

CRS Report for Congress

Apalachicola-Chattahoochee-Flint (ACF) Drought: Federal Reservoir and Species Management

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Apalachicola-Chattahoochee-Flint (ACF) Drought: Federal Reservoir and Species Management

Summary

Drought in the Southeast in 2007 has brought attention to an ongoing interstate water conflict among Alabama, Florida, and Georgia over management of the Apalachicola-Chattahoochee-Flint (ACF) river basin. How the current drought is managed may set precedents for federal drought responses on other rivers regulated by federal dams and for future management of the ACF. The current debate about managing the ACF is focused on whether the U.S. Army Corps of Engineers (Corps) should implement emergency measures to preserve more water in storage than is possible under current operating procedures. The water at stake is vital for municipalities (including Atlanta), electricity generation, threatened and endangered species, and the Apalachicola Bay oyster industry.

Drought in the ACF has escalated competition for the water in federal reservoirs that are near or at record lows. Reservoir drawdown and predictions for a continued drought have Georgia's upper basin municipal customers concerned about depleting their principal water supply, Lake Lanier. They also have Alabama's and Florida's lower basin interests concerned about river flows to meet their municipal, electricity, and ecosystem needs. At issue is how to manage federal reservoirs to meet municipal and industrial water needs equitably in the upper and lower basins, while maintaining compliance with federal law (e.g., the Endangered Species Act (ESA)) and minimizing harm to the ACF river and Apalachicola Bay species and ecosystems.

The Corps has proposed Exceptional Drought Operations that would maintain a 16% lower flow in the Apalachicola River, thereby reducing the rate of drawdown of federal reservoirs. The Corps currently is releasing water from Lake Lanier to meet the minimum flow requirement in the Apalachicola River. Consultation with the U.S. Fish and Wildlife Service under the ESA was initiated on November 1; a response from the Service was anticipated as early as November 15. Three species protected under the Endangered Species Act — two mussels and a sturgeon — depend on minimum flows in the Apalachicola River; to date, the current flows have been considered the minimum for these species. Maintaining more water in storage now would benefit Atlanta because more water would be available in Lake Lanier and for release to the Chattahoochee River next year. The Corps' proposal does not appear to cause significant immediate harm to electricity generation or grid reliability.

Federal decision-makers and the governors of the three states are faced with weighing the impacts of reducing flows against the benefit of improved water supply security. The current drought is raising the prominence of species protection as a factor in river management. It is also raising concerns about the vulnerability of urban areas to surface water supply shortages. Many view the conflict in the ACF as a harbinger of increasing competition for water in basins across the nation, including others in the East, and as a testing ground for legal action on federal river management, especially during drought. Moreover, resolution of conflicts between endangered species and other uses in the ACF basin could have much wider implications for ESA implementation, especially in western states.

Contents

Current Issues: Tradeoffs During Droughts	1
ACF Primer	2
Federal Dams Regulate for Multiple Uses	2
Relationship Between Federal and State Authorities	4
ESA and the ACF	4
NEPA and the ACF	4
The Current Drought	5
Reservoir Storage Conditions	6
The Three Species: A Sturgeon and Two Mussels	7
Corps' Proposal for Reducing Minimum Flows	8
Municipal Water Supply Issues	10
M&I Water Supply	10
Atlanta/North Georgia Water Supply	11
Electric Power Generation and Issues	12
Hydroelectric Generation	13
Nuclear Generation	13
Coal-Fired and Natural Gas-Fired Generation	14
Species and Ecosystem Issues	15
Bay Ecosystem and Industry	16
River Management and the Three ESA Species	17
The Three Species Under the Corps' Proposal: Consultation under § 7 of ESA	17
Other Options for Reducing Minimum Flows	20
Options Under the ESA	20
Dim Prospects Under the Disaster Provision	20
An Outright Exemption: The Long Road	21
Changing Current Law and Questions Raised	21
ACF in the Federal Water Policy Context: Conclusions	22
Appendix A. ACF Compact and Lawsuits	24
Appendix B. Is a NEPA Review Required?	27
Emergency Exception	28
The Right to Sue under NEPA	29
Appendix C. How the Endangered Species Act Works	30
Appendix D. The Corps and ACF Species Management: A Brief History	31

List of Figures

Figure 1. ACF Dams and Selected Power Plants	3
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Apalachicola-Chattahoochee-Flint (ACF) Drought: Federal Reservoir and Species Management

Current Issues: Tradeoffs During Droughts

Drought in the Southeast has brought attention to an ongoing interstate water conflict involving Alabama, Florida, and Georgia over management of the Apalachicola-Chattahoochee-Flint (ACF) river basin. The water at stake is vital for the basin's municipalities (especially Atlanta), electric power plants, navigational interests, irrigators, threatened and endangered species, and the Apalachicola Bay oyster industry. How the current drought is managed may set precedents for future federal drought responses, as well as the long-term management of the ACF.

Drought has escalated competition for the water in the ACF reservoirs, which are near or at record lows. The operation of federal reservoirs shape both the quantity of stored water and the river flows that support federally protected aquatic species and other public or private uses. Reservoir drawdown and predictions for a continued drought have Georgia's upper basin municipal customers concerned that their principal water supply may be depleted. They also have lower basin interests concerned about availability of current and future river flows to meet their municipal, electricity generation, and ecosystem needs. At issue is how to manage U.S. Army Corps of Engineers (Corps) reservoirs to meet municipal, agricultural, and industrial water needs equitably in the upper and lower basin, while maintaining compliance with federal law (e.g., the Endangered Species Act (ESA)) and minimizing harm to the ACF river and Apalachicola Bay ecosystems.

This report discusses issues in the ACF drought response, including the federal role. It also underscores that decision-makers are faced with weighing possible impacts of reducing flows in the current year to maintain water in storage against the benefit of improved water supply security next year. Many aspects of the complex ACF system are not discussed in detail in this report (e.g., navigation flows and commercial traffic in the ACF, the interconnections of the ACF to the Alabama-Coosa-Tallapoosa (ACT) basin, state or local water conservation efforts). Rather, the focus of the report is on selected federal issues related to federal reservoir management during drought. The first section of the report provides a brief introduction to the basin's water resources and issues, the current drought, and the Corps' proposal for reducing minimum flows for species to reduce the drawdown rate of federal reservoirs. Each of the next three sections discusses how the drought is affecting different water uses — municipal water supply, electric power generation, and species and ecosystems — and the potential impacts of the Corps' proposal. The last section discusses other alternatives for reducing the minimum flows under ESA and in proposed legislation. The report concludes with general comments about the ACF and the issues it raises in the broader context of federal water resources policies and projects.

ACF Primer

Federal Dams Regulate for Multiple Uses

The ACF basin drains areas of northern and western Georgia, southeastern Alabama and northwest Florida. (See **Figure 1.**) The basin extends from the Blue Ridge Mountains to the Gulf of Mexico at Apalachicola Bay. The basin's waters are used for hydropower generation at federal and private dams, for nuclear and fossil fuel powerplant cooling, for municipal drinking water, for agriculture, and for industrial water supplies. The rivers' flows also support species listed as threatened or endangered under the Endangered Species Act (ESA). The species most directly affected by the river system's management are discussed below. The ACF also provides freshwater into the river-dominated ecosystem of the Apalachicola Bay, which supports a regionally significant oyster industry.

Congress first authorized construction of federal facilities for water resources development of the ACF in 1946.¹ The Corps operates five dams — four on the Chattahoochee and one on the Apalachicola River at the confluence of Chattahoochee and Flint Rivers. Four of these dams — Buford Dam forming Lake Lanier (62% of the Corps' ACF storage capacity), West Point (18%), W. F. George (14%), and Woodruff (6%) — provide water storage. These facilities and other nonfederal dams in the ACF also have hydroelectric facilities. The fifth federal dam — Andrews Dam — is operated for navigation. The Corps has contracts with local interests for municipal and industrial (M&I) water supply storage space at Lake Lanier.² Lake Lanier provides Metropolitan North Georgia, the 10-county region that includes Atlanta, with 72% of its water supply.³

Since June 1990, the Corps has been managing the ACF under the agency's October 1989 *Draft Apalachicola-Chattahoochee-Flint Basin Water Control Plan* (WCP). In the fall of 2006, the Corps modified its operations under the plan to comport with an Interim Operating Plan (IOP) for Woodruff Dam.⁴ The Corps developed the IOP, in consultation with the U.S. Fish and Wildlife Service (FWS), to guide Woodruff Dam operations until an updated ACF water control plan is adopted; the IOP includes minimum instream flow requirements for protection of threatened and endangered species.

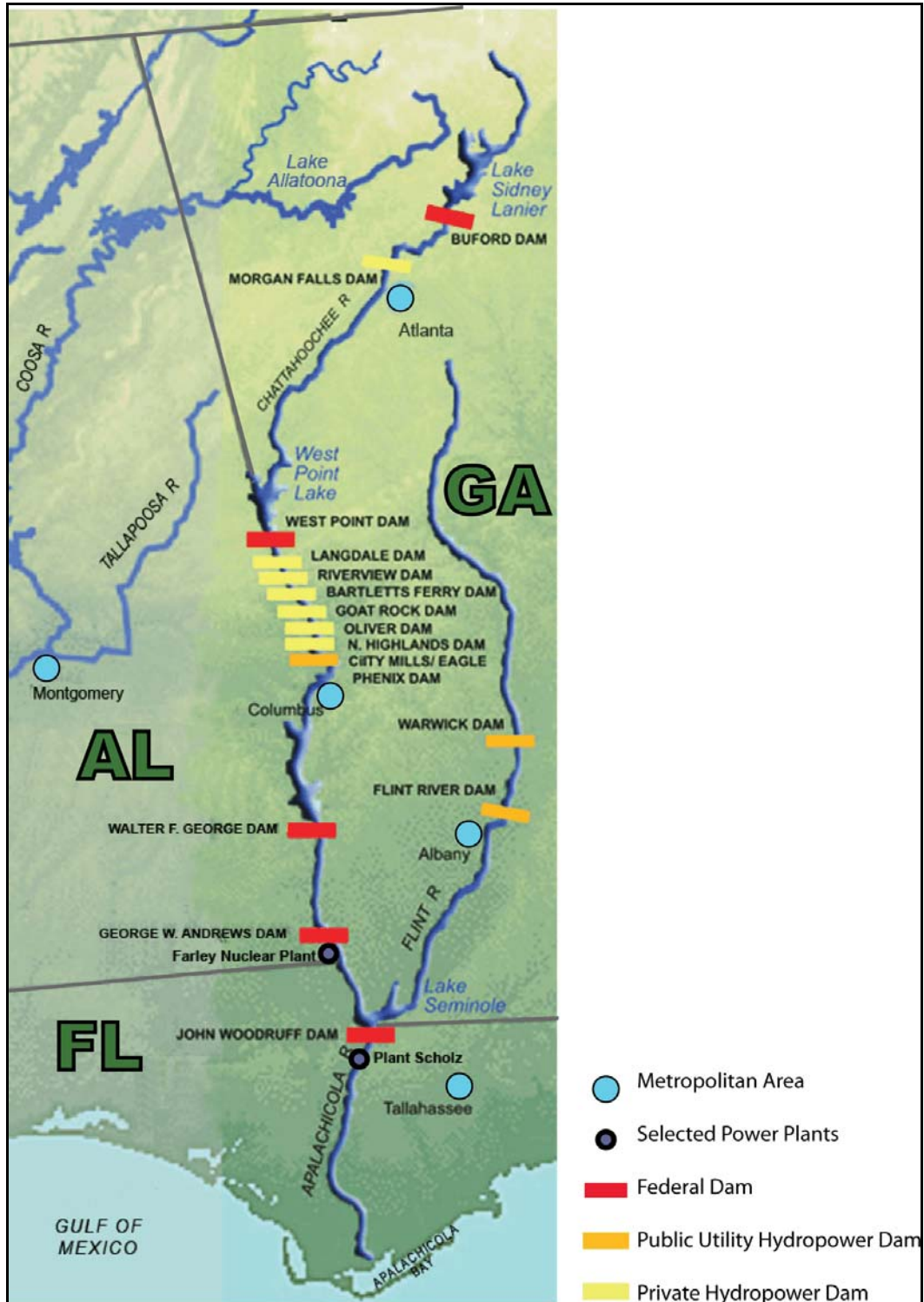
¹ Rivers and Harbors Act of 1946 (60 Stat. 634, 635).

² The Corps principally cites the Water Supply Act of 1958 (43 U.S.C. §390b) as its authorization to make water supply storage space available for M&I purposes. The act does not authorize the Corps to sell or allocate quantities of water. The contracts are for space in the reservoir and do not guarantee a fixed quantity of water. The Corps delivers the water if it is available in the storage space. The act does not authorize the Corps to make significant modifications to its projects in order to provide for M&I water supply.

³ Data from *Water Supply* website of the Atlanta Regional Commission, available at [http://www.atlantaregional.com/cps/rde/xchg/arc/hs.xsl/273_ENU_HTML.htm].

⁴ The IOP is integrated into the agency's *Environmental Assessment Interim Operations Plan for Support of Endangered and Threatened Species, Jim Woodruff Dam* (October 2006). Hereafter referred to as the IOP. Available at [http://www.sam.usace.army.mil/ACF%20Water%20Resources%20Management/JWDSect7/JWD_IOP_FONSI_EA/IOPF inalEA.pdf].

Figure 1. ACF Dams and Selected Power Plants



Source: Adapted from a Corps map at [<http://www.sam.usace.army.mil/Drought2007/droughtacf.htm>].

Relationship Between Federal and State Authorities. The federal government has authority to manage water resources, but it recognizes the states' authority to allocate and use water within their jurisdiction. Federal laws often require federal agencies engaged in water resources management to defer to state laws or cooperate with state officials in implementing federal laws. Although a state generally has broad authority over waters within its border, exercise of its intrastate authority cannot entirely dismiss the interests of other states. In the case of the ACF, there are three states involved in sharing the basin's water resources, and the Corps operates its five dams for multiple purposes — hydropower, flood control, navigation, water quality, water supply, recreation, and fish and wildlife conservation. Although the three states have authority over their waters, federal investments were made to develop the ACF for multiple purposes. The basin's federal dams control the releases to the rivers, thereby shaping the states' use of the water. After almost 20 years of lawsuits about and attempts at allocating water among the basin states, the three basin states have been unsuccessful at resolving how to allocate water through a compact. Consequently, the Corps' ACF operations have been the subject of extensive and ongoing litigation extending over nearly two decades. Most recently, the operations' impacts on federally protected species have joined the fray. (See **Appendix A** for an introduction to the history of efforts to establish an ACF Compact and selected ACF suits in federal courts.)

ESA and the ACF. While the ESA plays an important role in protecting species, it can also become a surrogate in quarrels whose primary focus is the allocation of scarce or diminishing water, lands, or other resources. Indeed, a stated purpose of the ESA is to “provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved.” (16 U.S.C. §1531(b).) Because other laws often lack ESA's strict substantive provisions, the act often becomes a surrogate battleground in such disputes, as it does in ACF management.

NEPA and the ACF. Another factor in the Corps' plan to release less water is whether an environmental review document, such as an environmental assessment (EA) or an environmental impact statement (EIS), is required under the National Environmental Policy Act (NEPA) (42 U.S.C. §§4321 et seq.). NEPA requires federal agencies to prepare an EIS when their actions constitute “major Federal actions significantly affecting the quality of the human environment.”⁵ The act requires that agencies comply “to the fullest extent possible.”⁶ However, NEPA does not require any particular results, such as choosing the least harmful project. The U.S. Supreme Court has said NEPA “merely prohibits uninformed — rather than unwise — agency action.”⁷ Accordingly, where courts have found that agencies took a hard look at the relevant areas of environmental impact and satisfied the other demands of Section 4332(2)(C), the courts have upheld the NEPA process. (See **Appendix B** for a discussion of NEPA and management of the ACF basin.)

⁵ 42 U.S.C. §4332(2)(C). For more details on environmental reviews, see CRS Report RS20621, *An Overview of the NEPA Process*.

⁶ 42 U.S.C. §4332.

⁷ *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351 (1989).

The Current Drought

Droughts create water management challenges because they are creeping disasters.⁸ It is often difficult to recognize when a drought is starting, and it is challenging to make decisions that entail tradeoffs between current and future costs and benefits on expectations about when a drought may end. The current drought is already eclipsing conditions experienced by Georgia during the mid-1950s, which is considered the most severe drought on record for the state. In addition, if the current drought extends another one or two years longer, its duration may equal or exceed the multi-year drought that afflicted Georgia in the 1920s.⁹

Extreme to exceptional drought conditions prevail over northwest Georgia and northeast Alabama, western North Carolina, and the northwest corner of South Carolina.¹⁰ According to the U.S. Drought Monitor, these conditions would be expected to result in major to exceptional crop and pasture losses, widespread water shortages in reservoirs, streams, and wells, and accompanying water emergencies or restrictions. Abnormally dry conditions affected the region in the late winter of 2006 and spring of 2007, and warmer than average temperatures and lower than average rainfall contributed to extreme and exceptional drought conditions in the summer and early fall, particularly August through October 2007.¹¹ Streamflow measurements indicate that the current drought is approaching record levels;¹² and according to the Corps staff meteorologist, Georgia and northern Alabama are experiencing the worst drought on record.¹³ If drought conditions persist, record low streamflows and ACF lake levels are expected to decline further.

⁸ While this report does not specifically discuss climate change, questions are often raised about the relationship between climate change and the possibility for increased drought and other changes to the hydrologic cycle. Increasing temperatures from climate change are expected to result in future hydrologic changes, but there are major uncertainties in making detailed projections of those changes at the scale of drainage basins, such as the ACF basin. (See, for example, the Intergovernmental Panel on Climate Change, Working Group II Report (p. 201), at [<http://www.ipcc-wg2.org/>]).

⁹ Personal communication between Peter Folger and David Stooksbury, Georgia State Climatologist, Nov. 5, 2007.

¹⁰ Drought conditions per the U.S. Drought Monitor at [<http://www.drought.unl.edu/dm/monitor.html>].

¹¹ See the U.S. Drought Monitor at [<http://www.drought.unl.edu/dm/thumbnails/2007.gif>]. The drought may have begun in 2006 when abnormally dry conditions persisted for much of the year in parts of the southeast, including Georgia, beginning in the spring months (Personal communication between Peter Folger and David Stooksbury, Georgia State Climatologist, Nov. 5, 2007).

¹² U.S. Geological Survey, “Drought Worsens During September with Many Georgia Streams Setting New Record Lows” (Sept. 2007); see [http://ga.water.usgs.gov/drought/drought_sept2007.pdf].

¹³ U.S. Army Corps of Engineers, *Mobile District River System Status for October 25, 2007*, at [<http://www.sam.usace.army.mil/pa/riverstatus.htm>].

Drought conditions in the afflicted region are anticipated to continue or intensify over parts of Georgia and Alabama through at least early 2008, if forecasts for strengthening La Niña conditions prove accurate.¹⁴ The National Weather Service also indicates that drought conditions will persist or intensify at least through January 2008.¹⁵

Reservoir Storage Conditions

The federal reservoirs on the ACF are insufficient to capture water volumes that can both augment stream flows during drought conditions and meet the water supply demands of the basin for more than a few months. As runoff in the basin has fallen below the flows necessary to meet demands and meet instream flow requirements, the reservoir levels have declined. Of critical concern is the reservoir level in Lake Lanier, which is the principal water supply for the 10-county Metropolitan North Georgia area that includes Atlanta. On October 19, 2007, the Corps commented on the near record low levels at Lake Lanier, stating:

Engineers estimate if we get virtually no more rain and we continue using water at the same rate, approximately 282 days of usable water supply in Lake Lanier are remaining. This includes approximately 169 days from below the normal usable pool. Access to this additional water may require modification to municipal owned withdrawal infrastructure.¹⁶

In early November, Lake Lanier was slightly over 2 feet above the reservoir's record low. The reservoir has approximately 50% of its conservation pool (550 thousand acre-feet of the 1,050 thousand acre-feet in the conservation pool).¹⁷ Below the conservation pool is the inactive storage which is accessed only to meet basic water supply needs; Lake Lanier's inactive storage provides another 868,000 acre-feet.

The debate about how to manage the ACF through the end of the current drought is currently focused on whether the Corps should implement emergency measures to preserve more water in storage than is permitted under its current operating procedures. The Corps has indicated that it has been releasing water from Lake Lanier to augment the water available at Woodruff Dam, and thus to provide minimum flow in the Apalachicola River of 5,000 cubic feet per second (cfs). In addition to being the minimum flow established in the IOP, a minimum flow of 5,000 cfs for downstream industrial users of the Apalachicola River was discussed in the

¹⁴ The National Weather Service Climate Prediction Center, El Niño/Southern Oscillation (ENSO) Diagnostic Discussion, at [http://www.cpc.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.pdf]; see this report for definitions of *El Niño* and *La Niña*; The University of Georgia College of Agricultural and Environmental Sciences, at [<http://apps.caes.uga.edu/news/storypage.cfm?storyid=3261>].

¹⁵ The National Weather Service Climate Prediction Center, U.S. Seasonal Drought Outlook, at [http://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html].

¹⁶ Army Corps of Engineers, *ACF Drought Conditions and Lake Lanier Water Storage for Water Supply* (Mobile, AL: Oct. 19, 2007).

¹⁷ The conservation pool is the normal usable pool of water. Above the conservation pool is flood and surcharge storage, and below the conservation pool is inactive storage.

1989 Water Control Plan. CRS could locate no Corps estimates of how much water has been released to date from Lake Lanier specifically to meet that minimum flow. Attempts to independently estimate releases from Lake Lanier for Apalachicola River minimum flows are complicated by numerous factors (e.g., withdrawals along the course of the river, return flows, and contributions from streams and groundwater) that influence river flow.¹⁸

The Three Species: A Sturgeon and Two Mussels

A focal point of the debate on management of the ACF basin during drought is protection of three species: Gulf sturgeon (*Acipenser oxyrinchus desotoi*), fat threeridge mussel (*Amblema neislerii*), and purple bankclimber mussel (*Elliptioideus sloatianus*). Water flow, temperature, oxygen content, and quality are important to all three. (See **Appendix C** for a brief description of the ESA.)

The threatened Gulf sturgeon are anadromous, migrating upriver from the Gulf of Mexico in the springtime to spawn near the headwater of rivers. These fish then spend the summer in the mid- to lower river before migrating back into the Gulf of Mexico. Gulf sturgeon seldom feed while in rivers, conserving energy needed for spawning.¹⁹ Major limiting factors for the population include barriers (dams) to historical spawning habitats, loss of habitat, poor water quality, and overfishing.²⁰ The Woodruff Dam prevents sturgeon from reaching previous spawning habitat above the dam, but it was once found in both the Chattahoochee and Flint Rivers. (See **Figure 1.**) It was listed on September 30, 1991. Critical habitat was designated on March 19, 2003.

The endangered fat threeridge mussel and threatened purple bankclimber mussel live in the sand and gravel bottoms of streams and rivers. Larvae of these mussels are parasites on the gills and fins of freshwater fishes (e.g., darters, minnows, and bass), using these host fish for dispersal and causing them little or no harm. These mussels require good water quality, stable stream channels, and flowing water. Major limiting factors include habitat modification by manmade structures (e.g., dams and channel alterations) that destroy free-flowing water habitats and restrict species from dispersing, resulting in small, isolated populations. These two species are also threatened by point and nonpoint source pollution, such as runoff containing fertilizers, herbicides, and pesticides from various land-use practices.²¹ These species usually move very little, but a muscular “foot” helps them burrow and allows slow

¹⁸ For example, there are numerous minimum flow requirements along the length of the Chattahoochee River (e.g., a 750 cfs requirement below Atlanta is required to maintain water quality conditions in the river).

¹⁹ U.S. Department of the Interior, Geological Survey (USGS), *Gulf Sturgeon Facts*, available at [http://cars.er.usgs.gov/Marine_Studies/Sturgeon_FAQs/sturgeon_faqs.html].

²⁰ U.S. Department of Commerce, National Marine Fisheries Service, *Gulf Sturgeon Recovery/Management Plan*, available at [http://www.nmfs.noaa.gov/pr/pdfs/recovery/sturgeon_gulf.pdf].

²¹ U.S. Department of the Interior, Fish and Wildlife Service, *Endangered and Threatened Mussels in the Apalachicola-Chattahoochee-Flint Basin*, available at [<http://www.fws.gov/southeast/october07/Mussels-FactSheet-ACFBasin.pdf>].

and limited movement if they are disturbed by floods or droughts. Both species were listed on March 16, 1998. No critical habitat has been designated for either species.

Corps' Proposal for Reducing Minimum Flows

On November 1, 2007, the governors of the three basin states met with President Bush to discuss the drought in the Southeast and its effects on the ACF Basin. Reportedly the three governors tentatively agreed to a 16% reduction in the Apalachicola River flows — a reduction from 5,000 cubic feet per second (cfs) to 4,200 cfs²² — and to develop a joint comprehensive basin drought water management plan for Corps ACF operations by February 2008. Although these two elements were tentatively agreed upon, their implementation requires additional steps. Since the November 1 meeting of the governors, the Florida Department of Environmental Protection and the Florida Fish and Wildlife Conservation Commission have expressed concerns about the impacts of the reduced flows.²³ These concerns and the protracted history and current tension of the tri-state water conflict have raised doubts about the feasibility of the February 2008 deadline. Others are optimistic about the Bush Administration's ability to bring the three Republican governors to an agreement on a drought management plan.

On November 1, 2007, the Corps requested expedited consultation with FWS under §7 of the Endangered Species Act to consider its proposed action of *Exceptional Drought Operations* (EDO). In support, the Corps submitted a Biological Assessment (BA) to FWS.²⁴ This proposal is now under an expedited

²² See p. 1 of Army Corps of Engineers, *Question and Answers: Biological Assessment* (2007), hereafter referred to as "Corps BA Q&A," available at [http://www.sam.usace.army.mil/ACF%20Water%20Resources%20Management/ACFDrought_Consultation2007/Q&A_BA_11-02-07.pdf].

²³ Letter from Florida Fish and Wildlife Conservation Commission to FWS Field Office in Panama City, FL, on ESA Section 7 Consultation of Nov. 7, 2007, hereafter referred to as Florida FWCC Nov. 7 Letter; Letter from Florida Department of Environmental Protection to FWS Field Office in Panama City, FL, and to Corps District Office in Mobile, AL on ESA Section 7 Consultation on Proposed "Exceptional Drought Operations" of Nov. 8, 2007, hereafter referred to as Florida DEP Nov. 8 Letter. The Florida FWCC Nov. 7 Letter included data from Florida's most recent annual survey of sport fish in the Apalachicola River. The commission cited data on strong production of sport fish in years with high flows that inundate the river floodplain, and data on low production for the low flow years of 2006 and 2007. The commission also noted higher salinities associated with low flows as diminishing fish habitat and food supplies. It also cited studies showing that while previous droughts had produced temporary surges in mussel populations, they were followed by rapid decreases in subsequent years. The Florida DEP Nov. 8 Letter stated opposition to the proposed lower minimum flows, claiming it would "starve the Apalachicola River and Bay of freshwater flows needed to keep the ecosystems, species, and economy alive." The department cited expected increases in salinity, and noted a potential increase in disease and predation with resulting effects on the oyster and seafood industries. The department requested that any biological opinion by FWS on the proposed lower minimum flows and related Corps drought operations expire no later than February 15, 2008.

²⁴ U.S. Army Corps of Engineers, *Biological Assessment: Temporary Modifications to the Interim Operating Plan for Jim Woodruff Dam and the Associated Releases to the* (continued...)

review by FWS; a response was expected as early as November 15, 2007. (See **Appendix C** for an explanation of consultation procedures.)

The EDO proposes a new minimum flow that would change the operations of the Corps' dams. Under the current IOP and its provisions for drought conditions, the Corps has been releasing 5,000 cfs (the minimum allowable under the IOP) from Woodruff Dam since May 2007. The record low precipitation in the basin has resulted in the Corps having to make releases from its upper basin reservoirs, including Lake Lanier, to maintain the 5,000 cfs minimum in the lower basin. The EDO would establish a set of immediate measures to reduce storage drawdown and to maintain the other purposes of its ACF projects, including species protection. The Corps is proposing to lower the minimum flow required below Woodruff Dam to 4,150 cfs; the Corps has stated its intention to ensure this minimum flow by releasing 4,200 cfs.²⁵ This 16% reduction in the minimum flow at Woodruff Dam would allow the releases from upstream storage reservoirs to be reduced. In other words, a justification provided for the lower minimum flows below Woodruff Dam is to lessen the risk of much lower flows in later years, if the drought continues. In effect, the EDO would risk harm to the species now, to reduce the risk of greater harm later.

On November 7, 2007, the Corps amended its BA to take into account new data it had received from FWS indicating a greater level of harm to the fat threeridge mussel could result from a reduction to 4,150 cfs than was previously thought.²⁶ It therefore proposed to reduce flows in increments — first to 4,750 cfs, then 4,500 cfs, and finally the target of 4,150 cfs. The Corps' letter also stated that it would consult with FWS on the triggers and conditions that would allow it to make the incremental reductions. It stated the Corps' understanding "based on review of the new mussel and modeling data and consultation with your [FWS] office, that this amendment will result in less adverse impacts" to the listed species and their designated or proposed critical habitat.

Given current storage levels, the EDO would become effective immediately if approved. These lower minimum flows would be maintained until reservoir storage returns to the levels specified under the EDO for triggering resumption of the 5,000 cfs minimum flows. One scenario in the Corps BA indicates that the reduced flows may be sustained through August 2009;²⁷ the Florida Department of Environmental Protection stated "the Corps' modeling shows the EDO in place through 2010."²⁸

²⁴ (...continued)

Apalachicola River, Document #CESAM-PD-E1 (hereafter referred to as the Corps BA), at [http://www.sam.usace.army.mil/ACF%20Water%20Resources%20Management/ACFDrought_Consultation2007/FinalBiologicalAssessment_1_Nov_2007.pdf].

²⁵ See Corps BA Q&A, p. 1, for an explanation of this difference.

²⁶ Letter from Corps to FWS Field Office in Panama City, FL, to amend BA of Nov. 1, 2007, at [http://www.sam.usace.army.mil/ACF%20Water%20Resources%20Management/ACFDrought_Consultation2007/BA_AmendmentLetter11_7_2007.pdf].

²⁷ Corps BA, p. 50.

²⁸ Florida DEP Nov. 8 Letter, p. 1.

The information in the Corps BA, as amended, is insufficient to understand how the Corps would operate the ACF for its multiple purposes under the EDO. For example, the Corps BA does not set out how the Corps would make operational decisions under the EDO for meeting the water supply demands of Metropolitan North Georgia.²⁹ A principal question is whether the volume of water retained in storage as the result of the lower minimum flow is *banked* specifically for ensuring future minimum flows for protected species, or if the water retained would be allocated among multiple ACF water uses. The Corps BA does not specify how the water accounting under the EDO would be maintained. The expectation may be that the governors' proposal for a drought management plan for the Corps (expected in February 2008) could be the basis for water allocation under the EDO.

Generally, significant changes to operations of a federal facility require analysis of environmental impacts under the federal National Environmental Policy Act (NEPA; 42 U.S.C. §§4321-4347) and often consultation with other federal agencies under ESA. Information on how the reservoir might be managed for multiple purposes and the potential economic and social impacts of alternative management regimes would normally be included in the agency's environmental analysis (either in an environmental assessment or environmental impact statement). To date, the Corps has not released new environmental documentation on the EDO. Thus, how the Corps' proposal may ultimately affect other uses is difficult to assess. (See **Appendix B.**)

Each of the next three sections discusses how the drought is affecting a different water use — municipal water supply, electric power generation, and species and ecosystems — and the potential impacts of the Corps' proposal. Maintaining more water in storage now would benefit Atlanta because more water would be available in Lake Lanier and for release to the Chattahoochee River next year. How significant the benefit of maintaining more water in storage may be for Atlanta and other municipalities depends on the protocol used to allocate the stored water among the multiple purposes of its ACF operations. The Corps' proposal does not appear to cause significant immediate harm to electricity generation or grid reliability. The effects on the three species protected under the ESA are still to be determined.

Municipal Water Supply Issues

M&I Water Supply

Municipal and industrial water supplies are withdrawn from the ACF rivers and tributaries, the federal reservoirs on those rivers, locally-owned surface storage, and aquifers. A significant portion of the water is returned to the river or groundwater. Depletion or inability to access municipal drinking water sources can represent a

²⁹ The Corps has indicated that it is currently releasing 2,600 cfs from Lake Lanier and that a minimum release of 1,500 cfs would be needed to meet upper basin municipal withdrawals, but not all industrial needs would be met. (Army Corps of Engineers, *ACF Drought Conditions and Lake Lanier Water Storage for Water Supply* (Mobile, AL: Oct. 19, 2007). It is unknown if 1,500 cfs is the anticipated Lake Lanier release rate under the EDO.

significant public health threat. The vast majority of surface water withdrawn for municipal and industrial use (excluding withdrawals for powerplants because these withdrawals are typically for cooling purposes and are returned to the water source) in the ACF is in Georgia. Alabama's share of M&I withdrawals (excluding powerplants) from the Chattahoochee River is considerably less than Georgia's, at approximately 24 million gallons per day (mgd), about 37 cfs.³⁰ Florida has no municipal withdrawals from the Apalachicola River.

Atlanta/North Georgia Water Supply. The 10-county metropolitan Atlanta area, referred to as Metropolitan North Georgia, gets more than 99% of its 652 mgd (1,011 cfs) of M&I water from surface water supplies.³¹ Lake Lanier and the Chattahoochee River supply 72% of that water.³² Metropolitan North Georgia's surface water dependency makes its water supply particularly vulnerable to regional drought and to changes in Buford Dam operations that may reduce water stored at Lake Lanier. A significant amount of the water withdrawn for M&I use is not consumed; it returns to the ACF rivers. The return flows represent a significant percentage of the upper Chattahoochee River's flow.

Metropolitan North Georgia's second largest source is the Corps-operated Lake Allatoona reservoir on the Etowah River, which is a tributary of the Alabama-Coosa-Tallapoosa river basin immediately west of the ACF, which also is affected by the current drought.³³ The Etowah basin provides 12% of Metropolitan North Georgia's water supply.³⁴ On November 5, 2007, the Corps notified one of Metropolitan North Georgia's water authorities that it had exceeded its authorized storage allocation in Lake Allatoona. Almost all of Metropolitan North Georgia's other supplies are surface water supplies from other basins.

Groundwater makes up less than 1% of Metropolitan North Georgia supply. Although Atlanta at the end of the 19th century was highly dependent on groundwater, the city shifted to surface water supplies as the demands surpassed the aquifers' yield. The groundwater aquifers are relatively small, so that no one well would provide significant yields as a long-term water source. The possibility of diversifying by

³⁰ Data derived from information provided to CRS by the Alabama Department of Economic and Community Affairs. In the United States, *mgd* is the standard unit for municipal water supplies, whereas *cfs* is the standard unit for streamflow. A flow of 1.55 cfs is approximately 1 mgd.

³¹ Metropolitan North Georgia Water Planning District, *Water Supply and Water Conservation Management Plan*, (Atlanta, GA: September 2003), p. 3-1. Hereafter referred to as MNG Water Supply Plan.

³² Data from *Water Supply* website of the Atlanta Regional Commission, available at [http://www.atlantaregional.com/cps/rde/xchg/arc/hs.xsl/273_ENU_HTML.htm].

³³ In early November, Lake Allatoona maintained 56% of its conservation storage, which is less than the historical average of 93% for the month. The lake, however, remains significantly above record low levels. (Personal communication between Nicole Carter and Army Corps of Engineers Mobile District Water Management Office, Nov. 8, 2007).

³⁴ Data from *Water Supply* website of the Atlanta Regional Commission, available at [http://www.atlantaregional.com/cps/rde/xchg/arc/hs.xsl/273_ENU_HTML.htm].

expanding groundwater use (e.g., to augment surface water supplies during drought) has received some attention. Groundwater, however, is not anticipated to provide a significant long-term supply for the area.

In 2003, Metropolitan North Georgia's total drinking water demands averaged 625 mgd. The average available yield of existing sources is 933 mgd. The population served was four million in 2000; under some projections, it may grow to 8 million by 2030.³⁵ Given population growth trends and under different levels of water conservation, Atlanta's average annual demand would exceed its available supplies between 2013 and 2020.³⁶ The Metropolitan North Georgia Water Planning District's Water Supply and Water Conservation Management Plan relies heavily on the reallocation of water storage in the ACF's Lake Lanier and in the ACT's Lake Allatoona from either hydropower or flood control to water supply. Contracts for the reallocated supply are considered "essential to guarantee water supply for the district for the next 30 years and beyond."³⁷ The District is also proceeding with efforts to complete the permitting process of new nonfederal reservoirs and options for indirect potable reuse. A major concern for lower basin ACF stakeholders and environmental groups is that increased municipal water withdrawals will markedly decrease lower basin low flows, particularly in the Apalachicola River. The management plan also calls for water conservation measures; these measures have the potential to reduce demand by 11%, thus extending existing supplies to 2020.³⁸

What the EDO may mean for those drawing their water supplies from federal reservoirs and the Chattahoochee River is unclear. If implemented, the EDO is anticipated to result in lower releases from Lake Lanier, thereby reducing the drawdown rate. Maintaining more water in storage now is anticipated to benefit Atlanta. That is, more water would be available in Lake Lanier and for release to the Chattahoochee River next year; because a significant amount of Metropolitan North Georgia's water withdrawals return to the ACF as return flows, the upper basin municipal and industrial users could withdrawal the water in the upper basin and have a portion be returned to meet the Apalachicola River's minimum flow requirement. The Corps BA does not set out how the Corps would operate to meet its multiple purposes under the EDO. That is, the Corps BA, because it is an ESA document and not an operating plan for the ACF basin, does not provide sufficient information to determine how much water Metropolitan North Georgia would be able to withdrawal from Lake Lanier and the Chattahoochee River under the EDO.

Electric Power Generation and Issues

Electric generation capacity along the ACF system was constructed to provide electric power to the region while taking advantage of the rivers' water supply. Power generation includes hydroelectric facilities operated by the Corps and Georgia

³⁵ MNG Water Supply Plan, p. ES-8.

³⁶ Estimated using data in MNG Water Supply Plan, p. ES-9.

³⁷ MNG Water Supply Plan, p. ED-10.

³⁸ MNG Water Supply Plan, p. ED-9 and ES-12.

Power as well as coal-fired, gas-fired, and nuclear plants operated by Southern Company and its subsidiaries, Southern Nuclear and Gulf Power.

Hydroelectric Generation

Historically, hydroelectric plants operating along the ACF have been used to provide power primarily during peak demand. At issue is whether the decreased flows along the river would result in the inability of turbines to operate. This would occur when water levels drop below the water intake conduit for the power plant. Currently, water levels are sufficient to generate peaking power for the region. At the Buford Dam below Lake Lanier, water levels were 1055 feet on November 6, 2007 and the plant generated 665 megawatt-hours (Mwh) of electricity, the largest generation of any of the Corps-operated dams on this river system. (See **Figure 1.**) According to the Corps, the two main units at Buford Dam can generate as long as water levels do not fall below 1035 feet. At current rates of water level decline in Lake Lanier, the two main units at Buford are projected to be operational at least until summer 2008.³⁹ Other dams are closer to critical water levels. Downstream from Buford, the W.F. George dam can generate power if water elevation is at least 184 feet. On November 6, 2007, water levels were at 185.25 feet, and the plant generated 411 Mwh of electricity.⁴⁰

The Southeastern Power Administration (SEPA) markets the power generated at Corps-operated dams to its customers in the Southeast.⁴¹ SEPA enters into five-year contracts with its preference customers (cooperatives and municipal power systems) with power delivery obligations based on 1981 drought levels. SEPA is obligated to meet its contract requirements whether or not sufficient hydroelectric power is available to meet its obligations. In the event of a hydropower shortfall, SEPA purchases power on the open market, generally at a cost greater than hydroelectric generation. The additional cost is passed on to SEPA's customers. SEPA does not own transmission lines and must contract with other utilities for use of the transmission system.⁴²

Nuclear Generation

Plant Farley, located in southeastern Alabama near the town of Dothan, is a 1,711 megawatt (MW) nuclear plant; water is used in the cooling system. (See **Figure 1.**) According to the SERC Reliability Corporation, in addition to being a large source of electricity, generation from Farley is also important for maintaining the stability of the local power system.⁴³

³⁹ Corps BA, p. 51.

⁴⁰ Daily and historical operational data can be found at [<http://water.sam.usace.army.mil/acfframe.htm>].

⁴¹ Southeastern Power Administration. *Annual Report 2005*. Available at [<http://www.sepa.doe.gov/files/2005%20SEPA%20Annual%20Report%205-3.pdf>].

⁴² Personal communication between Amy Abel and Douglas Spencer, Southeastern Power Administration, Nov. 5, 2007.

⁴³ Personal communication between Stan Kaplan and Carter Edge, Director, Reliability (continued...)

Plant Farley requires a minimum water flow of 2,000 cfs to operate at full load under its current water permit.⁴⁴ At lower flow, water discharges from the plant may have thermal or other impacts on the Chattahoochee River that could trigger regulatory action. As of October and November 2007, actual maximum daily flows at the upstream dam closest to Farley (the Walter F. George dam) were about 2,700 to 2,800 cfs.⁴⁵ This suggests that with implementation of the proposed 16% reduction in reservoir release, the flow to Farley might drop to about 2,300 cfs, still above the plant's full load requirement.

Because of the plant's design, it appears unlikely that all of the generation from Farley could be lost due to low water conditions, at least in the foreseeable future. Farley is a two-unit plant. On September 28, 2007, Unit 1 went off-line for refueling, and through October and early November, water flows often dipped far below 2,000 cfs (e.g., to 1,048 cfs on November 3, 2007).⁴⁶ This indicates that the plant can operate with one unit at full load with much less water than required for two unit operation. However, according to Southern Company, during the period October to May, when other generation and transmission assets are taken off-line for maintenance, both Farley units are necessary for reliable operation of the local power system.⁴⁷

According to the SERC Reliability Corp., alternative, albeit more expensive, natural gas-fired generation could be used to compensate for reduced generation from Farley during off-peak seasons. However, these alternatives may be otherwise committed during summer peaks and very cold winter periods, in which case reliability risks would be greater if Farley generation is unavailable or reduced.⁴⁸

Coal-Fired and Natural Gas-Fired Generation

Coal-fired power plants, older (steam electric) gas-fired plants, and modern combined cycle gas plants are dependent on water for steam processing, and primarily cooling. Older power plants, those whose construction began prior to 1972, use a once-through system where the water is discharged back into the water source. Newer power plants do not discharge water, but use cooling towers to evaporate the

⁴³ (...continued)

Services, SERC Reliability Corp., Nov. 6, 2007. SERC is the regional industry organization responsible for monitoring power grid reliability in the southeastern states.

⁴⁴ E-mail and attachment from Jerry L. Stewart, Southern Company, to Stan Kaplan, Nov. 7, 2007.

⁴⁵ Daily discharge data for the George and other dams is posted by the Corps of Engineers at [<http://water.sam.usace.army.mil/acfframe.htm>].

⁴⁶ Daily reactor status is posted by the Nuclear Regulatory Commission at [<http://www.nrc.gov/reading-rm/doc-collections/event-status/reactor-status/2007/index.html>]; dam discharge data is posted at [<http://water.sam.usace.army.mil/acfframe.htm>].

⁴⁷ E-mail and attachment from Jerry L. Stewart, Southern Company, to Stan Kaplan, Nov. 7, 2007.

⁴⁸ Personal communication between Stan Kaplan and Carter Edge, Director, Reliability Services, SERC Reliability Corp., Nov. 6, 2007.

water. In low water years, once-through plants may encounter issues with thermal discharge. The discharge from the power plant is typically warmer than the water source, and increases in the surrounding water temperature could affect the ability of fish and other aquatic species to survive. This effect is more pronounced with low stream flows. For both older and newer plants, water intakes for the plant must be below water level.

Although several large coal and gas-fired plants are located along the ACF system, only the coal-fired Plant Scholz in the Florida Panhandle has been mentioned as potentially being affected by low flow in the Apalachicola River. (See **Figure 1**.) This plant is considered a base load plant which generates power throughout the day. Although Scholz is small (capacity of 92 MW), the plant is a low-cost source of generation and is used in some situations to maintain the reliability of the local power system. Specifically, Scholz is needed during high-demand periods to help prevent overloading power lines under some circumstances, and during low demand periods to maintain voltage levels.⁴⁹

According to Southern Company affiliate Gulf Power, the plant's owner, the plant can operate with flows at 5,000 cfs. With the proposed reduction to 4,200 cfs, the plant should be able to continue operating without modifications for three months. The plant does not expect any issues with thermal discharge with the lower flows. Plant operators plan to make some modifications in its intake system to be able to continue operating into the summer of 2008.⁵⁰

If Scholz needs to shut down, there do not appear to be any transmission constraints in the area that would prevent power from being delivered from other generating plants. However, the cost of purchased power or generation from other Southern Company assets may be more expensive than generation from Scholz and Farley. Southern Company estimates that if all generation from both plants were lost, the incremental cost would be \$1.5 million per day.⁵¹ Also, the reduction in reserve margins from taking Plant Scholz and other generating plants off line could create reliability concerns, especially during the peak summer season.

Species and Ecosystem Issues

While the three species listed under the ESA have received the most attention, other species and economic interests depend on the ACF and on its supply of water to the Gulf. This section first briefly describes these wider interests and then details the issues under the ESA.

⁴⁹ E-mail and attachment from Jerry L. Stewart, Southern Company, to Stan Kaplan, Nov. 7, 2007.

⁵⁰ Personal communication between Amy Abel and John Hutchinson, spokesperson for Gulf Power, Nov. 5, 2007.

⁵¹ E-mail and attachment from Jerry L. Stewart, Southern Company, to Stan Kaplan, Nov. 7, 2007.

Bay Ecosystem and Industry

Apalachicola Bay oysters constitute an important part of northwestern Florida's economy. More than 1,000 people are employed by the oyster industry in Florida's Franklin County, which harvests approximately \$10 million in oysters annually. Historically, this county harvests more than 90% of Florida's oysters and 10% of the entire nation's supply of this seafood. Within Franklin County, oysters account for almost one-third of the value of all commercial marine landings.⁵²

In Apalachicola Bay, oyster distribution is controlled by both salinity and sea-floor geology. Oyster beds generally occur in areas where the salinity is 5 to 25 parts per thousand, on three types of shallow bars formed by different geologic processes.⁵³ Any decrease in freshwater inflow into the Bay from the Apalachicola River may result in increased salinity in the Bay. The potential effects of such increased salinity on oysters in the Bay would depend upon several factors, including how fresh and saltwater mix within the Bay, how rapidly and to what extent salinity increases, and the amount of oyster habitat in the Bay that might be exposed to salinities exceeding oyster tolerance (as well as the amount of time these oysters were exposed to salinities exceeding their tolerance). Although some studies have found that Gulf coast oyster landings generally are inversely related to freshwater inflow — i.e., oyster landings increase when freshwater inflow decreases,⁵⁴ the Florida Department of Environmental Protection has raised concerns that a the minimum flows proposed under the EDO could “precipitate a catastrophic collapse of the oyster industry in Apalachicola Bay.”⁵⁵

Apalachicola Bay is also an exceptionally important nursery area for Gulf of Mexico commercial fish species. More than 95% of all species harvested commercially and 85% of all species harvested recreationally in the open Gulf spend a portion of their life in estuarine waters (e.g., blue crabs may migrate as far as 300 miles to spawn in Apalachicola Bay). In addition, Apalachicola Bay is a major forage area for such offshore fish species as gag grouper and gray snapper.⁵⁶ Changes in Apalachicola Bay salinity could affect the suitability of this habitat for forage and nursery use. In contrast to oysters, a decline in some coastal fisheries with overall harm to biota is generally associated with reductions in freshwater flow.⁵⁷

⁵² Apalachicola Bay Chamber of Commerce, at [<http://www.apalachicolabay.org/eastpointhome.php>].

⁵³ D. Twichell, “Habitat Mapping to Assess Health of Oyster Fishery in Apalachicola Bay, Florida,” *Sound Waves* (USGS, June 2005).

⁵⁴ R. E. Turner, “Will Lowering Estuarine Salinity Increase Gulf of Mexico Oyster Landings?,” *Estuaries and Coasts*, vol. 29, no. 3 (June 2006), pp. 345-352.

⁵⁵ Florida DEP Nov. 8 Letter, p. 2.

⁵⁶ Florida Department of Environmental Protection, *About the Apalachicola National Estuarine Research Reserve and Associated Areas*, available at [<http://www.dep.state.fl.us/coastal/sites/apalachicola/info.htm>].

⁵⁷ K. F. Drinkwater and K. T. Frank, “Effects of River Regulation and Diversion on Marine Fish and Invertebrates,” *Aquatic Conservation: Marine and Freshwater Ecosystems*, v. 4, (continued...)

River Management and the Three ESA Species

Of the three species (Gulf sturgeon and two mussels), concern has been greatest for the two mussels. According to FWS, not only is flow rate, per se, important to the two mussels, but so are the effects of flow rates on other aspects of the species' biology. For example, as flow rates decrease, temperature tends to go up, and the oxygen content of the water goes down. The damaging effect of such a change is well-known for such species as trout, but may also be important to other aquatic species. Referring to the fat threeridge mussel, FWS states:

Water quantity is becoming more of a concern in maintaining mussel habitat in the Apalachicola Region. The potential impacts to mussels, their host fishes, and their respective habitats from ground water withdrawal may be profound. Within the Flint River basin, decreases in flow velocity and dissolved oxygen were highly correlated to mussel mortality (Johnson et al. 2001). Low DO [dissolved oxygen] conditions in stagnating stream pools due to drought conditions are having a disastrous effect on these mussels. Mussel mortality increases dramatically as DO decreases below 5 mg/L.⁵⁸

The groundwater losses referred to and the reduction in flow from natural springs (due not only to groundwater withdrawal but also to the drought) have exacerbated the problem of excessive water temperature (and hence decreased oxygen supply) since the springs generally supply cooler water that would help to reduce in-stream water temperatures. The storage capacity of the system's reservoirs — the bulk of which are controlled by the Corps — are the linchpin for the three listed species, since the flow rate of the system is limited by the storage capacity.

The Three Species Under the Corps' Proposal: Consultation under § 7 of ESA

On November 1, 2007, the Corps requested a new formal consultation to FWS, and submitted a new Biological Assessment (BA) concerning the proposed the Exceptional Drought Operations (EDO, amending the IOP) for the Jim Woodruff Dam. (For a brief description of earlier consultations, see **Appendix D**.) In it, the Corps proposed to reduce flows from the Jim Woodruff Dam still further:

- Minimum flow: 4,150 cfs (down from 5,000 cfs, and from the 6,500 cfs considered “desirable” in the current IOP);

⁵⁷ (...continued)
no. 2 (1994), pp. 135-151.

⁵⁸ FWS, “Species Profile: Fat three-ridge (mussel) (*Amblema neislerii*),” available at [http://ecos.fws.gov/docs/life_histories/F032.html] (citing Johnson et al., “Effects of drought on freshwater mussels and instream habitat in coastal plain tributaries of the Flint River, southwest Georgia (July-October, 2000),” final report to The Nature Conservancy, 2001). An identical paragraph is found in the species profile for the purple bank climber mussel, available at [http://ecos.fws.gov/docs/life_histories/F02E.html]. The recovery plan for Gulf sturgeon also cites the importance of cool water temperatures. (See p. 27 of Recovery Plan at [http://ecos.fws.gov/docs/recovery_plan/950922.pdf].)

- Maintenance of the 0.25 ft/day maximum fall rate, until 4,200 cfs is achieved.

According to the Corps BA, “adverse impacts to listed species (especially the listed mussel species) are reasonably certain to occur as flows on the Apalachicola River drop below 5,000 cfs.”⁵⁹ Among the issues mentioned in the rationale for adopting EDO and its lower minimum flows is reducing “the demand for storage in order to ... have greater assurance of future ability to sustain flows for listed species during a severe multi-year drought, as currently being experienced in the ACF basin.”⁶⁰ In essence, the proposal is that the three species would face a reduced water flow this year to reduce risks in later years, if the drought continues.⁶¹ The Corps requested a Biological Opinion (BO) from FWS on an expedited basis, and both agencies had agreed to a goal of November 15, 2007, for a BO and the associated Incidental Take Statement from FWS.

A comparison of the consultation request with other requests and normal procedures is useful. Commonly, when other agencies (e.g., Forest Service, Environmental Protection Agency) request formal consultation with FWS, the BA may provide considerable information not only about their own project, but also about the range, food, known distribution, laboratory studies, etc., of the species in question, and that information is site-specific. While the Corps BA includes relatively little new information about the three listed species (e.g., distribution changes of the three species since implementation of the IOP in Fall 2006), it does provide data concerning the effects to date on water quality. Among other things, the Corps BA⁶² states that under the *current* IOP:

impairments [due to point and non-point source pollution] identified include turbidity, coliforms, totals suspended solids, dissolved oxygen (DO), biology, and unionized ammonia.... We lack sufficient information to determine if implementation of the IOP has altered the baseline water quality of the action area. However, we recognize that the extraordinary drought conditions ... have resulted in salinity changes in Apalachicola Bay and increased temperatures and associated localized dissolved oxygen changes due to extended periods of low flow (approximately 5,000 cfs).

And, after acknowledging that the Corps does not have data on water temperature or dissolved oxygen levels, the Corps BA further notes:

⁵⁹ Ibid, p. 6.

⁶⁰ Ibid, p. 6.

⁶¹ While this tradeoff in time — some risk now, to lower a species’ risk later — is not especially common in the consultation process, it has occurred before (e.g., spotted owls and the Northwest Forest Plan). On the other hand, tradeoffs in general are very common in the consultation process. Examples would include direct habitat protection (less in one area, more acquired in another); greater intrusion outside a nesting season and less intrusion during it; more public access if access is more carefully controlled, etc. At issue with the three ACF species is not a tradeoff per se, but the degree to which the current clear harm is balanced by potential future benefits.

⁶² Corps BA, p. 21.

However, observations made by USFWS field personnel this summer, indicate that mussels found in isolated pools or shallow slack water habitats are showing signs of stress or mortality likely due to high temperatures and low DO [dissolved oxygen]. Significant reductions in river flow below 5,000 cfs would likely exacerbate the temperature and DO conditions observed this year; as well as substantially increase the risk of stranding aquatic organisms.⁶³

With this gloomy picture (not essentially contradicted by the rest of Corps BA), and putting the question only in terms of an ESA decision, the FWS decision concerning jeopardy would appear to turn on whether to trade rather likely immediate harm to the three species (and especially the mussels) to avoid a risk of still greater future harm. Given that, what choices are open to FWS?

First, one choice is *not* open: FWS does not require an agency to take action outside of the action agency's current authorities. Thus, while some might argue that reasonable and prudent measures (RPMs; see **Appendix C**) that may be prescribed by the FWS in the ACF Basin could (or should) include water conservation measures (e.g., restricting outdoor watering, changing commercial or residential building codes to improve water conservation, increasing water rates to fund municipal water conservation projects, etc.), FWS does not require that the Corps undertake these tasks because the Corps has no authority to implement them.⁶⁴ Only those choices legally open to the Corps are considered.

FWS does have several options in responding to the Corps. First, it can ask for more information, either on the proposal itself or on effects on the species. Second, if it concludes that the proposed EDO would not jeopardize any of the three species, nor adversely modify critical habitat, it may issue a "no jeopardy" opinion, which would allow the Corps to adopt the EDO immediately.⁶⁵ Given the need for action to be quick if it is to be effective, and for the concern already voiced over the effects of the current IOP, neither of these options seems particularly likely. Third, FWS could agree that, as a tradeoff, the action would not jeopardize the three species, but that the Corps should carry out one or more RPMs to reduce the risk still further. Fourth, FWS might conclude that there is no way to carry out the change without jeopardizing the species or adversely modifying critical habitat. Such decisions are extremely rare (and often referred to as the "nuclear option"), and would leave the

⁶³ Ibid, p. 22.

⁶⁴ However, the Corps would not have been prevented from volunteering such an option, if it had found partners willing to cooperate in the effort. In the Platte River Recovery Plan, for example, the Bureau of Reclamation consulted with FWS about a project; its partners — Colorado, Wyoming, and Nebraska — pledged to fund (with cash or payments in kind) a program of habitat improvement (including purchase of land from willing sellers), improved water flow, and adaptive management. The program provides \$317 million over 13 years, with the Bureau responsible for half. FWS could not have required the states to participate, but took their efforts into account in issuing a finding of no jeopardy. (Personal communication between Lynne Corn and Mark Butler, FWS Denver Regional Office, Nov. 6, 2007.)

⁶⁵ For illustration purposes, this analysis ignores the possibility that FWS might come to a different conclusion for one of the species compared to the other two, although nothing in the law would preclude that outcome.

Corps (a) facing a citizen suit if it proceeded anyway, (b) choosing not to carry out the modification, or (c) considering asking for a formal exemption under §7 (16 U.S.C. §1536(e)-(p); see below for description).

Other Options for Reducing Minimum Flows

Options Under the ESA

Without changing current law, the ESA offers three options to manage the conflict in the ACF basin: (1) additional consultation by the Corps under § 7(b) (16 U.S.C. §1536(b)) to determine if taking or adverse modification would result from changing management of the basin in this time of drought; (2) an attempt to invoke § 7(p) (16 U.S.C. §1536(p)), involving exemptions in presidentially declared disaster areas; and (3) an exemption for management of the basin under § 7(e)-(p) (16 U.S.C. §1536 (e)-(p)). The first option, discussed above, is currently being pursued by the federal agencies. The other two options are outlined below, since they may be considered at some later time.

Dim Prospects Under the Disaster Provision. In § 7(p) (16 U.S.C. §1536(p)), the ESA allows the President to make the determinations necessary for an exemption to be granted, in a presidentially declared major disaster area. However, the President's authority extends only to

the repair or replacement of a public facility substantially as it existed prior to the disaster ... which the President determines (1) is necessary to prevent the recurrence of such a natural disaster and to reduce the potential loss of human life, and (2) to involve an emergency situation which does not allow the ordinary procedures of this section to be followed.

This provision could be used for quick repair of a levee after a flood, for example. Since, on several factual grounds, these features are not present in the ACF basin, this provision offers apparently no solution in the ESA context. No such presidential declaration has occurred.

On October 20, 2007, the governor of Georgia requested a presidential drought disaster declaration. The likelihood of a *presidential* drought disaster declaration is unclear: the last presidential disaster declarations for a drought in the continental United States was in New Jersey in 1980.⁶⁶ Instead, accessing federal resources for drought disasters largely has been limited to agricultural assistance made available by disaster declarations by the Secretary of Agriculture. Because of the ongoing drought conditions and the severe April freeze, the U.S. Secretary of Agriculture already has declared every county in Georgia a disaster area this year, making the

⁶⁶ See [<http://www.fema.gov/femaNews/disasterSearch.do>], viewed on Nov. 9, 2007. There have been more recent declarations for droughts in U.S. territories in the Pacific.

entire state currently eligible for U.S. Department of Agriculture Farm Service Agency emergency disaster loans.⁶⁷

An Outright Exemption: The Long Road. The most straightforward avenue, were FWS to issue a jeopardy opinion in its consultation, would be for the Corps, or a governor, to ask for an exemption for the modified IOP. Under § 7 (16 U.S.C. §1536(e)-(p)), a seven-member Endangered Species Committee (usually called the “God Squad”) chaired by the Secretary of the Interior is empowered to pronounce on an activity of regional or national significance. This panel has been convened only three times in the history of the act. In part because of the time involved, and the fact that the requestor must both demonstrate that a variety of other options have been justifiably rejected, and pay for mitigation to balance the effects of the proposed action, this option has fallen out of favor, and has not been used in the past 15 years. (For more on this option, see CRS Report RL31654, *The Endangered Species Act: A Primer*.) It appears to be a somewhat unlikely option, and appears not to have been mentioned in the current debate.

Changing Current Law and Questions Raised

Another option would be simply to change current law. In the 110th Congress, identical bills, H.R. 3847 and S. 2165, have been introduced to address conflicts with the ESA arising from operation of the Corps’ dams during the ACF drought. These bills would suspend the entire ESA for both federal and state agencies managing a federal river basin if either the Corps or the governor determines that there is a drought in such a river basin and that the drought threatens the region’s health, safety, or welfare. The bills would end the suspension if the Corps or the governor determines that the drought is no longer in effect in the basin. As introduced, these bills raise several issues and questions about both operation of ESA in the ACF basin and the effects of the proposal in other situations, including the following.

Issues:

- Agencies other than the Corps, notably the Bureau of Reclamation, would not have authority to trigger the suspension provision but presumably would have to request that Corps or the governor act for the federal agency to trigger suspension do so on their behalf.
- As written, the bills may apply to species not directly affected by drought but which occur within the basin. Even terrestrial species in the basin could lose protections.
- It appears that the bills would suspend FWS’s obligation to consult with federal agencies even to help inform them about potential consequences of their actions.
- Because ESA is the implementing legislation for such international treaties as the Convention on International Trade in Endangered Species, it is unclear whether there could be enforcement in such

⁶⁷ For more information on this program, see CRS Report RS21212, *Agricultural Disaster Assistance*.

areas as ports and airports in the affected basin, or against activities that would normally be considered criminal under the ESA.

- Any state grants under § 6 of ESA to be used within the basin appear to be suspended.

Questions:

- In regions of the country where water shortages are chronic, and conflicts concerning listed species are abundant, would the bills effectively allow governors to opt out of the ESA permanently?
- Water basins and species' habitats commonly cross state lines. If governors of affected states do not agree on the need for emergency drought measures, would a governor's declaration in one state suspend the provisions of the ESA in a neighboring state?
- Because the ESA would remain in force outside of the affected river basin, would the burden of conserving the listed species fall that much more heavily on areas outside the basin? Or within the basin itself, once the drought was determined to be over?
- What is the definition of "Federal river basin"?
- What would happen if the Corps and the governor(s) do not agree on the drought determination?
- Is the Corps the best federal agency to determine if drought conditions are present?

ACF in the Federal Water Policy Context: Conclusions

Although the administrative and legislative proposals for managing ACF water resources during the current drought are focused on reducing minimum flows, the broader debate regarding how to manage municipal and other demands will continue to shape ACF management as the three states negotiate water allocations.

How the federal government responds to the current ACF drought may set precedents for the long-term management of not only the ACF basin but also other basins with intense competition over water resources. Increasing pressures on the quality and quantity of available water supplies — due to growing population, environmental regulation, in-stream species and ecosystem needs, water source contamination, agricultural water demand, climate variability, and changing public interests — have resulted in heightened water use conflicts throughout the country. The federal government has a long history of involvement in water resource development and management to facilitate water-borne transportation, expand irrigated agriculture, reduce flood losses, and more recently restore aquatic ecosystems. Congress makes decisions that define the federal role in planning, constructing, maintaining, inspecting, and financing water resource projects. These decisions occur within the context of multiple and often conflicting objectives, competing legal decisions, and long-established institutional mechanisms (e.g., century-old water rights, contractual obligations, etc.).

The ACF is a prime example of the complexity of the river management issues in which the Corps and other federal water management and resource agencies are embroiled along with state and local governments, and the general public. How the nation uses and values its rivers has changed over time. Rivers are now seen as not only providing economic benefits but also recreational opportunities and ecosystem services, such as species habitat. These changes have manifested themselves in law (e.g., ESA) and in implementation of water resources statutes. This shift has caused a reexamination by the courts, agencies, and stakeholders of the distribution of economic and other benefits of river management alternatives. The debate over ACF management raises some fundamental questions about water resources management in the nation, such as whether some river uses should take priority over others (e.g., threatened and endangered species protection over inland waterway transportation), how to evaluate alternatives (e.g., balancing multiple uses, maximizing economic benefits, reducing short-term or long-term risk), and how to manage extremes and change. The ACF is not unique and the controversy over river management is not limited to drought conditions.⁶⁸ Actions by federal agencies remain controversial on the Middle Rio Grande, San Joaquin, Colorado, Klamath, Columbia, Snake, Mississippi, and Missouri Rivers; and like the ACF, federal actions and facility operations on these rivers frequently are challenged in the courts.

⁶⁸ However, other droughts have not resulted in proposals to suspend the ESA basin-wide.

Appendix A. ACF Compact and Lawsuits

The apportionment of water rights in the ACF, and in many cases reduction in using those rights, is often disputed, as has occurred among Alabama, Florida, and Georgia. Each water from the three rivers to suit its varying needs. The use of water in Lake Lanier and the operation of its dam have been a source of contention for years among Alabama, Florida, and Georgia. In the early 1970s, Georgia officials became concerned with drought conditions and the amount of water available to the growing population of the Atlanta region. In 1989, the Corps agreed to provide Metropolitan North Georgia (including Atlanta) with twice as much water by reallocating Lake Lanier storage water from hydropower to water supply.⁶⁹

In 1990, Alabama and Florida filed suit against the Corps to stop the larger withdrawals, based in part on the impact they would have on downstream users and a failure to comply with the National Environmental Policy Act (NEPA; 42 U.S.C. §§4321-4347).⁷⁰ The parties suspended the proceeding to negotiate a settlement. Settlement negotiations ultimately resulted in an interstate compact (the ACF Compact) which was approved by Congress in 1997 (P.L. 105-104).

Through the ACF Compact, the parties intended “to develop an allocation formula for equitably apportioning the surface waters of the ACF Basin among the states while protecting the water quality, ecology and biodiversity of the ACF.”⁷¹ In other words, the Compact provided an agreement to agree on allocations at some future date. Although the states negotiated for years, they never reached an agreement and, after many extensions of the 1998 date on which the ACF Compact was to terminate, the Compact expired on August 31, 2003. Since then, litigation has resurfaced as the states attempt to secure their water rights.

There are three major cases arising from the controversy over the ACF River Basin, filed in three different federal district courts.⁷² The first, *Alabama v. U.S. Corps of Engineers* (the Alabama case),⁷³ was the original case that led to the ACF Compact; it was revived after the ACF Compact expired. The second, *Southeastern Federal Power Customers, Inc. v. U.S. Army Corps of Engineers* (the DC case),⁷⁴ was filed in the District Court for the District of Columbia in December 2000. The

⁶⁹ J. W. Hull, *The War Over Water*, Southern Legislative Conference (Oct. 2000), at [<http://trendsinafrica.org/pubs/Documents/slc-0010-warwater.pdf>]; J. Clemons, Water-Sharing Compact Dissolves, *Water Log*(2003), at [<http://www.olemiss.edu/orgs/SGLC/MS-AL/Water%20Log%20PDF/23.3.pdf>].

⁷⁰ *Alabama v. U.S. Corps of Engineers*, No. CV-90-H-01331-E (N.D. Ala., Eastern Division, filed June 29, 1990). Georgia joined the suit later as a defendant.

⁷¹ P.L. 105-104.

⁷² These lawsuits are ongoing, interrelated, and contain voluminous filings and numerous orders. Accordingly, the precise legal posture of each case may be subject to rulings or filings that CRS has not obtained or reviewed and the analysis herein is necessarily general.

⁷³ *Alabama v. U.S. Corps of Engineers*, No. CV-90-H-01331-E (N.D. Ala., Eastern Division, filed June 29, 1990).

⁷⁴ *Southeastern Federal Power Customers, Inc. v. U.S. Army Corps of Engineers*, No. 1:00CV02975 (D.D.C., filed on December 12, 2000).

DC case involved a dispute brought by Southeastern Federal Power Customers (SeFPC), a non-profit corporate consortium of rural electric cooperatives and municipal electric systems. The suit was a result of the 1989 agreements between the Corps and Georgia that increased withdrawals from Lake Lanier and consequently diminished the flow-through by which hydropower is generated. SeFPC claimed that its members were paying for Buford Dam hydropower at prices disproportionate to their residual share of water stored in Lake Lanier devoted to power generation.⁷⁵ The third case, *Georgia v. U.S. Army Corps of Engineers* (the Georgia case),⁷⁶ was filed in a Georgia federal district court in February 2001. In this case, Georgia sued the Corps to increase its water supply.

The proceedings of the three cases are interrelated. In the Alabama case, Alabama and Florida sued to prevent withdrawals of water from Lake Lanier made to the detriment of downstream users. While the action was suspended pending negotiations, the DC case was filed. In January 2003, the parties in the DC case, including Georgia and the Corps, reached a settlement agreement and requested the court's approval. Because the parties to the DC case attempted to implement a settlement agreement that would affect the use of the water at issue in the Alabama case, Alabama and Florida revived the Alabama case to challenge the settlement agreement. Alabama and Florida also intervened in the DC case to oppose the approval of the agreement as a violation of the suspension of proceedings in the Alabama case. In October 2003, the federal district court in the Alabama case granted Alabama and Florida's motion for a preliminary injunction, enjoining the Corps and Georgia from implementing the agreement in the DC case.⁷⁷ In 2004, the district court in the DC case approved the settlement agreement, but required that the injunction entered in the Alabama case be dissolved before the agreement could be implemented.⁷⁸ In 2005, the 11th Circuit Court of Appeals vacated the Alabama district court's injunction order, finding that Alabama and Florida did not establish an imminent threat of irreparable harm or a substantial likelihood of prevailing on the merits of the case.⁷⁹

While the Alabama and DC cases were being litigated, Florida and SeFPC filed motions to intervene in the Georgia case, but the motions were denied by the district

⁷⁵ *Southeastern Federal Power Customers, Inc. v. Caldera*, 301 F.Supp.2d 26, 30 (D.D.C. 2004). The Corps and Georgia were both named defendants in this suit.

⁷⁶ *Georgia v. U.S. Army Corps of Engineers*, No. CV 2:01-CV-26-RWS (N.D. Ga., Gainesville Division, filed on February 7, 2001).

⁷⁷ See *Alabama v. United States Army Corps of Engineers*, No. CV 90-BE-1332, Preliminary Injunction (N.D. Ala. entered October 15, 2003).

⁷⁸ 301 F.Supp.2d at 35. Alabama and Florida appealed the court's decision. The Court of Appeals for the D.C. Circuit dismissed the appeal for lack of jurisdiction, noting that because the district court's decision was conditional, it lacked the finality required to proceed with an appeal. See *Southeastern Federal Power Customers, Inc. v. Harvey*, 400 F.3d 1, 4 (D.C. Cir. 2005).

⁷⁹ *Alabama and Florida v. United States Army Corps of Engineers*, 424 F.3d 1117, 1133 (11th Cir. 2005).

court in a decision overturned by the 11th Circuit.⁸⁰ The 11th Circuit permitted the parties to intervene in the litigation, recognizing their legally protected interests, and returned the case to the district court for further adjudication.⁸¹ The district court, noting the similarity of the parties and the subject matter, found the case to be parallel to the Alabama case.⁸² It suspended the proceedings in the Georgia case pending resolution of the Alabama case.

The U.S. Supreme Court has not addressed the issues raised by the ACF Basin litigation at this time. In June 2006, the Court declined to review an 11th Circuit decision in the Alabama case.⁸³ The underlying 11th Circuit opinion had held that the action did not involve a controversy between states, which would have to be heard by the U.S. Supreme Court, but did involve a dispute between states and a federal agency, which was properly heard by the lower federal courts.⁸⁴

In March 2007, the Alabama and Georgia cases were consolidated and transferred to the Middle District of Florida “to serve the convenience of the parties and witnesses and promote the just and efficient conduct of the litigation.”⁸⁵ The DC case was excluded from this centralization of proceedings because it had already reached the appellate court, whereas the cases that were consolidated remained in various federal district courts.⁸⁶ There appears to be no further ruling in these cases since the consolidation. Currently, the states continue to dispute the apportionment of water.

⁸⁰ See *Georgia v. United States Army Corps of Engineers*, 302 F.3d 1242, 1247-1250 (11th Cir. 2002).

⁸¹ *Ibid.*, p. 1252, 1258.

⁸² *Georgia v. United States Army Corps of Engineers*, 223 F.R.D. 691, 696-699 (N.D. Ga. 2004).

⁸³ See *Alabama and Florida v. United States Army Corps of Engineers*, 126 S.Ct. 2862 (2006).

⁸⁴ *Alabama and Florida v. United States Army Corps of Engineers*, 424 F.3d 1117, 1130 (11th Cir. 2005).

⁸⁵ *Tri-State Water Rights Litigation*, 481 F.Supp.2d 1351, 1352 (Judicial Panel on Multidistrict Litigation 2007).

⁸⁶ *Ibid.*

Appendix B. Is a NEPA Review Required?

Another factor in the Corps' plan to release less water is whether an environmental review document, such as an environmental assessment (EA) or an environmental impact statement (EIS), is required under the National Environmental Policy Act (NEPA) (42 U.S.C. §§4321 et seq.). NEPA requires federal agencies to prepare an EIS when their actions constitute "major Federal actions significantly affecting the quality of the human environment."⁸⁷ The act requires that agencies comply "to the fullest extent possible."⁸⁸ However, NEPA does not require any particular results, such as choosing the least harmful project. The U.S. Supreme Court has said NEPA "merely prohibits uninformed — rather than unwise — agency action."⁸⁹ Accordingly, where courts have found that agencies took a hard look at the relevant areas of environmental impact and satisfied the other demands of Section 4332(2)(C), the courts have upheld the NEPA process. In this case, it does not appear that the Corps prepared any NEPA document.

The National Environmental Policy Act (NEPA; 42 U.S.C. §§4321 et seq.) applies to *major federal actions*. While there is no set formula for what type of action is a *major federal action* under NEPA, certain guidelines are provided by the Council on Environmental Quality (CEQ) regulations. Under those regulations, an action includes "new or revised agency rules, regulations, plans, policies, or procedures." 40 C.F.R. § 1508.18(a). Additionally, the regulations provide that federal actions include adopting plans, programs, and/or projects that use federal resources. 40 C.F.R. § 1508.18(b). It seems likely that a court would find that the Corps' plan to reduce water flows to levels outside of its operating plan requires at the minimum, an EA. In 2006, when the Corps decided to adjust the low flow operations of the Woodruff Dam, it conducted a NEPA review. It prepared an EA that resulted in a finding of no significant impact (FONSI), meaning that there were no significant environmental impacts from its planned actions and no full-blown EIS was required.

If the change in the water flow were found to be a major federal action, the next question would be whether it would significantly affect the human environment. The significance of an action is determined by its context and intensity. 40 C.F.R. § 1508.27. The significance of this program would be based on the length of time of the water reduction, which appears to be until the drought ends and the water levels in Lake Lanier rise to a certain level, and the impact on the region, which affects interests as diverse as those of municipal, industrial, recreational, and commercial users of water in three states. Also, there are three endangered species that would be adversely impacted by the water level change. These factors would dictate whether an EA or an EIS is required. The Corps appears to have acknowledged that its actions will impact the environment, by dint of the Biological Assessment alone.⁹⁰

⁸⁷ 42 U.S.C. §4332(2)(C). For more details on environmental reviews, see CRS Report RS20621, *An Overview of the NEPA Process*.

⁸⁸ 42 U.S.C. §4332.

⁸⁹ *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351 (1989).

⁹⁰ The statutory provision for a Biological Assessment contemplates that it will be used in (continued...)

Emergency Exception

It has been suggested that because the governor of Georgia declared a State of Emergency related to the drought, NEPA could be waived. However, the statute provides for no such unilateral waiver. NEPA emergency provisions are found within the Council on Environmental Quality (CEQ) regulations, 40 C.F.R. § 1506.11. The provision, in its entirety, states:

Where emergency circumstances make it necessary to take an action with significant environmental impact without observing the provisions of these regulations, the Federal agency taking the action should consult with the Council about alternative arrangements. Agencies and the Council will limit such arrangements to actions necessary to control the immediate impacts of the emergency. Other actions remain subject to NEPA review.

An agency must consult with the CEQ if it is taking action without following NEPA; without CEQ's authorization, the agency would be acting in violation of the law. Waiver authorization is within the CEQ's discretion. According to one court that considered the issue, CEQ has the authority to "waive its own regulations ... [and] also to interpret the provisions of NEPA to accommodate emergency circumstances."⁹¹ If the Corps requested a waiver from strict compliance with NEPA, and the CEQ agreed, that decision would be given substantial deference.⁹²

Research did not reveal many examples of Section 1506.11 being invoked by agencies in which a court reviewed the decision. None of the actions found was similar to the facts at hand. The cases involved waiving NEPA for an industrial project,⁹³ and night-time use of an Air Force base during the Desert Storm military operation.⁹⁴ In both cases where CEQ authorized the emergency provision, alternative environmental procedures were used. Shortly after Hurricane Katrina, CEQ issued a memorandum in which it emphasized that NEPA should continue to be followed to "demonstrate our continuing commitment to environmental stewardship."⁹⁵ It provided guidance on complying with Section 1506.11 as an appendix.

⁹⁰ (...continued)

conjunction with the NEPA process, and in fact can be considered part of a NEPA review, although it does not mandate that the two go together. 16 U.S.C. §1536(c)(1): "Such assessment may be undertaken as part of a Federal agency's compliance with the requirements of section 102 of the National Environmental Policy Act of 1969."

⁹¹ Crosby v. Young, 512 F.Supp. 1363, 1386 (D.C. Mich. 1981).

⁹² Andrus v. Sierra Club, 442 U.S. 347, 358 (1979).

⁹³ Crosby v. Young, 512 F.Supp. 1363 (D.C.Mich. 1981).

⁹⁴ Valley Citizens for a Safe Environment v. Vest, 1991 WL 330963 (D.Mass. May 06, 1991).

⁹⁵ Memo of Sept. 8, 2005, from the Associate Director for NEPA Oversight, "Emergency Actions and NEPA," available at [http://www.nepa.gov/nepa/regs/Memo_to_NEPA_Contacts_September_8_05.pdf].

The Right to Sue under NEPA

NEPA litigation is almost always based on claims that an EA or an EIS was not prepared, or was inadequately prepared. NEPA suits are brought under the Administrative Procedure Act (APA). Therefore, courts review whether an agency's action was arbitrary or capricious or otherwise not in accordance with law.⁹⁶ Parties have to show standing. That limits plaintiffs to those who could show they were adversely affected or aggrieved by the agency action and that NEPA intended to protect against that actual or threatened injury.⁹⁷ For example, an economic injury by itself is not the type of harm NEPA protects against and could not be the basis for a lawsuit. However, the reduced use of the river by a recreational kayaker could be the basis for standing. Plaintiffs could include individuals, and groups, provided they were able to show they suffered an injury in fact that was different from the injury suffered by the community at large.⁹⁸

⁹⁶ 5 U.S.C. §706(2)(A).

⁹⁷ 5 U.S.C. §702.

⁹⁸ See *Massachusetts v. EPA*, 127 S. Ct. 1438, 1453 (2007) (a personal stake confers standing, even when there is “widespread harm”).

Appendix C.

How the Endangered Species Act Works

Under the ESA (16 U.S.C. §531), the taking of species listed as endangered or threatened, is prohibited. *Taking* is broadly defined and includes not only obvious actions such as killing or trapping, but also *harm*. (See 50 C.F.R 17.3 for a definition of *harm*.) In addition, federal agencies must avoid destruction or adverse modification of designated critical habitat.

If a federal agency plans to carry out a program or action that may incidentally result in a taking, or in adverse habitat modification, it must consult with FWS on the activity. (For an overview of the ESA, see CRS Report RL31654, *The Endangered Species Act: A Primer*.) The action agency submits a Biological Assessment (BA) to FWS describing its proposed action and potential effects on the species; FWS returns with a Biological Opinion (BO) on the effects of the activity, and specifies any reasonable and prudent measures that the agency must take to avoid harm, or adverse modification of critical habitat. FWS issues an Incidental Take Statement (ITS) that specifies the impact of the incidental take, the reasonable and prudent measures, and the terms and conditions that the action agency must comply with to implement these measures (16 U.S.C. §1536(b)(4)).

Appendix D. The Corps and ACF Species Management: A Brief History

In March 2006, the Corps requested formal consultation with FWS on operation of the Jim Woodruff Dam. Prior to the current Corps BA for the EDO, a previous FWS consultation had been initiated on the Interim Operating Procedure (IOP) in March 2006. FWS responded with a Biological Opinion (BO), and included reasonable and prudent measures (RPMs) to modify the IOP to reduce incidental take of listed species. Among the five recommendations, one specified that the Corps develop a set of trigger points (of the reservoir, climatic or hydrologic conditions, and species conditions), and water management measures to take effect when drought conditions were reached. The Corps submitted a revised BA on February 16, 2007. FWS issued a BO and incidental take statement approving these changes to the IOP on February 28, 2007. Among the conditions set in the current IOP to protect listed species are these:

- Minimum flow in drought conditions: 5,000 cfs daily average, but 6,500 cfs daily average considered desirable.
- Maximum fall rate during drought conditions: 0.25 feet/day (i.e., the height of the river to drop no more than 3 inches in the course of any given day), but a lower rate considered desirable.

The first figure was intended to provide a certain minimum of available habitat. The second was intended to allow the sturgeon, and the very slowly moving mussels, some chance to re-locate to more suitable habitat before a given location dries out.