

MEMORANDUM FOR RECORD

SUBJECT: Jim Woodruff Dam Interim Operations Plan, Biological Opinion RPM3 – Drought Provision Workshop, 13 December 2006

1. On 13 December 2006, the US Army Corps of Engineers (Corps), Mobile District, and the US Fish and Wildlife Service (USFWS) hosted a 1-day workshop in Columbus, Georgia, relating to the Jim Woodruff Dam Interim Operations Plan (IOP) and requirements of the Biological Opinion issued by the USFWS on 5 September 2006. The purpose of this workshop was to present to the States of Alabama, Florida, and Georgia, and other stakeholders, a draft concept for a drought provision as developed by the Corps in consultation with the USFWS over the past couple of months. Technical comments on the draft concept were also anticipated from the workshop participants, as well as alternative concepts or considerations for incorporation into a drought provision. A copy of the draft agenda for the workshop and the list of workshop participants is attached.
2. Joanne Brandt, Mobile District, presented a summary of the IOP and requirements contained in the Biological Opinion. Reasonable and Prudent Measure No. 3 (RPM3) and associated terms and conditions of the Biological Opinion require the Corps to initiate a drought provision by 30 January 2007. The purpose of the drought provision is to identify the hydrologic and/or climatic conditions that would allow a higher minimum flow than the 5000 cfs minimum specified in the IOP to be released to the Apalachicola River; and identify the drought provision or “drought triggers” that would determine when the lower 5000 cfs minimum flow rather than the higher flows would be released. An excerpted summary of the RPMs and terms and conditions of the Biological Opinion are attached for reference.
3. Rob Erhardt and Memphis Vaughan, Mobile District, presented data on the 2006 drought conditions relative to previous droughts within the ACF basin, including the 1941, 1956, 1981, 1988, and 2000 drought conditions. We are currently experiencing a moderate El Nino climatic condition. Rob noted that the 1960s and 1970s may have presented an anomalous wetter than normal condition, with conditions since the 1980s exhibiting the normal variations between extremes of wetter and drier climatic conditions. El Nino conditions typically produce wetter than normal conditions in the southern Gulf state region along the coast, but normal to drier than normal in the northern portions of Alabama and Georgia. Memphis demonstrated the comparative impacts on reservoir levels in 2006 compared to the previous historic droughts.
4. James Hathorn presented several concepts for a drought provision as developed over the past few months in consultation with USFWS. Concept 1 through Concept 4 represent an evolution of concepts considered and then either incorporated or ruled out as an element of a drought provision. It should be noted that the proposed Concepts 3 and 4 are still considered draft concepts at this time, and the Corps and USFWS are interested in technical comments on these concepts.

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a. Concept 1 represents the first iterations of model runs, in an attempt to determine whether a higher minimum flow than 5,000 cfs could be supported. Several higher minimum flows were modeled, including 6,000 cfs, 6,300 cfs, 6,000 cfs and 8,000 cfs. All of these flows demonstrated significant draw downs of the reservoirs during critical drought periods.

b. Concept 2 included a provision to reduce the Spring upper flow threshold from 37,400 cfs to 25,000 cfs; and the Spring lower flow threshold to 16,000 cfs. These adjusted flow thresholds were suggested by USFWS for demonstration purposes. The models were run for higher minimum flows of 5,800 cfs, 6,500 cfs and 7,000 cfs, based on “real-world” operating system constraints. All scenarios showed shortages during the 2000-2001 drought conditions. In some cases, even the 5,000 cfs minimum flow could not be maintained.

c. Concept 3 includes the adjustments of the Spring upper and lower flow thresholds as described in Concept 2, and operate for a higher minimum flow of 6,500 cfs (desired flow) during normal to wetter conditions; with a drought trigger based on system composite storage used to determine when the minimum flow would revert back to the 5,000 cfs minimum (required flow) included in the current IOP. The drought provision concept would provide for release of the desired flow (6,500 cfs) until the composite storage fell below the Zone 3 boundary; at which time the drought trigger would provide for a minimum release of 5,000 cfs. This 5,000 cfs required minimum release would be in place until the composite storage recovered to the bottom of Zone 1, at which time the drought trigger would be de-activated and the desired minimum flow of 6,500 cfs would be re-implemented. Modeling did not demonstrate any shortages for any of the historic drought flow conditions.

d. Concept 4 includes Concept 3 operations, with the additional modification that the maximum amount of storage retained when operating between the upper and lower flow thresholds would be increased from 30 percent stored to 50 percent stored. This alternative had not been previously discussed with USFWS, but was presented just to demonstrate whether there would be any additional benefit in storage that could assist in providing a higher minimum flow. There were no significant differences in reservoir impacts observed between Concept 3 and Concept 4, although additional or more detailed modeling could demonstrate some differences.

5. Wei Zeng of GA-EPD noted he was encouraged by the concepts presented by the Corps, and he may use these concepts to assist in his additional evaluations of the IOP. Wei gave a presentation regarding spring flow needs for the sturgeon spawning, relating to availability of habitat by flow, and corresponding velocities by flow. Wei asserted that based on the two known gulf sturgeon spawning sites, the greatest efficiency in area of habitat provided may be provided by flows between 11,000 cfs and 18,000 cfs, since higher flows may make some habitat areas unusable due to depth and/or velocity (USFWS determined successful spawning occurs between 8.5 ft and 17.8 ft depth over hard bottom habitat, based on egg collections in 2005 and 2006, and less suitable habitat may be available when water depth over hard bottoms exceeds this range). Wei also noted the Biological Opinion states acceptable ranges of velocities for various life stages of sturgeon, and recommended that these be considered in any drought provision or modification to the IOP.

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6. Dan Sheer and Megan Rivera of Hydrologics (representing ARC) presented modeling results for an alternative concept for a drought provision and IOP operation. This concept would use either the Hirsch or NWSRFS methods of forecasting hydrological conditions within the basin to make water management decisions on a weekly basis. The concept would attempt to provide the highest minimum flow while also assuring refilling of the reservoirs in the system by 1 June of each year, and uses the 90 percentile flow projections. Lake Lanier was used as a surrogate for determining whether the system was full. Once the system was full, additional flows would be used to meet public health and safety (water supply and water quality demands), or to enhance endangered species flows (up to a release of 10,000 cfs from storage). The intent of this concept is to use forecasting to identify the largest minimum flow that can be released without compromising the next year's flow. No hydropower generation or other project purpose operations were included in the model (other than conjunctive release generation).

7. DISCUSSION.

a. It was suggested that additional evaluation of modeling results include showing pool elevations in relation to the action zones for each reservoir, so it could be determined how frequently the reservoirs were in specific zones between the different scenarios (Concept 3 and 4). James suggested that the DSS files could be posted for download by the various modelers for analysis and comparison of modeling outputs. The Corps agreed to post their modeling results for Concept 3 and 4 on a .FTP site for technical modeler use.

b. It was requested that a table of the Corps modeling assumptions be provided. The Corps agreed to provide a spreadsheet/table including a listing of the model settings and assumptions.

c. It was suggested that additional modeling runs be conducted, even if just for "sensitivity analysis" purposes, showing any differences in results due to storage of greater than 50 percent of basin inflows.

d. Another possible drought trigger or component of a trigger could be consideration of basin inflow on the Flint River. States and stakeholders were encouraged to recommend any other elements as appropriate.

e. ARC asked what USFWS would use for a baseline for comparison of the effects of the drought provision. Gail indicated that first we must determine that the drought provision would avoid or minimize adverse effect or harm to the mussels. Gail noted that there would also be evaluation of potential impacts to sturgeon spawning habitat availability. The Corps would conduct the analysis of the drought provision operation similar to that incorporated in the Biological Opinion, which compared impacts of the IOP operation to a baseline of post-West Point Lake operating conditions. Results of the IOP and the drought provision operations could also be compared with one another. Gail also noted that the administrative record for the IOP which was recently provided to the States includes all the tools used by USFWS in the Biological Opinion analyses.

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f. FWCC was concerned that analysis of impacts of the drought provision or any modification to the IOP take into account impacts to floodplain connectivity and inundation, which is important for reproduction and other life cycle needs of host fish for mussel species. It was noted that this analysis was included in the Biological Opinion and would be replicated for the drought provision analyses.

8. The Corps agreed to post copies of the workshop presentations on the Corps website: <http://www.sam.usace.army.mil/ACF.htm>. Comments on the draft drought concept were requested by 10 January 2007.

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