

Jim Woodruff Dam

Section 7 Consultation

and

Interim Operations Plan

Endangered Species Act of 1973

Section 7 Consultation

- “All Federal agencies shall, in consultation with and with the assistance of the Secretary of the Interior/Commerce, insure that any actions authorized, funded, or carried out by them do not jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary (Interior/Commerce) to be critical, unless an exception has been granted by the Endangered Species Committee.”

Federally Listed Species and Critical Habitat on Apalachicola River

- Gulf sturgeon – listed as threatened in Sep 1991; critical habitat listed Mar 2003
- Fat threeridge mussel – listed as endangered in Mar 1998
- Purple bankclimber mussel – listed as threatened in Mar 1998
- USFWS intends to propose critical habitat for listed mussels on 31 May 2006 – likely to include Apalachicola River

Section 7 Consultation

- Mobile District has been informally consulting with USFWS since 2000 on potential for impact to Gulf sturgeon and mussels
 - Impact of navigation window in Spring 2000 on fish spawning in Apalachicola River
 - Impact of drought operations on mussels in summer of 2000
 - Impact of reservoir fish spawn management on Apalachicola River/Gulf sturgeon spawning in 2002

Informal Consultation

- Potential for impact to Gulf Sturgeon or critical habitat for Gulf sturgeon
- Potential for impact to listed mussel species (Fat threeridge and Purple bankclimber mussels)
- Surveys of Gulf sturgeon spawning habitat and flow/depth study
- Mussel surveys and flow/depth distribution study
- Draft SOP for fish spawn operations to include management for Apalachicola River species in addition to reservoir fish spawn management – annual meetings
- Development of low flow operations protocol in 2004 (i.e., match releases to basin inflows)

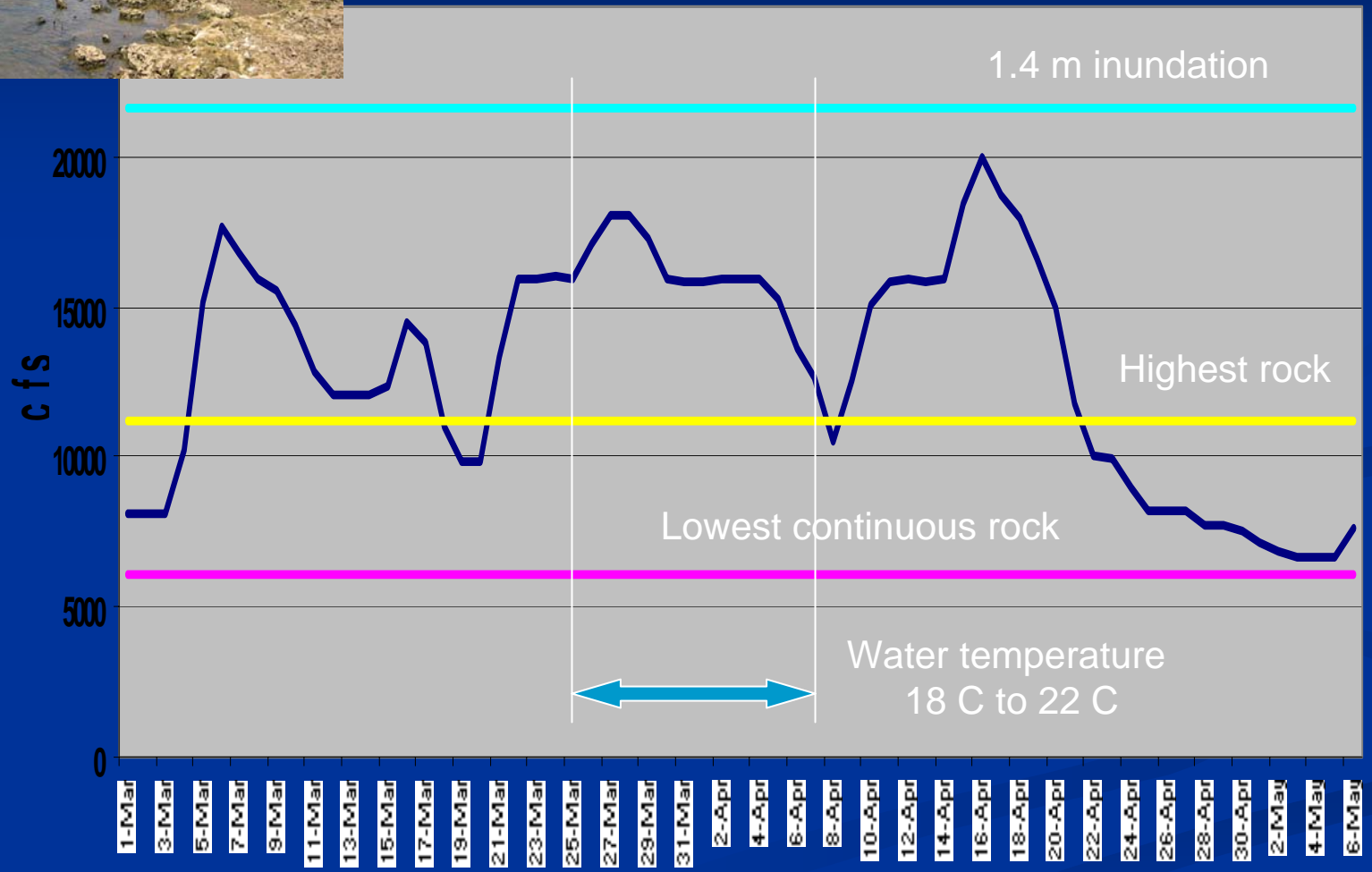
Gulf Sturgeon Spawning Flow Requirements

- Sampling in 2005 collected sturgeon eggs on rock ledge at NM 105 at flows between 37,400 cfs and 20,400 cfs
- Rock ledge at NM 105 is completely inundated to depth of 4.5 ft. at flows of 30,000 cfs
- At flows of 20,400 cfs approx. 75% of rock ledge is inundated to depth of 4.5 ft.
- Rock ledge at NM 105 becomes exposed at flows of 16,000 to 18,000 cfs
- Spawning habitat is a primary constituent element of critical habitat





Woodruff Discharge 3/1 to 5/6 2002



Flow Requirements for Protected Mussels

- Endangered Fat threeridge mussel and threatened Purple bankclimber mussel occur on the Apalachicola River
- Mussel surveys completed in the mid-1990s through 2003
- Mussel population locations and relative depth distribution have been correlated to flows
- Mussels begin to become exposed at flows of 8,000 cfs or less
- FWS has stated that continued existence of mussels could be jeopardized at flows less than 5,000 cfs

Informal Consultation Ramping Rates

- Attempt to mimic “natural flows”
- Minimize impacts on downstream habitat
- Minimize trapping of fish in out-of-bank or floodplain pools after high flows
- Reduce exposure/mortality of mussels
- Reduce bank sloughing
- Rates: 0.5 to 1.0 ft per day when flows are less than 20,000 cfs; Goal of 0.5 ft per day or less during fish spawning and for mussels

Formal Section 7 Consultation

- Interim Operations Plan for releases from Jim Woodruff Dam to the Apalachicola River
 - Incorporates elements developed or agreed to during informal consultation
 - Based on basin inflow and incorporates new information collected during informal consultation
- Formal Section 7 consultation requested on 7 March 2006
- FWS letter dated 9 March 2006 – intent to complete Formal Consultation by 21 July 2006

Intent of Interim Operations Plan

- Provide year-round operations to support flow needs for sturgeon spawning, young sturgeon, mussels, and host fish for mussels
- Minimize or avoid impacts of low flow operations on listed species or critical habitat
- Provide for storage when water is more plentiful to allow for future augmentation during low flows in support of mussels
- Minimize conflicts with management for other fish and wildlife species (e.g., reservoir fish management)

Interim Plan for March - May

Based on Basin Inflows (BI)

- If $BI \geq 37,400$ cfs, Woodruff outflow $\geq 37,400$ cfs
- If $BI > 20,400$ and $< 37,400$ cfs, outflow $\geq 20,400$ cfs and at least 70% of BI
- If $BI \leq 20,400$ cfs, outflow = BI
- Outflow $\geq 5,000$ cfs

Interim Plan for June - February

- If $BI \geq 37,400$ cfs, Woodruff outflow $\geq 37,400$ cfs
- If $BI > 8,000$ and $< 37,400$ cfs, outflow $> 8,000$ cfs and at least 70% of BI
- If $BI \leq 8,000$ cfs, outflow = BI
- Outflow $\geq 5,000$ cfs

Interim Plan Ramping Rates

- Exceeds Powerhouse Capacity (18,000 cfs)
0.5 to 1.0 ft/ day*
- Within Powerhouse Capacity and $>8,000$ cfs
0.25 to 0.5 ft/day*
- Within Powerhouse Capacity and $\leq 8,000$ cfs
0.25 ft/day or less*

*Consistent with safety requirements, flood control operations, and equipment constraints

**U.S Army Corps of Engineers, Mobile District
Interim Operations at Jim Woodruff Dam
and Releases to the Apalachicola River
In Support of Listed Mussels and Gulf Sturgeon**

Minimum Releases

Months	Basin Inflow (BI) (cfs)	Releases from JWLD (cfs)	Justification
March - May	$\geq 37,400$	not less than 37,400	Max. known flow of sturgeon spawning in the Apalachicola. All of rock shoal inundated by more than 4.59 ft. Majority of floodplain aquatic habitat (61%) in which mussel fish hosts may spawn is connected to the main channel. Peak flows of this magnitude or greater have occurred in all but 5 out of 85 years of record. No evidence of adverse effects to listed species if Corps stores BI above this level in these months while observing down ramping rates.
	$\geq 20,400$ and $< 37,400$	$\geq 70\%$ to 90% BI; not less than 20,400	In 2005 successful sturgeon spawning was documented to occur between 20,400 cfs and 37,400 cfs. All of rock shoal habitat at NM 105 is inundated in this range, and most ($>73\%$) inundated with > 4.59 ft (the min. reported depth of Gulf sturgeon spawning in any river). Storing up to 10% of BI (i.e., releasing $\geq 90\%$ BI) in this flow range would insignificantly affect the area of the rock shoal inundated or other characteristics that may influence its suitability as spawning habitat. During normal to wet periods releases would equal or exceed 90% BI. During extended dry or drought periods, if composite storage is less than full, it may be prudent to release less than 90% in order to all some refill for future augmentation flows. Releases between 70% and 90% of basin inflow would still provide access for spawning to between 74% and 100% of the rock ledge habitat at NM 105.
	$< 20,400$	\geq BI; not less than 5,000	No discretionary action except flow augmentation and ramping rates. 5000 cfs is the minimum condition to ensure using water stored during discretionary actions in other flow ranges and time periods.

Months	Basin Inflow (BI) (cfs)	Releases from JWLD (cfs)	Justification
June - February	>= 37,400	not less than 37,400	Majority of floodplain aquatic habitat (61 %) in which mussel fish hosts may spawn and rear is connected to the main channel. Peak flows of this magnitude or greater have occurred in all but 5 out of 85 years of record. No evidence of adverse effects to listed species if Corps stores BI above this level in these months while observing down ramping rates.
	>= 8,000 and < 37,400	> 70% to 90% BI; not less than 8,000	Max. known stage of listed mussels on the river bed (8000 cfs). Storing up to 10% of BI (i.e., releasing >= 90% BI) in this flow range would insignificantly effect habitat features relevant to sturgeon and mussel conservation in these months while observing down ramping rates. No mussels would be exposed. During normal to wet periods releases would equal or exceed 90% BI. During extended dry or drought periods, if composite storage is less than full, it may be prudent to release less than 90% (store some water from rain events) in order to allow some refill for future augmentation flows. Water stored during these conditions would be available for future augmentation to maintain flows above BI when 8000 cfs >BI >= 5000 cfs, and above 5000 cfs when BI < 5000 cfs.
	< 8,000	>= BI; not less than 5,000	No discretionary action except flow augmentation and ramping rates. 5000 cfs is the minimum condition to ensure using water stored during discretionary actions in other flow ranges and time periods.

Down Ramping Rates

Release Range	Maximum Fall Rate (ft/day), measured at Chattahoochee gage	Justification
Exceeds Powerhouse Capacity* (~18,000 cfs)	0.5 to 1.0 ft/day	Apalachicola River fall rates of greater than 0.5 ft/day were extremely rare prior to construction of the Corps ACF projects (analysis of gage records from the 1920s to present), except during flood pulses. Mussels and early sturgeon life stages have limited mobility to avoid stranding. The Corps ability to control fall rates at less than 0.5 ft/day when releases exceed the powerhouse capacity is very limited, but the stranding risk to listed species at these high flows is also limited (e.g., all of the known sturgeon spawning rock shoal is inundated by flows greater than 18,000 cfs). Previous operations have attempted to produce a fall rate of 0.5 ft/day or less whenever flows are less than 20,000 cfs, and less than 1.0 ft/day at flows greater than 20,000 cfs. These rates represent the best attempt within current capabilities to limit stranding risks of other species in the floodplain, such as potential mussel host fishes. Rates will approximate 0.5 ft/day, but not more than 1 ft/day except in emergency conditions.
Within Powerhouse Capacity and > 8,000 cfs*	0.25 to 0.5 ft/day	More gradual (lesser) fall rates become a greater conservation concern at flows that approach the stages at which the mussels are found and are achievable when releases are from the powerhouse instead of the spillway gates. 8,000 cfs is the highest stage at which the listed mussels are found. Fall rates of approximately 0.25 ft/day in advance of this stage gives mussels several days to move to lower bed elevations. 9,000 cfs provides approximately 0.5 ft or greater above the highest-stage listed mussels.
Within Powerhouse Capacity and <=8,000 cfs*	0.25 ft/day or less	8,000 cfs is the highest stage at which the listed mussels are found and when the most gradual rates are required if flows decline further. Fall rates of approximately 0.25 ft/day give the mussels several days to move to lower elevations. Rates of less than 0.25 ft/day may be possible when making releases from the powerhouse, but are more difficult to achieve (incremental reduction in releases of 500 cfs/day approximates 0.25 ft/day). Previous operations have been in range of 0.25 and 0.5 ft/day during sustained low flow periods. These rates appear to be within the tolerance of the two species ability to move to lower stages. It is supported mainly by the fact that they are present at stages above 5000 cfs after several years of flows hovering around 5,000 cfs for extended periods during the drought of 1998-2002.

*Consistent with safety requirements, flood control purposes, equipment capabilities.

Note: These operations are considered sufficient to minimize adverse effects on the listed species to the maximum extent practicable or feasible based on equipment constraints, and safety concerns. Consideration is also given to the need to balance releases to the river with the need to refill or conserve storage in upstream reservoirs in the interest of having adequate storage in later months when augmentation flows may be necessary to protect listed mussel species. Any of the numbers in this table are subject to revision based on better information that may be developed during the Section 7 consultation process. FWS recommends the release of 90% of BI as the degree to which the Corps could store water during intermediate flow ranges (i.e., March through May when BI is between 37,400 cfs and 20,400 cfs; and June through February when BI is less than 37,400 cfs and greater than 8,000 cfs) such that the amount of flow depletion would not measurably alter habitat quality features in those flow ranges (e.g., temperature, DO, channel area inundated, etc.). Although this requirement can be met during normal to wet periods, it may not be reasonable or prudent during extended dry or drought periods. Therefore, the Corps proposes a sliding percentage between 90% and 70% BI that would be released during extended dry or drought periods. The goal would be to release 90% BI. In the event this was not feasible or prudent (i.e. would prevent sufficient refill or conservation of storage to guarantee future augmentation flows for mussels or to meet other critical project purpose needs), then informal consultation discussions would be conducted with FWS to determine the appropriate percentage release and the justification for the reduced percentage release. The release to the Apalachicola River would be at least 70% BI. The 70% to 90% BI release would assure that at least 74% of the rock ledge spawning habitat at NM 105 would be submerged to a depth of 4.59 ft or greater during spawning periods during these intermediate flows during this discretionary action. No mussels would be exposed during these intermediate flows due to discretionary action. Any reduction in releases would represent a trade-off of minimal impact on other habitat or host species requirements in order to provide future augmentation flows as required to prevent or minimize mussel mortality due to exposure.

Interim Operations Plan

- Numbers in Plan subject to change based on new information
 - E.g., Powerhouse capacity = 16,000 cfs
 - Results of sturgeon spawning monitoring efforts in 2006?
 - How to calculate basin inflows?
 - How to account for ramping rates?
 - What is appropriate threshold for flood control operations?