TESTIMONY OF SAM D. HAMILTON, REGIONAL DIRECTOR, SOUTHEAST REGION, U.S. FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR, BEFORE THE HOUSE TRANSPORTATION AND INFRASTRUCTURE COMMITTEE, SUBCOMMITTEE ON WATER RESOURCES AND THE ENVIRONMENT REGARDING DROUGHT ISSUES IN THE SOUTHEAST
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Madame Chairwoman, and Members of the Subcommittee, thank you for the opportunity to testify on behalf of the Department of the Interior regarding the impacts of the current drought in the Southeast. I am Sam Hamilton, Regional Director for the Southeast Region of the U.S. Fish and Wildlife Service, headquartered in Atlanta, Georgia. I am accompanied today by Jess Weaver, Regional Executive for the Southeast Region of the U.S. Geological Survey.

As you are aware, the Southeast is in the midst of an historic drought. Many reservoirs are at their lowest recorded elevations and several cities and towns support significantly higher populations and demand more water than they did during previous droughts. In 2007, parts of Georgia, Alabama, North Carolina, South Carolina and Tennessee had their lowest annual rainfall on record and stream flows in many areas have been at all time lows. While some forecasts for 2008 suggest that conditions may improve later this year, the situation today remains very serious.

Using information provided by the USGS, this statement provides a brief overview of the relevant hydrology in the region. It includes a discussion of the principal regional reservoirs and the various water uses and competing demands for water in the relevant river basins. The testimony concludes with a discussion of the Department's ongoing role in the region.

Overview of Apalachicola-Chattahoochee-Flint (ACF) River Basin

The ACF Basin covers 19,600 square miles extending from the Blue Ridge Mountains with free-flowing trout streams to the ecologically rich Apalachicola Bay in the Gulf of Mexico. The ACF Basin covers parts of the Blue Ridge, Piedmont, and Coastal Plain

with 74 percent of the basin lying within Georgia, 15 percent in Alabama, and 11 percent in Florida. The Apalachicola River is formed by the confluence of the Chattahoochee River (8,770 square miles, of which 70 percent is within Georgia) and the Flint River (8,460 square miles, which lies entirely within Georgia) at the border between Florida and the southwestern corner of Georgia. From its confluence, the Apalachicola River flows about 107 miles to the Gulf of Mexico. The ACF Basin receives an average annual precipitation of 55 inches and the average annual streamflow near the mouth of the river is 25,100 cubic feet per second (1978-2006 at Sumatra, Florida).

There are five Federal reservoirs in the ACF Basin: Lake Lanier, West Point Lake, Walter F. George Lake, George W. Andrews Lock and Dam, and Lake Seminole at Jim Woodruff Lock and Dam. In addition, 11 non-Federal Georgia Power projects are present within the ACF Basin.

In the context of severe droughts, which occurred in the early and late 1980s and from 1999-2002, conflicts have arisen between increased water demands for Atlanta in the upper part of the Basins and increased demands for irrigation in the lower portion of the ACF. Lake Lanier is the uppermost and largest reservoir in the ACF Basin.

Principal Reservoirs of the ACF Basin

Much of the recent attention regarding the ACF Basin has focused on storage water that remains in Lake Lanier. Lake Lanier is the principal source of water supply for the population of metropolitan Atlanta, which doubled in size between 1980 and 2000, and grew to more than 4.9 million people in 2005. Despite abundant average rainfall, no large rivers flow through metropolitan Atlanta because of its location in the headwaters of five major river basins. Additionally, ground-water sources supply less than 1.5 percent of metropolitan Atlanta's water needs because the region is underlain by crystalline rock aquifers that typically do not support high-yield wells.

Lake Lanier was formed by Buford Dam in 1956 as a Federal reservoir. Located at the headwaters of the ACF system, Lake Lanier comprises 62.5 percent of the storage in the system, but only 6 percent of the drainage basin. This means that because of its huge

storage capacity and relatively small drainage area, it takes longer to refill Lake Lanier than it does other lakes in the system. Operation of the network of reservoirs to provide downstream water is complicated by having the majority of storage located in the upper end of the basin. Lake Lanier must release adequate water to meet water quality and water supply requirements at Peachtree Creek. During extreme drought conditions when storage in the downstream reservoirs is depleted, operations must meet other flow requirements downstream.

West Point Lake was created by West Point Dam in 1974 and represents 17 percent of the ACF Basin storage. Lake Walter F. George was formed by Walter F. George Dam in 1963 and represents 14 percent of the ACF Basin storage. Releases from West Point Lake are critical to meet minimum flow requirements for Columbus, Georgia and for temperature reduction at the Plant Farley thermoelectric generating plant. Plant Farley, completed in 1970 (phase one) and 1977 (phase 2), has a capacity of 1,776 megawatts. This plant supplies more than 20 percent of the electric power used in the State of Alabama. Releases are also required at times to provide adequate depth for navigation.

Lake Seminole was completed in 1957 with the construction of Jim Woodruff Lock and Dam and represents 6 percent of the ACF Basin storage. Releases from Lake Seminole are required to maintain minimum flows established at the time of dam construction to support the Herbert Scholz thermoelectric generating plant, which was completed in 1953 and has a 92 megawatt generating capacity. Recently, additional minimum flow requirements were set to support threatened and endangered species of the Apalachicola River.

Competing Demands for Water in the ACF Basin

There are numerous competing demands for the waters of the ACF Basin, which provide water supply for several million people representing about 60 percent of the population of Georgia, about 8 percent of the population of Alabama, and about 1 percent of the population of Florida. The waters of the ACF irrigate more than 780,000 acres of farmland. The lower ACF Rivers are home to one threatened fish species, and two threatened and four endangered mussels. The rivers of the ACF are the source for about

59 public water suppliers and about 41 industrial plants, including about 7 thermoelectric power plants that collectively withdraw more than 100,000 gallons per day. Additionally, there are more than 80 ground-water withdrawal permits in the ACF Basin for public supply and industrial use. The flood control, navigation, and recreation benefits of the rivers and reservoirs of this system provide both intrinsic and economic values. At the mouth of the ACF Basin, Apalachicola Bay represents a significant oyster and shrimp fishery.

How Much Water is in the ACF Basin, and How Much Water is Used?

There are no simple answers to the questions of how much water is in the ACF Basin and how much water is used. Instead, the answers depend on the location in the river basin and on the year and season. Location is important because as one moves from upstream to downstream in a typical river setting, additions to streamflow from tributaries including ground-water contributions and subtractions of streamflow for consumptive use are cumulative, with increasing total amounts in the downstream direction. Time is important because streamflow and consumptive use can vary by hundreds of percent from year to year and from season to season at any given location; consumptive use typically is highest during drought periods and summer months when streamflow typically is low.

Surface-water use may be classified as consumptive when water is removed from a source and is not returned to the source for reuse immediately downstream. These consumptive amounts depend on several factors, particularly the type of water use, which varies from region to region. Streamflow during low-flow periods comes primarily from ground water and can be affected by ground-water pumping.

On an average annual basis, consumptive use from the metropolitan Atlanta area represents about 1 percent of average annual streamflow of Apalachicola at Woodruff Dam, which is less than the measurement errors for these data. However, water-supply planning must focus on the amount of streamflow in the upper Basin and not on flows in the Apalachicola River. For instance, in the extreme drought of 1999-2001, average monthly streamflow into Lake Lanier during the summer was not sufficient to meet all

downstream needs without significant reservoir level declines during those drought conditions. A USGS Fact Sheet (FS 2007-3034) indicates that cumulative consumptive use in the ACF Basin down to Lake Seminole represented about one-fourth of the streamflow leaving Lake Seminole in July 2000. This was the lowest documented July streamflow in the Apalachicola River leaving Lake Seminole since recordkeeping began there in 1929, although other months have had even lower streamflow. Extreme droughts are rare but recurring and are the focus of water management and planning.

Complicating Factors

The greatest changes in Basin hydrology in the past three decades have been driven by increased public supply demands associated with the Atlanta region and increased agricultural withdrawals in the southern portion of the Basin. During extreme, protracted droughts, Lake Lanier is the storage of last resort to meet minimum flow requirements throughout the system. Another complicating factor is the effect on streamflow from intensive ground-water withdrawals used for irrigation in the lower ACF Basin. The vast majority of the 780,000 irrigated acres in the ACF are supplied by center-pivot wells. The cumulative influence of these wells can change the direction of ground-water flow. Streams that would normally gain water from surrounding aquifers during low flow begin to lose water to these aquifers. These dynamics have been simulated as part of a recently completed study conducted by the USGS. Interbasin transfers represent another important complicating factor, particularly in the upper AFC Basin. Because the Atlanta region is spread across the headwaters of 5 major river basins, water withdrawn from one basin may supply users in other basins; similarly, wastewater supplied from one basin may be discharged across a major basin boundary into another basin.

Overview of Alabama-Coosa-Tallapoosa (ACT) River Basin

The Alabama, Coosa, and Tallapoosa Rivers flow southwestward from northwest Georgia to southwest Alabama, draining 22,800 square miles into Mobile Bay. Twenty-three percent of the drainage area is within Georgia and 77 percent is within Alabama. There are five Federal projects within the Basin – Carters Lake, Lake Allatoona, Robert F. Henry Lock and Dam, Millers Ferry Lock and Dam, and Claiborne Lock and Dam,

and 11 non-Federal Alabama Power projects. Federal projects compose 22 percent of the total water storage in the Basin. The five Federal reservoirs are operated and managed to serve multiple purposes. Average precipitation across the Basin is about 55 inches per year. There are 29 threatened and endangered aquatic species in the ACT Basin. The waters of the ACT are used to irrigate about 28,000 acres of farmland. The rivers of the ACT are the source for about 218 industrial and public permitted water suppliers; 155 in Alabama and 63 in Georgia (2001 data). These permits are required for users to withdraw more than 100,000 gallons per day. Additionally, there are numerous ground-water withdrawal permits in the ACT Basin for public supply and industrial use. The flood control, navigation, and recreation benefits of the rivers and reservoirs in this Basin provide enormous intrinsic and economic values.

The upper reservoirs in the ACT Basin have been discussed extensively with respect to interbasin transfers for supply to the Atlanta region. The two upper reservoirs in this Basin are Carters Lake and Lake Allatoona. Carters Lake was formed in 1974 by construction of Carters Dam and represents 5.7 percent of the Basin reservoir storage and 2.3 percent of the Basin drainage area. Lake Allatoona, impounded in 1950 by Allatoona Dam, represents 11.4 percent of the overall Basin storage and 4.9 percent of the Basin area.

Federal Role in the Apalachicola-Chattahoochee-Flint (ACF) River Basin

Water is a public resource governed by state governments, not Federal agencies. However, Federal agencies play an important cooperating role, and the Federal government has made significant investments in the construction and maintenance of reservoirs to meet multiple public use purposes. As noted above, in the ACF basin there are four large Federal reservoirs. One of the Department's roles, through the Service, is to advise Federal agencies with regard to their obligations under the Endangered Species Act.

In the ACF River basin, this means working closely with the U.S. Army Corps of Engineers, the states of Alabama, Florida and Georgia, and other partners to ensure the

threatened Gulf sturgeon and three species of endangered mussels – the Purple bankclimber, Fat threeridge and Chipola slabshell - are not jeopardized by any agency action. Collectively, we are working towards the recovery of these species, which require flowing water to survive.

Balancing the water needs of millions of people across three States is not easy, particularly during this extreme drought. The river system supplies water for many municipal and industrial purposes, including power generation, flood control, navigation, drinking water, agriculture, pollution dilution, fish and wildlife habitat, and recreation. It is important to understand that the Service is not putting the needs of fish and mussels ahead of the needs of people. Conserving aquatic species is a means to ensure the health of our rivers and streams, and mussels are the canary in the coal mine for our rivers - declines in native mussel populations indicate an emerging problem with the health of the river that could affect people.

The Service has been working with the Corps since the 1980s when drafting of revisions to the ACF Water Control Plan began. Shortly thereafter the "ACF Water Wars" ensued in several Federal courts. Throughout the era of the tri-state water compact in the 1990s, the Service provided assistance as additional data was collected and as the States negotiated water allocations. With the listing of the Gulf sturgeon as threatened in 1991 and the mussels as endangered in 1998 under the Endangered Species Act, the Service consulted with the Corps as it managed flows within the system.

In addition to our participation in these overarching negotiations, the Service is working proactively on the ground in the ACF basin to help communities meet their growing water demands. For example:

- In 2001, we provided $200,000 to agricultural producers in the Flint River basin to retrofit irrigation systems in order to conserve water;
- In 2004, we helped develop guidance for streamlining the review process for water supply reservoirs throughout Georgia;

- In 2005-2006, we helped develop a water supply plan protocol to assist municipalities with securing water supply while minimizing impacts to federally listed species north of Atlanta; and
- In 2006, we provided $130,000 to the State of Georgia to begin the planning process for the development of a habitat conservation plan for the lower Flint River basin which would help engage basin stakeholders, primarily agricultural users, in water conservation and mussel protection.
- For many years, we have been working in high priority areas throughout the basin on mussel surveys and monitoring. By entering into partnerships with communities, landowners, and local, State and Federal agencies, we continue to explore opportunities to restore and protect aquatic habitat.

Regardless of these and other proactive efforts to conserve species, in 2006, the basin experienced diminishing precipitation levels and the situation worsened in 2007. Without rainfall, the Corps had to adjust its operations to meet the multiple purposes of the reservoirs, the needs of fish and wildlife, and the needs of basin stakeholders.

To address potential effects of reservoir operations, the Corps developed the Interim Operating Plan (IOP) in 2006, and the Service formally consulted on this plan. While some mussels could be affected by the IOP, we concluded that the 2006 IOP was not enough to avoid jeopardy to the species' continued existence. Measures to avoid and minimize harm to the species were recommended and accepted by the Corps.

As the drought worsened, the Corps and the Service agreed to several adjustments to the IOP in October 2007, to help maintain water in reservoir storage. The Corps then formally amended the IOP on November 1, 2007, producing the Exceptional Drought Operations (EDO) plan to increase opportunities to store water during rain events. Knowing that extreme drought was continuing, and given our close working relationship with the Corps, the Service marshaled a large team to collect additional data, complete the needed analyses, and complete formal consultation on the EDO in only 15 days, a process that typically takes up to 135 days.

Today we continue to work closely with the Corps, the States, and other Federal agencies to enhance flexibility in water management on the ACF, while considering the needs of fish and wildlife resources. Most recently, we have been supporting Secretary Kempthorne and his staff as they assist the States in negotiating a water sharing agreement for the ACF.

Drought Throughout the Southeast

Of course, the ACF basin is just one of the stressed river systems throughout the Southeast. In addition to working with Alabama, Florida, and Georgia, we are working with partners in North Carolina, South Carolina, and Tennessee as they wrestle with assessing and understanding the ongoing and future impacts of drought. For example:

- We are actively working with the Corps, the Federal Energy Regulatory Commission, and Alabama Power Company in the Alabama-Coosa-Tallapoosa (ACT) River Basin to address the impact of operational changes on listed species.
- We are working with six States most deeply affected by the current drought (AL, FL, GA, NC, SC and TN) to develop a drought contingency plan for freshwater mussels. The plan will guide decision-making with regard to appropriate actions that should be carried out in the event of extreme drought conditions. Contingency planning will identify a monitoring network of specific actions to be taken, expected consequences of these actions, and triggers for initiating actions and expectations regarding evaluation of any actions that are implemented.
- In Tennessee, we worked with the Tennessee Valley Authority (TVA) when they reduced flows at Normandy Dam on the Duck River in October 2007. The Duck River supports significant populations of three federally listed mussel species. In February 2008, we developed a plan with TVA and the state of Tennessee to further reduce flows from Normandy Reservoir in order to conserve water for future needs of humans and mussels if the drought continues.
- In South Carolina and North Carolina, we are working with key partners on strategies to save a number of mussel species. We have also initiated emergency rescue operations for one species, the federally endangered Carolina heelsplitter, of which only 10 small populations remain.

- In North Carolina, we are working with the Corps and other partners to manage reservoir levels and river flows in the Raleigh area.
- In Florida's Everglades, we are working with many partners including the South Florida Water Management District, local governments, and the Corps to manage the significant drought challenges currently found throughout the entire ecosystem. Lake Okeechobee, known as the liquid heart of the Everglades, is facing record low water levels that are expected to drop even further as the dry season continues. We are working together to strike a balance that meets south Florida's water needs, protects important habitat such as the Arthur R. Marshall Loxahatchee National Wildlife Refuge, and conserves species including the snail kite, a highly endangered bird.

Information Needs

The Department is seriously committed to working with states affected by drought now and in the future. The drought has highlighted data gaps and information needs that, if filled, would facilitate future decision-making for the Service and our State and Federal partners. For example, for the ACF we have created a list of projects that would increase our understanding of river hydrology and the habitat needs of sturgeon and mussels; implement key habitat restoration efforts; and provide incentives to private landowners to conserve water. We are developing similar lists of information needs for the ACT and other basins.

The drought has also highlighted existing areas of work that are crucial for understanding water shortages. For example, USGS stream gauges throughout these river systems have been important monitoring tools over the course of the drought. Data resulting from this program is basic to our ability to understand changing hydrology and manage these river systems.

While we need information to make decisions, partnerships with key water users and education efforts that encourage the public to conserve water are also needed. Water may soon become a limiting factor for growth and development in many areas of the

southeast. While we cannot produce more rain, we can all do more to maximize the use of the precipitation that the Southeast receives to best meet the needs of all water users.

Conclusion

The Department and its State and Federal partners have been working proactively for many years to implement solutions that balance the many uses of these systems, including meeting the water needs of people, while at the same time conserving species. Maintaining healthy river systems is critically important to the economy and natural environment of the Southeastern United States. The drought has taught us that more needs to be done to keep these systems healthy for generations to come. These lessons are particularly important in light of climate change predictions, which suggest more intense droughts, sea level rise and increased temperatures in the Southeast. The Department is committed to help states find practicable and balanced solutions, based on the realities of Mother Nature, to manage their water supplies.

Madame Chairwoman, thank you for the opportunity to testify today. This concludes my prepared remarks, and I would be happy to respond to any questions that Members may have.

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