USACE RIOP release schedules from Jim Woodruff Dam would jeopardize threatened and endangered mussels under the specified range of low flow conditions. The Biological Opinion also included some conservation recommendations that USACE can implement at its discretion. Flow data for the Apalachicola River was based on a 70-year UIF CMA (unimpaired flow, centered moving average) simulated data set developed by USACE and, thus, represented the monthly means and medians for a long period of time. Mean and/or median values were

[2] U.S. Fish and Wildlife Service. 2012. Biological opinion on the U.S. Army Corps of Mobile District, Revised Interim Operating Plan for Jim Woodruff Dam and the Associated Releases to the Apalachicola River. Prepared by USFWS Panama City Field Office, FL. 166 pp.

not assumed to be met every year, just as the 70-year monthly mean and median for the UIF will not be met every year.

Water Demands and Returns

Consumptive use is the difference between the total amount of water withdrawn from a defined hydrologic system and the total amount of measured withdrawn water that is returned to the same hydrologic system within a timely period. Consumptive use in the ACF Basin was important to understand for purposes of modeling potential alternatives for sustainable water management.

Current water demands estimates from existing sources were used as inputs to the ACF-DSS and RES-SIM models for the analysis of existing conditions in the Basin. Percentage increases and decreases from current demands also were used in the modeling to assess future conditions.

Water demands were compiled from information provided by each of the three states. In some cases, simplifying assumptions regarding growth were made to generate a consistent water demand projection data set. Uncertainties within the demands data set were presented.

Water demands compiled were broadly categorized into five major water-using sectors (agriculture, industrial, municipal, thermoelectric, and stream-aquifer or surface water impacts), three states (Alabama, Florida, and Georgia), three basins (Apalachicola, Chattahoochee, and Flint), and fourteen nodes. Agricultural uses also are included in the stream-aquifer impacts category.

In Alabama, Florida and Georgia, small water users falling below certain permit or reporting thresholds are not required to report their actual water use and an estimate for this use is not available. The magnitude of this non-reported water use is believed to be small relative to overall Basin demand; therefore, it is not considered an impediment to the ACFS' planning level analysis goals.

Net evaporation was not included in the tabulation of water demands for this task. However, loss due to net evaporation was included, and is an integral part of the surface water analysis modeling tools used by GWRI. Net evaporative losses are addressed specifically in the baseline modeling.

The data set prepared for use in the surface water models was based upon monthly average withdrawal and return values. A monthly forecast allows for the data set to exhibit an intra-annual pattern and, thus, captures seasonal variations in water demand. Historic monthly average data were used to generate a representative historic monthly intra-annual pattern and applied to future demand conditions. Intra-annual patterns are not the same for all water using sectors or for all geographies. Therefore, a unique intra-annual pattern was developed by node and by water using sector based upon historic data.

Ultimately, the net water use, or consumptive demand, was utilized as an input into the ACF-DSS model nodes. Treated wastewater that is land applied or managed in onsite septic systems was not considered a direct surface water return and assumed to be 100% consumptive for modeling purposes.

USACE used a similar methodology. However, differences between data used for this Plan and USACE data are observed for several reasons, including: different time scales, differences with regard to geographic assignment of withdrawals/returns to nodes, variability in how non-reporting agriculture use may be estimated, what the states had previously reported or provided to the USACE, political/litigation aspects, and others. While these differences (aside from drought versus non-drought) are known to be present, the comparison does provide an order of magnitude comparison that is useful. It is recognized that the ACFS current demand compilation does not reflect the highest consumptive demand that might be exerted on the ACF Basin during a drought condition.

Review of Unimpaired Flow Data Sets

Unimpaired flows (UIFs) represent historical streamflows that have been processed to remove as many human influences as possible. UIFs for the ACF River Basin have been developed by the USACE Mobile District in cooperation with the three states. The Georgia Environmental Protection Division (Georgia EPD) also has a UIF model. These UIFs have been used in various past planning and management investigations.

GWRI assessed existing UIF data series in two main phases: (1) a detailed, reach-by-reach analysis of all local data used in the UIF derivation process, and (2) a basin-wide evaluation of the cumulative UIF uncertainty impacts.

After reviewing this analysis and learning about the UIF data set being used by USACE and the states, ACFS considered undertaking the effort to improve the UIF dataset. However, given the time and monetary commitment to support this effort, and the time needed to coordinate with the three states and USACE for agreement on the improvements, ACFS decided to proceed with current conditions modeling runs using existing UIFs for trends and relative comparisons rather than for absolute numbers. ACFS also initiated development of a recommendation to the states and USACE regarding improvements to the UIF dataset, continuing on-going dialog with natural resource agencies regarding the environmental flows performance metrics relative to the concerns about errors in the UIF dataset, and including a discussion of the UIF uncertainties and how the ACFS made its decision to proceed using the current dataset.

Modeling

GWRI modeled flows and levels at 23 locations in the Basin and modeled salinity at nine locations in the Apalachicola Bay, first assessing baseline conditions and subsequently comparing a series of Water Management Alternatives against stakeholder performance metrics. In addition, GWRI produced modeled salinities in the Apalachicola Bay for selected water management alternatives

using a hydrodynamic model. Atkins Global then used these salinity outputs to develop an analysis of potential effects of various WMAs on bay bottom salinities and oyster habitat in Apalachicola Bay.

GWRI used RES-SIM, developed by the USACE, and a GWRI-developed river and reservoir model called the ACF-DSS model, to simulate the river and reservoir response under different hydrologic, development, and management scenarios. The Basin flow model was tailored to provide the outputs to enable results to be compared to the stakeholder developed performance metrics for the main stem flows. Tributary flows were accounted for, but results were calculated and presented at specific nodes on the main stem rivers.

ACFS reviewed modeling results at each step.

The following outlines the approach to the analyses. Findings are summarized in Chapter 5.

Baseline Conditions Modeling

Baseline comparisons of the effects of evaporation, reservoir management, and consumptive uses were made using four progressive modeling scenarios. These were as follows:

- **Unimpaired flows.** This scenario characterized the system response under UIFs, without reservoirs, evaporation losses, or consumptive use.
- **Reservoir operation without active management.** This scenario assumed that all main-stem reservoirs exist and are operated in run-of-river mode with storage kept constant at the mid-point of the conservation zone.[3] No water demands are included in this scenario. Comparing scenarios one and two allowed analysis of the effects of evaporation from the reservoirs.
- **Reservoir operation with current management.** This scenario is similar to the second scenario, but with the reservoirs regulated according to the Revised Interim Operations Plan (RIOP) currently in effect. No water demands are included.
- **Existing conditions with current management, withdrawals, and returns**. This scenario is similar to the last scenario, but includes consumptive uses.

Water Management Alternative Modeling

The first round of WMA modeling incorporated as many stakeholder concerns as possible within the constraints of the current RIOP. Round-one modeling investigated the impacts of adjusting one variable at a time to provide a context as to the sensitivity of flows and levels in the system which included (basin terminology is discussed in more detail in Chapter 3):

- Consumptive use scenarios
- Interbasin transfer reduction
- Elimination of release ramp rates
- RIOP basin inflow definition
- Reservoir rule curve/storage
- Hydropower generation variation

ACFS recognized that stakeholder interests may not remain the same. In the future, the magnitude of stakeholder needs may change; ecosystem conditions may change; and improvements in science may inform stakeholders' understanding of the system. Thus, in the modeling, results were compared for all years and for dry years to help assess drier possible future conditions. In addition, the group considered changes in consumptive use that could occur in the future, both increases and decreases. Rather than seeking to agree on any particular consumptive use projection, stakeholders used the modeling to assess the capacity of the system to respond to a range of possible future growth or reductions and consider their recommendations for sustainable water management accordingly.

The second round of WMA modeling was designed to allow for more substantive changes to the ACF regulation rules while maintaining their functional structure. This modeling effort was focused on defining operating rules that balance the competing needs and demands in the system in different ways. This was done by comparing operational strategies under a range of water allocation priorities, including the following:

- Navigation.
- Consumptive use changes under different environmental flow regimes.
- Environmental flows.[4]

[3] High, low and mid-point runs were performed, with the mid-point runs chosen for the analyses.

[4] GWRI used flow guidelines outlined in 2013 USFWS letter to USACE, Re: ACF Water Control Manual Updates—Request for Information (November 13, 2013). These recommendations are supplemental to earlier recommendations USFWS submitted in 2010 and 2011, as described by USFWS: "The previous Planning Aid Letters (PALs; dated April 2, 1010, and March 1, 2011) and the draft FWCAR (dated June 17, 2011) identified resource values and issues in the basin, including rare species, and proposed changes, mitigation, or enhancement opportunities to minimize impacts and facilitate the Corps' National Environmental Policy Act (NEPA) analysis of the project. The comments in these documents still are applicable. We now are advising the Corps on the current WCM update. In our July 19, 2013, letter (enclosed), we (1) identified a revised reservoir operation alternative that would not result in excessive impacts to river flows or reservoir levels and (2) recommended that the Corps give it full consideration in their NEPA analyses. We followed up with a PAL that identified performance measures the Corps should use in NEPA evaluations of project effects on fish and wildlife resources and their habitat (August 29, 2013, enclosed)."

- Storage options under different environmental flow regimes.
- Hydropower changes under different environmental flow regimes.
- Combination changes of water uses and targets.

Round two modeling was conducted in two phases focusing on: (1) assessment and optimization of existing RIOP and reservoir rule curves, and (2) assessment of selected composite scenarios.

Round Two, Phase One focused on how changes to system operations could expand the benefits to all interests in the Basin. In other words, it attempted to answer the question of what is possible in the system and whether it is possible to expand the envelope of what it can do. This was accomplished through running a suite of scenarios that alternatively emphasized each of the following objectives: consumptive uses, lake levels, environmental flows, hydropower and navigation, translating them into the format used by USACE, and then demonstrating whether a scenario did a better job than current operational strategies by evaluating the new rule curves against ACFS stakeholder performance metrics using RES-SIM.

Round Two, Phase Two focused on composite scenarios that showed improvements to system performance over current conditions (i.e. they "expanded the envelope") along with drought storage requirements and release options, modeling this using both current consumptive uses and long-term planning estimates using a percentage increase and decrease from current demands. The analysis of drought storage requirements provided findings pertaining to minimum composite and individual reservoir storage buffers required to meet current and projected consumptive uses and minimum environmental flows during critical drought periods. Impacts of pulsed Woodruff release patterns on Apalachicola Bay salinity and reservoir storage during critical drought periods also were assessed. The value of selected rule adjustments then were modeled under current and future consumptive use estimates.

A final set of optimization runs were conducted combining selected elements of the round two analyses into three "portfolios," chosen by a consensus of the stakeholders, which are shown in Table 2-1. Portfolios were compared with and without pulses.

Table 2-1 Final Optimization Run Scenarios Modeled

Variable	Portfolio A	Portfolio B	Portfolio C
Consumptive Use	Current minus 30% (with adjustments on the Flint)*	Current	2050 minus 10% (with adjustments on the Flint)*
West Point Rule Curve Adjustment	Increase winter pool from 628 to 632.5 feet	Increase winter pool from 628 to 632.5 feet	Increase winter pool from 628 to 632.5 feet
Reservoir Coordination	Define new zones to coincide with the USACE reservoir recreational impact zones. Only release from upstream if downstream reservoir is in a lower zone.	Define new zones to coincide with the USACE reservoir recreational impact zones. Only release from upstream if downstream reservoir is in a lower zone.	Define new zones to coincide with the USACE reservoir recreational impact zones. Only release from upstream if downstream reservoir is in a lower zone.
Hydropower Adjustment	Adjusted rules	Adjusted rules	Adjusted rules
Navigation	Spring shoulder	Spring shoulder	Spring shoulder
2 feet addition to Lake Lanier	Yes	No	Yes
Pulses**	14,000 cfs pulse for two weeks in May and 9,000 cfs pulse for two weeks in July	9,000 cfs pulse for all of May OR 9,000 cfs pulse for two weeks in May and two weeks in July	9,000 cfs pulse for 2 weeks in May and 2 weeks in July

** Portfolio A uses the following consumptive use projections:*

- *Chattahoochee and Apalachicola Rivers: Current -30%*
- *Flint River (Griffin, Carsonville, Montezuma): Current, adjusted to reflect return of all current interbasin transfers and conversion of all LAS to direct discharges at 50% of permitted LAS capacity*
- *Flint River (Griffin and Carsonville) flows augmented by up to 6.2 cfs and 9.3 cfs respectively when flows fall below monthly 7Q10 during low flows. If the maximum Griffin augmentation amount is not used and Carsonville flow is below its monthly 7Q10, then flows can be added at Griffin to aid Carsonville up to 6.2 cfs total. Monthly 7Q10 based on unimpaired flow (UIF) data 1939-1974 provided by GWRI.*
- *Flint River (Albany and below): Current -15%*

Portfolio C uses the CU as Portfolio A, except Chattahoochee and Apalachicola Rivers use 2050 projections -10%

*** Pulses were modeled as 9000 cfs flows at Chattahoochee, FL (not as an additional 9,000 cfs) – as well as at 14,000 cfs – and only during periods when flows fell below 9,000 cfs (thus not reducing flows to 9,000 cfs when flows otherwise would have been higher).*

Predictive Drought Management

Predictive drought management approaches also were evaluated. Specifically, ACFS explored how triggers based on forecasted values could be used to anticipate drought conditions earlier, when more modest reductions in water use could be put in place so that deeper reductions or even catastrophic shortages would be avoided.

Drought storage requirements also were assessed, using data from April 1, 2007 through December 31, 2008. Current and future consumptive use scenarios

were run, with minimum release targets at Woodruff of 5,000, 5,500 and 6,000 cfs. The operational goal was to determine the minimum reservoir storage that would meet the consumptive uses and Woodruff release targets.

Bay Assessment

Salinity distributions were modeled throughout Apalachicola Bay using a hydrodynamic model developed by GWRI. Freshwater flows at the USGS Sumatra gage were also generated by GWRI using a watershed model; these flows were entered into the hydrodynamic model to evaluate the effect of differing upstream WMAs on salinity distributions throughout the Bay for the months of May through October.

Salinity distributions in the Bay under various WMAs were evaluated at five oyster regions in the Bay (see Figure 2.1) and at nine discrete stations located throughout the Bay (Figure 2.2). Daily salinity at oyster regions was calculated as the mean of the daily salinities of the number of model grid cells (each a discrete station) that represented a particular oyster region, as shown in Figure 2.1. Daily salinity at discrete stations was determined as the daily mean for each discrete grid cell. In both cases, only cells located on the Bay bottom were used to determine salinity (i.e., cells were not vertically averaged), since these cells would be the ones to which oysters would be exposed.

Figure 2-1 Location of Oyster Regions Evaluated in Apalachicola Bay

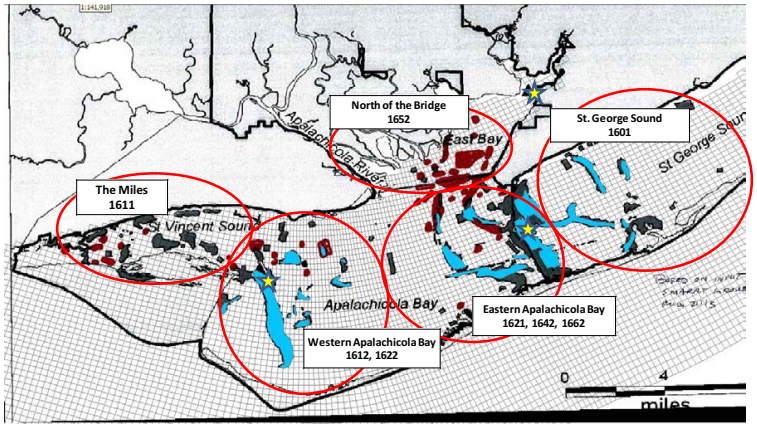
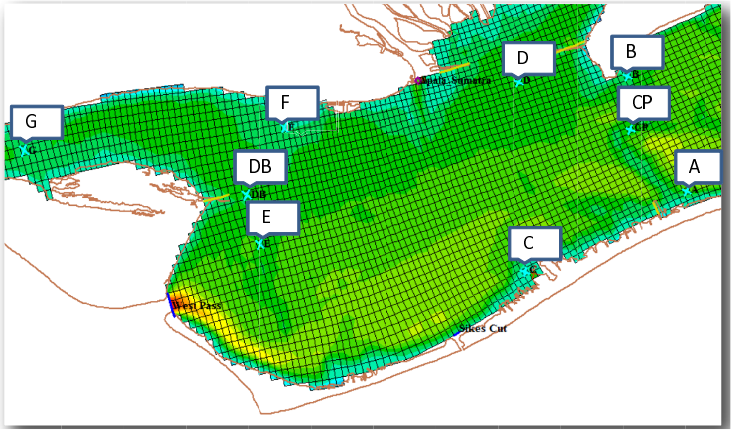


Figure 2-2 Location of Nine Discrete Stations Evaluated in Apalachicola Bay



Based on a literature review and discussions with researchers who have authored peer-reviewed studies of oysters, oyster predators/parasites, and/or oyster habitat, Atkins Global selected salinity ranges that may be desirable for oyster productivity. Model parameters were set in cooperation with GWRI with respect to results from WMA model runs used to evaluate WMAs and corresponding impacts to oyster bars (habitat). Finally, the degree to which modeled scenarios departed from the desirable or optimum salinity range (for oysters) in comparison to any other scenario was used to assess the relative merits of any one strategy against another.

Eight WMA scenarios were modeled using data from the period 1984 to 2008. These scenarios included the portfolios developed for the final optimization modeling runs described above as well as current management conditions and a model scenario using UIF flows.

CHAPTER 3.

Understanding the ACF Basin

ACF Basin

The Chattahoochee and Flint Rivers join at Lake Seminole on the Georgia-Florida state line to form the Apalachicola River. This ACF Basin extends from the Blue Ridge Mountains to the Gulf of Mexico at Apalachicola Bay with about 3/4 of the drainage Basin in Georgia and 1/8 each in Alabama and Florida. (See Figure 3.1 for Basin map.)

The Chattahoochee and Flint Rivers are distinct river systems, bound together at the confluence. The Flint River is nearly as long as the Chattahoochee River; however, it has only two main-stem reservoirs with limited ability to influence flow. In contrast, the Chattahoochee River has 14 main-stem dams with the ability to influence flow in the Basin. Over 300 miles of the Chattahoochee River are measured across reservoirs.

USACE operates five federal reservoir projects on the Chattahoochee River and its confluence with the Flint. Five Federal Energy Regulatory Commission (FERC) projects are licensed in the ACF Basin with seven small to medium-sized impoundments (Morgan Falls Dam, Lake Harding, Goat Rock Lake, Lake Oliver, North Highland Lake, Lake Blackshear and Lake Chehaw) as shown on Table 3-1.

Table 3-1 ACF Basin Main-Stem Dams

Project Name	Owner/State/ Year Initially Completed	Reservoir Size (Ac.)	Total Usable Storage (Ac-Ft.)	Power Capacity (kW)	Full Pool Lake Elevation (Ft.)
Buford Dam/Lake Lanier	COE / GA / 1957	38,542	1,087,600 [a]	125,000	1,071
Morgan Falls Dam	GPC / GA / 1903	580	2,240 [a]	16,800	866
West Point Dam and Lake	COE / GA / 1975	25,900	306,100 [a]	82,200	635
Langdale Dam	GPC / GA /1860	152	NA	1,040	548
Riverview Dam	GPC / GA / 1902	75	NA	480	531
Bartletts Ferry Dam	GPC / GA / 1926	5,850	57,000 [a]	173,000	521
Goat Rock Dam	GPC / GA / 1912	965	4,960 [a]	38,600	404
Oliver Dam	GPC / GA / 1959	2,280	6,080 [a]	60,000	337
North Highlands Dam	GPC / GA / 1900	131	935 [a]	29,600	269
City Mills Dam*	City Mills / GA / 1863	110	684 [b]	740	226
Eagle and Phenix Dam*	Consolidated Hydro / GA / 1834	NA	260 [b]	4,260	215
W. F. George Lock and Dam and Lake (Lake Eufaula)	COE / GA / 1963	45,180	244,400 [a]	130,000	190
George W. Andrews Lock and Dam and Lake	COE / GA / 1963	1,540	NA	None	102
Blackshear Dam and Lake	Crisp Co./ GA / 1930	8,700	144,000 [b]	13,000	237
Flint River Dam/Lake Chehaw	GPC / GA / 1920	1,400	NA	5,400	182
Jim Woodruff Lock and Dam/ Lake Seminole	COE / FL / 1954	37,500	NA	30,000	77

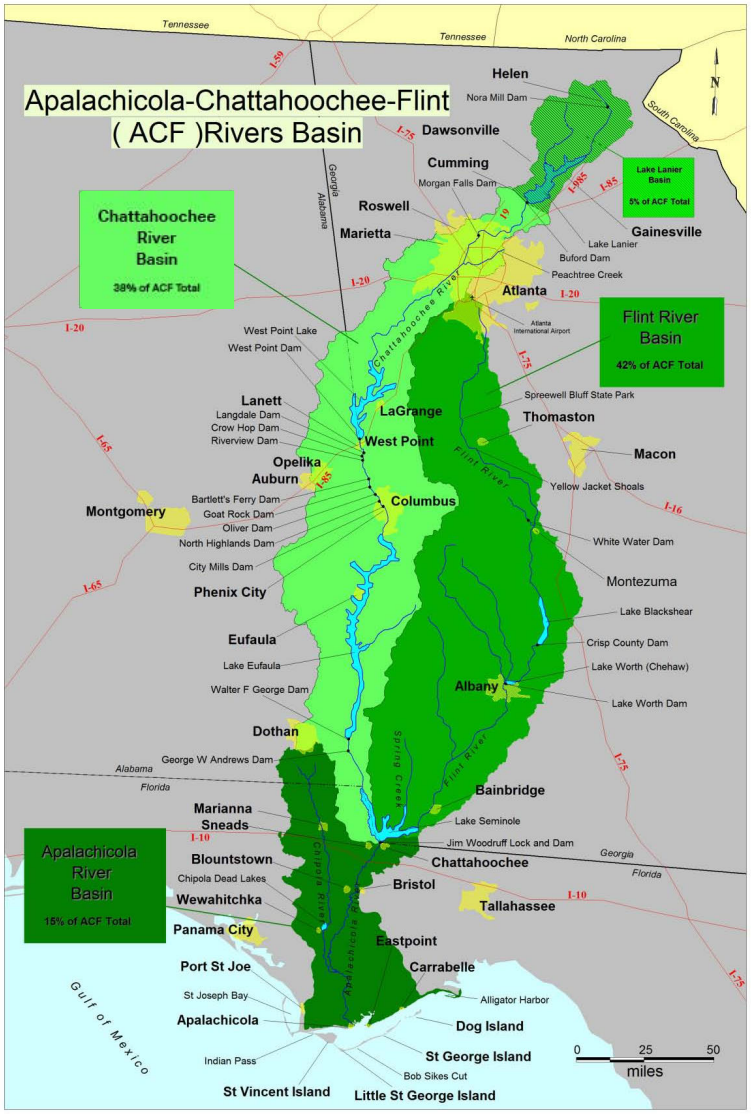
Legend: a=Conservation Storage; b=Total Storage

*Removed in 2013 to create habitat improvement and the whitewater course at Columbus, GA and Phenix City, AL.

Source: Adapted from the U. S. Army Corps of Engineers Final Scoping Report, Environmental Impact Statement, Update of the Water Control Manual for the Apalachicola-Chattahoochee-Flint River Basin, in Alabama, Florida, and Georgia.

The southern portion of the ACF Basin, south of the Fall Line, is underlain by Coastal Plain sand, gravel, and limestone aquifers. The Floridan aquifer, one of the most productive aquifers in the US, underlies a significant portion of the Basin in southwestern Georgia, southeastern Alabama, and parts of the Florida Panhandle. The streams and aquifers within the Coastal Plain region may be hydraulically connected such that groundwater and stream flow are exchanged. The direction and rate of water exchange is related to the geology and the head differential between the aquifers and streams. Where the groundwater head exceeds the stream head, groundwater is discharged into the stream. Aquifer withdrawals reduce groundwater elevations and can result in a reduction in the rate of groundwater discharge into many streams. During dry and drought periods, the hydraulic gradient may reverse and stream flow may be lost to the aquifer. In some parts of the lower ACF Basin, streams sometimes cease to flow as a result of climate and groundwater pumping.

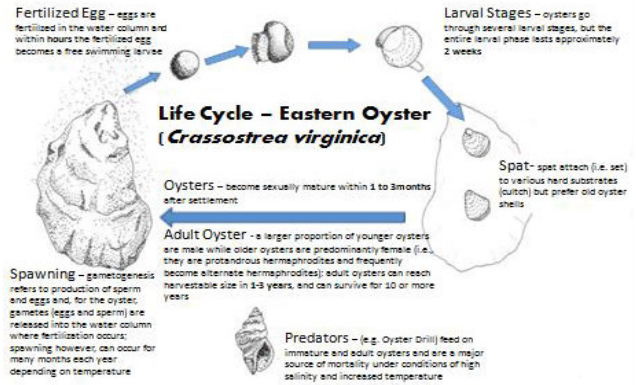
Figure 3-1 ACF Basin Map (Credit: Roy Ogles)



The Apalachicola River flows south for 106 miles through the Florida Panhandle into Apalachicola Bay, which discharges into the Gulf of Mexico. The Chipola River, Apalachicola River's largest tributary in Florida, drains one-half of the Apalachicola River Basin and has over 63 springs. The largest spring in the Chipola Basin is Blue Springs, also called Jackson Blue Spring.

The Apalachicola Bay and Estuary are an integral component of the ACF Basin; a fishery habitat for not only an historical oyster production industry, but also the other associated shrimp, crab and fin fish that spend part of their life-cycle in this habitat. The bay is an important nursery area for Gulf of Mexico commercial fish species as many spend a portion of their lives in the bay. Figure 3-2 illustrates the life cycle of the Eastern oyster which is vulnerable to the freshwater/salinity balance at different times during its life cycle (see performance metric on page 42).

Figure 3-2 Life Cycle of the Eastern Oyster



Instream Flows and Lake Levels

Instream flows and lake levels support navigation, recreation, hydropower, water quality and assimilative capacity, and habitat for aquatic dependent species in the ACF Basin.

Recreation on the federal reservoirs is closely tied to lake levels and directly impacts the economies of nearby communities. The reservoirs also provide for flood control and for storage of water that is released during dry years or times of year.

Instream flows also support recreation. Columbus has recently made significant modifications to their reach of the river to support a world-class whitewater

course. Minimum flows were considered to support this major economic driver for the area.

Although navigation is an authorized purpose of the ACF System, navigation availability up the Apalachicola River has deteriorated over the past 20 years. Preliminary assessment by USACE and others suggests that about 21,000 cfs at the Chattahoochee USGS gage is needed to provide a commercially navigable channel (9 ft. x 100 ft.) without dredging as long as minor snag maintenance is accomplished.[5] Some dredging, with limited structural modifications, will also increase channel availability with a flow of 16,000 cfs.[6]

Floodplains provide habitat for numerous, aquatic dependent species. For example, on the Apalachicola River, a reduction in flow during high flow season by a certain percentage would reduce the ability of crawfish to emerge from the burrows in the floodplain, spawn, and have a successful hatch of young. This has effects throughout the food chain for all the wildlife (birds, fish, mammals, and reptiles) that feed on crawfish and for humans that make part of their living harvesting and selling crawfish.

There are sections of the Flint River and its tributaries that currently experience flows equivalent to historical droughts even during moderately wet and wet years. In addition, there are sections that currently experience zero and near-zero flows during drought years, affecting water quality, recreation and recreational navigation, aquatic life, and private property uses.

There are also many sections of the Chattahoochee and two sections of the Flint that experience altered instream flow regimes and in some cases temperature regimes due to impoundments and releases from those impoundments. Some of these alterations have in fact established desirable public benefits, such as the coldwater trout fishery (rainbow and brown) in Metro Atlanta downstream of Buford Dam/Lake Lanier, perhaps the best urban trout fishery in North America. Other affects are undesirable, such as the extirpation of shoal bass (Micropterus cataractae) from large segments of the Chattahoochee. Blockage of historical spawning and other migrations of striped bass, Alabama shad, and Gulf sturgeon have occurred as a direct affect of dam placement. Other effects on aquatic habitats are less direct, and are related to reservoir operation and consumptive water uses enabled by the existence of the impoundments. For example, shoal bass spawning downstream of the Crisp County dam on the Flint is disrupted by large daily fluctuations in flow regime due to power generation; the attenuated spawning is mitigated by substantial investment in the stocking of shoal bass by the state wildlife agency. Recently, over two miles of shoals on the Chattahoochee at Columbus have been re-exposed due to removals of small dams, generating new opportunities for recreation, recreational navigation, and biological recovery.

[5] Verbal communications with Sam Hill (USACE) and Steve Leitman.
[6] Leitman, S, S. Graham, and C. Stover. An Evaluation of the Common Ground Between Environmental and Navigation Flows in the Apalachicola-Chattahoochee-Flint Basin. Report to Apalachicola Riverkeeper and Tri-Rivers Waterway Development Assoc. 2012.

Consumptive Water Use

Adequate flows and levels also support consumptive water uses.

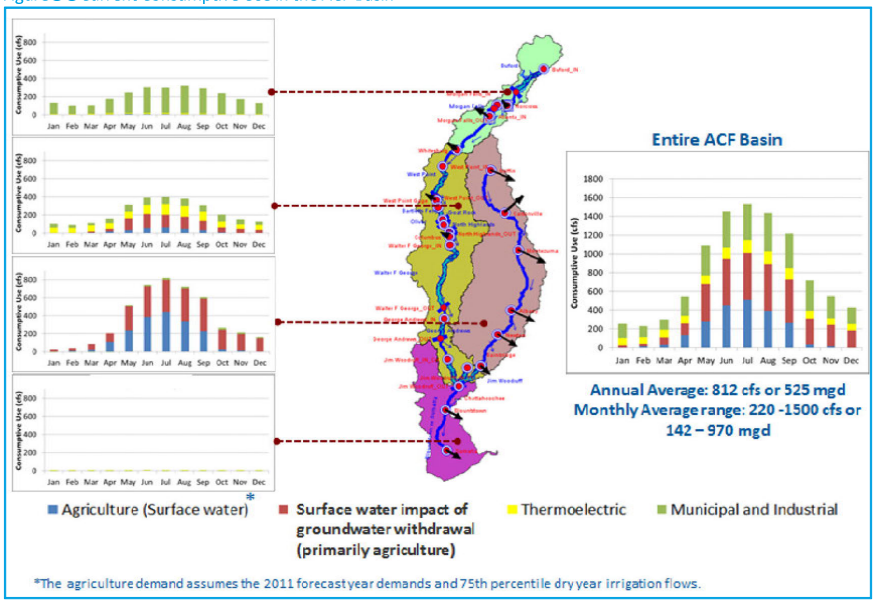
ACFS worked closely with state and federal agencies to compile the best available water withdrawals and returns data in the ACF Basin. Compiled water demands are broadly categorized into five major water-using sectors (agriculture, industrial, municipal, thermoelectric, and stream-aquifer impacts). While water use estimates for larger permitted users are generally well-defined, water use estimates for smaller withdrawals that fall below state permit thresholds are less well-defined.

For the development of the Plan, it was important to understand the amount of water that is returned to the hydrologic system after it is used. Consumptive use is the portion of the total amount of water withdrawn that is not returned to the original source and represents the net effect of water withdrawals and water returns. For the ACF Basin, the annual average consumptive use is 812 cfs, which varies from month to month and between wet, normal and dry years.

Consumptive use is not constant throughout the year, as is shown in Figure 3.3. The higher consumptive use, lower Basin inflow, and higher temperatures in the summer months combine to increase Basin water stress in the warmer seasons.

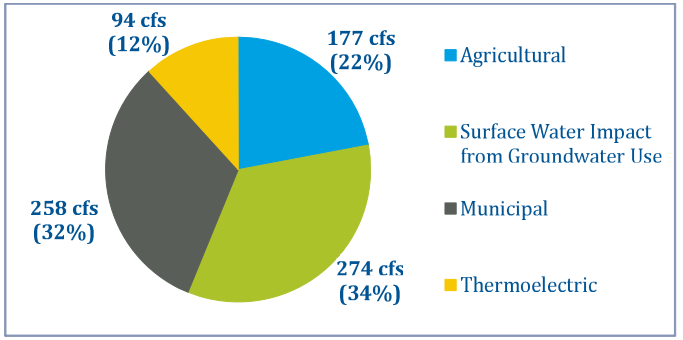
It is important to note, however, that in both the Flint and Chattahoochee portions of the system, water is stored in times of higher flow to meet water needs when flows are lower. This affects streamflow impacts in various ways. Some impacts occur at the time the water is stored, and other impacts occur based upon release prescriptions. Some, but not all, impacts occur when the water is withdrawn. As such, streamflow impacts do not necessarily coincide with the period in which consumptive use occurs, and it cannot be assumed that consumptive use in a given month reduces streamflow by the same amount.

Figure 3-3 Current Consumptive Use in the ACF Basin



Current consumptive water use demand is summarized in Figure 3-4 on an annual average basis. The surface water impact category in this Figure includes effects on flows from groundwater use from agriculture and other sources. The following subsections describe some water use sectors in the Basin. The estimates are presented as annual averages, but seasonal and annual variations are relevant to meeting stakeholder needs. The estimates also do not include all water interests, particularly instream uses such as environmental flows and recreational opportunities, since these are not generally considered consumptive uses.

Figure 3-4 Current Consumptive Demand on Surface Waters (values are in cfs expressed as a percentage on an annual average basis)



Agricultural Use

Agricultural water demands include irrigation for crop production and non-irrigation uses for livestock operations, nurseries, and golf courses. Demand projections are primarily composed of estimates based on aggregate irrigation application depths applied to acres under production. Water withdrawals for agricultural uses are assumed to be 100 percent consumptive; therefore, no returns data are estimated or projected. The combination of surface water withdrawals for agriculture and the estimated surface water impacts of agricultural groundwater withdrawals represents the largest water using sector in the ACF Basin.

Impact on Surface Water

For the southern portion of the Basin, estimates for current groundwater pumping impacts to surface water are also included in the input data for Georgia. Groundwater pumpage-induced reductions to stream flow occur because of geologic conditions in the southern portion of the Basin. The discharge of groundwater to stream flow and loss of stream flow to the aquifer, or "surface water impact" is dependent on multiple

"Water is personal, water is local, water is regional, water is statewide. Everybody has a different idea, a different approach, a different issue, a different concern. Water is the most personal issue we have."

—Susan Marks, Journalist and Author

variables including: stream dimensions, hydraulic conductivity of streambed materials, streambed thickness, stage of stream, hydraulic head in the aquifer, and groundwater pumping rates[7].

The data set available provides an estimate for stream-aquifer impacts from current groundwater withdrawals from individually permitted wells and from agricultural irrigation in Georgia. This data set reflects surface water impacts resulting from agricultural irrigation under dry year conditions ("75th percentile"). Surface water impact data sets for Alabama and Florida were not available.

Industrial Use

Industrial water use projections are highly dependent on assumed employment and/or production growth for the tri-state area. Industries require water for processes, sanitation, cooling, and other purposes, in addition to domestic (employee) water use. Water need is directly linked to production. Wastewater generation and returns by industries are tied to the process requirements specific to that industry.

Municipal Use

Municipal water and wastewater demands are generally associated with utilities possessing a water withdrawal permit for water use or a National Pollution Discharge Elimination System (NPDES) permit or reporting requirement for surface water returns. This water use sector includes residential and commercial water demand and demands of industries that are not separately permitted. Municipal land application facilities and septic systems have been assumed to be 100% consumptive.

Thermoelectric Use

Thermoelectric power generation requires water for cooling purposes. The amount of water consumed depends on the cooling technology as well as the power generation technology utilized.

Current Water Management

The ACF Basin functions as a complex, integrated system, and recent historic droughts have made more visible the variability of and stresses on the system.

[7] Torak, Lynn J., McDowell, Robin J., Ground-Water Resources of the Lower Apalachicola-Chattahoochee-Flint River Basin in Parts Of Alabama, Florida, and Georgia—Subarea 4 of the Apalachicola-Chattahoochee-Flint And Alabama- Coosa-Tallapoosa River Basins: USGS Open-File Report 95-321, United States Geological Survey, 1996.

Role of the U.S. Army Corps of Engineers

Water demands in the ACF Basin have changed since the construction of the reservoirs. USACE has attempted to meet changing and competing water uses by modifying how it operates its reservoirs.

The USACE Master Water Control Manual (WCM), last updated in 1958, guides decisions regarding the ACF Basin operations for the five federal reservoir projects on the Chattahoochee and at its confluence with the Flint. The WCM is intended to set operational guidelines to "achieve and balance all authorized project purposes" by operating the federal projects as a system. In the 1946 Rivers and Harbors Act, Congress adopted and authorized the works of improvement for the ACF Basin that were proposed in reports of the Chief of Engineers and South Atlantic Division Engineer, BG Newman (the Newman Report) in order to provide system wide benefits for multiple purposes including flood control, hydropower, navigation, water supply, fish and wildlife conservation, and recreation (Memorandum for Chief of Engineers from Office of Chief Counsel, USACE, June 25, 2012). In June 1990, USACE began operating the ACF Basin under its October 1989 Draft Apalachicola-Chattahoochee-Flint Basin Water Control Manual. Because of litigation, the 1989 WCM has never been finalized.

The USACE's authority to operate Lake Lanier for water supply was challenged by Alabama, Florida and others and was litigated for more than 20 years. In 2011, the 11th Circuit Court of Appeals overturned lower court rulings, stating, "the district court and the Corps erred in concluding that water supply was not an authorized purpose of the Buford Project under the [Rivers and Harbors Act]." (The litigation also included many other claims originally, but the 11th Circuit ruled these claims cannot not be adjudicated until the Corps takes "final agency action" to adopt a new water control plan.) The Court then directed the Corps to determine the balance between power production and other authorized project purposes. The Supreme Court declined to hear an appeal on the case.

Separately, in 2013, the State of Florida requested leave to file an original action against the State of Georgia to resolve disputes about the uses of the waters of the ACF Basin. Florida has requested the Supreme Court enter a decree "equitably apportioning" the waters of the ACF Basin between Georgia and Florida. It further requested that the Court cap Georgia's "depletive uses" at the level existing in 1992. The Supreme Court granted Florida leave to file its complaint in 2014, and the suit is now pending.

The Endangered Species Act requires federal agencies to consult with the U.S. Fish and Wildlife Service (or NOAA Fisheries where appropriate) to ensure that the effects of their actions "are not likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat." (USFWS Fact Sheet). Some stakeholders read the Newman Report's

reference to fish and wildlife conservation to mean that USACE has a broader responsibility to manage the ecosystem as a whole, not just for listed species.

In March 2006, USACE consulted with USFWS regarding the effects of existing operations at Jim Woodruff Dam (Figure 3-5) and releases to the Apalachicola River for endangered and threatened species and associated critical habitat. Endangered and threatened species included the following:

- Gulf sturgeon. (A in Figure 3-5)
- Purple bankclimber mussel. (B in Figure 3-5)
- Chipola slabshell mussel. (C in Figure 3-5)
- Fat three ridge mussel. (D in Figure 3-5)

Figure 3-5 Endangered Species. Photos Courtesy of the USFWS.

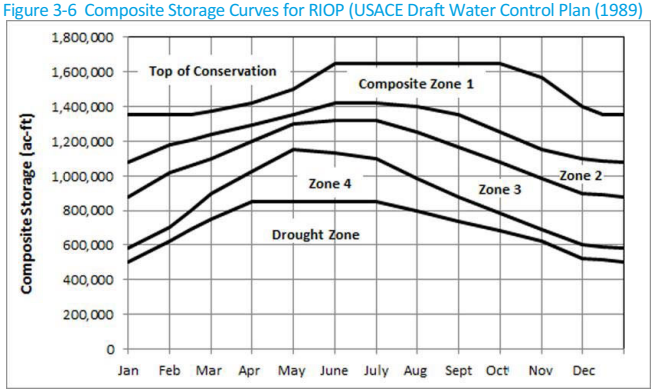
The formal consultation on what was termed the Interim Operation Plan (IOP) was completed with the issuance of a Biological Opinion in September of 2006. The IOP added new in-stream Apalachicola River flow requirements for protection of threatened and endangered species to the USACE ACF operational decision criteria. The IOP established minimum flows in the Apalachicola River based on different inflow rates into ACF reservoirs, and was intended to be an interim plan until an updated comprehensive WCM was adopted.

USACE consulted with USFWS in April 2008 to consider further revising the IOP, to be known as the Revised Interim Operation Plan (RIOP), to include a drought contingency plan while still providing support for federally listed species and their critical habitat. USFWS issued a final Biological Opinion in June 2008, determining that this RIOP would not significantly impact the federally listed species. While the RIOP is intended to govern releases from Jim Woodruff Dam, USACE attempts to operate the entire system of federal reservoirs while trying to meet the project purposes during critical drought periods.

USACE reinitiated consultation with the USFWS in November 2010 due to the availability of additional information about distribution and mortality of specific mussel species. The USFWS issued a Biological Opinion, and USACE announced additional changes to the RIOP in May 2012 based on this consultation. Changes included adjustments to the rule curves and resumption of normal operations when Zone 1 of composite storage is reached following drought contingency operations.

The RIOP is a relatively complicated set of release rules that provide minimum flow guidance to the USACE based on basin inflow, time of year, and the amount of storage available in the federal projects to meet the various authorized purposes. It is important to note that the USACE operates all the federal reservoirs as a system. Release rules are established for "action zones" based on the composite storage of the reservoirs. The composite storage is the sum of the storage in Lake Lanier, West Point Lake, Walter F. George Lake, and Lake Seminole as shown in Figure 3-6. The action zones provide for a phased approach to support authorized purposes through flow releases, and reflect flood storage in certain seasons of the year. The curves are similar in shape but vary in level and storage amount between the projects.

Figure 3-6 Composite Storage Curves for RIOP (USACE Draft Water Control Plan (1989)

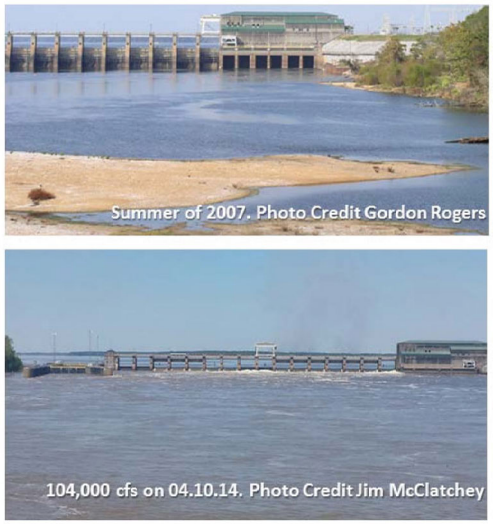


The zone operational concept allows the USACE to provide flow support for Basin needs differently when available storage is lower, reflecting dryer conditions where releases and evaporation have exceeded the amount of flow into the federal projects. The "zone" concept is outlined below:

- **Zone 1**: Releases can be made to support navigation, hydropower, water supply, and water quality.

- **Zone 2:** Releases for navigation may be limited. Releases for hydropower are at a reduced level. Releases are made for water supply and water quality.
- **Zone 3:** Releases for navigation may be significantly limited. Releases for hydropower are at a reduced level. Releases are made for water supply and water quality.
- **Zone 4:** Releases for navigation are not supported. Releases for hydropower are at the minimum level. Releases are made for water supply and water quality.
- **Drought Zone:** Once the composite storage drops into the drought zone, releases to the Apalachicola may be lowered from 5,000 cfs to 4,500 cfs. When the composite storage rises above the drought zone, releases return to 5,000 cfs. The drought zone is approximately the sum of the "inactive" storage of Lake Lanier, West Point Lake, Walter F. George Lake, plus the Zone 4 storage of Lake Lanier. The inactive storage is the volume of the reservoirs designed for storing sediment that enters the reservoir, and is typically not used for water supply or discharge downstream.

Figure 3-7 Jim Woodruff Dam



The flow release decisions guided by the action zones described above give a general picture of how the reservoirs in the ACF are managed. There are more detailed guidelines for releases from Lake Seminole to the Apalachicola River. While the RIOP rule curves describe the releases from Lake Seminole only, the reservoir does not contain enough storage to support these releases itself. Therefore, the releases made to the Apalachicola River from Lake Seminole reflect the result of the system-wide operation of the ACF. The major determinants for releases are the time of year, the available storage in the reservoirs, and Basin inflow to accomplish desired flows in the Apalachicola River as shown in Table 3-2. The release levels vary by three seasons: spawning season (March through May), non-spawning season (June through November), and winter (December through February). Regardless of the season, when the composite storage reaches Zone 4, releases to the Apalachicola are reduced to 5,000 cfs or to 4,500 cfs if the composite storage is in the drought zone. The values in the following table are minimum values, not prescribed releases. Actual releases may be greater to meet other purposes, such as hydropower, navigation, flood control, etc.

Table 3-2 Revised Interim Operating Plan releases to the Apalachicola River (USFWS 2012)

Months	Composite Storage Zone	Basin Inflow (BI) (cfs)1	Release from Lake Seminole (cfs)1	Basin Inflow Available for Storage
March – May	Zones 1 and 2	>= 34,000	>= 25,000	Up to 100% BI > 25,000
		>= 16,000 and < 34,000	>= 16,000 + 50% BI > 16,000	Up to 50% BI > 16,000
		>= 5,000 and < 16,000	>= BI	
		< 5,000	>= 5,000	
	Zone 3	>= 39,000	>= 25,000	Up to 100% BI > 25,000
		>= 11,000 and < 39,000	>= 11,000 + 50% BI > 11,000	Up to 50% BI > 11,000
		>= 5,000 and < 11,000	>= BI	
		< 5,000	>= 5,000	
June – November	Zones 1, 2, and 3	>= 22,000	>= 16,000	Up to 100% BI > 16,000
		>= 10,000 and < 22,000	>= 10,000 + 50% BI > 10,000	Up to 50% BI > 10,000
		>= 5,000 and < 10,000	>= BI	
		< 5,000	>= 5,000	
December – February	Zones 1, 2, and 3	>= 5,000	>= 5,000	Up to 100% BI > 5,000
		< 5,000	>= 5,000	
At all times	Zone 4	N/A	>= 5,000	Up to 100% BI > 5,000
At all times	Drought Zone	N/A	>= 4,500	Up to 100% BI > 4,500
1 cfs = cubic feet per second				

The advantage in maintaining as much storage as possible in all the reservoirs, but particularly in the most upstream reservoir, is that this increases the degree of operational flexibility and system reliability to augment low flows throughout the Basin to provide at least partial support of Basin needs. Since future Basin hydrologic conditions and water uses may result in lower inflows to the projects

than those experienced over the period of record since the construction of the reservoirs, it is important that the operating plan release requirements be established to accommodate desired needs without planned utilization of all available storage. At the time of this publication, USACE expects to release a draft Water Control Manual and Environmental Impact Statement in the summer of 2015, with a public comment period to follow the release of the draft. The Corps expects that the process will be complete in 2017.

Role of the States and Other Federal Agencies

While USACE has a large influence in how water moves within the ACF Basin, USACE does not address the quantity of water demands or the quantity and quality of return flows.

The ACF Basin is subject to several overlapping layers of water resource management by state and other federal agencies. State permitting programs for wastewater discharges and water withdrawals affect most water users. Wastewater discharge is a permitted activity that requires a NPDES permit issued by the individual state with flow and water quality limitations. Alabama, Florida and Georgia each have primacy for this permitting program delegated from the federal EPA, and each has similar programs.

Water withdrawal permitting, however, varies between the states. In Alabama, entities with the capacity to withdraw 100,000 gallons per day are required to register and submit an annual usage report to the Office of Water Resources. In Florida, permitted consumptive water users, which include agricultural water users, are required to submit usage reports on a monthly basis. In Georgia, users withdrawing more than 100,000 gallons per day are permitted and report water use. Georgia agricultural water users are permitted, but usage reporting to date has primarily been done by the state on an annual basis. The fact that the three states have different permitting rules and requirements has resulted in inconsistency in information availability on water usage throughout the ACF basin.

Additionally, the following items are relevant to water management in the ACF Basin:

- Adopted in 2000, the Georgia Flint River Drought Protection Act (OCGA §12-5-540) and its implementing rules (GA DNR Rule 391-3-28) originally provided for demand management of agricultural surface water use in times of drought via an irrigation suspension auction. The Flint River Water Development and Conservation Plan, adopted by GAEPD in 2006, led to changes in the Act rules that included making certain agricultural groundwater permits eligible for the suspension auction and providing GAEPD the discretion to implement the auction in smaller sub-watersheds rather than the entire Flint River Basin. This 2006 Plan also put in place revised agricultural permitting requirements specific to the Flint Basin, mandatory conservation practices for new irrigation systems and a moratorium on new agricultural withdrawals (surface water and Upper Floridan groundwater) in areas identified as "Capacity Use." In 2014, the Georgia General Assembly amended the Act by modifying the irrigation suspension auction implementation language, mandating efficiency requirements for all irrigation systems by 2020 and addressing management of augmented flows provided by the state specific to maintaining habitat critical for "vulnerable aquatic life." Changes to the implementing rules consistent with the recent amendments to the Act were adopted by the Georgia Department of Natural Resources Board in December 2014.
- Federal Energy Regulatory Commission (FERC) licensing requirements for privately-owned hydroelectric impoundments. Morgan Falls, FERC Project #2237, expires in 2039. Bartlett's Ferry Dam/Lake Harding, FERC Project #485, expires in December of 2044. The Middle Chattahoochee Project (FERC Project #2177), which is comprised of the smaller Goat Rock, Oliver, and North Highlands projects, expires in 2034.
- The Georgia Comprehensive State-wide Water Management Plan as approved by the Water Council on January 8, 2008, is the guiding document for the development of Regional Water Plans in Georgia and documents State policies regarding water management. In 2011, ten regional water planning councils prepared regional water plans designed to manage water resources in a sustainable manner through 2050. Planning utilized an integrated water management approach that includes water resource assessments, estimates of current and future water needs for supply and assimilative capacities, and identification and selection of management practices. The Middle Chattahoochee, Upper Flint, and Lower Flint-Ochlockonee Water Councils encompass the majority of the ACF Basin area, although the Coosa North Georgia, Middle Ocmulgee, and Suwanee Satilla Water Councils all include some portion of the ACF Basin. All of these regional plans are scheduled to be updated in 2016.
- Through the Metropolitan River Protection Act (O.C.G.A 12-5-440 et. Seq)., the State of Georgia has created a 2000-foot protected buffer along both banks of the Chattahoochee River for an 85-mile reach encompassing the entire Atlanta region. The Act called for the Atlanta Regional Commission to adopt a plan to protect this corridor. All proposals for development within the corridor are reviewed by the Atlanta Regional Commission for consistency with the plan and all land-disturbing activities within the corridor are required to comply with this plan.
- The Georgia Water Stewardship Act of 2010, SB 370, reaffirms Georgia's commitment to creating a culture of water conservation. Hailed by the Georgia Conservancy as "one of the nation's most progressive water conservation policies," the Act requires local governments and water systems to restrict outdoor watering, update plumbing codes to require high efficiency fixtures, and conduct annual water loss audits. It also requires state agencies in Georgia to collaborate to encourage water conservation and enhance water supplies.

- In 2012, the Georgia Environmental Protection Division imposed a moratorium on new agricultural surface water withdrawals and new agricultural groundwater withdrawals from the Upper Floridan Aquifer in the Dougherty Plain.
- The Metropolitan North Georgia Water Planning District (Metro Water District) was created by the Georgia General Assembly in 2001 in order to preserve and protect water resources in the 15-county metropolitan Atlanta area. The Metro Water District is charged with developing comprehensive regional and watershed specific water resources plans to be implemented by local governments. Planning publications include a Watershed Management Plan, a Wastewater Management Plan, and a Water Supply and Water Conservation Management Plan. The Metro District Plans will be updated on the same schedule as the other regional water councils.
- The State of Florida has enacted a variety of water resources management programs, including designation of Franklin County (including the Apalachicola Bay) as an Area of Critical State Concern in 1985. This designation remains partially in effect. In addition, Florida has designated the Apalachicola Bay as an Aquatic Preserve. Other programs applicable to this Basin include the Outstanding Florida Waters program and a conservation and recreation lands acquisition program under which the State of Florida purchased approximately 265,000 acres in the lower Apalachicola floodplain, delta, Little St. George Island and the St. George Island State Park.
- The Apalachicola Basin is in the Northwest Florida Water Management District (NWFWMD or District). The District is one of five water management districts in Florida created by the Water Resources Act of 1972. The District works to protect and manage water resources in a sustainable manner for the continued welfare of people and natural systems across its 16-county region. Through planning efforts, the District identified up to 9 million gallons a day of alternative water supplies to protect coast wells from saltwater intrusion and to meet projected needs in Franklin and Gulf counties through 2025. In addition, the District has purchased land and undertaken restoration programs under a variety of state programs including, Save Our Rivers, Preservation 2000, the Surface Water Improvement and Management program, etc.
- The Alabama Water Agencies Working Group, a combination of state agencies with water resource responsibilities, on December 1, 2013 recommended an action plan and timeline for implementing a statewide water management plan.
- The Environmental Protection Agency (EPA) enforces existing federal clean water and safe drinking water laws, provides guidance and support for pollution prevention efforts, and works to develop additional regulations to protect watersheds and sources of drinking water.

- The United States Fish and Wildlife Service (USFWS) is a bureau within the Department of the Interior that enforces federal wildlife laws, protects endangered species, manages migratory birds, restores nationally significant fisheries, and works to restore wildlife habitat, such as wetlands.
- The United States Geologic Survey (USGS) is the Nation's largest water, earth, and biological science and civilian mapping agency. USGS collects, monitors, analyzes, and provides scientific understanding about natural resource conditions, issues, and problems. USGS maintains river gauging stations throughout the ACF Basin and the nation. USGS collects and disseminates this information to better understand water resources.
- The National Park Service's (NPS) mission is to care for special places saved by the American people. The National Park Service is a bureau of the U.S. Department of the Interior. NPS manages the Chattahoochee River National Recreation Area in the ACF Basin. This area preserves a series of sites within Atlanta and up to Lake Lanier along the Chattahoochee River that creates public recreation opportunities and access to historic areas.

This chapter described consumptive uses within ACF Basin and how the Basin is managed. The next chapter describes more about the benefits water provides to stakeholders in the ACF Basin and their needs and concerns.

CHAPTER 4.

Understanding Stakeholder Needs and Concerns

People benefit from healthy aquatic ecosystems, drawing on water resources for many needs. Analyses by GWRI and others show that most stakeholder needs are met in normal and wet years. Some stakeholders, such as those interested in instream flows to support recreation, navigation and aquatic ecosystems are concerned that their needs are not being adequately supported even in normal years. In addition, the Basin is more stressed in dry and drought conditions, with fewer stakeholder needs being met. Further, many stakeholders are concerned about how to plan for future needs in light of forecasted reductions in average rainfall or forecasted population increases.

ACFS documented and incorporated these concerns in this Plan by developing performance metrics. In general, performance metrics are a way to describe and compare what is important to stakeholders in the Basin. They are like yardsticks to measure the degree to which stakeholder interests or concerns are met by different water management alternatives.

ACFS members identified metrics by sub-basin and by interest group category. In 2012, individual sub-basin meetings were held to identify how interests might be translated into metrics. A table summary of the performance metrics was developed from the meetings and approved by the ACFS members for subsequent use on the project, and is linked in Appendix A.

Figure 4-1 Lower and Middle Chattahoochee Meeting to Discuss Performance Metrics

It is important for decision makers to understand that ACFS approved these metrics to ensure that all stakeholder interests would be represented in the list of metrics to be used. Approval does not mean that every stakeholder agreed with each other's metrics or that the system can meet those metrics under all conditions, but rather that every stakeholder had a "yardstick" that was meaningful to them for understanding whether possible recommendations would improve water management in the Basin.

The stakeholders recognized that some of their interests overlapped with other interests. For example, the need for high flows to support spring time fish spawning would also support flow needed for navigation. These and other conjunctive uses can be found throughout the Basin. They also recognized that tradeoffs will need to be made. Thus, modeling results were presented using the performance metrics developed by the stakeholders so that both the tradeoffs and the ability of the system to provide "joint gains" for many if not all stakeholders under different scenarios could be clearly understood.

Stakeholders identified many performance metrics in terms of flows and levels at specific, individual nodes in the Basin. Stakeholder interests also were presented in other metrics relevant to those interests. For example, recreation interests used USACE identified recreation impact levels. Salinity ranges were used as performance metrics for the Apalachicola Bay. These are described below and linked in Appendix A.

The following performance metrics examples are illustrative of the types of metrics used for various stakeholder interests. These have been included here, not because they are more important than other measures, but rather to provide examples representative both of diverse stakeholder interests and locations throughout the four sub-basins. See Appendix A for the complete list of performance metrics by node.

- Important metrics for **wastewater assimilation** included (among other locations) the percentage of time flows at:
  - Peachtree Creek are below 750 cfs.
  - Whitesburg are 1,000 cfs or greater (and the 7-day average is 1,350 cfs or greater).
  - Columbus daily average flows are 1,350 cfs or greater and the seven-day average is 1,850 cfs or greater.
  - Montezuma are below 317 cfs.
- **Water supply** flow metrics in some locations (e.g. Whitesburg and Columbus are the same as above). Other water supply interests included:
  - A long-term projected water demand of 705 mgd for Metro Atlanta
- **Recreation interests** identified metrics at (among other locations):
  - Lanier as the time that lake levels are below 1,061 ft.
  - Morgan Falls as the time that levels are greater than 864 ft.
  - Peachtree Creek as the percentage of time that flows are between 1,000 and 1,250 cfs.
  - Whitesburg as the percentage of time that flows are greater than 2,200 cfs based on 4 ft depth.
  - West Point as the percentage of time levels from April to October are 635 ft or above and 632.5 ft at all other times.
  - W.F. George as the percentage of time levels from April to October are 190 ft or above and 187.5 ft at all other times.
  - Woodruff as the percentage of time levels from April to October are 77.5 ft or above and 76.5 ft at all other times.
- **Navigation** stakeholders identified the following metrics, assuming Basin hydrology conditions allow:

- A typical navigational season beginning in January of each year and continuing for four to five months (January through April or May), with flows at the Blountstown, FL, USGS gage during the navigation season that are adequate to provide a 7 ft channel.[8] A navigation season will depend on actual and projected system wide conditions in the ACF Basin before and during January, February, March, April, and May. These conditions include:
  - A navigation season can be supported only when the ACF Basin composite conservation storage is in Zone 1 or Zone 2 of the Corps RIOP.
  - A navigation season will not be supported when the ACF Basin composite conservation storage is in Zone 3 and below. Provided drought operations have not been triggered, navigation support will resume when Basin composite conservation storage level recovers to Zone 2, and is forecast to remain above Zone 3 for a practical, continuous period.
  - A navigation season will not be supported when drought operations are in effect. Navigation will not be supported after drought operations have ceased until the ACF Basin composite conservation storage recovers to Zone 1.
  - Releases that augment the flows to provide for the navigation channel will also be dependent on navigation channel conditions that ensure safe navigation.

Though special releases will not be standard practice, they can occur for a short duration to assist navigation during the navigation season, provided the releases will not significantly affect other project purposes, and any fluctuations in reservoir levels or river stages will be minimum.

- Identified metrics for **aquatic resources** included:
  - Six percent reduction in flow at the Blountstown gage using the UIF CMA median monthly flows of pre-dam dry years to develop the flow lines for comparing alternatives. This was equated to an approximate overall 13% reduction in the functional value of the habitat in the riparian area of the Apalachicola River using a tool that was developed for the Apalachicola River based primarily on the work of: 1) Light et al. 1998 who examined acres of connected aquatic and floodplain habitat as a function of flow for the Apalachicola River at Chattahoochee gage, and 2) the USFWS biological opinion issued in 2012 regarding whether proposed USACE RIOP release schedules from Jim Woodruff Dam would jeopardize threatened and endangered mussels under the specified range of low flow conditions. The Biological Opinion also included some conservation recommendations that USACE can implement at its discretion.
  - Maximizing monthly flows at the Blountstown gage during non-drought conditions fluctuating between 18,000 cfs and 14,000 cfs for the months of February through May, then between 16,000 cfs and 10,000 cfs annually also were identified by Apalachicola stakeholders for sustaining floodplain habitat and seafood productivity.
  - Metrics developed for the Apalachicola Bay and Estuary included flows at the USGS Sumatra gage during droughts that maintain salinities within the range of 10-24ppt for a minimum of 50-55% of the time at locations specified throughout the Bay during the spawning, reproduction and recruitment season from May through October. During the primary growth season for oysters of November through April, salinities should be maintained in the desirable range a minimum of 75-80% of the time at these locations.
  - Metrics for the Chattahoochee included:
    - For the Atlanta and Norcross nodes on the Chattahoochee, comparison of monthly mean and monthly median flows and percent change for WMAs against UIFs generated for all years (1939-2008).
    - 1029 cfs at the Atlanta gage to meet the flow requirement of 750 cfs at Peachtree Creek needed to assimilate metro Atlanta's treated wastewater.
  - Identified metrics for the Flint included:
    - For the Griffin, Carsonville and Montezuma nodes, the percentage of time flow is more than 15% below the cumulative unimpaired average daily flow between February 15 and June 15 and more than 30% below at all other times. In addition, the percentage of time flow is greater than the monthly 7Q10 flow plus 80%.
    - For Albany, Newton and Bainbridge nodes, the percentage of time flow is more than 15% below the cumulative unimpaired average daily flow between February 15 and June 15 and more than 30% at all other times. Further, the percentage of time flow is greater than a 6% reduction in flow (monthly) for dry years and the percentage of time flow is greater than the monthly 7Q10 plus 30%.
- Cooling water for **industrial** and power water users requires flows at levels above intake pipes.
  - Several industrial water users on the middle/lower Chattahoochee, including two large paper mills and a nuclear power plant, rely on water from the river for cooling, industrial processes and waste water assimilation. Metrics for river flow in the middle and lower Chattahoochee include 2,000 cfs at the USGS Columbia gage to support these facilities. Other industrial and businesses in the middle Chattahoochee depend solely on adequate levels in West Point Lake to support mass production,

[8] The most recent channel survey and discharge-stage rating was used to determine a flow of 16,200 cfs is required to sustain a minimum navigation depth during the navigation season.

fire protection, business development, economic expansion and job growth.

- **Hydropower** identified metrics consistent with their permits or Congressional authorization:
  - Performance metrics in middle-lower Chattahoochee nodes are incorporated into the FERC license to the Georgia power Company for the Middle Chattahoochee Hydro project.
  - For the federal projects, nodes with specific weekly minimum megawatt hours generated per month are indicated in the performance metrics table linked in Appendix A (not all nodes have numeric criteria).
- **Agriculture**
  - Numeric criteria were not identified except at Carsonville and Montezuma gages on the Flint River, where the percent of time flow is below 180 cfs affects permitted agricultural withdrawals.

In Appendix B, stakeholders have described in their own words the interests and concerns that they are seeking to achieve with the performance metrics used in the modeling. The consensus of ACFS is that stakeholders' diverse perspectives are important to understand. However, the perspectives expressed in Appendix B are not a consensus statement of ACFS as a whole nor are they necessarily a consensus of all the members associated with the various sub-Basin or stakeholder interest group perspectives represented.

CHAPTER 5.

Findings

A summary of the findings from the modeling are provided below to provide a context for the recommendations that follow in Chapter 6.

Baseline Conditions: The Effects of Evaporation, Dam Operation and Consumptive Use

It is important to understand the effects of evaporation from the federal reservoirs, how releases from these reservoirs are currently managed, and consumptive uses. These are major drivers in the system to consider when framing recommendations intended to improve current conditions, since such recommendations are effective only to the degree that they address the cause behind an existing or potential future problem.

GWRI conducted the following baseline modeling (see the methods section of Chapter 2 for more detail):

- The impacts of evaporation were assessed by comparing the USACE UIFs to run of the river scenarios. The latter assumed all main-stem reservoirs exist and are operated with storage kept constant at the mid-point of the conservation zone.
- The impacts of current dam operations were assessed by comparing the UIF scenario to the RIOP without consumptive use.
- The impacts of consumptive use were assessed by comparing the RIOP scenario to the RIOP with consumptive use.

Detailed results of the modeling were compared by node, by sub-basin and for the Basin overall against performance criteria related to the following stakeholder interests:

- Lake levels and releases
- Recreation impacts and opportunities
- Navigation opportunities
- Consumptive use deficits
- Environmental flows
- Monthly river flows
- Hydropower

GWRI made the following observations from this analysis:

- While recognizing the need to improve the accuracy of the unimpaired inflow dataset at a daily resolution, the UIF scenario establishes a baseline flow regime throughout the ACF basin that allows for a relative comparison of various WMA model runs.
- Evaporation effects are higher during summer (hot, dry) months and dry years; changes in flows from the UIF scenario to the UIF with evaporation (UIF/Ev) scenario due to evaporation losses are larger at the downstream reservoirs in an absolute sense and larger at the upstream reservoirs in a relative sense; the long-term annual evaporation losses under the UIF/Ev scenario amount to about 20% of current Basin wide annual consumptive uses.[9]
- Operation of the system under the RIOP rules changes the natural seasonal distribution of flows (generated by the UIF scenario); average flows during high inflow months (winter/spring) are lower with regulation, and average flows during low inflow months (summer/fall) are higher with regulation; the relative effects of regulation are most pronounced in the upstream watersheds, while the absolute magnitudes are largest downstream in the Apalachicola; regulation may increase navigation opportunities at Chattahoochee and along the Apalachicola.
- Consumptive uses decrease river flows across the Basin by 7 – 13 % in the Chattahoochee and Apalachicola Rivers and by 5-35 % in the Flint River; federal reservoir levels also decrease with the addition of consumptive uses, with the largest decreases occurring under dry conditions when the reservoir levels are already low.[10]

Other Observations

- Current consumptive use targets are met at almost every node in the ACF Basin for the **RIOP/CU** scenario. The only exception is Griffin, where deficits are calculated during low flow events.

[9] In considering evaporation losses, it should be noted that the same land mass as now occupied by the reservoirs also would lose water due to evapotranspiration if it were still in vegetation.

[10] In considering the modeled streamflow changes described in this section, it should be noted that determining the degree of streamflow reduction that results from consumptive use requires additional, careful analysis. Modeled streamflow differences may reflect (in whole or in part) changes in release patterns under the USACE's operational rules, rather than depletions caused by consumptive uses themselves. For example, changes to modeled consumptive uses may cause storage to cross a particular operational "threshold," leading to large changes in modeled releases at a particular point in time.

- Metrics computed based on dry years reveal important information about system performance under conditions of greater stress. It is highly recommended that attention be paid to dry year metrics and drought conditions during the evaluation of WMAs in order to help in the development of a plan that is truly sustainable.

The UIF dataset used as input for all of the scenarios is subject to errors and uncertainties when viewed on daily time-scales. In particular, high flow events are not well represented by the current UIF data set.

Eight scenarios were modeled for the entire period of record (1939 to 2008) conditions. The output from these runs was also post processed to calculate the requested metrics for the 13 driest years in the 1939 to 2008 period of record. Basin-wide effects include:

- Evaporation decreases spring/summer/fall average monthly flows.
- Regulated scenarios (i.e., **RIOP**) generally result in lower winter/spring and higher summer/fall releases than unregulated scenarios. The differences between regulated and unregulated scenarios are generally increased during dry years.
- Consumptive uses decrease average monthly flows and lake levels, especially during dry years. Recreational impacts are generally higher in the scenarios with consumptive uses versus those without consumptive uses. These differences are in the range of 0 to 20%. Consumptive uses reduce energy generation from 1091 to 1040 gigawatt hours (GWh) for all years.
- Navigation opportunities are slightly reduced with increasing evaporation at Chattahoochee (Apalachicola).
- Navigation opportunities at Chattahoochee are slightly higher for unregulated scenarios (**UIF**, **UIF/Ev**) than regulated scenarios (**RIOP**) during January to May. However, regulation may increase navigation opportunities during the dry months, especially during droughts.
- Limited consumptive use shortages are calculated only at Griffin up to 10% of monthly average water supply targets during dry years (September).

Round One Modeling: The Effects of Water Management Alternatives

The first round of modeling provided information on as many of the WMAs suggested by stakeholders as possible, with the exception of WMAs that required major changes to reservoir zones or RIOP curves. The WMAs involving more complex changes to reservoir regulation rules were included in Round Two. WMAs were assessed relative to all proposed stakeholder metrics.

The categories of WMAs analyzed included:

- Alternative consumptive use levels;

- Conservation storage change options at ACF reservoirs;
- Alternative interbasin transfer levels;
- Different reservoir ramp down outflow rates under existing reservoir zones and RIOP curves; and
- RIOP implementation driven by (1) unimpaired and (2) impaired Basin inflows.

Additional detail about the WMA scenarios modeled can be found in the Water Management Alternatives Technical Memorandum prepared by Black & Veatch.

Round one was similar to the baseline conditions modeling in that it minimized the number of variables changing at one time to help ensure that the stakeholders could tell what is causing an effect, i.e. whether a WMA led to improvements relative to baseline conditions or caused potentially adverse effects. This approach also revealed tradeoffs, to provide the basis for stakeholders to think together about the impacts of each proposal on others, whether positive or negative, and to design the round two scenarios to preserve improvements and address adverse effects.

Scenario Definitions

Several modeling runs were performed to compare with baseline conditions. All of the scenarios used the most recent USACE unimpaired flow data set (1939 to 2008) and, if applicable, the associated net evaporation rates. The model output was post processed for all years of the record as well as separately for the 13 driest years (1941, 1951, 1955, 1981, 1985, 1986, 1988, 1999, 2000, 2002, 2006, 2007, and 2008). Comparison of the metrics in these two cases provides an understanding of how metrics can vary from average conditions to dry years.

The scenarios are briefly defined below:

Baseline Scenarios (from Current Conditions Runs):

- **UIF:** Unimpaired flows without reservoirs and without consumptive uses.
- **RIOP/CU:** All reservoirs are regulated according to the Revised Interim Operations Plan currently in effect. Evaporation losses are considered and current consumptive uses are at the levels compiled by Black & Veatch.

Consumptive Use Scenarios: This group of scenarios is intended to evaluate how changing the consumptive uses affect the water resources in the Basin. Four scenarios at consumptive use levels differing by -30%, -15%, +15%, and +30% from the RIOP/CU baseline scenario, were chosen:

- **RIOP/CU -30**: Same as RIOP/CU, but with consumptive uses decreased by 30 % basin-wide.
- **RIOP/CU -15**: Same as RIOP/CU, but with consumptive uses decreased by 15 % basin-wide.
- **RIOP/CU +15**: Same as RIOP/CU, but with consumptive uses increased by 15 % basin-wide.
- **RIOP/CU +30**: Same as RIOP/CU, but with consumptive uses increased by 30 % basin-wide.

Interbasin Transfer Scenario: This scenario was chosen to evaluate the effect of Interbasin Transfers (IBT) on the ACF Basin water resources. Existing IBTs were quantified and then used to create a new consumptive use scenario that adjusts the current consumptive uses such that any existing transfers of water into and out of the Basin do not occur. While at some locations adjusting the IBTs result in higher consumptive uses when compared to the current uses, overall the IBT adjustments tend to lower consumptive uses throughout the Basin.

- **RIOP/CU IBT:** Same as RIOP/CU, but any consumptive use transfers into or out of the ACF Basin were removed.

Release Ramp Rate Scenarios: This scenario was chosen to determine the effect that ramp rates (i.e., limitations on the rate of change of reservoir releases or reservoir levels) have on the ACF Basin water resources.

- **RIOP/CU No RR:** Same as RIOP/CU, but all ramp rates (pertaining to reservoir level and release changes) have been removed.

RIOP Implementation Scenarios: This scenario group assesses alternative definitions of the Basin Inflows (BI). Basin Inflows are a key variable in the Revised Interim Operations Plan (RIOP) since release requirements (magnitudes and ramp rates) from Jim Woodruff Dam are directly linked to Basin Inflows during parts of the year and for certain flow ranges. Under the RIOP, the Basin Inflows represent the Basin-wide *impaired* inflows upstream of the Chattahoochee gage (i.e. unimpaired inflows minus evaporation and consumptive use losses). The following scenarios correspond to slightly different definitions of the Basin Inflows:

- **RIOP/CU BI: Evap**: Same as RIOP/CU, but with RIOP using Basin Inflows computed by adding back in evaporation losses.
- **RIOP/CU BI: CU**: Same as RIOP/CU, but with RIOP using Basin Inflows computed by adding back in consumptive uses.
- **RIOP/CU BI: CU+Evap**: Same as RIOP/CU, but with RIOP using Basin Inflows computed by adding back in consumptive uses *and* evaporation losses. Basin Inflows computed in such a manner most closely resemble unimpaired inflows

Reservoir Rule Curve and Storage Change Scenarios: This group consists of scenarios that make either structural changes to the system reservoirs or changes the location of the reservoir zones.

- **RIOP/CU WP**: Same as RIOP/CU, but with changes to the West Point zones.
- **RIOP/CU L+2**: Same as RIOP/CU, but with an additional 2 feet of storage in the conservation zone of Lake Lanier. This increase is applied to the top of the

Lake Lanier conservation zone, with all other zones at Lanier and the other system reservoirs remaining as in the original RIOP/CU.

- **RIOP/CU L+2 P**: Same as RIOP/CU, but with an additional 2 feet of storage in the conservation zone of Lake Lanier. This increase was applied proportionally to all Lanier conservation zones. All other reservoirs are operated as in RIOP/CU.

Hydropower Requirements Scenario: This scenario, when compared to the RIOP/CU baseline scenario, aims to determine the benefits and impacts that the hydropower generation requirements have on other water uses.

- **RIOP/CU No Power**: Same as RIOP/CU, but with all hydropower generation requirements removed from the operational plan. Hydropower can still be generated but releases are not made to specifically meet generation targets.

Detailed results of all scenario runs were compiled and presented for every node in the system similarly to the presentation of the Current Conditions Model runs. The detailed results were compared and summarized using performance metrics pertaining to:

- Lake levels and releases;
- River flows;
- Relationship of flows to levels for inundation of aquatic habitat;
- Recreation impacts and opportunities;
- Environment, Conservation, Water Quality, and Navigation opportunities;
- Hydropower; and
- Consumptive use target deficits.

In addition, information pertaining to each individual metric was also summarized across the Basin.

Summary Observations

While this summary identifies the major changes in performance metrics that result from different WMAs, the ACF stakeholders made the final determination about which WMAs represent an improvement over existing conditions.

Decreased water storage is experienced at times in scenarios that increase consumptive uses from current levels. Conversely, a decrease in consumptive uses (including through the removal of Inter Basin Transfers) increases storage throughout the system. Major infrastructure improvements or rule curve changes such as increasing Lake Lanier storage by 2 feet are also found to increase amounts of water available in the system. However, it is shown that the manner in which the additional storage is allocated affects the overall system performance.

Hydropower generation requirements are found to affect system conditions, tending to decrease reservoir levels. On the other hand, hydropower releases are also found to provide some in-stream flow benefits during certain months of the year.

Changing the Basin Inflows used in the RIOP implementation from impaired to unimpaired inflows has a long-term positive effect on the amount of in-stream flows being released. However, there are certain months of the year when using the unimpaired Basin Inflows would consistently result in lower in-stream flows when compared to the baseline RIOP/CU scenario. Such a shift also leads to lower average reservoir levels, since more water is released from the reservoirs to meet instream flow requirements. These changes are the result of RIOP rules that condition release requirements on the Basin-wide composite storage. A comprehensive re-analysis of the release requirements mandated by the RIOP has the potential to improve system operations and performance metrics. This aspect was explored in the second scenario assessment round.

Specific Findings

Specific findings are divided into two subsections. The first highlights the major relative benefit and impact responses *within* each scenario group relative to baseline conditions and the evaluation criteria. The second summarizes the relative benefits and impacts *across* the scenario groups.

Impacts within Individual Scenario Groups

This section highlights impacts *within* each scenario group relative to baseline conditions and the above-mentioned criteria.

Consumptive Use Scenarios: Increased CU results in lower reservoir levels and decreased Basin-wide flows. The opposite effect occurs when consumptive uses are decreased.

Inter Basin Transfer Scenarios: The Interbasin Transfer (IBT) scenario generally results in a net increase of the amount of water available in the ACF basin. This is due to the fact that there are more IBTs leaving the system than entering.

Release Ramp Rate Scenarios: The removal of ramp rates resulted in system responses that are not appreciably different from the RIOP/CU baseline scenario.

RIOP Implementation Scenarios: The RIOP operation shift from using Basin Inflows based on impaired flows to Basin Inflows more closely resembling unimpaired flows leads to lower average reservoir levels since more water is released from the reservoirs to meet in-stream flow requirements. However, the changes are not uniform throughout the year, and several months exhibit drops in river flows. This is partially due to the fact that the RIOP release requirements are dependent on basin inflows for only portions of the year and only within certain flow ranges. Furthermore, the RIOP release requirements are a function of the available composite reservoir storage and become lower as storage decreases. If large releases are made during a particular time period, it is possible that lower storages and hence lower release requirements and river flows may result in subsequent months.

Reservoir Rule Curve and Storage Change Scenarios: The alteration of the West Point rule curve increases the West Point elevation while having only minor impacts on the other reservoir and river flows. Increasing Lake Lanier storage by 2 feet also increases the average storage in that reservoir without impacting most of the rest of the system. However, the manner in which the increase is implemented changes the level of the benefits that can be accrued.

Hydropower Requirements Scenarios: Removing hydropower generation as an explicit operational goal obviously reduces hydropower generation availability (though power is still generated). On the other hand, several other metrics, such as reservoir levels and recreational opportunities are positively affected. The removal of generation requirements can however have an adverse effect on river flows and in-stream flow metrics for certain months of the year. Hydropower releases thus coincidentally provide some flow benefits that would not be provided by the RIOP alone. The in-stream flow metrics tend to be more similar to the UIF flow medians during the winter and spring months, but lower during the summer months.

Impacts Across Scenario Groups

This section highlights impacts a*cross* the scenario groups. Subsections for major metric categories (reservoir levels, in-stream flows, etc.) identify scenarios that are beneficial or detrimental to metric performance.

Reservoir Levels: Reservoir levels can be impacted by a variety of changes to the system operations, system infrastructure, and management options. Since several recreational benefits are directly derived from reservoir levels, similar conclusions would apply to these metrics.

- Scenarios with positive impacts: Consumptive use reductions increase reservoir levels. Removing IBTs also increases reservoir levels, though to a lesser degree. The addition of extra storage at Lake Lanier raises the levels in that reservoir. However, if the additional storage is only allocated to the top conservation zone, then there are only minor level increases during dry times. On the other hand, larger and more sustained increases can be achieved if some of the additional storage is also allocated to the lower zones. Changing the West Point zones increases West Point levels but leaves other reservoir levels essentially unaltered. Finally, removing hydropower requirements leads to significant average and minimum reservoir level increases.
- Scenarios with negative impacts: Reservoir levels decrease across the Basin when consumptive uses are increased. Additionally, changing the Basin Inflow computation from impaired to unimpaired flows results in lower reservoir levels since more water is released for in-stream flow purposes on average.

Reservoir Releases and River Flows, Including In-stream Flow Metrics: Several scenarios affect river flows and in-stream flow metrics, though such effects can be beneficial or detrimental depending on the time of the year.

- Scenarios with positive impacts: The reduction of consumptive uses (including reductions due to the removal of IBTs) increases river flows and improves in-stream flow metrics across the Basin. The removal of hydropower generation requirements tends to increase flows during the winter and spring months. Changing the RIOP Basin Inflow computation from impaired to unimpaired flows increases river flows and improves instream flow metrics during the spring and early summer months. Adjustments to the West Point zones generally increase releases from West Point (and other flows and releases downstream) during most of the year except in the fall and early winter.
- Scenarios with negative impacts: An increase of consumptive uses results in reductions of river flows and lower in-stream flow metrics. The removal of hydropower generation requirements decreases flow during the summer and fall months. Changing the RIOP Basin Inflow computation from impaired to unimpaired flows leads to declines in river flows during the late summer and fall months relative to RIOP/CU. However, the same change generates median flows that approximate the UIF baseline flow conditions better than the RIOP/CU scenario for spring and summer. In this sense, some of the environmental flow changes of the RIOP/CU BI: CU+Evp scenario may be considered to be positive.

Hydropower: Several scenarios affect hydropower generation, though these changes can be beneficial or detrimental depending on the time of the year.

- Scenarios with positive impacts: The reduction of consumptive uses (including reductions due to the removal of IBTs) tends to increase hydropower generation. Changing the RIOP Basin Inflow computation from impaired to unimpaired flows can lead to higher generation in the spring and early summer months of dry years. Increasing Lake Lanier storage positively impacts energy generation, though this benefit is more pronounced for the scenario where only the top conservation zone is increased.
- Scenarios with negative impacts: Removing hydropower generation as an explicit operational goal can reduce hydropower production significantly in several months, especially during dry years. Changing the Basin Inflow computation from impaired to unimpaired flows can lead to lower generation in the late summer and fall months.

Consumptive Uses: All of the scenarios meet the consumptive use targets at all locations except Griffin.

- Scenarios with positive impacts: Decreasing consumptive uses results in smaller deficits. This includes the IBT scenario since the removal of IBTs lowers consumptive uses at the Griffin node.

- Scenarios with negative impacts: Increasing consumptive uses results in larger deficits.

Round Two Modeling: Optimizing for Stakeholder Interests

Optimized reservoir management rule alternatives were modeled under current consumptive use conditions in a series of analyses that reflected increasing degrees of deviation from the current operational rules as follows:

- Analysis 1: Keeps the existing RIOP and hydropower rules and makes modifications to reservoir coordination within the confines of the existing rules.
- Analysis 2: Keeps the existing RIOP rules, makes modifications to reservoir coordination, and makes modifications to hydropower rules.
- Analysis 2b**:** Makes modification to reservoir coordination, makes modifications to hydropower rules, and makes modifications to RIOP rules. Modifications were designed to follow similar general structures as those used by USACE in the current operations.

Under current CUs, modifications to reservoir coordination rules in Analysis 1 increase composite storage relative to current operations at West Point and Lanier. The storage of the lower reservoirs (George and Woodruff) fluctuates over a wider range. Recreation benefits increase at Lanier and West Point and stay practically unchanged at Columbus, George and Woodruff. Environmental flow metrics at Chattahoochee and hydropower metrics remain unchanged or improve, especially during dry years.

The second round of analyses builds on Analysis 1 and makes modifications to the hydropower generation rules. Results show storage increases at West Point and Lanier, especially during dry years. Storage of the lower reservoirs (George and Woodruff) fluctuates over a wider range. Total energy generation remains unchanged, but average dependable generation is reduced. Minimum dependable hydropower increases during dry years. Recreation benefits increase at Lanier and West Point and remain practically unchanged elsewhere. Environmental flow metrics at Chattahoochee remain practically unchanged.

The third round of analyses builds on both Analysis 1 and 2 and adjusts RIOP rules such that when Chattahoochee flows are less than 10,000 cfs, it adds 550 cfs to Jim Woodruff outflows during the summer months (June through September). Results show that relaxation of hydropower requirements coupled with environmental flow target increases can provide benefits for upstream and downstream uses. Other observations for these modeling assumptions include:

- The composite storage and individual reservoir storages increase (relative to current operations) at West Point and Lanier during the winter and spring months. They are not worse than current operations during the summer and early fall months. The storage of the lower reservoirs (George and Woodruff) fluctuates over a wider range.
- Total energy generation remains unchanged, but average dependable hydropower generation is reduced. Minimum dependable hydropower increases (relative to current operations) during dry years. An analysis by hydropower stakeholders projected about $1 million in lost capacity and $3 million in energy losses in terms of replacement costs. Additional modeling is needed to investigate alternative sources of supply from other basins.
- Recreation benefits increase at Lanier and West Point and remain practically unchanged elsewhere in the ACF.
- Environmental flow metrics at Chattahoochee improve, especially during extreme low flows.

Optimization for future consumptive use increases suggests that, relative to current CUs, performance metrics generally decline, though the relative magnitudes vary among the different uses. Relaxation of hydropower requirements under future consumptive use conditions results in:

- Composite storage increases (relative to current operations) at West Point and Lanier, especially during dry years. The storage of the lower reservoirs (George and Woodruff) fluctuates over a wider range.
- Total energy generation remains unchanged, but average dependable hydropower generation is reduced.
- Minimum dependable hydropower at Lanier increases during dry years.
- Recreation benefits increase at Lanier and West Point and remain practically unchanged elsewhere in the ACF.
- Environmental flow metrics at Chattahoochee remain practically unchanged.

Based on these analyses, ACFS members requested a final round of modeling to compare several combinations of options and to model drought storage conditions. See Chapter 2 and Table 5-1 below for a summary of the "portfolios" modeled.

Table 5-1 Final Optimization Run Scenarios Modeled

Variable	Portfolio A	Portfolio B	Portfolio C
Consumptive Use	Current minus 30% (with adjustments on the Flint)*	Current	2050minus 10% (with adjustments on the Flint)*
West Point Rule Curve Adjustment	Increase winter pool from 628 to 632.5	Increase winter pool from 628 to 632.5	Increase winter pool from 628 to 632.5
Reservoir Coordination	Define new zones to coincide with the USACE reservoir recreational impact zones. Only release from upstream if downstream reservoir is in a lower zone.	Define new zones to coincide with the USACE reservoir recreational impact zones. Only release from upstream if downstream reservoir is in a lower zone.	Define new zones to coincide with the USACE reservoir recreational impact zones. Only release from upstream if downstream reservoir is in a lower zone.
Hydropower Adjustment	Adjusted rules	Adjusted rules	Adjusted rules
Navigation	Spring shoulder	Spring shoulder	Spring shoulder
2 feet addition to Lake Lanier	Yes	No	Yes
Pulses**	14,000 cfs pulse for two weeks in May and 9,000 cfs pulse for two weeks in July	9,000 cfs pulse for all of May OR 9,000 cfs pulse for two weeks in May and two weeks in July	9,000 cfs pulse for 2 weeks in May and 2 weeks in July

** Portfolio A uses the following consumptive use projections:*

- *Chattahoochee and Apalachicola Rivers: Current -30%*
- *Flint River (Griffin, Carsonville, Montezuma): Current, adjusted to reflect return of all current interbasin transfers and conversion of all LAS to direct discharges at 50% of permitted LAS capacity*
- *Flint River (Griffin and Carsonville) flows augmented by up to 6.2 cfs and 9.3 cfs respectively when flows fall below monthly 7Q10 during low flows. If the maximum Griffin augmentation amount is not used and Carsonville flow is below its monthly 7Q10, then flows can be added at Griffin to aid Carsonville up to 6.2 cfs total. Monthly 7Q10 based on unimpaired flow (UIF) data 1939-1974 provided by GWRI.*
- *Flint River (Albany and below): Current -15%*

Portfolio C uses the CU as Portfolio A, except Chattahoochee and Apalachicola Rivers use 2050 projections -10%

*** Pulses were modeled as 9000 cfs flows at Chattahoochee FL (not as an additional 9,000 cfs) – as well as at 14,000 cfs – and only during periods when flows fell below 9,000 cfs (thus not reducing flows to 9,000 cfs when flows otherwise would have been higher).*

With the operational changes described and reductions in consumptive use (Portfolio A), there is more water in storage and, thus, more water available for increased environmental flows (pulses). At current consumptive uses, with these same operational changes but without the two foot increase in the rule curves at Lanier (Portfolio B), pulses can still be accommodated although at a lower level. The two foot increase at Lanier accommodates both increased consumptive use and pulses (Portfolio C). Generally, with all three portfolios, the window for navigation increases, recreation improves at Lanier and West Point but has some impacts at George and Woodruff, and dependable hydropower is reduced.

Drought storage modeling results suggest that, under current CUs and minimum Woodruff release targets in the 5,000 to 6,000 cfs range, drought storage requirements amount to 42 to 65 percent of the total composite conservation storage. Under projected future CU increases and minimum Woodruff release targets in the 5,000 to 6,000 cfs range, drought storage requirements amount to 58 to 86% of the total composite conservation storage. Lanier contributes more than 75% of the total required drought storage in all cases. Under projected future CU increases, the critical drought period for Lanier extends an additional year.

Predictive Drought Management

The impacts of extended drought affect all stakeholders in the ACF Basin. The earlier that drought conditions can be predicted, the earlier water managers can respond and, thus, the more likely those responses will have less adverse consequences. Thus, ACFS commissioned GWRI to examine potential changes to the Water Control Manual that would incorporate the use of predictive drought indicators that would reliably anticipate potential drought and non-drought periods and would enable USACE to adjust operations to mitigate stakeholder impacts or realize additional benefits. The study examined tools that would provide information on expected operational adjustments reliably and with sufficient lead time.

GWRI compared 90 distinct indices and their lag times (nine specific indices over 10 sub-basins or nodes) against the period of record for accuracy and reliability. Index variables with good explanatory value were the previous months' UIFs, soil moisture using the GWRI watershed model, and the Palmer Drought Severity Index (PDSI).

The reason the soil moisture reservoir is a useful predictor is that it is a major contributor to baseflow in surface water. They also noted that the best forecast models for different sub-basins may use different index variables.

GWRI modeled various combinations of assumptions with associated adjustments to reservoir operations and concluded that varying reservoir release rules based on predictive drought indicators would be beneficial to stakeholder interests. GWRI provided a set of assumptions and a method for predictive drought management that, as an example, produced results better than Portfolio B when compared against stakeholder metrics.

Apalachicola Bay and Estuary Assessment

The Apalachicola Bay and Estuary is a complex ecosystem, providing habitat to numerous plants and animals. There are many potential factors that may affect oyster health including increased disease and predation as salinity in the Bay

increases without the typical rate of freshwater inflow – due to naturally dry conditions as well as water consumption, nutrient limitation of the food web, and levels of oyster harvesting. This SWMP addresses one factor in this complex system, which is the extent to which freshwater input to the Apalachicola Bay can be increased through better management throughout the ACF Basin.

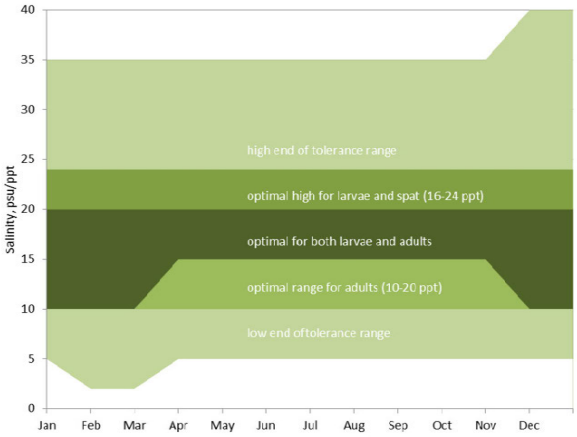
Salinity is often viewed as one of the principal drivers affecting oyster growth and reproduction. The salinity distributions in Apalachicola Bay change in complex ways in response to many factors, including freshwater inflow from the Apalachicola River, tides and wind. At high salinities, oysters are susceptible to predation and disease. The salinity conditions relevant to oysters, then, are a function both of the oysters' salinity tolerance and the tolerance of the organisms that prey on or affect the oysters.

Although oysters can survive high salinities (40 for adults and 35 for larvae), mortality due to both predation and parasitic infections (i.e. *Perkinsus marinus)* increases with increasing salinity, with a noticeable break between 17 (less predation/ parasitism) and 25 (greater predation/ parasitism) (Petes et al. 2012). Studies at Cat Point and Dry Bar in Apalachicola Bay showed maximum growth rates occurred between approximately 17 and 26 (Wang et al. 2008)

Atkins selected bay bottom salinities ranging from 10 to 24 psu/ppt as the most desirable for oyster habitat in Apalachicola Bay for purposes of comparing hydrodynamic model outputs for WMAs with respect to seasonal distribution of salinity at various oyster bar locations.

A simple summary of selected desirable salinity ranges for oyster adults, larvae, and spawning is presented in Figure 5.1.

Figure 5-1 Salinity Ranges Affecting the Eastern Oyster



A total of eight scenarios were evaluated, including historic flows (USGS data at Sumatra), modeled unimpaired flows (UIF), current conditions (RIOP with Consumptive Use and RIOP with no CU) as well as four round two portfolios as follows:

- Scenario 1) Historic Sumatra Flows (USGS flows)
- Scenario 2) Unimpaired Flows (UIF)
- Scenario 3) Revised Interim Operations Plan (RIOP with Consumptive Use (RIOP CU)
- Scenario 4) RIOP without Consumptive Use (RIOP No CU)
- Scenario 5) Portfolio B Run 1 (current CU, reservoir coordination adjustment, West Point and hydropower adjustments, single 4-week pulsed water release)
- Scenario 6) Portfolio B Run 2 (current CU, reservoir coordination adjustment, West Point and hydropower adjustments, two 2-week pulsed water releases)
- Scenario 7) Portfolio A (current CU reduced by 30% with variations for the Flint, reservoir coordination adjustment, West Point and hydropower adjustments, two 2-week pulsed water releases, 2 ft increase at Lanier)
- Scenario 8) Portfolio C (future CU reduced by 10% with variations for the Flint, reservoir coordination adjustment, West Point and hydropower adjustments, two 2-week pulsed water releases, 2 ft increase at Lanier)

Outputs from the GWRI hydrodynamic model were used to calculate the percentage of time and number of days that salinities were in the desirable range for oysters (10-24 salinity range from May to October) at the five oyster regions in the bay and nine discrete stations. Salinity distributions were examined for a subset of months (May to October) that coincide with the period over which gametogenesis is likely to occur (when water temperature meets or exceeds 26°C).

Model results predicted the greatest increase in number of days in the range of salinities described above under Portfolio A at seven of the nine discrete stations and all of the five areas. With two exceptions (stations C and E), model results from all of the round two portfolios predicted increased number of days in the identified range in comparison with current conditions (scenario 3/RIOP with CU).

The relative performance among the various WMA scenarios was compared based on the number of days in which salinities under each scenario fall within the 10-24 ppt salinity range from May to October selected by Atkins. This is summarized in Table 5.2 both for discrete stations and for oyster regions.

Table 5-2 Scenario Ranking by Station and by Oyster Region

Station	A	B	C	CP	D	DB	E	F	G
More days	7	7	7	7	7	7	7	6	5
	6	6	6	6	6	5	3	8	7
	8	8	8	8	8	6	5	7	6
	5	5	3	5	5	8	6	5	8
Fewer Days	3	3	5	3	3	3	8	3	3

Oyster Region	NOB	EAB	WAB	SGS	MILES
More Days	7	7	7	7	7
	6	6	6	6	6
	8	8	8	8	8
	5	5	5	5	5
Fewer Days	3	3	3	3	3

A comparison of the frequency at which salinity is in the range of 10 to 24 ppt at the Cat Point Station during May through October for the eight modeled scenarios is provided as an example in Table 5.3.

As an example, the suite of changes modeled in Scenario 7 (reductions in consumptive use, 2 feet of additional storage in Lanier, hydropower adjustments, and other operational changes) would result in a 20% increase in time (from 19.7% to 24% or 7.9 additional days) with salinity between 10 and 24 ppt in the eight driest years, as compared to Scenario 3 (RIOP with consumptive use). The consultants selected Bay bottom salinities ranging from 10-24 PSU/ppt as the most desirable (salinities) for oyster habitat in Apalachicola Bay. As directed by ACFS, the consultants then used this salinity range to compare the relative benefits of each scenario. The consultants did not draw conclusions as to the degree to which these scenarios will improve the health and productivity of oysters. Therefore, ACFS recommends that the effects of these flows on oyster health be studied carefully. ACFS has concluded that the combination of changes modeled in Scenario 6 (Portfolio B2) be considered as a starting point for adaptive management. (See recommendation in Chapter 6, Theme 2).

Table 5-3 Cat Point Station Results

		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 7	Scenario 5	Scenario 6	Scenario 8
Rank	Year	CP_USGS	CP_UIF	CP_RIOP_CU	CP_RIOP_No_CU	CP_Portfolio A	CP_PortfolioB1	CP_PortfolioB2	CP_PortfolioC
1	2007	7.6%	12.0%	7.6%	10.9%	16.8%	8.2%	10.9%	10.9%
2	2000	12.5%	13.0%	9.2%	13.6%	13.6%	11.4%	13.0%	12.5%
3	1986	21.2%	24.5%	19.0%	25.0%	23.9%	20.1%	19.6%	20.1%
4	2006	29.3%	38.0%	27.7%	39.1%	33.7%	28.3%	31.5%	29.9%
5	2002	2.7%	4.9%	3.3%	4.3%	7.6%	3.8%	4.9%	4.3%
6	2008	20.1%	28.8%	17.9%	24.5%	21.7%	18.5%	21.2%	21.7%
7	1993	39.1%	38.0%	34.2%	38.0%	34.8%	34.2%	34.2%	34.2%
8	1990	45.1%	42.4%	38.6%	41.8%	39.7%	39.1%	39.1%	39.1%
9	1999	34.2%	35.9%	34.2%	38.6%	35.9%	36.4%	34.2%	33.7%
10	1988	33.7%	36.4%	33.2%	36.4%	33.2%	32.1%	31.5%	32.6%
11	2001	41.3%	41.8%	40.2%	41.3%	40.8%	39.7%	39.1%	39.7%
12	1985	47.8%	46.2%	38.6%	44.0%	40.8%	39.7%	39.7%	39.7%
13	1992	41.8%	48.9%	38.6%	45.1%	40.8%	39.1%	39.1%	37.5%
14	1995	44.6%	49.5%	40.2%	44.0%	41.3%	40.2%	40.2%	40.8%
15	1987	51.1%	50.5%	47.3%	50.5%	47.8%	47.3%	47.3%	47.3%
16	1996	72.3%	70.7%	67.4%	71.7%	69.6%	68.5%	68.5%	67.4%
17	2004	55.4%	59.8%	54.3%	58.7%	56.0%	54.9%	54.3%	53.8%
18	1997	69.6%	60.3%	56.0%	58.7%	57.6%	55.4%	55.4%	56.5%
19	1998	60.3%	69.0%	68.5%	70.7%	65.2%	60.3%	60.3%	64.7%
20	1989	76.1%	76.1%	69.6%	75.5%	72.3%	71.2%	71.2%	69.6%
21	1984	67.4%	66.3%	64.7%	67.4%	65.2%	64.7%	64.7%	64.1%
22	1991	72.8%	68.5%	69.0%	68.5%	69.6%	69.0%	69.0%	69.0%
23	2005	57.6%	57.1%	56.5%	56.5%	57.6%	57.1%	57.1%	57.1%
24	2003	81.5%	80.4%	81.0%	82.1%	81.0%	81.0%	81.0%	81.0%
25	1994	77.2%	78.8%	76.6%	77.2%	76.1%	76.1%	76.1%	76.1%
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 7	Scenario 5	Scenario 6	Scenario 8
Rank	Year	CP_USGS	CP_UIF	CP_RIOP_CU	CP_RIOP_No_CU	CP_Portfolio A	CP_PortfolioB1	CP_PortfolioB2	CP_PortfolioC
Mean of Frequency for All Years		46.5%	47.9%	43.7%	47.4%	45.7%	43.8%	44.1%	44.1%
Mean of Frequency for 8 Driest Years		22.2%	25.2%	19.7%	24.7%	24.0%	20.4%	21.8%	21.6%
Mean of Frequency for 7 Driest Years		18.9%	22.7%	17.0%	22.2%	21.7%	17.8%	19.3%	19.1%
Mean of Frequency for 6 Driest Years		15.6%	20.2%	14.1%	19.6%	19.6%	15.0%	16.8%	16.6%
Mean of Frequency for 5 Driest Years		14.7%	18.5%	13.4%	18.6%	19.1%	14.3%	16.0%	15.5%
Mean of Frequency for4 Driest Years		17.7%	21.9%	15.9%	22.1%	22.0%	17.0%	18.8%	18.3%
Mean of Frequency for 3 Driest Years		13.8%	16.5%	12.0%	16.5%	18.1%	13.2%	14.5%	14.5%
Mean of Frequency for 2 Driest Years		10.1%	12.5%	8.4%	12.2%	15.2%	9.8%	12.0%	11.7%
2007		7.6%	12.0%	7.6%	10.9%	16.8%	8.2%	10.9%	10.9%

CHAPTER 6.

Recommendations

ACFS has concluded from the findings above that improvements to the current conditions in the Basin are possible and that planning for dry and drought years is critical.

ACFS urges decision makers and citizens in this Basin to implement the recommendations that follow in order to improve current conditions in the Basin and achieve more sustainable water management in the future.

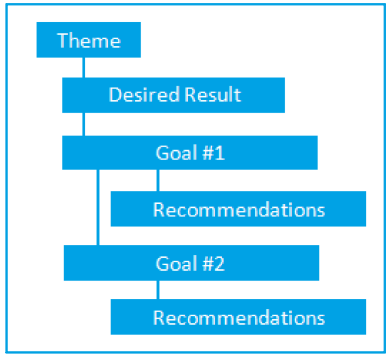
We can and must act with common purpose to manage our shared water resources sustainably. Water use efficiency and conservation measures, creative alternatives to water control operations, predictive drought management, investment in scientific knowledge for future decisions, and transboundary coordination and cooperation offer real ways to improve environmental, social and economic conditions in this Basin.

The recommendations are organized into the following themes:

- Achieve Sustainable Use and Return
- Improve Water Storage and Control Operations
- Target Dry and Drought Years
- Advance Scientific and Technical Knowledge for Future Decisions
- Strengthen Basin Coordination

The recommendations are grouped into themes, intended to achieve a desired result or goal. The structure of these themes is shown below.

Each theme is elaborated in the sections that follow, identifying desired results and goal(s) and actions for achieving those goals. However, these five themes do not stand alone. Implementation of the recommendations from each individual theme is needed for sustainable water management of the ACF Basin.



Decision makers and citizens alike play important roles to implement these actions, to learn from the results, and to adapt our actions in the future based on what we learn. Suggested roles and responsibilities are highlighted in the Implementation chapter that follows.

THEME 1

Achieve Sustainable Use and Return

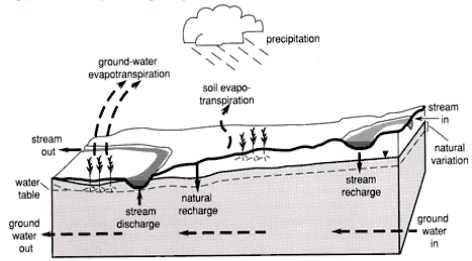
Desired Result: Ensure a reliable supply of water to sustain ecosystems to support environmental, social and economic needs.

Comparing sustainable water management to personal finance can help convey some basic concepts. If you manage a checking account sustainably, you likely do the following:

- Ensure accurate accounting of all the transactions.
- Avoid spending more than you deposit.
- Plan for emergencies by having a savings account.

A water budget operates in much the same way. The choices people make are important for sustainable water resources management, since human activities can affect the amount and timing of water flows. Unlike your personal bank account, however, there is not one entity that controls and manages the deposits and withdrawals in a basin.

Figure 6-1 Hydrologic Cycle



Water budgets also are complicated by the fact that the amount of water varies seasonally and annually, and water moves within a basin through a hydrologic cycle, as shown on Figure 6-1.

To ensure a reliable and sustainable supply of water to sustain environmental, social and economic needs, ACFS agreed on the following goals:

- Goal 1: Recognize success in water use efficiency
- Goal 2 : Achieve water use efficiency and conservation improvements
- Goal 3 : Increase water returns and return flows back to the basin of origin

Individual goals are discussed in the following sections.

Goal 1: Recognize success in water use efficiency

Sometimes when you are climbing a mountain, it is easy to forget how far you have climbed until you look back and see where you started. The adage “what gets measured gets done” also can prove helpful benchmarking in maintaining momentum and achieving more. Thus, ACFS recommends that all state and local agencies measure and recognize water efficiency gains on a regular basis.

In the ACF Basin, water efficiency gains include the following:

Municipal

Cities and towns throughout the regional are increasingly aware of the importance of reducing their impact on aquatic resources. For example, the city of Columbus GA returns much of the water it withdraws from the Chattahoochee River because approximately 95% of its service area is sewered. In addition, the total water withdrawn throughout the Metropolitan North Georgia Water Planning District decreased by almost 12% from 2000 to 2010, while the population increased by almost 1,000,000 people.

Agricultural

Agricultural water use efficiency continues to improve through innovation with mechanical retrofits that spray water closer to the ground so less water is lost to evaporation. Variable rate irrigation is another innovation that allows a farmer to refine irrigation patterns through GPS–based software, remove non–crop areas from irrigation and view soil moisture data from sensors in the field. The University of Georgia, the Natural Resources Conservation Service (NRCS), regional soil and water conservation districts, the Georgia Water Planning and Policy Center at Albany State University, and other institutions in Georgia and elsewhere are helping to develop, refine, and advance agricultural irrigation efficiency through research and demonstration projects. At the University of Georgia's Stripling Irrigation Research Park, researchers are studying new irrigation efficiency methods and technologies, including irrigation scheduling, variable rate irrigation, conservation tillage, and deficit irrigation. The NRCS's Conservation Innovation Grants program has supported projects in the region in the past few years to promote the adoption of irrigation automation for water use efficiency as well as the use of low-cost irrigation scheduling tools. NRCS also supported the Agricultural Water Enhancement Program (AWEP), a voluntary conservation initiative that provided financial and technical assistance to agricultural producers to conserve surface and groundwater and improve water quality.

Energy

Georgia Power and the Electric Power Research Institute have recently opened a Water Research Center at Georgia Power's Plant Bowen, near Cartersville, GA, to research water-dependent technologies associated with power generation. The center provides a research platform for testing technologies to address efficiencies of water use in generating electricity. Research may also result in lower water withdrawal and/or consumption, and improved overall water quality in power plant processes.

While more can be done to support Basin wide implementation of water conservation measures, recognizing success provides an important accounting benchmark and helps focus on sector appropriate demand reduction strategies in the future.

Recommended Actions

ACFS recommends that:

1.1.1 All appropriate agencies within each state should report status and outcomes of use and return policies, regulations, and practices that affect water quantity and quality in the Basin and report progress so that states can share successes with all water users in the Basin.

1.1.2 All stakeholders in the Basin promote education and public awareness of issues associated with sustainable water management planning and implementation.

Goal 2: Achieve Water Use Efficiency and Conservation Improvements

It is one thing to find fault with an existing system. It is another thing altogether, a more difficult task, to replace it with an approach that is better.

–Nelson Mandela

Analyses by the Georgia Water Resources Institute and others show that conditions improve for most stakeholder interests with reduced consumptive use in the Basin especially during dry and drought years. Under existing reservoir operations, reducing demand increases storage in federal projects increasing lake levels which, in turn, reduces the risk of having insufficient water to satisfy Basin needs during drought.

Water use efficiency and conservation can reduce consumptive use. Water use efficiency means using improved technologies and practices that deliver equal or better service with less water. For example, leak detection programs can reduce the amount of water, pressure, and energy required to deliver the same amount of water to consumers' taps. Efficiency measures conserve water. Conservation can also include beneficial reductions in water use. For example, a water conservation management practice could involve minimizing lawn watering in order to conserve water in a drought. Further advances in water use efficiency and conservation are expected in coming years.

ACFS recommends that:

1.2.1 States implement the water use efficiency and conservation policies and practices that will achieve:

- Reduced impacts to stream flow of consumptive use from agriculture by 15% overall through a suite of management practices that minimize water loss from agriculture including equipment retrofits, identification of source switching opportunities, and tillage practices including sod-based rotation.
- 80% efficiency by 2020 of all center pivot irrigation systems in the ACF Basin.
- More efficient cooling towers.
- Increased use of xeric landscaping.

- Improved commercial and industrial water conservation.
- Conservation rate structures for residential water users.
- Water efficient toilets when old ones are being replaced.
- Water utility programs to assess and reduce water system leakage.
- Limitations on non-agricultural outdoor water use during dry periods.
- Local government or permitted utility long-range water supply plans, which include the following components: a description of the water system, anticipated needs and how they will be met (including specific conservation targets), storm water management systems, system water loss and integrity, and public information/education to highlight water management concerns.
- Encouragement for experimentation for programs with the potential to improve water conservation and efficiency.

The following discussion elaborates ACFS intent with respect to several of the recommendations above.

Reduced impacts to stream flow from consumptive use from agriculture

Agriculture in the ACF Basin, particularly in the Dougherty Plain of the lower Flint and upper Apalachicola, has made tremendous strides in water-use efficiency over the last 15-plus years. Tillage practices plus hardware and software upgrades have decreased annual individual-producer water use on a per-acre basis between 5 and 20%, depending upon location and other factors. Yet, overall agricultural water use has increased over that time period, and hydrologic effects on surface-water flows have increased apace. Some of the streams which are impacted by agriculture have experienced decreases in baseflow of between 80 and 100%. Intense research on water use and management practices has been accomplished and is ongoing. There are significant opportunities to not only increase water-use efficiency, incrementally, but to also produce an instream result in terms of improvement of baseflows. Thus, ACFS is recommending as an initial operational goal to increase baseflows in areas directly impacted by agriculture by approximately 15%. Changes in a wide variety of business and management practices will be necessary to achieve this goal. ACFS recognizes these as viable areas of best practice and management activity:

- Continued hardware and software retrofits and upgrades of existing irrigation equipment inventories: end-gun shutoffs; drop nozzles; variable-rate irrigation systems including incorporation of soil-moisture sensor technologies; sub-surface irrigation systems.
- Identification of opportunities to switch agricultural users from surface-water sources, and groundwater sources that are tightly connected to surface waters, to alternative sources of water (such as deeper aquifers) so that surface flows are restored and conserved. The process of identifying such opportunities should be careful to include detailed analyses and understanding of how and to what degree alternative sources may be actually connected to the surface waters and overlying aquifers, working diligently to avoid further diminishments of overall regional resources.
- Expansion of conservation tillage practices, where applicable, such as sod-based rotation and no-till, along with other on-farm practices such as stream buffers and grassed waterways that improve soil health, water retention and water quality.
- Strategic uses of conservation easements to diminish water use and increase aquifer recharge.

Related to the goal of increasing agriculturally-affected instream flows by 15%, not only must we maintain a detailed understanding of mainstem measured flows, we must also achieve and maintain a detailed understanding of flows on major tributaries such as Spring, Ichawaynochaway, and Kinchafoonee/Muckalee creeks. Extensive databases exist and many analyses are already extant for these major tributary flowages. In most cases, the period of record equals those of mainstem gages. Their flows must be included in initial analyses and monitoring to assure maximum probabilities of success. Otherwise, there will be no clear method of measuring progress.

Improved commercial and industrial water conservation

Government officials and water managers should consider developing a commercial water audit program that targets high water users in the commercial and industrial sectors. Auditors can offer site specific assessments of use and provide suggestions for improved efficiency. These audits should consist of a site visit, characterization of existing water uses, and recommended changes to process and operations to reduce water usage.

Government officials and water managers should consider offering financial incentives, such as a rebate program, to high water users in the commercial and industrial sectors to reduce demand and improve efficiency. Rebates can be offered to businesses that retrofit buildings with high efficiency plumbing fixtures and equipment.

Government officials and water managers should consider dedicating resources to educate and assist new commercial and industrial customers on the importance of water efficiency and conservation. New customers can receive information on the maintenance of cooling towers, identifying leaks, and analyzing historical water data to identify previously undiscovered problems – such as leaks or inefficient equipment.

Government officials and water managers may also implement conservation rates for commercial customers. While increasing block rate structures may be appropriate for customers that have water use profiles similar to residential customers, commercial buildings that have more predictable water use patterns should be subject to uniform rates at minimum.

Conservation rate structures for residential water users

Conservation rate structures should set pricing signals that motivate customers to reduce waste. If properly designed, they can allow a utility to promote efficient water use while also ensuring the utility's revenue stability. Generally speaking, there are four different pricing structure options that are effective in encouraging conservation:

- Increasing Block Rate – reduces water use by increasing the per-unit charges for water as the amount used increases. The first block is charged at one rate, the next block is charged at a higher rate, and so forth. This is a common rate structure and is considered an effective and aggressive water conservation measure.
- Time of day pricing – higher prices are charged during a utility's peak demand periods.
- Water surcharges – a higher rate is imposed on excessive water use – i.e. water consumption that is considered higher than average.
- Seasonal rates – prices rise and fall according to water demands and weather conditions – higher prices usually occur during the summer.

Periodic rate adjustments may be needed to ensure that funds needed for regular operations are not jeopardized.

Replacement of old and inefficient toilets

Local water providers may offer a program to convert older and inefficient toilets to higher efficiency models (1.28 gpf) within their community. Strategies to distribute, install, or provide incentives to replace these fixtures on accounts owning pre-1993 built homes can employ the following options:

- Rebate incentive programs – customers can receive a credit to the water bill, cash, or voucher offsetting the cost for a new high efficiency toilet.
- Direct install program – the customer can exchange older toilets for a low-flow toilet with discounted installation through the water provider.

Water providers should focus on homes built prior to 1993 as they are most likely to contain inefficient toilets. Water providers should work with their jurisdiction's planning department to determine the number of housing units built by decade to determine the level of investment that will be required for a successful retrofit program.

Programs to assess and reduce water system leakage

Water systems should develop a program for identifying and reducing local water system loss. Water systems may implement the IWA (International Water Association)/AWWA (American Water Works Association) methodology for determining the extent of water losses in the distribution system. This methodology is especially relevant in that it identifies the areas of biggest water losses as well as their financial impact. Based on the data provided, the local water provider can develop a program to control water loss that is specific to their particular system. Additionally, a leak detection and repair program to recover lost water may benefit the water provider in that it can delay the need for developing new water sources and infrastructure.

The water system should keep the following in mind when developing such programs:

- Water losses should be assessed on an annual basis.
- Based on the assessment, a program should be developed for reducing water system loss.
- Achievable goals should be set to limit water losses.

Xeriscape/Climate Appropriate Landscaping

Local water providers and local governments should provide public education materials to residents on the benefits of xeriscape or climate appropriate landscaping. Education materials should demonstrate the effective methods for planning, installing, and maintaining a xeriscape. Xeriscape methods include planning around sun/shade areas, analyzing soil to understand type and fertilization needs, proper plant and turfgrass selection appropriate for climate, efficient irrigation design, sufficient mulch application, and appropriate maintenance to keep a healthy landscape.

Non-agricultural Outdoor Water Use

Water managers can also limit outdoor water demand through the implementation of a watering schedule. Decision makers should consider encouraging residents and other non-agricultural water users to direct their water consumption for the purposes of planting, growing or maintaining ground cover, trees, shrubs or other plants to appropriate times of the day (i.e. before 10 a.m. and after 4 p.m.). Outdoor water use for purposes other than watering of plants, such as washing personal cars or power washing, should be restricted to an odd/even day schedule.

Reducing outdoor water waste may be an appropriate tool to reduce water demand during dry periods. Local governments and utilities may adopt a water waste policy or ordinance to reduce the occurrence of improper irrigation and outdoor leaks. Non-compliance with the policy or ordinance may be treated as a municipal code violation.

Goal 3: Achieve Increased Water Returns

The effect of consumptive use is to decrease flows, particularly during dry years. Assuming all other things being equal, if the amount of water that is returned to the Basin is increased, consumption would be reduced and flows increased.

For some areas in the ACF Basin, portions of a water service area may be supplied from different river basins than the treatment and disposal of the resulting wastewater. This is an example of an interbasin transfer.

While, in some instances, it is possible for a wastewater provider to return some water from an interbasin transfer to the source basin once it has been treated at a wastewater facility, this can be expensive. For example, Clayton County was

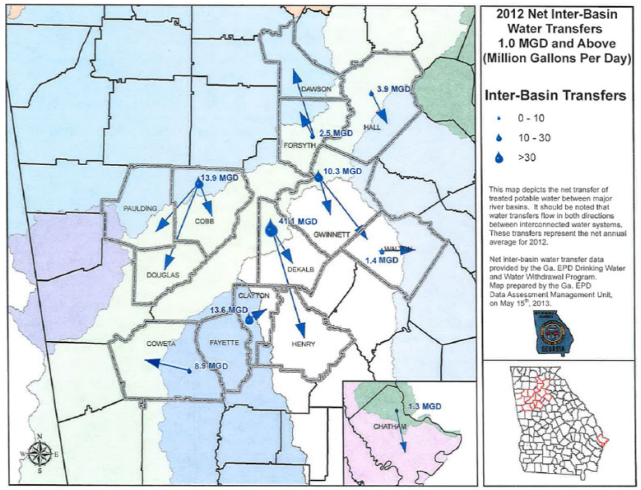
recently permitted to return 6.6 million gallons per day (mgd) to the Flint Basin rather than the Ocmulgee Basin. The estimated construction cost is $15 million. A summary of the interbasin water transfers for Chattahoochee and Flint Basins in Georgia during calendar year 2012 is shown on Figure 6-2 and in Table 6-1[11].

Table 6-1 Summary of the Interbasin Water Transfers for Calendar Year 2012

River Basin	Water Gained (cfs/mgd)	Water Lost (cfs/mgd)	Net (+/- cfs/mgd) [1]
Chattahoochee	35.2/22.8	89.4/57.8	-54/-35.0
Flint	0.0/0.0	34.8/22.5	-34.8/-22.5

[1] **Positive value indicates cumulative gain while a negative value indicates cumulative loss.**

Figure 6-2 2012 Net Interbasin Water transfers 1.0 mgd and Above: From Georgia Department of Natural Resources Environmental Protection Division



ACFS modeled a scenario in which net interbasin transfers out of the Basin were offset by flow increases into the Basin. Results show that this change increased reservoir levels and river flows. This is due to the fact that there are currently more interbasin transfers leaving the ACF Basin than entering. Consequently, "net neutral" interbasin transfers results in a net increase of the amount of water available in the ACF Basin.

[11] 2012 Annual accounting of interbasin transfers in Georgia. Produced by Georgia Department of Natural Resources Environmental Protection Division.

Response to ACF139 – ACFS

Other observations included the following:

- Flint Flows: Flint flows at all locations in the upper Flint Basin (above the Dougherty Plain) are sensitive to interbasin transfers changes, especially in dry years. Removal of the interbasin transfers results in a 20% flow increase at Griffin and a 7% increase at Carsonville during dry years.
- Reservoir Levels: Interbasin transfers removal increases the minimum lake level at Lanier by 2 feet during dry years.
- Consumptive Use: Interbasin transfers removal reduces consumptive use deficits at Griffin from 15% to nearly 3%. This is due to the fact that at this location adjusting the interbasin transfers increases return flows that were previously discharged into an adjacent basin, thereby effectively decreasing the consumptive use target.
- Hydropower: Interbasin transfers removal results in slight improvements in meeting hydropower minimum generation requirements.
- Environment: All other things being equal, removing IBTs improves environmental metrics.

ACFS recommends that:

1.3.1 Water users should implement actions that maximize water returns where ever possible. This can include, among other actions:

- Increasing connections to centralized sewage treatment, where feasible;
- Storm water management strategies that increase groundwater infiltration;
- Minimizing land application, where possible;
- Retrofitting and/or minimizing interbasin transfers (i.e. returning flows back to their basin of origin), where feasible.

Natural Flow Paradigm is the preservation of the natural flow variability and ecological function of river systems.

-From the Instream Flow Council 2008

The Instream Flow Council (IFC) is a non-profit organization made up of wildlife agencies working to improve the effectiveness of instream flow programs and activities for *conserving* fish and wildlife and related aquatic resources.

Increased returns are important throughout the Basin. Increasing returns from municipal and industrial withdrawals in the Upper Flint to a level closer to the percentage returns in other parts of the Basin is a particular priority.

1.3.2 ACFS recommends that USACE study incentivizing return flows to federal multi-purpose reservoirs in the ACF Basin by crediting such flows to the appropriate users, taking into consideration the location and

D

D. USACE's practice is to consider all return flows as basin inflow. Any changes to that methodology would require a national change. The Assistant Secretary of the Army for Civil Works is currently considering return flows as part of a national rule making.

timing of returns and potential Basin impacts, including water quality and hydropower generation. Such a study should have as its goals improving the availability of water throughout the Basin and minimizing the need for new reservoirs.

THEME 2

Improve Water Storage and Control Operations

Desired Result: Realize improved environmental, social and economic benefits from available water resources.

Healthy aquatic ecosystems ensure people and aquatic life have adequate water for instream and consumptive uses. Understanding how these ecosystems have evolved in response to flow variability is central to making decisions that keep them healthy.

Over the past 50 years, the ACF Basin has experienced alterations to its flow regime due to impoundments and reservoir operations, withdrawals, discharges, dredging, channelization, impervious surfaces, and climate change. These changes have had both beneficial and adverse consequences. While storage provides benefits in terms of the reliable delivery of water to users and environment during normal variations in flow, aquatic habitat and other ecosystem functions on which people rely have been reduced by these same alterations in normal flow variations. Recent droughts have posed further challenges to the system's resiliency, or ability to maintain function and integrity for all stakeholder interests.

However, progress toward the protection and restoration of ecosystem function and integrity – and the benefits those provide for all – can be achieved if decision makers explicitly consider the natural variability of a river's hydrologic regime in terms of magnitude, timing, duration, frequency, and rate of change, when evaluating the environmental impacts of WMAs.

"JUST AS RIVERS HAVE BEEN INCREMENTALLY MODIFIED, THEY CAN BE INCREMENTALLY RESTORED, WITH RESULTING IMPROVEMENTS TO MANY PHYSICAL AND BIOLOGICAL PROCESSES."
Poff, et.al., "The Natural Flow Regime," BioScience Vol. 47 No. 11. 1997.

Recommended Actions

Modeling done for this plan demonstrates how changes in the storage in and operations of the current federal reservoirs, in combination with the water efficiency and conservation measures discussed in Theme 1, could simultaneously improve instream flows that sustain aquatic habitats in the Basin and the Apalachicola Bay while providing for both current and future consumptive uses. These operational changes also result in improvements to instream uses in the Basin and the Bay at current consumptive uses.

This demonstration is the basis for optimism that improvements in the benefits from operations of the federal dams can be achieved. However, modeling

results must be confirmed in practice under the complex and variable realities of natural seasonal and annual variations in rainfall and human use. In reviewing the modeling results, stakeholders have additional questions about the degree of risk to upstream storage in the worst drought years, whether environmental flows at a magnitude and duration larger than what was modeled are possible and under what conditions, and how releases from the reservoirs might be managed to mimic natural flow variability more closely and still provide for authorized uses.

Thus, based on the modeling conducted for this plan, ACFS recommends that:

2.1 USACE adopt a policy of adaptive management in the revisions to the Water Control Manual, with the involvement of the states and stakeholders in the ACF Basin, implementing the following suite of actions taken together as a starting point to improve operations of the federal reservoirs on the Chattahoochee River:

- Raise the winter pool rule curve at West Point Lake from 628 ft to 632.5 ft.
- Define new zones to coincide with the USACE reservoir recreational impact zones and then only release water from an upstream reservoir when the downstream reservoir is in a lower zone.
- Adjust hydropower requirements to achieve more flexibility.
- Provide two pulsed water releases to achieve 9,000 cfs at Chattahoochee, FL for two weeks each, one in May and one in July. [12]

E

It is important to consider this suite of actions as a package. Using the banking analogy again, some of the changes add to system "savings" and others "spend" those savings on priorities for restoring instream flows and levels and for consumptive uses during droughts. Thus, each is interdependent on the other to achieve the intended results.

The sustainability of the package of recommendations, particularly under drought conditions, is based on technical modeling performed by ACFS consultants. Their adoption was predicated on three conditions: 1) the system storage during drier years is not worse than storage associated with conditions experienced currently under drier years, 2) instream flows during drier years do not become target flows in normal and wetter years and 3) the assumption (not modeled) that flood control will not be adversely affected. The sustainability of the package of recommendations and consistency with these conditions should be confirmed by USACE prior to implementation.

This adaptive management approach also should include a regular assessment of the effects of this package of operational rules and adjustments, as frequently

[12] Pulses were modeled as 9000 cfs flows at Chattahoochee, FL (not as an additional 9,000 cfs) – as well as 14,000 cfs – and only during periods when flows fell below 9,000 cfs (thus not reducing flows to 9,000 cfs when flows otherwise would have been higher).

Response to ACF139 – ACFS

E. The recommendations contained in the ACF Stakeholders' sustainable water management plan have been considered to the extent possible given the limited technical information provided. The plan is discussed in section 4.1.4 of the final EIS.

as advances in science and the results of data collection to monitor desired outcomes warrant, but no less often than every five years and more often in the first years after this approach is adopted. Such assessments should consider increases and decreases in water use over time and should seek to achieve conjunctive instream flow benefits to the environment, navigation, hydropower, and recreation through pulse magnitudes and durations under dry conditions, consistent with the conditions identified above. USACE should utilize the expertise of one or more of its centers of excellence in implementing this adaptive management approach to draw on lessons learned across the country and to enable lessons learned in this Basin to be shared more widely.

In addition to this suite of recommendations for the current revisions to the WCM, ACFS also recommends the following. Both recommendations affect the water budget in the Basin, although in different ways:

2.2 USACE study and implement, if feasible, a 2 ft increase in the rule curve at Lake Lanier.

Over time, raising the rule curve at Lanier by two feet would add about 78,000 acre-feet of storage capacity to the system, or about 7% of the original Lanier active storage, which is needed now during drought years and will be needed as conditions and needs change in the future. This SWMP does not address allocation of this capacity; however, ACFS members concur that increased storage resulting from operational changes should be shared equitably and used in a manner that relieves the adverse impacts of drought conditions.

F

2.3 USACE study and implement, if feasible, modifying the calculation of Basin Inflow to account for consumptive use, taking overall system operations into account.

Adjusting the current method for calculating Basin Inflow needs to be better understood in a system-wide context, since it could result in changes to current operations and, thus, how well stakeholder performance objectives are met. The current method now results in downstream users experiencing lower flows with increased upstream consumptive use. Such a study also should consider: 1) potential adverse effects throughout the system if the recalculation results in system storage being expended sooner or reservoir levels remaining lower, 2) potential adverse impacts downstream if the recalculation results in longer duration of flows at the 5000/4500 cfs level, 3) the challenges of collecting consumptive use information, and 4) the effects on other authorized purposes including flood control.

G

Further, ACFS also recommends that:

2.4 USACE add a flow control node in the WCM at Columbus. This recommendation is contingent on the implementation of recommendation 2.1 above and is not a standalone recommendation.

The minimum flows for the proposed node should be developed to retain an approximation of the historical flow frequency while still achieving the benefits to upstream and downstream interests sought in recommendation

H

F. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

G. During section 7 consultation with USFWS, USACE evaluated a revision to basin inflow that would account for water use consumption. A near-real-time basinwide water use reporting scheme would be required to implement the suggested basin inflow computation concept. Currently, USACE receives the actual water use data upon request. The data typically lag 1–2 years behind the current year. Until the states implement a real-time water use reporting requirement associated with withdrawal and discharge permits, USACE will continue the current basin inflow computation method.

H. The authorized purposes of the federal ACF system do not include a specific directive to meet flow targets at Columbus, Georgia, or Columbia, Alabama. The stated daily and weekly average flow targets at Columbus, Georgia, are established in the Federal Energy Regulatory Commission (FERC) license for Georgia Power Company projects downstream of West Point Lake (see section 6.1.1.2.1 of the EIS). Each of the FERC target flows include an important qualifier (e.g., “a daily average target minimum flow of 1,350 cfs, or inflow, whichever is less” [emphasis added]). Model results over the 73-year hydrologic period of record indicate that a daily average flow of 1,350 cfs at Columbus would be achieved on 94 percent of the days for the PAA compared to 95 percent for the NAA (see section 6.1.1.2.3.9 of the EIS). The Alabama Office of Water Resources and the Southern Nuclear Operating Company have identified a daily average flow need of 2,000 cfs at Columbia, Alabama, to support continued operation of the Farley Nuclear Plant. Model results indicate that the daily average flow need at Columbia would be met 95 percent of the days over the period of record for the PAA compared to 96 percent for the NAA.

2.1. The following, observed from technical modeling used to develop Recommendation 2.1, should guide establishment of flow criteria:

- Daily flow at Columbus of 1,350 cfs was maintained at a frequency of approximately 97% for all years and 90% for dry years (see Chapter 5 for detailed discussion of model scenarios).
- West Point Lake elevation of greater than 632.5 ft was maintained at a frequency of approximately 82% for all years and 50% for dry years, and an elevation of 628 ft was maintained at a frequency of nearly 98% in all years and approximately 82% in dry years.
- Daily flow at Columbia of 2000 cfs was maintained at a frequency of approximately 97% for all years and 90% for dry years.

Criteria for minimum flows and lake levels that may occur as a result of extreme drought events should be developed through additional technical and stakeholder engagement and should incorporate the use of predictive drought triggers as discussed in Recommendation 3.2. USACE should work with Georgia Power and the State of Georgia to determine how operations need to be coordinated in order to meet these minimum flows effectively since Georgia Power reservoirs are between West Point Lake and the Columbus node.

This recommendation is intended to be implemented in the context of the overall recommendation that USACE take an adaptive management approach to the WCM, considering the needs and performance objectives of all stakeholders within the Basin. This includes the needs of upstream and downstream users as well as a variety of water needs throughout the Middle & Lower Chattahoochee Basin including: lake levels at West Point Lake for recreation and other purposes, municipal water supply (Columbus, Phenix City, AL, Ft. Benning), wastewater assimilation (Columbus, Phenix City, Ft. Benning, Meade Westvaco, GA Pacific Corp), recreation (whitewater boating in Columbus), environmental (shoal habitat restoration in Columbus) and nuclear power generation (Plant Farley).

In addition, ACFS recommends that:

2.5 USACE should work with the USFWS and other appropriate federal or state agencies to consider the Apalachicola River, Floodplain and Bay freshwater flow needs.

In its June 2012 Legal Opinion, USACE Chief Counsel states that "The system wide plan of development for the ACF Basin was intended to provide benefits for the purposes of hydropower, navigation, and flood control, estimated in annual average dollar values, and also to provide benefits for the purposes of municipal and industrial water supply, recreation, and fish and wildlife conservation, which were not quantified in the same manner." The legal opinion goes on to state that fish and wildlife protection and conservation are also general purposes for the ACF projects pursuant to the Fish and Wildlife Coordination Act.

I

Response to ACF139 – ACFS

I. USACE has worked extensively with the USFWS staff to fully comply with the requirements of the Fish and Wildlife Coordination Act (FWCA) and the Endangered Species Act (ESA) for water management activities in the ACF Basin for many years. Relative to ongoing work to update the Master WCM, the USFWS and District staff have engaged in formal consultation under section 7 of the ESA and have cooperated to develop several USFWS Planning Aid Letters and draft reports prepared in accordance with the FWCA. These consultation and coordination activities are summarized in section 6.4 of the EIS, and all pertinent documents are compiled in appendix J of the EIS.

Other federal law, policies and guidance exist that allow USACE to be proactive in sustaining and restoring ecosystem function and instream flows.

Finally, ACFS recommends that:

2.6 USACE update the Water Control Manual on a regular schedule, with a process for amending the Water Control Manual on a more frequent basis. J

Recommended Actions for Navigation

Navigation is an authorized purpose of the ACF System. Navigation availability up the Apalachicola River has deteriorated over the past 20 years as outlined under the Stakeholder Interest Section. Preliminary assessment by the Corps suggests that about 21,000 cfs at the Chattahoochee USGS gage is needed for a commercially navigable channel (9 ft. x 100 ft.) without dredging as long as minor snag maintenance is accomplished.[13] Dredging may also increase channel availability, but must be done in a manner sensitive to aquatic habitat. It has also been shown that these flow levels to accommodate navigation may also have positive implications for other conjunctive instream flow uses including fish and wildlife, recreation and hydropower.[14] Floodplain habitat health can improve with appropriately timed releases for a duration that provides inundation beneficial for vegetation, fish and wildlife. A report was developed that documents this conceptually. Sustained flows at lower levels may also have positive benefits for water based recreation in lower and mid Chattahoochee River reservoirs and the Apalachicola River when channel depths of 3 to 5 feet can be maintained through low water months. Hydropower releases can provide low cost clean energy if releases are appropriately timed.

The following are recommended steps to USACE and its partners to improve navigation and related uses, while avoiding adverse environmental impacts:

2.7 USACE perform necessary field and design studies to confirm water flows needed and to define improvements to provide a reliable navigation channel with and without dredging, including time and conditions when full nine foot commercial channel is or may not be available and the degree to which such improvements can be done while preserving or enhancing aquatic habitat. K

2.8 USACE perform necessary channel maintenance to maximize channel availability both in high flow without dredging for full nine foot channel depths and for sub-optimal channel depths (e.g. a seven foot channel). Studies outlined in recommendation 2.7 should consider channel L

[13] Verbal communications with Sam Hill (USACE) and Steve Leitman.
[14] Leitman, S, S. Graham, and C. Stover. An Evaluation of the Common Ground Between Environmental and Navigation Flows in the Apalachicola-Chattahoochee-Flint Basin. Report to Apalachicola Riverkeeper and Tri-Rivers Waterway Development Assoc. 2012.

J. For the past 26 years, USACE has attempted to update the Master WCM but has been unsuccessful through litigation, interstate compacts, live-and-let-live agreements, and injunctions. The Mobile District reviews the WCMs at least every 5 years pursuant to a South Atlantic Division regulation and updates the WCMs as needed. Section 3.2 of the EIS includes the following statement: "The Mobile District continually reviews the WCM as needed to ensure that the best use is made of available water resources." In addition, the section refers to USACE, South Atlantic Division Regulation No. RBT-2 (*Water Control Management in South Atlantic Division* [2010]), which mandates that "at a minimum, Districts should review their water control manuals/plans every 5 years." The reviews provide the basis for determining whether formal updates are needed, including any formal or informal input received from agencies and stakeholders. Future WCM updates would include appropriate technical analysis, public involvement, and environmental compliance activities.

K. USACE explored several options to provide the most reliable navigation season possible within the constraints of water availability and a lack of dredging. USACE used updated channel survey data collected during 2009 for the Apalachicola River in developing management measures for navigation. The PAA includes actions that, when supported by ACF Basin hydrologic conditions, will increase the availability of a navigable 7-ft channel in the Apalachicola River for a portion of the year (January–April/May) by making additional releases. Augmenting flows at other times of the year would jeopardize the ACF projects' abilities to fulfill other authorized project purposes.

L. Current constraints associated with navigation channel maintenance in the Apalachicola River, which are likely to continue for the foreseeable future, are described in detail in section 2.1.1.2.4.3 of the EIS. Accordingly, USACE is unlikely to pursue maintenance dredging of the navigation channel because of the environmental permitting issues with Florida Department of Environmental Protection (DEP), budgetary constraints, and other factors. Limited snagging under a 10-year Florida DEP snagging permit issued November 27, 2013, could provide some relief to users of the navigation channel. Maintenance dredging might occur in the future for other federally authorized navigation projects in the Apalachicola Bay area, subject to environmental permitting and budget considerations.

modifications that will enhance channel availability during lower flow periods.

2.9 US Coast Guard provide effective guides for channel usage by all river travelers including facilities to support electronic boat guidance.

2.10 Local, state and federal governments and private sector should cooperate to support economically feasible and environmentally sensitive development that would support commercial and recreational benefits from navigation.

Additional Discussion

Stakeholders also discussed but did not agree on including water supply planning generally in this Sustainable Water Management Plan. Clearly, the responsibility to plan for water supplies should accompany population growth. However, stakeholders do not agree that new surface water reservoirs or aquifer storage in the ACF Basin are environmentally sustainable and purchase of water from other basins raises issues beyond the scope of this Plan.

THEME 3
Target Dry and Drought Years

Desired Result: Establish a shared framework for action and specific policy tools to reduce the adverse impacts of drought conditions.

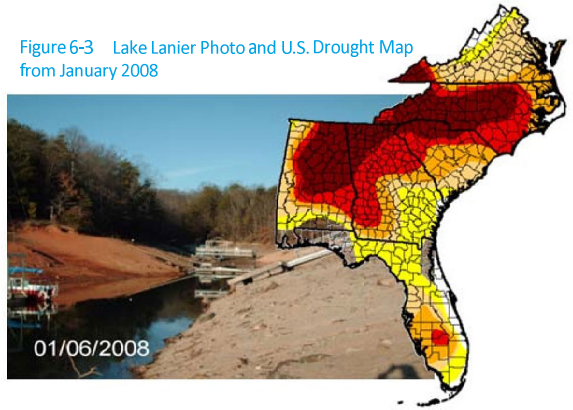
Droughts in many ways are like economic recessions. It is difficult to know when they start and end. Drought lacks a universal definition. One commonly accepted definition is that drought is a condition when there is insufficient water to meet needs.[15] Drought is often said to be one of the most complex of all natural hazards, with more people affected by it than any other hazard.[16]

The Southern U.S. has experienced severe to exceptional drought conditions in the last ten years. During droughts, ACF experiences critical stresses with respect to most water uses and interests, such as reduced reservoir levels and streamflows, increased risk in maintaining adequate water supply, lowered hydropower potential, and reduced navigation availability.

[15] Redmond, K. The depiction of drought—A commentary. Bulletin of the American Meteorological Society 83(8):1143–1147, 2002.
[16] Wilhite, DA; Glantz, MH. Understanding the drought phenomenon: The role of definitions. Water International 10:111–120, 1985.

Drought Planning Overview

Figure 6-3 Lake Lanier Photo and U.S. Drought Map from January 2008



Drought results in precipitation deficiencies and exacerbates demand placed on water resources. A drought today of similar intensity and duration as a past drought also may produce different impacts.

Because of this complexity, drought plans serve as important tools that help guide state and water managers throughout the different stages of a drought. There are a variety of different processes water users and states may follow to develop an effective plan as shown in Figure 6-4.

Figure 6-4 Drought Planning Processes

Multiple indicators for characterizing drought conditions exist, including precipitation deficits, stream flow, groundwater levels, and reservoir storage levels as shown in Table 6-2. Triggers, which are the specific values of indicators for activating drought responses, are often uniquely determined for each region. Establishing accepted drought triggers can help identify the onset and severity of deteriorating drought conditions and provide a warning for adequate drought response.

The three states have different indicators or triggers that water resource managers can use since each water basin or region is unique. Multiple jurisdictional boundaries, water supply demands and returns, and the number of water users can determine the scope and complexity of potential drought triggers.[17] While multiple drought indicators may improve detection, decision makers often use multiple indicators without realizing their spatial or temporal inconsistencies.

[17] American Water Works Association (AWWA). (2008). Drought Management Planning Handbook, Publication, Denver.

Table 6-2 Indicator Considerations

Indicator	Notes	Advantages	Disadvantages
Reservoir Level	Historical reservoirs levels are not reliable drought indicators due to changes in operations and uses over time. Instead, drought triggers relying on simulations using historical hydrology with current basin conditions should be considered.	Generally easy to measure.	Simulated levels may have to be used.
Streamflow	Streamflow is the result of the total moisture in the watershed. It is a function of soil moisture, groundwater levels, runoff, and precipitation.	Accessible data through the network of USGS gages. Integrates soil moisture, groundwater level, runoff, and precipitation into a single indicator.	To remove effects of changing operations and water use over time, simulated streamflow or unimpaired streamflow should be used.
Groundwater Level	More important for many public water supply systems in the Coastal Plain.	Generally easy to Measure. Readily available where wells exist; groundwater levels in near surface aquifers reflect expected baseflow.	Groundwater levels are usually the slowest to respond to drought and the slowest to recover from drought. Other factors such as pumping could complicate the use of groundwater levels. Information available only where wells exist.
Drought Monitor	Integrates several drought indices and ancillary indicators into a weekly operational drought-monitoring map product.	A "big picture" assessment of drought conditions. Relatively simple presentation allows public, media, policy makers, and others to assess drought conditions.	Not intended to reflect drought conditions at smaller resolutions.
Precipitation (SPI)	Standardized Precipitation Index (SPI) quantifies precipitation deficit for multiple timescales, such as for 3-, 6-, 9-, and 12-month prior periods, relative to those same months historically.	Standardized, so its values represent the same probabilities of occurrence, regardless of time period, location, and climate.	1) No soil water-balance component, thus no ratios of evapotranspiration/potential evapotranspiration (ET/PET) can be calculated. 2) Generally calculated for a single gage, which may or may not adequately capture the spatial resolution.
PDSI AND PHDSI	Palmer Drought Severity Index (PDSI) and Palmer Hydrologic Drought Index (PHDI) The PDSI is derived from a moisture balance model, using historic records of precipitation, temperature, and the local available water capacity of the soil. The PHDI uses a modification of the PDSI to assess longer term moisture anomalies.	Permit comparisons of drought events over relatively large areas. Offer a long-term historic record, going back more than 100 years.	Cumulative frequencies vary, depending on the region and time period under consideration Indices are based on departures from climate normals, with no consideration of precipitation variability, so they tend not to perform well in regions with extreme variability in rainfall

Adapted from the following sources:

[1] Steinemann, A., Hayes, M., and Cavalcanti, L. (2005). "Drought indicators and trigger." Drought and water crises: Science, technology, and management issues, D. Wilhite, ed., Dekker, New York, 71-92.

[2] Wilhite, DA; Glantz, MH. Understanding the drought phenomenon: The role of definitions. Water International 10:111–120, 1985.

[3] Mizzell, Hope, Improving Drought Detection in the Carolinas: Evaluation of Local, State and Federal Drought Indicators, Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in the Department of Geography College of Arts and Sciences, University of South Carolina, 2008.

Modifying Drought Management in the ACF Basin

Drought management involves temporary, equitable reductions in water uses during droughts to conserve water so that deeper reductions or even catastrophic shortages can be avoided. A drought management plan typically includes triggers and reductions, either of which can be tiered to reflect increasing levels of drought. Triggers are conditions that activate or deactivate different levels of the drought management plan. Reductions are the amounts by which water uses are decreased once a level of the drought management plan has been triggered. Reductions can be applied in different ways to different water users or can vary by location.

Conceptual differences exist between two types of indicators, those based on measurements and those based on forecasted values. Examples of measured indicators include: reservoir storage or levels, composite reservoir storage, recent stream flows, groundwater levels, and drought indices such as the Standard Precipitation Index or Palmer Index. Forecasted values include: prediction of inflow quantities over coming months, classification of an upcoming season into wet/normal/dry categories, and modeled soil moisture. Triggers can be constructed by combining multiple indicators.

Measured indicators are more likely to be accurate, but are considered "lagging" indicators in that they often trigger action after drought has already become severe and options are more limited. Indicators based on forecasted values may not be as accurate, but they may allow more proactive and gradual reductions because those actions can be put in place earlier.

Recommended Actions

ACFS urges local, state and federal decision makers to establish consistent drought management plans that trigger incremental and equitable actions as early as possible. Water users and water managers need to be more proactive and less reactive in order to manage the system sustainably.

3.1 The states of Alabama, Florida and Georgia should collaborate in the development of a drought management plan, perhaps in the context of a regional MOU that includes the following:

- Defines drought conditions, using NOAA as a resource
- Identifies triggers for actions
- Delineates responses by water use sector
- Documents changes in operational strategies

The states are urged to collaborate with USACE, USGS, USFWS, EPA and NOAA (NIDIS) to develop a mechanism for determining drought triggers and to develop an ongoing evaluation of drought conditions in the Basin. Additionally, the states should develop appropriate conservation actions throughout the Basin and work with USACE to develop appropriate changes in operations when flows and levels reach drought conditions in sub-regional portions of the ACF Basin. Such a mechanism should recognize that reservoir operations and other actions taken by people may create drought-like conditions for some users even when the Basin as a whole is not in drought. Graduated drought mitigation actions should be considered for sub-basins not experiencing drought to help address conditions within sub-basin(s) experiencing drought.

3.2. ACFS urges USACE to utilize predictive drought indicators in the revised Water Control Manual. Various combinations of predictive drought indicators can be used that allow operation decisions to be made in drought years that enhance system flows while still preserving adequate reservoir storage during the drought. As a starting point for discussion, drought management planning discussions should consider: M

- Triggers based on drought conditions (antecedent inflow, areal precipitation, and soil moisture), streamflows, time of year, and remaining storage in federal reservoirs.
- The RIOP uses composite storage alone as a drought trigger. USACE should also consider the state of the Basin (how dry or wet) in triggering drought operations. A drought index should be developed to guide the decision based on the predictive drought indicators selected (e.g. antecedent Mean Areal Precipitation and/or soil moisture). In addition, USACE should use regional sub-basin drought indicators (e.g. for the Apalachicola River, Apalachicola Bay, the middle Chattahoochee or the Flint) to consider changes in operations rather than waiting for designation of drought in the entire ACF Basin.

3.3 The State of Georgia, through financing or other mechanisms, should facilitate the augmentation of instream flows through the use of existing storage in existing reservoirs constructed, owned or operated by local governments, especially in the Upper Flint River Basin.

3.4 USACE should develop special operations to address extended drought (multi-year) conditions in the Basin, based on the proactive, predictive triggers and responses as recommended above. N

THEME 4

Advance Scientific and Technical Knowledge for Future Decisions

Desired Result: Improve understanding of the watershed to support adaptive management.

Developing a common, scientifically valid understanding of the ACF Basin is one of the goals of ACFS. In the development of the Plan, ACFS members gained a better understanding of the Basin and the Apalachicola Bay, but also encountered challenging gaps in scientific and technical knowledge both for near-term decisions and for future adaptive management. This theme identifies some of the information needs in the Basin.

Response to ACF139 – ACFS

M. The drought contingency plan contained as an exhibit in the WCMs in appendix A of the EIS includes a discussion of drought identification and the National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional drought early warning information system. The system will use key indicators of drought to make timely drought forecasts. USACE is a contributor and user of the NIDIS pilot project tool.

N. The drought contingency plan (DCP) contained as an exhibit in the WCMs in appendix A of the EIS includes a discussion of drought identification and National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional drought early warning information system. The system will use key indicators of drought to make timely drought forecasts. USACE is a contributor and user of the NIDIS pilot project tool. The DCP describes the emergency operations that would occur in the event of extreme drought conditions, most likely resulting from a multiyear drought.
The WCMs contain a drought plan that provides guidance for managing system operations during extended droughts. USACE addressed and considered the information provided in the sustainable water management plan before determining the PAA in the final EIS.

What is Adaptive Water Management?

Traditionally, water resource management involved using historical data to predict future conditions.

Adaptive water management is an approach that is able to operate under a wider range of variability and with a greater focus on gathering data to inform future decisions. It encourages articulation of performance measures, monitoring to assess how well planned actions are achieving the intended objectives, and adjustments in plans based on what was learned. Within the corporate setting, similar concepts are total quality management and continuous improvement.

Figure 6-5 Data Decision Feedback Loop

Adaptive management is a structured, iterative process of optimal decision-making in the face of uncertainty, with an aim to reduce uncertainty over time via system monitoring.[18] As new knowledge is gained, predictive models can be updated and management decisions adapted based on new data collected on the performance of the previous decision as shown on Figure 6-5. The feedback loop is the tool at the heart of adaptive management.

The WaterSMART Geographic Focus Area Study in the ACF Basin

WaterSMART, which stands for Sustain and Manage America's Resources for Tomorrow, is an initiative launched by the U.S. Department of the Interior in February 2010 to implement the SECURE Water Act. One of the three geographic areas that the USGS is focusing on is the ACF Basin. This study will build on existing USGS data collection and modeling capabilities to enhance estimates of water use, develop linked surface-water and groundwater models, and develop relations between streamflow and ecological conditions.

The ACF Basin Focus Area Study has three major components:

- Estimating water use. The water-use component is developing a site-specific database of water use for the ACF Basin, developing improved methods for estimating agricultural withdrawals, and compiling available water-use projections.
- Modeling surface-water and groundwater flow. The hydrologic modeling component will consist of a surface-water model for the entire ACF Basin and a groundwater model for the lower ACF Basin. These models will be linked where agricultural pumpage of groundwater is greatest.
- Developing a better understanding of the ecological effects of hydrologic alterations. The ACF River Basin's physical and biological diversity, and its importance to diverse water users, provide an ideal context for developing tools that will allow stakeholders to better estimate streamflow requirements for ecological purposes. Ecological water science activities in the ACF combine basin-wide streamflow models with on-the-ground measurements of changes in the occurrence or abundance of different kinds of fish and mussel species.

The Study is expected to be completed in 2015. Additional information can be found by visiting:
http://water.usgs.gov/watercensus/acf.html

[18] Stankey, George H; Roger N. Clark and Bernard T. Bormann. Adaptive management of natural resources: theory, concepts, and management institutions. Gen. Tech. Rep. PNW-GTR-654. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, 73 p.

Recommended Actions

ACFS members recommend that investments in the knowledge about the Basin be made in the following areas:

- Environmental and ecological studies
- Climate variability studies
- Shared real-time water use/return/storage/flow information
- Improvements in modeling

Additional Environmental and Ecological Studies

ACFS agrees that maintaining the ecological integrity of the water and land resources now and in the future is a priority. Understanding what will be needed to achieve this will require additional environmental and ecological studies. These include information needed for instream flow assessments in all three rivers, expanded Bay modeling and interconnectivity between land application, agricultural water use and groundwater recharge, among others.

Specifically, ACFS suggests that USACE develop a full instream flow assessment, taking into consideration the natural variability of the ecosystem's hydrologic regime (magnitude, timing, duration, frequency and rate of change) as a framework for the EIS for the revisions to the Water Control Manual. This should be done in coordination with USFWS, NOAA, EPA, ACFS and others.

Climate Variability Studies

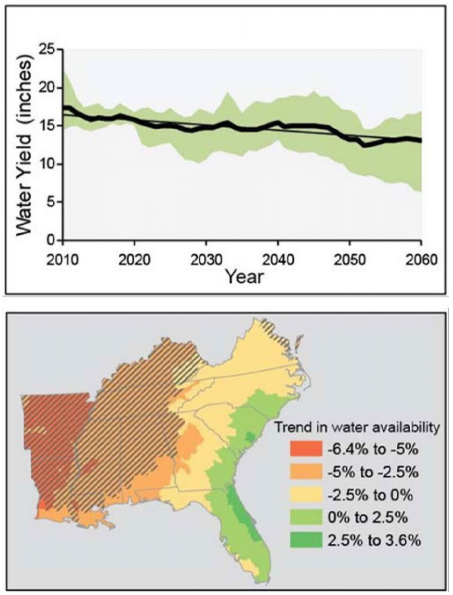
Climate varies over seasons and years instead of day-to-day like weather. In April 2014, 300 experts guided by a 60-member Federal Advisory Committee produced the National Climate Assessment, which summarizes the impacts of climate change and variability on the United States, now and in the future. For the Southeast, the report noted the following:

- While temperatures across the Southeast and Caribbean are expected to increase during this century, projections of future precipitation patterns are less certain than projections for temperature increases.[19]
- The net water supply availability in the Southeast is expected to decline over the next several decades, particularly in the western part of the region as shown in Figure 6-6[20].

[19] Kunkel, K.E., L.E. Stevens, S.E. Stevens, L. Sun, E. Janssen, D. Wuebbles, C.E. Konrad, II, C. M. Fuhrman, B.D. Keim, M.C. Kruk, A. Billet, H. Needham, M. Schafer, and J.G. Dobson, 2013: Regional Climate Trends and Scenarios for the U.S. National Climate Assessment.
[20] Sun, G., S. Arumugam, P.V. Caldwell, P.A. Conrads, A.P. Covich, J. Cruise, J. Feldt, A. P. Georgakakos, R.T. McNider, S.G. McNulty, D.A. Marion, V. Misra, T. C. Rasmussen, L. Romolo, and A. Terando, 2013: Impacts of climate change and variability on water resources in the Southeast USA. Climate of the Southeast United States: Variability, Change, Impacts, and Vulnerability, K.T. Ingram, K. Dow, L. Carter, and J. Anderson, Eds., Island Press, 210-236.

A better understanding of the implications of possible future conditions can help with management decisions. For example, since changes in temperature can have an effect on reproduction in fish, additional scientific research could help determine the potential impacts on fish spawning and migration in the ACF Basin from changing rainfall, temperature increases, and sea level rise.

Figure 6-6 Projected trend in Southeast annual water yield due to climate change. The green area represents the range in predicted water yield from four climate models (Adapted from the 2014 National Climate Assessment Report from the U.S. Global Change Research Program)



Shared Real-time Water Use/Return/Storage/Flow Information

Access to real-time water information is fractured among different federal agencies, state agencies, and water users. For example, while USGS provides data access to river flow (approximately 15 minute interval) and lake levels (daily basis), there is no single location where stakeholders and water managers can access information concerning the status of the Basin's rivers and lakes.

ACFS members believe better real-time water data will enhance Basin water management decisions.

Improvements in Modeling

During the development of the SWMP, questions about specific sources of data used as inputs to modeling basis arose. For example, the UIFs dataset used in the modeling was examined in a study for ACFS by the Georgia Water Resources Institute/Georgia Tech. UIFs for the ACF Basin have been developed by the U.S. Army Corps of Engineers Mobile District and by the Georgia Environmental Protection Division (GAEPD). These UIFs have been used to evaluate the comparative effects of alternative development and management plans. The study found some methods to improve this dataset; however, additional funding to improve this dataset was not available.

Some stakeholders are concerned about policies that rely on UIFs to the extent that uncertainties in the assumptions may lead to a UIF data set that substantially diverges from historical stream flows. Although modeling results

using UIFs are intended for evaluating the relative benefits or impacts of water management alternatives, these stakeholders are concerned that modeling outputs may lead to policies that do not accomplish the intended goal. For example, modeled results may be too optimistic and, thus, policies allocate more water than will actually be available over time, if consumptive uses actually are higher than assumed or evaporation losses are lower than assumed.

Recognizing that all UIF data sets have flaws, ACFS decided to use the existing UIF data sets, in part because of the time and expense involved in commissioning a revised UIF data set, but also so that the modeling conducted for this plan would provide comparable results to modeling being done by USACE for the Water Control Manual revision.

In making this decision, ACFS also approved initiating development of a recommendation to the states and USACE regarding improvements to the UIF dataset, continuing on-going dialog with natural resource agencies regarding the environmental flows performance metrics, relative to the concerns about errors in the UIF dataset and a discussion of the UIF uncertainties.

Therefore ACFS members recommend that:

4.1 USACE, in cooperation with the states, improve and further refine the UIF data set currently available for the ACF Basin. These refinements should assess the timing of the relationship among precipitation, evapotranspiration and flow; whether farm ponds supplement, reduce, or do not meaningfully alter low flows during droughts; and other items as determined appropriate by USACE. O

4.2 The following additional studies be considered, among others, as funding becomes available. Government agencies, academic institutions and private organizations may wish to undertake or to sponsor specific studies within their areas of expertise or mandate; collaborative efforts are encouraged; and results should be shared widely.

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O. The unimpaired flow data set has continued to expand since its initial development and release in 1997 to support USACE's *ACT/ACF Comprehensive Water Resources Study*. Limitations of the data usage are included in the Unimpaired Flow Report in Volume I, Surface Water Availability, of the 1997 Water Resources Study. The unimpaired flow data set has been updated for the period 1939–2011, and documentation has been included in appendix O of the final EIS. With every update to the data set, USACE shared the data with the three states—Alabama, Florida and Georgia—for review and input. The data set was developed to provide modeling support for the impacts analysis of proposed water management alternatives. USACE will continue working with the states to improve the unimpaired flow data set for the intended purpose. An important distinction: The unimpaired flow data set was never intended to represent natural flow conditions.

Table 6-3 ACF Basin Studies to Consider

Additional Environmental and Ecological Studies
Connectivity between surface and groundwater in the upper Apalachicola lower Flint Basin.
Desired flow regimes for specific species of interest for reaches throughout the Basin.
Instream flow assessment that determines flow variability and flow needs in the Flint River.
Flow needs for both cold water (trout) and warm water (shoal bass) fisheries in the upper Chattahoochee River.
Comprehensive hydraulic, hydrologic, hydrodynamic and geomorphic assessments and monitoring of Apalachicola Bay and establish a Bay Recovery and Management Plan to sustain 7500 acres of healthy oyster bar habitat.
Apalachicola River fluvial geomorphologic assessment and restoration project evaluation and prioritization for recovery of flood plain connectivity, channel pattern, profile, and cross section and overall ecological function.
An Apalachicola Bay Management Plan specifically related to saltwater intrusion, fishery management, etc.
Expanded bay monitoring.
Additional measures to improve consistency in the performance data. Additional measures could include the number of days with inundated floodplain and monthly increases/decreases in acres of healthy oysters in the Apalachicola Bay.
Interconnectivity between land application, agricultural water use, and groundwater recharge.
Study on flow impacts to eastern gulf.
Woodruff Dam structural improvements to eliminate operational constraints
Potential river channel modifications including physical habitat restoration to improve ecological conditions and improve flood plain connectivity.
Potential bay modifications that could enhance maintenance of desirable salinity ranges for oysters during low flow conditions.
Improve understanding the impact of farm ponds and other impoundments and their hydrologic function.
Upper Flint Reservoir Study to investigate the feasibility of utilizing existing reservoir in the upper Flint for support of instream flows during droughts.
Feasibility of converting direct stream withdrawals to groundwater sources and exploring the feasibility of switching those Floridan Aquifer withdrawals that have strong (>0 .4 or 0.5:1) connections to surface stream flows to deeper aquifers, along with the exploration of the switching of surface withdrawals.
Climate Variability Studies
Climate variability projections in the ACF Basin to improve the accuracy of forecasted weather patterns, resulting rainfall projections, and sea level rise.
Effect of climate variability on sea level rise on Apalachicola Bay and its estuaries.
Effect of climate variability on fish spawning and migration in the ACF Basin.
Effect of climate variability on impacts of and potential mitigation both for droughts and floods, including implications for flood control and storage infrastructure.
Provide real-time flow and storage information and move toward the capability to add real-time withdrawal and return flow information.
Increase the number of rainfall/ flooding forecast sites in the Basin.
Develop comprehensive database of ACF rainfall data (this could also provide useful information for Basin modeling).
Develop a web-based tool to explain real-time water management constraints and drivers.
Improve the unimpaired flow (UIF) data set, in particular to address systematic errors that may exist.
Increase the number of continuous, real-time water flow, groundwater monitoring, and water quality monitoring stations in the Basin
Other Studies
West Point and Lanier Studies to implement rule curve changes.
Alternative Water Supply studies to meet projected increases in consumptive use in the Basin.

Funding for Additional Studies

ACFS recommends that funding be appropriated for additional studies in order to ensure continued progress toward better water management in the ACF Basin. Recommendations include the following:

4.3 Federal funding should be sought for federal, state and regional basin studies.

4.4 All states should provide funding for ongoing research studies for enhanced Basin understanding.

Consistent Permitting and Better Water Use / Return Reporting

4.5 ACFS members agree that more consistent permitting and better water use and return reporting would be beneficial to water management in the ACF Basin and urge Alabama, Florida and Georgia to review their policies for consistency with the following desired objectives:

- Water withdrawal permits for all groundwater and surface water withdrawals in the Basin will be required for users greater than 100,000 gallons per day.
- All permitted municipal and industrial water users (including both surface and groundwater) self-report daily water withdrawals in electronic format on a monthly basis. All permitted agricultural users (including both surface and groundwater) self-report water withdrawals in electronic format annually. States should report status and outcomes of use over time to the public.
- All water dischargers self-report daily water discharges in electronic format on a monthly basis.
- Permit issuers should develop usage benchmarks calculated in a consistent way.
- Establish a consistent, strong permit enforcement program.
- Perform a comparative evaluation of the water use regulatory and permitting systems and consider adopting approaches that would enhance water availability for the existing and future uses/needs in the ACF Basin.

THEME 5

Strengthen Basin Coordination

Desired Result: Establish sustainable, efficient, and adaptive Basin-wide management of water resources.

The Water Resources Reform and Development Act of 2014, signed by the President on June 10, 2014, could not be clearer. Discussing conflicts in the ACF, Congress states the following in Section 1051:

> *"Interstate water disputes of this nature are more properly addressed through interstate water agreements that take into consideration the concerns of all affected States including impacts to other authorized uses of the projects, water supply for communities and major cities in the region, water quality, freshwater flows to communities, rivers, lakes, estuaries and bays located downstream of projects, agricultural use, economic development and other appropriate concerns. To that end, the Committees of jurisdiction strongly urge the Governors of [Florida, Georgia, and Alabama] to reach agreement on an interstate water compact as soon as possible, and we pledge our commitment to work with the affected States to ensure prompt consideration and approval of any such agreement."*

ACF Stakeholders agree that a mechanism for Basin coordination should be established through a carefully constructed, enduring management framework that fosters collaboration and responds to changing conditions. This is possible if a concerted effort is made. Congress has issued an invitation; the time to respond is now.

The current adversarial relationship between the states cannot be ignored and should not be dismissed. Nor should it paralyze action. The current climate of litigation is, in fact, the reason it is more critical than ever to provide an *immediate* forum for discussions among water users, state and federal agencies, and state executive offices. Thus, ACFS recommends establishment of a transitional organization that brings all parties together at least to start a conversation that might lead to a common vision and framework for a formal transboundary institution.

Establishment of a transboundary water management institution can coordinate and integrate existing water programs, address gaps, provide an ongoing forum for building consensus and resolving conflicts between jurisdictions and upstream and downstream users, and anticipate and respond equitably to changing conditions in climate, population, and land use.

No organization currently exists to perform such essential services in the ACF. A new transboundary organization can provide the ongoing administrative infrastructure needed to transcend current jurisdictional divisions to promote water security, aquatic health and biodiversity, and economic development for all three states.

Many lessons can be learned from the numerous examples of transboundary water management institutions across the United States and around the world. Among these lessons is the value, even the necessity, of engaging all concerned in determining the functions and shaping the institutional arrangements best tailored to the specific needs and circumstances in that Basin. In other words, begin now but take the time needed to establish a lasting mechanism. This is particularly important in the ACF Basin.

Transitional organizations have been successful facilitating the discussion and consensus necessary to build support for permanent transboundary water management institutions. For example, in 1955, after 25 years of litigation and a U.S. Supreme Court decree, the governors of the states in the Delaware River Basin and the mayors of Philadelphia and New York established the Delaware River Basin Advisory Committee to survey its water resources and recommend a course of cooperative action; the group's work ultimately resulted in the drafting and adoption of the Delaware River Basin Compact in 1961 and the creation of the Delaware River Basin Commission. The Ohio River Valley Water Sanitation Commission was established in 1948 specifically to oversee pollution control pursuant to a federal-interstate compact. In determining whether they should expand their role to include water supply and other functions, the Commission in 2011 established a Water Resources Committee to identify the Basin's water resources, examine laws and regulations, and evaluate the need for and feasibility of an expanded role. The Committee includes state and federal agency representatives, appointees of the Chairman of the Commission, and ex officio technical experts.

Recommendations for a Transitional Organization Leading to a Future Transboundary Institution

Based on research of The University Collaborative funded by ACFS, ACFS recommends:

5.1 Establishment of a transitional organization that brings together stakeholders with state and federal agency representatives to develop a common vision and framework for a future permanent transboundary institution to facilitate sustainable and adaptive management of the Basin that shares water equitably among stakeholders, balancing economic, ecological and social values.

ACFS recommends consideration of three scenarios. Two initial alternatives for structuring a transitional organization in the ACF Basin are provided. In the first alternative, ACFS would maintain its current organizational framework and host the transitional organization. The other two alternatives involve creating a new entity. With the second alternative, ACFS would provide the organizational home for the new entity but would accommodate federal and state

representatives. Two potential models for the second alternative are: (a) the Catawba-Wateree River Basin Advisory Commission, and (b) the ACT[21]/ACF Comprehensive Study Executive Coordination Committee and Technical Coordination Group which was active in the 1990s. The third alternative would establish a new organization, independent of ACFS. ACFS expects to make a decision on an approach in 2015.

In the ACF, the most critical role for a transboundary organization to address is the fragmentation of existing water management programs and entities in the Basin by providing a forum for collaborative planning and decision making. The organization would not duplicate existing programs but would enhance them. In 2013-2014 the TUC conducted a Gap Analysis of Water Management Functions in the ACF and, based on these findings, ACFS has identified the following as the most important functions on which a permanent transboundary organization should initially focus its efforts:

- Acting as a data clearinghouse and facilitator of common data standards (collection, management, etc.);
- Encouraging and facilitating coordination and consensus building and providing conflict resolution services;
- Supporting development of basin-level water management plans, specifically related to conservation and returns, supply augmentation and drought management; and
- Educating the general public and specific stakeholders about the need for transboundary management and particular opportunities and strategies for doing so.

More detail about these functions is defined below.

Data Clearinghouse and Facilitation

Data management and facilitation is critical in the ACF, where disputes over research and data reliability have resulted in a number of impasses. Here, a permanent water management organization could: (1) provide easily accessible, accurate and relevant data to decision makers, researchers and the general public; (2) facilitate new studies to close current gaps in data to better inform decisions; and (3) compile comprehensive datasets critical for sustainable water management (currently lacking). Easily accessible and comprehensive data could improve decision making and research and help engage and inform the general public.

[21] Alabama-Coosa-Tallapoosa (ACT)

Coordination, Consensus Building and Conflict Resolution

Empowering parties to work together rather than at cross purposes is the most important task for a permanent ACF transboundary institution. Facilitation of communication will be critical in building consensus for coordinated management and a unified vision to attract funding and other investment. Resolving conflicts is also a critical role. Water management is by its nature contentious, and transboundary negotiations can, as has been experienced in the ACF, quickly become antagonistic. Professionally facilitated consensus building and conflict resolution can help prevent disputes and find acceptable solutions to those that are unavoidable.

Adaptive Planning

Adaptive planning is used to achieve widespread institution-level goals (such as comprehensive water quality or water allocation planning) and to address specific issues (such as drought or flooding), through a structured and iterative process of decision making that aims to reduce uncertainties through time. Three priority areas for adaptive planning were identified through facilitated discussions at 2014 ACFS Governing Board meetings in Apalachicola, FL and Eufaula, AL: 1) drought, 2) supply augmentation, and 3) conservation/returns.

Drought planning is engaged in by a number of transboundary institutions, including the Murray-Darling Basin Authority in Australia, the Interstate Commission on the Potomac River Basin, and the Delaware River Basin Commission. Numerous federal, state, and regional organizations have initiated some form of drought planning in the ACF. However, these efforts are insufficient because they are limited in geographic scope and/or authority; thereby reducing their ability to influence activities outside of agency jurisdiction or across state lines. Building upon successful aspects of these efforts and harnessing existing momentum would be one appropriate course for a permanent ACF organization.

Supply Augmentation, which includes supplementing inadequate supplies with traditional (reservoirs, interbasin transfers) and non-traditional (desalination, storage and recovery) sources, requires long-range planning. These approaches are and will continue to be utilized in the ACF, and a permanent transboundary organization should be involved in planning here to some extent to ensure a system-wide perspective is maintained.

Finally, Conservation/Returns includes decreasing water demand and increasing returns to the system. Because of the large impact on water supply and the potential to alleviate effects of drought, a transboundary organization should play some role in developing plans for conservation and returns, in order to ensure costs and risks, as well as benefits, are shared evenly.

Education

It is critical to keep the public informed of transboundary water management activities and the reasons for organizational decisions. A supportive public

makes compliance with and implementation of decisions more likely and generates the political support that assures a more informed, smoothly functioning, appropriately funded, and long‐lasting organization.

Additional Recommendations

In addition to the formation of a transitional organization to provide a forum for shaping a common vision and framework for a formal transboundary institution, ACFS also recommends that:

5.2 The Sustainable Water Management Plan for the ACF Basin should be revised on a 5 to 10-year schedule.

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CHAPTER 7.
Implementation

Achieving the ACFS' vision for improvements to conditions in the Basin requires implementation of the recommendations identified and detailed in Chapter 6. What follows are general implementation actions, not necessarily the full recommendations, grouped by the suggested responsible party.

United States Army Corps of Engineers:

- Study incentivizing return flows to federal multi-purpose reservoirs in the ACF Basin by crediting such flows to the appropriate users, taking into consideration the location and timing of returns and potential Basin impacts, including water quality and hydropower generation. Such a study should have as its goals improving the availability of water throughout the Basin and minimizing the need for new reservoirs (1.3.2).

P

P. See USACE responses to these recommended implementation actions in Chapter 6 of this SWMP.

- Adopt a policy of adaptive management in the revisions to the Water Control Manual, with the involvement of the states and stakeholders in the ACF Basin, implementing the following suite of actions taken together as a starting point to improve operations of the federal reservoirs on the Chattahoochee River (2.1):
  - Raise the winter pool rule curve at West Point Lake from 628 ft to 632.5 ft.
  - Define new zones to coincide with the USACE reservoir recreational impact zones and then only release water from an upstream reservoir when the downstream reservoir is in a lower zone.
  - Adjust hydropower requirements to achieve more flexibility.
  - Provide two pulsed water releases to achieve 9,000 cfs at Chattahoochee, FL for two weeks each, one in May and one in July. [22]
- Study and implement, if feasible, a 2 ft increase in the rule curve at Lake Lanier (2.2).
- Study and implement, if feasible, modifying the calculation of Basin Inflow to account for consumptive use, taking overall system operations into account (2.3).

[22] Pulses were modeled as 9000 cfs flows at Chattahoochee FL (not as an additional 9,000 cfs) – as well as 14,000 cfs – and only during periods when flows fell below 9,000 cfs (thus not reducing flows to 9,000 cfs when flows otherwise would have been higher).

- Add a flow control node in the WCM at Columbus. This recommendation is contingent on the implementation of Recommendation 2.1 above and is not a standalone recommendation (2.4).
- Work with the USFWS and other appropriate federal or state agencies to consider the Apalachicola River, Floodplain and Bay freshwater flow needs (2.5).
- Update the Water Control Manual on a regular schedule, with a process for amending the WCM on a more frequent basis (2.6).
- Perform necessary field and design studies to confirm water flows needed and to define improvements to provide a reliable navigation channel with and without dredging, including time and conditions when full 9 ft commercial channel is or may not be available and the degree to which such improvements can be done while preserving or enhancing aquatic habitat (2.7).
- Perform necessary channel maintenance to maximize channel availability both in high flow without dredging for full 9 ft channel depths and for sub-optimal channel depths (e.g. a 7 ft channel). Studies outlined in recommendation 2.7 should consider channel modifications that will enhance channel availability during lower flow periods (2.8).
- Utilize predictive drought indicators in the revised Water Control Manual. Various combinations of predictive drought indicators can be used that allow operation decisions to be made in drought years that enhance system flows while still preserving adequate reservoir storage during the drought. As a starting point for discussion, drought management planning discussions should consider (3.2):
  - Triggers based on drought conditions (antecedent inflow, areal precipitation, and soil moisture), streamflows, time of year, and remaining storage in federal reservoirs.
  - The RIOP uses composite storage alone as a drought trigger. USACE should also consider the state of the Basin (how dry or wet) in triggering drought operations. A drought index should be developed to guide the decision based on the predictive drought indicators selected (e.g. antecedent Mean Areal Precipitation and/or soil moisture). In addition, USACE should use regional sub-basin drought indicators (e.g. for the Apalachicola River, Apalachicola Bay, the middle Chattahoochee or the Flint) to consider changes in operations rather than waiting for designation of drought in the entire ACF Basin.
- Develop special operations to address extended drought (multi-year) conditions in the Basin, based on the proactive, predictive triggers and responses as recommended above (3.4).

- In cooperation with the states, improve and further refine the UIF data set currently available for the ACF Basin. These refinements should assess the timing of the relationship among precipitation, evapotranspiration and flow; whether farm ponds supplement, reduce, or do not meaningfully alter low flows during droughts; and other items as determined appropriate by USACE. (4.1).
- Contribute to the knowledge in the ACF Basin by implementing the full instream flow assessment described on page 83, taking into consideration the natural variability of the ecosystem's hydrologic regime (magnitude, timing, duration, frequency and rate of change) as a framework for the EIS for the revisions to the Water Control Manual, as well as other studies described in Table 6.3.

Other Federal Agencies:

- Contribute to the knowledge in the ACF Basin by providing funding for and/or implementing the studies described in Table 6.3 (4.2 and 4.3) *(All)*.
- Contribute to development of predictive drought indicators and triggers for drought management control in collaboration with USACE and the States (3.1) *(National Oceanic and Atmospheric Administration (NIDIS), US Geological Survey, US Fish and Wildlife Service, US Environmental Protection Agency and others)*.
- Develop effective guides for channel usage by all river travelers including facilities to support electronic boat guidance (2.9) *(US Coast Guard)*.

The states of Alabama, Florida and Georgia:

- All appropriate agencies within each state should report status and outcomes of use and return policies, regulations, and practices that affect water quantity and quality in the Basin and report progress so that states can share successes with all water users in the Basin (1.1.1).
- Implement water use efficiency and conservation policies and practices that will achieve (1.2.1):
  - Reduced impacts to stream flow of consumptive use from agriculture by 15% overall through a suite of management practices that minimize water loss from agriculture including equipment retrofits, identification of source switching opportunities, and tillage practices including sod-based rotation;
  - 80% efficiency by 2020 of all center pivot irrigation systems in the ACF Basin;
  - More efficient cooling towers;
  - Increased use of xeric landscaping;
  - Improved commercial and industrial water conservation;
  - Conservation rate structures for residential water users;

- Water efficient toilets when old ones are being replaced;
- Water utility programs to assess and reduce water system leakage;
- Limitations on non-agricultural outdoor water use during dry periods;
- Local government or permitted utility long-range water supply plans, which include the following components: a description of the water system, anticipated needs and how they will be met (including specific conservation targets), storm water management systems, system water loss and integrity, and public information/education to highlight water management concerns;
- Encouragement for experimentation for programs with the potential to improve water conservation and efficiency.

- Collaborate in the development of a drought management plan, perhaps in the context of a regional Memorandum of Understanding, that includes the following: (1) defines drought conditions, using NOAA as a resource, (2) identifies triggers for actions, (3) delineates responses by water use sector, and (4) documents changes in operational strategies (3.1).

  In doing so, also collaborate with USACE, USGS, USFWS, EPA and NOAA (NIDIS) to develop a mechanism for determining drought triggers and to develop an ongoing evaluation of drought conditions in the Basin. Additionally, the states should develop appropriate conservation actions throughout the Basin and work with USACE to develop appropriate changes in operations when flows and levels reach drought conditions in sub-regional portions of the ACF Basin. Such a mechanism should recognize that reservoir operations and other actions taken by people may create drought-like conditions for some users even when the Basin as a whole is not in drought. Graduated drought mitigation actions should be considered for sub-basins not experiencing drought to help address conditions within sub-basin(s) experiencing drought.

- Contribute to drought management planning discussions in the context of the WCM and regional drought management planning, considering triggers based on drought conditions (antecedent inflow, areal precipitation, and soil moisture), time of year, and remaining storage in federal reservoirs (3.1).

- Through financing or other mechanisms, facilitate the augmentation of instream flows through the use of existing storage in existing reservoirs constructed, owned or operated by local governments, especially in the Upper Flint (3.3) *(Georgia)*.

- Contribute to the knowledge in the ACF Basin by providing funding for and/or implementing the studies described in Table 6.3 (4.2 and 4.4).

- Establish more consistent permitting and better water use and return reporting to inform water management in the ACF Basin, reviewing their policies for consistency with the following desired objectives (4.5):

  - Water withdrawal permits for all groundwater and surface water withdrawals in the Basin will be required for users greater than 100,000 gallons per day.

  - All permitted municipal and industrial water users (including both surface and groundwater) self-report daily water withdrawals in electronic format on a monthly basis. All permitted agricultural users (including both surface and groundwater) self-report water withdrawals in electronic format annually. States should report status and outcomes of use over time to the public.

  - All water dischargers self-report daily water discharges in electronic format on a monthly basis.

  - Permit issuers should develop usage benchmarks calculated in a consistent way.

  - Establish a consistent, strong permit enforcement program.

  - Perform a comparative evaluation of the water use regulatory and permitting systems and consider adopting approaches that would enhance water availability for the existing and future uses/needs in the ACF Basin.

- Participate in a transitional organization that brings together stakeholders with state and federal agency representatives to develop a common vision and framework for a future permanent transboundary institution to facilitate sustainable and adaptive management of the Basin that shares water equitably among stakeholders, balancing economic, ecological and social values (5.1).

Local Governments, Utilities and other Permit Holders:

- Water users should implement actions that maximize water returns where ever possible. This can include, among other actions (1.3.1):

  - Increasing connections to centralized sewer treatment, where feasible;
  - Storm water management strategies that increase groundwater infiltration;
  - Minimizing land application, where possible;
  - Retrofitting and/or minimizing interbasin transfers (i.e. returning flows back to their basin of origin), where feasible.

ACFS and/or Other Stakeholders:

- All stakeholders in the Basin should promote education and public awareness of issues associated with sustainable water management planning and implementation (1.1.2).
- Encourage local, state and federal agencies and the private sector to cooperate to support economically feasible and environmentally sensitive development that would support commercial and recreational benefits from navigation (2.10).
- Work with state and federal partners to establish a transitional organization that brings together stakeholders with state and federal agency representatives to develop a common vision and framework for a future permanent transboundary institution to facilitate sustainable and adaptive management of the Basin that shares water equitably among stakeholders, balancing economic, ecological and social values (5.1).
- Support local, state and federal partners in securing funding to complete the additional studies recommended in Table 6-3.
- Review and revise the Sustainable Water Management Plan on a 5 to 10 year schedule (5.2).

APPENDIX A:

Performance Metrics

A comprehensive table of performance metrics as well as a detailed report concerning performance metric development is available at ***http://www.acfstakeholders.org/swmp***

APPENDIX B:

Stakeholder Perspectives

Basin stakeholders' perspectives are presented in the following sections. The perspectives presented were prepared by subgroups of stakeholders, both at a regional sub-basin and stakeholder interest group level. They do not reflect a consensus of ACFS membership, the various sub-basin groups, or stakeholder interest groups and members of a sub-basin group or stakeholder interest group may disagree with the perspective included in this Appendix.

Geographic Stakeholder Interests

Apalachicola Sub-basin

The development of this Sustainable Water Management Plan for our Caucus has demonstrated the importance and enjoyment of the relationships, knowledge and experience gained from our fellow stakeholders within the Apalachicola Sub-basin Caucus as well as our fellow stakeholders in the Chattahoochee and Flint ACF sub-basins. As a Caucus and as individuals, we want to thank our fellow stakeholders and others, funders, state and federal stakeholders, and consultants that have joined and supported our enterprise and journey and express our desire to continue to work together with sufficient resources.

Having now lived the ACFS challenges of the legal aspects of the courts since Oct. 2013 and experienced that as an obstacle to a good outcome for us all we do recognize that perhaps there may be some potential benefit to the "jurisdiction" of the court to forcing the issues and parties to one table.

Using the best available, commonly accepted data and science to work from creates understanding and provides for discussion not otherwise possible. Using an ACF Basin-wide/watershed approach, collaborative, facilitated transparent process, structure and commitment has been the key to our potential success through the ACFS proposed Sustainable Water Management Plan and a Transboundary Water Management Institution. Adaptive management has been and must continue to be a component for both the Basin and the process over the years into the future. To that end we offer the following Apalachicola Sub-basin Caucus perspective.

Sub-basin Organization and Perspective

Six years ago, stakeholders representing various water needs in the Apalachicola Basin began an initiative to "build bridges" to other ACF Basin stakeholders to our north in Georgia and Alabama. After years of personal effort on the part of Basin leaders, this initiative resulted in a joint intent by stakeholders in the ACF Basin to institutionalize common ground and seek an equitable distribution of ACF waters through change in the management of the shared waters of the ACF Basin. Stakeholders of Florida, Georgia, and Alabama came together in crafting a Charter and By-laws for a 501c3 ACF Stakeholder organization.

The resultant Apalachicola Sub-Basin Stakeholders were drawn from each of the six counties along the River and Bay (Calhoun, Franklin, Gadsden, Gulf, Liberty, and Jackson). The 14 ACF Stakeholder Governing Board members represent Charter specific interest groups. Six of these members are also appointed representatives of the Apalachicola Riparian County Stakeholder Coalition (RCSC). These RCSC members, while representing an ACFS identified Interest Group, additionally serve from each of the six counties and report the overall progress of the ACFS back to their respective County Commissions It is the conviction of the Apalachicola Sub-Basin Caucus that a substantive, scientifically validated, and equitable water management plan for the ACF Basin is still achievable and critical to the interests of all ACF Stakeholders. Further, that the final form of that Sustainable Water Management Plan (SWMP – including the supporting technical documents) must be successfully implemented through a Transboundary Water Management Institution involving the Stakeholders, the Federal Agencies (USACE, USFWS, NPS, EPA, NOAA, etc.), Congressional representation, and the riparian States in a new transparent process.

It was a profound, shared dissatisfaction with 20-plus years of fruitless negotiation, mediation and litigation that motivated us to join in forming ACF Stakeholders some five years ago. Our "Holy Grail" from that time unto today is institutionalizing the Mission of the ACFS in a Sustainable Water Management Plan (SWMP) and Transboundary Water Management Institution (TWIO). A recent return to the failed path of lawyer-led litigation, adversarial posturing and attorney-client "privilege" has threatened to destroy more than four years of substantive, shared progress. Only sheer determination to realize the projected "return on investment" of our Stakeholders and retained commitment to this grassroots process motivates continuation.

Preserving Natural Flow Variability

The Apalachicola River and Estuary system is of exceptional ecological importance, constituting one of the least polluted, most undeveloped, resource-rich systems left in the United States (Edmiston 2008). Combined, the river and bay have been designated by the United Nations as an International Biosphere Reserve, by the United States as a National Estuarine Research Reserve, and by the State of Florida as an Outstanding Florida Water with significant portions of the lower river and Bay designated as Aquatic Preserves. The river harbors the most diverse assemblage of freshwater fish in Florida, the largest number of species of freshwater snails and mussels, and the most endemic species in western Florida. Apalachicola Bay is one of the most productive estuaries in the Northern Hemisphere, historically supporting commercially important oyster beds and a wide variety of fish, and providing habitat for migratory birds and other animals. The river basin is home to some of the highest densities of reptile and amphibian species on the continent. The Apalachicola River and Bay are

closely linked, as the river waters and its inundated floodplain are the biological factory that fuels the productivity of the estuary.

Despite its enormous ecological value, the Apalachicola River, Floodplain and Bay ecosystem has been degraded through a long history of human alterations, including impoundment of water by upstream reservoirs, consumptive use of water by farms and cities upstream, 19th -20th century navigational dredging and channel alterations by the U.S. Army Corps of Engineers (Corps), and bank alterations. The combined effect of these activities has been to alter the river's flow regime; destabilize and widen the river channel; reduce the river's hydraulic complexity and habitat diversity; smother and displace habitat in the river's rich sloughs, floodplains, and channel margins. Restoration assessments and activities are required to reverse the trends and loss of the biological, physical and chemical integrity of the ecosystem.

In addition to its high ecological diversity and seafood productivity, the Apalachicola portion of the Basin provides significant economic activity resulting from agriculture, tourism, forest products, manufacturing among others. For instance Jackson County is one of the highest peanut producing counties in the nation and has one of the largest wood pellet manufacturing mills in the world, providing a large export industry that helps foreign countries meet their commitments to reduce carbon emissions. Tourist flock to the six county area along the Apalachicola for excellent hunting and fishing and unique natural attractions such as Jackson Blue Springs Recreation Area (A first magnitude spring in Jackson County), USACE Lake Seminole Park and Angus Gholson Nature Park (featuring endangered plants and excellent birding) in the City of Chattahoochee and Gadsden County, Torreya State Park, TNC Apalachicola Bluffs and Ravines Preserve, TNC Dog Island Preserve, Little St. George Island State Preserve, NWFWMD Florida River Water Management Area in Liberty County, Dead Lakes State Park in Wewahitchka, the Apalachicola Wildlife and Environmental area, St. George Island State Park (ranked one of the best in the country) St. Vincent Island Wildlife Reserve, Apalachicola National Forest, and Apalachicola National Estuarine Research Reserve education center in Franklin County. The history of the area can be seen still alive at The Pioneer Settlement in Blountstown and historic community of Apalachicola. A major effort is underway by RiverWay South Apalachicola/Chattahoochee (RWSAC) to make these unique natural, historic and cultural tourist amenities an international destination.

Because the Apalachicola Sub-basin is both the natural and consequent termination point of upstream stakeholder water needs, management of freshwater flows into the Apalachicola can put at risk floodplain inundation and the critical salinity levels for seafood and marine life productivity in the Estuary and Eastern Gulf of Mexico. The following analysis provides the limits and quantities of freshwater flows stakeholders in the sub-basin have concluded are needed to sustain the health and productivity of this unique ecological, economic and cultural asset. It is a starting point and requires an over-riding commitment to adaptive management to:

- Preserve the natural flow variability and ecological functions of a river and bay system. The first principle of protecting instream flow is that the natural variability of flows (magnitude, timing, duration, frequency) in natural channels provides favorable conditions for native plants and animals.
- Minimize the loss of acres of river and floodplain habitat that are occurring under specific flow reductions for the Apalachicola River.
- Maintain flow regimes at the Sumatra gage that provide salinity conditions in the Bay to sustain historic acres of healthy oyster bars and submerged aquatic habitat in the lower river, delta and estuary.
- Based on a review of existing literature, available data and analysis accomplished by stakeholders' consultants and performance metrics to achieve a maximum overall 13% habitat loss for dry year flows, sub-basin stakeholders concluded that a maximum 6% reduction in flow from pre-dam dry years provides adequate inundation of the floodplain for this ecosystem to be sustainable.

In the development of alternative water management concepts, Apalachicola sub-basin stakeholders used this performance metric, the Presumptive Flow Standards recommended by The Nature Conservancy, and the alternative habitat loss/flow relationships to evaluate the extent to which modeled flows and the resultant loss of habitat and floodplain function are significant, and fundamentally alter the integrity of the ecosystem.

Measuring the Health and Productivity of the Sub-basin: Critical Flow Needs

The salinity and water quality of the Bay is driven by and closely correlated with the freshwater inflow from the river and surrounding floodplain. Desirable salinity conditions, water levels and quality, and nutrients can serve as true indicators of the health and productivity of the river, floodplain and bay. Historic observable measurements are necessary to understand the flows needed to sustain the functions, health and productivity of the floodplain/bay habitat and fisheries at historic levels. Apalachicola sub-basin stakeholders seek to regain sufficient freshwater flows into the River, Floodplain and Bay that recover the economy upon which their social and cultural heritage is based. Performance metrics were developed from IFA results, Bay Assessment evaluations, local knowledge of the fishermen, and GWRI modeled outputs. Specific performance metrics include:

- Maximize monthly flows at the Blountstown gauge during non-drought conditions fluctuating between 18,000 cubic feet per second (cfs) and 14,000 cfs for the months of Feb thru May, then between 16,000 cfs and 10,000 cfs annually.

- Minimize the time flows during drought conditions go below 14,000 cfs for the months of April thru June (Spat Set) and minimize the time flows go below 8000 cfs for the months of July thru November (oyster growth). This may be accomplished by instituting pulses that would achieve or approach pre-dam flow. This, in essence, is a spring pulse from mid-April thru mid-June and a second mid-summer pulse in July/August time period that would keep the salinity conditions moderated thru the summer and fall. The spring pulse is considered the most important and the timing and volume of the second pulse will be dependent on additional modeling to determine how quickly the Bay reacts to pulses from the river.

- Provide flows at the USGS Sumatra Gage during droughts that maintain salinities within the desirable range (10 - 24 PPT as defined in the Bay Assessment) for a minimum of 50-55% of the time at locations specified throughout the Bay during the spawning, reproduction and recruitment season from May thru October. During the late fall and winter (primary growth season) months of November, December, and January-April, salinities should be maintained in the desirable range a minimum of 75-80% of the time at locations throughout the Bay.

The following assumptions and considerations are provided to understand the basis for the above flow requirements:

- The flow regime at the USGS gauge at Sumatra that will produce between 10 and 24 PSU at specified points in the Bay when entered in the hydro-dynamic model. The timing and duration of increased flows and/or reduced flows for pulses should be correlated to these salinities in the desired range for oyster productivity and growth.
- Metric performance should be monitored and adapted for as required both as weekly average flows at Sumatra in cfs and weekly average salinity levels in PSU at locations in the Bay.
- Management approaches should consider conjunctive release opportunities we should model and seek to exploit. (e.g. The timing of pulses to accommodate optimum timing for spat generation/spat set and spat and oyster growth should be aligned with potential Navigation and Power Generation "releases".
- *The Corps' interpretation of the Congressionally authorized purpose for Fish and Wildlife on the ACF System should set a solid foundation for equitable treatment of upstream and downstream water users by addressing Apalachicola's needs on a broader Ecosystem function foundation rather than just the Endangered Species Act.* This authority has been provided by a number of federal laws including but not limited to: WRDA 2007, Endangered Species Act, Clean Water Act, Safe Drinking Water Act, the Magnuson-Stevens Fishery Conservation and Management Act, the Coastal Zone Management Act, other laws, executive orders, and national policies promulgated in the past decade, and mitigation requirements applicable to Corps civil works project.

Flow Augmentation Opportunities

The Apalachicola Sub-Basin Caucus has identified additional interests and concerns that members believe will improve the likelihood of future success in achieving adequate and dependable river flows. These include:

1. Basin-wide water conservation programs, supported by state legislation, that will achieve water demand reduction, including such measures as conservation pricing, leak elimination, public education, provide water saving devises, and water reuse where feasible and practical, including phased drought management planning with water reduction thresholds based on the nature and extent of drought conditions.
2. Long-range water supply planning (needs and sources) by all water utilities and major water users by 2020.
3. Water use permitting in each State which incorporates significant conservation measures into its permitted allocation criteria.
4. Drought management planning, incorporating a water loss limit for the ACF Basin based on the occurrence of drought and meeting basic water demand needs during that climatological condition.
5. Objective and agreed-upon "triggers" for forecasting/indicating a condition of drought in the ACF Basin; and prioritization of water uses to provide for use cutbacks with implementation of the Drought Management Plan.
6. Changing the USACE flow management rules during drought conditions to reflect the USACE requirement to protect the Federal fishery that is the Apalachicola Estuary as an "essential use" of up-stream dam/reservoir operations.
7. Identifying measurable flow nodes in the Basin where imposition of required controls might have the greatest potential impact on relieving negative impacts of prolonged drought on the community of ACF Stakeholders.
8. Enactment of comprehensive state agriculture water use permitting systems to reduce the increasing demand on ground and surface water supplies in the ACF Basin. Sub-basin stakeholders believe the new permitting system should include:
    - Establishment of maximum daily uses based on type of crop and type of irrigation application system.
    - Permit issuance periods in areas of potential water supply deficits to five years.

- Mandatory threshold reductions in water withdrawals based on level reductions in regional monitor wells and prevent the mining of water.
- Permit enforcement including: site inspections, flow monitors, weekly pumping completion reports, irrigation system efficiencies, and other auditing procedures.
- Permits based on actual water pumpage and not on well sizes, capacities, or acres irrigated.
- Utilization of available irrigation technologies (e.g. drip irrigation, sod-based practices, crop selection) and the costs/benefits of these alternatives and also consider limits on agriculture water uses from center pivot systems.

9. Assessment of the feasibility for the development of Alternative Water Supply sources in the ACF Basin where projected water demands exceed current uses.
10. Evaluation of need and the development of recommendations for securing alternative water supply sources to support the increasing water needs of the Upper Chattahoochee Sub-Basin metropolitan areas including: the purchase of water from other regional sources on a wholesale basis, the development and/or enhancement of additional water storage capacity (both above and below ground in periods of excess flows), water reuse, and elimination of water losses within the existing supply systems.
11. Opportunities to support projected Upper Basin water demands by the purchase of wholesale waters from the Tennessee Valley Authority (TVA) within the State of Georgia.
12. Water reuse systems for domestic and industrial wastewater, storm water, and other waters to maximize utilization potentials for all waters.
13. An audit of each public water and sewer system to identify and eliminate water losses from these systems.
14. Comparative evaluation of the water use regulatory and permitting systems in Alabama, Florida, and Georgia and recommend approaches in these systems which would effectively enhance water availability for the existing and future uses/needs of the Basin.
15. Emphasis by local governments on water conservation, conservation pricing, controlling stormwater, wetlands preservation, water losses from faulty utility systems, and the development of long-range water supply plans.
16. Designation of the ACF Basin in their respective States as an Area of State Water Supply Concern, which should trigger an extensive number of water control applications for both water conservation and alternative water supply development.
17. Creation of a Regional Water Supply Authority with the specific mission of planning, developing, and managing water supplies for existing and future Upper Basin metropolitan water supply needs.
18. Regional Water Management based on hydrologic boundaries along the lines of the system of regional districts in Florida with the authority for permitting water wells, water withdrawals and uses, managed storage of surface waters, artificial recharge, and water supply.
19. In order that all three states have adequate and equivalent enabling legislation to conduct comprehensive water management in their respective states, Georgia and Alabama should consider passing language comparable to the Florida Model Water Code (1972) which provides the basis for Florida's water management programs. Florida should keep this Model Water Code and adopt legislation where Georgia or Alabama legislation would improve control of water resources. The intent of this legislation is to give more control over management of the water resources in each state.

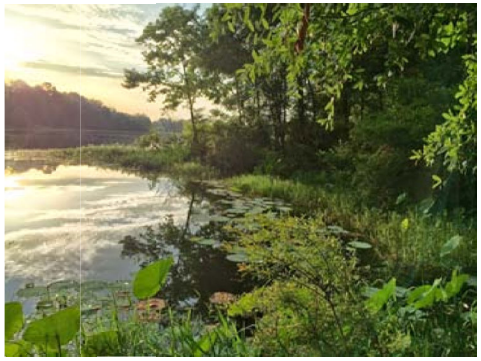
In summary, the Apalachicola Sub-Basin Caucus has attempted to explain our perspective on the issues relating to the critical needs of the Apalachicola River, Floodplain, and Estuary and to present management objectives intended to recover natural conditions and productivity. We feel strongly that this Sustainable Water Management Planning process has become a positive and permanent milestone in our Basin's water management for current and future generations. While the Plan does not include everything we have suggested, it does represent a substantial improvement to the current situation and should provide some enlightened and workable solutions to optimize our collective river and bay management as we continue to work towards our collective sustainable future. We thank our fellow stakeholders for this opportunity to plan with them.

Middle and Lower Chattahoochee

The essential goals of the middle-lower Chattahoochee sub basin are sustainability of historical flows since the Corps' ACF project was completed in 1975 and better flow management to benefit hydropower, recreational, navigational, industry water quality purposes, flood control, domestic water supply and protection of endangered species.

The middle-lower Chattahoochee River reaches extend some 130 miles across the piedmont and coastal plain regions of Georgia and Alabama. Included are three major federal projects: West Point, Walter F. George, and J. Woodruff. Although some 40% of the total ACF Basin drainage feeds the river along this stretch, the three main reservoirs can only hold about 27% of the total storage capacity of the system.

The middle-lower Chattahoochee reach is located between a large growing urban area upstream and a downstream endangered species habitat that requires storage release from the Corps' reservoirs to meet minimum flows in dry periods. Increases in consumptive uses and significant changes in flow management for environmental needs have the potential to challenge the sustainability of flows and lake levels in the middle-lower Chattahoochee. High agricultural irrigation demands in the Basin have the potential to stress the water supply, especially during droughts when reduced Flint River flows increases reliance on Chattahoochee storage to meet environmental flows in the Apalachicola River. Establishment of specific flow target sub basin metrics in the Corps' revised Water Control Manual would offer significant confidence to stakeholders in this geographic area of the ACF Basin for sustainable flows and levels in the future. The middle-lower Chattahoochee sub basin is not requesting an increase in allocations to meet its needs but is requesting sustainability, so that allocations outside the sub-basin do not diminish historical water supply.



Lake Eufaula

Recreation on the federal reservoirs, West Point and Walter F. George, is a very important stakeholder interest. Stakeholders identified that recreation and local economies were closely intertwined. Metrics for desired reservoir levels were established to support avoiding low lake levels during peak use periods. Low lake levels have been shown to have adverse impacts on local, regional and state economies. In addition, Columbus has recently made significant modifications to their reach of the river to support a world-class whitewater course. Minimum flows were considered to support this major economic driver for the area.

The middle-lower Chattahoochee stakeholders saw commercial navigation, an original congressionally authorized purpose, as currently inactive and desires its renewal. Metrics for reservoir levels and river flows were developed to support seasonal commercial and year-round recreational navigation in this sub basin.

For the Columbus/Phenix City/Fort Benning region, the largest metropolitan and military area in the middle-lower Chattahoochee sub basin, minimum flows referenced in the Performance Metrics Table, which are also incorporated into the Federal Energy Regulation Commission (FERC) license to the Georgia Power Company for the Middle Chattahoochee Hydro project represent a request for flow sustainability. The referenced minimum daily flow (1350 cfs) has been achieved 97.6% at the time between 1975-2008, even though this flow target is not included in the Corps' Water Control Manual. By having these metrics incorporated into the Corps revised Water Control Manual, the Columbus area will have reliability established that its primary water needs for municipal (public health, safety, economic development), military (national security), recreation, aquatic habitats, navigation, industry, water quality and hydro power will be achievable within the 2050 planning horizon.

There are several major industrial water users on the middle / lower Chattahoochee that have domestic water supply needs. There are two large paper mills and a nuclear power plant that rely on Chattahoochee water for cooling, industrial processes and waste water assimilation. Metrics for river flows were identified in the corresponding reaches to support adequate pump suction and dilution flow for these industries.

The water needs of other communities and interest groups within the middle-lower Chattahoochee, including agriculture, environment, water quality and others have been considered and are reflected in the ACFS Performance Metrics Table.

Upper Chattahoochee

The ACFS "Upper Chattahoochee sub-basin" originates in the portions of Lumpkin, White and Habersham Counties that drain to form the Chattahoochee headwaters and runs south and west to USGS's Franklin Gage in Heard County, Georgia. This sub-basin includes Lake Lanier, a major federal project, and much of the greater Atlanta metropolitan area, which is home to approximately five million people, or half of Georgia's population. It is noteworthy that Lake Lanier stores 65% of the total managed reservoir conservation water storage in the ACF Basin even though the drainage basin is roughly 6 percent of the ACF watershed drainage area, making management of it critical, especially during a drought.

Many distinct stakeholder perspectives exist in the Upper Chattahoochee sub-basin that must be understood and balanced in the management of the Upper Chattahoochee system specifically and the broader ACF more generally. These stakeholders are: environment and conservation, hydropower, industry, thermal power and manufacturing, recreation, and water supply. A brief summary of each stakeholder group's most important interests, issues and challenges are provided below.

Environment and Conservation. From the north Georgia mountains to the Florida border, the Chattahoochee River is impacted by unplanned development, storm runoff and trash from industries, roads, and construction sites, and discharges from sewage treatment plants. Withdrawals from the river by municipalities and industries also affect its health through consumptive loss of water that is not returned to the river, impacting downstream water quality, recreation and ecology. While significant improvements have been made, much remains to be accomplished to restore and preserve the river system's ecological health for the people and wildlife that depend on the river system.

Hydropower. Appropriate management of lake levels (water in storage) is critical to producing hydropower, which is of vital importance to the region's

energy mix. Buford Dam, with a maximum generating capacity of 125,000 kilowatts, is one of the larger hydropower generating plants in the ACF Basin. However, the project's reservoir retains [65] % of the storage of the ACF Basin, and is operated by the Corps of Engineers in coordination with all of the federal hydropower projects on the Chattahoochee River. The Morgan Falls Hydroelectric Plant, operated by Georgia Power and located in Roswell, Georgia, has a maximum generating capacity of 16,800 kilowatts. It is operated in a modified run-of-river mode to generate power and to re-regulate peaking flows from Buford Dam to meet flow releases requested by the Atlanta Regional Commission. The project also generates power while reregulating flow. The project's reservoir, Bull Sluice, has 673 acres of surface area at full pond.

Industry, Thermal Power and Manufacturing. Water plays a vital role in the economic activity in the Upper Chattahoochee sub-basin. Industrial, thermal power and manufacturing water users all rely on adequate lake levels and stream flows to support the region's business practices.

Recreation. In addition to the homeowners, boaters and businesses interested in maximizing and maintaining water levels in Lake Lanier, many residents and visitors enjoy recreational opportunities throughout the sub-basin including Lake Lanier and the Chattahoochee National Recreation Area which, combined, have over 10 million visitors annually and over $400 million in annual economic contribution.

Water Supply. This sub-basin has substantial water supply needs due to its large population and robust economic activity. For example, over 70 percent of metro Atlanta's population of five million people relies on the Chattahoochee River for drinking water. In light of these sizable needs, Metro-Atlanta water suppliers are committed to and keenly interested in water conservation and water stewardship. In line with these interests, the Metro District has implemented a rigorous conservation program. As a result, despite population increases of over 1,000,000, water use in metro-Atlanta has declined by over 10 percent from 2001 levels. Additionally, metro-Atlanta users return approximately 67 percent of all water withdrawn, where it is available to meet downstream needs. Data collected by the Metro-Atlanta water suppliers, the group of local governments and utilities uniquely responsible for securing and supplying the sub-basin's current and future water supply needs, show that Metro-Atlanta consumes approximately 3% of the average annual flow in the Apalachicola River.

The Metro-Atlanta water suppliers are also keenly interested and concerned about the limits of what conservation can achieve in terms of water savings and other benefits. Although the region has achieved water use reductions despite a decade of population growth, water conservation savings cannot offset population growth indefinitely. In light of future water supply needs, one of our fundamental interests is ensuring the availability of additional supplies to meet future water supply needs in the Upper Chattahoochee sub-basin. Ultimately, the most important source of water for metro-Atlanta is the Chattahoochee River system.

Another fundamental interest for the Metro-Atlanta water suppliers that withdraw from Corps of Engineers' operated reservoirs is the need for the Corps to adopt policies that create incentives or grant credit for return flows to those reservoirs. Metro-Atlanta water suppliers have already invested more than $2 billion to construct the infrastructure necessary to return large quantities of water to federal reservoirs. This infrastructure investment has resulted in the return of more than 50 mgd to the federal projects, a number we expect to grow larger with appropriate crediting of return flows. The Metro-Atlanta water suppliers see a number of benefits associated with the adoption of such policies. For example, we believe that return flows provide a reliable source of stored water which can be held until needed by those returning these flows in the event of limited natural inflows. Additionally, we anticipate that crediting return flows will limit impacts to natural resources and enhance reservoir levels. If return flows into the existing, shared federal reservoirs are not credited, some of our water providers may see a strong incentive to build their own storage reservoirs. This approach carries environmental costs, increased evaporative losses, and increased impacts due to alterations in in-stream flow that can be avoided with a sound return flow credit policy.

Flint

The Flint rises in the Georgia Piedmont province in the hills of Coweta, Fayette, Fulton, and Clayton counties, which now form much of south and southwest metropolitan Atlanta. The headwater is in Eastpoint, GA, near Hartsfield-Jackson International airport, the busiest passenger air terminal in the world. The Flint River, with a watershed of about 8,460 square miles, is slightly smaller in drainage area than the Chattahoochee, but has historically contributed 40-50% of the annual flow into the ACF Basin. The Flint and the Chattahoochee are markedly different in many ways including the geology, ecology, hydrology and stream-flow management (reservoirs). The urban and suburban areas of the upper Flint watershed are home to over 600,000 Georgians and thousands of businesses; the total population of the watershed being about 1,000,000.

The 'river' in the uppermost portion of the Flint is a network of creeks, large and small, that historically have provided water for the human population and the environment. Impoundments have been constructed on many tributary streams to capture water during wet periods to be used later for water supply. Withdrawals and returns in the upper Flint watershed are unbalanced, and are maintained by an engineered, interconnected system which withdraws water from the streams as well as from the impoundments, including withdrawing water from the stream to fill certain of the impoundments. Many of these withdrawals are governed by permits that are conditioned on low-flow guidelines that may not be adequate to protect instream flows or the environment. On the returns side of the equation, utility records show that only 25-30% of withdrawals are discharged to the Flint on any given day. The 70-

75% that is not returned to the supplying streams is directed to interbasin transfers (Ocmulgee/Altamaha and Chattahoochee Basins), land application systems, landscape reuse systems, and sprawling suburbs serviced by septic tank drain-field systems.

Numerous private impoundments, vast acreages of paved and other impervious surfaces, channelization of tributaries, and changing rainfall patterns are also adversely impacting upper Flint flows. Professional opinions vary, but most analyses indicate that approximately 25% of the observed flow declines can be attributed to changes in rainfall patterns, leaving the remainder of the decline related to the human uses of the water and management of runoff, some of which may be remedied, some not. The fact remains that the net result of the combined factors has significantly reduced dry-period and drought flows in the upper Flint to unacceptable levels. Since 1975, low flows in the upper Flint have decreased between 50 and 100% depending upon location and selection of the flow-measurement statistics. Natural instream uses and instream private use rights have been attenuated. Clearly, changes in water management are necessary in order to meet the present and future human demands for the upper Flint, while restoring and preserving an aquatic habitat that supports the many sports, as well as numerous rare and endangered species that rely on a semblance of historic stream flow patterns for existence.

In the lower reaches of the upper Flint the Piedmont briefly gives way to a system of ridges, small mountains, reaching from Alabama into Georgia that resulted from geologic faulting many millions of years ago. The Flint is here recognizable as a river and historically has provided over 40 miles of high quality whitewater paddling, outstanding fishing for endemic shoal bass, and spectacular riverfront vistas. High biological diversity reigns in this area of the river, the tributaries, and along their banks. A mixture of Appalachian, Piedmont, and Coastal Plain species meet where Spanish moss adorns riverside trees immediately adjacent to mountain laurel and rhododendron, in turn adjacent to Piedmont native azaleas. Shoal spider lilies cover the shallows, displaying their splendor in May and June each year. This is also the area that the U. S. Army Corps of Engineers proposed to inundate with one to four impoundments, a portion of the original ACF development plan laid out in the late 1940s. These plans were blocked by a broad political spectrum of activists and elected officials in the 1970s. Many claim that if these reservoirs had been built 'there would be no flow issues in the ACF today', postulating that the storage in these impoundments, originally slated to support navigation, would now support modern downstream uses, including needs for Apalachicola Bay. This of course ignores the current private and public uses and values in the area that would be have been flooded by impoundments, and ignores the functions that intact riverine habitat provides.

The middle Flint, or upper Coastal Plain portion, is a hilly, sandy region of large orchards, timber plantations, cattle operations, poultry operations, and small towns. Tributary streams in this region generally remain perennial, but unmanaged increases in consumptive use could adversely impact these streams, which are closely tied to the underlying aquifers. Baseflow in the main stem of this region of the Flint has declined by more than 30% since 1975, partially due to reduced upper Flint flows emerging from the Piedmont. However, at least 60% of the reduction is due to factors occurring within the region.

The lower Flint region begins in the upper reaches of the Crisp County Power impoundment (aka Lake Blackshear) where the river bed transitions from soft, silty sediments transported from the Piedmont to hard, fossil-rich limestone. In the Dougherty Plain area of southwestern Georgia, carbonate rocks comprise the Floridan aquifer, which has been described as one of the most productive aquifers in the U.S. The limestone rocks are at or near land surface and receive recharge directly and indirectly from an average annual precipitation of about 52 inches. Many of the area streams have cut into the aquifer and provide a dynamic connection between the stream and the aquifer. During much of the year, the groundwater elevations exceed the stream and water from the aquifer supplies additional flow to the stream. However, during periods of dry and drought climatic conditions, when the use of groundwater and stream water for crop irrigation peaks, the flow from the aquifer is reduced and may cease. This relationship has changed profoundly since 1975. Groundwater flow reversals have been documented in springs proximate to the Flint River. As a result of the reduced and depleted groundwater flow, the flow of numerous streams in the region is frequently diminished, ranging from reductions of around 70% to complete cessation.

Since the 19th century settlement the Dougherty Plain has been home to row cropping and orchards, which by the mid-19th century had been established on an industrial scale. But it was not until the late 20th century that the advent of mechanized irrigation combined with mechanized tillage and petroleum-based fertilizers and pesticides launched the Dougherty Plain region to an elevated position in the global market. Cotton, corn, and peanuts are king; truck crops and pecans are of growing importance; pasturage and poultry are solidly established; and grain sorghum receives its annual share of dedicated acres. Annual farm gate values are in the billions of dollars. Combined with a timber plantation and hunting plantation economy, this rural economic engine has established itself as the most important industry in Georgia.

This economy is fueled by water. Dry-land (un-irrigated farming) has not ceased to exist, but is a minor component of the agribusiness system. Water use, straight from the creeks, from agricultural impoundments, and from the Floridan aquifer, launched in the mid-1970s and accelerated through the end of the century. Recent spikes in the commodity market and corresponding increased farm production has placed additional demands on regional resources.

Effects of human water use on stream flow in the Flint Basin were noted by scientists and water managers as early as the 1980s. Recent stream flow evaluations using USGS records indicate that climate changes and intense water

use have adversely impacted natural stream flow throughout much of the Flint Basin particularly during periods of below normal rainfall. Because of these impacts, a moratorium in Georgia on agricultural withdrawals from surface and Floridan aquifer sources in the lower Flint region was established in 1999 and then lifted in 2006 except for a core area of the Dougherty Plain (known as "Capacity Use Areas" or the "Red Zones"). Then, in late July of 2012, due to continued diminishments of surface flows, the moratorium was again expanded to 100% of the Dougherty Plain. Thus the private use rights and values, in addition to the public values and benefits of instream flow and a full Floridan aquifer have been truncated. It is important to note that these restrictions occurred in the lower Flint only, and on agricultural uses only. Upper and middle Flint uses have not been restricted in any way, and no municipal or industrial uses have been restricted anywhere in the basin.

Because of the observed impacts of agricultural water use on the region's water resources and because using less water generates less production overhead, agricultural researchers have made tremendous advances in the efficiencies of irrigation technologies. Certain center-pivot applications use upwards of 30% less water per acre per year than technologies of 40 years ago. New tillage practices, drip irrigation, and other techniques hold greater promise. But the effects on aquifer levels and surface flows remain. A new concern is that now numerous new irrigation wells have been installed into the deeper Claiborne aquifer system, which underlies the Floridan and is a source of municipal and industrial supply. The connectivity of this deeper aquifer to overlying resources and the sustainable yield of the Claiborne are poorly understood, and development of this resource is only lightly regulated.

It is critical that the water resources available for instream uses throughout the Flint be improved. The entire Flint Basin is suffering the effects of change due to population growth and municipal/industrial needs for water and sewer, development and land use, agricultural practices and increased irrigation withdrawals, permitting and implications of that permitting, as well as climate and the associated extremes of drought and flood. Improvements in management of the issues that we can influence hold promise to accommodate these changes. It is possible to establish sustainable flow regimes over the entire Flint Basin. Success will increase the flexibility for management of the Chattahoochee impoundments, and simultaneously diminish the impairments to the private and public users of the Flint and its tributaries.

The Flint Caucus of ACF Stakeholders is compelled to remind readers of the significant achievements in conservation and water management that are already in place throughout the watershed. For example, Flint Basin utilities within the Metro North Georgia Water Planning District have implemented numerous water conservation programs and, by monitoring and limiting certain withdrawals based on preliminary target streamflows, have helped lay the foundation for future adaptive management within the region. Likewise, industrial users throughout the basin have invested millions of dollars in infrastructure to reduce withdrawals, increase quantity and quality of returns and implement water reuse programs. For agriculture, the percentage of producers employing on-farm water conservation measures, some of which were described above, is at an all-time high. However, conservation and efficiency that leads only to ever-increasing consumptive use is environmentally, and ultimately economically, unsustainable.

To actually improve flows throughout the Flint, and indeed throughout the ACF, commitments to instream results are critical. Members of the Caucus note that, within the context of this SWMP, of all consumptive users, only agriculture has committed to making positive changes in flow regimes versus mere commitments to conservation. Members of the Caucus also note that declines in Flint River flows began in the mid-to-late 1970s due to rapid and progressive increases in human water use, primarily in the upper and lower portions of basin, less so in the middle reaches. Poor management strategies coupled with a false paradigm that an endless supply of water existed resulted in a significantly over permitted river basin. In the Flint, a fully operational SWMP will depend upon not only conservation and efficiency among agricultural, municipal, and industrial users, but a substantially strategic array of permit decisions by state water managers.

Stakeholder Interests by Interest Group Category

The needs and concerns of stakeholders by interest group category are discussed in the following subsections.

Navigation

Navigation has always been a part of the ACF Basin from the early canoes to the 300 ton steamboats that plied the rivers in the 1800s. This growth was initially fueled by the cotton industry and later by the logging industry. Through the late 1980s, more than 1,000,000 tons of freight per year were transported in the rivers, including sand & gravel, agricultural chemicals and petroleum products.

Navigation is an authorized purpose for all the federal projects in the ACF Basin. In accordance with the Clean Water Act of 1972, the USACE obtained water quality certifications from the State of Florida for maintenance dredging in the Apalachicola River, beginning in 1979. Over the years, conditions placed on the certification have imposed increasing restrictions on dredged material disposal area usage. Problems with dredged spoil disposal permitting eliminated USACE dredging operations and resulted in the deterioration of the main channel in the Apalachicola River. A recent study performed by the Tri Rivers Waterway Development Association and the Apalachicola Riverkeeper, however, has indicated that navigation flows and winter-spring needs for improving ecological conditions are compatible. While a year round navigation program is desired, a system that would operate in specific seasons would be an improvement.

Recreation

Recreation is an essential and growing activity in the ACF watershed. Recreation often involves visiting areas that contain bodies of water such as parks, wildlife refuges, wilderness areas, public fishing areas, and water parks, as well as vast stretches of the rivers and their tributaries. Most of these areas are publicly accessible.

While tabulating the exact daily recreational uses throughout a watershed is difficult, the U.S. Army Corps of Engineers reported in 1995 the following visitation rates for riverine recreation in the ACF Basin[23] :

- 781,500 visitor days to the Apalachicola, Chipola, and Flint Rivers
- 3,500,000 visitor days to the Chattahoochee River National Recreation Area (the 36 miles immediately downstream of Buford Dam)

Georgia Parks reported 823,000 visitor days to Sprewell Bluff and State Parks on the Flint. Camp Thunder, one of the top-10 boy scouting destinations in the U.S., has nearly 30,000 annual visitors on the upper Flint. With the removal of the City Mills and Eagle and Phenix Dams, the natural flow of the Chattahoochee River through downtown Columbus, Georgia has been restored and now whitewater rafts and kayaks fill the river.

Recreation opportunities on the lakes are also plentiful. In 2006 USACE documented:

- 7,552,119 visitor days to Lake Lanier
- 3,300,836 visitor days to West Point Lake
- 4,340,890 visitor days to Lake Walter F George (Eufala)
- 1,223,532 visitor days to Lake Seminole
- Total of 16,417,377 visitor days to USACE lakes

Based on the Corps of Engineers data, the total direct economic benefit from the Corps lakes is $583.05 million. However, more focused studies on West Point and Lake Lanier document substantially higher numbers when other economic factors are considered.

Economic impact data are not available for the Flint or the Apalachicola sub-basins. However, considering the numerous public and private recreational venues on the Flint from above Sprewell Bluff to Bainbridge and from Lake Seminole to Apalachicola Bay, the total economic impact of recreational activities in the total ACF Basin likely exceeds $2 billion dollars annually.

[23] U.S. Army Corps of Engineers (USACE), Mobile District. 1998. *Draft Environmental Impact Statement, Water Allocation for the Apalachicola-Chattahoochee-Flint (ACF) River Basin, Alabama, Florida, and Georgia.* U.S. Army Corps of Engineers, Mobile District, Mobile, Alabama, Table 4-57 and page 4-214

Recreation often is not prioritized as a critical benefit of the ACF watershed by operational and policy decision makers. This causes social, environmental and economic harm. This is also exacerbated during droughts when recreation benefits are often ignored. Seasonal metrics were developed as part of the development of this SWMP for minimum reservoir levels and river flow to support recreation.

Water Quality

ACF Basin is faced with water resources challenges including maintaining superior water quality within the entire Basin. Some areas in the Basin are performing better than others when it comes to watershed management efforts focused on water quality. ACF Stakeholders has a goal of meeting or exceeding all federal, state, and local water quality standards within our watershed borders and supporting all designated uses. All the waters inside the ACF Basin have been designated by USEPA with highest use “fishable and swimmable”.

ACF Stakeholders have developed a set of metrics to ensure that proper water quality is available for all interest groups within the Basin. Water quality goals within ACF are related to:

- Protecting aquatic health and habitat including threatened and endangered species
- Assisting with educating the public on the need for good stewardship of our limited water resources
- Helping to increase and enhance recreational opportunities on or next to the waters within our Basin
- Protecting drinking water supplies
- Ensuring proper assimilative capacity for wastewater discharges, which is often a function of water quantity
- Promoting best management practices when it comes to stormwater runoff and non-point source pollution

When water quality standards or goals are not being met then a plan shall be developed to get these areas back into compliance. This includes any stream segments currently listed as impaired by State and Federal agencies. Where there are water quality improvement plans (or TMDLs) within the ACF Basin, ACF Stakeholders shall be willing partners to assist where needed to make these plans a success. It is the goal of ACF Stakeholders to improve water quality conditions in all areas of our Basin.

Water Supply Interest Group

The key responsibility of Water Providers is to provide reliable, clean and safe drinking water to the citizens and businesses which are served. This includes identifying and securing adequate water supplies, treating and distributing water, and working with other stakeholders to develop and implement a comprehensive approach to sustainable water management planning.

The metrics selected by the Water Supply Interest Group focus on specific stream flows and lake levels and are informed by levels of risk associated with ensuring adequate availability of water supply. Representative lake levels were identified for lakes used for water withdrawal and water storage. Additionally, flows were identified at key locations associated with existing or anticipated river withdrawals. It should be noted that the flows and levels selected as metrics are used for comparative purposes only. The exact flow or level selected was not a target. Furthermore, in many cases a single number was picked in a given vicinity to serve multiple interests. For example, in the Columbus region, the same flow level was selected as a stakeholder metric for water supply, water quality (which includes wastewater discharge) and recreation.

The following are examples of Water Supply stakeholder interest metrics:

Lake Lanier – Percent of years at full pool (1071) by May 1st

Lake Lanier - Percent of weeks above the 90% refill threshold

Lake Lanier – Monthly rate of decrease

West Point Lake – Percent of time level is > 635 (April – October), >632.5 (November – March)

Columbus – Percent of time daily average >1350 cfs, 7-day average > 1850 cfs

Woodruff Lake - Percent of time level is > 77.5 (April – October), >76.5 (November – March)

Griffin - Percent of time daily average <60 cfs

Sumatra – Elevation at City of Port St. Joe water supply canal

Many of the flows and levels selected for metrics have been used by the USACE for operating the river for decades. As such, we anticipate considerable familiarity with the specified metrics. The risk of water demands not being met is also of concern. Key criteria to evaluate risk included the amount of time reservoirs were sustained at various levels, the likelihood of reservoir recharge and the rate of change in reservoir levels. Although water quality is of significant importance to water suppliers, the modeling work performed by the ACFS did not address water quality. As such, water quality metrics associated with water supply were not included in the water supply interest category.

Given the primary concern of Water Providers is meeting current and future water needs, Water Suppliers are concerned that all tools and options remain available; including river and reservoir management, conservation, improved water efficiency, engineered solutions and sound growth policy. From a water supply perspective, optimization of USACE operations with respect to water releases and the implementation of sustainable planning goals that are based on net returns rather than water withdrawals are fundamental to sustainable water management. Similarly, the adoption of policies that create incentives for increasing return flows, including credit for return flows and funding to return flow to the basin of origin, is of significant interest.

As a group responsible for billions of dollars of infrastructure whose members are subject to considerable regulation, ongoing consideration of costs, benefits, and equity across the full range of policy decisions associated with sustainable water management is important. When programs are required to be implemented and tracked, setting baselines that take into account work that has already been performed is significant.

Region Specific Concerns of Water Suppliers. Water suppliers have many concerns in common; however, there are concerns which are specific to regions and specific utilities.

Metropolitan Atlanta. The Metro Atlanta water suppliers are specifically interested in developing conservation programs that could be implemented appropriately throughout the Basin. Likewise, it is important that strategies implemented upstream not be used to the exclusion of other programs and projects for providing additional downstream flow.

Columbus Metropolitan Area. A primary concern for the Columbus region is sustaining the flow levels that have been occurring since completion of the Corps' ACF project (West Point Reservoir in 1975). These flows at Columbus (1350 cfs minimum daily flow and 1850 cfs minimum weekly flow) are included in the FERC license issued to the Georgia Power Company for the Middle Chattahoochee Hydropower Project. These flows meet both current and future needs for municipal water supply in the Columbus area based on the planning horizon of this plan. To ensure that these flows continue to be met, it is important to the water suppliers in the Columbus area that the USACE include a flow control node in the upcoming update of the USACE's Water Control Manual which targets the 1350 cfs minimum daily flow and the 1850 cfs minimum weekly flow levels.

Upper Flint. The Upper Flint water suppliers are concerned that current management practices to store water during high flow periods are not recognized for their limited impact during dry periods. There are multiple water supply reservoirs in the Flint River Basin that are pumped storage off the main stem. Withdrawals from the river are set up in a tiered structure that is based on the amount of flow in the river (a sort of Prescribed Adaptive Management system). Low flow in the river equals zero to low withdrawals and high flows allow more water to be withdrawn.

Agriculture

A wise sage once said: "To protect the water you must first protect the land". Since the days of the Civil War, farmers and other regional stakeholders in the ACF Basin have been excellent stewards and taken great care to conserve this unique landscape. Besides sustaining working landscapes, stewardship of the land, in turn, provides wildlife habitat, protects our clean air, and serves as a critical recharge area for our aquifers. This region contains some of the most pristine riparian and river habitat found in the contiguous U.S., and is home to numerous protected species of plants and animals.

The scenic beauty and diverse recreational opportunities provided by these streams and lands are integral to the cultural heritage and quality of life for stakeholders throughout the ACF Basin. As one example, Jackson County Florida, on Lake Seminole and the Apalachicola River, has by far the largest freshwater spring in the ACF Basin. Jackson Blue Spring, a rare natural resource used for cave diving, recreation and tourism, averages flows of more than 100 million gallons of freshwater per day. However, Jackson Blue Spring flows also have the second highest nitrate concentrations of Florida's 33 first-magnitude springs, which is attributed to high density farming in the springshed. Prudent land use is critical in order to protect water quality within our aquifer recharge areas.

Jackson Blue Spring

The Floridan aquifer of the lower ACF Basin is the primary source of fresh drinking water for the stakeholders of southeastern Alabama, northwest Florida and southwestern Georgia. It also is the source for most industrial and agricultural supply in the lower ACF Basin. Because of the hydraulic connection between many regional streams and the Floridan aquifer, pumping from one source can adversely impact the other. During most of the year, the Floridan aquifer is a large contributor to stream flow throughout this karst region, but the contribution declines as a result of drought and heavy groundwater withdrawals. Reduced stream flows and aquifer contributions to flows during drought in the Flint and Chipola Basins also reduces flows to the Apalachicola River, which increases demands on the Chattahoochee River and the U S Army Corps of Engineers reservoirs. Intense water use, coupled with pervasive droughts requires augmentation of stream flows from reservoirs to support endangered species and support the ecology of the Apalachicola Bay; this is one of the primary water-sharing issues embedded within the long-term conflict between the States.

Agricultural economists have predicted that as the effects of climate change worsen in the Midwest, that the Southeastern U.S. will become the "breadbasket" of the Nation. The use of water to supplement rainfall is essential to ensure that regional farmers can meet our future food and fiber needs. An adequate water supply is the lifeblood for the agriculture based economy of the stakeholders within the lower Flint and upper Apalachicola region. The sale of farm goods, and the industry to support farm production, annually generates many billions of dollars within the lower ACF.

Because of the relatively flat landscape and dependable supply of water, the Dougherty Plain physiographic district of southwestern Georgia, southeastern Alabama, and northwestern Florida has supported intense development of irrigated agriculture. An abundant water supply and ability to irrigate greatly increases crop yields, crop quality, crop diversity, and land values. Agricultural irrigation in this region, particularly in the lower Flint River and upper Chipola River sub basins, markedly increased since the late 1970s. Agricultural irrigation peaks during the May to October growing season, but in normal to wet years, irrigation's impact on stream flow and aquifer levels does not jeopardize availability of water in the region and the stream ecology is generally not adversely impacted. However, that is not the case during dry conditions, when both direct stream and groundwater withdrawals can significantly impact most streams in the region. Climate change or the conversion to more water-intensive vegetable crops could increase agricultural water demand in the future.

Crop irrigation cannot be turned on and off as in other types of water use. Once the crop is planted and growing, it must have a uniform application of water, either from rainfall or irrigation, to survive and flourish. In Alabama, Florida and Georgia scientists and farmers are working together to improve water use efficiency through the development and implementation of water saving measures such as installation of drop-pipe low-pressure sprinkler systems, end-gun shut offs and variable-rate irrigation systems among other water conservation practices. Pending Georgia legislation will require an 80% efficiency rating for irrigation systems in order for farmers to obtain water withdrawal permits. In 2000, Georgia legislature enacted the Flint River Drought Protection Act in an effort to reduce the impact of agricultural withdrawal during critical drought periods. Because of the potential impact of existing irrigation systems in the lower Flint River Basin, the Director of Georgia Environmental Protection Division placed a temporary moratorium on all new agricultural permits in this region, effective 2012. However, conservation and stream augmentation are being achieved using efficient application during irrigation and reaching into other water sources such as deeper aquifers to supplement impacted stream flows during intensive drought periods. Farmers and researchers in the region have studied and implemented conservation based best management practices that include limited/strip-till, and no-till farming. Developing farming practices now include, among others, the Sod-Based-Rotation (SBR) production system which is reported to increase productivity while using minimal inputs of nutrients and water. Agricultural

water supply is not an authorized purpose of the federal ACF Reservoirs; however, it is a significant consumptive use in the ACF Basin. Improved water conservation and efficiency are key elements of developing a sustainable water management plan for agriculture and the ACF Basin.

In the upper ACF Basin, within the Piedmont physiographic region, the landscape changes from large irrigated fields to an urban landscape of homes, industry, and shopping centers. However, that urban landscape created a significant demand for water; particularly during periods of drought. Urban agriculture has adapted conservation strategies over the past three decades to mitigate these demands. Many urban landscapes were originally irrigated using highly treated potable water which put significant stress on the distribution systems of municipal water systems. Recurring droughts of the past 14 years, and resulting water use restrictions began to impact landscape installation, as well as the maintenance of existing landscapes. As a result, new landscape irrigation strategies and technologies emerged. Specialized irrigation equipment such as rain sensor shut-offs, drip irrigation, and micro-spray applications became the norm. Beyond that, new design trends such as those used in green infrastructure, help protect both water supply and quality.

Our water supply has and continues to play a critical role in the sustainability of agriculture in the ACF Basin. A dependable supply of water will determine which areas have the ability to attract new business, industry, and agriculture, and prosper economically. The value of the water resources of the ACF Basin to continue to support our myriad agricultural practices is immeasurable in terms of economics and human welfare. For this reason, the prudent development and diligent conservation of our water resources are key elements of developing a sustainable water management plan for the ACF Basin.

Industry and Manufacturing

Industry and Manufacturing concerns vary greatly across the Basin, ranging from intensive water using industry such as pulp and paper production to less water intensive water industry, such as car manufacturing. While more opportunities undoubtedly exist, many industries have already undertaken water conservation measures to reduce consumption. Industry and manufacturing requires an adequate water supply now and in the future.

Seafood Industry

The nutrient-rich, sediment-filled, waters that flow from the Apalachicola-Chattahoochee-Flint river system initiates the complex network of food chains in the Apalachicola Bay, helping to create one of the most productive estuaries in the northern hemisphere. The 210 square miles of bay provides an abundance and variety of fish and shellfish from its shallow waters, such as Apalachicola Bay's world famous oysters, and its plentiful shrimp and finfish. The Florida Department of Agriculture and Consumer Services reports that Apalachicola Bay is home to 180 types of fish, 360 types of marine mollusks and 1300 specimens of plant life. In 1997, 1.4 million pounds of oysters were shucked in local seafood houses.

Historically, Apalachicola Bay produced about 90 percent of Florida's oysters and 10% of the nationwide supply. Equally important, shrimp harvested from the waters around Apalachicola Bay generates more than a million pounds per year. Blue crabs are harvested from the inshore waters of the Bay, providing approximately 10% of commercial market sales. The Bay continues to be one of Florida's best saltwater fishing locations for both commercial catch and recreational anglers.

Unfortunately, these statistics do not reflect oyster harvest production today. Harvesters and processers that work and rely on the Bay for their livelihood have experienced a collapse of commercial oyster harvesting since production turned down significantly in 2012 as a result of an extended drought period along with other ripple effects. Harvesters of other seafood products report that they are also feeling the economic pressure resulting from this most recent Bay crisis. On August 12, 2013, the National Oceanic and Atmospheric Administration (NOAA) declared a commercial fishery failure of the oysters in Apalachicola Bay, citing the flow of fresh water from the Apalachicola River has decreased in recent years.

Decisions made today…from water flow - to Bay recovery efforts - to economic challenges…will directly affect the future of the seafood industry.

Hydropower

The Hydropower Stakeholder Interest Group can be divided into two groups – federally owned, multi-purpose projects (Buford Dam – Lake Lanier, West Point Dam – West Point Lake, Walter F. George Dam – Lake George or Eufaula, and Jim Woodruff Dam – Lake Seminole) and private Federal Energy Regulatory Commission (FERC) licensed projects (Morgan Falls, Riverview, Langdale, Bartlett's Ferry, Goat Rock, Oliver, and North Highlands on the Chattahoochee and Crisp County and Worth on the Flint). These projects lie in each of the four sub-basins of the ACF river system. The federally owned projects control storage and provide flow augmentation and flow regulation. The FERC-licensed projects are for the most part run-of-river projects and do not control storage nor are they able to augment or re-regulate flows to any significant extent. Their operation is governed by the terms of their FERC licenses.

The federal multi-purpose projects were authorized by Congress to satisfy federally authorized purposes based on project reports prepared by the Corps of Engineers that demonstrated the benefits would exceed the costs, i.e., a benefit to cost ratio greater than one. Given the hydrology of the ACF Basin, the hydropower function of the federal projects was conceived, designed, constructed and is operated to provide hydropower during a "peaking" operation. Without hydropower as an authorized project purpose the benefit to cost ratio would not have exceeded one and therefore the projects most likely would not have been built. For projects on the Chattahoochee, the benefit of hydropower generation was a significant portion of the expected project

benefits. The costs for each project were allocated among the authorized project purposes based on the actual costs and expected benefits, with the hydropower purpose being allocated from a low of 48% to a high of 81% of project costs. The power is sold by the Southeastern Power Administration (SEPA) to its statutorily defined customers (not-for-profit cooperative and municipal utilities) in North Carolina, South Carolina, Georgia, Alabama, Florida and Mississippi for the benefit of the U.S. Treasury at a rate that is required to recover 100% of the cost of generation, including the allocated cost of construction and interest. Modification or elimination of peaking operations would impact the value from the sale of power and, therefore, the benefits anticipated from the investment and cost allocation.

There are a number of water quantity and timing issues that affect hydropower, many of which do not affect any other stakeholder in a similar fashion. Hydropower as a peaking resource must provide capacity and energy during specific hours of the day to have value to the utilities that buy it. In the southeast and more specifically within the Southeastern Power Administration marketing territory, the hydropower peaking resource must be available to be called upon during the peak hours, which are typically between the hours of 2:00 PM and 7:00 PM (1400 – 1900 Hours) on a five-day work week (Monday-Friday) during the summer. It is during this block of hours that the value of the hydropower resources is at its peak. Generation on hot summer afternoons is especially crucial as this is when the annual peak demands occur and is the time when utilities must have all of their generation available. Being able to generate at full capability during this peak is the basis for maximizing the peaking value.

SEPA's utility customers have been purchasing the output of these generators since they were initially constructed. The customers rely on the availability of these purchases as an integral part of their power supply portfolio. Alternative operating scenarios that allow all hydropower generation to be scheduled during the summer afternoon peaks will have little impact on value. However, tradeoffs that shift generation between months, between weeks or even between days (particularly between weekdays and weekends), could have a significant impact on value. The value is determined by the cost of replacing any reduction in hydropower generation with other, more expensive sources, offset by any lesser reduction in cost at the time the hydropower is actually generated.

Because the availability of hydropower generation is significantly affected by drought, electric utilities plan for a power system that relies on only the hydropower capacity and energy that can be delivered during the worst droughts. Further, demand for electricity, particularly in the South to power air conditioners, tends to be higher during drought periods, which are typically hotter than normal. Thus, the only mitigation for drought operations is to construct other generators to be available when hydropower generation is not available.

In order to create the highest value from the ten projects in the ACT, ACF and Savannah river basins in South Carolina, Georgia and Alabama, SEPA markets the output of these projects as a system, allowing some generation to be shifted between projects in the case of droughts, mechanical breakdown, maintenance outages, or other constraints, to create a more reliable product. (The Woodruff project is marketed as a stand-alone system in Florida.) SEPA works with the Corps to schedule generation among the projects in order to make the best use of the diversity of these projects, given the water available to be released from storage at any given time.

The federal hydropower customers recognize and understand the competitive environment for the use of the waters of the ACF Basin, especially during times of drought. It is this recognition and understanding that has always guided the federal hydropower customers in agreeing to the use of the water storage in the federal reservoirs for a "higher and better" use, as long as the economic impact is not unfairly shouldered by the federal hydropower customers when hydropower operation is curtailed, modified or eliminated in order to support the "higher and better" use.

Thermal Power

Thermoelectric power generation requires water for cooling purposes. The amount of water consumed depends on the cooling technology as well as the power generation technology utilized. Federally mandated cooling tower technologies consume water through evaporation while once-through cooling does not consume water. Of the water withdrawn across the ACF Basin for power generation cooling, the vast majority is returned to the cooling water sources. Cooling towers release heat to the atmosphere while once-through cooling returns heat back to the cooling water source. At any one time the amount of thermoelectric power being generated directly correlates to end-user demand for electricity. Demand side management and advances in power generation cooling water technologies may reduce water consumed during thermopower generation.

Georgia's state wide water plan forecasted water needs for future energy production. The projections beyond 2020 were only at a state level. Regional estimates could not be made through 2050 because the location of the additional energy capacity is unknown (http://www.georgiawaterplanning.org/documents/Energy_Tech_Memo_102910.pdf).

Local Government

Local governments' interests vary across the Basin depending on population, land use, and specific industries. In general, local governments' interests are met when stakeholder interests within their jurisdiction are met. In addition to other conjunctive interests, local governments are concerned with flood control. The ability of the federal projects to provide flood control benefits is of importance to these stakeholders.

Environment and Conservation

Principles of Sustainable Water Management

Inherent in defining sustainable water management for the ACF Basin is protection of the river and bay ecosystem to support people and wildlife. Protecting the ACF ecosystem depends in part on restoring those ecological functions that have been pushed outside of the realm of natural variability. It would be an obvious mistake to impact the ACF ecosystem beyond the point of recovery, pushing the ecosystem into an alternate equilibrium that does not provide all of the basic ecological services that our economy and culture are based upon. A nearly equal mistake is the risky proposition of repeatedly pushing the ecosystem to the edge of equilibrium, given that we do not know under what circumstances recovery may become impossible. The ACF river/bay ecosystem provides life support for our existence. Once we start down the slippery slope of consumptive use or artificial flows that exceeds the limits of sustainable conditions within the rivers and bay, it is only a matter of time before ecological decline is accompanied by water shortages to irrigate food crops, drinking water supply, wastewater assimilation, and other commercial, industrial, and recreational uses upon which people depend.

History provides numerous examples of over allocation of water resources, and other alterations, leading to ecosystem decline and human suffering. Loss of fisheries, inadequate clean drinking water, floodplain loss, property destruction in floodplains, and even catastrophic events such as famine during normal droughts adorn history's span. We have the opportunity to adopt ACF operations and best management practices that protect and restore ecosystem function and integrity. We can make our communities and economies resilient and sustainably productive. Full ecological function, realized as profitable businesses, healthy communities, robust cultures, and equitable benefits will be the hallmarks of successful long-term sustainable water management.

Success requires that:

- Water supply and use is met solely by the water that exists currently within the ACF Basin. Borrowing, or taking, from one ecosystem to offset impacts in another ecosystem leads not only to shifting environmental impacts without alleviation but also to degradation of neighboring communities left to suffer economic losses or worse at our expense. In order to avoid this inequity,
  - Water taken from the ACF must be returned to the ACF Basin, and any water taken from other basins must be returned to that respective basin.
  - Groundwater levels must be fully protected and naturally recharged, or nearly so, annually during normal weather conditions. During the dry periods of normal and wet years, and during drought periods, groundwater withdrawals must not deplete groundwater levels below the point where healthy surface flows cease.
- Instream flow conditions that support ecological function are maintained, not only in terms of volume, but also variable flows over time and space necessary to sustain both the river and bay.
- Water withdrawn from surface waters should be treated after use to a quality as good or better as when withdrawn and returned to the surface water.

We can achieve the aforementioned by sustaining instream flows consistent with the Natural Flow Paradigm. Over the last several decades scientists and laypeople alike have accepted that the Natural Flow Paradigm is essential to the ecological integrity of river systems. The first principle of instream flow is that natural flow (magnitude, timing, duration, frequency) in natural channels provides favorable conditions for native plants and animals (Instream Flow Council 2008). Healthy instream flows also ensure we have adequate water to support human uses, including clean drinking water, wastewater assimilation, recreation, navigation, power generation, and fisheries support.

Aquatic ecosystems evolve over time not only in response to natural flow variability, but also in response to human-induced changes in hydrology, climate, species composition, water quality and other factors. Aquatic ecosystems are unique because their integrity and function depends on flow variability over time and space. Significant flow alteration can adversely impact aquatic and riparian organisms, and those human services that depend upon intact ecosystems to persist.

Over the past 50 years, the ACF Basin has experienced significant alterations to its flow regime due to impoundments, withdrawals, discharges, dredging, channelization, impervious surfaces, and climate change. For much of the Chattahoochee and Flint portion of the ACF Basin, scientific information is lacking with respect to the impacts of flow alteration on the system's biological diversity. Impacts are better documented on the Apalachicola, but need more study to understand discrete causation. More intense and frequent weather events, and a well documented rise in sea level, pose additional challenges to the system's resiliency. The ability to maintain function and integrity will become increasingly difficult. In order to maximize resiliency, decrease uncertainty, and provide a 'cushion' for future change, adaptive management is a crucial tool, and is in fact our best hedge against data deficiency, current uncertainties, and conflicting stakeholder goals.

Understanding the Current Condition of Apalachicola, Chattahoochee and Flint Sub-basins

An understanding of the basis of comparisons to natural flow conditions is necessary in order to correctly interpret modeling results and findings of ecological analyses. The Unimpaired Flow data set (UIF) used by the US Army

Corps of Engineers was used by ACFS in the model runs analyzing initial environmental conditions as well as comparing various water management alternatives. In theory, the UIF represents non-impacted or "natural" river flows. In reality, the UIF is not a true, quantitative representation of "unimpaired" or "natural" flows for a variety of reasons, including errors and omissions in the information underlying the UIF data itself (see the ACFS UIF report). Moreover, some human-induced changes, particularly those due to land use alteration, remain unaccounted for in the data set. Discussions within the subsets of the ACFS Board (e.g. the TOCWG) and by the full Board resulted in agreement to use what is essentially an artificial dataset, understanding not only the flaws and their import/implications, but also the need to improve the data as soon as possible.

Most of the analyses have been with the aid of several relatively simple spreadsheet models that incorporate a benchmark flow record extending from January 1, 1939 to December 31, 2008. These spreadsheets have been constructed so that any flow record of comparable length could be inserted in place of the UIF and used as a "baseline." For example, a simulated run-of-river flow record spanning the same time period could be used, should the ACFS decide that is the more appropriate "benchmark." Similarly, a corrected UIF could be used.

Although questions have been raised regarding various uncertainties associated with the UIF, given the schedule and funding available it was necessary to use existing data that can be compared to the Corps model runs. The environmental caucus agreed to go forward with a UIF dataset known to be incorrect at the temporal and spatial scale necessary for truly assessing the environmental impacts and benefits associated with various water management alternatives. This agreement to move forward with the existing UIF dataset contained the explicit understanding that because these flaws limit confidence in the results, ACFS thereafter agrees to a qualitative rather than 'absolute quantitative' approach. In other words, we (the entire ACFS technical review group, a subset of the ACFS Board known as the TOCWG) agreed to evaluate results by asking whether a given water management alternative moves the flow regime closer or further from a natural flow regime. However, we were unable to use the UIF, or any data set, to address the question of precisely how much flow and in what spatial and temporal configuration is necessary to ensure ecosystem protection and recovery. In order to effectively manage the ACF ecosystem in an adaptable and sustainable way, the UIF data set must be updated and corrected. Improved management of the ACF river/bay ecosystem can be initiated using this first iteration of an SWMP, to which our perspective is appended. But future iterations of the SWMP and future management must include improvements to the UIF as well as other inputs and tools.

It is also important to know that the gages or nodes analyzed in this process were all mainstem nodes. This was due to financial and time constraints. While there were at least two nodes added to the analysis beyond what the Corps and the states have historically examined, none of the nodes on the major tributaries of the Chattahoochee, Flint, or Apalachicola were analyzed. Many of these unanalyzed nodes are best positioned to examine the details of certain types of flow impairments in the ACF system. Future iterations of ACFS and other modeling should incorporate an expansion of nodal analyses as time and finances allow.

Finally, it is paramount to understand that flows in the ACF system have been vastly altered. In many cases, major tributaries experience flows during the dry portions of wet and normal years that were characteristic of drought flows prior to the mid-1970s. These same tributaries experience extended periods of extremely low flows (deteriorated by 50 to 100% below pre-1970 drought flows), including zero flows, during recent droughts. The Chattahoochee's flows are highly controlled and regulated by impoundments, and the Corps does not address instream needs other than wastewater assimilation at two nodes on its entire reach. The Flint's flows are vastly altered by consumptive uses. The upper Apalachicola, including its Chipola tributary, is experiencing a significant increase in agricultural well permitting, while the main channel and floodplain are experiencing flows significantly lower than normal dry and drought flows for much longer periods of time. The net result of these changes in the system is the loss of major portions of creek, riverine, floodplain and estuarine habitats, functions and associated benefits. Some of these losses can be recovered, others cannot. There are several improvements to the system that can and must be effectuated, soon. There are others that must wait on additional, improved analyses. The Environment/Conservation Interest Group views this first version of the SWMP as that, a first version, that provides a beginning from which to improve sustainability and resiliency of the ACF Basin. This work must continue, and indeed ACFS has designed this process so that it can continue.

Business and Economic Development

Water is a critical input to production in many economic sectors within the ACF Basin. Access to safe and adequate water is essential for business and economic development. The nexus between water, energy, and food is well documented; yet, its total economic value immeasurable.

Direct use of water in the Upper Chattahoochee basin is concentrated in major sectors of the economy, which include hospitality, urban-agriculture, farm, energy production, beverage, manufacturing and public water supply, among many others. The output from these sectors and associated activity elsewhere in the region, support nearly 5 million residents and over $300 billion in economic impact. Interactions among these sectors have demonstrated an "energy-water-food nexus," in which demands for water, energy resources, and agricultural products are interrelated. As a result, the use of water in these sectors cannot be viewed in isolation; changes in one sector can have a direct and significant impact on the demand for, and availability of, water to others. Thus, the economy as a whole is directly or indirectly dependent upon the output of

industries for which water is an important input, and is potentially sensitive to water supply shocks or shortages.

Protecting and efficiently managing our water resources is essential to maintaining a strong, vibrant economy. The impact of a water supply shock can extend well beyond the industries that are immediately affected, with implications for consumers and ripple effects on activity in other areas of the economy including loss of jobs and industrial output.

Climate variability is expected to further stress local water resources, increasing the risk of prolonged droughts in the region. It is important to recognize that water does not have one single value; even in the context of a single use, its value may change over time. This is true for all water-uses and stakeholder interests in the Basin.

Historic and Cultural

The rivers in the ACF Basin have helped to shape the history and cultural development in the Basin. Water in sufficient quality and quantity maintains the historic character of areas and is often associated with tourism. The ability to control floods for the preservation of archeological sites is also important.

Urban Agriculture

Urban agriculture interests vary across the Basin depending on population density and land use. Access to sufficient quantity of water to support establishment of new plantings and to maintain, residential landscaping, parks, green spaces, and recreation facilities are needed. Fulfilling this stakeholder interest also supports the urban agricultural industry.

From: Sharon Solomon
Sent: Thursday, January 28, 2016 12:02 PM
To: ACF-WCM
Subject: [EXTERNAL] Apalachicola River and Bay Proposal

- *The health, productivity and sustainability of the Apalachicola River and Bay are critical to the economy and cultural heritage of Florida and the entire Gulf Coast. The Corps of Engineers must give the same fair and equal consideration to fish and wildlife conservation in the Apalachicola River ecosystem as they do the other authorized purposes of the ACF river system.* A

- *It is imperative that the Corps' rewrite of its manual revises the way it manages the flow of freshwater needed to maintain the extraordinary richness and productivity of the Apalachicola River, Floodplain and Bay ecosystem.* B
- **PLEASE SAVE OUR RIVER AND BAY!**

Sincerely,
Sharon Solomon
Franklin County Concerned Citizen

Response to ACF140 – Sharon Soloman

A. The PAA includes fish and wildlife conservation operations throughout the basin (e.g., the reservoir fish spawn operations, minimum flow provisions in the Apalachicola River, and fish passage at Jim Woodruff Lock and Dam). Section 5 of the EIS provides additional information on the PAA. The EIS considered and disclosed the expected impacts that the PAA could have on fish and wildlife resources in the Apalachicola River and Bay (or elsewhere in the system). If expected impacts to significant resources would be adverse as a result of revised operations, USACE must consider potential measures to mitigate those effects. The analysis presented in section 6 of the EIS indicates that the PAA would have a minimal effect on flow conditions in the Apalachicola River and into the Bay, compared to current reservoir operations under the NAA. Because flow and water quality changes in the Apalachicola River and Bay are not expected under the PAA, no anticipated incremental effect would be expected on fish and wildlife resources in the bay.

B. The authorized purposes of the federal ACF system do not include a specific directive to provide freshwater inflows to Apalachicola Bay to sustain the resources of the Bay. USACE does make releases to limit adverse effects to threatened and endangered species downstream of Jim Woodruff Lock and Dam, including Apalachicola Bay. USACE consulted on the PAA and the results are presented in appendix J of the final EIS. In the biological opinion the USFWS concluded that effects to estuarine invertebrate production are insignificant because the PAA provides slightly beneficial effects from increasing the number of freshwater pulses and increasing the number of days greater than or equal to 16,200 cfs in the winter. USFWS also anticipate only minor changes in salinity regimes and estuarine habitat due to the WCM.

From: Amy B Camacho
Sent: Friday, January 29, 2016 8:35 AM
To: ACF-WCM
Subject: [EXTERNAL] The Corps' Water Control Manual ("WCM")

ATTN:
Commander, U.S. Army Corps of Engineers
Mobile District
Attn: PD-EI (ACF-DEIS)

In regards to the Corps' Water Control Manual (WCM), I would like to impress on your organization the need to respect and support the businesses and homes that actually sit on Lake Lanier. We, who border the Lake, have the most vested interest in the beauty, cleanliness and upkeep of this beautiful water resource. We would like to work in unison with the Corp to ensure that Lake Lanier remains natural, beautiful and recreationally useful. As such, I am requesting that you revise the navigation plan as outlined in the WCM to avoid the severe impact the proposed plan would have on Lake Lanier's water levels in drought conditions. This revision should include provisions that enable the Corp to adequately predict drought conditions, plan for them and ensure that Lake Lanier never again reaches the low levels experienced in December 2007. The Corp is keeper of the Lake Level, and it is your responsibility to ensure that your drought predictions trigger automatic changes in reservoir operations that will preserve lake levels during droughts. Additionally, please incorporate into your models and plans to include a raising of Lake Lanier's full pool level to 1073.

A

B

A happy but concerned resident of Lake Lanier,
Amy Camacho

Response to ACF141 – Amy Camacho

A. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.) It should be noted that navigation is not supported when drought operations are in effect.

B. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

Response to ACF142 – WestRock Corporation- Scott Fryer

WestRock

January 28, 2016

Via Overnight Delivery and E-mail at

Commander, Mobile District
U.S. Army Corps of Engineers
Attn: PD-EI (ACF-DEIS)

Re: Apalachicola-Chattahoochee-Flint River Basin: Comments on Water Control Manual and Draft Environmental Impact Statement

Dear Colonel Chytka:

WestRock Corporation (NYSE: WRK) appreciates the opportunity to provide comments on the U.S. Army Corps of Engineers (Corps) efforts in revising the Environmental Impact Statement (EIS) and updating the Master Water Control Manual (WCM) for the Apalachicola-Chattahoochee-Flint (ACF) River Basin, released for public review and comment on October 2, 2015.

On July 1, 2015, MeadWestvaco merged with RockTenn to form WestRock, a premier partner and unrivaled provider of paper and packaging solutions in global consumer and corrugated markets. Our team of 42,000 employees proudly supports customers around the world from approximately 275 operating and business facilities spanning North America, South America, Europe and Asia-Pacific.

For nearly 50 years, WestRock's Mahrt mill has operated responsibly along the middle Chattahoochee River in Cottonton, Alabama. Our mill employs more than 680 individuals and has a significant positive economic impact in the region. Around the clock, highly skilled employees at the Mahrt mill produce Coated Natural Kraft (CNK) paperboard, providing packaging solutions to some of the world's most admired consumer brands. CNK is the paperboard of choice for packaging of multiple beverage cartons, as well as a grade designed specifically for packaging frozen foods, dry foods, toys, sporting goods, automotive parts and more. As such, WestRock has a vital interest in the ACF River Basin, which is integral to Mahrt's daily operations that depend on established adequate river flows and levels to operate successfully.

WestRock supports comments filed by the Tri Rivers Waterway Development Association, the Alabama Pulp & Paper Council and Manufacture Alabama, of which WestRock is a member. WestRock also offers the following specific comments.

WestRock's Mahrt Mill Depends on the Corps to Provide Adequate Flows & Levels
Although much of the focus in the ACF river system has been on water supply issues in North Georgia and protected species in the Apalachicola River, the ACF System was authorized and constructed for the benefit of all stakeholders in the basin, including those along the middle and lower Chattahoochee River. WestRock urges the Corps to acknowledge and address the flow needs of these portions of the ACF River System.

- ***The Corps Should Provide Agreed-Upon Minimum Flows***
  Over the years, WestRock has made, and continues to make, significant capital investments at our Mahrt mill. These investments are made in reliance upon the Corps' lawful operation of the ACF System and commitment to maintain flows sufficient to serve congressionally authorized purposes. The future of WestRock's facilities depends on continuing adequate flows to support cooling and process water needs. Further, WestRock's NPDES permit limits for wastewater discharges are based on established river flow rates. As a leader in sustainability, WestRock's Mahrt mill has taken substantial steps to reduce the amount of water needed to operate its processes and continues to explore innovative measures to further reduce our water needs. A

  In 2003, the governors of Alabama, Florida and Georgia signed an agreement establishing flow parameters of the ACF River System. The revised WCM should reflect those agreed-upon flow measures. WestRock points in particular to the middle and lower Chattahoochee flow requirements of 1,350 cubic feet per second ("cfs") daily average and 1,850 cfs weekly average at Columbus, Georgia, and 2,000 cfs daily average at Columbia, Alabama. We believe these flows are sufficient to meet the congressionally authorized purposes of the ACF River System. Additionally, they correspond to the flows needed to meet the water supply and water quality needs of Columbus Water Works, as well as, WestRock's Mahrt mill.

- ***The Corps Should Not Rely on Flint River Flows to Meet Apalachicola River Needs to the Detriment of Chattahoochee River Flows***
  In the past, the Corps has reduced flows in the Chattahoochee River when Flint River inflow was sufficient to meet requirements for the Apalachicola River. This practice is harmful to those on the middle and lower portions of the Chattahoochee River. WestRock urges the Corps not to use the additional flows from uncontrolled sources as a justification to reduce the flows within the Corps' control to the detriment of middle and lower Chattahoochee River stakeholders. The minimum flows mentioned above should continue to be maintained during these times. B

- ***The Corps Should Provide Established Adequate Lake Elevations***
  In addition to necessary river flows, established, adequate lake elevations are also important to maintain. WestRock urges the Corps to maintain minimum lake elevations under normal conditions of 187.5 to 190 MSL at Lake Eufaula (Walter F. George). Should the lake elevation at Lake Eufaula fall below 184 MSL, Mahrt's mill operations will be substantially adversely impacted. Further, by codifying the implementation of a water management node in Columbus, Georgia, the Corps will be able to ensure these adequate elevations are effectively met. C

On behalf of WestRock, I want to thank you in advance for your consideration. Should you have any questions regarding our comments or our operations, please contact me directly at

Sincerely,

L. Scott Fryer
Vice President Mahrt Operations
WestRock Corporation

Response to ACF142 – WestRock Corporation- Scott Fryer

A. Sections 2.6.1.5.3 and 6.1.1.5.3 of the EIS recognize WestRock's Mahrt Mill as a significant withdrawal facility in the ACF Basin. Stakeholders within the basin provided their needs during the 2007–2008 drought period. Additionally, the Mahrt Mill intake is listed as a critical industrial in-take in Table 9 in the Master WCM drought contingency plan (DCP). The authorized purposes of the federal ACF system do not include a specific directive to meet flow targets at Columbus, Georgia, or Columbia, Alabama. Model results over the 73-year hydrologic period of record indicate that a daily average flow of 1,350 cfs at Columbus would be achieved on 94 percent of the days for the PAA compared to 95 percent for the NAA (see section 6.1.1.2.3.9of the EIS). As discussed in DCP section 8-03, the division commander will initiate the teleconference calls. The purposes of the calls are to share ongoing water management decisions with basin stake-holders and to receive stakeholder input regarding needs and potential effects on users in the basin.
Any purported agreements made between the governors of the states of Alabama, Georgia, and Florida in 2003 have never been finalized nor approved by the U.S. Congress; therefore, USACE has no authority to operate to support those agreements.

B. The Apalachicola River flow requirements and rules that are described in Table 5.4-3 of the EIS were developed through years of consultation with USFWS. There are provisions in the rules that provide opportunities to refill the USACE reservoirs on the Chattahoochee River during periods when flow requirement can be met by Flint River flows. Refill of the reservoirs is a critical component of managing the system to fulfill authorized project purposes under various hydrologic conditions. During this refill period, USACE continues to manage releases from the federal projects to fulfill their authorized purposes.

C. The Walter F. George conservation storage pool ranges from elevation 184 to 188 ft mean sea level (msl) in winter and 190 ft msl in the summer. The entire conservation storage pool is used to fulfill the federal authorized project purposes. Drought operations are designed to conservatively release water. Elevations below 184 ft msl are extremely rare and have not occurred during the period since all three federal storage projects were constructed. Model results over the 73-year hydrologic period of record indicate that the Walter F. George reservoir will not fall below 184 ft msl. Section 7-03 of the WCM describes the operation during extreme drought operation when the reservoir could drop below 184 ft msl. USACE would coordinate with basinwide stakeholders to support public health and safety

Response to ACF142 – WestRock Corporation- Scott Fryer

WestRock

January 28, 2016

A RESOLUTION BY WESTROCK CORPORATION ENCOURAGING AND REQUESTING THAT THE U.S. ARMY CORPS OF ENGINEERS ESTABLISH FLOW TARGETS FOR THE MIDDLE AND LOWER CHATTAHOOCHEE RIVER.

WHEREAS, Congress authorized the construction of locks and dams in the Apalachicola-Chattahoochee-Flint River Basin for purposes including flood control, hydropower production, and navigation from Columbus, Georgia, and Phenix City, Alabama, to and from the Gulf of Mexico; and

WHEREAS, flows from Corps of Engineers reservoirs on the Chattahoochee River provide important and necessary water resources for downstream municipalities and industries; and

WHEREAS, cities and businesses on both sides of the Chattahoochee River, in reliance and anticipation of flows from Corps of Engineers reservoirs, have made substantial investments in water infrastructure, industrial facilities, and steam-driven electrical generation; and

WHEREAS, the continued and future social, economic, and ecological vitality of communities along the Middle and Lower Chattahoochee River depends on the Corps of Engineers providing a steady and reliable source of flow; and

WHEREAS, the Corps of Engineers has accorded special legal status to flow targets at Peachtree Creek and the Jim Woodruff Dam; and

WHEREAS, from time to time, the Corps of Engineers is able to rely on uncontrolled flows from the Flint River to satisfy Jim Woodruff requirements without augmenting flows from its Chattahoochee River reservoirs; and

WHEREAS, the Corps of Engineers has allowed flows in the middle and lower sections of the Chattahoochee River to fall to dangerously low levels while flows from Lake Lanier, the largest storage reservoir on the system, were controlled so as to allow reservoir elevation levels to maintain and even increase; and

WHEREAS, the Corps of Engineers justifies operating in that manner by citing a lack of a binding flow target in the Middle and Lower Chattahoochee River; and

WHEREAS, as a consequence, the Corps of Engineers favors one region at the direct expense of another, through water management decisions that allow one region to improve through the refilling of water storage while another region worsens due to diminished flow; and

WHEREAS, it is inconceivable that Congress, in authorizing the construction and operation of projects in the Apalachicola-Chattahoochee-Flint River Basin, intended for reservoir operations to favor one region over another; and

WHEREAS, despite protracted conflict and controversy over the management of Chattahoochee River reservoirs of the Corps of Engineers, the Governors of the States of Alabama, Florida, and Georgia in 2003 reached an agreement that set forth principles to allocate water flow among the three states; and

WHEREAS, those principles included flow requirements to be included in a water allocation among the states, to be met in part by state action and in part through operation of Corps of Engineers reservoirs; and

D

WHEREAS, those targets included a flow of 1350 cubic feet per second (cfs) daily average and 1850 cfs weekly average at Columbus, Georgia, and 2000 cfs weekly average at Columbia, Alabama; and

WHEREAS, current operational guidelines of the Corps of Engineers and the draft Water Control Manual, are, therefore, inconsistent with both statutory requirements and flows agreed upon by the three states;

NOW, THEREFORE, BE IT RESOLVED BY WESTROCK CORPORATION that the U.S. Army Corps of Engineers is encouraged and requested:

(1) to establish and honor the flow requirements identified by the Governors of Alabama, Florida, and Georgia, namely, 1350 cubic feet per second (cfs) daily average and 1850 cfs weekly average at Columbus, Georgia, and 2000 cfs weekly average at Columbia, Alabama; and

E

(2) to operate the Chattahoochee River reservoirs as an integrated system in the service of all the populations along the full extent of the river, without reliance on uncontrolled flows from the Flint River as a basis to reduce support for certain Chattahoochee River communities.

F

L. Scott Fryer, Vice President Mahrt Operations
WestRock Corporation

Response to ACF142 – WestRock Corporation- Scott Fryer

D. Comment noted.

E. Whatever purported agreements were made between the governors of the states of Alabama, Georgia, and Florida in 2003 were never approved by the United States Congress; therefore, USACE has no authority to operate for these flow targets. The stated daily and weekly average flow targets at Columbus, Georgia, are established in the Federal Energy Regulatory Commission (FERC) license for Georgia Power Company projects downstream of West Point Lake (refer to section 6.1.1.2.1). Each of the FERC target flows include an important qualifier, e.g., "a daily average target minimum flow of 1,350 cfs, *or inflow, whichever is less*" (emphasis added). Model results over the 73-year hydrologic period of record indicate that a daily average flow of 1,350 cfs at Columbus would be achieved on 94 percent of the days for the PAA compared to 95 percent under the NAA (refer to section 6.1.1.2.3.9). The Alabama Office of Water Resources and the Southern Nuclear Operating Company have identified a daily average flow need of 2,000 cfs at Columbia, Alabama, to support continued operation of the Farley Nuclear Plant. Model results indicate that the daily average flow need at Columbia would be met 95 percent of the days over the period of record compared to 96 percent under the NAA

F. One of the key objectives of the Master WCM update process has been to develop a plan to operate the USACE reservoir projects more effectively as an integrated system in accordance with authorized project purposes. Even with an updated WCM, there will be a greater dependence on releases from the USACE Chattahoochee River reservoirs to meet minimum flow requirements for endangered species conservation below Jim Woodruff Lock and Dam under drought conditions, when uncontrolled flows from the Flint River could be abnormally low. Conversely, abnormally high Flint River flow conditions would not necessarily trigger a corresponding reduction in releases from the Chattahoochee River reservoirs, which would adversely affect middle and lower Chattahoochee River communities. Releases from the USACE Chattahoochee River reservoirs under normal or abnormally high flow conditions in the ACF Basin are governed by project guide curves, action zones, hydropower needs, and other considerations associated directly with each individual reservoir. The rules contain provisions for opportunities to refill the federal storage reservoirs on the Chattahoochee River during periods when endangered species flow requirements can be met primarily by Flint River flows. Refilling the reservoirs is a critical component of managing the system to fulfill authorized project purposes under various hydrologic conditions. During the refill period, USACE continues to manage releases from its reservoirs to fulfill authorized purposes throughout the system.

Response to ACF143 – Douglas Barr

From:
Sent: Friday, January 29, 2016 8:04 AM
To: ACF-WCM
Subject: [EXTERNAL] Draft ACF Water Control Manual Comments
Attachments: Comment letter COE WCM_January 29_2016.pdf

Attached are comments on the Apalachicola-Chattahoochee-Flint (ACF) River Basin water control manual and draft Environmental Impact Statement (EIS).

Douglas E. Barr

Sent via Email 01/28/2016
ACF-WCM@usace.army.mil

January 28, 2016

Commander
U.S. Army Corps of Engineers, Mobile District
Attn: PD-EI (ACF-DEIS)
P.O. Box 2288
Mobile, Alabama 36628

Commander:

Below are comments on the Draft Environmental Impact Statement for the "Update of the Water Control Manual for the Apalachicola-Chattahoochee-Flint River Basin in Alabama, Florida, and Georgia and a Water Supply Storage Assessment." In part, these comments are based on review of the HEC-ResSim simulations of the Preferred Action Alternative (PAA) which is listed as Option 7H in the HEC-ResSim Modeling Report included as Appendix E of the draft EIS. The comments focus on releases from Jim Woodruff Dam on Lake Seminole to Apalachicola River with emphasis on conditions during "drought operations".

The Corps of Engineers (COE) is aware of the catastrophic impacts to the biota of Apalachicola Bay that occurred in 2012. This coincided with extremely low releases from Jim Woodruff dam to Apalachicola River over a period of many months in 2011 and 2012. Since inflow to Apalachicola River is the primary source of freshwater to Apalachicola Bay there was a corresponding period of extreme low inflows to the bay. As a consequence, salinity levels in the bay increased to levels far in excess of the maximum optimum concentration for oysters during this period. This resulted in the loss of essentially the entire commercial oyster fishery in the bay along with losses of crabs, shrimp and commercial and recreational finfish. Impacts also occurred to the nursery areas of the bay which are utilized by the juveniles of commercial and recreational finfish and other important species. The 2012 impacts to the ecosystem functions and biota of the bay were unprecedented. The impacts were so severe that even after three years the oyster populations in the bay have still not recovered.

In 2011 and 2012 releases to Apalachicola River and inflows to Apalachicola Bay were at record lows for many months in both years. Figure 1 shows the observed flows to Apalachicola River at the Chattahoochee streamflow monitoring station located immediately downstream of Lake Seminole. In 2011, inflows to the Apalachicola River were approximately 5,000 cfs from late May through December with the exception of a few short duration spikes. In 2012, the inflow was at or near the COE drought operations release limit of 5,000 cfs for the 8 month period from early May through the end of December. The collapse of the oyster populations and the accompanying decline in crabs, shrimp and other species began in early to mid-summer of 2012. The extreme low flows in 2011 and 2012 coincided with long periods of extremely high salinity in Apalachicola Bay (Figure 2) including during the 2012 biological collapse of the bay (Figure 2).

A

The Florida Fish & Wildlife Commission has determined that a salinity of 25,000 parts per million (ppm) is the maximum optimal salinity for oysters and that levels in excess of this are detrimental to oysters. In 2012, the salinity at a long term monitoring station at Cat Point was at or near 25,000 ppm and higher from January-April. More generally, salinity at the station remained at levels of approximately

Response to ACF143 – Douglas Barr

A. USACE continues to maintain that numerous factors contribute to the variability of oyster and seafood harvests. Potential impacts of the PAA to Apalachicola Bay salinity were modeled by a University of Florida scientist under contract to USFWS and freshwater inflows from the Apalachicola River were found to have no significant impact on salinity levels. In addition, virtually no differences were noted in river flows between the PAA and the NAA as documented in the EIS.

23,000 to 33,000 ppm for a continuous period of 19 months from June 2011 to December 2012. During this entire period, the mean and median salinity concentrations were both 27,200 ppm. By August 2012 when the population of oysters and other bay species collapsed, the average salinity at Cat Point had averaged over 27,000 ppm for the preceding year including the three months immediately prior to the collapse of the oyster populations.

Figure 1. -- Observed Flow at the Chattahoochee Streamflow Station, Apalachicola River, 2011- 2012.

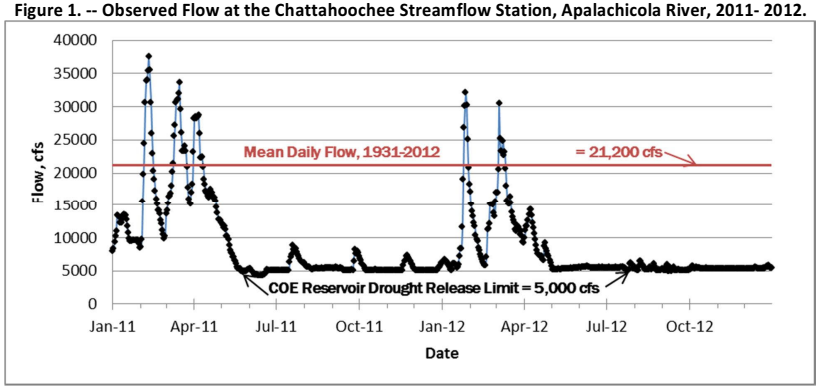
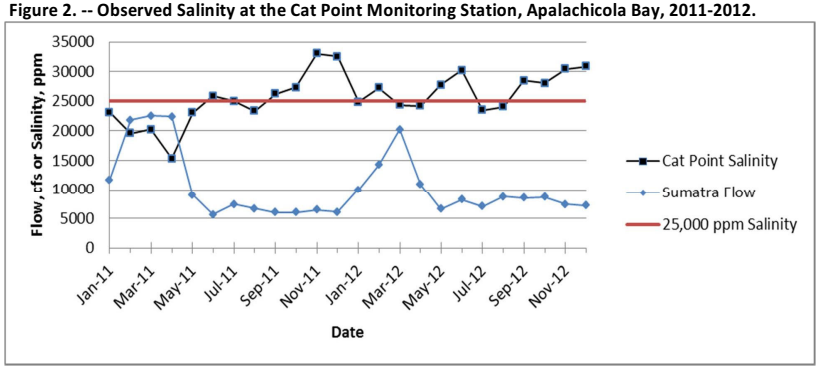


Figure 2. -- Observed Salinity at the Cat Point Monitoring Station, Apalachicola Bay, 2011-2012.



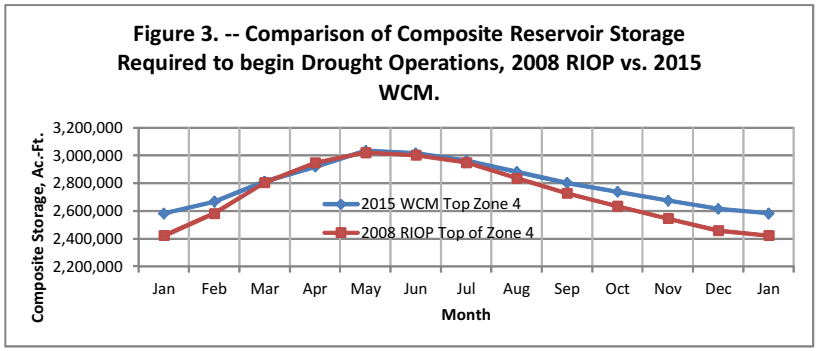
There is clearly a strong inverse relationship between bay salinity and inflow from Apalachicola River. At Cat Point, as inflow to the bay declined towards the minimum in June 2011, salinity increased from approximately 15,000 in April to 25,000 ppm in June. Inflow to the bay remained at a monthly average of 6,400 cfs for the remainder of the year and salinity increased to approximately 33,000 ppm in November and December of 2011. The salinity at Cat Point, therefore, continued to increase as the extreme low inflow persisted for progressively longer durations. By December 2011, high salinity water from the Gulf of Mexico had intruded so far into the Bay that the increased inflow from January through April 2012 was insufficient to reduce the salinity significantly below 25,000 ppm. Thereafter, salinity again increased to over 25,000 ppm coincident with the decline in freshwater inflow. The steady increase in salinity from July through December again illustrates the increase in bay salinity that occurs as the duration of low inflows increases.

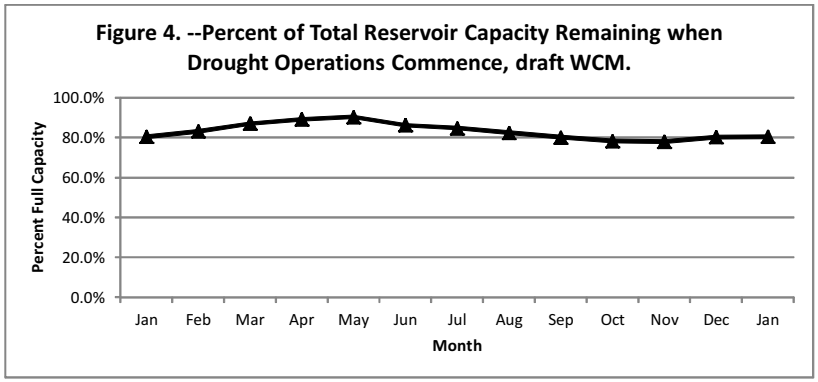
Even though the relationship between bay salinity and both bay inflow and releases to Apalachicola River (which accounts for 80%+ of the inflow to Apalachicola Bay) is well established, the COE nevertheless ignored the environmental impacts of the draft WCM on Apalachicola Bay. The COE's HEC-ResSim model analysis even excluded simulation of flows in 2012 – the year in which the collapse of the bay occurred. These omissions seriously degrade the validity and accuracy of the Environmental Impact Statement for the WCM update. On this basis, the EIS should be rejected until the COE amends the EIS to include the impacts to Apalachicola Bay. Otherwise, one of the single most important environmental issues in the basin will have been ignored by the COE.

Progressive Changes to Interim Operations from 2008 RIOP to 2014 draft WCM

The Preferred Action Alternative (PAA) selected by the COE for the draft EIS continues a series of progressive changes to the operating procedures that increased the potential for severe impacts to Apalachicola River. During drought operations the COE is allowed to reduce releases to Apalachicola River to near the historical minimum for the period 1939-2014 (5,000 cfs). The trigger for the start of drought operations is based solely on the composite storage of the reservoirs. Beginning in 2008 and continuing through the May 2012 modification to the revised interim reservoir operating procedures and the draft WCM the composite reservoir storage level that triggers the start of Emergency Drought Operations has increased to higher composite storage levels. Currently, the Emergency Drought Operations begin when the reservoirs are much nearer to full capacity. The COE also added a "Drought Zone to the composite storage action zones which allows the COE to reduce releases to Apalachicola River from 5,000 cfs to 4,500 cfs. The COE also raised the composite storage volume that must be reached to discontinue drought operations and the 5,000 cfs limit on release to Apalachicola River. The goal of the Emergency Drought Operations is conserve reservoir storage to protect the water supply withdrawals for the metro-Atlanta area. This is achieved at the expense of Apalachicola River and Bay by reducing releases to Florida to 4,500 to 5,000 cfs during drought operations.

As noted above, only composite reservoir storage is used to trigger the start of the emergency drought operations. The COE begins drought operations when the composite storage of the reservoirs enters Action Zone 4. Figure 3 illustrates the changes that have been made by the COE to the volumetric definition of the top of Zone 4 between the 2008 Revised Interim Drought Operations and the draft WCM. In 7 of 12 months the COE increased the composite storage definition of the top of zone 4. The revisions to the trigger for commencement of emergency drought operations are up to 160,000 acre-feet higher in December and January and approximately 130,000 acre-feet higher in November. These changes allow the COE to reduce the required release to Apalachicola River to the historical minimum of 5,000 cfs at higher levels of composite reservoir storage. As shown in Figure 4, the revision to the definition of the top of Zone 4 allows the COE to reduce the release to Apalachicola River even though the composite reservoir storage is at 78% to 90% of the full capacity.





The COE has also significantly changed the required reservoir refill level required to discontinue emergency drought operations and the 5,000 cfs limit on releases to Apalachicola River. As shown in Figure 5, the COE has substantially increased the reservoir refill requirement in 10 of 12 months before the emergency drought operations are discontinued. The increased refill requirement ranges up to approximately 300,000 acre-feet in January is over 150,000 acre-feet from September through March. As a result, the COE is requiring that the reservoirs be refilled to between 90% and 97% of full capacity before the release limitation of 5,000 cfs is removed (Figure 6)..

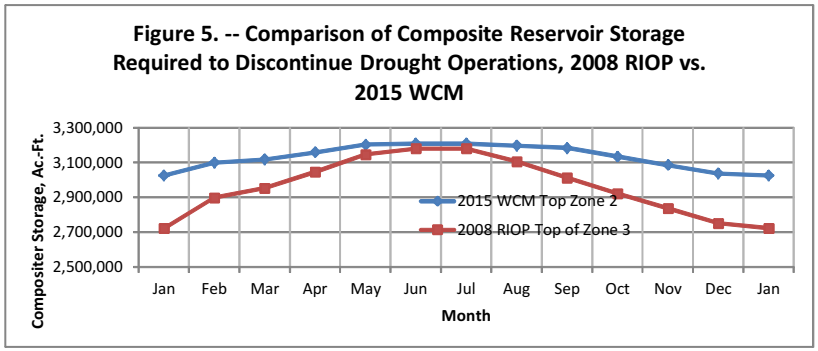
B

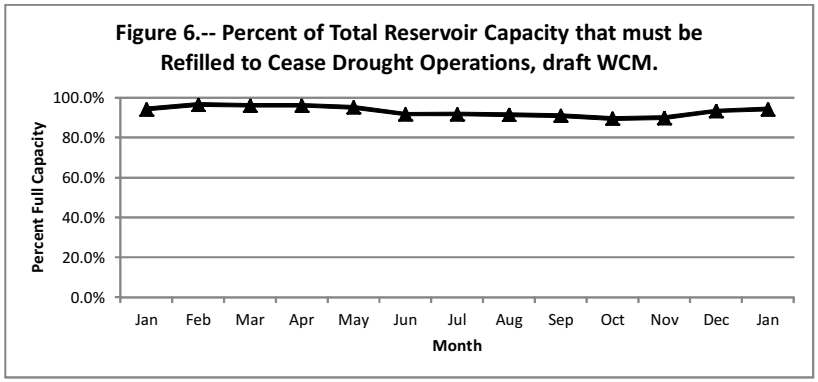
Response to ACF143 – Douglas Barr

B. Some confusion exists about the implementation of drought operations. Drought operation in the PAA is triggered when composite storage enters Zone 3 at the first of the month. A more conservative drought operation that provides for a minimum flow from Jim Woodruff Dam of 4,500 cfs is triggered when the composite storage drops below the drought zone, which is the lowest composite action zone. The "no action" alternative is described in section 5.2.1 of the EIS and includes the provisions of the 2012 RIOP. Chapter 6 of the EIS evaluates the impacts of implementing the PAA which includes drought operations.

The goal of the drought management plan is to ensure that the authorized project purposes can be fulfilled at some level through prolonged drought periods with an emphasis on public health and safety. Support for other authorized purposes is reduced (e.g., hydropower) or eliminated (e.g., navigation) as system storage is depleted.

The NAA as presented in the EIS includes the 2012 revised interim operation plan. USACE prepared an amended biological assessment on February 13, 2012, for the proposed modifications, and the USFWS prepared a biological opinion on the operation on May 22, 2012. The effect of the proposed action is included in those documents as a requirement of section 7 of the Endangered Species Act. A time line of consultation regarding Jim Woodruff project operation is presented in section 2.1.1.2.4.4 of the EIS.





The incremental approach to changing the interim reservoir operations has allowed the COE to make major alterations to the timing and duration of drought operations without conducting an environmental impact statement. Therefore, the draft WCM "No Action" alternative does not represent the operations under the current Water Control Manual but rather the 2012 Modified Revised Interim Operating Procedures. The environmental impacts of the drought operations, therefore, are not examined in the draft EIS. This is also the case for changes to the non-drought operations. Effectively, the COE has used the "interim operations" to avoid conducting an EIS on the most significant changes to the operations under the existing WCM. These include the release limits from Jim Woodruff Dam to Apalachicola River. Given the severity of the impacts on Apalachicola River from the "interim operation", the COE should be required to prepare an Environmental Impact Statement that compares the operations prior to all interim operations with the impact of the changes that have been made under the various versions of the interim operations including the 2012 Modified RIOP.

Calculation of Basin Inflow and Provision of 100% of Current and Future Demands in the Georgia Portion of the Basin

The 2007/08 and subsequent interim operations use basin inflow and composite reservoir storage as the basis for determining releases to Apalachicola River and the flows that will be diverted to storage in the reservoirs. The computational method used by the COE to determine basin inflow, however, fails to account for withdrawals of water for consumptive demands. These are almost entirely in Georgia and include direct withdrawals from Lake Lanier, direct surface withdrawals from the Chattahoochee River and the Flint River and streamflow losses resulting from ground water withdrawals in the Flint River Basin. Therefore, the COE's calculated basin inflow is actually the hydrologic inflow minus Georgia's consumptive withdrawals. As a result, the releases to Apalachicola River during non-drought periods are determined only after 100% of Georgia water demands are met both now and in the future.

C

Since the Georgia consumptive demands always "come off the top" of the actual hydrologic inflow, the basin inflow available for release to Apalachicola River during non-drought periods will continuously decline as the Georgia demands increase. Effectively, the past and current Interim Operating Procedures and the draft WCM make Georgia water demands the highest allocation priority in the ACF Basin and releases to Apalachicola River the lowest priority during non-drought periods.

The methodology for computing basin inflow creates a fundamental inequity between water for Georgia's consumptive water demands and releases of water to Florida for Apalachicola River and ultimately Apalachicola Bay. The WCM update should eliminate this inequity and use the true hydrologic basin Inflow for determining releases to Apalachicola River during non-drought periods.

HEC ResSim Simulations

The COE ResSim model of the ACF was used for analysis of the impacts of the reservoir operating options for the draft Water Control Manual. The model analysis was also used for selection of the PAA and the reservoir releases that will directly impact Apalachicola River and Bay during normal and drought periods. The model, however, has not been calibrated nor have simulations been made comparing the model results with observed data on reservoir levels or streamflow measured at U.S. Geological Survey streamflow stations. Likewise, no sensitivity analysis or systematic error analysis have been performed. As a result, no objective measures or analysis are available demonstrating that the model can accurately reproduce observed flows and reservoir levels that occurred in the past. This is an essential component in the development of any hydrologic model and especially for a model used to predict future flows and reservoir levels/storage in a large, complex basin such the ACF. If the model cannot replicate flows that occurred in the past, then it cannot be expected to accurately predict future impacts resulting from new reservoir operations and increased demands. The lack of validation is a serious deficiency in the development of the current model especially given the importance of the modeling in preparation of the draft Water Control Manual and for examining the impact the changes in operating procedures will have on the future of Apalachicola River and Bay. Similarly, no "baseline" simulation was performed with the reservoir operations that were used prior to the June 2008 Revised Interim Operating Procedures (RIOP) and May 2012 Modified RIOP. Therefore, the majority of the revisions to the draft Water Control Manual were not separately evaluated and documented as part of the formal Environmental Impact Statement. As noted above, these changes were effectively "grandfathered" into draft WCM based solely on the much less rigorous consultation process with the U.S. Fish and Wildlife Service.

D

Response to ACF143 – Douglas Barr

C. USACE evaluated a revision to basin inflow that would account for water use consumption. A near-real-time basinwide water use reporting scheme is required to implement the suggested basin inflow computation concept. Presently, USACE receives the actual water use data upon request. The data typically lag 1–2 years behind the current year. Until the states implement a real-time water use reporting requirement associated with withdrawal and discharge permits, USACE will continue using the current basin inflow computation method. USACE does not prioritize project purposes. The PAA continues to balance all authorized project purposes.

D. The discussion in section 6.0 of the EIS was revised indicating that the HEC-ResSim model was not "calibrated" to observed data and, therefore, would not be expected to necessarily simulate observed data for high or low flows. The HEC-ResSim model follows the operating plan when, in actuality, deviations from the operating plan might have been approved that the model cannot capture precisely. As stated in section 4.2.1.1 of the draft EIS:

> Water Management Alternative 1 represents no change from the current management direction or level of management intensity. This alternative would represent continuation of the current water control operations at each of the USACE projects in the ACF Basin. Basinwide management for all seven project purposes (i.e., flood risk management, hydroelectric power generation, navigation, fish and wildlife conservation, recreation, water quality, and water supply) is also considered in the alternative.

Model simulations of the current management direction do not necessarily represent observed conditions as in cases in which deviations are requested as stated in section 6.10:

> As in past years, USACE, working closely with states and affected stakeholders, could make special releases from USACE projects to support public health and safety throughout the ACF Basin. USACE will periodically notify users when such releases are made; water users also can directly notify USACE of their needs for special releases.

Historic special releases were not simulated in this modeling effort as the intent of the model was not to mimic historic conditions but to evaluate the effects of changes in USACE's current management direction.

The verification and analysis of the HEC-ResSim model is described throughout the HEC-ResSim modeling report provided in appendix E of the EIS. For example, the Muskingum routing method was selected for use in the final model because well-calibrated coefficients were available from an HEC-HMS model of the ACF Basin. The Muskingum parameters were used in developing the unimpaired inflow data set (USACE 2010b).

Although no systematic calibration and verification of the model or "baseline" simulations were performed, Option 1B as described in Table 5-2.1 provides a perspective on simulated versus observed flows using the existing reservoir action zones, drought operations, power generation and withdrawals of 20 Mgal/d from Lake Lanier and 277 Mgal/d from the Chattahoochee River. Absent a true baseline simulation by the COE, this simulation is the most useful for comparing the simulated flows with the observed flows at the Chattahoochee streamflow station on the Apalachicola River. This is especially useful for examining the predictive capability of the model during low flow periods.

Previous analysis suggests that the COE began operating the reservoirs in a manner similar to the original Interim Operating Procedures in 2007. This is confirmed by correspondence transmitting comments by the Northwest Florida Water Management District to the Mobile District COE and U.S. Fish and Wildlife Service on the impact of the 2007 interim procedures on inflows to Apalachicola River. Specifically, the impacts examined were associated with the U.S. Fish and Wildlife Service February 28, 2007 approval of the COE request to operate the federal reservoirs under "Concept 5" of the Interim Operating Procedures as requested by the COE on February 27, 2007.

In 2007 the COE began operating the reservoirs under the first version of the Interim Operating Procedures. Subsequently, (2008-2012) the reservoir operations followed the June 2008 RIOP or some variation that may have incrementally added provisions that would eventually be codified in the May 2012 Modified RIOP. Actual demands during this period are likely best approximated by the draft WCM "no action" (Water Management Alternative 1B) simulations which includes Georgia's latest estimates of current demands. Therefore, during the period from mid-2008 through 2011 the actual reservoir operations are best represented by the "No Action" simulation. This simulation utilizes the May 2012 Modified RIOP operations rather than the June 2008 RIOP, however, this will provide a reasonable estimate of the adequacy of the current model in simulating the observed flows during 2007-2011.

Figure7 illustrates the 2007-2008 observed flows versus OPT1_BX0 (No Action) simulated flows during low flow periods (i.e., observed flows ≤7000 cfs). As shown, under low flow conditions the simulated flows are not well correlated with the observed flows. In addition, the value of R^2=0.38 means only 38% of the variation in the simulated flow is accounted for by the linear regression with the observed flow. The Correlation Coefficient of r=0.51 means the simulated and observed flows are only weakly correlated. The "No Action" model, therefore, does not accurately reproduce releases of 7,000 cfs or less to Apalachicola River in 2007-08. A similar plot for 2011 is shown in Figure 8. In this case, R^2=0.16 indicating that only 16% of the variation of the simulated flow is accounted for by the observed flow. This is of particular interest since conditions in 2011 were the most similar to flows in 2012 when oyster populations in Apalachicola Bay collapsed. The corresponding correlation coefficient of r=0.40 indicates that the correlation between the observed and simulated flows is weak.

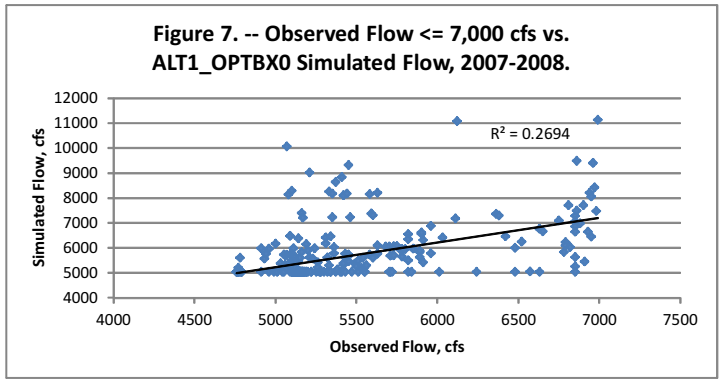
E

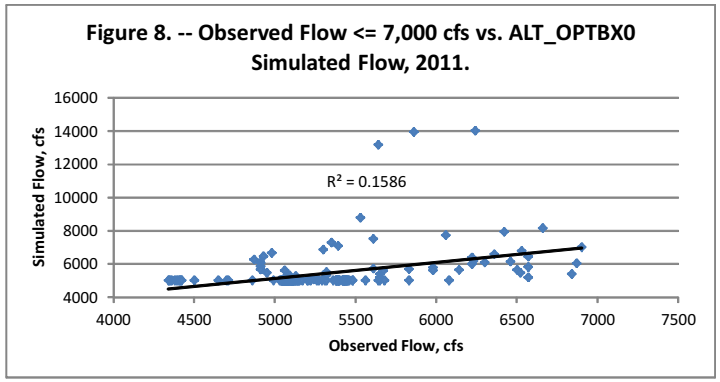
Response to ACF143 – Douglas Barr

E. See the response to comment 15.19, which addresses comparisons to observed flow.

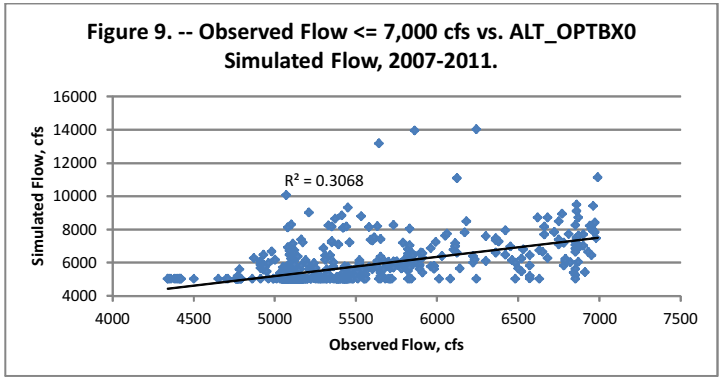
The following differences were noted between the actual operation and the NAA simulation: In 2008, USACE requested a deviation to West Point and Walter F. Georgia operations above the normal winter level, the 2012 modifications to the revised interim operating plan were not implemented during the 2007–2011 observed period, and there were shifts in the Chattahoochee gage rating results in instances of revised historic observed flows compared to actual during the period of operation.

The NAA is most similar to actual conditions during the 2007–2011 period; however, there is no intent to exactly replicate the actual operation during the entire simulation period. The NAA simulation pro-vides a means to compare alternative ACF Basin operations. The HEC-ResSim software is the USACE standard for its reservoir operations modeling. The software incorporates characteristics of the basin and individual reservoirs, including physical constraints (e.g., spillway capacities, area-discharge curves, and flows associated with hydroelectric power generation) and operational procedures (e.g., action zones, balancing, and the like). As the HEC-ResSim model for the ACF Basin was refined and the initial baseline model runs were conducted, USACE conducted two workshops to familiarize stakeholders with the model and its capabilities





Finally, Figure 9 illustrates the observed and simulated flow over the entire period from 2007 through 2011 for observed flows <= 7,000 cfs. Again, the simulated flows vary over a wide range when the observed flows are 7,000 cfs or less. Even over the longer period, the correlation coefficient is weak and only about 31% of the variance of the simulated flows is accounted for by observed flows. The model, therefore, does not accurately replicate the observed flow at the Chattahoochee streamflow station (reservoir releases to Apalachicola River) during 2007-2011. Significantly, when the actual releases were are at or near 5,000 cfs, the simulated flows were generally higher suggesting the model is augmenting extreme low flows to a greater extent than actually occurred (i.e., the model understates the occurrence of flows at or slightly above 5,000 cfs). These results are very similar to simulations performed in support of the Water Control Manual and plans utilizing the "IMProved" operations as described in the 2012 "Remand Report" entitled "Apalachicola-Chattahoochee-Flint (ACF) Remand Technic al Modeling Report" (comment letter from D. Barr to Colonel Steven J. Roemhildt, Mobile COE dated January 14, 2013).



The most critical periods of environmental impact to Apalachicola River and Bay occur during drought periods when inflows to Apalachicola River are at or near 5,000 cfs. During these periods, however, the model does not accurately replicate the observed flows under simulated conditions (No Action alternative) most similar to actual conditions. As shown by Figures 7-9, the model residuals are extremely high and far greater than can be accounted for by demand and operational differences between the No Action alternative and actual conditions. As a result the model simulations are not a reliable basis for determining environmental impacts of the draft WCM on Apalachicola River and Bay under the all-important low flow conditions that occur during droughts.

Simulated Excess Inflows to Apalachicola River Due to Demand and Return Assumptions

During negotiations between the states under the Apalachicola-Chattahoochee-Flint River Basin Interstate Compact, the demand estimates for agricultural irrigation used by Georgia in the Flint River Basin were overstated to such a degree that simulated flows at Bainbridge were reduced to zero. For the HEC RES-SIM modeling used as the basis of the draft WCM and Environmental Impact Statement, the COE utilized agricultural Irrigation demands provided by the State of Georgia for the Flint River Basin. These were represented to be the approximate demands in the basin for current conditions. Therefore, the COE modeling of the Flint Basin should correspond to the current demands in the basin. The COE utilized these demands in the Flint River Basin for simulation of options and alternatives (OPT 1A-OPT7H).

Figure 10 shows the observed Bainbridge flow minus the OPT7-H0X simulated flow (residuals). Negative residuals occur when the model flow is higher than the observed. In dry years and some normal years as defined by the COE (Draft EIS, Table 4.1-9), the simulated monthly flows during the peak irrigation months are approximately 200-500 cfs higher than the observed flow. In 2011, the excess simulated flow averages 400 cfs in May – August with a peak of 500 cfs in June. On a daily basis the simulated excess flow is up to 885 cfs higher than the observed flow. During most of 2011 the simulated flow at the Chattahoochee streamflow station is 5,050 cfs since drought operations are in effect. As a result, during the critical summer month of 2011 the model overstates the inflow to Apalachicola River (or equivalently understates the simulated impacts). This also understates the impacts on the reservoirs by

reducing the augmentation required to meet the 5,000 cfs minimum release. As also shown by Figure 10, this is a systematic error that occurs in 2001, 2002, 2006-2008, 2010 and 2011. The model, therefore, is understating the impacts of Georgia withdrawals in the Flint River Basin during the peak irrigation period in 7 of 11 years from 2001-2011. Had the COE included 2012 in the model, a similar error would have likely occurred in the summer of 2012 (coinciding with the collapse of the oyster population in Apalachicola Bay).

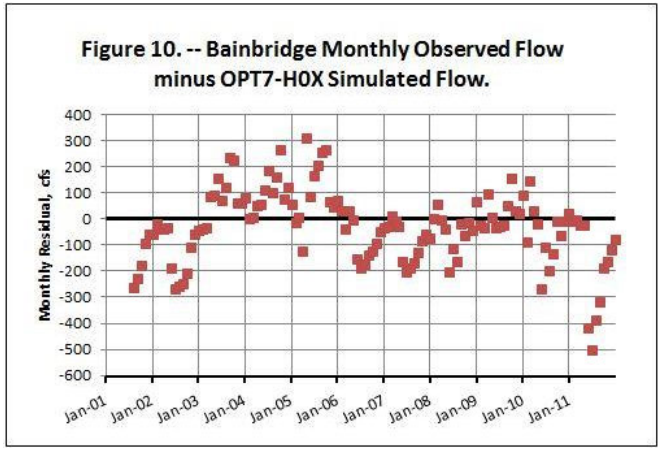
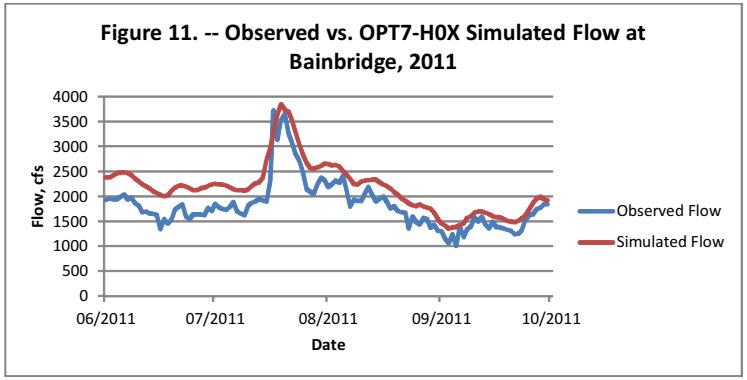


Figure 11 illustrates the daily observed and OPT7-H0X simulated flow for the peak irrigation period in 2011. This provides a perspective on the variation of the excess simulated flow during the 2011 peak irrigation period (the most severe drought period simulated).



F

Response to ACF143 – Douglas Barr

F. Net water use demands outside of Metro Atlanta were set to actual values that occurred in year 2007. The highest levels of basinwide water supply withdrawals occurred in 2007, during the 2006–2008 drought. Although basinwide withdrawals since 2007 have been lower overall, the year 2007 was selected as representative of "current" demand because using the highest recent figure provides the most conservative estimate of the storage available for all purposes. It also assumes the greatest amount of reasonably forecasted water supply demand, including during times of drought. Actual water use demands by reach will deviate from the 2007 values, both higher and lower. The commenter highlights an instance in which agricultural withdrawal might have been higher; however, the greatest basinwide water use occurred in year 2007 and represents the most conservative estimate basinwide.

In the description of water supply option H (draft EIS, Table 5.1-2) the COE indicates that withdrawals from the Chattahoochee River are 408 Mgal/d with wastewater returns of 384 Mgal/d - a return rate of 94%. This is described as the 2035 rate of return with the Glades Reservoir pumping. The actual return for the period 2000-2009 as listed in Table 2.1-21 however, range from 56% to 79%. This indicates the COE is assuming that at some point in the future a much greater proportion of river withdrawals will be returned. The COE has no assurances that this will be the case nor is it likely possible that the COE could require that Georgia increase in the rate of return. As a result, the COE has made a questionable assumption that the higher return rate will be achieved at some point in the future. The better option is to assume that the current return rates will continue and use the lower return rate to simulate the impacts of the draft WCM on reservoir operations, the frequency that drought operations are triggered and the level of reduced releases to Apalachicola River during droughts.

The rate of return for 2000, 2006 and 2007 (dry years) listed in Table 2.1-21 are 56, 64 and 61%, respectively, with an average of 60%. Using these current return rates for dry years, gives an average annual return of 244.8 Mgal/d in comparison to 383.5 Mgal/d based on 94% return. The difference of 136.7 Mgal/d (=214.7 cfs) is the average daily excess flow resulting the assumed return rate of 94% rather than the current dry year rate of 60%. This avoids the obvious problem of understating the impacts of the withdrawals for metro-Atlanta in an environmental impacts statement on COE operations used to support these withdrawals.

The simulated excess flow in the Flint Basin and simulated excess wastewater returns in Atlanta occur during the May-August peak demand period in drought years (and some non-drought years). The combined total during the simulated 2011 drought is 615 cfs in May-August. In other drought years, the combined total ranges from approximately 380-450 cfs. The model, therefore, is understating the impact of the draft WCM on inflows to Apalachicola River and ultimately to Apalachicola Bay. This is especially the case in 2011 which most closely coincides with the inflows to Apalachicola River and Bay during the 2012 collapse of the biota in the bay. Under actual conditions, the excess simulated flow would have to be offset by either reducing the releases to Apalachicola River from the June-August simulated level of 5050 cfs to approximately 4,450 cfs or increase releases from the reservoirs by approximately 150,000 acre-feet . In either case, the impact is substantially greater than the COE simulated impacts.

The current and future demands in Georgia were provided by the State of Georgia. In the case of agricultural demands in the Flint River basin during droughts periods the simulated flow is systematically higher than the observed flow at Bainbridge. In addition, the wastewater return rate for metro-Atlanta as provided by the State of Georgia far exceeds the current documented return rate resulting in systematically higher inflow in the upper Chattahoochee Basin. It was not possible to ascertain the accuracy or reasonableness of the majority of Georgia demands from the draft EIS or accompanying documentation since these were not provided by the COE. The two cases discussed above, however, indicate that demands may be understated and that the impact of the demands on inflows to Apalachicola River and Bay may be much greater than simulated by the COE simulations. As a result the COE should release the monthly demands by reach provided by the State of Georgia and used by the COE for model simulations. Without additional review and verification, the COE risks adopting the draft WCM without having realistically determined the impact of the demands on the proposed reservoir operations.

G

Response to ACF143 – Douglas Barr

G. The 94-percent river return rate was part of Georgia's January 2013 water supply request. That value included the assumption that wastewater treatment capacities would be expanded by the year 2035. Since Georgia's projected return rate was within the range of computed historic river return rates by USACE (79–111 percent), it was deemed to be a reasonable assumption. The 94-percent river return rate was validated by reviewing existing and proposed treatment facility returns described in the Metropolitan North Georgia Water Planning District wastewater treatment plan of May 2009. That plan documented a larger volume of returns, which could represent treating and releasing water from sources outside the Chattahoochee River basin. The State of Georgia provided updated water supply demand projections in December 2015 that included revised return rates. The return rate from Metro Atlanta wastewater utilities in 2040 is expected to be 95 percent. Details of the actual 2007 values are provided in appendix B of the EIS

Loss of Inflow to Apalachicola River Due to COE Change in Inflow Monitoring from Woodruff Release to Chattahoochee Streamflow Monitoring Station

There was a significant loss of inflow to the Apalachicola River when the COE changed from using the outflow from Jim Woodruff Dam to measure compliance with the 5,000 cfs minimum release to use of the U.S.G.S. streamflow station on the Highway 90 Bridge near Chattahoochee, Florida. During the 2000 drought, compliance with the minimum release was measured at Jim Woodruff Dam. As illustrated in Figure 12, the drought period releases as measured at Woodruff averaged approximately 5,200 cfs (i.e., 5000 cfs plus a 200 cfs buffer). During this same period, the observed flow at the Chattahoochee streamflow station was approximately 5,760 cfs. By 2007, the COE had changed from using the Woodruff release to use of Chattahoochee streamflow station. As a result, during the lowest flow period the mean flow at Chattahoochee station was 5,140 cfs or approximately 600 cfs less than in 2000 (Figure 13). The release from Woodruff was 4,723 cfs in 2007 or approximately 420 cfs less than the 2000 release. This demonstrates that the COE change from using the Woodruff release to use of the Chattahoochee streamflow station resulted in an actual reduction of inflow to Apalachicola River.

Figure 12. -- 2000 Observed Woodruff Releases and Flow at the Chattahoochee Streamflow Station. Woodruff Release is Used as measure of inflow to Apalachicola River.

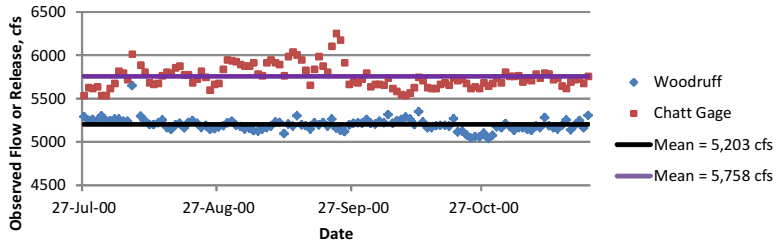
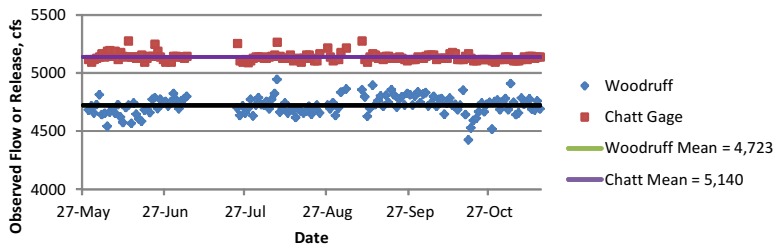


Figure 13. -- 2007 Observed Woodruff Release and Flow a the Chattahoochee StreamFlow Station. Chattahoochee Gage Flow used as Measure of inflow to Apalachicola River.



H

Response to ACF143 – Douglas Barr

H. The change to the U.S. Geological Survey (USGS) streamflow station improves the accuracy of the Jim Woodruff Dam outflow.

USACE computes its mean daily discharge from the Jim Woodruff project. Historically, this mean daily discharge is a combination of spillway releases, turbine releases, and water released through lockages. The flow amounts are based on rating tables and measured parameters to include pool and tailwater elevations, power generation, and a number of lock chamber dumps.

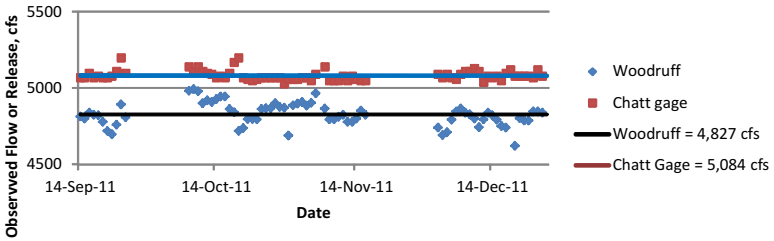
The USGS, in cooperation with the Northwest Florida Water Management District and USACE, maintains a stream gage on the U.S. Highway 90 bridge located approximately 0.6 mile down-stream of the Jim Woodruff Dam. That gage has been in continuous operation since October 1928, and the records are considered good at this site. The water surface elevations and dis-charges for the gage are available in real time on the USGS Web site (http://fl.water.usgs.gov/) and are used by stakeholders, government agencies, and the general public to track flows on the Apalachicola River.

There is a documented long-term variation between the USACE reported discharge from Jim Woodruff Dam and the reported discharge at the Chattahoochee gage. The documented vari-ation in the flows between the Woodruff discharge and the flow at the Chattahoochee gage on the Apalachicola River could be the result of differences in the estimated turbine and spill-way discharge ratings as well as other flow movements beneath the dam that are not readily measurable.

The use of the USGS Chattahoochee gage to compute inflow to the Jim Woodruff Dam as well as to measure outflow to the Apalachicola River is one of USACE's recommended changes to the interim operations plan (2006). There is a high level of interest among all stakeholders to ensure that the best data are used to operate the system. In addition to increasing the accuracy of the USACE reported re-leases, the use of the USGS Chattahoochee gage data will increase the transparency of USACE operations by using data that are generally already in universal use among basin stakeholders.

In 2011, the mean flow at the Chattahoochee stream flow station was 5,084 cfs when the COE was targeting the 5,000 cfs minimum flow or approximately 670 cfs less than in 2000 (Figure 14). The mean Woodruff release was 4,827 or approximately 380 cfs less than in 2000. Clearly, the change from using the Woodruff release to the flow at Chattahoochee streamflow station for measuring compliance with the 5,000 cfs minimum resulted in a reduction of inflow to Apalachicola River.

Figure 14. -- 2011 Observed Woodruff Release and Flow at C hattahoochee Streamflow Station. Chattahoochee Gage Flow used as Measure of Inflow to Apalachicola River.



Unfortunately, the COE did not reset the minimum from 5,000 cfs at Woodruff to the higher corresponding flow at the USGS streamflow station. Instead the COE simply equated the Woodruff discharge to the gage flow and thereby reduced the actual inflow to the river. Based on the Woodruff release, the loss of inflow is on the order of 400 cfs (+/-) and approximately 600 cfs (+/-) based on the Chattahoochee streamflow station.

Draft WCM Flow Releases from Jim Woodruff Dam to Apalachicola River

Drought Operations and Releases

As discussed above, the COE initiates drought operations in the basin based solely on the total composite storage in the reservoirs. No objective measure that the basin has entered an actual hydrologic drought is used by the COE to trigger drought operations and the automatic reduction of releases to Apalachicola River to 5,000 cfs. Therefore, the drought operations could be triggered by any number of causes unrelated to drought. Since 2000, for example, a faulty water level recorder on Lake Lanier resulted in excessive releases and a significant decline in the level of the lake before the problem was recognized and corrected. In another well documented instance, the COE violated the minimum release requirement specified under the interim operating procedures. Although a violation had clearly occurred, no action was taken by the COE to rectify the violation by offsetting the loss of inflow to Florida with additional releases. Further, nothing in the draft WCM specifies what actions the COE will take in the event of a similar violation in the future.

Since the initial Interim Operating Procedures (IOP) and continuing through the Revised Interim Operating Procedures (RIOP), Modified Revised Interim Operating Procedures (Modified RIOP) and the draft WCM, the COE has progressively changed the composite reservoir storage required to begin and

end the emergency drought operations. As shown by Figure 4 (above), the emergency drought operations begin when the composite reservoir storage is still at 78% - 90% of full capacity. Once the COE has triggered the Emergency Operations, the required releases to Apalachicola River remains at 5,000 cfs until the composite reservoirs storage has been refilled to 90%-96% of full capacity. The COE, therefore, never allows the composite reservoir storage to drop below three-quarters of full capacity before automatically cutting releases to Apalachicola River to extreme minimum levels to provide for refilling of the reservoirs to near full capacity. I

The impact of the drought operations and restrictions on releases to Apalachicola River are understated by the COE simulations. In 2011, the simulation of the PAA creates an additional 215 cfs of water on a continuous basis. This results from the use of a 94% wastewater return rate for withdrawals from the Chattahoochee River for Metro-Atlanta water supply instead of the documented current rate of 60%. In addition, the COE simulation using the water demands provided by Georgia for the Flint River Basin overstate the 2011 flow at Bainbridge by an average of 405 cfs during the May-August peak irrigation period in comparison with the observed flows. Therefore, the COE simulation of the 2011 drought inflates the flows in the Chattahoochee and Flint Rivers by approximately 600 cfs during the critical summer period. During most of this period (June-September), the simulated inflow to Apalachicola River was 5,050 cfs. Correcting for the overstated returns to the Chattahoochee River and overstated flows in the Flint River, reduces the simulated inflow to the Apalachicola River to approximately 4,450 cfs. The corrected inflows would require additional reservoir releases of approximately 150,000 acre-feet from June-August to achieve a flow of 5,050 cfs. This may have triggered the reduced inflow of 4,500 cfs allowed for under the draft WCM. Similar errors also occurred in the simulation of 2001, 2002, 2006-2007 and 2010. In each of these six years the excess wastewater returns and excess flow in the Flint River in all or parts of the peak withdrawal period averages approximately 450 cfs in 2001 and 2002, and 400 cfs in 2006-2008 and 2010. Therefore, in 7 of 11 years in the period 2001-2011 the COE simulations understate the impacts of the draft WCP on Florida. These include the 2001, 2006, 2007 and 2011 drought years which are some of the most severe droughts that have occurred over the 73 simulation period (1939-2011).

Non-Drought Operations and Releases

Below is the table from the draft WCM listing releases from Jim Woodruff Dam to Apalachicola River for the periods March-May (spring spawning period), June-November (includes dry season and peak demands) and December –February (typically a wet period). The last column in the table is identified as the "Minimum Outflows from Jim Woodruff Dam". This column is also the maximum required releases from Jim Woodruff Dam as measured at the Chattahoochee Streamflow Station on the Apalachicola River. In all instances, during non-drought periods the required release to Apalachicola River is solely a function of basin inflow. As noted above, the basin inflow is calculated by the COE without adjusting for withdrawals by Georgia from the Chattahoochee and Flint Rivers. The calculation of basin inflow, therefore, is not the true basin inflow but rather the remnant inflow after 100% of Georgia's current and future withdrawals are met. From March through November of each year the remnant basin inflow is proportioned between refilling of the reservoirs and release to Apalachicola River. No release that would lower composite reservoir storage is ever required for Apalachicola River when the composite reservoir storage is in zones 1-3 (above the top of zone 4). The only exception is if the remnant basin inflow is less than 5,000 cfs at which time releases would be made from the reservoirs but only to the extent of raising the inflow to the 5,000 cfs minimum. In contrast, storage in Lake Lanier is drafted whenever necessary for water supply purposes in Georgia.

Response to ACF143 – Douglas Barr

I. The 94 percent river return rate was a component of Metro Atlanta water supply scenarios considered in the draft EIS. According to USACE analysis of actual historic water use, the 2012 return rate was 82 percent for the Metro Atlanta river withdrawals. To increase the return rate to 94 percent, treatment capacity will be expanded by year 2040. The 94 percent return rate, there-fore, is not unreasonable to include as a component of the Metro Atlanta water supply scenario. It is inaccurate to assume that the USACE PAA simulation creates an additional 215 cfs by assuming 94 percent return rate for Metro Atlanta river withdrawals. Additional information pro-vided by the State of Georgia in December 2015 regarding future water demands indicates that the return rate from the Metro Atlanta waste treatment facilities will be 95 percent.

Net water use demands outside Metro Atlanta are set to actual values that occurred in year 2007. The highest levels of basinwide water supply withdrawals occurred in 2007, during the 2006–2008 drought. Although basinwide withdrawals since 2007 have been lower overall, 2007 was selected as representative of "current" demand. Using the highest recent figure provides the most conservative estimate of the storage available for all purposes, assuming the highest reasonably forecasted water supply demand, including during times of drought. That modeling assumption is presented in the executive summary on page ES-9 and in section 4.1.2.9 of the EIS. Because the actual 2011 withdrawals were not included in the HEC-ResSim modeling, the resulting Flint River flows will not exactly match the 2011 observed flows. It is inaccurate to assume that the PAA simulation overstates the Bainbridge flow by an average of 405 cfs because the modeling used 2007 level withdrawals. The modeling effort did not attempt to exactly match observed flows.

In December-February the draft WCP the required release to Apalachicola River is limited to 5,000 cfs even when the composite reservoir storage is in zones 1-3. This allows the COE to refill the reservoirs to full capacity even if this means reducing the release received by Florida to 5,000 cfs. Thereafter, no draft from storage is required that would benefit Florida and Apalachicola River and Bay except for the 5,000 cfs extreme low flow. This is also the case during the March-May spawning period. Only the remnant basin inflow is used to meet the required release to Apalachicola River.

Table 7-3. Flow Releases from Jim Woodruff Dam

Months	Composite Storage Zone	Basin Inflow (BI) (cfs)[a]	Minimum Outflows from JWLD (cfs)[b]
March - May	Zones 1 and 2	>= 34,000 >= 16,000 and < 34,000 >= 5,000 and < 16,000 < 5,000	= 25,000 = 16,000 + 50% BI > 16,000 = BI = 5,000
	Zone 3	>= 39,000 >= 11,000 and < 39,000 >= 5,000 and < 11,000 < 5,000	= 25,000 = 11,000 + 50% BI > 11,000 = BI = 5,000
June - November	Zones 1,2, and 3	>= 22,000 >= 10,000 and < 22,000 >= 5,000 and < 10,000 < 5,000	= 16,000 = 10,000 + 50% BI > 10,000 = BI = 5,000
December - February	Zones 1,2, and 3	>= 5,000 < 5,000	= 5,000 = 5,000
IF Drought Triggered[c]	Zone 3	NA	= 5,000[d]
At all times	Zone 4	NA	=5,000
At all times	Corps Extreme Drought Zone	NA	= 4,500[e]

Footnotes:
a. Basin inflow for composite conservation storage in Zones 1, 2, and 3 are calculated on the basis of the 7-day moving average basin inflow. Basin inflow for composite conservation storage in Drought Operations, Zones 3 and 4 or lower (Drought Zone) is calculated on the basis of the one-day basin inflow.
b. Consistent with safety requirements, flood risk management purposes, and equipment capabilities.
c. Drought plan is triggered when the composite conservation storage falls into Zone 3, the first day of each month represents a decision point.
d. Once drought operation triggered, reduce minimum flow to 5,000 cfs following the maximum ramp rate schedule.
e. Once composite storage falls below the top of the Corps Extreme Drought Zone ramp down to a minimum release of 4,500 cfs at rate of 0.25 ft/day based on the USGS gage at Chattahoochee, Florida (#02358000).

Summary

1. The EIS fails to consider the impacts of the draft WCM on Apalachicola Bay. In 2012, oyster populations collapsed as a result of minimal releases of 5,000 cfs to Apalachicola River in May through December. Other species such as shrimp, blue crab finfish were also impacted. The failure to consider impacts to Apalachicola Bay is a major oversight by the COE and the draft WCM modified as appropriate to preserve and protect Apalachicola Bay.

2. The COE HEC-ResSim modeling did not include 2012. As noted above, this is the year in which there were catastrophic loss oysters and other species in the bay. It is essential, therefore, that the COE include 2012 as part of the modeling and analysis of environmental impacts of the draft WCM.

3. The COE simulations made in support of the draft WCM and EIS did not include the operations under the current WCM. The "existing conditions" used by the COE is the operations from the May 2012 Modified Revised Interim Operating Procedures. Therefore, the drought and non-drought operations used for the EIS analysis and the draft WCM are essentially identical to the May 2012 Modified RIOP. For purposes of the EIS the "existing condition" is not the May 2012 operations but rather the operations under the existing WCM that were used prior to the 2007 Interim Reservoir Operations. The COE should revise the EIS and draft WCM (as necessary) using the pre-2007

J

Response to ACF143 – Douglas Barr

J. The column labeled "Minimum Outflows from Jim Woodruff Dam" in Table 7-3 in the EIS appears to have been misinterpreted as maximum required release. No such limiting flow requirement exists in the Jim Woodruff Dam operation.

During nondrought periods, the Jim Woodruff flow requirement is a function of three parameters: season (i.e., spawn, nonspawn, and winter), composite storage (zones 1–3), and basin inflow.
USACE evaluated a revision to basin inflow that would account for water use consumption. A near-real-time basinwide water use reporting scheme is required to implement the suggested basin inflow computation concept. At present, USACE receives the actual water use data upon re-quest. The data typically lag 1–2 years behind the current year. Until the states implement a real-time water use reporting requirement associated with withdrawal and discharge permits, USACE will continue using the current basin inflow computation method.
Releases might be required from storage during periods when Flint River flows combined with flows below the Walter F. George Dam are less than the Jim Woodruff Dam required flow.
USACE has the legal authority under the River and Harbor Act of 1946 to release water from Buford Dam sufficient to accommodate Metro Atlanta's downstream withdrawals. Withdrawals of 20 mgd from Buford Dam (Lake Lanier) are authorized under reallocation agreements. USACE has discretion under the Water Supply Act of 1958 to accommodate additional withdrawals from Lake Lanier.

High flows occur in the ACF Basin during the December–February period. Flint River flows are uncontrolled and typically exceed the 5,000 cfs flow during that period. December releases near the 5,000 cfs level will occur only during extreme droughts such as those that occurred in 2007, 2011, and 2012. Conversely, January and February releases are well above 5,000 cfs even in extreme drought years.

operations as the existing condition for purposes of determining the environmental impacts of the various water supply options and operational alternatives.

4. The COE HEC-ResSim has not been calibrated nor have simulations been made comparing the model results with observed data on reservoir levels or streamflow measured at U.S. Geological Survey streamflow stations. Similarly, no sensitivity analysis or systematic error analysis have been performed. As a result, no objective measures or analysis are available demonstrating that the model can accurately reproduce observed flows and reservoir levels that occurred in the past.

5. The COE model simulations do not include operations under the current WCM. The No Action Alternative is the closest to actual conditions for the period 2007-2011 since it utilized the interim reservoir operations and the "current" demands. Comparison of simulated and observed flows at the Chattahoochee Streamflow Station on the Apalachicola River indicates that the model does not accurately replicate observed low flows (<= 7,000 cfs). Simulated flows are poorly correlated with observed flows for the periods 2007-2011, 2007-2008 and 2011. Less than 30% of the variation of the simulated flows is accounted for by linear regression with observed flows. As a result, the model simulations do not provide an accurate assessment of the impact of the draft WCM operations on releases to Apalachicola River.

6. Simulated flows at Bainbridge are higher than the observed flows in 7 of the 11 years from 2001 through 2011 during the summer peak demand period in drought years (and some non-drought years). In addition, the COE assumed wastewater returns to the Chattahoochee River in Metro-Atlanta were 94% of the withdrawals. The COE, however, reports that the actual return rates for 2000, 2006 and 2007 (dry years) of 56%-64% with an average of 60%. The simulations, therefore, overstate the current wastewater returns. The combined total of these during the simulated 2011 drought is 615 cfs in May-August or higher. In other drought years, the combined total ranges from approximately 380-450 cfs. The model, therefore, is understating the impact of the draft WCM on inflows to Apalachicola River and ultimately to Apalachicola Bay. This is especially the case in 2011 which most closely coincides with the inflows to Apalachicola River and Bay during the 2012 collapse of the biota in the bay. Under actual conditions, the erroneously high simulated flow would have to be offset by either reducing the releases to Apalachicola River from the June-August simulated level to approximately 4,450 cfs or increase releases from the reservoirs by approximately 150,000 acre-feet. In either case, the actual impact will be substantially greater than the impacts used for the EIS and draft WCM.

7. The current and future demands in Georgia were provided by the State of Georgia. The agricultural demands in the Flint River basin result in simulated flows that are systematically higher than the observed flow at Bainbridge during droughts. In addition, the wastewater return rate for metro-Atlanta as provided by the State of Georgia far exceeds the current documented return rate resulting in systematically higher inflows from wastewater returns. These suggest that the demands may be systematically understated in Georgia and that the impact of the demands on inflows to Apalachicola River and Bay may be much greater than indicated by the COE simulations. As a result the COE should release the monthly demands by reach provided by the State of Georgia and used by the COE for model simulations. Without additional review and verification, the COE risks adopting the draft WCM without having realistically determined the impact of the demands on the proposed reservoir operations.

8. There was a significant loss of inflow to the Apalachicola River when the COE changed from using the outflow from Jim Woodruff Dam to measure compliance with the 5,000 cfs minimum release to use of the U.S.G.S. streamflow station on the Highway 90 Bridge near Chattahoochee, Florida. Based on the Woodruff release, the loss of inflow is on the order of 400 cfs (+/-) and approximately 600 cfs (+/-) based on the Chattahoochee streamflow station.

9. Reservoir releases to Apalachicola River during non-drought periods are based on the composite storage level of the federal reservoirs and the calculated Basin Inflow. The COE's calculated Basin Inflow is actually the true (hydrologic) basin inflow minus all of Georgia's consumptive withdrawals from the Chattahoochee River and Flint River. Therefore, releases to Apalachicola River are determined only after 100% of Georgia water demands are met both now and in the future. This inequity should be corrected in the update of the Water Control Manuals by modifying the method used to compute Basin Inflow.

10. The draft WCM operations during both non-drought and drought periods place the highest priority on meeting 100% of the consumptive water demands in Georgia at the expense of releases to Apalachicola River and inflow to Apalachicola Bay.

Non-Drought Operations

a) During non-drought periods the releases from Jim Woodruff dam to Apalachicola River are based on the computed Basin Inflow. The basin inflow, however, is computed in a manner that does not account for losses from consumptive withdrawals in Georgia. This ensures that 100% of the current and future water demands in Georgia are met at all times.
b) Only the Basin Inflow remaining after all water needs in Georgia have been met is used allocate water to refilling of reservoir storage and releases to Apalachicola River.
c) In December through February the required release to Apalachicola River is set at 5,000 cfs which is near the historical minimum flow. All basin inflow in excess of 5,000 cfs can be diverted to reservoir storage to keep the reservoirs at full capacity. No release from storage is ever required for Apalachicola River except when the basin inflow is at or below the 5,000 cfs minimum.
d) In June through November, no release from reservoir storage is ever required for Apalachicola River except when the 7-day average basin inflow is 5,000 cfs or less. At most, the required release to Apalachicola River is allowed to increase to the basin inflow only when basin inflow is in the narrow flow interval from 5,000 to 10,000 cfs. Even then, however, the required release is not the true basin inflow but rather the remnant inflow that remains after all Georgia demands have been met.

Drought Operations

a) Under the draft WCM, when drought operations are triggered the maximum required release to Apalachicola River is cut to near the historical minimum daily flow of 5,000 cfs. Under some conditions, the maximum release can by further reduced to 4,500 cfs.
b) The burden of drought operations falls entirely on Florida. Even when drought operations are triggered Georgia can still withdraw water to meet 100% of all demands.
c) Drought operations are triggered based solely on composite reservoir storage. No objective measure of drought is ever employed by the COE. It is possible, therefore, that drought

operations could be triggered for reasons unrelated to drought such as excessive withdrawals in Georgia.

d) Drought operations and releases to Apalachicola River reduced to 5,000 cfs when the composite reservoir storage declines to the top of composite reservoir zone 4. At this level, the composite storage in the reservoirs is at 78% to 90% of full capacity.
e) Under the draft WCM, once triggered the drought operations continue until the composite storage of the reservoirs has been refilled to composite Zone 1 or 90% to 97% of full capacity. Only then is the required release to Apalachicola River raised above 5,000 cfs.
f) Drought operations are triggered even if composite reservoir storage declines to the top of composite zone 4 for just a single day. Even if the composite storage were to immediately recover above zone 4, the draft WCM would allow the COE to cut the release to Apalachicola River to 5,000 cfs until the composite reservoir storage recovers to Zone 1.

11. The "Current Condition" (i.e., existing condition) used for the EIS, draft WCM and HEC-ResSim modeling is the reservoir operations from the May 2012 Modified RIOP. Therefore, the reservoir operations and other provisions of the Modified RIOP have never been examined as part of EIS. It appears this was the intent of the incremental changes made by the COE to the reservoir operations in the IOP, Revised IOP, and Modified Revised. The actual existing conditions, however, are the operations that predated the first of the many "interim" operations first adopted by the COE in 2007.
12. The COE HEC-ResSim model is not well suited for simulation of extreme low flows. The residuals, for example, between the "No Action" alternative and the simulation of the PAA are extremely high for flows less than 7,000 cfs. As a result, the impacts of the draft WCM may be considerably greater than simulated by the COE. This will not become evident until after the draft WCM is adopted. This represents a very substantial potential threat to Apalachicola River and Bay.
13. The model simulations assume the wastewater return in metro-Atlanta is 94% of the withdrawals. The actual return during recent droughts, however, has ranged from 56 to 64% with an average value of 60%. In comparison to the existing return rate the presumed rate of 94% results in an excess return of 215 cfs on a daily basis. In addition, during the 2011 drought the simulations also overstate the flow of the Flint River at Bainbridge by up to 400 cfs. In 2011, there is a simulated excess flow of 615 cfs during the critical summer months when demands are highest. In other drought years (and some non-drought years) the simulated excess flow ranges from 380 to 450 cfs with an average of 405 cfs. During drought years the simulated release to Apalachicola River was 5,050 cfs per the draft WCM drought operations. The release, however, is overstated due to the errors in the return rate to the Chattahoochee River and the simulated flow of the Flint River at Bainbridge.

    a) Correcting for the excess flow in 2011, the actual release to Apalachicola River is 4,435 cfs for the period from May-August. The actual impact of the draft WCM operations, therefore, is understated. This could only be rectified by reducing the release to Apalachicola River (resulting in a violation of the release requirement) or by increasing reservoir releases by approximately 150,000 acre-ft over the period May-August.
    b) In other recent drought years, the actual release would have averaged 4,645 cfs for the period May-August requiring either a reduction of the release to Apalachicola River or an increase in reservoir releases of approximately 98,800 acre-ft. over the period May-August.
    c) The error in the simulated flow at Bainbridge is systematic occurring in 7 of the 11 years from 2001 through 2011. It likely would have also occurred in 2000 and 1999 but could not be determined since the observed flow at Bainbridge is not available. The error would have also likely occurred in 2012 but this year was excluded from the period simulated by the COE.
    d) It is certainly possible that there are other errors in the simulated withdrawals in Georgia. Unfortunately, the COE has not provided the monthly simulated withdrawals by reach in the Chattahoochee and Flint basins. These data should be released by the COE to allow for review by stakeholders. The concern is that the simulations results in the draft WCM and EIS may not accurately reflect the severity of impacts on Apalachicola River and ultimately to Apalachicola Bay.

Sincerely,

Douglas E. Barr[1]
Barr Water Resources, LLC

[1]Executive Director, Northwest Florida Water Management District, 2002-2012
State of Florida Technical Representative, Apalachicola-Chattahoochee-Flint River Basin Comprehensive Study and Apalachicola-Chattahoochee-Flint River Basin Interstate Commission

From: Dlynn Hart
Sent: Thursday, January 28, 2016 1:59 PM
To: ACF-WCM
Subject: [EXTERNAL] Apalachicola River and Bay Comments before January 30, 2016

My husband and I have been coming to the St. George Island, Forgotten Coast, for over 10 years, and we have seen the decline of the health, productivity & sustainability of the Apalachicola River and Bay over these years. Yes there are many reasons and many unknown reasons for this decline. However, we as a people, historically tend to destroy "nature" to almost extinction..... and then try to repopulate/bring back nature. Have we learned nothing historically??

This nature area is similar to what I am referring to. Atlanta and other areas continue to build houses/new buildings even though it has been proven the area resources, including water, cannot sustain this increase..... unless ..... they take away from someone else. Where is their accountability for being stewards of nature? And when all of the fish, oysters, shrimp, etc. are gone, I suspect these will be the people demanding that we do something so they "can have what they want". We all need to do our part to insure that nature survives! Survival is critical to the economy and cultural heritage of Florida, the entire Gulf Coast and to all of us who love sea life and seafood! A

I sense urgency in rewriting your manual as to revising the way the Corp manages the flow of freshwater needed to maintain the extraordinary richness and productivity of the Apalachicola River, Floodplain and Bay ecosystem.

With hope,
Phil & Donna Hart
Snowbirding on St. George Island, FL

Response to ACF144 – Phil and Donna Hart

A. Control of the population growth in Metro Atlanta is the responsibility of state or local governments and is outside the scope of the Master WCM update.

The authorized purposes of the federal ACF system do not include a specific directive to provide freshwater inflows to Apalachicola Bay to sustain the resources of the bay. USACE does make releases to limit adverse effects to threatened and endangered species downstream of Jim Woodruff Lock and Dam, including Apalachicola Bay. USACE consulted on the PAA and the results are presented in appendix J of the final EIS. In the biological opinion the USFWS concluded that effects to estuarine invertebrate production are insignificant because the PAA provides slightly beneficial effects from increasing the number of freshwater pulses and increasing the number of days greater than or equal to 16,200 cfs in the winter. USFWS also anticipate only minor changes in salinity regimes and estuarine habitat due to the WCM.

From: Joanna Cloud
Sent: Thursday, January 28, 2016 2:30 PM
To: ACF-WCM
Subject: [EXTERNAL] Lake Lanier Association Water Control Manual Comments
Attachments: WCM Comments_01282016.pdf

Please see the attached document containing the Lake Lanier Association's comments regarding the Water Control Manual update.

Joanna Cloud
Executive Director

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January 28, 2016

Colonel Jon J. Chytka
Commander USACE
Mobile District
Attn: PD-EI (ACF-DEIS)
P.O. Box 2288
Mobile, AL 36628

RE: Comments regarding update of ACF Water Control Manual

Dear Colonel Chytka:

Thank you for the opportunity to submit comments regarding the Corps of Engineers' ("Corps") revision of the Water Control Manual ("WCM") for the Apalachicola-Chattahoochee-Flint River ("ACF") system. The Lake Lanier Association ("Association") represents approximately 3,000 individuals and businesses whose lives, livelihoods, and profitability depend on Lake Lanier. Please accept this submission on behalf of all our constituents. We previously submitted scoping comments via letters of November 20, 2008, January 2, 2010, and January 14, 2013, yet it was not clear in the DEIS that due consideration had been given to those comments. We would appreciate your considering the contents of all our previous correspondence – especially the 2013 letter - in addition to the comments in this letter.

The Association's constituency is most concerned with preserving the water level and quality of Lake Lanier through the Corps' management. It is obvious that considerable time and effort was invested in the DEIS, and that effort is sincerely appreciated. It is also apparent that much consideration has been given to maintaining Lake Lanier in a healthy and sustainable condition as an integral part of the ACF, which is not only appreciated but crucial to the successful operation of the entire system.

However, we have one area of critical concern and several constructive criticisms of the DEIS that we wish to address. These are Navigation, Projections of Reservoir Levels During Recreation Season, Fall Rates, Unplanned Deviations, Full Pool Level of 1073, Drought Operations, and Reservoir Operations.

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"Committed to a Clean, Full, and Safe Lake Lanier"

Navigation

In light of the fact that navigation is one of the authorized purposes for the ACF facilities, we understand why the proposed WCM calls for its support. However, the proposed navigation releases would be made even during the most severe droughts in history, despite the fact that the volume of water needed to support a 9-foot channel has more than doubled from 9,300 cfs in the 1950's to over 20,000 cfs today. The discontinuation of dredging of the Apalachicola, continued widening of the Chipola Cutoff, and significant reach losses near the Blountstown gage that are not addressed in the DEIS are among the primary causes, none of which is going away.

We are extremely concerned that the Corps has not accurately or adequately modeled the impacts on Lake Lanier (or the other ACF reservoirs) of the proposed navigation plan, especially in times of drought. According to a draft technical analysis shared with us by the Atlanta Regional Commission, we understand that the proposed navigation provisions would lower Lake Lanier by more than four feet in a drought similar to that of 2007-2008. As you know, Lake Lanier reached its lowest point in history at 1050.79 MSL during that drought, even though navigation was not being regularly supported due to Florida's earlier discontinuation of dredging permits. As you also know, droughts risk enormous impact to everyone who depends on the ACF reservoirs - and Lanier in particular, due to the huge recreational economy that has grown up in dependence on it.

A

There has been no change in Florida's stance on dredging permits, and none can reasonably be contemplated in light of the potential impact on the Apalachicola River's ecology, especially threatened and endangered species. Moreover, there is very little demand for navigation on the ACF, a purpose that was imagined to be far more useful a century ago than history has shown it to be since. In contrast, the relatively minor impact that recreation was expected to exert when the Corps first proposed building the ACF facilities has turned out to be an enormous economic engine in the area around Lake Lanier. The extreme disparity in the true importance of these two authorized purposes is dramatic and real.

As a result, we object strenuously to the proposed navigation plan. The Corps' DEIS modeling shows that the lowest reservoir elevations in Lake Lanier are caused by navigation releases, not by increased water supply withdrawals to meet Georgia's projected demand. Using that model, if navigation releases were discontinued during a drought similar to that of 2007-2008, Lake Lanier would remain three feet higher than the historical low of 1050.79 feet even while meeting Georgia's entire increased demand. From this, it is apparent that the navigation portion of the proposed WCM alone risks serious damage to the primary source of ACF water storage during droughts. It prioritizes the few who might be interested in occasional navigation at the expense of not only millions of Lake Lanier users, but millions more who rely on Lake Lanier for drinking water – and does so during the Lake's most vulnerable periods.

Response to Comment ACF145 – Lake Lanier Association

A. The operations described in the Master WCM are based on balancing all authorized purposes throughout the ACF system. Navigation remains an authorized purpose for the system although it currently faces many challenges, as documented in section 2.1.1.2.4.3 of the EIS. The navigation season contained in the PAA provides for authorized navigation while preserving conservation storage by occurring during a time of naturally high flows, by providing only a 7-ft channel depth, and occurring only when ACF Basin composite conservation storage is in Zone 1 or 2. Navigation would not be supported when ACF Basin composite conservation storage is in Zone 3 or lower (drought operations). Seasonal navigation would not resume until ACF Basin composite conservation storage returns to Zone 1. Under the PAA and hydrology similar to 2007–2008, navigation would have been suspended as of May 1, 2007, as part of drought operations and would not have been reinstated until May 2009. As shown in Figure 6.1-6 of the EIS, the PAA would likely result in lake levels at Lake Lanier ranging from about 2 to 4 ft lower than those for the NAA. That condition would be expected to occur less than 2 percent of the days over the entire modeled period of record (73 years) during the worst drought conditions for that period. The differences would be attributable largely to increased water supply withdrawals from the lake as well as increased releases from Buford Dam to meet future water supply demands for Metro Atlanta users (i.e., Cobb, Fulton, and DeKalb counties and the City of Atlanta).

We would urge the Corps to reconsider its entire navigation plan and revise the WCM to reflect the realities of the 21st century, in which much of the economic value of the Corps' ACF operations has proven to be recreation, not navigation. The Apalachicola channel will continue to degrade over time, and will eventually make it impossible to maintain even a 7-foot navigation channel, much less a 9-foot channel. Attempting to do so in the near-term as outlined in the DEIS risks the welfare of the entire system when it is most vulnerable and, without some enormous and unforeseeable hydrologic change, is ultimately doomed to failure. Navigation as originally contemplated has become an obsolete function of the ACF system, and the Corps should reflect that fact in the WCM.

Projections of Reservoir Levels During Recreation Season

As noted in Section **4.2.7.2.5 Recreation**, "Under Water Management Alternative 7 (Table 4.2-22), the pool levels during the recreation season would be below the IIL and the RIL more often and below the WAL much more often than under Water Management Alternative 1." The negative impact to water levels in Lanier during the recreation season is our foremost concern. We understand that increased water consumption due to the higher projected population of North Georgia will impact Lanier, but believe that every measure possible to minimize that impact should be implemented.

B

We are particularly concerned that the Corps performed its calculations of impacts to recreation water levels and of the revised Action Zones using different recreation seasons for the three principal ACF reservoirs, as shown in Table 4.2-22:

Table 4.2-22.
Recreation Water Levels for Water Management Alternative 7

	Project		
	Buford (May-Jul)	West Point (May-Sep)	Walter F. George (Jun-Aug)
Number of weeks below IIL during period of record	142	333	57
Number of weeks below RIL during period of record	26	46	0
Number of days below WAL during period of record	0	74	0
Percent of time below IIL	15	22	6
Percent of time below RIL	3	3	0
Percent of time below WAL	0	1	0

We believe that the same period should be used for all three reservoirs and that the period of May-July used for Lanier is inappropriate. The recreation season at Lake Lanier, which as you know is one of the most highly-visited Corps lakes in the entire country, simply does not end in July. Moreover, the suggestion that the recreation period for West Point Lake extends through September while Lanier's does not begs the question of what data the Corps relied on in

Response to Comment ACF145 – Lake Lanier Association

B. Additional research into USACE's visitation reporting system identified that the months with the most visitors to Lake Lanier are May–August. The recreation analysis has been revised in section 6 of the final EIS to reflect that change.

coming to such a conclusion. The only response provided at the Open House was that fishing is the primary recreation activity at West Point Lake and goes on through September. As anyone who lives or works on Lanier can tell you, fishing hardly stops in July on Lanier, and in fact anecdotal observation suggests that fishing activity significantly increases on Lanier after the summer crowds decline with the resumption of school (which would occur simultaneously at the two lakes in any event, given that all of Georgia's primary and secondary schools resume operation at approximately the same time). As most any angler can also tell you, fishing is often better when the weather cools off, leading to an increase in fishing after Labor Day.

But beyond the volume of fishing that takes place on the two lakes, it strains credibility to assert that the recreation season ends for Lake Lanier in July. In light of the extreme importance of selecting analytical data based on that assertion, we question the basis for making it. The Corps' consideration of all alternatives was performed on conclusions that were based on that assertion, which we believe is false. We do not believe it is an overstatement to say that the potential impact of every alternative, and especially the Proposed Action Alternative, was miscalculated based on an incorrect identification of the recreation periods of the three reservoirs.

B

Tables 5.2-3 and 5.2-19, reproduced below, show the impacts on water level of the Corps' calculations. According to the tables, IIL impact increases by over 29% and WAL impact doubles from the NAA to the PAA. Those impacts are bad enough, but our fear is that the true impacts will be even more severe because the wrong data was used in their calculation. As is well known, Lanier's level typically declines from August through November, and eliminating a significant portion of that data from the impact calculation likely skewed the results published in the tables.

Table 5.2-3.
Percent of Time Below Established Recreational Impact Levels During the Recreation Season

Project	Percent of time below Initial Impact Level	Percent of time below Recreation Impact Level	Percent of time below Water Access Limited Level
Buford	17	5	1
West Point	21	3	1
Walter F. George	3	0	0

Table 5.2-19.
Percent of Time Below Established Recreational Impact Levels During the Recreation Season

Project	Percent of time below Initial Impact Level	Percent of time below Recreation Impact Level	Percent of time below Water Access Limited Level
Buford	22	5	2
West Point	22	2	0
Walter F. George	5	0	0

Unfortunately, the data needed to assess the impact of the recreation season differential was not included in the DEIS, so we are unable to provide numerical corrections to the results that were published. However, the main point is readily stated: Lanier's increase in percent of time below recreational impact levels during the recreation season as shown in Tables 5.2-3 and 5.2-19 is significant. To the extent that the published impacts have been reduced by the use of inaccurate recreation season periods, the true impacts are likely even greater. The DEIS conclusions must be recalculated to reveal the true impacts to Lanier, and if the impacts are greater than those published, the alternatives must be reconsidered so that the negative impacts on Lanier can be eliminated to the greatest extent possible.

Fall Rates

We have pointed out previously that the Apalachicola River mussels not only endured but thrived for millennia with large and rapid fluctuations in river levels. We understand that the U. S. Fish and Wildlife Service has expressed its opinion that fall rates must be incorporated in ACF operations to minimize the possibility of stranding mussels as river levels decline following high-flow events. But the Service's requirement appears not only unnecessary but at odds with the reality of thousands of years of biological history. The query we would pose is this: if low fall rates were crucial to the survival of the mussels, then why did they thrive in the face of the far more drastic fall rates that existed prior to construction of the Corps' ACF facilities? Requiring the artificially-reduced fall rates proposed in the DEIS negatively impacts upstream reservoirs without a sound scientific foundation. We would encourage the Corps and the Service to examine the possibility that this requirement is not only unnecessary but ill-advised, as it may contribute to unfavorable natural selection among the individuals in the relevant species.

C

Unplanned Deviations

Section **2.1.1.2.4.7 Special Operations and Releases** of the DEIS describes "unplanned deviations" in only general terms, as follows:

> "The need for unplanned deviations might be caused by unforeseen conditions that do not allow sufficient time to plan for the deviation, but do not involve an imminent threat to public health and safety, property, or the environment."

D

That section goes on to state that, "Any extended temporary deviation … is required to be approved by the … South Atlantic Division." However, Section **7-15. Deviation from Normal Regulation** of the Master Manual states, "Approval for unplanned deviations, either major or minor, will be obtained from the Division Office by telephone or electronic mail prior to

Response to Comment ACF145 – Lake Lanier Association

C. The fall rates used in the PAA and other alternatives were developed in conjunction with the USFWS under the section 7 consultation process incorporating the best available data and science. As part of the finalization of the WCMs, USACE engaged in section 7 consultation with USFWS and the resulting biological opinion is included in appendix J of the final EIS.

D. The first portion of the comment identifies a perceived inconsistency between section 2.1.1.2.4.7 of the draft EIS and paragraph 7-15 of the ACF Master WCM in regard to the approval process for a temporary deviation. The process for deviating from normal operations described in section 7-15 of the Master WCM allows the Mobile District to vary from normal operations, with approval of the South Atlantic Division (SAD), in unforeseen circumstances that do not involve threats to health, safety, or the environment. There are limited exceptions for emergency conditions in which the district can proceed with the emergency action and notify SAD staff of action taken as soon as possible after the fact. The EIS has been revised to remove any inconsistencies in the description of the temporary deviation process. The releases mentioned in the comment (i.e., August 15–29, 2014) were the result of increased hydropower demand and do not qualify as a deviation. The use of the Lake Lanier pool to fulfill the authorized hydropower mission does not require command approval as it is within the authorities granted to the Mobile District to manage the ACF system. The Master WCM allows for telephone or e-mail confirmation of deviation requests because of the time-sensitive potential of some requests. The process proposed in the comment would not allow USACE to address deviation requests in a timely manner.

implementation." We note the inconsistency in the two provisions and are concerned about the review and approval process for unplanned deviations.

We believe that unplanned deviations have occurred in the past that should not have been approved. One relatively recent example was a request for increased water releases that impacted Lake Lanier from August 15-29, 2014. We understand the request was verbal and are aware of no factual support for it. The impact to Lanier was significant and immediate, dropping the lake by approximately one foot in less than two weeks during the (real) summer recreation period. We are not aware of any justification for the release, and the absence of warning and documentation made it virtually impossible to object or to intervene.

In order to eliminate such instances in the future, we have four recommendations to offer. First, we recommend that ALL deviation requests be required to be in writing from the party making the request. This would provide a paper trail of accountability for all deviations, whether planned or unplanned. Second, we recommend that all deviations be required to be authorized in writing by the Division rather than by the District. This would prevent the possibility of favorable treatment of undocumented and either inappropriate or insufficiently founded requests. Third, we recommend that the basis for approval of all deviations be stated in writing in the approval document. Fourth, we recommend that all deviation requests be published on the District website, making the reason for the deviations public and creating accountability for the approval of such requests. Lake levels are too critical for them to be subject to undocumented and unjustified manipulations, and the WCM should contain strict requirements that impose appropriate accountability for deviations from normal operations.

Full Pool Level of 1073

The DEIS summarily rejects the Association's proposal to raise Lanier from 1071 to 1073. This rejection is short-sighted and ultimately unjustifiable.

The Corps currently operates Lanier with a summer pool of 1071 and a winter pool of 1070. The operational change of raising summer pool from 1070 to 1071 was implemented with little study many years ago, and there have been no negative effects whatsoever. Yet the DEIS states that flood control capacity will be preserved without modification. We fully recognize the crucial importance of adequate flood control, but the additional foot of flood control pool that was given up in Lanier has not been needed at any time in the entire history of the Buford Project, and no projections of which we are aware substantiates the need for maintaining every single remaining foot of flood control storage.

E

The Association has long championed raising full pool to 1073, creating a substantial additional volume of water for all ACF stakeholders. The resulting additional 26 billion gallons of stored water at that level would be available for all authorized purposes and would increase

Response to Comment ACF145 – Lake Lanier Association

E. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

the margin of safety in the event of severe drought. Significantly, other than the need to update some Lanier-specific infrastructure, we are aware of no objection by any ACF stakeholder to the proposition of raising Lanier's full pool level to 1073. The sheer magnitude of that statement alone underscores what a tremendous improvement raising full pool would be for the ACF. It therefore appears that the Corps' refusal to consider the proposal boils down to two things: preserving flood control capability and the integrity of Buford Saddle Dike #3.

Weather prediction and climate modeling have improved markedly since the full pool level of 1071 was set for Lanier, and the best science available for forecasting can and should be used in managing lake levels. The Corps already incorporates forecasting in its management activities, and should have little trouble in utilizing those capabilities to maintain adequate flood control capability in Lake Lanier while still accommodating much-needed additional water supply storage. If there is a structural issue regarding Saddle Dike #3, then it should be addressed sooner rather than later and not used as a reason to ignore what is indisputably the most cost-effective means of increasing water supply storage for the entire ACF. Whatever studies and infrastructure adaptations are necessary to accomplish the goal of raising full pool year-round to 1073 should be incorporated in the new WCM and accomplished as soon as possible to benefit all ACF stakeholders.

Drought Operations

We applaud the consideration given in the proposed WCM to improve drought operations, particularly activating drought operations upon transition from Zone 2 to Zone 3. The earlier a drought condition is reflected in operations, the better.

F

However, we also recommend further consideration of drought triggers that could be useful in predicting oncoming drought conditions. Assessments of soil moisture, ground water levels, and stream flow conditions in the ACF Basin can be useful early warning signals that might not be reflected in Composite Storage data. Existing models such as the Palmer Drought Index and antecedent flows could greatly improve drought predictions and the Corps' operational responses. Incorporating regional drought considerations rather than looking only at full basin-based parameters could also provide better insight into potential drought conditions as they develop.

Reservoir Operations

The PAA continues the practice of using Basin Inflow and reservoir storage balancing as the determining factors for operational decisions. Based on extensive modeling performed by the ACF Stakeholders, we highly recommend the use of Recreation Impact levels as an operational parameter. Under this, new zones could be defined to coincide with the Corps reservoir recreational impact zones, and water would be released from an upstream reservoir

G

Response to Comment ACF145 – Lake Lanier Association

F. The drought contingency plan contained as an exhibit in the WCMs in appendix A of the EIS includes a discussion of drought identification and the National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional drought early warning information system. The system will use key indicators of drought to make timely drought forecasts. USACE is a contributor and user of the NIDIS pilot project tool.

G. Use of recreation impact levels as a parameter for operating decisions would prioritize the recreation mission and could have significant impacts to other authorized project purposes such as hydropower and navigation. That type of prioritization is contrary to USACE's stated intent to operate the ACF system in a balanced manner to support all authorized purposes.

when the downstream reservoir is in a lower zone. ACF's modeling has shown that this action will result in increased water storage in reservoirs for use during drought conditions. This action would be consistent with the Corps' stated desires and obligations to provide for maximum water availability during drought conditions.

CONCLUSION

It is obvious that as water withdrawals increase due to population growth, all water resources in the ACF Basin will be under increased stress - but none more than Lake Lanier. In addition to planning for those increases, effective plans need to be put in place to mitigate their impacts. The Corps should be at the forefront of actions to reduce Interbasin Transfers, increase water conservation, and increase water storage for drought operations.

H

During the 2007-2008 drought, Lake Lanier became the sole source of augmentation flows to maintain the 5,000 cfs minimum required flow at the Chattahoochee Gage. Augmentation releases from Lanier during late summer and fall of 2007 at times was as much as three times the basin inflow of the entire ACF. The same phenomenon occurred again in 2012, dropping Lake Lanier nearly six feet in six weeks between late October and mid-December. It is critical that the ACF be operated in a way that minimizes such severe draw-downs and that safeguards Lake Lanier's water levels for the future – for all stakeholders. That can be done most effectively by incorporating the recommendations we have addressed above, and especially by substantially revising or eliminating the proposed navigation provisions, which we sincerely encourage the Corps to do.

Yours truly,

Val Perry
President

Response to Comment ACF145 – Lake Lanier Association

H. USACE had no authority over interbasin transfers or water conservation measures. Because of the nature of the ACF Basin system, Lake Lanier will need to be relied upon heavily to meet water demands in times of severe drought. Lake Lanier has at times been the primary source for meeting the flows necessary to support the threatened and endangered species below Jim Woodruff Lock and Dam as required by the Endangered Species Act, which is one of many purposes for which the ACF system is operated. In updating the Master WCM, USACE examined processes to minimize drawdowns and con-serve storage across the system..

From:
Sent: Thursday, January 28, 2016 2:42 PM
To: ACF-WCM
Subject: [EXTERNAL] WCM Comments - Lake Lanier

Dear Commander

My biggest issue is raising the full pool level of Lake Lanier to 1073 feet. It seems that is a very inexpensive way to increase the reservoir/flywheel of the lake with minimal expenditures (my understand is that only a couple of bridges would be impacted. A

Bill Moore
Gainesville, GA

1

Response to Comment ACF146 – Bill Moore

A. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From: Jodi Wacho
Sent: Friday, January 29, 2016 8:58 AM
To: ACF-WCM
Subject: [EXTERNAL] Comments re: update of ACF Water Control Manual

Colonel Jon J. Chytka,

I am sending this to you regarding the proposed updated Water Control Manual for the ACF Basin. I trust all information you are basing future decisions on for the water management of this basin is updated with current methods of use for the basin and known historical data for all forms of life around the basin. A

I do propose that the navigation plan be reviewed once again to avoid the severe impact it will have on Lake Lanier's Water levels. It needs to be looked at current levels of use not what was supposed in the past as those have changed significantly. B

Plan to raise the full pool level for Lake Lanier to 1073. This will help to maintain the quality of the reservoir, as well as help during drought. I also recommend rigorous plans be in place to preserve the lake's reservoir during drought. The reservoir should be managed to maintain the storage levels so we will not see the impact of severe drought conditions as we did in the past, most recently 2007. C

Recreation is one of the biggest economic engines of Lake Lanier throughout the entire year. Maintaining the water levels and quality of the water is paramount in keeping this engine running at all times of the year, not just certain months out of the year.. It also provides drinking water downstream no matter the weather conditions. Again, maintaining water levels in the lake has a lot to do with the quality and availability of the water down stream for this source. D

The priority in maintaining and managing the ACF basin has to consider the main uses of this basin for today's terms, not what was considered in the past. In preparing this manual for future generations, please consider the real uses of this basin and work to maintain its integrity and its usefulness at all stages. E

Thank you,

Jodi Wacho

Response to Comment ACF147 – Jodi Wacho

A. USACE has used state-of-the-art models to evaluate alternative operations of the multiple reservoir projects as one system in a large river basin. Further, the Master WCM update process employed the best hydrologic and other scientific information available to assess impacts of the alternatives on project purposes and environmental resources as presented in the final EIS.

B. As shown in Figure 6.1-6 of the EIS, the PAA would likely result in lake levels at Lake Lanier ranging from about 2 to 4 ft lower than those for the NAA. That condition would be expected to occur less than 2 percent of the days over the entire modeled period of record (73 years) during the worst drought conditions for that period. The differences would be attributable largely to increased water supply withdrawals from the lake as well as increased releases from Buford Dam to meet future water supply demands for Metro Atlanta users (i.e., Cobb, Fulton, and DeKalb counties and the City of Atlanta). It should be noted that navigation is not supported when drought operations are in effect.

C. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

D. USACE proposed and evaluated water management measures and alternatives that balance across all authorized project purposes, while considering Georgia's water supply storage request as directed by the 11th Circuit Court of Appeals. USACE operates Buford Dam and Lake Lanier as part of the overall ACF system to fulfill all authorized purposes, including water supply and water quality.

E. The Master WCM update is not a study and is only a change to operation of existing constructed projects. The operations described in the WCM are based on balancing all authorized purposes throughout the system. Examination of any potential structural modifications to projects that might be made to provide for additional project purposes was outside the scope of this WCM update.

From: George Verdier
Sent: Thursday, January 28, 2016 3:11 PM
To: ACF-WCM
Subject: [EXTERNAL] WCM Comment

Dear Corps of Engineers
The current proposed plan for operating the ACH system and managing lake levels gives me great concern. Specifically, I am concerned that the navigation portion of the plan alone would lower Lake Lanier by more than four feet in a drought similar to the one in 2007-2008. This impact is even greater than the impact of the projected population increases between now and 2050.

Other areas I would like you to consider or reconsider before this plan is acted into law are these:

1. Revise the navigation plan to avoid the severe impact the proposed plan will have on Lanier's water levels. A
2. Incorporate rigorous drought prediction that will trigger changes in reservoir operations to preserve lake levels during drought. B
3. Manage the reservoirs to retain maximum storage levels in the reservoirs so that drought conditions will not have the devastating impact that was experienced in December 2007. C
4. Model and plan for raising Lake Lanier's full pool level to 1073. D

Thank you.

George Verdier

Response to Comment ACF148 – George Verdier

A. As shown in Figure 6.1-6 of the EIS, the PAA would likely result in lake levels at Lake Lanier ranging from about 2 to 4 ft lower than those for the NAA. That condition would be expected to occur less than 2 percent of the days over the entire modeled period of record (73 years) during the worst drought conditions for that period. The differences would be attributable largely to increased water supply withdrawals from the lake as well as increased releases from Buford Dam to meet future water supply demands for Metro Atlanta users (i.e., Cobb, Fulton, and DeKalb counties and the City of Atlanta). It should be noted that navigation is not supported when drought operations are in effect.

B. USACE regulations do not allow use of forecasts in real-time project operations. Forecasted conditions may be used for planning future operations, but releases will follow the water control operations plan based on observed conditions within the watershed to the extent practicable. The Drought Contingency Plan (DCP) sections 3-02 and 3-03 contained as an exhibit in the WCMs in appendix A of the EIS includes discussion of drought identification and National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional Drought Early Warning Information System. The system will use key indicators of drought to make timely drought forecast. USACE is a contributor and user of the NIDIS pilot project tools.

C. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.

D. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From: Roy Beavers
Sent: Thursday, January 28, 2016 3:12 PM
To: ACF-WCM
Subject: [EXTERNAL] Navigation Plans for Lake Lanier

Colonel Chytka:

I understand that there are pending changes to The Corps' Water Control Manual ("WCM") and we are allowed to provide comments.

These pending changes will have a devastating effect on Lake Lanier by seriously decreasing the level of the lake during drought conditions similar to the one in 2007 and 2008. With the amount of silting that has occurred over the years since the lake was created, this amount of change poses threats to navigation in areas off the main body of the lake and in many instances prevents many residents from having any access to the lake.

A

In the coming years, this will only increase with the unbridled development of the communities downstream from the lake specifically, but not limited to, the Metro Atlanta area. It is apparent that they have little concern for how much water is being used, now that a drought condition has dissipated. The Corps must continue to pressure the downstream communities to develop responsible water management policies to minimize the water needed to allow growth.

I ask that you revise the navigation plan to avoid the severe impact the proposed plan will have on Lanier's water levels. Develop a detailed drought prediction program to trigger changes in reservoir operations to preserve lake levels during drought conditions. Better manage all the reservoirs downstream to retain maximum storage levels so that drought conditions will not have the devastating impact that was experienced in December 2007. I cannot emphasize enough that the normal full pool level should be increased to 1073' and possibly higher. The recent heavy rains allowed the lake level to rise to over 1075' with minimal adverse effects. With proper notice and shoreline maintenance, 1073' should pose no major impact to landowners along the lake shore.

B

C

I appreciate the ability to provide feedback to The Corps.

Roy L. Beavers
Hall County Georgia

Response to Comment ACF149 – Roy Beavers

A. Water policies and conservation practices are determined by the State of Georgia, not by USACE. The State of Georgia has the sole ability and right to control water withdrawals within its boundaries.)

As shown in Figure 6.1-6 of the EIS, the PAA would likely result in lake levels at Lake Lanier ranging from about 2 to 4 ft lower than those for the NAA. That condition would be expected to occur less than 2 percent of the days over the entire modeled period of record (73 years) during the worst drought conditions for that period. The differences would be attributable largely to increased water supply withdrawals from the lake as well as increased releases from Buford Dam to meet future water supply demands for Metro Atlanta users (i.e., Cobb, Fulton, and DeKalb counties and the City of Atlanta.

B. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.) It should be noted that navigation is not supported when drought operations are in effect.

C. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From: Greg Smallwood
Friday, January 29, 2016 8:33 AM
To: ACF-WCM
Subject: [EXTERNAL] Water Control Manual

I am writing to you as a concerned homeowner on our beautiful Lake Lanier. I have been reading the navigation plan and it seems to be in need of some revision from the Corps. It reads to me that even in serious drought conditions the same amount of water releases would occur. I would ask that all consideration be taken when looking at the impact on Lake Lanier as the proposed manual reads. A

I also would ask that drought management be discussed to where prediction be installed as a precaution to preserve lake levels in drought conditions. The weather services are so much more accurate in determining conditions that the Corps could rely on them for future assessments. When dry conditions are forecast, plan ahead. The lakes should all be managed to retain maximum storage levels so that drought conditions don't completely have a devastating effect. In 2007 the level of Lanier was so low personal property got destroyed by having to sit on dry land. It also is very dangerous to be on the water at those levels. Businesses, as well as homeowners, feel the effect of devastating low water levels. Lake Lanier is one of the most visited lakes in the country for recreation. We should be proud of that and the Corps should also be proud of that. B

I personally think that the Corps should consider raising the full pool level of Lake Lanier to 1073.00 to help combat some of the drought conditions we have witnessed. The lakes downstream, if capable, could also raise by a foot or so. As we have seen this winter Lake Lanier can easily have a full pool level of 1073.00 and not hurt anything. This extra 26 billion gallons of water could only help for future years. C

Please take our concerns seriously. This lake represents North Georgia, Gainesville area. We are known to have the best fresh water lake that everyone enjoys using for various purposes. Please try to protect it.

Thank you,

Greg Samllwood

Response to Comment ACF150, Greg Smallwood

A. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.) It should be noted that navigation is not supported when drought operations are in effect.

B. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.
(13.2) USACE regulations do not allow use of forecasts in real-time project operations. Forecasted conditions may be used for planning future operations, but releases will follow the water control operations plan based on observed conditions within the watershed to the extent practicable. The Drought Contingency Plan (DCP) sections 3-02 and 3-03 contained as an exhibit in the WCMs in appendix A of the EIS includes discussion of drought identification and National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional Drought Early Warning Information System. The system will use key indicators of drought to make timely drought forecast. USACE is a contributor and user of the NIDIS pilot project tools

C. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From: Ben Taylor
Sent: Thursday, January 28, 2016 3:24 PM
To: ACF-WCM
Cc:
Subject: [EXTERNAL] Lake Sidney Lanier Navigation Plan

Bethel Road Communities

Gainesville, GA 30506 - Forsyth County

January 28, 2016

Colonel Jon J. Chytka Commander USACE Mobile District
Attn: PD-EI (ACF-DEIS)

RE: Comments regarding update of ACF Water Control Manual

Dear Colonel Chytka:

Hello sir, hope all is well for you.

I have written to you once before on 12/21/2015 regarding our amazing lake here and am sending a brief note again to advocate for another specific concern regarding the lake- the revision of the ACF Water Control Manual.

My website _____ represents approximately 594 resident homes on the Bethel Road peninsula, which is surrounded by the lake. We are a group of engaged and informed citizens. We attend regular Forsyth County meetings, lead HOA's, speak to residents and communicate respectfully with our Lake Lanier Army Corps leaders- such as Nick Baggett, Darrell Stone and Tim Rainey. I actually met with all three of them today, along with about 15 residents, on another issue we are working on regarding the Two Mile Creek park upgrades (my email from 12/21).

Sir, we are very concerned about the Lake Lanier water levels and water quality. We support the revision of the AFC Water Control Manual to avoid water level and quality impact on Lake Lanier. Residents feel that rigorous drought forecasting methods should be installed to protect our water level and quality during droughts. This would include enhanced management of the reservoirs so they can assist during these times and also modeling towards raising Lake Lanier's full pool level to 1073. A

Response to Comment ACF151 – Bethel Rd Communities, Ben Taylor

A. USACE regulations do not allow use of forecasts in planning project operations. As stated in section 4.1.1 of the draft EIS, the purpose of the Master WCM update is to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of conservation pool at Lake Lanier would require reallocation of storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in draft EIS section 1.4.4 is maintaining at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

We appreciate the diligence and work that the Army Corps puts into the Lake Lanier project and also into their projects all around the US. I am personally from New Orleans and certainly appreciate the levies and flood walls the Army Corps builds, manages and maintains for us there.

Thank you very much for the opportunity to hear our concerns about this update.

Sincerely,

Ben Taylor

From: Martin Avery
Sent: Thursday, January 28, 2016 3:34 PM
To: ACF-WCM
Subject: [EXTERNAL] PROPOSED PLAN FOR LAKE LANIER

PLEASE TAKE INTO CONSIDERATION THE FOLLOWING:

PLEASE REVISE THE PLAN SO THAT THE IMPACT WILL NOT HAVE ADVERSE EFFECTS ON THE HOMEOWNERS AND THE LAKE ITSELF. A

PLEASE PUT INTO PLACE A METHOD THAT WOULD PERSERVE THE LAKE LEVELS DURING SEVERE DROUGHT. B

CONSIDER MAINTAINING MAXIMUM LAKE LEVELS IN RESERVE SO THAT THE LAKE AND HOMEOWNERS WILL NOT BE SO DRASTICALLY AFFECTED BY DROUGHT CONDITIONS. C

WE WOULD LIKE TO SEE THE FULL POOL LAKE LEVELS RAISED AT LEAST TWO FEET TO MINIMIZE THE EFFECT ON HOMEOWNERS
AND LAKE LANIER. D

PLEASE GIVE CONSIDERATION TO THE ABOVE MENTIONED COMMENTS PRIOR TO MAKING ANY DRASTIC DECISIONS.

SINCERELY,

MARTIN C. AVERY

Financial Management Solutions, Inc.
Martin C. Avery
Director

Response to Comment ACF152- Martin Avery

A. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008. The impacts resulting from changes in Lake Lanier were considered and captured in the final EIS. See section 6.1.1.1.1 of the final EIS for additional information.

B. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.

C. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.

D. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From: Douglas Hill
Sent: Thursday, January 28, 2016 3:35 PM
To: ACF-WCM
Cc:
Subject: [EXTERNAL] Lake Lanier Water Level Management

Commander, U.S. Army Corps of Engineers
Mobile District
Attn: PD-EI (ACF-DEIS)

January 28, 2016

Dear Sir,

As a long-time, year-round resident on the shore of Lake Lanier, I fully support the arguments provided to you by the Lake Lanier Association. Lake Lanier is a national asset for both flood control and recreational uses. Indeed, the continually increasing need for water to support population growth and economic development demands that water conservation be a national goal and will require additional reservoirs in the future. The most economical way to increase storage is to increase the full pool storage level of existing reservoirs. In the case of Lake Lanier, a 2 foot increase of summer full pool level adds about 75,000 acre-feet at little or no cost. In fact we have experienced that level for several weeks this winter with no significant detrimental impact. Is there any other way to add that much storage at so little cost or impact? I think not. A

The more severe impact is any action to lower water levels. The impact on recreation of low water is severe both in terms of safety and in terms of availability of lake access to those living on shoreline with shallow drop off. Some coves become unusable with water levels only a few feet below full pool and underwater hazards become a safety issue. B

I strongly recommend that you accept the recommendations of the Lake Lanier Association. They are valid and result from serious study by citizens who truely understand the value of Lake Lanier and its importance both as a flow control asset and as an economic and recreational asset. C

Sincerely,

J. Douglas Hill

Response to Comment ACF153- Douglas Hill

A. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

B. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008. The impacts resulting from changes in Lake Lanier were considered and captured in the final EIS. See section 6.1.1.1.1 of the final EIS for additional information.

C. Comments from Lake Lanier Association were considered and addressed, and responses are provided at comment ID number ACF145.

From: Chelsea Hagood
Sent: Thursday, January 28, 2016 3:51 PM
To: ACF-WCM
Cc: CESAM-PD-H
Subject: [EXTERNAL] ACF Master Water Control Manual Update and EIS - PUBLIC COMMENT
Attachments: Council Comment on USACE ACF-WCM and EIS.pdf

Commander, U.S. Army Corps of Engineers,

Please find attached the Council for Quality Growth's comments on the 2015 ACF Water Control Manual Update and Draft Environmental Impact Statement. Thank you for updating this plan and allowing us the opportunity to comment.

Thank you,

Chelsea Hagood
Policy Analyst

To join the Council, click HERE

COUNCIL for QUALITY GROWTH

COUNCIL for QUALITY GROWTH

January 21, 2015

Attn: PD-EI (ACF-DEIS)
Commander
U.S. Army Corps of Engineers, Mobile District

Re: 2015 ACF Water Control Manual Update and Draft Environmental Impact Statement

Commander, U.S. Army Corps of Engineers,

The Council for Quality Growth (the "Council") is a not-for-profit trade association comprised of a diverse membership of developers, contractors, engineers, architects, planners, law firms and bankers with a vested interest in quality growth and development in the metro Atlanta Region. The Council appreciates the opportunity to comment on the Draft Environmental Impact Statement: Update of the Water Control Manual for the Apalachicola-Chattahoochee-Flint River Basin in Alabama, Florida, and Georgia and a Water Supply Storage Assessment (Oct. 2015) (the "Draft EIS").

Thank you for updating this plan and for considering Georgia's water supply needs. Assuring a secure water supply from Lake Lanier should be the Corps' top priority. The water supplied by Lake Lanier and the Chattahoochee River plays a crucial role in the balanced and responsible growth of State of Georgia and the metro Atlanta region. Recognizing this, Georgia and the Metropolitan North Georgia Water Planning District has adopted long-term plans for stormwater management, wastewater treatment, water supply, water conservation, and the general protection of water quality. Thanks to these programs, as well as State-wide initiatives such as the 2010 Water Stewardship Act, the most recent water demand forecast for the 15-county Metro Water District projects that by 2050, the daily water demand will be approximately 25 percent lower than the District's 2009 forecast, highlighting the effectiveness of conservation and efficiency measures.

A

While Georgia and Metro Atlanta remain committed to water conservation, it is clear that the region's future water supply needs cannot be satisfied through additional conservation measures alone. This is why the Draft EIS should be revised to grant Georgia's full water supply request, as recently updated. In the Draft EIS, the Army confirms that the entire amount of Georgia's requested 2050 water demand is needed. However, it proposes to grant only 225 mgd from Lake Lanier without establishing a rational relationship between this proposal and any project purpose or environmental impact. While we are pleased the Army has proposed to provide the full request of 408 mgd from the Chattahoochee River below Lake Lanier, the Draft Water Control Manual should be revised to meet the entire projected demand of 242 mgd for withdrawals from Lake Lanier. The Army's proposal to not grant the entire request from Lake Lanier will hamstring and foreclose future economic

B

Response to Comment ACF154- Council for Quality Growth, Chelsea Hagood

A. The final EIS addresses an updated water supply request based on the lower population forecasts.

B. In December 2015, the State of Georgia submitted additional information regarding the water supply needs in Metro Atlanta. The final EIS considers the 2015 water supply request by evaluating water supply withdrawals of 242 mgd directly from Lake Lanier (20 mgd under the existing relocation contracts and 222 mgd under the 1958 Water Supply Act and releases from Buford Dam to provide 379 mgd for withdrawal by Metro Atlanta water supply providers.

opportunity by all but ensuring that limited State and local resources are expended to build new reservoirs to make up for the storage the Army opts not to provide in Lake Lanier.

It is also clear that the water supply options being considered for Metro Atlanta, including Lake Lanier, will not have any material adverse impact on the Apalachicola River or Bay. The Army's scientific analysis and conclusions in the Draft EIS confirm what Georgia and Metro Atlanta water supply providers have long understood: that Georgia is not to blame for the collapse of the oyster industry or other related problems in the Apalachicola River, the Bay or Florida – and that attempts to blame Georgia are rooted in politics and not science.

C

The Council appreciates the opportunity to comment on the Draft EIS and will remain committed to assisting the Atlanta Region in addressing its important water needs.

Sincerely,

Michael E. Paris

Michael Paris
President & CEO
Council for Quality Growth

James Touchton
Director, Policy & Government Affairs
Council for Quality Growth

Chelsea Hagood
Policy Analyst
Council for Quality Growth

Response to Comment ACF154- Council for Quality Growth, Chelsea Hagood

C. As noted previously in response to other comments, the environmental effects of the PAA on the Apalachicola River and Bay compared to the NAA (current reservoir operations) are considered in the EIS. The analysis in the EIS demonstrates that the PAA would result in little to no change in flow and water quality conditions in the Apalachicola River and Bay and, consequently, that there would be little to no effect on biological and other resources in the river and bay.

From: Chris Fenn
Sent: Thursday, January 28, 2016 3:55 PM
To: ACF-WCM
Cc:
Subject: [EXTERNAL] Comments Re: Revised Water Control Manual ("WCM") for the Apalachicola-Chattahoochee- Flint River ("ACF") system.

Dear Madam/Sir,

The Army Corp of Engineer's navigation plan contained in the proposed WCM referenced above raises serious concerns with me and my neighbors who reside on Lake Lanier. The impact of this navigation plan would significantly lower Lake Lanier in a drought similar to the one in 2007-2008. The critical water shortage would be exacerbated by the projected population growth between now and 2050. Moreover, the impact of a significant drop in Lake Lanier's level during a drought would be disproportionately harmful to the natural environment as well as business and residential communities of the ACF system's northern section. A

I respectfully urge the Corp to implement the following measures to prevent another serious water shortage that devastated Lake Lanier and metro Atlanta during the recent drought years:

1. **RAISE LAKE LANIER POOL LEVELS BY 2 FEET.** Permanently raise the Lake Lanier full pool levels (winter and summer) by at least two feet. As you know, early in January 2016, the level rose as high as 1075.46 with no pervasive repercussions. An additional two feet in Lake Lanier's pool levels would represent a significant and cost effective measure to permanently increase water reserves and provide a proportionate preservation of the natural environment throughout the ACF system. B
2. **INCORPORATE RIGOROUS DROUGHT PREDICTION MEASURES.** Rigorous drought prediction measures are absolutely essential to prevent the devastating impact that recent droughts have caused to the business and residential communities of Lake Lanier as well as metropolitan Atlanta. C
3. **PROVIDE MORE EFFECTIVE MANAGEMENT OF RESERVOIRS.** Reservoirs must be managed more effectively in order to retain maximum water storage in the event of another severe drought such as that experienced in 2007-2008. D

In addition, I urge you to accept the recommendations contained in a January 28, 2016 letter from Val Perry, President of Lake Lanier Association (LLA), Inc. to Colonel Jon J. Chytka, as well as comments/recommendations by LLA, Inc. in letters dated November 20, 2008, January 2, 2010, and January 14, 2013.

Thank you for your consideration.
Sincerely,

--
Chris Fenn, MBA, MTax, CPA
Robinson College of Business
School of Accountancy, 5th floor
Georgia State University

1

Response to Comment ACF155- Chris Fenn

A. As shown in Figure 6.1-6 of the EIS, the PAA would likely result in lake levels at Lake Lanier ranging from about 2 to 4 ft lower than those for the NAA. That condition would be expected to occur less than 2 percent of the days over the entire modeled period of record (73 years) during the worst drought conditions for that period. The differences would be attributable largely to increased water supply withdrawals from the lake as well as increased releases from Buford Dam to meet future water supply demands for Metro Atlanta users (i.e., Cobb, Fulton, and DeKalb counties and the City of Atlanta). It should be noted that navigation is not supported when drought operations are in effect.

B. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

C. USACE regulations do not allow use of forecasts in real-time project operations. Forecasted conditions may be used for planning future operations, but releases will follow the water control operations plan based on observed conditions within the watershed to the extent practicable. The Drought Contingency Plan (DCP) sections 3-02 and 3-03 contained as an exhibit in the WCMs in appendix A of the EIS includes discussion of drought identification and National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional Drought Early Warning Information System. The system will use key indicators of drought to make timely drought forecast. USACE is a contributor and user of the NIDIS pilot project tools.

D. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.

From: Travis Bond
Sent: Thursday, January 28, 2016 4:00 PM
To: ACF-WCM
Subject: [EXTERNAL] Against raising the full pool level of Lake Lainier

I am a resident in Atlanta that has had a house on Lake Lanier for over 51 years. Over this time, I have seen the devastating impact high water levels have had on the irreplaceable shoreline.

I am vehemently opposed to any alteration of raising the official full pool level from the current 1071.

A

Rather, the full pool level should be lowered to protect the future ability to use the lake as a flood safety reservoir. With all of the building and installation of impervious surfaces within the Lake Lanier watershed, the need to adequate flood control is more important now than ever.

Sincerely,

Travis H. Bond
Managing Director
Axis Mobile Ventures LLC

Response to Comment ACF156- Travis Bond

A. The PAA does not include any increase in the normal pool elevations of Lake Lanier and maintains the current level of flood risk management protection.

From: Trudy D Taylor
Sent: Thursday, January 28, 2016 4:04 PM
To: ACF-WCM
Subject: [EXTERNAL] Lake Lanier

The lower water levels will strongly impact the value of lake Lanier property, causing a significant loss to the property owners. Those who purchased Lake Lanier with the good faith that Lake Lanier water levels would stabilize and remain at normal levels or higher . Please consider the property owners and the loss to there property value, before make any decisions concerning water levels on Lake Lanier. A

Kindest Regards

Trudy D. Taylor, GRI
Realtor
Harry Norman Realtor's

Selling Lake Lanier since 1993
Sent from my iPhone

1

Response to Comment ACF157- Trudy Taylor

A. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008. The impacts resulting from changes in Lake Lanier were considered and captured in the final EIS. See section 6.1.1.1.1 of the final EIS for additional information.

From: Dianna Van Horn
Sent: Thursday, January 28, 2016 4:12 PM
To: ACF-WCM
Subject: [EXTERNAL] public input re Apalachicola River and Bay

It is imperative that the rewrite of your manual revises the way it manages the flow of freshwater needed to maintain the extraordinary richness and productivity of the Apalachicola River, Floodplain and Bay ecosystem.

The river's floodplain is the biological factory that fuels the productivity of Apalachicola Bay. The Corps management of the river system's dams and reservoirs prioritizes other authorized uses of the river's water over the conservation, preservation and long-term sustainability of the ecosystem itself. As a result, the Apalachicola River receives less and less freshwater and we are losing the ecological functions of the Apalachicola's Floodplain and Bay.

A

The health, productivity and sustainability of the Apalachicola River and Bay are critical to the economy and cultural heritage of Florida and the entire Gulf Coast. The Corps of Engineers must give the same fair and equal consideration to fish and wildlife conservation in the Apalachicola River ecosystem as they do the other authorized purposes of the ACF river system.

Thank you for considering this public input.

Dianna Van Horn

Response to Comment ACF158- Dianna VanHorn

A. The PAA includes fish and wildlife conservation operations throughout the basin (e.g., the reservoir fish spawn operations, minimum flow provisions in the Apalachicola River, and fish passage at Jim Woodruff Lock and Dam). Section 5 of the EIS provides additional information on the PAA. The EIS considered and disclosed the expected impacts that the PAA could have on fish and wildlife resources in the Apalachicola River and Bay (or elsewhere in the system). If expected impacts to significant resources would be adverse as a result of revised operations, USACE must consider potential measures to mitigate those effects. The analysis presented in section 6 of the EIS indicates that the PAA would have a minimal effect on flow conditions in the Apalachicola River and into the Bay, compared to current reservoir operations under the NAA. Because flow and water quality changes in the Apalachicola River and Bay are not expected under the PAA, no anticipated incremental effect would be expected on fish and wildlife resources in the bay.

From: Jennifer Hopper
Sent: Thursday, January 28, 2016 4:29 PM
To: ACF-WCM
Subject: [EXTERNAL] Please revise navigation plan.

Please address the following:

1. Revise the navigation plan to avoid the severe impact the proposed plan will have on Lanier's water levels. A
2. Incorporate rigorous drought prediction that will trigger changes in reservoir operations to preserve lake levels during drought. B
3. Manage the reservoirs to retain maximum storage levels in the reservoirs so that drought conditions will not have the devastating impact that was experienced in December 2007. C
4. Model and plan for raising Lake Lanier's full pool level to 1073. D

Thank you for your attention to his matter.

Jennifer Hopper

Sent from my iPhone

Response to Comment ACF159- Jennifer Hopper

A. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.) It should be noted that navigation is not supported when drought operations are in effect.

B. USACE regulations do not allow use of forecasts in real-time project operations. Forecasted conditions may be used for planning future operations, but releases will follow the water control operations plan based on observed conditions within the watershed to the extent practicable. The Drought Contingency Plan (DCP) sections 3-02 and 3-03 contained as an exhibit in the WCMs in appendix A of the EIS includes discussion of drought identification and National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional Drought Early Warning Information System. The system will use key indicators of drought to make timely drought forecast. USACE is a contributor and user of the NIDIS pilot project tools.

C. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.

D. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From:
Sent: Thursday, January 28, 2016 4:30 PM
To: ACF-WCM
Subject: [EXTERNAL] Lake Lanier water level

We would like to urge reconsideration of the new regulations regarding the navigation plan that could cause Lake Lanier to be lowered below a reasonable level during times of drought. The home owners, businesses, and thousands of people involved in recreational activities on the lake should not have to unnecessarily experience the terrible situation we went though in 2007. The 2007 crisis was partly due to nature but also partly due to bad management decisions. A

There is an unfair balance between the many people who depend on Lake Lanier and the demands of those further down the river. We urge a more fair minded evaluation of the regulations. B

What if there were no dam on the river? There would be times of very low flow on the river. Therefore, to demand a fixed flow regardless of the weather cycle should not be considered some kind of inherent right. We need to have reasonable rules and guidelines. C

We also urge the Corps to consider the advantage to all concerned to increase the lake's full level to 1073 feet. D

Thank you for your consideration,
Jim and Sue Inglis

Response to Comment ACF160 – Jim and Sue Inglis

A. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.) It should be noted that navigation is not supported when drought operations are in effect.

B. USACE proposed and evaluated water management measures and alternatives that balance across all authorized project purposes throughout the basin while considering Georgia's water supply storage request as directed by the 11th Circuit Court of Appeals. In developing water management measures and alternatives, USACE considered stakeholder needs and uses throughout the system.

C. Minimum flow requirements have been established for Buford Dam and West Point Dam for water quality control and at Jim Woodruff Dam to protect endangered and threatened species. These are legal requirements either under the River and Harbor Act of 1946 for the Buford and West Point dams or under the Endangered Species Act for Jim Woodruff Dam.

D. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

Response to Comment ACF161 – John Cannon

From: John W Cannon
Sent: Thursday, January 28, 2016 4:40 PM
To: ACF-WCM
Cc: lakeinfo@lakelanier.org
Subject: [EXTERNAL] Lake Lanier water level and proposed navigation plan

January 28, 2016

Commander, U.S. Army Corps of Engineers
Mobile District
Attn: PD-EI (ACF-DEIS)

Re: Lake Lanier water level and proposed navigation plan

Commander,

I am relatively new to this area. I have owned property on the lake less than two years, but I have learned so much in the past two years, including what a valuable and precious asset this lake is to the area. I commend those who had the foresight many years ago to undertake the project to create the Lake, an invaluable asset which so many depend on and enjoy, myself included. As I see it, its utility ranges from residential and commercial development to flood control, water supply and storage, recreation, and more.

A lot has changed since the Lake was conceived and built, and the thinking of its management needs to keep pace with the changing circumstances and the common good of the people which this resource serves. You should listen to some of their voices.

I urge you to rethink your current position and give more consideration to the points raised by the Lake Lanier Association and others. I will not regurgitate all the same points here. I will remind you that many times men tinker with things and we end up suffering unintended consequences. I understand that your job is a difficult one with many different points of view to consider, including the fact that the impact of what you do will be widespread. A

A. Comments from Lake Lanier Association were considered and addressed, and responses are provided at comment ID number ACF145.

It is sound logic to balance flood control and water storage, and your job should be made easier than it was 50 years due to much improved weather forecasting and more reliable predictions. Water is so precious and valuable that a nominal increase in the full pool level

and retaining extra water during drought or predicted drought should be doable without a navigation plan which could negatively impact the overall and ongoing water levels maintained. B

Please revisit your present plan and listen to the people you will be impacting, in my opinion, negatively.

Sincerely,

John Cannon

Response to Comment ACF161 – John Cannon

B. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008. It should be noted that navigation is not supported when drought operations are in effect.

From: thebailers
Sent: Thursday, January 28, 2016 4:48 PM
To: ACF-WCM
Cc:
Subject: [EXTERNAL] Comments Re: Revised Water Control Manual ("WCM") for the Apalachicola-Chattahoochee- Flint River ("ACF") system.

Importance: High

Dear Madam/Sir,

The Army Corp of Engineer's navigation plan contained in the proposed WCM referenced above raises serious concerns with me and my neighbors who reside on Lake Lanier. The impact of this navigation plan would significantly lower Lake Lanier in a drought similar to the one in 2007-2008. The critical water shortage would be exacerbated by the projected population growth between now and 2050. Moreover, the impact of a significant drop in Lake Lanier's level during a drought would be disproportionately harmful to the natural environment as well as business and residential communities of the ACF system's northern section. A

I respectfully urge the Corp to implement the following measures to prevent another serious water shortage that devastated Lake Lanier and metro Atlanta during the recent drought years:

1. **RAISE LAKE LANIER POOL LEVELS BY 2 FEET.** Permanently raise the Lake Lanier full pool levels (winter and summer) by at least two feet. As you know, early in January 2016, the level rose as high as 1075.46 with no pervasive repercussions. An additional two feet in Lake Lanier's pool levels would represent a significant and cost effective measure to permanently increase water reserves and provide a proportionate preservation of the natural environment throughout the ACF system. B
2. **INCORPORATE RIGOROUS DROUGHT PREDICTION MEASURES.** Rigorous drought prediction measures are absolutely essential to prevent the devastating impact that recent droughts have caused to the business and residential communities of Lake Lanier as well as metropolitan Atlanta. C
3. **PROVIDE MORE EFFECTIVE MANAGEMENT OF RESERVOIRS.** Reservoirs must be managed more effectively in order to retain maximum water storage in the event of another severe drought such as that experienced in 2007-2008. D

In addition, I urge you to accept the recommendations contained in a January 28, 2016 letter from Val Perry, President of Lake Lanier Association (LLA), Inc. to Colonel Jon J. Chytka, as well as comments/recommendations by LLA, Inc. in letters dated November 20, 2008, January 2, 2010, and January 14, 2013. E

Thank you for your consideration.

Don Bailer
Cumming, GA

1

Response to Comment ACF162 – Don Bailer

A. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.) It should be noted that navigation is not supported when drought operations are in effect.

B. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

C. USACE regulations do not allow use of forecasts in real-time project operations. Forecasted conditions may be used for planning future operations, but releases will follow the water control operations plan based on observed conditions within the watershed to the extent practicable. The Drought Contingency Plan (DCP) sections 3-02 and 3-03 contained as an exhibit in the WCMs in appendix A of the EIS includes discussion of drought identification and National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional Drought Early Warning Information System. The system will use key indicators of drought to make timely drought forecast. USACE is a contributor and user of the NIDIS pilot project tools.

D. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.

E. January 2016 comments (and previous comments) from the Lake Lanier Association have been considered (see responses to ACF145).

From: Millard Choate
Sent: Thursday, January 28, 2016 4:53 PM
To: ACF-WCM
Subject: [EXTERNAL] 01-28-16 Re: COE Proposed Navigation Plans

Sirs,

I am deeply concerned about the impact proposed navigation plan will have on the integrity and viability of Lake Lanier and tributaries. I understand this plan will result in a significantly lower lake level which will have a devastating effect on the utility of the lake and associated economy. Past droughts have demonstrated the need for increasing the reservoir capacity of the lake. However, it seems the proposed navigation plan is going in the wrong direction, essentially reducing the volume of water available for not only Georgia, but Alabama and Florida. A

Drought Planning: There needs to be more aggressive planning and forecasting to reduce the impact of droughts, which no doubt will be occurring due to the changing pattern of weather. B

Lake Level: In order to mitigate the impact of drought, the "Full" lake level should be increased to at least 1073. This would provide enough water capacity to overcome droughts and help reduce the lower water flow to other states. This can be accomplished for a fraction of the cost of building reservoirs, with little impact. C

Other Reservoirs: For the same reasons stated above, the volume capacity of all reservoirs should be maximized. D

My company and I personally am involved in economic development, not only for the state of Georgia but the entire Southeast. We are involved in construction and are members of civic organizations, chambers of commerce, environmental preservation, and wildlife enhancement in Georgia, Alabama, Florida, North Carolina, South Carolina and Tennessee. As such, I can attest economic impact, on both businesses and employees' quality-of-life will be significant.

I respectfully request you consider these valid concerns from an individual, a business, and a staunch supporter of our region and nation. Please let me know if I can be of any assistance in this regard.

Sincerely,

Millard Choate

Wm. Millard Choate

CHOATE
CONSTRUCTION
Reputation is Everything

Choate Construction Company

Response to Comment ACF163 – Choate Construction, Millard Choate

A. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008. It should be noted that navigation is not supported when drought operations are in effect.

B. USACE regulations do not allow use of forecasts in real-time project operations. Forecasted conditions may be used for planning future operations, but releases will follow the water control operations plan based on observed conditions within the watershed to the extent practicable. The Drought Contingency Plan (DCP) sections 3-02 and 3-03 contained as an exhibit in the WCMs in appendix A of the EIS includes discussion of drought identification and National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional Drought Early Warning Information System. The system will use key indicators of drought to make timely drought forecast. USACE is a contributor and user of the NIDIS pilot project tools.

C. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

D. As stated in section 7-03 of the ACF Master WCM (appendix A of the EIS), ACF Basin water control regulation considers all project functions and accounts for the full range of hydrologic conditions, from flood to drought. In general, to provide for the authorized project purposes, flow must be stored during wetter times of each year and released from storage during drier periods of each year. Traditionally, that means water is stored in the upstream storage lakes during the spring and released for authorized project purposes in the summer and fall months. Some authorized project purposes such as recreation, water supply, and fish and wildlife conservation are achieved by retaining water in the lakes, either throughout the year or during specified periods of each year. The water control plan also establishes action zones within the conservation storage for each project. The zones are used to manage the lakes at the highest level possible while balancing the needs of all the authorized purposes.

From: Bradford Moore
Sent: Thursday, January 28, 2016 4:59 PM
To: ACF-WCM
Cc: Brad Moore; Mary Jo Powell
Subject: [EXTERNAL] Indian Hills Neighborhood Association Comments on ACF WCM & DEIS

Colonel Jon J. Chytka January 28, 2016
Commander, Mobile District
U.S. Army Corps of Engineers
ATTN: PD-EI (ACF-DEIS)

Re: Apalachicola-Chattahoochee-Flint River Basin
Water Control Manual and Draft Environmental Impact Statement

Dear Colonel Chytka:

This letter provides the comments of the Indian Hills Neighborhood Association (IHNA) regarding the Draft Environmental Impact Statement ("DEIS") for a new Water Control Manual for the Apalachicola-Chattahoochee-Flint ("ACF") River Basin. We are grateful to the U.S. Army Corps of Engineers ("Corps") for this opportunity to provide our views.

IHNA is a non-profit neighborhood organization of 24 members who have residences on Walter F. George reservoir shoreline.

Before listing our concerns IHNA wishes to state that we found the report to be very comprehensive. A significant if not overwhelming amount of information is presented in the DEIS. IHNA appreciates the complexity of analyzing the ACF basin and trying to balance the competing reservoir purposes the complicate decision making.

Comments

A. Most Significant Concerns

- The two phase modeling methodology does not do justice to analyzing all the water management alternatives (WMA's). The first phase eliminates all but one WMA which is very much like the current condition using a flawed ranking methodology (see next bullet) before analyzing any of the possible 2040 Atlanta water use options. First it is difficult to understand how none of the other WMA's could have been modeled to produce more desirable results. Secindly, how can the Corps be sure that any of the other six rejected WMA's might not have had yielded better results for downstream stakeholders than the one preferred action alternative (PAA) that was chosen for the additional Atlanta water supply model runs? A
- The composite ranking methodology for evaluating which was best of the seven water management alternatives is considered flawed. The methodology gave equal weighting to each of the performance measures: navigation, hydropower, recreation, fish & wildlife and water supply. For each of these performance measures a weighting of one through seven was assigned based on model results to develop a composite ranking of the WMA's. It is not clear that model result differences for each of these performance measures justifies a difference in magnitude of 1 to 7. For example, the performance rankings for hydropower range from 1 to 7 when the difference between the highest and lowest B

Response to Comment ACF164 – Indian Hills Neighborhood Association, Brad Moore

A. During the scoping process for the EIS, several stakeholders suggested water management alternatives for consideration. USACE reviewed those suggestions and found, in general, that they focused on maximizing one or two of the authorized project purposes at the expense of the others. Several of the suggested alternatives completely omitted one or more of the authorized purposes. The review, however, concluded that some of the measures included in the suggested alternatives had merit and would be considered while others that would seriously adversely affect project purposes would not be considered. The final EIS has been revised to better explain the process of determining the water management alternatives. Section 4 of the draft EIS describes in detail the performance of the seven water management alternatives and the evaluation of their performance.

Optimization for downstream, or any specific group of, stakeholders was not the objective of the Master WCM update. The purpose of the WCM update was to determine how the federal projects in the basin should be operated for their authorized purposes, in light of current conditions and applicable laws.

B. USACE used a straightforward and transparent ranking methodology. As a result of public and agency comments, USACE reviewed the methodology it used to rank performance of the water management alternatives and considered other methodologies. The Agency determined that other methodologies would not improve on the methodology employed. Section 4 of the final EIS has been revised to better explain the ranking process.

megawatt-hrs and megawatt capability for all the WMA's is less than 1%. Another example is how each WMA was given a ranking of 1 to 7 for water supply when the discussion of results says every one of the WMA's has no appreciable impact on current water supply. In these two measure areas the difference between 1 and 7 could make the composite ranking (Table 4..3-14) differ by as much as 12 bias points.

- One of the stated objectives for the master WCM update (Section 4.1) was to reduce or eliminate return to drought operations. With drought being one of the major problems for the ACF basin it is difficult to understand why the Corps would choose a preferred alternative that will result in triggering drought operations seven times more often than with current operations (Section 6.1.1.3.9). C
- The DEIS states that the PAA has an "Adverse" effect on land use along Walter F. George reservoir. The number of years that lake levels would likely drop below IIL(187') would increase from 5 (NAA) to 20 (PAA) over a 73 period, based on the full 12-month period, and from 3 (NAA) to 6 (PAA) for the peak recreation season (Jun-Aug). Adverse effects from dropping below the IIL would make some boat launching ramps unusable, most beaches would be unusable or minimally usable, and navigation hazards would surface due to exposed shoreline and lakebed. The peak recreation period for WF George is stated to be June-August. Walter F. George is considered a premier fishing lake in the south and prime fishing occurs between March and May. To only analyze the recreational and economic impacts based on June - August understates the true impact. In addition, the frequency of lower reservoir levels will have an impact on minority and low income populations around the reservoir and thus could impact the environmental justice finding of "no change" for the PAA. D
- The Corps has assumed into the baseline the massive increases in Atlanta-area consumption over the past 40 years. Those changes were made possible by the Corps' operation of Lake Lanier, via water-related agreements with water utilities and other actions. However, those federal actions, which are clearly major in their effect, have not been subjected to a complete review under NEPA. In NEPA terminology, the Corps' actions to facilitate ever-increasing withdrawals constitute a major federal action, the effects of which the Corps has failed to consider in the manner NEPA requires. NEPA requires federal agencies to determine a "No Action Alternative" (NAA) to serve as a "benchmark"or baseline against which a proposed federal action can be evaluated. Determination of an appropriate baseline is critical, as it forms the basis to measure the magnitude of any changes to be brought about by the proposed action. In this proceeding, the Corps has designated as the baseline its *current* operations under the 1989 draft ACF Basin Water Control Plan, as further modified to accommodate Atlanta water supply and other interests, as the NAA for the ACF DEIS. Obviously, if a given federal action is assumed to occur already in the baseline, then the environmental review of the proposal and its alternatives will fail to capture the effects associated with the given action. In this instance, the Corps attempts to avoid its obligation to study the effects of its actions to facilitate the massive increases in water withdrawals from the mid-1970s to the present time. That would not present a legal problem under NEPA if those withdrawals had undergone a lawful NEPA review in the past. However, that has not been the case. A comprehensive NEPA review of Corps operations at the Buford Dam has not been conducted since 1974, and even that 1974 review could hardly be characterized as providing a reasonably thorough evaluation of the increases in water withdrawals in the subsequent four decades since that time (which, again, occurred *only as a consequence of the Corps' actions*). The State of Alabama raised this very issue in its 1990 lawsuit, wherein it sought to enjoin the Corps from reallocating water from Lake Lanier before performing the required NEPA analyses and other relevant studies. At that time, the Corps argued that it could not complete its NEPA obligations due to the litigation. With that litigation having concluded, the Corps no longer has that excuse to avoid fulfilling its NEPA obligations. The Corps is required to review the environmental consequences of its actions. E

B. Other Comments

Response to Comment ACF164 – Indian Hills Neighborhood Association, Brad Moore

C. There appears to be a misunderstanding regarding "drought" as compared to reservoir "drought operations." Droughts are a function of hydrologic conditions across the basin, not how the USACE ACF Basin projects are managed. The NAA includes a drought contingency plan developed in the 1980s. That plan was included as part of the revised interim operating plan in consultation with the USFWS under section 7 of the Endangered Species Act. The PAA includes a more robust drought contingency plan than the NAA under which drought operations are triggered more often because the drought trigger has been revised to promote faster recovery of the reservoirs and less severe impacts throughout the basin. As described in section 6.1.1.3 of the EIS, drought operations would be triggered more frequently under the PAA than under the NAA, but that fact does not mean that droughts would be occurring more frequently. Under the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue to fulfill all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs.

D. The recreation season for Walter F. George Lake has been revised to May–September in section 6 of the final EIS.

E. Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) require consideration of the No Action Alternative (NAA) (40 CFR section 1502.14). In the CEQ's memorandum of March 23, 1981, *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*, question no. 3 addresses how the NAA is defined depending on the nature of the specific federal action. The response to question no. 3 states, in part:

> The first situation might involve an action … where ongoing programs initiated under existing legislation and regulations will continue, even as new plans are developed. In these cases, "no action" is "no change" from the current management direction or level of management intensity. To construct an alternative that is based on no management at all would be a useless academic exercise. Therefore, the "no action" alternative may be thought of in terms of continuing with the present course of action until that action is changed.

Consequently, for purposes of the Master WCM update process, the NAA reflects current reservoir operations as they have evolved over time in response to laws, regulations, policy, and new technical information. Basing the NAA for the ACF Basin on a pre-NEPA 1958 WCM or on a predam condition to assess the effects of alternative WCM update plans would neither accurately reflect current baseline operations nor be consistent with "no action" as defined in the referenced CEQ memorandum

- The modeling utilizes 2007 diversions as the basis for consumptive use because that year represents the greatest human use. However, in projecting forward for 2040 only the Atlanta supply values were escalated. Atlanta's consumptive use now represents about 20% of all use. Certainly the Corps recognizes that agricultural use represents over 50% of consumptive use during normal years and over 75% during drought periods. The agricultural use was not escalated above the 2007 value for the 2040 Atlanta water supply runs. How could it be considered conservative analyses if agriculture, the largest consumptive user, is not considered to grow higher than the drought year of 2007? The report states no basis for agricultural diversions not growing in the future. F
- The Corps seems to take the 94% return rate from water supply withdrawals downstream of Buford as gospel. This 94% return rate higher than the industry average for municipal returns. The DEIS does not state a process for confirming that Atlanta will achieve such a high return rate. G
- The DEIS shows the PAA as being positive toward navigation. ACF system authorization is for 9'x100'x365 channel. By analyzing for a 7 ft channel and judging acceptability of metrics toward a 7 ft channel the Corps is effectively abandoning a 9 ft navigation capability as one of its originally authorized purposes. H
- IHNA expresses its support for mandatory flow targets of 1,350 cubic feet per second (cfs) daily and 1,850 cfs weekly at Columbus and 2,000 cfs daily at Columbia. IHNA supports Tri Rivers Waterway Development Association who has consistently advocated in favor of these flow targets, including in their scoping comments submitted to the Corps previously on November 21, 2008; December 30, 2009; and January 11, 2013. I

Under current practice the Water Control Manual in times of scarcity in the basin the Corps favors keeping elevations at Lake Lanier higher than necessary for purposes of water supply. Meanwhile, the basic needs for recreation, environmental flows, and municipal and industrial interests downstream are given diminished consideration. This is not a fair or reasonable distribution of the project's resources. Walter F. George reservoir level and flow targets on the middle and lower Chattahoochee are necessary to ensure that the Corps strives to meet the needs and share burdens on a proportionate basis across the area served by the project. J

The Corps has asserted that it manages upstream water resources conservatively due to the relative difficulty of refilling Lake Lanier, which has both a greater storage capacity and a smaller drainage area. In the abstract, that position is not illogical. However, in practice, it has not proven to be unacceptably difficult to refill the upper reservoirs. In any event, the Corps has failed to consider WMA's that would strive to meet flow targets across the region on an equitable and proportionate basis the better utilize the Lanier storage capability. Therefore, the Corps also has failed to provide sufficient information to allow the public to consider whether such a flow regime would have unreasonable upstream effects. K

In summary, IHNA appreciates the Corp's difficult task of analyzing the ACF basin and trying to meet multiple stakeholder needs; however, the preferred alternative in the DEIS appears to be heavily weighed toward meeting the requested 2040 Atlanta water supply at the cost of downstream stakeholders. IHNA feels that additional WMA's are possible (for example the alternative presented in the Apalachicola-Chattahoochee-Flint Stakeholders {ACFS} Sustainable Water Management Plan) that can not only meet Atlanta's future water needs, but also better meet downstream environmental and recreational needs. L

Sincerely,

Brad Moore
Brad Moore
IHNA President

Response to Comment ACF164 – Indian Hills Neighborhood Association, Brad Moore

F. The purpose of the EIS is to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws, and to implement those operations through updated water control plans and manuals. Because of the 11th Circuit Court ruling of June 2011 and the 2012 USACE legal opinion, updating the water control plans and manuals includes making a decision on Georgia's water supply request. Accordingly, this EIS considers not only operations for all authorized purposes, but also an expanded range of water supply alternatives associated with the Buford Dam/Lake Lanier project, including current levels of water supply withdrawals and additional amounts from Lake Lanier and downstream for Metro Atlanta that Georgia requested in 2015. Forecasting water demands for parts of the ACF Basin other than Metro Atlanta is outside the scope of the Master WCM update process and this EIS.

G. The EIS has been revised to better explain return rates used in considering Georgia's 2015 request. The return rates used in the water supply analysis considered the withdrawals of multiple water supply providers and the returns of multiple wastewater treatment facilities discharging either into Lake Lanier or the downstream reaches of the Chattahoochee River. The return rates used for Metro Atlanta include interbasin transfer so that discharges from wastewater treatment plants exceed the amount of water withdrawn. Regulating the return rates of wastewater treatment plants is a local or state responsibility, not USACE. Water Supply Storage Agreements do not contain provisions requiring or giving credit for return flows. Regulation of irrigation uses of water in the ACF Basin is a local or state responsibility, not USACE.

H. The difficulties associated with operating and maintaining the ACF Basin project for navigation are well documented in section 2.1.1.2.4.3 of the draft EIS. The original design of the project documented that a discharge from Jim Woodruff Lock and Dam of 9,300 cfs together with dredging would provide a 9-ft channel. By the mid-1980s, the required discharge with dredging to provide a 9-ft channel was estimated to be 11,000 cfs. By 1995, the predredging flow requirement to provide a 9-ft navigation channel had increased to 16,000 cfs. Today, the predredging flow requirement for a 9-ft channel exceeds 20,000 cfs.

The PAA provides an opportunity for navigation to occur in the January through May timeframe each year. Given the physical and regulatory constraints on the ACF system, this opportunity is limited.
Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers it along with the other authorized purposes when making operational decisions.

I. The authorized purposes of the federal ACF system do not include a specific directive to meet flow targets at Columbus, Georgia. Daily and weekly average flow targets at Columbus, are established in the 2004 Federal Energy Regulatory Commission (FERC) license for Georgia Power Company projects downstream of West Point Lake (refer to section 6.1.1.2.1). Each of the FERC target flows include an important qualifier, e.g., "a daily average target minimum flow of 1,350 cfs, or *inflow, whichever is less*" (*emphasis added*). Model results over the 73-year hydrologic period of record indicate that a daily average daily flow of 1,350 cfs at Columbus would be achieved on 94 percent of the days for the PAA compared to 95 percent under the NAA (refer to section 6.1.1.2.3.9).

J. USACE proposed and evaluated water management measures and alternatives that balance across all authorized project purposes throughout the basin while considering Georgia's water supply storage request as directed by the 11th Circuit Court of Appeals. In developing water management measures and alternatives, USACE considered stakeholder needs and uses throughout the system

Response to Comment ACF164 – Indian Hills Neighborhood Association, Brad Moore

K. Minimum flow requirements have been established for Buford Dam and West Point Dam for water quality control and at Jim Woodruff Dam to protect endangered and threatened species. These are legal requirements either under the River and Harbor Act of 1946 for Buford and West Point dams or under the Endangered Species Act for Jim Woodruff Dam. No other flow targets have been authorized or required by Congress or federal law. The three federal storage reservoirs—Buford, West Point, and Walter F. George—are operated in a balanced manner to fulfill the authorized project purposes. Action zones subdivide the conservation storage of the three reservoirs. System operation includes keeping the reservoir in zone. The upstream reservoir is maintained at an equivalent or lower zone than the downstream reservoir. Action zones were refined in PAA. Generally, they were revised upward in the winter months at Lake Lanier and at West Point Lake and downward in the summer months at Walter F. George Lake. The revised action zones achieve the objectives of putting the greater burden of the system demands on the lower two reservoirs when in the upper action zones and on Lake Lanier when the system reaches drought operation. That revision is an improved utilization of the system storage, not just of Buford Dam (Lake Lanier). USACE has a responsibility to operate the reservoirs in the basin to fulfill all authorized purposes in a balanced manner. The updated WCMs accomplish this goal. USACE does not own the water or have a responsibility to establish flow targets to evenly apportion the water. Apportionment of the water in the ACF basin is an issue between the states that is currently being litigated before the U.S. Supreme Court. USACE will review any decision by the court and respond appropriately.

L. USACE requested that the ACF Stakeholders organization provide the technical supporting documentation for the recommendations in the ACF sustainable water management plan (SWMP), with their formal comments on the draft EIS, so that they may be fully evaluated and considered in the Master WCM update process. Unfortunately, the technical supporting documentation was not provided to USACE. The SWMP recommendations have been considered to the extent possible with the limited technical information available. GWRI did not provide information or data to support the ACFS alternative. It is inappropriate to approach the ACF Stakeholder's consultant independently to request technical information that the ACF Stakeholder organization was unable to make available to USACE. Furthermore, there was no way to validate that any information submitted by GWRI was the information that underpinned the ACF Stakeholder submittal. Where information was not available, USACE made assumptions to develop an additional alternative that is evaluated in the final EIS. GWRI did not approach USACE to volunteer information regarding the ACFS SWMP. See section 4.1.4 of the final EIS for a discussion of the ACF Stakeholders' SWMP.

From: Bradford Moore
Sent: Thursday, January 28, 2016 5:07 PM
To: ACF-WCM
Cc: Brad Moore; Dennis Fineout
Subject: [EXTERNAL] Friends of Lake Eufaula Comments on ACF WCM & DEIS

Colonel Jon J. Chytka January 28, 2016
Commander, Mobile District
U.S. Army Corps of Engineers
ATTN: PD-EI (ACF-DEIS)

Friends of Lake Eufaula (FOLE)

Re: Apalachicola-Chattahoochee-Flint River Basin
Water Control Manual and Draft Environmental Impact Statement

Dear Colonel Chytka:

This letter provides the comments of the Friends of Lake Eufaula (FOLE) regarding the Draft Environmental Impact Statement ("DEIS") for a new Water Control Manual for the Apalachicola-Chattahoochee-Flint ("ACF") River Basin. We are grateful to the U.S. Army Corps of Engineers ("Corps") for this opportunity to provide our views.

FOLE is a non-profit organization with a mission to protect and promote Walter F. George reservoir (Lake Eufaula). FOLE has over 200 members which include shoreline property owners, local business and local governments.

Before listing our concerns FOLE wishes to state that we found the report to be very comprehensive. A significant if not overwhelming amount of information is presented in the DEIS. FOLE appreciates the complexity of analyzing the ACF basin and trying to balance the competing reservoir purposes the complicate decision making.

A major concern of FOLE is that under current practices the Water Control Manual in times of scarcity in the basin the Corps favors keeping elevations at Lake Lanier higher than necessary for purposes of water supply. Meanwhile, the basic needs for recreation, environmental flows, and municipal and industrial interests downstream are given diminished consideration. This is not a fair or reasonable distribution of the project's resources. Walter F. George reservoir level and flow targets on the middle and lower Chattahoochee are necessary to ensure that the Corps strives to meet the needs and share burdens on a proportionate basis across the area served by the project. A

The Corps has asserted that it manages upstream water resources conservatively due to the relative difficulty of refilling Lake Lanier, which has both a greater storage capacity and a smaller drainage area. In the abstract, that position is not illogical. However, in practice, it has not proven to be unacceptably difficult to refill the upper reservoirs. In any event, the Corps has failed to consider WMA's that would strive to meet flow targets across the region on an equitable and proportionate basis the better utilize the Lanier storage capability. Therefore, the B

Response to Comment ACF165 – Friends of Lake Eufaula, Brad Moore

A. USACE does not prioritize authorized purposes. The PAA in the EIS provides for modifying the action zones of the storage projects—Lake Lanier, West Point Lake, and Lake Water F. George. The current action zones were refined to better achieve the objective to define action zones on a scientific basis that eliminates disproportionate impact on reservoirs and addresses current system needs. The revised action zones were derived considering numerous factors to include the ability of the reservoirs to refill (considering hydrology, watershed size, and physical constraints of each reservoir), recreation effects and hazard levels, and the proportionality of zone drawdown between projects. At Lake Lanier, the summer period for zones 1, 2, and 3 was expanded to reflect proportionality of contributing watershed size and historic operations to meet system demands. The action zones included in the PAA achieve a more equitable balance between action zone sizing based on the project's watershed size and the proportionately balanced drawdown among the projects when operating in Zone 1. As the action zones were refined, generally they were revised upward in the winter months at Lake Lanier and West Point Lake and revised downward in the summer months at Walter F. George Lake. The zones included in the PAA achieve the objectives of putting the greater burden of the system demands on the lower two reservoirs when in the upper action zones and on Lake Lanier when the system reaches drought operation. The storage projects are operated to maintain their lake level in the same zones concurrently. Because of the hydrologic and physical characteristics of the river system, however, there might be periods when one lake is in a higher or lower zone than another. When that occurs, USACE makes an effort to bring the lakes back into balance with each other as soon as conditions allow. By doing so, effects on the river basin are shared equitably among the projects.

B. USACE does not operate to meet flow targets other than at the base of its projects as congressionally authorized or pursuant to the biological opinion under the Endangered Species Act. USACE balances all authorized project purposes throughout the basin as reflected in the proposed action and the final EIS.

Corps also has failed to provide sufficient information to allow the public to consider whether such a flow regime would have unreasonable upstream effects.

Other Comments

A. Most Significant Concerns

- The two phase modeling methodology does not do justice to analyzing all the water management alternatives (WMA's). The first phase eliminates all but one WMA which is very much like the current condition using a flawed ranking methodology (see next bullet) before analyzing any of the possible 2040 Atlanta water use options. First it is difficult to understand how none of the other WMA's could have been modeled to produce more desirable results. Secondly, how can the Corps be sure that any of the other six rejected WMA's might not have had yielded better results for downstream stakeholders than the one preferred action alternative (PAA) that was chosen for the additional Atlanta water supply model runs? C
- The composite ranking methodology for evaluating which was best of the seven water management alternatives is considered flawed. The methodology gave equal weighting to each of the performance measures: navigation, hydropower, recreation, fish & wildlife and water supply. For each of these performance measures a weighting of one through seven was assigned based on model results to develop a composite ranking of the WMA's. It is not clear that model result differences for each of these performance measures justifies a difference in magnitude of 1 to 7. For example, the performance rankings for hydropower range from 1 to 7 when the difference between the highest and lowest megawatt-hrs and megawatt capability for all the WMA's is less than 1%. Another example is how each WMA was given a ranking of 1 to 7 for water supply when the discussion of results says every one of the WMA's has no appreciable impact on current water supply. In these two measure areas the difference between 1 and 7 could make the composite ranking (Table 4..3-14) differ by as much as 12 bias points. D
- One of the stated objectives for the master WCM update (Section 4.1) was to reduce or eliminate return to drought operations. With drought being one of the major problems for the ACF basin it is difficult to understand why the Corps would choose a preferred alternative that will result in triggering drought operations seven times more often than with current operations (Section 6.1.1.3.9). E
- The DEIS states that the PAA has an "Adverse" effect on land use along Walter F. George reservoir. The number of years that lake levels would likely drop below IIL(187') would increase from 5 (NAA) to 20 (PAA) over a 73 period, based on the full 12-month period, and from 3 (NAA) to 6 (PAA) for the peak recreation season (Jun-Aug). Adverse effects from dropping below the IIL would make some boat launching ramps unusable, most beaches would be unusable or minimally usable, and navigation hazards would surface due to exposed shoreline and lakebed. The peak recreation period for WF George is stated to be June-August. Walter F. George is considered a premier fishing lake in the south and prime fishing occurs between March and May. To only analyze the recreational and economic impacts based on June - August understates the true impact. In addition, the frequency of lower reservoir levels will have an impact on minority and low income populations around the reservoir and thus could impact the environmental justice finding of "no change" for the PAA. F
- The Corps has assumed into the baseline the massive increases in Atlanta-area consumption over the past 40 years. Those changes were made possible by the Corps' operation of Lake Lanier, via water-related agreements with water utilities and other actions. However, those federal actions, which are clearly major in their effect, have not been subjected to a complete review under NEPA. In NEPA terminology, the Corps' actions to facilitate ever-increasing withdrawals constitute a major federal action, the effects of which the Corps has failed to consider in the manner NEPA requires. NEPA requires federal agencies to determine a "No Action Alternative" (NAA) to serve as a "benchmark"or baseline against which a proposed federal action can be evaluated. Determination of an appropriate baseline is critical, as it forms the basis to measure the magnitude of any changes to be brought about by

Response to Comment ACF165 – Friends of Lake Eufaula, Brad Moore

C. During the scoping process for the EIS, several stakeholders suggested water management alternatives for consideration. USACE reviewed those suggestions and found, in general, that they focused on maximizing one or two of the authorized project purposes at the expense of the others. Several of the suggested alternatives completely omitted one or more of the authorized purposes. The review, however, concluded that some of the measures included in the suggested alternatives had merit and would be considered while others that would seriously adversely affect project purposes would not be considered. The final EIS has been revised to better explain the process of determining the water management alternatives. Section 4 of the draft EIS describes in detail the performance of the seven water management alternatives and the evaluation of their performance.

Optimization for downstream, or any specific group of, stakeholders was not the objective of the Master WCM update. The purpose of the WCM update was to determine how the federal projects in the basin should be operated for their authorized purposes, in light of current conditions and applicable laws.

D. USACE used a straightforward and transparent ranking methodology. As a result of public and agency comments, USACE reviewed the methodology it used to rank performance of the water management alternatives and considered other methodologies. The Agency determined that other methodologies would not improve on the methodology employed. Section 4 of the final EIS has been revised to better explain the ranking process.

E. There appears to be a misunderstanding regarding "drought" as compared to reservoir "drought operations." Droughts are a function of hydrologic conditions across the basin, not how the USACE ACF Basin projects are managed. The NAA includes a drought contingency plan developed in the 1980s. That plan was included as part of the revised interim operating plan in consultation with the USFWS under section 7 of the Endangered Species Act. The PAA includes a more robust drought contingency plan than the NAA under which drought operations are triggered more often because the drought trigger has been revised to promote faster recovery of the reservoirs and less severe impacts throughout the basin. As described in section 6.1.1.3 of the EIS, drought operations would be triggered more frequently under the PAA than under the NAA, but that fact does not mean that droughts would be occurring more frequently. Under the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue to fulfill all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs.

F. The recreation season for Walter F. George Lake has been revised to May–September in section 6 of the final EIS.

the proposed action. In this proceeding, the Corps has designated as the baseline its *current* operations under the 1989 draft ACF Basin Water Control Plan, as further modified to accommodate Atlanta water supply and other interests, as the NAA for the ACF DEIS. Obviously, if a given federal action is assumed to occur already in the baseline, then the environmental review of the proposal and its alternatives will fail to capture the effects associated with the given action. In this instance, the Corps attempts to avoid its obligation to study the effects of its actions to facilitate the massive increases in water withdrawals from the mid-1970s to the present time. That would not present a legal problem under NEPA if those withdrawals had undergone a lawful NEPA review in the past. However, that has not been the case. A comprehensive NEPA review of Corps operations at the Buford Dam has not been conducted since 1974, and even that 1974 review could hardly be characterized as providing a reasonably thorough evaluation of the increases in water withdrawals in the subsequent four decades since that time (which, again, occurred *only as a consequence of the Corps' actions*). The State of Alabama raised this very issue in its 1990 lawsuit, wherein it sought to enjoin the Corps from reallocating water from Lake Lanier before performing the required NEPA analyses and other relevant studies. At that time, the Corps argued that it could not complete its NEPA obligations due to the litigation. With that litigation having concluded, the Corps no longer has that excuse to avoid fulfilling its NEPA obligations. The Corps is required to review the environmental consequences of its actions. G

B. Second Tier Comments

- The modeling utilizes 2007 diversions as the basis for consumptive use because that year represents the greatest human use. However, in projecting forward for 2040 only the Atlanta supply values were escalated. Atlanta's consumptive use now represents about 20% of all use. Certainly the Corps recognizes that agricultural use represents over 50% of consumptive use during normal years and over 75% during drought periods. The agricultural use was not escalated above the 2007 value for the 2040 Atlanta water supply runs. How could it be considered conservative analyses if agriculture, the largest consumptive user, is not considered to grow higher than the drought year of 2007? The report states no basis for agricultural diversions not growing in the future. H
- The Corps seems to take the 94% return rate from water supply withdrawals downstream of Buford as gospel. This 94% return rate is higher than the industry average for municipal returns and serves as the basis for acceptability of the 408mgd withdrawal below Buford. The DEIS does not state a process for confirming that Atlanta will achieve such a high return rate. I
- The DEIS shows the PAA as being positive toward navigation. ACF system authorization is for 9'x100'x365 channel. By analyzing for a 7 ft channel and judging acceptability of metrics toward a 7 ft channel the Corps is effectively abandoning navigation as one of its originally authorized purposes. J
- FOLE reiterates its support for mandatory flow targets of 1,350 cubic feet per second (cfs) daily and 1,850 cfs weekly at Columbus and 2,000 cfs daily at Columbia. FOLE supports Tri Rivers Waterway Development Association who has consistently advocated in favor of these flow targets, including in their scoping comments submitted to the Corps previously on November 21, 2008; December 30, 2009; and January 11, 2013. K

In summary, FOLE appreciates the Corp's difficult task of analyzing the ACF basin and trying to meet multiple stakeholder needs; however, the preferred alternative in the DEIS appears to be heavily weighed toward meeting the requested 2040 Atlanta water supply at the cost of downstream stakeholders. FOLE feels that additional WMA's are possible (for example the alternative presented in the Apalachicola-Chattahoochee-Flint Stakeholders {ACFS} Sustainable Water Management Plan, recommendation 2.1) that can not only meet Atlanta's future water needs, but also better meet downstream environmental and recreational needs. L

Sincerely,

Response to Comment ACF165 – Friends of Lake Eufaula, Brad Moore

G. Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) require consideration of the No Action Alternative (NAA) (40 CFR section 1502.14). In the CEQ's memorandum of March 23, 1981, *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*, question no. 3 addresses how the NAA is defined depending on the nature of the specific federal action. The response to question no. 3 states, in part:

> The first situation might involve an action … where ongoing programs initiated under existing legislation and regulations will continue, even as new plans are developed. In these cases, "no action" is "no change" from the current management direction or level of management intensity. To construct an alternative that is based on no management at all would be a useless academic exercise. Therefore, the "no action" alternative may be thought of in terms of continuing with the present course of action until that action is changed.

Consequently, for purposes of the Master WCM update process, the NAA reflects current reservoir operations as they have evolved over time in response to laws, regulations, policy, and new technical information. Basing the NAA for the ACF Basin on a pre-NEPA 1958 WCM or on a predam condition to assess the effects of alternative WCM update plans would neither accurately reflect current baseline operations nor be consistent with "no action" as defined in the referenced CEQ memorandum.

H. The purpose of the EIS is to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws, and to implement those operations through updated water control plans and manuals. Because of the 11th Circuit Court ruling of June 2011 and the 2012 USACE legal opinion, updating the water control plans and manuals includes making a decision on Georgia's water supply request. Accordingly, this EIS considers not only operations for all authorized purposes, but also an expanded range of water supply alternatives associated with the Buford Dam/Lake Lanier project, including current levels of water supply withdrawals and additional amounts from Lake Lanier and downstream for Metro Atlanta that Georgia requested in 2015. Forecasting water demands for parts of the ACF Basin other than Metro Atlanta is outside the scope of the Master WCM update process and this EIS.

I. The EIS has been revised to better explain return rates used in considering Georgia's 2015 request. The return rates used in the water supply analysis considered the withdrawals of multiple water supply providers and the returns of multiple wastewater treatment facilities discharging either into Lake Lanier or the downstream reaches of the Chattahoochee River. The return rates used for Metro Atlanta include interbasin transfer so that discharges from wastewater treatment plants exceed the amount of water withdrawn. Regulating the return rates of wastewater treatment plants is a local or state responsibility, not USACE. Water Supply Storage Agreements do not contain provisions requiring or giving credit for return flows. Regulation of irrigation uses of water in the ACF Basin is a local or state responsibility, not USACE.

J. The difficulties associated with operating and maintaining the ACF Basin project for navigation are well documented in section 2.1.1.2.4.3 of the draft EIS. The original design of the project documented that a discharge from Jim Woodruff Lock and Dam of 9,300 cfs together with dredging would provide a 9-ft channel. By the mid-1980s, the required discharge with dredging to provide a 9-ft channel was estimated to be 11,000 cfs. By 1995, the predredging flow requirement to provide a 9-ft navigation channel had increased to 16,000 cfs. Today, the predredging flow requirement for a 9-ft channel exceeds 20,000 cfs.

The PAA provides an opportunity for navigation to occur in the January through May timeframe each year. Given the physical and regulatory constraints on the ACF system, this opportunity is limited.

Response to Comment ACF165 – Friends of Lake Eufaula, Brad Moore

Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers it along with the other authorized purposes when making operational decisions.

K. The authorized purposes of the federal ACF system do not include a specific directive to meet flow targets at Columbus, Georgia. Daily and weekly average flow targets at Columbus, are established in the 2004 Federal Energy Regulatory Commission (FERC) license for Georgia Power Company projects downstream of West Point Lake (refer to section 6.1.1.2.1). Each of the FERC target flows include an important qualifier, e.g., "a daily average target minimum flow of 1,350 cfs, *or inflow, whichever is less" (emphasis added).* Model results over the 73-year hydrologic period of record indicate that a daily average daily flow of 1,350 cfs at Columbus would be achieved on 94 percent of the days for the PAA compared to 95 percent under the NAA (refer to section 6.1.1.2.3.9).

L. USACE requested that the ACF Stakeholders organization provide the technical supporting documentation for the recommendations in the ACF sustainable water management plan (SWMP), with their formal comments on the draft EIS, so that they may be fully evaluated and considered in the Master WCM update process. Unfortunately, the technical supporting documentation was not provided to USACE. The SWMP recommendations have been considered to the extent possible with the limited technical information available. GWRI did not provide information or data to support the ACFS alternative. It is inappropriate to approach the ACF Stakeholder's consultant independently to request technical information that the ACF Stakeholder organization was unable to make available to USACE. Furthermore, there was no way to validate that any information submitted by GWRI was the information that underpinned the ACF Stakeholder submittal. Where information was not available, USACE made assumptions to develop an additional alternative that is evaluated in the final EIS. GWRI did not approach USACE to volunteer information regarding the ACFS SWMP. See section 4.1.4 of the final EIS for a discussion of the ACF Stakeholders' SWMP.

Brad Moore

Brad Moore
FOLE President

4

From:
Sent: Thursday, January 28, 2016 5:07 PM
To: ACF-WCM
Subject: [EXTERNAL] Navigation plan re Lake Lanier

Dear Sir

We live on Lake Lanier and have several investment properties on the lake all of which are affected by the lake levels.

We would ask you to 1. revise the navigation plan so as avoid considerable impact it will have on lake levels and property values A

2. Incorporate drought prediction that will trigger changes in reservoir operations to maintain water levels in drought periods B

3. The lake should be managed to retain maximum storage levels so we do not have the devastating impact experienced in December 2007 C

4. Model and plan for a raising full pool to 1073 ft D

Yours sincerely

Lloyd Thompson

Response to Comment ACF166 – Lloyd Thompson

A. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.) It should be noted that navigation is not supported when drought operations are in effect.

B. USACE regulations do not allow use of forecasts in real-time project operations. Forecasted conditions may be used for planning future operations, but releases will follow the water control operations plan based on observed conditions within the watershed to the extent practicable. The Drought Contingency Plan (DCP) sections 3-02 and 3-03 contained as an exhibit in the WCMs in appendix A of the EIS includes discussion of drought identification and National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional Drought Early Warning Information System. The system will use key indicators of drought to make timely drought forecast. USACE is a contributor and user of the NIDIS pilot project tools.

C. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.

D. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of cur-rent conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From: Tom Hyde
Sent: Thursday, January 28, 2016 5:46 PM
To: ACF-WCM
Cc:
Subject: [EXTERNAL] LAKE LANIER

TODAY WE NEED TO PLAN ON THE FUTURE TO ACCOMPLISH THE FOLLOWING:

- RAISE LAKE FULL CAPACITY CLOSER TO 1085
- WE ALL KNOW THE LARGEST CAPACITY OF A BOWL IS AT THE TOP
- THE FUTURE NEEDS WILL INCREASE SO THE STATES CAN PLAN TOGETHER TO INVEST IN THE ENGINEERING , DESIGN AND PHYSICAL COST TO BUILD A LARGER TOP OF THE BOWL. A
- THE ORIGINAL LAKE WAS INITIALLY DESIGNED TO TAKE CARE OF 100 YEARS. THIS IS TRUE AS WE ALL KNOW.
- AS DEMAND INCREASES THE BOTTOM AT THE SAME TIME IS FLATTING OUT.
- WE NEED TO PUT IN PLACE TODAY DESIGN AND ENGINEERING TO BE READY TO RELEASE GRADING CONTACTS TO GO AROUND THE LAKE WHILE THE LEVEL IS DOWN GRADING AND REMOVING EARTH AT THE EDGE OF THE TOP OF THE BOWL. THIS CAN BE DONE WITH HEAVY GRADING EQUIPMENT, BARGES AND TRAINS. B
- THE COUNTRY HAD WISDOM TO BUILD THE LAKE. THIS WE ARE THANKFUL. **NOW LET WE THE PEOPLE TODAY USE OUR WISDOM TO BUILD A NEW LAKE LANIER**.
- WITH THE ABOVE COMMENTS I LEAVE WITH THANKS FOR THE ARMY ENGINEERS FOR THE SERVICE AND MANAGEMENT OF ONE OF OUR GREAT RESOURCES, WE ALL APPRECIATE, TREASURE AND CHERISH NOW AND IN THE FUTURE.

TOM HYDE

1

Response to Comment ACF167 – Tom Hyde

A. As stated in section 4.1.1 of the draft EIS, the purpose of the Master WCM update is to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of conservation pool at Lake Lanier would require reallocation of storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in draft EIS section 1.4.4 is maintaining at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft was not carried forward.

B. Activities to increase the capacity of the ACF Basin reservoirs are outside the scope of the Master WCM update.

From:
Sent: Thursday, January 28, 2016 5:48 PM
To: ACF-WCM
Subject: [EXTERNAL] Comment on Plans for Lake Lanier

As a property owner with lake access, and a significant tax payer in Forsyth County, I am very concerned about the negative impact your proposals will have on the environment and the use of Lake Lanier.

Joining in with others, I specifically I urge you to:

1. Revise the navigation plan to avoid the severe impact the proposed plan will have on Lanier's water levels. A
2. Incorporate rigorous drought prediction that will trigger changes in reservoir operations to preserve lake levels during drought. B
3. Manage the reservoirs to retain maximum storage levels in the reservoirs so that drought conditions will not have the devastating impact that was experienced in December 2007. C
4. Develop a model and plan raising Lake Lanier's full pool level to 1073. D

Keep up your great work and do not make changes that diminish the value of this beautiful community.

Sincerely,

Rev John Martin

Response to Comment ACF168 – John Martin

A. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008. It should be noted that navigation is not supported when drought operations are in effect.

B. USACE regulations do not allow use of forecasts in real-time project operations. Forecasted conditions may be used for planning future operations, but releases will follow the water control operations plan based on observed conditions within the watershed to the extent practicable. The Drought Contingency Plan (DCP) sections 3-02 and 3-03 contained as an exhibit in the WCMs in appendix A of the EIS includes discussion of drought identification and National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional Drought Early Warning Information System. The system will use key indicators of drought to make timely drought forecast. USACE is a contributor and user of the NIDIS pilot project tools.

C. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.

D. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From: Tammy B. Bennett
Sent: Thursday, January 28, 2016 5:54 PM
To: ACF-WCM
Subject: [EXTERNAL] WCM comments to the Corps

Please, as a property owner on Lake Lanier,

- Change the navigation plan to minimize impact on Lanier's water levels. A
- Add robust drought prediction that will preserve lake levels during drought and minimize erosion of the shoreline. B
- Maintain maximum storage levels in our reservoirs to ensure drought conditions don't have significant impact on the lake, shoreline, business owners & home owners C
- Consider plans for raising Lake Lanier's full pool level to 1073. D

Best regards,
Tammy Bennett
Lake Lanier homeowner

Response to Comment ACF169 – Tammy Bennett

A. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008. It should be noted that navigation is not supported when drought operations are in effect.

B. USACE regulations do not allow use of forecasts in real-time project operations. Forecasted conditions may be used for planning future operations, but releases will follow the water control operations plan based on observed conditions within the watershed to the extent practicable. The Drought Contingency Plan (DCP) sections 3-02 and 3-03 contained as an exhibit in the WCMs in appendix A of the EIS includes discussion of drought identification and National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional Drought Early Warning Information System. The system will use key indicators of drought to make timely drought forecast. USACE is a contributor and user of the NIDIS pilot project tools.

C. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.

D. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From: Scott Tittle
Sent: Thursday, January 28, 2016 6:03 PM
To: ACF-WCM
Subject: [EXTERNAL] Water Control Manual comments

As a Lake Lanier homeowner here are my issues with the updated WCM:

1. Revise the navigation plan to avoid the severe impact the proposed plan will have on Lanier's water levels. A
2. Incorporate rigorous drought prediction that will trigger changes in reservoir operations to preserve lake levels during drought. B
3. Manage the reservoirs to retain maximum storage levels in the reservoirs so that drought conditions will not have the devastating impact that was experienced in December 2007. C
4. Model and plan for raising Lake Lanier's full pool level to 1073. D

Regards,

Scott Tittle

Response to Comment ACF170 – Scott Tittle

A. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008. It should be noted that navigation is not supported when drought operations are in effect.

B. USACE regulations do not allow use of forecasts in real-time project operations. Forecasted conditions may be used for planning future operations, but releases will follow the water control operations plan based on observed conditions within the watershed to the extent practicable. The Drought Contingency Plan (DCP) sections 3-02 and 3-03 contained as an exhibit in the WCMs in appendix A of the EIS includes discussion of drought identification and National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional Drought Early Warning Information System. The system will use key indicators of drought to make timely drought forecast. USACE is a contributor and user of the NIDIS pilot project tools.

C. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.

D. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From: Dick Pressnall
Sent: Thursday, January 28, 2016 7:25 PM
To: ACF-WCM
Subject: [EXTERNAL] Corps' Water Control Manual

As a homeowner on Lake Lanier and active user of the Lake, I strongly agree and support the observations and conclusions of the Lake Lanier Association. A

Dick Pressnall

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Response to Comment ACF171 – Dick Pressnall

A. Comments from Lake Lanier Association were considered and addressed, and responses are provided at comment ID number ACF145.

From:
Sent: Thursday, January 28, 2016 7:35 PM
To: ACF-WCM
Cc:
Subject: [EXTERNAL] Future Lake Lanier Operations

Dear Corps of Engineers,

I am writing as a private citizen, however, I am also on the Board of Commissioners of Forsyth County for District 5.

I highly encourage your new plans for Lake Lanier to consider stabilizing and even increasing the water levels of the lake. A

Although I believe that you have an awesome task in operating Lake Lanier, and that generally you do a good job
for all who use it, we all remember the embarrassment you brought on yourself with both the unjustified release of 2 feet of water from the
lake a few years ago and the recent double step you have done on claiming you would not honor pumping water for
irrigation. Paying more attention to detail and holding people accountable would be good for everyone including your own policies. B

In keeping with that please make your rules include using predictive software and consultation so that lake levels are maximized if we have
another drought. This should also be used to minimize the recovery time of the lake when the drought subsides. C

Also please continue your efforts to study and conclude that the best thing for the lake and all others would be to increase the
level to 1073 as the Lake Lanier Association recommends. I feel certain that financial support for the small things that would have to change
can be accommodated and that there would be substantial financial support from individual residences and local communities if you
needed it. More water in the lake gives you much more leeway to make decisions about downstream navigation and all of the other
considerations for which you must be responsible. D

Thank You

Jim Boff

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Response to Comment ACF172 – Jim Boff

A. The storage projects—Lake Lanier, West Point Lake, and Lake Walter F. George—are operated to maintain their lake level in the same zones concurrently. Because of the hydrologic and physical characteristics of the river system, however, there might be periods when one lake is in a higher or lower zone than another. When that occurs, USACE makes an effort to bring the lakes back into balance with each other as soon as conditions allow. By doing so, effects on the river basin are shared equitably among the projects. As stated in draft EIS section 4.1.1, the Master WCM update has been conducted to determine how the USACE projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocation of storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in draft EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 feet (ft) would not meet that screening criterion and was not carried forward.

B. Thank you for your comment. Historically, at USACE reservoir projects with shoreline management plans that allow for permitting of docks and other facilities (including Lake Lanier, West Point Lake, Walter F. George Lake, Lake George W. Andrews, and Lake Seminole in the ACF Basin), water pumps of 2 horsepower or less have been authorized in conjunction with a permitted facility for incidental cleaning purposes or watering lawns and gardens. South Atlantic Division Regulation 1130-15-1 (*Shoreline Management at South Atlantic Division Civil Works Projects* [2015]) revised that policy by placing limits on pumping water from the reservoir under shoreline use permits and real estate licenses. Parties holding shoreline use permits and/or real estate licenses may not pump or remove water from the reservoirs for use extending beyond the permitted or licensed facility. This prohibition includes lawn and garden irrigation and other land-based uses. Section 2.1.1.2.5.6 of the EIS has been revised to reflect the revised policy.

C. USACE regulations do not allow use of forecasts in real-time project operations. Forecasted conditions may be used for planning future operations, but releases will follow the water control operations plan based on observed conditions within the watershed to the extent practicable. The Drought Contingency Plan (DCP) sections 3-02 and 3-03 contained as an exhibit in the WCMs in appendix A of the EIS includes discussion of drought identification and National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional Drought Early Warning Information System. The system will use key indicators of drought to make timely drought forecast. USACE is a contributor and user of the NIDIS pilot project tools.

D. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of cur-rent conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From: Frank Farrell
Sent: Thursday, January 28, 2016 9:29 PM
To: ACF-WCM
Subject: [EXTERNAL] Maintaining Sensible Water Level in Lake Lanier

As residents of a home on the shore of Lake Lanier we are very concerned about the Corps of Engineers new navigation plan. Water being the most critical resource for life anywhere in the world, the Corps has the great responsibility of maintaining safe levels to counter drought conditions. The proposed navigation plan will have a severe negative impact on water levels. The modified navigation plan must implement drought prediction models so that maximum storage levels are maintained and operations are planned accordingly. We believe that maintaining the 1073 water level will prevent many serious problems for now and the future. A B

We thank you for revising the navigation plan.

Frank and Jean Farrell

Response to Comment ACF173 – Frank and Jean Farrell

A. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.) It should be noted that navigation is not supported when drought operations are in effect.

B. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of cur-rent conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From: Rich P
Sent: Thursday, January 28, 2016 10:26 PM
To: ACF-WCM
Subject: [EXTERNAL] Water levels - Lake Lanier

Dear US ARMY Corps of Engineers,

I recently read an email about some changes that may be implemented for Lake Lanier during a drought that would lower the lake levels to unprecedented levels. Is this true?

I boat, camp and own 4 properties on Lake Lanier and can not believe that you would even consider such a plan. During the last time that the lake was low in 2007, I witnessed so many accidents of boats running aground and endangering lives. Why would you even consider this? A

If there is a drought, then we need to protect everyone. Putting lives at danger for our boaters is unacceptable.

I would like to hear back from you on your plans and if you are seriously planning to go forward with this plan. If so, why didn't you contact every boater and home ownver on the lake to get their input before proceeding?

Sincerely,

Richard Pickering

Response to Comment ACF174 – Richard Pickering

A. Lake Lanier is a multipurpose reservoir. USACE must balance all authorized project purposes across the basin. As shown in Figure 6.1-2 of the EIS, the PAA would likely result in lake levels at Lake Lanier ranging from about 2 to 4 ft lower than those for the NAA. The differences would be attributable largely to increased water supply withdrawals from the lake as well as increased releases from Buford Dam to meet future water supply demands for Metro Atlanta users (i.e., Cobb, Fulton, and DeKalb counties and Metro Atlanta). That condition would be expected to occur less than 2 percent of the days over the entire modeled period of record (73 years) during the worst drought conditions for that period.

From: Diane Rothberg
Sent: Thursday, January 28, 2016 11:24 PM
To: ACF-WCM
Subject: [EXTERNAL] WCM Comments

I would like to express solidarity with the proposals of the Lake Lanier Association. A

We need a clean, safe Lake Lanier with an adequately high water level, and what better way to prepare for drought conditions than to start with the highest water level possible? B

When I read the excerpts from the Corps of Engineers proposed Navigation plan, I was shocked to see that the LLA assessed the recommendations to be based on unrealistic navigational requirements, inaccurate data on recreational usage in Lake Lanier, and a stubborn resistance to increasing the full pool level slightly. C

How can any part of the report be looked at as valid, if the data on which it is based appears askew? And how can any decisions, which have such a huge effect on so many people, be based on such a report?

As a Lake Lanier Dweller, property owner and recreational user of the lake, perhaps I should have been more familiar with the Corps Water Control Manual (WCM). But, if it weren't for an email I received from the Lake Lanier Association, I certainly wouldn't have known about the "large, unrevealed impact" of the hydrological analysis in the Corp's proposed navigation plan. And then, I find out that I have only two days to make any kind of submission.

It seems that the wishes and needs of the residents and primary users of the lake are of little importance to the decision makers. D

Lake Lanier is a public trust, and allowances need to be make for a full public discussion of this matter by all affected parties.

Property owners who would pretty much lose their lake front during droughts must be heard. Those who would be unable to navigate to and from their docks due to shallow water must be heard. Those whose property values would plummet when they lose their water front, but must still pay a waterfront property tax bill must be heard. E

Boat rental companies and fishing charters whose businesses would be adversely affected by low water levels must be heard.

Water skiers and wake-boarders, who contribute economically to the area by purchasing expensive boats and equipment and frequenting the gas docks and restaurants on the lake must be heard.

As we know from prior years when the lake level has been allowed to drop, the lower water depth has exposed many of the rocky shoal areas and making the area much more hazardous for these activities and for boating in general. F

Response to Comment ACF175 – Diane Rothberg

A. Comments from Lake Lanier Association were considered and addressed, and responses are provided at comment ID number ACF145.

B. As stated in section 4.1.1 of the draft EIS, the purpose of the Master WCM update is to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of conservation pool at Lake Lanier would require reallocation of storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in draft EIS section 1.4.4 is maintaining at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft was not carried forward.

Compared to the drought operation provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008. USACE believes that the PAA represents the best way to maintain Lake Lanier water levels while operating in a balanced manner to fulfill all authorized purposes.

C. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008. It should be noted that navigation is not supported when drought operations are in effect.

D. USACE considered and addressed equally comments made by all stakeholders throughout the basin.

E. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008. The impacts resulting from changes in Lake Lanier were considered and captured in the final EIS. See section 6.1.1.1.1 of the final EIS for additional information.

F. Lake Lanier is a multipurpose reservoir. USACE must balance all authorized project purposes across the basin. As shown in Figure 6.1-2 of the EIS, the PAA would likely result in lake levels at Lake Lanier ranging from about 2 to 4 ft lower than those for the NAA. The differences would be attributable largely to increased water supply withdrawals from the lake as well as increased releases from Buford Dam to meet future water supply demands for Metro Atlanta users (i.e., Cobb, Fulton, and DeKalb counties and Metro Atlanta). That condition would be expected to occur less than 2 percent of the days over the entire modeled period of record (73 years) during the worst drought conditions for that period.

The best solution is to increase full pool to at least 1073', and to better manage the storage levels of the reservoirs.

G

In this way, if we experience drought conditions, adequate water will still be available for downstream requirements, and yet we will still able to preserve our beautiful shoreline, and the recreational activities that are the economic lifeblood of the Lake Lanier area.

Diane Rothberg

Response to Comment ACF175 – Diane Rothberg

G. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From: Jay Joes
Sent: Friday, January 29, 2016 6:05 AM
To: ACF-WCM
Subject: [EXTERNAL] Input for your review re. new WCM

My concerns are primarily aimed at the heavy recreational use of Lake Lanier. To this end I humbly suggest that you lend less credence to the navigational use of the ACF and more to the recreational uses of the lake. A

Also, you need to reconsider the peak summer season on Lanier. I live on the lake and my peak usage occurs on weekdays during the summer and only includes weekend use after the summer crowds dwindle later in the fall. B

I also fail to see where your objections originate to the proposal to raise full pool to 1073 feet. It would benefit everyone who uses the lake whether they be boaters, anglers, power plant operators or anyone else.
I would hope that you would give my suggestions careful consideration. C

Regards,
Jay Jones

Response to Comment ACF176 – Jay Jones

A. The operations described in the WCM are based on balancing all authorized purposes throughout the system. Navigation remains an authorized purpose for the ACF system, although it currently faces many challenges. USACE does not prioritize project purposes, and the PAA continues to balance all authorized project purposes.

B. Peak usage for the project is determined by reported visitation numbers. The largest visitation numbers occur on summer weekends or on summer holidays (e.g., Independence Day, Memorial Day, Labor Day). Overall weekday visitation is higher during the summer than other times of the year.

C. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From: betsy malcolm
Sent: Friday, January 29, 2016 6:22 AM
To: ACF-WCM
Subject: [EXTERNAL] Navigation Plan comments from Lake Lanier Homeowner

Dear Corp Representative,

I am emailing because we have been made aware of the new navigation plan which would include a possible lowering of the lake in certain situations. If that were to occur we would be have to consider if it is worth keeping our property since not having water (which would effect about one half of all homeowners) is not reasonable. A

As a real estate agent, I constantly tell potential buyers to go to Lake Lanier instead of Lake Burton, Chatuge etc.. I have sold many homes and have great relationships with the top real estate agents in your community.

Please consider to keep the lake levels at a level that everyone who is a property owner can enjoy their dock and the water. Lake Lanier has given us some of the best times in our lives. Let's keep that going for all lake lovers..

We appreciate the work that you do for the area...

Sincerely,

Betsy B. Malcolm
Coldwell Banker-Atlanta, GA
Crystal Phoenix Award
Top 5 - Company Wide

Response to Comment ACF177 – Betsy Malcom

A. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008. It should be noted that navigation is not supported when drought operations are in effect.

From: Ray Kasten
Sent: Friday, January 29, 2016 6:39 AM
To: ACF-WCM
Subject: [EXTERNAL] Lake Lanier WCM plans.

Commander:

I just read the Lake Lanier email below about the Army Corp trying to make changes to once again screw with the Lake water levels. Does somone at the Corp feel they are out of job if they don't come up with ideas, good or bad? This is the same type of idea that lost millions annually so that a barge could be run in South Georgia years ago.

The Corp is messing with people's investments that pay taxes and small businesses that need decent water levels to make money and pay taxes. Lastly, low water levels expose dangerous objects in the lake which can cause injury.

Please make some smart decisions. One would be raising the water level two feet. Another one would be tightening up the fisherman that drop garbage in the Lake all fall and winter long. They should have a larger tax on them to help pay for the clean up. It's amazing how careless they are for something that should be kept beautiful.

Sorry for the frustration but you finally have been keeping the water levels in check but it seems the Corp wants to mess with it.

Regards.

1. Revise the navigation plan to avoid the severe impact the proposed plan will have on Lanier's water levels. A
2. Incorporate rigorous drought prediction that will trigger changes in reservoir operations to preserve lake levels during drought. B
3. Manage the reservoirs to retain maximum storage levels in the reservoirs so that drought conditions will not have the devastating impact that was experienced in December 2007. C
4. Model and plan for raising Lake Lanier's full pool level to 1073. D

Response to Comment ACF178 – Ray Kasten

A. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008. It should be noted that navigation is not supported when drought operations are in effect.

B. USACE regulations do not allow use of forecasts in real-time project operations. Forecasted conditions may be used for planning future operations, but releases will follow the water control operations plan based on observed conditions within the watershed to the extent practicable. The Drought Contingency Plan (DCP) sections 3-02 and 3-03 contained as an exhibit in the WCMs in appendix A of the EIS includes discussion of drought identification and National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional Drought Early Warning Information System. The system will use key indicators of drought to make timely drought forecast. USACE is a contributor and user of the NIDIS pilot project tools.

C. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.

D. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.

From: Mack & Coco
Sent: Friday, January 29, 2016 7:01 AM
To: ACF-WCM
Subject: [EXTERNAL] WCM

1. We are in complete agreement with Lake Lanier Association's recommendations. We urgently request you do the following:
2. Revise the navigation plan to avoid the severe impact the proposed plan will have on Lanier's water levels. A
3. Incorporate rigorous drought prediction that will trigger changes in reservoir operations to preserve lake levels during drought. B
4. Manage the reservoirs to retain maximum storage levels in the reservoirs so that drought conditions will not have the devastating impact that was experienced in December 2007. C
5. Model and plan for raising Lake Lanier's full pool level to 1073. D

Sent from Coco's iPhone

Response to Comment ACF179 – Mack and Coco

A. Navigation is one of several project purposes for which Congress authorized the ACF Basin project, and USACE considers that purpose along with all other authorized purposes when making operational decisions.

Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations provisions in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008. It should be noted that navigation is not supported when drought operations are in effect.

B. USACE regulations do not allow use of forecasts in real-time project operations. Forecasted conditions may be used for planning future operations, but releases will follow the water control operations plan based on observed conditions within the watershed to the extent practicable. The Drought Contingency Plan (DCP) sections 3-02 and 3-03 contained as an exhibit in the WCMs in appendix A of the EIS includes discussion of drought identification and National Integrated Drought Information System (NIDIS). An NIDIS pilot program has been established for the ACF River Basin with the goal of developing a regional Drought Early Warning Information System. The system will use key indicators of drought to make timely drought forecast. USACE is a contributor and user of the NIDIS pilot project tools.

C. Under the drought operations provisions in the PAA, USACE would more proactively manage water resources in the reservoirs as drier conditions emerge in the basin. In the early stages of drought operations, the water management constraints on the projects would be subtle and the effects in the system barely noticeable. Operations would become progressively more constrained as drought conditions become more severe. Conserving storage in that way would enable the projects to continue meeting all authorized project purposes and needs in the basin until drought conditions improve and would promote faster recovery of the reservoirs. Compared to the drought operations in the NAA, the provisions in the PAA would result in improved conditions in Lake Lanier under extreme drought conditions such as occurred in 2007–2008.

D. As stated in section 4.1.1, the Master WCM update has been conducted to determine how the federal projects in the ACF Basin should be operated for their authorized purposes, in light of current conditions and applicable laws. Raising the top of the conservation pool at Lake Lanier would require reallocating storage from the flood control pool and would adversely affect the level of flood risk management provided by the project. One of the screening criteria described in EIS section 1.4.4 was to maintain at least the current level of flood risk management. Accordingly, raising the conservation pool at Lake Lanier by 2 ft would not meet this criterion and was not carried forward.