INTEGRATED LETTER REPORT AND TIERED ENVIRONMENTAL ASSESSMENT

OF THE

OPERATIONAL ANALYSIS AND TARGETED WATER CONTROL PLAN UPDATES FOR THE APALACHICOLA-CHATTAHOOCHEE-FLINT RIVER BASIN IN ALABAMA, FLORIDA, AND GEORGIA

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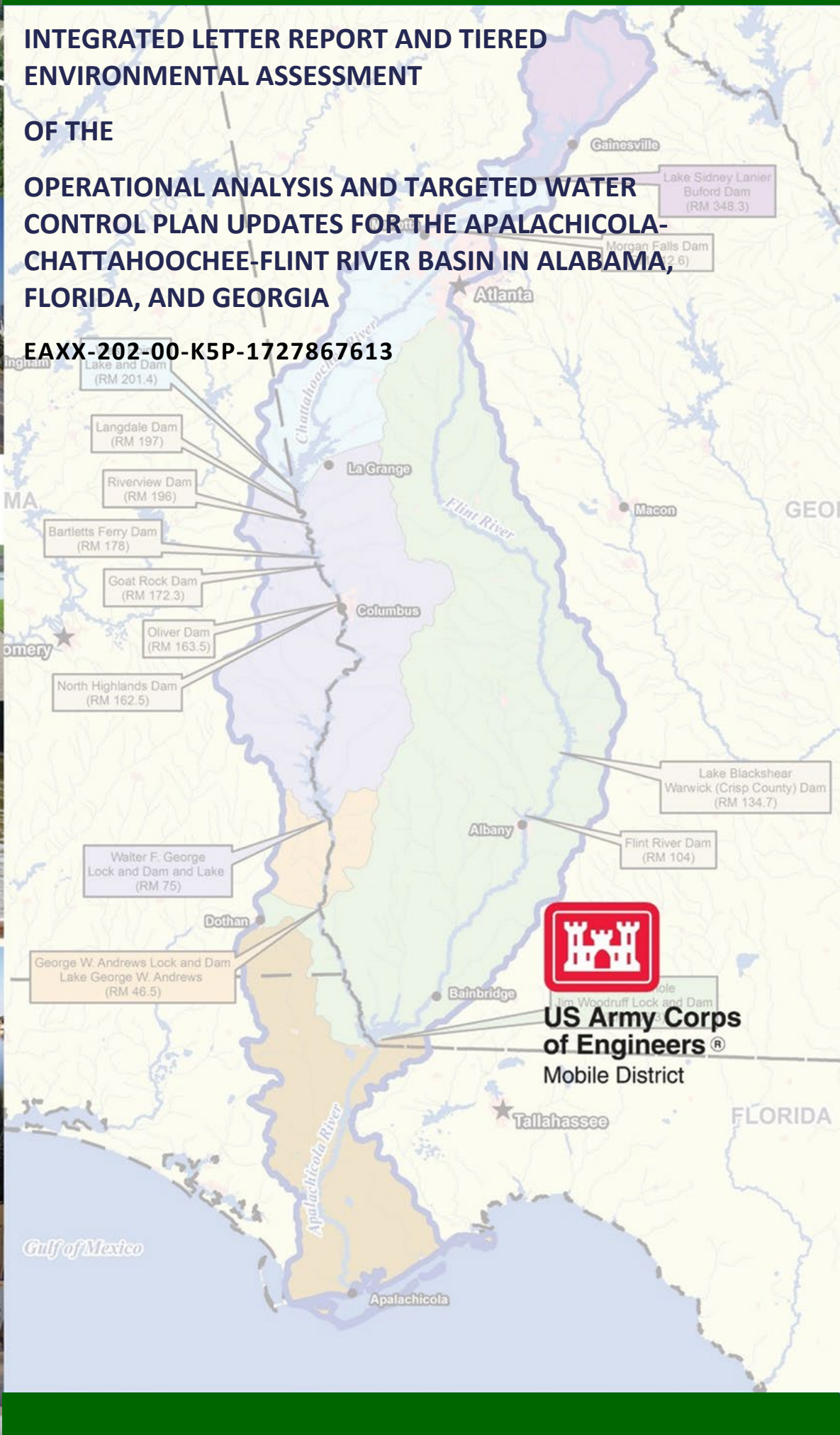


Appendix C

Master Water Control Plan

The enclosed document contains chapters 3, 7, and Exhibit C: Standing Instructions to the Damtenders for Water Control from each of the West Point, Walter F. George, George W. Andrews, and Master Water Control Manuals. These chapters have been selected out of the complete 2017 Water Control Manuals due to their direct relation to implementation of the 4 Flow Objectives analyzed in the ILR/TEA pursuant to the Stay Agreement Alternative. The Stay Agreement itself can be found in Appendix A. All added language within is indicated by red text.

US Army Corps
of Engineers®
Mobile District

WATER CONTROL MANUAL

APALACHICOLA-CHATTAHOOCHEE-FLINT (ACF) RIVER BASIN

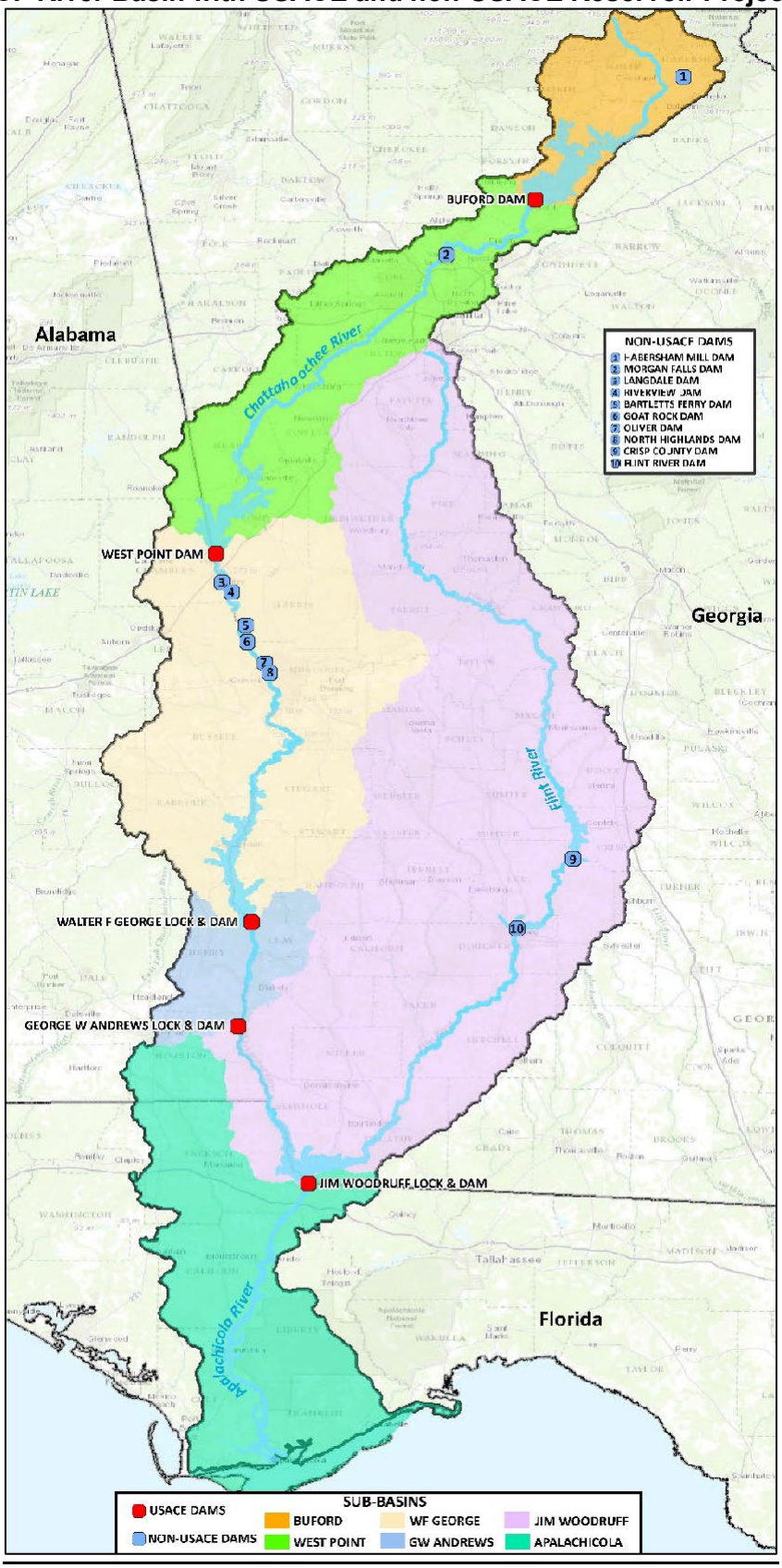
ALABAMA, FLORIDA, GEORGIA

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
MOBILE, ALABAMA

February 1958

Revised March 2017 and December 2024

ACF River Basin with USACE and non-USACE Reservoir Projects



II - GENERAL HISTORY OF BASIN

3-01. Authorization for Federal Development. Federal expenditures for improvements in the ACF Basin were first made during the period 1828 to 1831. Although there was no definite project at that time, $13,000 was spent to remove obstructions in the Apalachicola River and lower Chipola River. In 1835 and 1836, appropriations totaling $9,000 were made for work on the upper Chipola River. The first reports on surveys for river improvements were submitted in 1853 for the Chattahoochee River below Columbus, Georgia, and in 1872 for the Apalachicola River and the Flint River below Albany, Georgia.

The Rivers and Harbors Act of 23 June 1874 provided the original project authorization for navigation improvements in the ACF Basin. The act authorized the following improvements:

- A 6-foot deep by 100-foot wide channel in the Apalachicola River by removing snags and overhanging trees
- Widening and straightening Moccasin Slough
- A 4-foot deep by 100-foot wide channel on the Chattahoochee River from the mouth to Columbus, Georgia, a distance of 161 miles
- A 3-foot deep by 100-foot wide channel on the Flint River from the mouth to Albany, Georgia, a distance of 102 miles

The Rivers and Harbors Act of 14 June 1880 authorized a navigation channel for light-draft steamers at moderate stages from Albany, Georgia, to Montezuma, Georgia, a distance of 79 miles.

The Rivers and Harbors Act of 13 January 1902 modified the project to include a channel 5-foot deep by 60-foot wide through the Cut-off, Lee Slough, and Lower Chipola River.

The Rivers and Harbors Act of 1925 authorized a preliminary examination and survey of an “inland waterway” to include the Apalachicola and Chattahoochee Rivers “suitable to the economical operation of self-propelled barges.”

The Rivers and Harbors Act of 6 January 1934 included snagging and dredging in the lower 2,500 feet of the Styx River.

The Emergency Relief Appropriation Act of 8 April 1935 authorized and funded a flood control project near the vicinity of West Point, Georgia, on the upper Chattahoochee River. That project provided for increasing the channel section at critical points between the Town of West Point and Langdale Dam, clearing a floodway on both banks, constructing a 1,500-foot-long levee, and constructing an additional span in a highway bridge.

The Rivers and Harbors Act of 1945 approved the general plan presented in House Document No. 342, 76th Congress, First Session (1939 Report of the Chief of Engineers), for the full development of navigation and power in the Apalachicola, Chattahoochee, and Flint Rivers. It also authorized the initiation and partial accomplishment of that plan by construction of two locks and dams for a 9-foot project depth; one lock was authorized at the junction of the Chattahoochee and Flint Rivers and the other at Fort Benning, Georgia. A 6-foot navigation channel would be accomplished by dredging, and construction works to Columbus, Georgia, and Bainbridge, Georgia. The remaining elements of the approved plan included four navigation-power dams on the Chattahoochee River between the Junction and Fort Benning

Dams, near Florence, Fort Gaines, Columbia, and Paramore Landing. Storage-power reservoirs were authorized on the upper Chattahoochee River at Roswell, Cedar Creek, and Lanier sites. On the Flint River storage-power reservoirs were authorized at Woodbury No. 2, Potato Creek, and Auchumpkee Creek sites. Also authorized were dredging, cut-offs, contraction works and other methods to provide (with the aforementioned dams and flow regulation) channels 9 feet deep and 100 feet wide from the mouth of the Apalachicola River to Columbus, 7 feet deep and 100 feet wide in the Flint River to Bainbridge and 5 feet deep and 100 feet wide to Albany, Georgia. The three reservoir projects on the Flint River were deauthorized in the Water Resources Development Act of 1986.

In a report dated 20 March 1946 ("Newman Report") the South Atlantic Division Engineer, Brigadier General James B. Newman, Jr., recommended a number of modifications to the plan authorized in the previous year, reducing the number of separate locks and dams and reservoirs from twelve to four: one "navigation-power" and two "storage-power" facilities with a combined hydropower capacity of 144,700 kilowatts (kW), and one lock and dam project without storage or hydropower. The Newman Report anticipated that the Federal hydropower installations would be operated "as units of an integrated power system" with the existing, non-Federal projects in the ACF Basin, adding 97,800 kW dependable capacity to the system and contributing system power benefits estimated at $3,377,000 annually.

The Rivers and Harbors Act of 24 July 1946 authorized project modifications in accordance with the general plan presented in House Document No. 300, 8th Congress, First Session. The Act provided for the initiation and partial accomplishment of the modified plan by constructing the Buford multiple-purpose reservoir, the Fort Benning Lock and Dam, and the Upper Columbia and Jim Woodruff multiple-purpose developments. Supplemental channel works were also included to provide a 9-foot deep by 100-foot wide channel from the Gulf Intracoastal Waterway in the Apalachicola River to Columbus, Georgia, on the Chattahoochee River and to Bainbridge, Georgia, on the Flint River. A resolution of the Committee on Public Works of the House of Representatives, adopted on 19 May 1953 approved the modification of the plan for a low dam at the Columbia site and a high dam at Fort Gaines site in lieu of a high dam at the Upper Columbia site and a high dam at the Fort Benning site.

The Flood Control Act of 23 October 1962 (P.L. 87-874) authorized the construction of West Point Dam in accordance with House Document 570, 87th Congress, Second Session. The original purposes contained in the project authorization were flood control (now termed flood risk management), hydropower, recreation, fish and wildlife conservation, and navigation.

Section 311 of the Water Resources Development Act of 1990 directed the Secretary of the Army to review and report upon the authorized and operating purposes of reservoirs under his control. The Corps report, *Authorized and Operating Purposes of Corps of Engineers Reservoirs* dated July 1992, identifies the authorized and operating purposes of 541 Federally-owned reservoirs. On page 2 of that report, it states, "The purposes that a reservoir is to serve are given in laws that may be grouped into three categories: (1) laws initially authorizing construction of the project; (2) laws specific to the project passed subsequent to construction; and (3) laws that apply generally to all Corps reservoirs. In the latter category, the following laws have the greatest relevance to Corps reservoirs:

- P.L. 78-534, Flood Control Act of 1944 (provides authority to add recreation as a purpose and to contract for use of surplus water for domestic purposes);
- P.L. 85-500, Title III, Water Supply Act of 1958 (provides authority to include storage for municipal and industrial water supply);

- P.L. 85-624, Fish and Wildlife Coordination Act of 1958 (provides authority to modify projects to conserve fish and wildlife);
- P.L. 92-500, Federal Water Pollution Control Act Amendments of 1972 (establishes goal to restore and maintain the quality of the Nation's waters);
- P.L. 93-205, Endangered Species Act of 1973 (provides authority for operating projects to protect Federally listed threatened and endangered species and their designated critical habitat.)"

3-02. Planning and Design. The authorizations for developing the Federal projects in the ACF Basin provided for the specific multiple purposes of flood risk management, hydropower, navigation, and, in the case of the West Point Dam Project, recreation and fish and wildlife conservation. During the planning stages, each project was designed to fulfill its authorized purposes and to complement total basin development.

a. Jim Woodruff Lock and Dam. The Corps first considered a dam with a navigation lock on the Apalachicola River near Chattahoochee, Florida, in the early 1930s in preparing a report on the Apalachicola River System in accordance with House Document No. 308, 69th Congress, First Session. Definite Project Report, Junction Project, Apalachicola River, Florida, was completed by the Mobile District on 1 October 1946 and transmitted to higher headquarters on 4 October 1946. The plan consisted of a dam with its axis about normal to the river channel, providing at extreme low flow a 33-foot pool differential between elevations 77.0 and 44.0 feet NGVD29; an 82- by 450-foot single-lift lock; a 30,000-kilowatt (kW) power plant and appurtenances; and a reservoir extending up the Chattahoochee River to the vicinity of Columbia, Alabama, and up the Flint River to a point about 18 river miles above Bainbridge, Georgia. A revised report entitled *Definite Project Report on Jim Woodruff Dam* was issued on 15 March 1948. The change in name of the project from Junction Project to Jim Woodruff Dam was done in accordance with Public Law 525, dated 24 July 1946.

b. Buford Dam. Congress authorized Buford Dam for construction in 1946 as part of the overall development of the Nation's waterways after World War II.

The Buford Dam site was investigated and its possibilities considered by the Corps in the early 1930s when a report on the Apalachicola River Basin was being prepared in accordance with House Document No. 308, 69th Congress, First Session. It was first recommended for construction in a report by the District Engineer dated 20 November 1945 that modified a previously approved comprehensive plan for basin-wide development.

Studies made in 1949 for a definite project report showed that the Buford site was especially favorable for an earth dam and that considerable savings (more than $2 million) could be affected by constructing an earth dam instead of a concrete dam. Figure 3-1 shows an early stage in construction.

The Definite Project Report prepared by the Corps' Mobile District proposed an earth dam supplemented by saddle dikes and an unpaved chute spillway, an 86 megawatt (mw) power plant and appurtenances and a reservoir at elevation 1,075 feet NGVD29, the top of primary flood control storage pool. The Definite Project Report dated 1 December 1949 was approved by the Chief of Engineers on 3 February 1950 subject to certain modifications and considerations proposed by that office and the SAD.

As a result of recommendations of additional studies by the Mobile District during construction, on 11 September 1953, the Chief of Engineers approved raising the top of power pool from elevation 1,065 to 1,070 feet NGVD29. At the same time, the top of flood control pool was raised from elevation 1,080 to 1,085 feet NGVD29. In February 1976, the Division Engineer approved raising the top of conservation pool to elevation 1,071 feet NGVD29 from May through September with transitions starting 15 April and ending 30 November for the benefit of navigation on the Apalachicola River. The change was consonant with National policy, statutes, and administrative directions; and that the total public interest was best served by modification of the reservoir regulation procedures for the benefit of downstream navigation.

c. Walter F. George and George W. Andrews Locks and Dams. The Rivers and Harbors Act of 1945 approved the general plan for the overall development of the Apalachicola River Basin, authorizing construction of two dams. The Rivers and Harbors Act of 1946 modified that plan to include improvements of Buford Dam, Fort Benning Lock and Dam, and upper Columbia and Jim Woodruff multiple-purpose developments. On 19 May 1953 the House of Representatives Committee on Public Works approved a plan consisting of a low navigation dam near Columbia, Alabama, and a high navigation and power dam near Fort Gaines, in lieu of the Fort Benning Lock and Dam and the upper Columbia projects. In March 1958, the 85th Congress, Second Session, enacted Public Law 85-363 officially designating Fort Gaines Lock and Dam as the Walter F. George Lock and Dam in honor of the Senator Walter F. George of Georgia. The President signed the bill into law on 28 March 1958.

In February 1972, the 92nd Congress enacted Public Law 92-229, which provided that the Columbia Lock and Dam on the Chattahoochee River, Alabama, would be known and designated as the George W. Andrews Lock and Dam, and the reservoir formed by the dam would be known and designated as Lake George W. Andrews.

Figure 3-1. Foundation work at Buford Dam (Circa 1950-51)

Design Memorandum No. 1. *Basic Hydrology* was submitted on 14 August 1953 and approved by the Chief of Engineers on 12 November 1953. Design Memorandum No. 2 was submitted on 9 October 1953 and approved 10 November 1953. Figure 3-2 shows construction at Walter F. George Lock and Dam.

d. West Point Dam. A survey report of the Chattahoochee River at and in the vicinity of West Point, Georgia, was authorized in resolutions by the Committee on Public Works of the House of Representatives adopted 29 July 1955 and 31 July 1957 with a view to determining whether it was advisable to authorize construction of a multiple-purpose reservoir on the Chattahoochee River at and in the vicinity of West Point, Georgia. That report was published as House Document No. 570, 87th Congress, Second Session. Construction of the West Point Dam Project was authorized by the Flood Control Act of 23 October 1962. In view of the unbalanced civil works load between districts in SAD, the Division Engineer by letter dated 16 November 1962 assigned responsibility for design, construction, and real estate acquisition of the West Point Project to the Savannah District.

e. Navigation Channel. The original project for stream improvement in the Apalachicola River Basin was authorized by the Rivers and Harbors Act of 23 June 1874. That Act authorized the improvement of the Apalachicola River, the Chattahoochee River to Columbus, and the Flint River to Albany for navigation by snagging, dredging, and related works. Since construction of Jim Woodruff Lock and Dam, several modifications to improve navigability in the Apalachicola River have been done. Seasonal dredging along with training dikes were methods used to maintain the 9-foot by 100-foot channel.

3-03. Construction of Federal Projects. Jim Woodruff Lock and Dam and Lake Seminole was the first project to be constructed in the basin. Project construction began in the summer of 1947. The lock was open to navigation in May 1954, and the power plant was placed in operation in February 1957.

Buford Dam and Lake Sidney Lanier was the second Federal project to be constructed in the basin. The Buford Dam Project construction began in March 1950. Storing of water in the reservoir was initiated in February 1956. Power generation began on a limited schedule in June 1957 and the reservoir reached full conservation pool in 1959.

Figure 3-2. Construction at Walter F. George Lock and Dam (Circa 1962)

Construction of the Walter F. George Lock and Dam and Lake Project began in 1955 and was completed in 1963. A major rehabilitation project at Walter F. George Project, consisting of a concrete cutoff wall in the earth embankments to correct under-seepage problems, was completed in March 1985. A second cutoff wall in front of the Walter F. George powerhouse, lock, and dam was completed in 2004.

Construction of the George W. Andrews Project began in 1959 and was completed in 1963.

West Point Dam Project construction began in 1965 and was completed in 1975. Beginning in the late 1990s and continuing through 2011, major rehabilitations of the Buford, Walter F.

George, and Jim Woodruff powerhouses were completed. The rehabilitations included replacing the major power train components of the generators because they had surpassed their life expectancy and for efficiency gains. The rehabilitation resulted in greater generation capacity and increased reliability. The revised capacities at those powerhouses are reflected in description of the projects presented in this manual.

3-04. Related Projects. In addition to the five Corps projects in the basin, eight privately owned dams are on the Chattahoochee River, and two privately owned dams are on the Flint River (Table 1-1.). The privately owned reservoirs on the Chattahoochee River are primarily run-of-the-river projects containing very little storage capacity and, consequently, do not significantly influence flows in the river or the operation of the Corps projects.

3-05. Modifications to Regulations. The first *Master Reservoir Regulation Manual for the ACF Basin* was published in February 1958. A draft ACF Basin Water Control Plan update was developed in October 1989 but was never finalized. Appendices for Jim Woodruff Lock and Dam (Appendix A) and Buford Dam (Appendix B) were also prepared in 1958. Appendices A and B were revised in August 1972 and February 1991, respectively. Appendices for the remaining projects were completed as follows: Walter F. George Lock and Dam (Appendix C) April 1965, revised February 1993; George W. Andrews Lock and Dam (Appendix D) April 1965, revised February 1978 and November 1996; West Point Dam (Appendix E) June 1975, revised August 1984.

Over the span of years since 1955 that the Corps reservoirs in the ACF Basin began to become operational, changes in needs and conditions in the basin have influenced certain modifications to the regulation of the projects. The following describe the major factors influencing modifications to project regulation that have occurred in the basin.

a. Metropolitan Atlanta Population Growth. The significant population growth and resulting increase demand for M&I water supply in metropolitan Atlanta has resulted in increased water demands for M&I water supply, for additional flows in the river to better maintain water quality and aquatic life, and for higher pool levels to support recreational needs. Concerns associated with flooding also increased with increases in population.

The project authorization required minimum releases of up to 600 cfs from Buford Dam, when combined with local inflow to the river, to provide at least 650 cfs at Atlanta for water supply purposes. Over time, demand for M&I water supply downstream of the project increased. Additionally, higher flows were needed at Peachtree Creek for waste assimilation. These increased demands led to the development of interim plans in 1975 and 1979 to accommodate increased downstream water withdrawals. The 1979 agreement between the Corps, Atlanta, and the GPC agreed to an operating procedure under which the GPC would schedule a portion of weekly power generation on the weekend. The Corps also committed to make available certain minimum summer weekly flows from Buford Dam. The two commitments allowed for increased downstream water supply withdrawals while providing for the 750 cfs in-stream flow requirement at Peachtree Creek.

The Corps recognized that withdrawals beyond the peak amount of 327 mgd provided under the 1975 and 1979 interim plans might exceed the amount available incidental to operations under the project authority, and could require a contract under a separate authority. Accordingly, to meet additional water supply demands of the Atlanta region in 1986, the Corps entered into a contract with the Atlanta Regional Commission (ARC) under the Independent Offices Appropriation Act, providing for withdrawals by ARC of up to 377 mgd from the Chattahoochee River, with payment required for withdrawals exceeding 327 mgd (Contract No.

DACW01-9-86-145). The contract incorporated the Corps' determination that downstream withdrawals of up to 327 mgd were available, apart from that contract, "from normal operation of the Buford Project for non-water supply purposes," and "can be provided year-round with no impact on the [Lake Sidney Lanier] Project." That 1986 contract was an interim arrangement pending either construction of a new reregulation facility that would further alter flow regimes, or execution of a contract for permanent storage space, which has expired.

b. Tri-State Water Rights Litigation. The ACF litigation was divided into two phases to address separate distinct legal issues. Phase I addressed the Corps' authority to operate Lanier for water supply and reallocate storage under the Water Supply Act (WSA), as well as claims raised under NEPA and other statutes. The Phase I summary judgment hearing was held on 11 May 2009. On 17 July 2009, Judge Magnuson issued a ruling that found that the Corps' operations in support of water supply had "seriously affected the project purposes for which the Buford Project was originally authorized" and that "the Corps is therefore in violation of the WSA."

On 3 May 2010, the Solicitor General authorized appeal of the Phase I ruling. On 28 June 2011, the Eleventh Circuit Court issued a ruling that reversed the findings of the District Court. The court found that water supply was an authorized project purpose of Buford Dam under the Rivers and Harbors Act of 1946 (RHA) and the Water Supply Act (WSA). The case was remanded to the district court with instructions to remand to the USACE for further proceedings. As to the merits, the court held that the majority of Plaintiffs' claims in the ACF were not final agency actions and therefore not subject to judicial review.

Phase II of the ACF litigation concerns the Corps' compliance with the Endangered Species Act (ESA), as well as claims raised under NEPA. The Phase II summary judgment hearing was held on 8 June 2010. Judge Magnuson issued a ruling on Phase II in the summer of 2010. In his ruling, he determined that the Corps and the FWS had complied with the ESA, but that the Corps had not properly complied with its NEPA requirements. The appropriate remedy would be for the Corps to conduct new NEPA on the WCM; however, because the Corps had already agreed to develop an EIS as part of the WCM update, Judge Magnuson determined Florida's claims were moot. Florida appealed the Phase II ruling to the Eleventh Circuit. After the appeal was filed, new information on the endangered species caused the FWS to request the Corps reinitiate consultation. All parties agreed to stay the appeal while the Corps and the FWS conduct additional studies. On 24 January 2013 the district court vacated its Phase II ruling on the grounds that the USACE and the USFWS reinitiated consultation while the appeal was pending, thus rendering the appeal moot and making it proper to vacate the underlying order. Accordingly, there is no active litigation regarding the USACE operation of the ACF Basin.

In October 2013, the State of Florida filed a motion seeking leave to file a complaint in an original action in the United States Supreme Court against the State of Georgia to equitably apportion the waters of the ACF Basin, and to limit Georgia's overall depletive water uses at 1992 levels. The case was ultimately decided in favor of Georgia. See State of Florida v. State of Georgia, 592 U.S. 433 (2021). No impacts to USACE operation of the ACF system occurred as a result of this lawsuit.

c. Revised Interim Operating Plan. The Revised Interim Operating Plan (RIOP) was implemented in June 2008 and modified in May 2012 to support endangered or threatened species and their critical habitat in the Apalachicola River and to avoid or minimize potential adverse effects associated with discretionary operations at Jim Woodruff Lock and Dam. The

RIOP directly affected flows, and fall rates, in the Apalachicola River and prescribed the minimum flow releases to be made from Jim Woodruff Lock and Dam under specific conditions. However, the releases to be made from Jim Woodruff Lock and Dam in accordance with the RIOP used the composite conservation storage of all the upstream reservoirs in the ACF System. The Corps operates five Federal reservoirs on the ACF as a system, and releases made from Jim Woodruff Lock and Dam under the RIOP reflected the downstream end result for system-wide operations measured by daily releases from Jim Woodruff Lock and Dam into the Apalachicola River. The RIOP did not describe operational specifics at any of the four Federal reservoirs upstream of Jim Woodruff Lock and Dam or other operational parameters at those reservoirs. Instead, the RIOP described the use of the composite reservoir storage of the system and releases from the upstream reservoirs as necessary to assure that the releases made from Jim Woodruff Lock and Dam would minimize adverse effects on endangered or threatened species and their critical habitats. Future management actions in support of endangered or threatened species and their critical habitat in the Apalachicola River are described in Section 7-08 b.

d. Navigation. A major factor influencing reservoir regulation was the additional flow required to maintain the authorized 9.0-foot navigation depth on the Apalachicola River. At the time the ACF system of projects was constructed, a discharge from Jim Woodruff Lock and Dam of 9,300 cfs, together with dredging, provided a 9.0-foot deep navigation channel in the Apalachicola River. A discharge of 20,600 cfs from Jim Woodruff Lock and Dam is currently required for a 9.0-foot channel without dredging. The increase of 11,300 cfs to support a 9.0-foot channel is equivalent to 4.1 feet of storage at Lake Sidney Lanier, 5.6 feet of storage from West Point Lake, or 3.6 feet of storage from Walter F. George Lake over a one week period. In practice any use of storage to support navigation would be distributed between the three ACF storage projects with consideration to the current action zone of each reservoir. The increasing flow requirements to achieve suitable navigation channel depth in the Apalachicola River are attributable to (1) channel degradation and (2) escalating flow diversion through Chipola Cutoff. In response to those changing conditions, it became necessary to periodically schedule the release of increased flows over the minimum 9,300 cfs from Jim Woodruff Lock and Dam for periods of a few days to as long as two weeks to accommodate commercial river traffic. Those periods were known as navigation windows. During navigation windows, water was released in varying amounts from the upstream reservoirs, stored in the downstream reservoirs, and then released through Jim Woodruff Lock and Dam to provide sufficient flow in the Apalachicola River to achieve suitable navigation depths. In preparation for navigation windows, releases were made from Buford Dam to help supply sufficient water in storage downstream to successfully implement the navigation window.

Increased flow requirements when there is no dredging plus the denial of water quality certification from the state of Florida, which prevents the Corps from dredging the Apalachicola River, significantly reduced commercial navigation on the Apalachicola River. Those conditions limit navigation to periodic, special commercial shipments. Coordination with waterway users identified the need for changes in the Corps' water control operations to provide a more reliable flow regime, without dredging, to support at least a 7.0-foot navigation channel in the Apalachicola River. At the print of this manual, a discharge of 16,200 cfs from Jim Woodruff Lock and Dam is required for a 7.0-foot channel without dredging. Through an iterative hydrologic modeling process, it was determined that a 4-month navigation season, January through April with an extension through May if conditions allow (i.e., basin composite storage in zones 1 or 2), could improve navigation reliability without significantly affecting other project purposes. The 5-month navigation season on the ACF waterway, in the absence of maintenance dredging, will improve the total reliability of a 7.0-foot navigation channel in the

Apalachicola River from 21 percent to as much as 42 percent. For a 7.0-foot channel that is at least 90 percent reliable for any single navigation season, the total reliability over the period of record would improve from the present 36 percent to 54 percent during the navigation season. Releases made from Buford Dam, West Point Dam, Walter F. George Lock and Dam, and to a limited extent, Jim Woodruff Lock and Dam during hydropower operations contribute to the needed downstream navigation flows.

e. Hydropower. The Southeastern Power Administration (SEPA) negotiates contracts for the sale of power from the Corps hydropower projects in accordance with the Flood Control Act of 1944. Under the provisions of the Act, the Corps determines the amount of energy available at the ACF projects each week and advises SEPA of the amount available. SEPA schedules when Corps facilities will generate and arranges the sale. In the early years, power generation was conducted at each hydropower project for a set number of hours per day as long as sufficient water was in conservation storage to accommodate the hydropower operation. In dry years, conservation storage was depleted at some projects to the point that release requirements for other project purposes could not be met. Under current operations, power generation demands are balanced between the projects weekly to enhance long-term generating capability of the entire system and to provide for the needs of other project purposes in the system.

f. Fish Spawn Operations. The Corps' South Atlantic Division Regulation DR 1130-2-16 (31 May 2010) and Mobile District Draft Standard Operating Procedure (SOP) 1130-2-9 (February 2005) were developed to address lake regulation and coordination for fish management purposes. The SOP addresses procedures necessary to gather and disseminate water temperature data and manage lake levels during the annual fish spawning period between March and June, primarily targeted at largemouth bass. The major goal of the operation is to not lower the lake level more than six inches in elevation during the reproduction period to prevent stranding or exposing fish eggs. The lake elevation that exists at the time spawning begins becomes the datum point for the downward fluctuation. The beginning and ending of the spawning season is determined by the Mobile District biologists in cooperation with the fish and game personnel of the states concerned. Table 3-1 presents the expected timing for fish spawning at each of the Corps lakes and the Apalachicola River.

Table 3-1. Expected Spawning Dates

Project	Fish spawn period
Lake Sidney Lanier	1 April–1 June
West Point Lake	1 April–1 June
Walter F. George Lake	15 March–15 May
Lake Seminole	1 March–1 May
Apalachicola River	1 April–1 June

g. Settlement Flow Objectives. Settlement negotiations in the lawsuit challenging the 2017 updates to ACF Water Control Manuals resulted, after completion of the Integrated Letter Report and Tiered Environmental Assessment (ILR/TEA) for the Operational Analysis and Targeted Water Control Plan Updates for the Apalachicola Chattahoochee Flint River Basin in Alabama, Florida, and Georgia, in dismissal of the state of Alabama's lawsuit against USACE and option of the following Flow Objectives:

1. An objective to maintain a minimum average daily flow of 1,350 cfs over any 7- day period at the gage located on the Chattahoochee River at 14th, Street at Columbus, Georgia (Gage No. 02341460) when the ACF Basin is not in "Drought Zone

Operations" as that term is defined in the 2017 ACF Master Manual.

2. An objective to maintain a minimum average weekday flow of 2,000 cfs at the gage located on the Chattahoochee River near Columbia, Alabama (Gage No. 02343801) when the ACF Basin is not in "Drought Zone Operations" as that term is defined in the 2017 ACF Master Manual.

3. An objective to maintain the minimum average flows at Columbus, Georgia and Columbia, Alabama, described in items (1) and (2) above, on two days each calendar week starting each Monday, when the ACF Basin is in "Drought Zone Operations" as that term is defined in the 2017 ACF Master Manual; and

4. An objective to maintain Lake Seminole at or above an elevation of 76 feet NVGD in the same manner and to the same extent as provided in the 2017 ACF Master Manual, and in particular the following paragraphs from Appendix A, the Water Control Manual for Jim Woodruff Lock and Dam and Lake Seminole: Chapter lll, paragraph 3-03; Chapter VII, paragraphs 7-03, 7-0S(a), 7-10, and 7-11; and Chapter VIII, Paragraph 8-11 b.

In order to meet the Flow Objectives at West Point, the discharges necessary to support maintaining a daily average flow of 1,350 cfs over any 7-day period (7-day forward moving average) at 14th, Street at Columbus, Georgia (Gage No. 02341460) and a minimum average weekday flow of 2,000 cfs on the Chattahoochee River near Columbia, AL (Gage No. 02313801) under normal conditions will be made. When Extreme Drought Operations have been triggered, the flow target shifts to maintain the minimum average Flows of 1,350 cfs for at least two calendar days at Columbus, Georgia and 2,000 cfs for at least two calendar days at Columbia, Alabama, on two days each calendar week starting each Monday.

3-06. Principal Regulation Problems

a. Buford Dam. The main problem affecting regulation at Buford Dam is encroachment within the floodplain downstream of the project. Residential and other developments in the floodplain have necessitated a change in how stored flood waters are evacuated from the reservoir. Before encroachments, waters stored in the flood risk management pool during major flood events were evacuated by running the turbines 24 hours a day until the reservoir returned

to its normal conservation pool elevation. Presently, to avoid inducing flooding of downstream development, flood waters are released through the turbines at a lower rate by generating less than 24 hours at full plant capacity each day. However, conditions might indicate that it is necessary to run all or fewer units 24 hours a day at full or reduced loads.

b. Head Limitations. To maintain structural integrity of the structures on the lower ACF, each of these projects has a maximum head differential criteria, as follows:

Walter F. George Project - The head differential at this structure is limited to 88 feet. At no time shall the headwater elevation minus the tailwater elevation be allowed to exceed 88 feet. If it becomes apparent that this criteria could be violated, then additional releases shall be made from the project to ensure this 88 foot criteria is not violated.

George W. Andrews Project - The allowable head differential at this project is a function of the elevation of the upper pool. If the upper pool elevation is less than 102 feet NGVD29, then the criteria is 26 feet. If the upper pool elevation is greater than 102 feet NGVD29, then the criteria is 25 feet. Again, if becomes apparent that the criteria could be violated, an action must be taken to prevent this and the typical action will be to increase releases. Of course, any increase in releases from the George W. Andrews Project must be closely coordinated with the Walter F. George Project operation as releases from Andrews will impact the tailwater below Walter F. George Lock and Dam.

Jim Woodruff Project - The head limitation at Jim Woodruff Dam is a function of both the pool elevation of Lake Seminole and the tailwater elevation below Jim Woodruff Dam and varies between 38.5 and 33.0 feet. Furthermore, whenever the tailwater elevation drops below 44.5 feet NGVD29, static head can control project operation.

A detailed explanation of the head limitation at Jim Woodruff Dam as well as a schematic of the head limitations within the ACF Basin is shown on Plate 7-1.

i. - SYSTEM WATER CONTROL PLAN

7-01. General Objectives. The general objective of water control management is to accomplish the authorized purposes of the Federal ACF System of improvements. Many factors must be evaluated in determining project or system reservoir regulation procedures, including project requirements, time of year, climate conditions and trends, downstream needs, and the amount of water remaining in storage. Various interests and project conditions must be continually considered and balanced when making water control decisions for the basin and individual projects. The water control plan seeks to balance the needs of all project purposes of the ACF Basin. Project purposes and basic parameters guiding water management activities at each of the Corps projects in the ACF Basin are discussed below. This master water control plan summarizes general project water control regulation and management objectives at Corps projects in the basin from the perspective of the authorized project purposes. Individual project appendices to this master manual provide specific guidance and instructions for each project.

7-02. Constraints. Individual project physical constraints and limitations are addressed in each project specific appendix. Head limitations are one of the physical project constraints that exist at several projects. Walter F. George Lock and Dam, George W. Andrews Lock and Dam, and Jim Woodruff Lock and Dam have head limitations that must be maintained to ensure the structural integrity of the dam and powerhouse. The head limit is the maximum head differential between the headwater and the tailwater at each dam; the head differential must not be exceeded (Plate 7-1).

The head limit at Walter F. George Dam is 88 feet, and at George W. Andrews Dam it is 25 feet unless the George W. Andrews pool falls below 102 feet NGVD29, then the head limit is 26 feet. There is a variable head limit at Jim Woodruff Lock and Dam (Appendix A, Jim Woodruff Lock and Dam and Lake Seminole Water Control Manual, Plate 7-1, Limitation on Maximum Head) that ranges from 38.5 feet to 33.0 feet.

The time required to physically make a spillway gate change at the Woodruff Project can take up to 1 ½ hours if the gate change is required outside the normal working hours of 8:00 am to 4:00 pm. During normal working hours, the time required is approximately 30 minutes.

It is critical that the lake levels at Lake Seminole and Lake George W. Andrews be maintained at the highest practicable levels before any extended shutdown at the Walter F. George power plant, especially during low-flow periods. During low-flow periods at Jim Woodruff Lock and Dam, there could be times when the management of the system to meet the low-flow criteria might require release of additional water from Jim Woodruff Lock and Dam. Typically, the water release will be for a short period to raise the tailwater to not exceed the head limitation. In those situations, operations to ensure that head limitation requirements are met will supersede any low-flow operations guidance.

7-03. Overall Plan for Water Control. The Corps operates five projects in the ACF Basin: (in downstream order) Buford Dam and Lake Sidney Lanier, West Point Dam and Lake, Walter F. George Lock and Dam and Lake, George W. Andrews Lock and Dam and Lake George W. Andrews, and Jim Woodruff Lock and Dam and Lake Seminole. Those are all on the Chattahoochee River arm of the basin except Jim Woodruff, the most downstream project, which is immediately below the confluence of the Chattahoochee and Flint Rivers and marks the upstream extent of the Apalachicola River. Lake Sidney Lanier, West Point Lake, and Walter F. George Lake are storage reservoirs. Andrews Lock and Dam is a run-of-river project without

any appreciable storage. Jim Woodruff Lock and Dam is operated as a run-of-river project with only very limited storage pondage available to support project purposes.

Authorized purposes for operation of the Federal ACF System of projects include flood risk management, hydropower, navigation, fish and wildlife conservation, recreation, water supply, and water quality, pursuant to the specific ACF project authorizing legislation and other, more generally applicable statutory authorities (e.g., the Flood Control Act of 1944, P.L. 89-72, and P.L. 85-624). Each of the legally authorized project purposes is considered when making water control regulation decisions, and the decisions affect how water is stored and released from the projects.

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 that 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 lakeside recreation, water supply, and lake fish spawn are achieved by retaining water in the lakes, either throughout the year or during specified periods of each year. The flood risk management purposes at certain reservoirs require drawing down reservoirs in the fall through winter months to store possible flood waters.

Because actions taken at the upstream portion of the basin affect conditions downstream, the ACF projects are operated in a coordinated manner to the maximum extent possible rather than as a series of individual, independent projects. Balancing water control actions to meet each of the project purposes varies between the individual projects and time of year. Water Management considers the often-competing purposes and makes water control decisions accordingly. When possible, the Corps manages reservoir water control regulation to complement and accommodate those purposes. For example, flood waters are evacuated to the greatest extent practicable through the powerhouse turbines to produce electricity. In addition to specific authorized purposes for which the projects are operated, over the years a variety of activities (industrial and municipal water supply, in-stream recreation, water quality, and the like) have become dependent on the operational patterns of the projects. The Corps considers these needs when regulating the Federal projects in an attempt to meet all authorized purposes, while continuously monitoring the total system water availability to ensure that project purposes can at least be minimally satisfied during critical drought periods. This water management strategy does not prioritize any project function, but seeks to balance all project authorized purposes. The intent is to maintain a balanced use of conservation storage rather than to maintain the pools at or above certain predetermined elevations. However, in times of high-flow conditions, flood risk management regulation will supersede all other project functions. At all times, the Corps seeks to conserve the water resources entrusted to its regulation authority.

This manual, including the project specific manuals included as appendices, prescribe guide curves to facilitate the water control regulation of the three major storage projects in the ACF Basin, Buford/Lake Sidney Lanier, West Point, and Walter F. George (Figures 7-1 through 7-3). The guide curve for each project defines the top of conservation storage water surface elevation. 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. Zone 1, the highest in each lake, defines a reservoir condition where all authorized project purposes can be met. As lake levels decline, Zones 2 through 4 define increasingly critical system status where purposes can no longer fully

be met. The action zones also provide guidance on meeting minimum hydroelectric power needs at each project. Typical peaking hours of hydropower operation according to action zones for each project are discussed in paragraph 7-10, Hydroelectric Power, below.

The 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. Other factors or activities might cause the lakes to operate differently than the action zones described. Examples of the factors or activities include; exceptional flood risk management measures, fish spawn operations, short-term special releases for fish and wildlife, approved deviations, maintenance and repair of turbines, emergency situations such as a drowning and chemical spills, draw-downs because of shoreline maintenance, releases made to free grounded barges, and other circumstances.

The storage projects are operated to maintain their lake level in the same zones concurrently. However, because of the hydrologic and physical characteristics of the river system and factors mentioned above, there might be periods when one lake is in a higher or lower zone than another. When that occurs, the Corps 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.

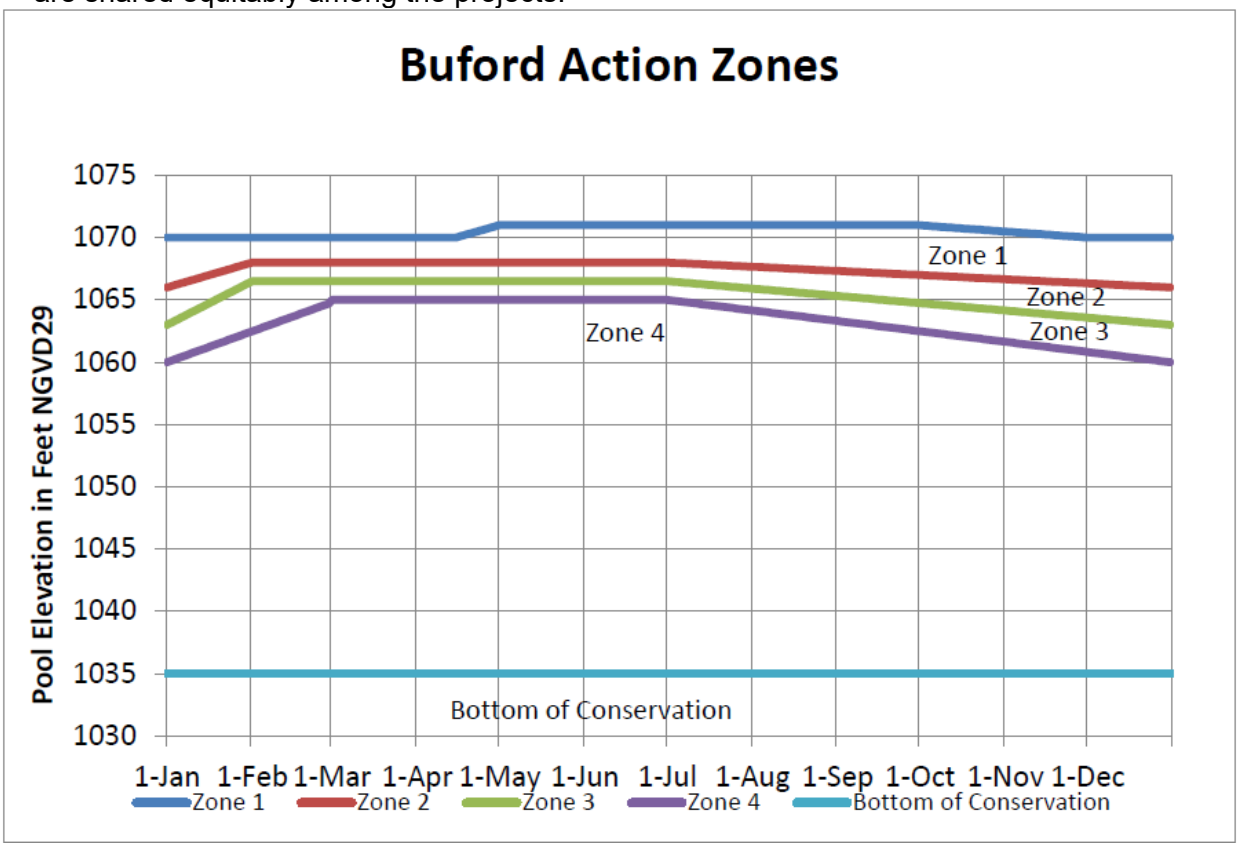


Figure 7-1. Action Zones for Lake Sidney Lanier

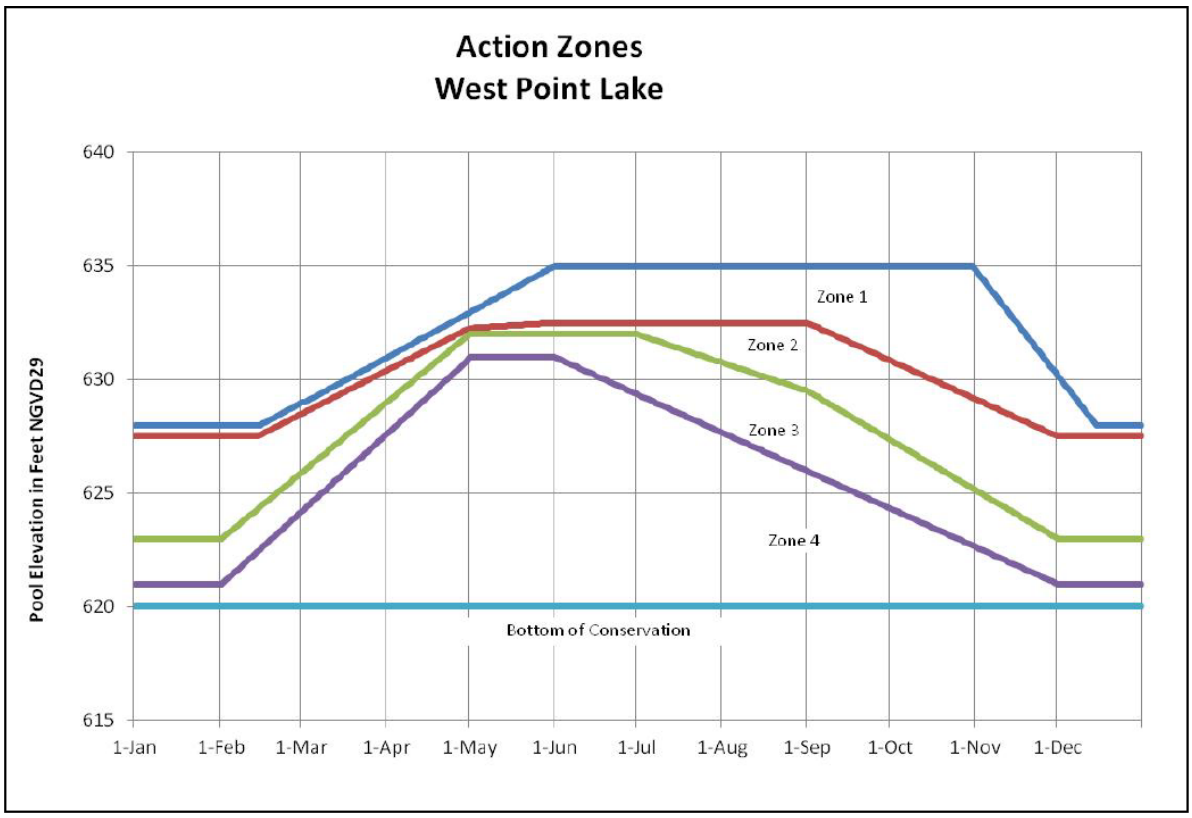


Figure 7-2. Action Zones for West Point Lake

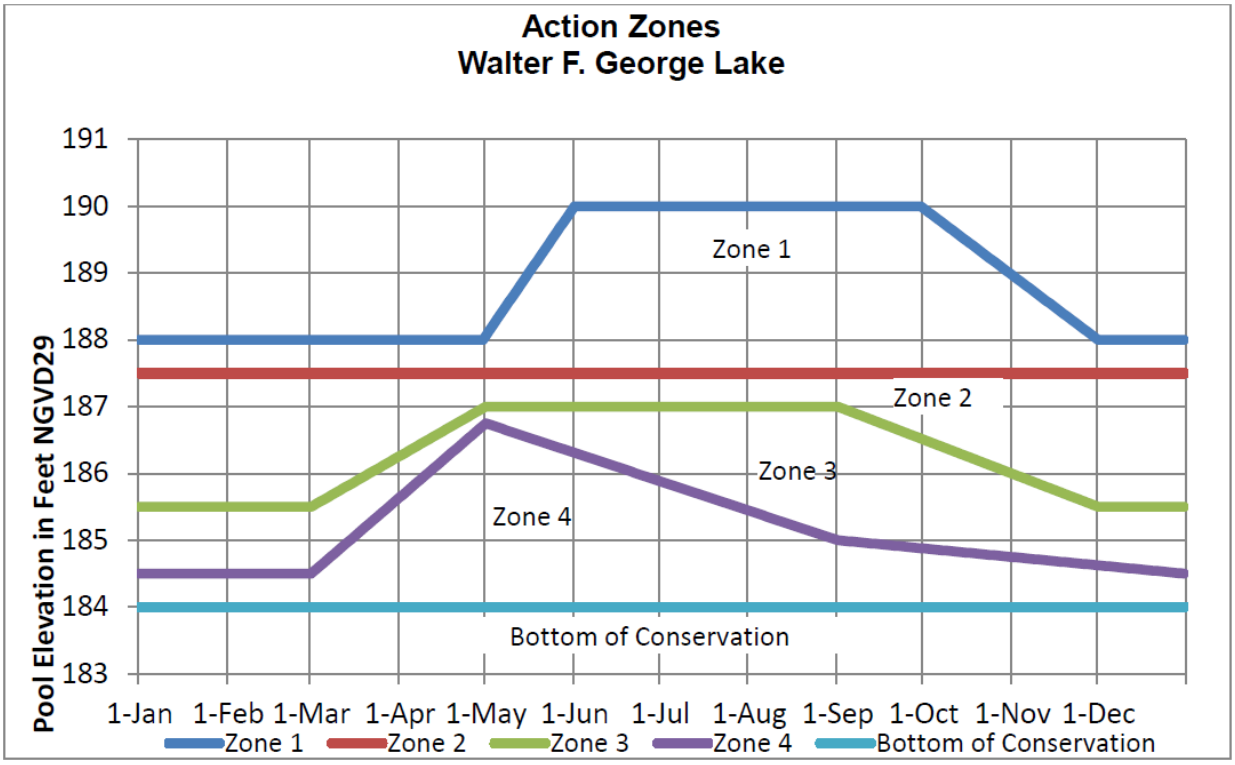


Figure 7-3. Action Zones for Walter F. George Lake

The action zones are integral to the system-wide regulation of the ACF Basin through the concept of composite conservation storage. Composite conservation storage is calculated by combining the conservation storage of Lake Sidney Lanier, West Point Lake, and Walter F. George Lake. Composite conservation storage is shown in Figure 7-4. Each of the individual storage reservoirs consists of four action zones. The composite conservation storage uses the four zone concepts as well; i.e., Zone 1 of the composite conservation storage represents the combined storage available in Zone 1 for each of the three storage reservoirs. When composite conservation storage is in Zones 1 and 2, a less conservative operation is in place. When composite conservation storage is in Zone 3, drought contingency operations are triggered, hydropower is supported at a reduced level, and water supply and water quality releases are met. When composite conservation storage is in Zone 4, severe drought conditions exist, navigation is not supported, and hydropower is likely to be generated only during concurrent uses.

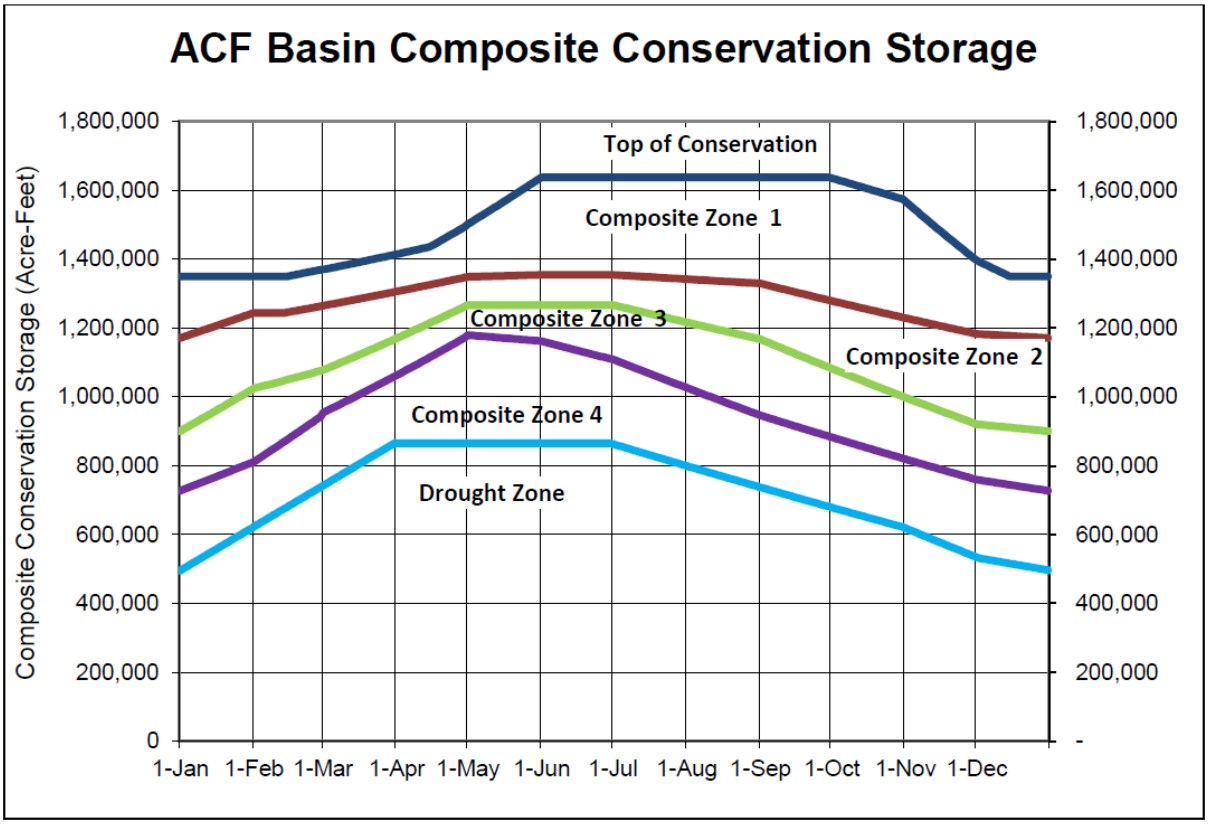


Figure 7-4. ACF Basin Composite Conservation Storage

The following definitions apply to the composite action zones:

Zone 1: If all the lakes are in Zone 1 or above, the river system would operate in a fairly normal manner. Releases can be made for hydroelectric power, water supply, and water quality. If system composite conservation storage is in Zone 1, releases can be made in support of a navigation season (January to April or May). Drought contingency operations cease when levels return to composite action Zone 1 in accordance with the Drought Contingency Plan.

Zone 2: Hydroelectric power generation is supported at the same or a reduced level. Water supply and water quality releases are met. Minimum flow targets are met. If system composite conservation storage is in Zone 2, releases can be made in support of a navigation season (January to April or May).

Zone 3: Hydroelectric power generation is supported at a reduced level. Water supply and water quality releases are met. Minimum flow targets are met. If system composite conservation storage is in Zone 3, navigation is not supported. Drought contingency operations are triggered when levels drop to Zone 3.

Zone 4: Hydroelectric power demands will be met at a minimum level and might occur for concurrent uses only. Water supply and water quality releases are met. Minimum flow targets are met. If system composite conservation storage is in Zone 4, navigation is not supported.

Drought Zone: Hydroelectric power will only be met as a result of meeting other project purposes. Water supply and water quality releases are met. Minimum flow targets are met but are reduced to their lowest level. If system composite conservation storage is in the Drought Zone, navigation is not supported and the emergency drought operations are triggered. This reduces the minimum discharge from Jim Woodruff Lock and Dam to 4,500 cfs.

7-04. Standing Instructions to Damtender. During normal operations, the powerhouse operators will operate the Corps Projects in accordance with the daily hydropower schedule. Any deviation from the schedule must come through the Mobile District. Normally, flood control instructions are issued by the Water Management Section in the Mobile District Office. However, if a storm of flood-producing magnitude occurs and all communications are disrupted between the Mobile District and the powerhouse operators, the operators will follow detailed instructions provided in the "Standing Instructions to the Damtender for Water Control" exhibit found in the individual project manuals.

7-05. Flood Risk Management. The objective of flood risk management operations on the ACF System is to store excess flows thereby reducing downstream river levels below flood stage and producing no higher stages than would otherwise occur naturally. However, post flood evacuation of stored water may result in a longer duration of river levels downstream at or near bankfull or minor damage stages at downstream control points. Whenever flood conditions occur, operation to reduce flood damage takes precedence over all other project functions. Of the five Corps reservoirs, only Lake Sidney Lanier and West Point Lake were designed with space to store flood waters. Flood risk management operations for those projects are described in Sections 7-05 and 8-02 of their respective water control manuals (Appendices B and E). Annual fall through winter drawdown of reservoir storage is one foot at Lake Sidney Lanier and seven feet at West Point Lake. This drawdown provides additional storage capacity to protect life and property in the basin. The Walter F. George Lake annual fall through winter drawdown is two feet and is used to temporarily store inflows to the project during flood events and from which regulated releases are made to reduce the peak flows downstream of the dam. Flood risk management operations for the Walter F. George Project are described in Sections 7-05 and 8-02 of the project's water control manual (Appendix C). The George W. Andrews and Jim Woodruff Dams operate to pass inflows to the projects.

The timing of flood peaks in the ACF System is of considerable importance in determining the effectiveness of reservoir flood risk management operations and the degree to which such operations can be coordinated. During a flood event, excess water above normal pool elevation, or guide curve, should be evacuated through the use of the turbines and spillways in a manner consistent with other project needs as soon as downstream waters have receded sufficiently so that releases from the reservoirs do not cause flows to exceed bankfull capacity or maximum, non-damaging, channel capacities. Stored floodwater can be released up to the maximum, non-damaging, downstream channel capacities, consistent with regulation procedures, provided the releases do not exceed peak inflow of that event into the reservoir(s). Under certain instances, induced surcharge operations might be required to ensure project integrity, which could result in flows that exceed bankfull capacity.

7-06. Recreation. All the Corps lakes have become important recreational resources. The five Corps projects include many facilities, both public and private, that have been developed around the lakeshore. The water control plan for each project considers the recreation effects and impact levels associated with lake levels. Recreation benefits are maximized at the lakes by maintaining full or nearly full pools during the primary recreation season which are the warm summer months (May – September). In response to meeting other authorized project purposes,

lake levels can and do decline during the primary recreation period, particularly during drier than normal years. Recreation impact levels have been identified for various lake elevations at each of the reservoir projects (Table 7-1). Recreational impact levels are not applicable to the George W. Andrews Project due to the lack of conservation storage and the run-of-river operation at the project.

Table 7-1. Water Levels Affecting Federal Project Recreation

Corps project	Initial impact level (ft NGVD29)	Recreation impact level (ft NGVD29)	Water access limited level (ft NGVD29)
Lake Sidney Lanier	1,066	1,063	1,060
West Point Lake	632.5	629	627
Walter F. George Lake	187	185	184
Lake Seminole	76	NA	NA

The first impact level is generally characterized by marginal effects on designated swimming areas, increased safety awareness regarding navigation hazards, minimal effects on Corps boat ramps, and minimal effects on private marina and dock owners. More substantial impacts begin to occur at the second and third impact levels.

When pool levels must be lowered, the rates at which the draw-downs occur are as steady as possible. The action zones at Lake Sidney Lanier and West Point Lake are drawn down to correlate the line between Zone 2 and Zone 3 near the Initial Impact Level at the beginning of the recreation season (May through early September). This is an attempt to maximize the time these projects are above the Initial Impact Level during the recreation season.

7-07. Water Quality. Buford, West Point, and Jim Woodruff Dams provide continuous minimum flow releases. Those releases benefit the water quality immediately downstream of the dams. There are no minimum flow provisions downstream of Walter F. George Lock and Dam. Occasional special releases are also made at Buford Dam to ensure adequate dissolved oxygen and water temperature at the Buford Fish Hatchery downstream of the dam.

Additionally, self-aspirating turbines were installed at Buford Dam to improve dissolved oxygen levels downstream. At Buford Dam, the small turbine generator runs continuously to provide a minimum flow from the dam, which ranges from approximately 550 to 660 cfs, depending on head conditions. This minimum flow from Buford Dam helps to meet the minimum flow requirement of 750 cfs at Atlanta, Georgia, in the Chattahoochee River just upstream of the confluence with Peachtree Creek. At West Point Dam, the minimum flow requirement is 670 cfs and a similar small generating unit provides a continuous release of approximately 675 cfs. A varying minimum flow from 4,500 to 25,000 cfs, dependent upon basin conditions, is maintained as a release from the Jim Woodruff Lock and Dam to the Apalachicola River which assures an adequate water supply for downstream industrial use and water quality. Walter F. George Dam has two siphons on each spillway gate. The siphon discharge can range from about 15 cfs up to 200 cfs when all 12 are in use. Typically, the siphon tubes are opened continuously from May through the end of September and all 12 are used at full capacity. The siphons provide a gravity-fed, typically continuous, minimum flow that benefits dissolved oxygen levels below the dam. No water quality problems below Jim Woodruff Lock and Dam have been identified in association with project operations.

Although there is no Corps requirement to maintain minimum flows for assimilative capacity at Columbus, Georgia, the Georgia Power projects above Columbus are required in their FERC

licenses to provide 1,850 cfs weekly average, 1,350 cfs daily average, and 800 cfs instantaneous, or inflow if less, minimum flow at Columbus. Releases from the Georgia Power projects are dependent on upstream releases from West Point Dam and, to a limited extent, those requirements are recognized when making release decisions for West Point Dam. There is a desired flow for 2,000 cfs below George W. Andrews Lock and Dam for cooling at Farley Nuclear Plant and for assimilative capacity needs downstream. Although those are not Corps authorized project purposes, to the extent practicable, the needs are considered in operations at Walter F. George Lock and Dam and Jim Woodruff Lock and Dam. Those needs are met only if they can be met incidentally and for concurrent use toward the authorized project purposes of the basin.

7-08. Fish and Wildlife

Fish and wildlife conservation is an authorized purpose of the reservoirs in the ACF Basin in accordance with P.L. 85-624 (Fish and Wildlife Coordination Act of 1958). All the Corps reservoirs in the ACF Basin support important fisheries and are operated accordingly, consistent with other project purposes. In addition to fishery management, such operations include aquatic plant control and waterfowl management activities. Fish and wildlife conservation operations specific to each project in the ACF Basin are described in its individual reservoir regulation manual.

a. Fish Spawning. In addition to providing for minimum flow and water quality releases, the Corps operates the system to provide favorable conditions for annual fish spawning, both in the reservoirs and the Apalachicola River. In most water years (October 1 to September 30) it is not possible to hold both lake levels and river stages at a steady or rising level for the entire spawning period, especially when upstream lakes or the Apalachicola River spawning periods overlap. During the fish spawning period for each water body (Table 7-2), the Corps' goal is to operate for a generally stable or rising lake level and a generally stable or gradually declining river stage on the Apalachicola River for approximately 4 to 6 weeks during the designated spawning period. When climatic conditions preclude a favorable operation for fish spawn, the Operations Division or Planning Division of the Corps consults with the state fishery agencies and the U.S. Fish and Wildlife Service (USFWS) on balancing needs in the system and minimizing the effects of fluctuating lake or river levels. Those operations are described in Division Regulation SADR PDS-O-1, *Lake Regulation and Coordination for Fish Management Purpose* dated 31 May 2010, and the Mobile District's draft Standard Operating Procedure 1130-2-9, *Lake Reservoir Regulation and Coordination for Fish Management Purposes* dated February 2005.

During spawning period (March to May), the Corps operates Jim Woodruff Lock and Dam to avoid potential Gulf sturgeon take. Potential Gulf sturgeon take is defined as an 8-foot or greater drop in Apalachicola River stage over the last 14-day period (i.e., is today's stage greater than 8 feet lower than the stage of any of the previous 14 days) when flows are less than 40,000 cfs at the USGS Apalachicola River gage near Chattahoochee, Florida (#0235800).

During the non-spawning period(June to November), one set of four basin inflow thresholds and corresponding releases exists according to composite conservation storage in Zones 1 - 3. When composite conservation storage falls below the bottom of Zone 2 into Zone 3, the drought contingency operations are triggered (see Figure 7-6).

Table 7-2. Project-Specific Principal Fish Spawning Period

Project	Fish spawn period
Lake Sidney Lanier	1 April – 1 June
West Point Lake	1 April – 1 June
Walter F. George Lake	15 March – 15 May
Lake Seminole	1 March - 1 May
Apalachicola River	1 April – 1 June

b. Endangered Species. The Corps manages releases from Jim Woodruff Lock and Dam to support the Federally protected Gulf sturgeon and mussel species (fat threeridge, purple bankclimber, and Chipola slabshell) in the Apalachicola River. Daily releases to provide support for fish and wildlife conservation from Jim Woodruff Lock and Dam are dictated by two parameters: a minimum discharge (measured in cfs) and a maximum fall rate (measured in feet per day [ft/day]) as shown in Tables 7-3 and 7-4..

c. Fish Passage. The Corps, as conditions allow, operates the lock at Jim Woodruff Lock and Dam during the March through May time frame to facilitate downstream to upstream passage of Alabama shad (*Alosa alabamae*) and other anadromous fishes (those that return from the sea to rivers where they were born to spawn). There could be slight differences in the locking technique each year. However, when possible, two fish locking cycles are performed each day between 8 a.m. and 4 p.m. on each day the lock operators are scheduled to be present - one in the morning and one in the afternoon. The operation consists of opening the lower lock gates and getting fish into the lock in one of three ways; transporting them into the lock by boat, using attraction flows to entice the fish into the lock, or leaving the lower gate open for a period before a lockage and allowing the fish to move in without an attraction flow. Once the fish are in the lock (or assumed to be in the lock), the downstream doors are closed. The lock is filled to the lake elevation, and the upper gates are opened. Studies are ongoing to determine the most appropriate technique and timing for the locks, but the number of lock cycles per day will not change. The lock schedule and techniques will be closely coordinated with the Planning Division and the interagency fish passage partnership.

d. Minimum Discharge. Minimum discharges from Jim Woodruff Lock and Dam vary according to composite conservation storage, basin inflow per the 7-day moving average and by month. Table 7-3 shows these minimum releases, which are measured as a daily average flow in cfs at the USGS Chattahoochee, Florida, gage (#02358000). During normal and above normal hydrological conditions within the basin, releases greater than the minimum release provisions can occur consistent with the maximum fall rate schedule described herein, or as needed to achieve other project purposes; such as hydroelectric power generation or flood risk management.

Table 7-3. Flow Releases from Jim Woodruff Lock and Dam

Months	Composite Storage Zone	Basin Inflow (BI) (cfs)[a]	Minimum Outflows from JWLD (cfs)[b]
March - May	Zones 1 and 2	>= 34,000	= 25,000
		>= 16,000 and < 34,000	= 16,000 + 50% BI > 16,000
		>= 5,000 and < 16,000	= BI
		< 5,000	= 5,000
	Zone 3	>= 39,000	= 25,000
		>= 11,000 and < 39,000	= 11,000 + 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
		>= 10,000 and < 22,000	= 10,000 + 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
		< 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 into the Drought Zone, ramp down to a minimum release of 4,500 cfs at rate of 0.25feet/day based on the USGS gage at Chattahoochee, Florida (#02358000).

Minimum releases are dictated according to basin inflow threshold levels that vary by three seasons - spawning season (March to May) depicted on Figure 7-5; non-spawning season (June to November) depicted on Figure 7-6; and winter (December to February) depicted on Figure 7-7. Composite conservation storage threshold factors are also incorporated into minimum release decisions. Any minimum release that falls above the "Basin Inflow" line on the charts indicates water must be used from storage to meet the requirement, while any release requirement that falls below that line indicates that basin inflow in excess of the minimum flow requirement can be stored in the conservation storage. Composite conservation storage is calculated by combining the conservation storage of Lake Sidney Lanier, West Point Lake, and Walter F. George Lake. Flood storage is not included in the calculation of composite conservation storage, with the exception of temporary deviations (an example being temporarily storing water within West Point's flood zone due to head limits at Walter F. George). Composite conservation storage is shown in Figure 7-4. Each of the individual storage reservoirs consist of four action zones. The composite conservation storage uses the same four action zone concepts. Zone 1 of the composite conservation storage represents the combined storage available in Zone 1 for each of the three storage reservoirs. During the spawning season, two sets of four basin inflow thresholds and corresponding releases exist according to composite

conservation storage. When composite conservation storage is in Zones 1 and 2, a less conservative operation is in place. When composite conservation storage is in Zone 3, a more conservative operation is in place while still avoiding or minimizing effects on listed species and critical habitat in the river. When composite conservation storage falls below the bottom of Zone 2 into Zone 3, the drought contingency operations are triggered. Within Zone 4, the minimum flow is the same as in zone 3. When the composite conservation storage drops further into the Drought Zone, the minimum flow from Jim Woodruff Lock and Dam is reduced to 4,500 cfs. A detailed description of the drought contingency operations is provided in Paragraph 7-12. During the spawning season, a daily monitoring plan that tracks composite conservation storage and basin inflow will be implemented to determine water management operations.

(1) Spawning Period (March to May). During this period, the Corps operates Jim Woodruff Lock and Dam to avoid potential Gulf sturgeon take. Potential Gulf sturgeon take is defined as an 8-foot or greater drop in Apalachicola River stage over the last 14-day period (i.e., is today's stage greater than 8 feet lower than the stage of any of the previous 14 days) when flows are less than 40,000 cfs. When composite conservation storage falls below the bottom of Zone 2 into Zone 3, the drought contingency operations are triggered (see Figure 7-6).

(2) Non-Spawning Period (June to November). During the non-spawning period, one set of four basin inflow thresholds and corresponding releases exists according to composite conservation storage in Zones 1 - 3. When composite conservation storage falls below the bottom of Zone 2 into Zone 3, the drought contingency operations are triggered (see Figure 7-6).

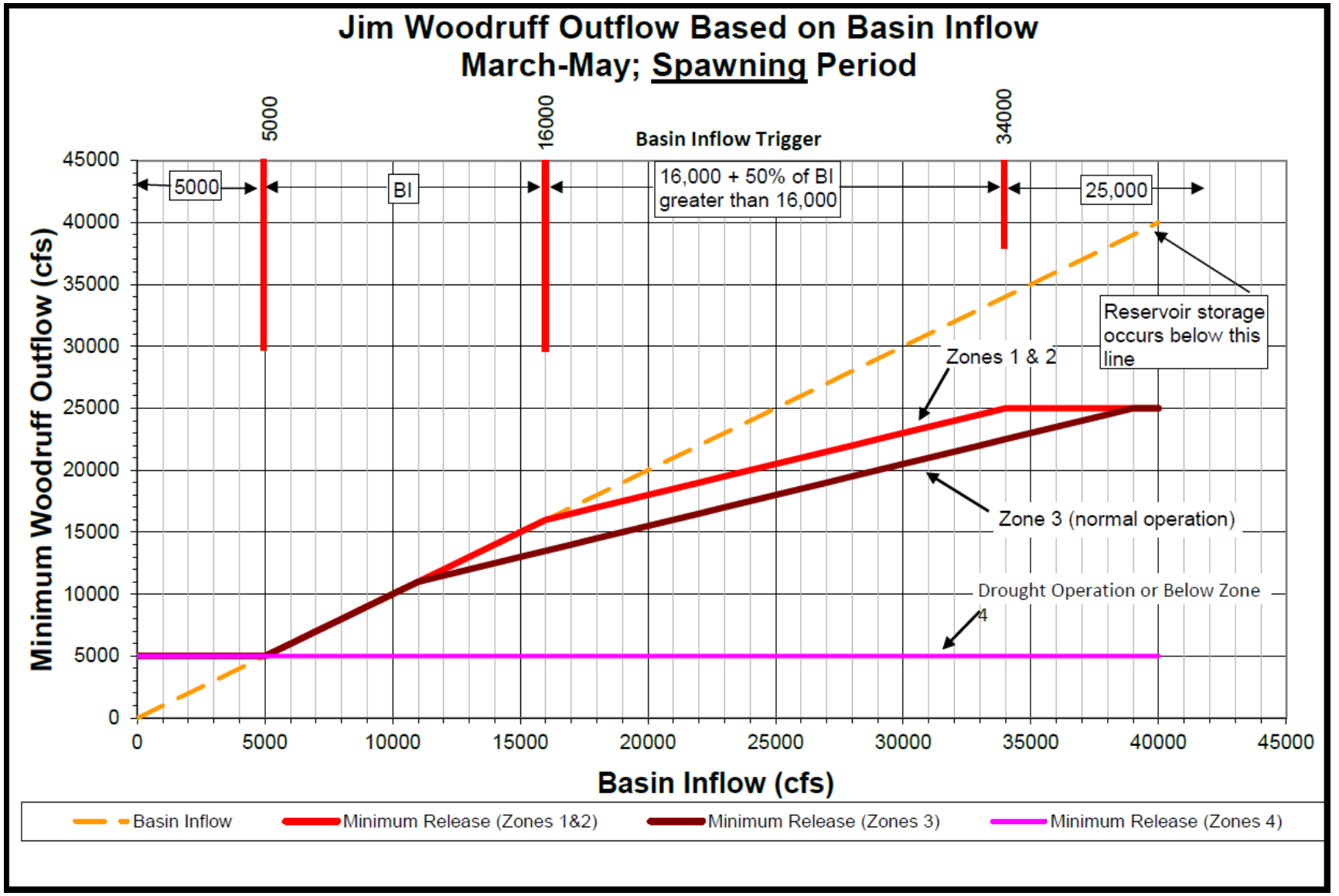
(3) During the winter season (December to February), only one basin inflow threshold and corresponding minimum release (5,000 cfs) exists while in composite conservation storage Zones 1 - 4. That provides the greatest opportunity to refill the storage reservoirs. No basin inflow storage restrictions are in effect as long as this minimum flow is met under such conditions.

e. Maximum Fall Rate. Fall rate, also called down-ramping rate, is the vertical drop in river stage (water surface elevation) that occurs over a given period of time. The fall rates are expressed in units of feet/day and are measured at the USGS Apalachicola River gage (#02358000) near Chattahoochee, Florida, as the difference between the daily average river stage on consecutive calendar days. Rise rates (e.g., today's average river stage is higher than yesterday's) are not addressed. The maximum fall rate schedule is provided in Table 7-4. When composite conservation storage falls into Zone 3, and the drought contingency operation described below is implemented, the maximum fall rate schedule is suspended and more conservative drought contingency operations begin (see Drought Contingency Operations, paragraph 7-11). Down-ramping rates are also suspended during periods of prolonged low flow (flows less than 7,000 cfs for a period of more than 30 consecutive days). A prolonged low flow period is considered over and down-ramping rates would be reinstated when flows are greater than 10,000 cfs for 30 consecutive days. Unless drought zone operations are triggered, fall rates under drought contingency and prolonged low flow operations would be managed to match the fall rate of the basin inflow.

Table 7-4. Maximum Down-Ramping Rate

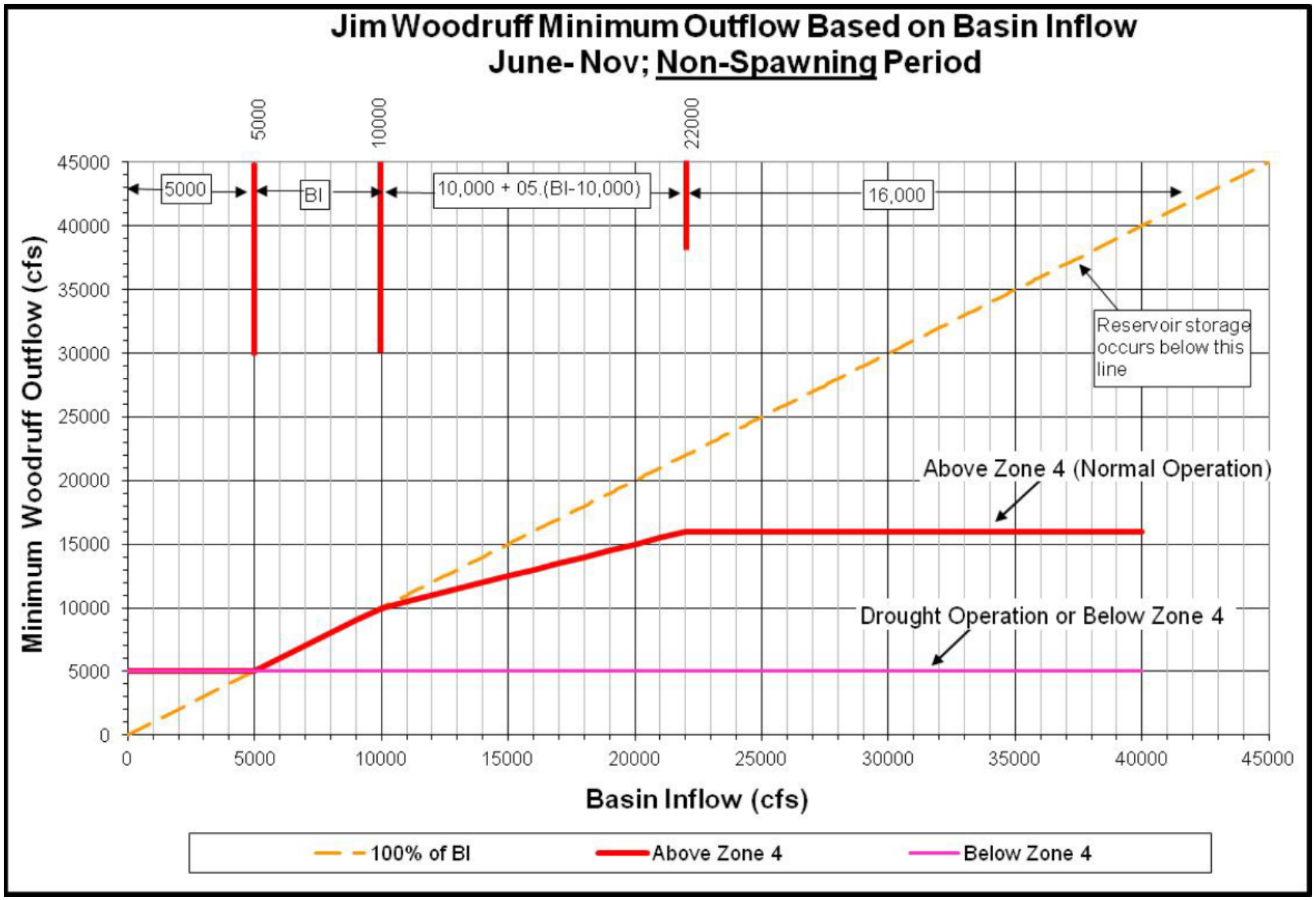
Release Range (cfs)	Maximum Fall Rate (ft/day), measured at USGS Chattahoochee, FL gage #02358000
> 30,000*	No ramping restriction**
> 20,000 and <= 30,000*	1.0 to 2.0
Exceeds Powerhouse Capacity (~ 16,000) and <= 20,000*	0.5 to 1.0
Within Powerhouse Capacity and > 10,000*	0.25 to 0.5
Within Powerhouse Capacity and <= 10,000*	0.25 or less

*Consistent with safety requirements, flood control purposes, and equipment capabilities.
**For flows greater than 30,000 cfs, it is not reasonable and prudent to attempt to control down ramping rate, and no ramping rate is required.



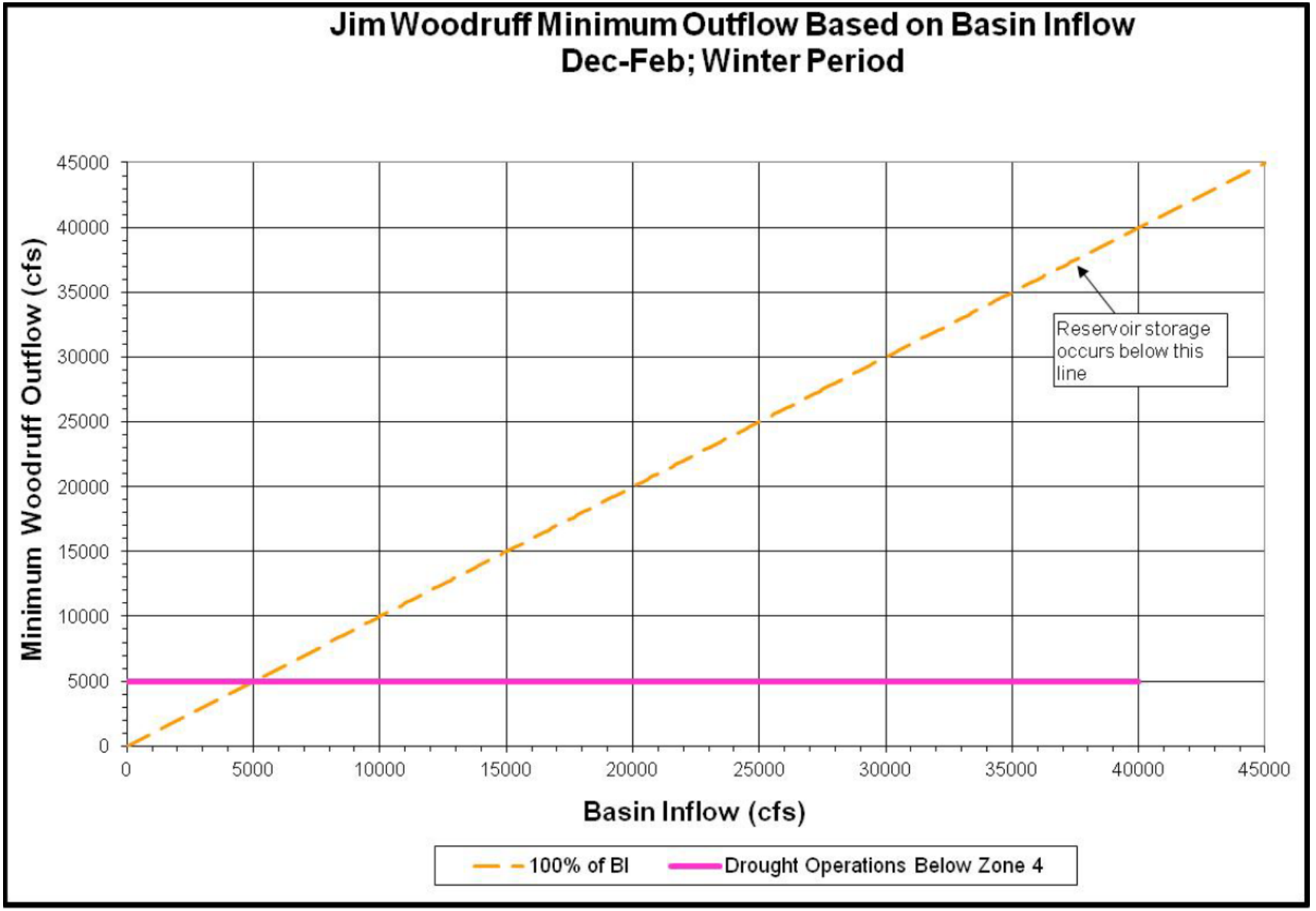
Note: The area below the dashed 100% of BI line represents the potential to store water in the basin storage projects
Note: The flow target is 4,500 cfs in the Drought Zone

Figure 7-5. Minimum Woodruff Discharge during Spawning Season



Note: The area below the dashed 100% of BI line represents the potential to store water in the basin storage projects
Note: The flow target is 4,500 cfs in the Drought Zone

Figure 7-6. Minimum Woodruff Discharge during Non-Spawning Season



Note: The area below the dashed 100% of BI line represents the potential to store water in the basin storage projects
Note: The flow target is 4,500 cfs in the Drought Zone

Figure 7-7. Minimum Woodruff Discharge during Winter Season

7-09. Water Supply. Municipal and industrial (M&I) entities withdraw water from both the reservoirs and the rivers that comprise the ACF System. The reservoir withdrawals are made pursuant to two different legal authorities. M&I entities withdraw water directly from Lake Sidney Lanier and West Point Lake under relocation agreements. At Lake Sidney Lanier, water withdrawals from the reservoir are made pursuant to the existing relocation contracts for the Cities of Gainesville, Georgia, and Buford, Georgia, at rates not exceeding 8 (net) and 2 mgd, respectively. Buford intakes are at elevations 1,062, 1,052, 1,042, and 1,032 feet NGVD29. Gainesville has three intake structures, each with multiple intake ports ranging from elevation 1,063 down to 1,025 feet NGVD29. At West Point Lake, the City of LaGrange, Georgia, has a relocation contract for 8.35 mgd and was assigned the 12.96 mgd relocation contract of the now defunct Milliken Carpet Company for a total relocation contract of 21.31 mgd. LaGrange's intakes are at elevation 600, 618, 623, and 628 feet NGVD29.

Pursuant to the Water Supply Act of 1958, the Corps has allocated 252,950 acre-feet in Lake Sidney Lanier for water supply in accordance with a water storage agreement with the State of Georgia. The amount of storage was estimated to yield 222 mgd during the critical drought, i.e., during the worst drought on record at the time the agreement was executed. The severity and frequency of droughts change over time, therefore, the yield of this storage may change over time. The M&I water supported by this 252,950 acre-feet will be a direct lake withdrawal.

For the purpose of managing water supply storage, the Mobile District has employed a storage accounting methodology that applies a proportion of inflows and losses, as well as direct withdrawals by specific users, to each account. The amount of water that may actually be withdrawn is ultimately dependent on the amount of water available in the storage account, which will naturally change over time.

Other M&I entities withdraw water directly from the Chattahoochee, Flint, and the Apalachicola Rivers for water supply. Reservoir operations are also influenced by agricultural water withdrawals on the Flint River. Agricultural demands vary depending on the climatic conditions but are generally 1.5 to 2 times the withdrawals by M&I entities (USFWS 2006). Water withdrawals in Georgia are made pursuant to water withdrawal permits issued by GADNR.

Releases from Buford Dam flow downstream in the Chattahoochee River to the Atlanta area municipal water intakes downstream. Peaking hydroelectric power generation generally occurs between 5:00 a.m. to 9:00 a.m. Central time and 3:00 p.m. to 10:00 p.m. Central time on Monday through Friday between 1 October and 31 March and between 1:00 p.m. to 7:00 p.m. on Monday through Friday between 1 April and 30 September. A by-product of these peaking releases is the accommodation of most water withdrawal supply needs for the City of Atlanta. However, under the 1946 Rivers and Harbors Act, generation might occur outside those time frames to specifically meet the city of Atlanta water supply needs, not to exceed 379 mgd.

ARC and the GPC have agreements to reregulate power releases from Buford Dam to provide a more dependable flow below Morgan Falls Dam. GPC operates the Morgan Falls Dam to support ARC's Water Management System for the Chattahoochee River. Morgan Falls Dam maintains a continuous minimum seasonal flow to provide a set flow at Peachtree Creek. The GPC releases include anticipated withdrawals by Cobb County-Marietta Water Authority and Atlanta. Withdrawals also occur at a number of other downstream M&I water supply intakes including the Cities of LaGrange, West Point, Columbus, and a number of industries; however, the Corps does not make specific water supply releases for these withdrawals.

7-10. Hydroelectric Power. The SERC Reliability Corporation (SERC) is one of the eight regional entities of the North American Electric Reliability Corporation (NERC). SERC is divided geographically into five diverse sub-regions identified as Central, Delta, Gateway, Southeastern, and VACAR. The ACF Basin is in the Southeastern sub-region. Individually managed utilities operating in the ACF Basin include the Alabama Electric Cooperative, Oglethorpe Power Corporation, South Mississippi Electrical Power Association, Walton Electric Membership Corporation, and the Southern Company (which serves as the primary balancing authority for the area). Southern Company's Georgia Power Company (GPC) Division is the primary private operator in the ACF Basin. GPC operates eight hydroelectric dams. The Buford, West Point, Walter F. George, and Jim Woodruff Projects include hydroelectric power plants. The total generation capacity of the four ACF hydroelectric power plants is 425.35 MW (declared). Through the Department of Energy's Southeastern Power Administration, the power plants provide power to nearly 500 preference customers throughout the southeastern United States. In calendar year (CY) 2015, the ACF Basin hydroelectric power plants generated over 1.00 million megawatt hours (MWH), enough electricity to supply approximately 93,000 households in the region. Table 7-5 shows the annual variation in hydropower generation for Calendar Years (CY) 2006-2015 at the four, ACF Federal hydropower projects. Hydroelectric power generation is achieved by passing flow releases to the maximum extent possible through the turbines at each project, even when making releases to support other project purposes.

Table 7-5. ACF Hydropower Generation (MWH)

CY	Buford	West Point	Walter F. George	Woodruff	Total
2006	141,196	56,881	296,463	194,452	688,992
2007	123,860	93,526	210,311	171,531	599,228
2008	69,693	92,730	253,989	190,909	607,321
2009	134,932	237,765	491,488	171,762	1,035,947
2010	199,158	214,140	362,317	159,685	935,300
2011	176,028	134,378	266,926	178,608	755,940
2012	106,343	96,257	187,062	146,144	535,806
2013	212,413	251,237	470,117	233,401	1,167,168
2014	182,282	194,001	410,605	202,303	989,191
2015	163,359	197,569	410,629	230,076	1,001,633
10-year sum	1,509,264	1,568,484	3,359,907	1,878,871	8,316,526
10-year average	150,926	156,848	335,991	187,887	831,653
% by Project	18.1%	18.9%	40.4%	22.6%	100%

The Buford, West Point, and Walter F. George Projects are operated as peaking plants, and provide electricity during the peak demand periods of each day and week. Hydroelectric power peaking involves increasing the discharge for a few hours each day to near the full capacity of one or more of the turbines. Typically, the Buford, West Point, and Walter F. George Projects provide generation five days a week at plant capacity throughout the year, as long as their respective lake levels are above Zone 4 and drought operations have not been triggered. For example, demand for peak hydroelectric power at Buford Dam typically occurs on weekdays from 5:00 a.m. to 9:00 a.m. Central time and from 3:00 p.m. to 10:00 p.m. between 1 October and 31 March, and on weekdays from 1:00 p.m. to 7:00 p.m. between 1 April and 30 September. The typical hours of generation represent releases that would normally meet water system demands and also provide the capacity specified in marketing arrangements. During

dry periods, generation could be eliminated or limited to conjunctive releases. The typical, but not required, hours of operation by action zone are presented in Table 7-6.

Table 7-6. Typical Hours of Peaking Hydroelectric Power Generation by Federal Project

Action zone	Buford (hours of operation) normal ops/drought ops	West Point (hours of operation)	Walter F. George (hours of operation)
Zone 1	3/2	4	4
Zone 2	2/1	2	2
Zone 3	2/1	2	2
Zone 4*	0	0	0

***While hydropower would still be generated in Zone 4, it could not be generated on a regular peaking schedule under severe drought conditions.**

In addition to hydroelectric power generation being governed by action zone, there are also physical limitations that factor into the power generation decisions. During high flow conditions, the reduction in the difference in headwater and tailwater may cause the hydropower units at West Point, Walter F. George or Jim Woodruff Projects to become inoperable due to loss of head. This would only occur during extremely high releases at West Point and Walter F. George Projects, but often occurs multiple times in one year at Jim Woodruff Project as a result of more moderate high flow releases. A reduction in the generation capacity of a unit can also occur as a result of extremely low lake levels during droughts. Each plant's minimum operating head is included in supplementary pertinent data in the appendix for each project. Hydroelectric power generation at Buford Dam is often limited by the downstream channel capacity, limiting the continuous generation with both main units to four hours followed by five hours continuous generation with one main unit, before resuming generation with both main units. This is especially critical during periods of high flow in the winter and spring months.

Scheduled and unscheduled unit outages can occur throughout the year affecting the ability to release flow through some or all the turbines.

Because it does not have the ability to store appreciable amounts of flow, the Jim Woodruff Lock and Dam is operated as a run-of-the-river plant where inflows are passed continuously and electricity is generated around the clock. A limited hydroelectric power peaking operation occurs at Jim Woodruff Dam when daily average releases are less than the combined capacity of the powerhouse turbines (about 16,000 cfs) to deliver extra power during hours of peak demand for electricity. Those peaking releases are included in the daily average discharge computations for minimum flow provisions. The peaks are also included in the stage computations for the maximum fall rate schedule; however, the maximum fall rate schedule addresses the difference between the average river stage on consecutive calendar days, not the shorter-term differences that result from peaking operations within a calendar day. As average daily releases approach 6,500 cfs, peaking operations at the Jim Woodruff plant may

be curtailed to maintain instantaneous releases greater than or equal to the 5,000 cfs minimum flow requirement.

7-11. Navigation. The existing project authorizes a 9-foot deep by 100-foot wide waterway from Apalachicola, Florida, to Columbus, Georgia, on the Chattahoochee River, and to Bainbridge, Georgia, on the Flint River. Conditions on the Apalachicola River have been such in recent years that a 9-foot deep channel has not been available for much of the year. Dredging on the Apalachicola River has been reduced since the 1980s because of a lack of adequate disposal area capacity in certain reaches of the river. No dredging has been conducted on the Apalachicola River since 2001 for a variety of reasons related to flow or funding levels and has been indefinitely deferred because of denial of a section 401 water quality certificate from the State of Florida. Also, the Apalachicola River was designated as a low use navigation project in Fiscal Year 2005 which greatly reduces the likelihood of receiving funding for maintenance dredging. The lack of dredging and routine maintenance has led to inadequate depths in the Apalachicola River navigation channel.

When supported by ACF Basin hydrologic conditions, the Corps will provide a reliable navigation season. The water management objective is to ensure a predictable minimum navigable channel in the Apalachicola River for a continuous period that is sufficient for navigation use.

Assuming basin hydrologic conditions allow, a typical navigation season would begin in January of each year and continue for 4 to 5 consecutive months (January through April or May). Figure 7-8 graphically represents the navigation season and its relationship to composite conservation storage. During the navigation season, the flows at the Blountstown, Florida, gage (USGS # 02358700) should be adequate to provide a minimum channel depth of 7 feet. The most recent channel survey and discharge-stage rating was used to determine the flow required to sustain a minimum navigation depth during the navigation season. Flows of 16,200 cfs provide a channel depth of 7 feet. Flows of 20,600 cfs provide a channel depth of 9 feet. The Corps' capacity to support a navigation season will be dependent on actual and projected system-wide conditions in the ACF Basin before and during January, February, March, April and May. Those conditions include the following:

- A navigation season can be supported only when ACF Basin composite conservation storage is in Zone 1 or Zone 2.
- A navigation season will not be supported when the ACF Basin composite conservation storage is in Zone 3 and below. Navigation support will resume when basin composite conservation storage level recovers to Zone 1.
- A navigation season will not be supported when drought operations are in effect. Navigation will not be supported until the ACF Basin composite conservation storage recovers to Zone 1.
- The determination to extend the navigation season beyond April will depend on ACF Basin inflows, recent climatic and hydrologic conditions, meteorological forecasts, and basin-wide model forecasts. On the basis of an analysis of those factors, the Corps will determine if the navigation season will continue through part or all of May.
- Down-ramping of flow releases will adhere to the Jim Woodruff Lock and Dam fall rate schedule for Federally listed species during the navigation season.

- Releases that augment the flows to provide a minimum 7-foot navigation depth will also be dependent on navigation channel conditions that ensure safe navigation.

When it becomes apparent that, because of diminishing inflows, downstream flows and depths must be reduced, the Water Management Section will notify the Navigation Section that flows are anticipated to approach critical navigable depths. Water Management will provide the Navigation Section with a forecast of flows over the coming week and the Navigation Section will then issue navigation bulletins to project users. The notices will be issued as expeditiously as possible to give barge owners, and other waterway users, sufficient time to make arrangements to light load or remove their vessels before action is taken at Jim Woodruff Lock and Dam to reduce releases.

Although special releases will not be standard practice, they could occur for a short duration to assist navigation during the navigation season. For instance, releases can be requested to achieve up to a 9-foot channel. The Corps will evaluate such request on a case-by-case basis, subject to applicable laws and regulations and the conditions above.

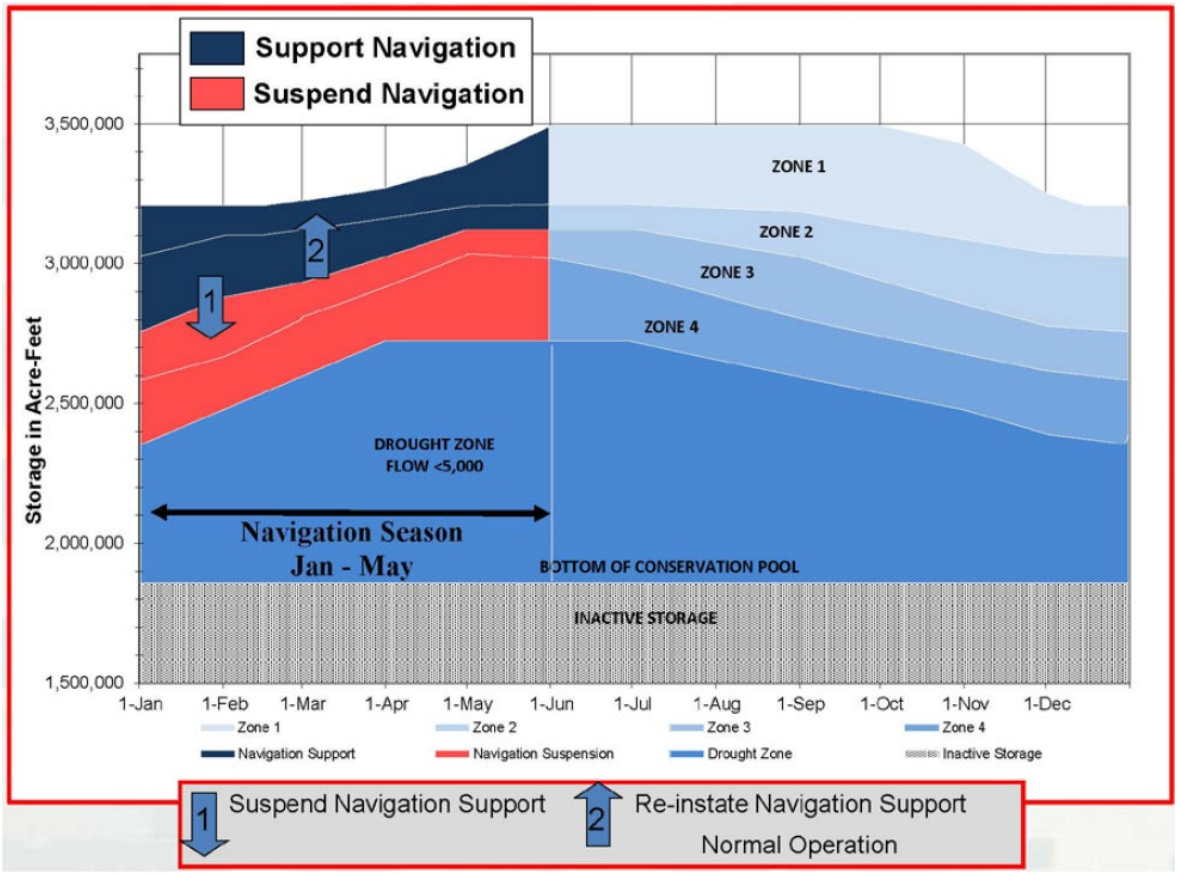


Figure 7-8. Composite Conservation Storage for Navigation

7-12. Drought Contingency Plans. In accordance with ER 1110-2-1941, Drought Contingency Plans, dated 15 September 1981, an ACF Drought Contingency Plan is included as Exhibit B of this manual. The following information provides a summary of the Drought Management Plan water control actions for the ACF Basin Corps projects.

Drought operations are triggered on the first day of the month following the day that ACF composite conservation storage enters Zone 3, from Zone 2 (Figure 7-9). At that time, all the composite conservation storage Zone 1 - 3 provisions (seasonal storage limitations, maximum fall rate schedule, and minimum flow thresholds) are suspended and management decisions are based on the provisions of the drought plan. Under the drought plan, the minimum discharge is determined in relation to composite conservation storage only. The drought plan for the ACF Basin specifies a minimum release from Jim Woodruff Lock and Dam and temporarily suspends the other minimum release and maximum fall rate provisions until composite conservation storage in the basin is replenished to a level that can support the minimum releases and maximum fall rates. The drought plan also includes a temporary waiver from the water control plan to allow temporary storage above the winter pool guide curve at the Walter F. George and West Point Projects if the opportunity presents itself. There is also an opportunity to begin spring refill operations at an earlier date to provide additional conservation storage for future needs.

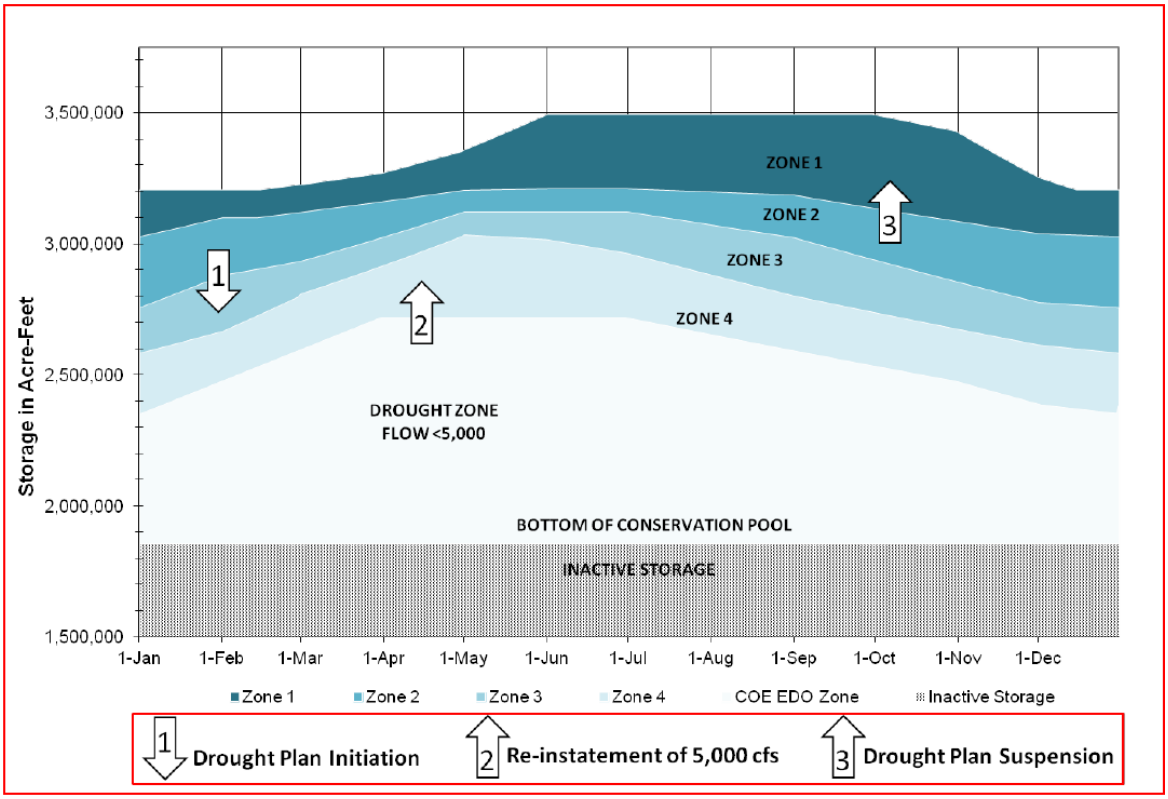


Figure 7-9. Drought Operation Triggers

The drought plan prescribes two minimum releases based on composite conservation storage in Zones 3 and 4 and an additional zone referred to as the Drought Zone. The Drought Zone delineates a volume of water roughly equivalent to the inactive storage in Lake Sidney Lanier, West Point Lake, and Walter F. George Lake plus Zone 4 storage in Lake Sidney Lanier. The Drought Zone line has been adjusted to include a smaller volume of water at the beginning and end of the calendar year. When the composite storage is within Zone 4 and above the Drought Zone, the minimum release from Jim Woodruff Lock and Dam is 5,000 cfs, and all basin inflow above 5,000 cfs that is capable of being stored may be stored. Once the composite

conservation storage falls into the Drought Zone, the minimum release from Jim Woodruff Lock and Dam is 4,500 cfs and all basin inflow above 4,500 cfs that is capable of being stored may be stored. When transitioning from a minimum release of 5,000 to 4,500 cfs, fall rates will be limited to a 0.25-ft/day drop. The 4,500 cfs minimum release is maintained until composite conservation storage returns to a level above the top of the Drought Zone, at which time the 5,000-cfs minimum release is reinstated.

The drought plan provisions remain in place until conditions improve such that the composite conservation storage reaches Zone 1. At that time, the temporary drought plan provisions are suspended, and all the other provisions are reinstated. During the drought contingency operations, a monthly monitoring plan will be implemented that tracks composite conservation storage to determine the water management operations (the first day of each month will represent a decision point) that will be implemented and to determine which operational triggers, if any, should be applied. There is a special provision for the month of March under drought operation. If recovery conditions are achieved in February (after the 1st), drought plan provisions will not be suspended until 1 April, unless the level of composite conservation storage reaches the top of zone 1 (i.e. all Federal reservoirs are full) prior to 1 March. The month of March usually provides the highest inflows into the reservoirs, but also has some of the highest flow requirements for release from Jim Woodruff Lock and Dam. This extension of drought operations allows for the full recovery of the Federal storage projects in preparation for the spawning and spring refill period that occur from April through June.

7-13. Flood Emergency Action Plans. The Corps is responsible for developing Flood Emergency Action Plans for the ACF System, in accordance with ER 1110-2-1156, *Engineering and Design Safety of Dams – Policy and Procedures*, 31 March 2014. Each Federal reservoir project in the ACF Basin has a stand-alone Emergency Action Plan document retained on site and in the Mobile District Office. Example data available are emergency contact information, flood inundation information, management responsibilities, and procedures for use of the plan.

7-14. Other. Other considerations, in addition to the authorized project purposes, may be accommodated on an as needed basis. Adjustments are made to system regulation at times for downstream construction, to aid in rescue or recovery from drowning accidents, environmental studies, or cultural resource investigations.

For the purpose of meeting the requirements of the Settlement Flow Objectives, discharges from West Point will be made to support maintaining a daily average flow of 1,350 over any 7-day period (7-day forward moving average) cfs at the gage located on the Chattahoochee River in Columbus, Georgia (Gage No. 02341460) and a minimum average weekday flow of 2,000 cfs on the Chattahoochee River near Columbia, Georgia (Gage No. 02343801) when the ACF basin is not in Drought Zone Operations. When the ACF basin enters Extreme Drought Operations, two days each calendar week starting each Monday, releases from West Point will be made to maintain the 1,350 cfs daily average flow as measured by the Columbus, Georgia (Gage No. 02341460) and the 2,000 cfs daily average flow as measured by the downstream gage at Columbia, Alabama (Gage No. 02343801).

7-15. Deviation from Normal Regulation. Water management inherently involves adapting to unforeseen conditions. The development of water control criteria for the management of water resource systems is carried out throughout all phases of a water control project. The water control criteria are based on sound engineering practice utilizing the latest approved models and techniques for all foreseeable conditions. There may be further refinements or enhancements of the water control procedures in order to account for changed conditions resulting from unforeseen conditions, new requirements, additional data, or changed social or economic goals. However, it is necessary to define the water control plan in precise terms at a particular time in

order to assure carrying out the intended functional commitments in accordance with the authorizing documents (EM 1110-2-3600 Management of Water Control Systems). Adverse impacts of the water control plan may occur due to unforeseen conditions. When this occurs, actions will be taken within applicable authority, policies, and coordination to address these conditions when they occur through the implementation of temporary deviations to the water control plan, such as interim operation plans. Such deviations may require additional environmental compliance prior to implementation.

The Corps is occasionally requested to deviate from the water control plan. Prior approval for a deviation is required from the Division Commander except as noted in subparagraph a. Deviation requests usually fall into the following categories:

a. Emergencies. Examples of some emergencies that can be expected at a project are drowning and other accidents, failure of the operation facilities, failure of another ACF project, chemical spills, treatment plant failures, and other temporary pollution problems. Water control actions necessary to abate the problem are taken immediately unless such action would reasonably be expected to create equal or worse conditions. The Mobile District will notify the Division office as soon as practicable.

b. Declared System Emergency. A Declared System Emergency can occur when there is a sudden loss of power within the electrical grid and there is an immediate need of additional power generation capability to meet the load on the system. In the Mobile District, a system emergency can be declared by the Southern Company or the Southeastern Power Administration's Operation Center. Once a system emergency has been declared, the requester will contact the project operator and request generation support. The project operator will then lend immediate assistance within the projects operating capabilities. The safety rules concerning horn notification at Buford must be complied with in all instances. Once support has been given, the project operator should inform the Mobile District Office immediately. The responsibilities and procedures for a Declared System Emergency are discussed in more detail in Division Regulation Number 1130-13-1, *Hydropower Operations and Maintenance Policies*. It is the responsibility of the District Hydropower Section and the Water Management Section to notify South Atlantic Division Operations Branch of the declared emergency. The Division Operations Branch should then coordinate with SEPA, District Water Management, and the District Hydropower section on any further actions needed to meet the needs of the declared emergency.

c. Unplanned Deviations. Unplanned instances can create a temporary need for deviations from the normal regulation plan. Unplanned deviations may be classified as either major or minor but do not fall into the category of emergency deviations. Construction accounts for many of the minor deviations and typical examples include utility stream crossings, bridge work, and major construction contracts. Minor deviations can also be necessary to carry out maintenance and inspection of facilities. The possibility of the need for a major deviation mostly occurs during extreme flood events. Requests for changes in release rates generally involve periods ranging from a few hours to a few days, with each request being analyzed on its own merits. In evaluating the proposed deviation, consideration must be given to impacts on project and system purposes, upstream watershed conditions, potential flood threat, project condition, and alternative measures that can be taken. Approval for unplanned deviations, either major or minor, will be obtained from the Division Office by telephone or electronic mail prior to implementation.

d. Planned Deviations. Planned deviations can result from scheduled maintenance of the water control equipment associated with the dam or hydropower generation or activities associated with the operation and maintenance of the reservoir facilities, including shoreline maintenance. Each condition should be analyzed on its merits. Sufficient data on flood potential, lake and watershed conditions, possible alternative measures, benefits to be expected, and probable effects on other authorized and useful purposes, together with the district recommendation, will be presented by letter or electronic mail to the Division Office for review and approval.

7-16. Rate of Release Change. Gradual changes are important when releases are being decreased and downstream conditions are very wet, resulting in saturated riverbank conditions. The Corps acknowledges that a significant reduction in basin releases over a short period can result in some bank sloughing, and release changes are scheduled accordingly when a slower rate of change does not significantly affect downstream flood risk. Overall, the effect of basin regulation on streambank erosion has been reduced because higher peak-runoff flows into the basin are captured and metered out more slowly.

Maximum fall rate on the Apalachicola River is addressed in Paragraph 7-08.e of this manual.