



DEPARTMENT OF THE ARMY  
MOBILE DISTRICT, CORPS OF ENGINEERS  
P.O. BOX 2288  
MOBILE, ALABAMA 36628-0001

REPLY TO  
ATTENTION OF:

April 24, 2008

Inland Environment Team  
Planning and Environmental Division

Ms. Gail Carmody  
Field Supervisor  
U.S. Fish and Wildlife Service  
1601 Balboa Avenue  
Panama City, Florida 32405-3721

Dear Ms. Carmody:

This is in response to your letter of April 18, 2008 regarding the recent decline in river stage on the Apalachicola River as measured at the Chattahoochee gage between April 11 and 14, 2008. In that letter, you requested: 1) clarification regarding the circumstances that resulted in the stage change; 2) assurances that continuing operations will adhere to the fall rate analyzed and approved in the biological opinion (BO) for the Exceptional Drought Operations (EDO) temporary modification of the Interim Operations Plan (IOP) at Jim Woodruff Dam; 3) clarification on how the fall rate will be calculated and implemented; and 4) notice of any changes to the recently submitted modified IOP proposal resulting from this event.

As noted in your letter, we are currently operating under the provisions of the EDO regarding releases from Jim Woodruff Dam. Under these provisions, the IOP maximum fall rate schedule is suspended and fall rates are managed to match the fall rate of the basin inflow (BI). Please note that the EDO does not require a match of the volume of water, but rather a match of the rate of change when releases are being reduced. This technique considers the change in 1-day BI on the falling limb of a rain event, and the fall rate is calculated by measuring the difference between the daily BI of consecutive calendar days. Similar to the IOP fall rate, the fall rate can be measured in feet per day (ft/day) by converting the 1-day BI to an elevation using the Chattahoochee stage-discharge rating curve. The difference in elevation as the basin inflow decreases is defined as the 1-day basin inflow fall rate. The 1-day BI values used to determine the fall rate are calculated by summing the daily local inflows at Buford, West Point, Walter F. George, and Jim Woodruff dams. However, the West Point, Walter F. George, and Jim Woodruff local calculations incorporate a 3-, 2-, and 1-day lag respectively due to the large size of the basin and resultant travel times. The 1-day BI and local values are available on the water management website at the following location: <http://water.sam.usace.army.mil/locals-7-day.htm>. As noted in the BO for the IOP, managing fall rates to conform to specific values is a

difficult undertaking at Woodruff Dam when flow rates exceed the release capacity of the powerhouse, which is about 16,000 cubic feet per second (cfs). Releases greater than 16,000 cfs require the use of spillway gates in addition to the turbines, and require an operator to open or close the gates using a rail-mounted crane on the crest of the dam. The water discharge openings of the gates are not fully adjustable and inclement weather, floating debris from the reservoir, and other factors often complicate the procedure of opening and closing the gates. Fall rates are relatively more manageable when releases are less than 16,000 cfs and controlled by the powerhouse, but this control is also not a precise operation. This is the reason the IOP maximum fall rate schedule describes a lower and upper maximum fall rate rather than specific values.

We are also currently operating to support fish spawn at the projects and in the Apalachicola River. As described in the February 2005 Draft Standard Operating Procedures (SAM-SOP-1130-2-9) for reservoir regulation and coordination for fish management purposes, the U. S. Army Corps of Engineers (Corps) operates for generally stable or rising reservoir levels and generally stable or gradually declining river stages on the Apalachicola River, for approximately 4 to 6 weeks during the designated spawning period for the specified project area. Generally stable or rising levels are defined as not lowering the reservoir levels by more than 6 inches, with the base elevation generally adjusted upward as levels rise due to increased inflows or refilling of the reservoir. Generally stable or gradually declining river stages are defined as ramping down of ½ foot per day or less.

The unusually rapid fall rate experienced between April 11 and 14 was a result of several factors. The EDO was designed to maximize refill potential in the storage reservoirs in an attempt to gain sufficient storage to support the many needs within the basin throughout the continuing drought. Although refill at Lake Lanier has been limited over the winter, Walter F. George and West Point Lakes have refilled due to hydrologic conditions and project operations. As you know, Lake Seminole has essentially no storage. During the month of April, West Point and Walter F. George have been full or in the flood pool. The Corps has accepted this additional risk because of the persistent drought conditions in the upper basin. Significant rainfall (2-7 inches) occurred in the lower basin on April 4-5 (Figure 1). As depicted in Figure 2, this rainfall resulted in increased outflows from Jim Woodruff Dam on April 5-6 from approximately 15,000 cfs to 35,000 cfs (change in stage of approximately 8 feet). The location of the rainfall in the lower basin coupled with a lack of available storage in the lower Corps projects reduced Corps flexibility to store water and re-shape the hydrograph. Consequently, on April 11-13, a roughly equivalent decrease in discharge and river stage occurred as water managers adjusted the releases in response to the rapidly dropping BI. This reduction in discharge was accomplished by incrementally reducing the number of spillway gate openings from step 7, to step 5, to step 0. Figure 2 also illustrates the time line of our operations regarding spillway gate settings.

Figure 3 illustrates a comparison of the Apalachicola River flows, measured at the Chattahoochee gage, to the 1-day basin inflow from March 24 to April 22, 2008. Analysis of the falling limb of the peak event for the two curves provides a comparison of the 1-day BI and Jim Woodruff release fall rates (falling slopes). Although there is a delay regarding the timing of the peak due to the location of the rainfall and actual water travel time versus BI calculation, the discharge fall rate generally matches the 1-day BI fall rate. However, it appears that the discharge fall rate was slightly higher than the 1-day BI fall rate between the afternoons of

April 12 - 13. The decision to reduce releases from Jim Woodruff Dam was based on the hydrologic conditions experienced, a continuing need to maximize storage, and constraints regarding the spillway gate operations. This decision resulted in an inability to meet the provisions of SAM-SOP-1130-2-9. However, the SOP recognizes that droughts and floods within the basin present specific water management challenges that may limit our ability to meet both the reservoir and river spawning provisions. The water managers did not intend to violate the fall rate provisions of the EDO.

Due to the high importance of water management on the Apalachicola-Chattahoochee-Flint (ACF) basin, coupled with the recent loss of highly experienced personnel, several interim management controls have been implemented to insure the best operation possible at Jim Woodruff Dam and the upstream reservoirs. Firstly, the Chief of the Hydrology and Hydraulics Branch has assigned both a primary and secondary Basin Manager to the ACF. Subject to availability, the two Water Managers will jointly agree on operational decisions. Secondly, once an operational decision is made, the proposed operation will then be subject to review by a Senior Water Manager familiar with the ACF basin and Jim Woodruff Dam operations. Finally, all major operational decisions will be approved by either the Chief of the Hydrology and Hydraulics Branch, or his designated representative.

A review of fall rate data over the last 90 days indicates that detailed fall rate monitoring is most critical following rainfall events that result in BI and Jim Woodruff discharge greater than 30,000 cfs. As described in the IOP maximum fall rate schedule, fall rate maintenance does not occur when releases are greater than 30,000 cfs. However, fall rates are managed once BI and corresponding releases drop below 30,000 cfs. Additionally, there are periods when Jim Woodruff discharge increases (rises) when the basin inflow is decreasing (falling). In other words, the basin outflow may increase as the basin inflow decreases. This typically occurs during periods exhibiting rapid changes in the BI. In most cases, the 1-day basin outflow (Jim Woodruff release) rate of change both falling and rising is more gradual than the 1-day BI rate of change. In order to ensure this occurs, the Basin Manager will use hydrograph comparisons to monitor the fall rates. While operating under the EDO or the drought contingency plan incorporated into the recent IOP modifications proposal, a visual comparison between the 1-day BI and Jim Woodruff release fall rates will be performed daily when releases are less than 30,000 cfs to ensure they are reasonably consistent. If necessary, the Basin Manager will also convert the BI fall rate analysis to feet/day using the Chattahoochee gage latest stage-discharge rating (Figure 4).

While at this time we do not recommend any changes to the recent IOP modifications proposal, we are considering, as part of the Water Control Manual update process, including additional language in the Jim Woodruff Dam Water Control Manual regarding Gulf sturgeon spawning behavior and early life cycle requirements. Although this supplemental information will not result in additional provisions regarding releases during the spawning season, it will be readily available for quick reference when system conditions and local hydrology result in the need to adjust releases significantly from standard spawning season operations.

We appreciate your continued cooperation regarding operations at Jim Woodruff Dam in support of endangered and threatened species during the recent exceptional drought period and persisting drought. Should you have any questions, comments, or recommendations, please contact Mr. Brian Zettle, (251) 690-2115, Email: [brian.a.zettle@sam.usace.army.mil](mailto:brian.a.zettle@sam.usace.army.mil).

Sincerely,

A handwritten signature in black ink, appearing to read 'Curtis M. Flakes', with a long horizontal stroke extending to the right.

Curtis M. Flakes

Chief, Planning and Environmental  
Division

Enclosures



Figure 2.

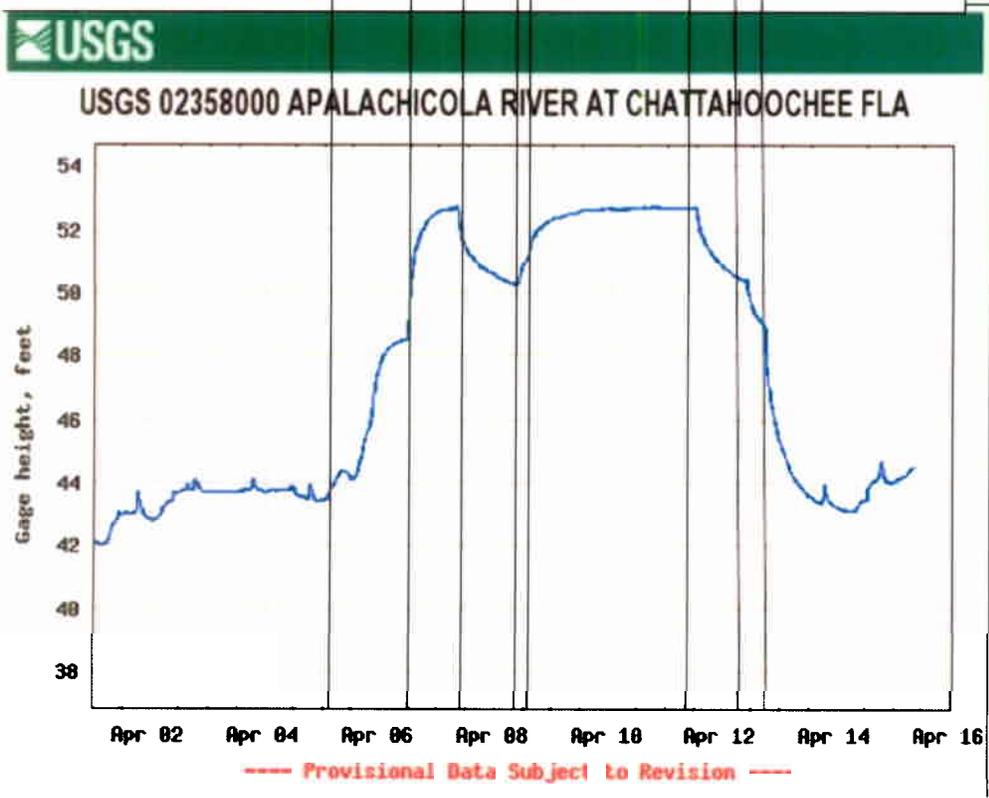
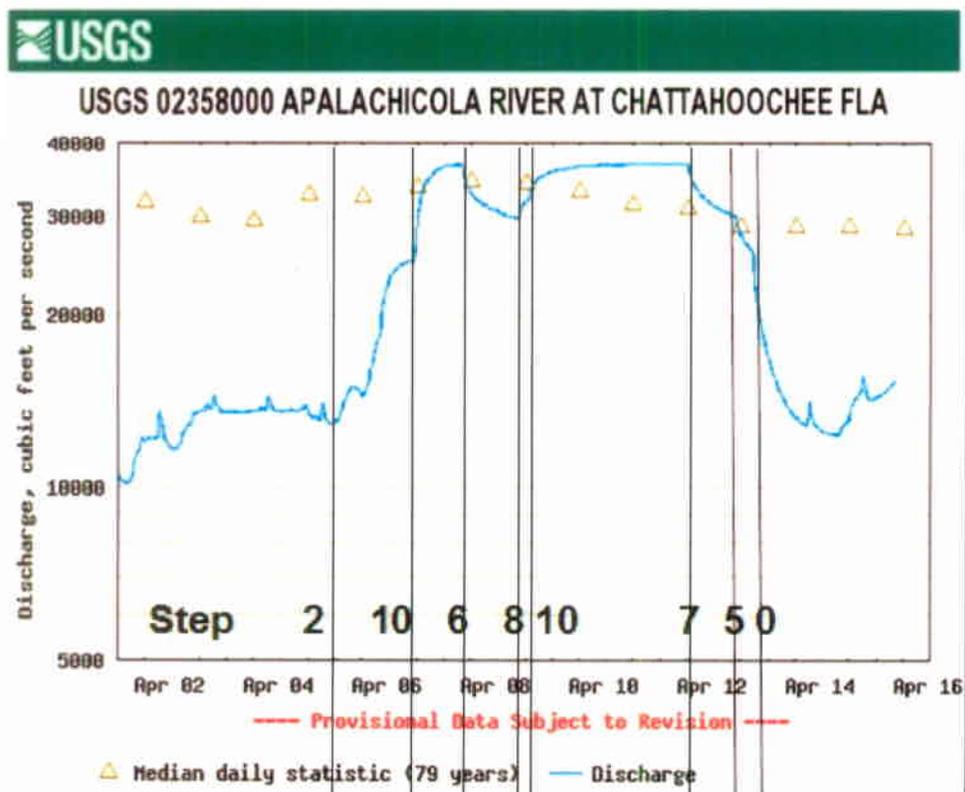


Figure 3.

1-Day Basin Inflow vs. 1-Day Chattanooga Flow

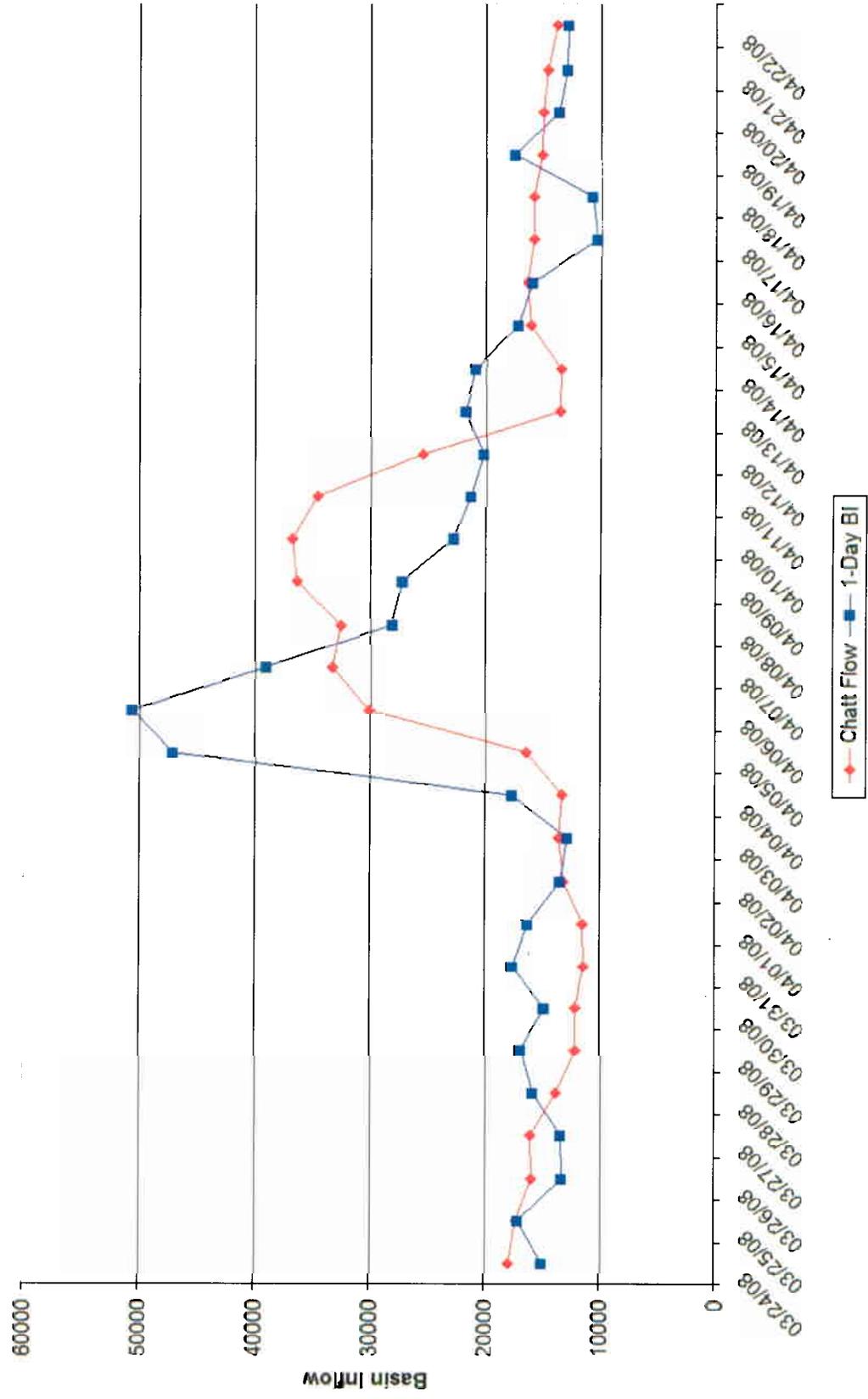


Figure 4.

Comparison of 1-d Basin Inflow vs. 1-d Chatt Flow Fall Rates

