

# ENSURING WATER SECURITY FOR PEOPLE AND NATURE

A STATUS REPORT FROM THE UPPER FLINT RIVER WORKING GROUP

MARCH 2019



**American Rivers**  
RIVERS CONNECT US®





# ENSURING WATER SECURITY FOR PEOPLE AND NATURE

A STATUS REPORT FROM THE UPPER FLINT RIVER WORKING GROUP

MARCH 2019

Successes to Date and Next Steps for Drought Resilience



**American Rivers**  
RIVERS CONNECT US®

# ACKNOWLEDGEMENTS

The efforts described in this report have been sustained by the generous support of the Richard King Mellon Foundation, Charles Stewart Mott Foundation, Turner Foundation, Bonneville Environmental Foundation, and the Kresge Foundation, as well as by Upper Flint River Working Group participants and by supporters of American Rivers and Flint Riverkeeper®.

This Status Report was written by Ben Emanuel at American Rivers in collaboration with Upper Flint River Working Group participants. It has benefited from review by Laura Craig, Jenny Hoffner and Chris Williams at American Rivers, in addition to Gordon Rogers at Flint Riverkeeper. Design is by Hannah Palmer.

## THE UPPER FLINT RIVER WORKING GROUP





# TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
BACKGROUND: THE UPPER FLINT RIVER WORKING GROUP	4
Statement of Purpose	5
Participants	5
THE UPPER FLINT RIVER BASIN	6
Extreme Low Flows During Drought in the Upper Flint	8
NEW CONVERSATIONS	11
TAKING ACTION	13
Consumptive Water Use: Ongoing Challenges	18
MOVING FORWARD	19
Consensus Goals	19
Localized Flooding in the Flint's Urban Headwaters	20
NEXT STEPS	22
Securing Resources for Drought Resilience	24
CONCLUSION	26



# EXECUTIVE SUMMARY

**This Status Report describes efforts of** the Upper Flint River Working Group to achieve drought resilience and water security for people and nature in Georgia's upper Flint River basin. This Working Group is a voluntary collaborative made up of the staff leadership of all the large water utilities in the upper basin, local conservationists, non-profit conservation organizations, and sustainability staff of Atlanta's international airport.

From its outset in 2013, the Working Group has provided a forum for new conversations about the upper Flint River system's future and its role in the communities that depend on it. Group members share a vision of a river system healthy enough to maintain the many social, ecological, recreational and economic values that the Flint River system provides—values such as water supply, recreation, fisheries, property values and a healthy river ecosystem.

Since the year 2000, four droughts have struck the Flint basin in the Georgia Piedmont. Each has brought on low river flows that are unprecedented in the

historical record of flows on the Flint. The severity of recent drought impacts on the river is cause for concern, and there is a clear need to improve drought resilience in the basin.

This report details the Working Group's consensus-based goals and strategies for river system resilience. These goals fall under an over-arching common vision that the upper Flint River system has the capacity to meet human and ecological water needs, now and in the future.

In addition, this report describes specific actions by individual Working Group participants that are enhancing water availability for people and nature during drought in the basin. Many of these actions carry multiple benefits for water utilities and other land and water managers, as well as for local communities and the river's ecological health.

Some actions being undertaken in the basin were conceived of prior to the creation of the Working Group, while others came about precisely through this group's collaboration.

LINE CREEK,  
PEACHTREE CITY, GA,  
JUNE 2018  
PHOTO: STACY  
FUNDERBURKE





# CONSENSUS-BASED GOALS

- Ensure Water Availability for Public Water Supply
- Protect and Restore Opportunities for Recreational Use
- Protect the Ecological Function of the River System
- Provide a Platform for a Healthy Regional Economy
- Reduce Frequency and Duration of Extreme Main Stem Low Flows
- Reduce Incidence of Zero Flow Conditions in Historically Perennial Tributaries
- Reduce Flooding Damage

**Group members share a vision of a river system healthy enough to maintain the many social, ecological, recreational and economic values that the Flint River system provides—values such as water supply, recreation, fisheries, property values and a healthy river ecosystem.**

As Working Group participants have gained an increased awareness of the critical nature of drought flows in the upper Flint, they have chosen to emphasize and accelerate the implementation of projects that support mutual Working Group goals.

Because the water utilities participating in the Working Group all have different characteristics, they are pursuing differing opportunities relevant to their respective water, wastewater and stormwater systems in moving forward for a resilient upper Flint River system.

Management strategies that address mutual Working Group goals include pursuing water efficiency and conservation, increasing return flows of treated wastewater, and improving stormwater management through implementation of green infrastructure. Certain additional water management

strategies already in progress by some participants include efforts to improve reservoir management and to develop a land protection plan and landscape-scale green infrastructure vision that help protect and restore healthy flows in the upper Flint. The Working Group has also identified key areas of research to better inform water management going forward and to improve collective understanding of basin-wide hydrology and environmental flows.

Despite ongoing challenges for water availability during drought in the upper Flint basin, the quickening pace of positive actions in the basin is an encouraging sign for the future. Upper Flint River Working Group participants remain committed to continuing their work, through honest collaboration and open dialogue, toward meeting a vision of a healthy and resilient Flint River for future generations.





# BACKGROUND

The participants in the **Upper Flint River Working Group** first gathered together in June 2013 at the invitation of American Rivers, a national river conservation organization. That invitation followed the publication of the report *Running Dry: Challenges and Opportunities in Restoring Healthy Flows in Georgia's Upper Flint River Basin*, authored by American Rivers and Flint Riverkeeper. The report documented recent and disconcerting low-flow trends in the upper Flint River, especially during drought, and it analyzed the role of changes in land use, climate, water use and water management in recent decades in the changes seen in the river.

Rather than assign blame for the urgent conservation issues in the upper Flint River system on any one entity or action, the conservation groups acknowledged the complexity of the issues and the need for dialogue and action toward solutions. When the water utilities of the river basin and local conservationists accepted this invitation for dialogue, the Upper Flint River Working Group was established.

For five years, the Working Group has provided a voluntary, collaborative forum for conservation groups, water utilities and other key stakeholders in the upper Flint River basin to engage in new conversations about the river's future and its role in the communities that depend on it.

Participants in the Working Group agree that its efforts are vitally important and the need to improve drought resilience in the basin remains critical. In the five years since the Working Group was founded, unprecedented drought conditions during the summer and fall of 2016 emphasized the urgency and significance of the group's efforts. These efforts continue to hew to a broad statement of purpose adopted by consensus in 2013.

UPPER FLINT BASIN  
DROUGHT RESILIENCE  
WORKSHOP, NEWNAN, GA,  
JANUARY 2018  
PHOTO: STEPHEN  
GOLLADAY



# STATEMENT OF PURPOSE

The Upper Flint River Working Group's purpose is to keep the upper Flint River and its tributary streams flowing to protect the social, ecological, recreational and economic values the river system provides. Through this voluntary Working Group, diverse stakeholders come together to share information, identify barriers, seek common ground, and proactively pursue opportunities to restore and protect the river system and its flows.

## PARTICIPANTS

### **BEN EMANUEL**

Director, Clean Water Supply,  
American Rivers

### **JAY BOREN**

Chief Executive Officer, Coweta  
County Water Authority

### **RICHARD CANDLER**

Co-owner and operator, Wildcraft  
Flowers; Coweta County resident;  
member, Flint Riverkeeper Board  
of Directors

### **MIKE DELISLE**

Environmental educator and  
Fayette County resident

### **STACY FUNDERBURKE**

Assistant Regional Counsel &  
Conservation Acquisition Associate,  
The Conservation Fund

### **CHRIS HINDMAN**

Director of Public Services,  
City of Fayetteville

### **ELLIOTT JONES**

Retired U.S. Geological Survey  
hydrologist; Chair, Flint River Water  
Trail; member, Flint Riverkeeper  
Board of Directors

### **BRANT KELLER, PH.D.**

Director of Public Works and  
Utilities, City of Griffin

### **NICK KILBURG**

Director of Conservation and  
Outdoor Education, Southern  
Conservation Trust

### **BRAD KONWICK**

Environmental Technician,  
Town of Tyrone

### **SUSAN LEE**

Division Manager of Operations,  
Peachtree City Water and Sewer  
Authority, 1998-2018; Spalding  
County resident

### **BRANDON LOVETT**

Director of Water Operations,  
Newnan Utilities

### **KEVIN OSBEY**

Stormwater Utility Section  
Manager, Clayton County Water  
Authority

### **JIM POFF**

Assistant General Manager, Clayton  
County Water Authority, 2014-2018;  
Fayette County resident

### **LEE POPE**

Director, Fayette County Water  
System

### **GORDON ROGERS**

Executive Director and Riverkeeper,  
Flint Riverkeeper

### **POLLY SATTLER**

Senior Sustainability Planner, Asset  
Management and Sustainability  
Division, Hartsfield-Jackson Atlanta  
International Airport; President,  
Board of Directors,  
Flint Riverkeeper

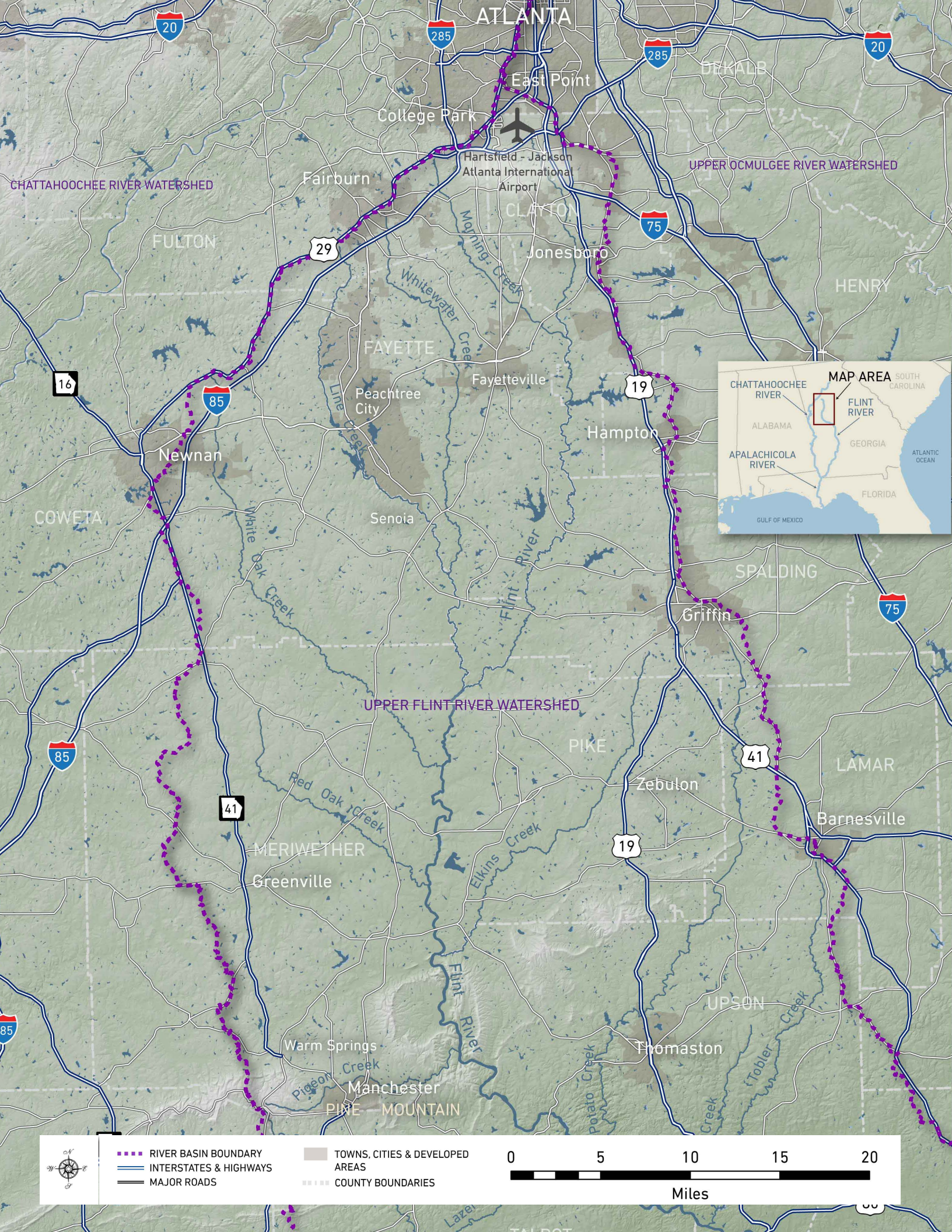
### **MIKE THOMAS**

Member Relations & Leadership  
Development, Georgia Association  
of Water Professionals; General  
Manager, Clayton County Water  
Authority, 2006-2018

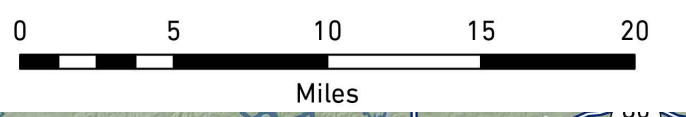
### **TIM THOMS**

Business owner and Fayette County  
resident





- RIVER BASIN BOUNDARY
- INTERSTATES & HIGHWAYS
- MAJOR ROADS
- TOWNS, CITIES & DEVELOPED AREAS
- COUNTY BOUNDARIES





# THE UPPER FLINT RIVER BASIN

**The Upper Flint River Working Group's area of focus** is on the Piedmont portion of Georgia's Flint River basin, from its headwaters just above Atlanta's international airport to the Fall Line of central Georgia between Macon and Columbus. Although this 1,850-square-mile area represents just one part of the Flint River basin and of the greater **Apalachicola-Chattahoochee-Flint (ACF) River basin**, the upper Flint in the Georgia Piedmont is remarkable for its scenery, its biodiversity, its sport fishery and the recreational value it provides, all while serving as a water supply source for hundreds of thousands of Georgians.

The main stem of the Flint River is undammed from its source southward throughout the Piedmont and well into the Coastal Plain, making it one of only 42 rivers in the country running for more than 125 miles (200 km) without obstruction by a

dam.<sup>1</sup> This fact, in addition to the physical geography of the basin, make the Flint a gem of the Georgia outdoors and highly ecologically significant. Where the upper Flint River cuts through the ridges of the Pine Mountain chain in Meriwether, Pike, Talbot and Upson counties, it is the lifeblood of a diverse landscape where Coastal Plain, Piedmont and mountain species intermingle.

The seven extensive areas of shoal habitat along the river in the Pine Mountain region—each where the river falls steeply and swiftly for up to three miles over a broad bed of exposed bedrock shoals—are hotspots of aquatic biodiversity and productivity, home to threatened and endangered species including freshwater mussels and fish like the Halloween Darter, found nowhere else in the world. These shoal complexes are also critical to the life history of the Flint's iconic and endemic sportfish, the aptly named shoal bass.

1. Benke, Arthur C. (1990). "A perspective on America's vanishing streams." J. N. Am. Benthol. Soc., 1990, 9(1):77-88.



# EXTREME LOW FLOWS DURING DROUGHT

**The Flint River has always suffered from droughts.** In the severe droughts that struck Georgia in the 1930s, 1950s and 1980s, flows in the Flint River dropped significantly. Near where it crosses the Fall Line, records show, the Flint had only 100 cubic feet per second of flow, at its lowest, in each of these major 20th-century droughts.<sup>2</sup>

From the year 2000 to 2016, four droughts struck the Flint in quick succession. Apart from the single-year drought of 2016, all were between two and four years in duration. And in each of these droughts, beginning in 2000, the Flint's lowest flows totaled only 30 to 50 percent of the amount of its lowest flows during droughts in the 20th century. Major tributaries like Line Creek ceased flowing completely. Due to the combined effects of land development, water

resource development and repeated drought throughout the basin, the river system's hydrologic response to dry weather is more severe today than in the past.

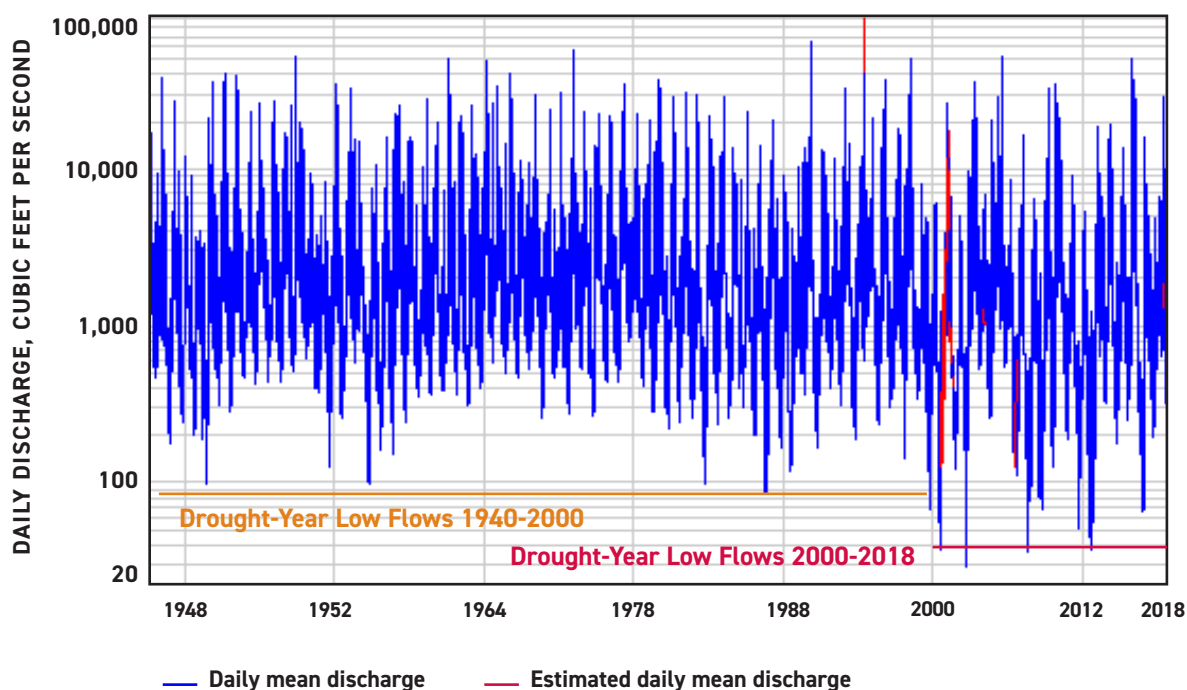
Longtime Flint River lovers have been alarmed to see the river nearly running dry. "You could walk across it in your Sunday shoes without them getting wet," said the late Dr. Mack Dallas of Thomaston, who spent a lifetime fishing the river at Pasley Shoals, of the repeated drought conditions since the year 2000. In these dry weather conditions, the paddling season ends far earlier in the summer than usual due to lack of water, and in some recent years canoeing and kayaking opportunities have been nearly nonexistent during the warm months of the year.

LOW FLOWS AT PASLEY  
SHOALS, OCTOBER 2016  
PHOTO: ALAN CRESSLER

2. These and other statistics on main stem upper Flint River flows in this report reference data from the U.S. Geological Survey "Carsonville" stream gauge, number 02347500, on the Flint River at U.S. Highway 19/80 near Culloden.



## STREAMFLOW: FLINT RIVER AT US 19, NEAR CARSONVILLE, GA



**“The new upper Flint doesn’t have as much water as the old upper Flint.”**

—DR. STEPHEN GOLLADAY, THE JONES CENTER AT ICHAUWAY

As documented in the *Running Dry* report in 2013, a variety of human-influenced factors play significant roles in exacerbating the impacts of drought on the river. The impervious surfaces of urban landscapes shed water quickly in the river’s headwaters area, rather than allowing rainwater to soak into the ground to feed baseflow in the tributary streams that form the capillary network of the river system. Numerous small- and medium-sized lakes and ponds throughout the tributary network evaporate water from the river system, especially during drought, altering natural hydrologic patterns. And only approximately one-third

of the water withdrawn from the upper Flint and its tributaries for water supply returns directly to the river system via wastewater discharges; much of the rest is exported from the Flint altogether via interbasin transfer or is destined for the largely consumptive uses of landscape irrigation, land application of wastewater, septic tanks and “purple pipe” reuse irrigation.

In both drought and non-drought conditions, flows in the upper Flint River are more variable and less predictable than in the past. Perhaps more important, there has been a decline in overall water availability

in the river system for approximately 40 years. In the words of Dr. Stephen Golladay, a hydro-ecologist at the Jones Center at Ichauway, “The new upper Flint doesn’t have as much water as the old upper Flint.”

Recent observed trends in upper Flint River hydrology align with expectations for how the basin will be impacted by a changing climate. As noted regarding the Southeast United States in the Fourth National Climate Assessment, published in 2018, “Climate change is expected to intensify the hydrologic cycle and increase the frequency and severity of extreme events like drought and heavy rainfall.” The assessment notes also: “Extreme drought events are expected to become more frequent and severe.”<sup>3</sup>

With careful planning and proactive management, the municipal water providers of the upper basin have weathered every

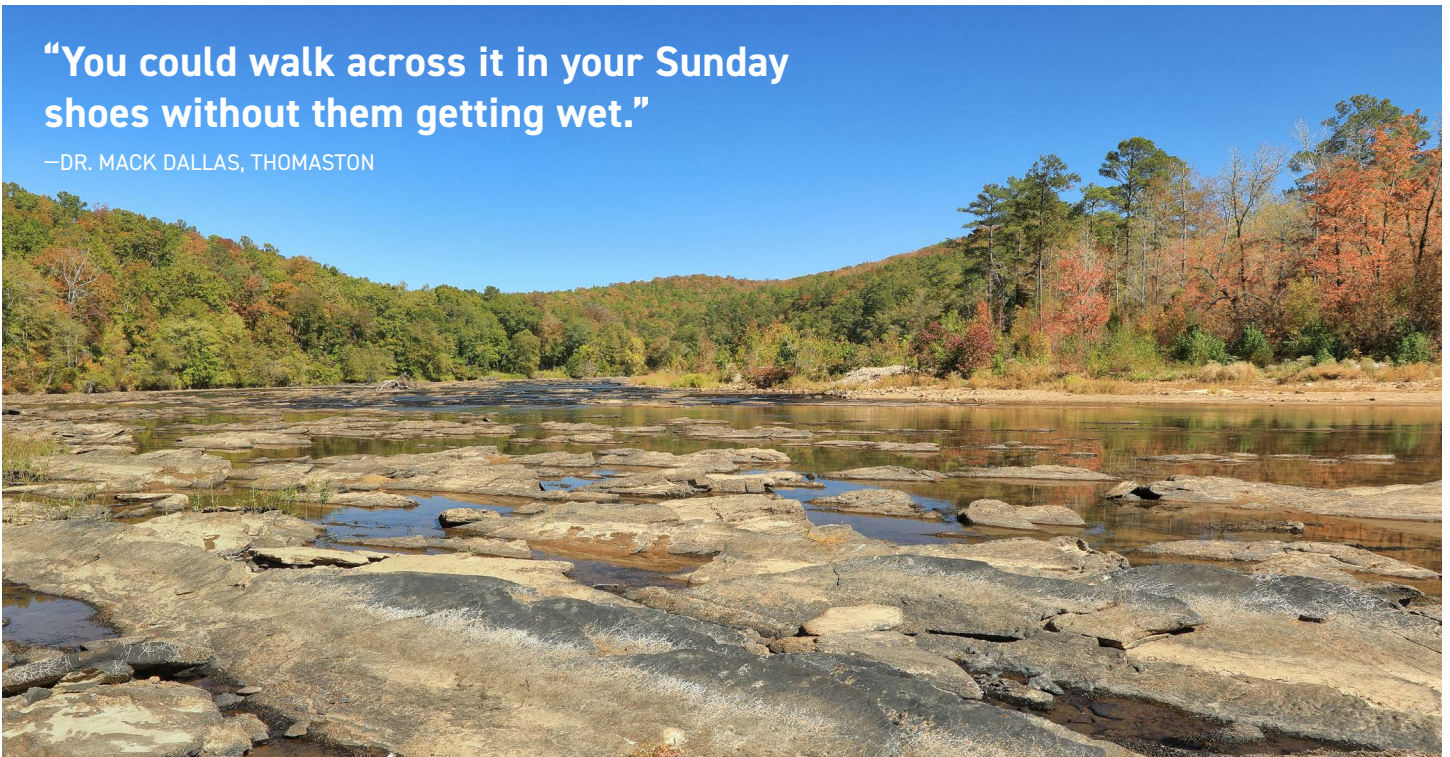
drought to date. These water utilities chiefly secure water supply using pump-storage reservoirs built on tributary streams to hold river water for later use. In the case of Clayton County Water Authority, which is the most upstream water system sourcing Flint River water, innovative constructed treatment wetlands are the backbone of a highly sustainable system of indirect potable water reuse.

Even from the water utility perspective, however, recent droughts have been a cause for concern. As the 21st century marches on, the need to improve drought resilience in the upper Flint basin for all the values the river provides—water supply, recreation, fisheries, property values, and a healthy river ecosystem—is clear.

3. USGCRP, 2018: Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II: Report-in-Brief. U.S. Global Change Research Program, Washington, DC, USA, 186 pp.

**“You could walk across it in your Sunday shoes without them getting wet.”**

—DR. MACK DALLAS, THOMASTON







# NEW CONVERSATIONS

**The value of planning for drought when not in drought is a central tenet of Working Group activities.**

**The Working Group typically meets bi-annually** for an afternoon around a conference table at Brooks United Methodist Church in Fayette County. These meetings provide an opportunity to share updates about ongoing activities all around the basin, as well as important opportunities for in-person discussions among the group.

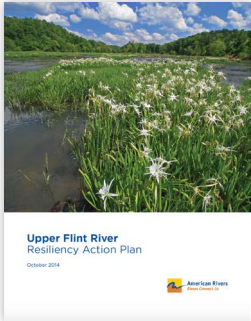
Group members also communicate with one another often about various issues and projects. The group remains committed to maintaining productive dialogue especially in non-drought time periods. The value of planning for drought when not in drought is a central tenet of Working Group activities. Further, during drought and near-drought conditions, the basin's water providers

convene monthly via conference call to share information on conditions and drought response actions in their respective service areas.

Working Group members share a vision of a river system healthy enough to maintain the many social, ecological, recreational and economic values that the Flint River system provides. The group has provided a new and important framework for seeing how the actions of individual organizations and utilities improve conditions at the scale of the entire upper river basin. Many of these actions carry **multiple benefits** for water utilities and other land and water managers, as well as for local communities and the river's ecological health.

THE WORKING GROUP  
GATHERS AT THE FLAT  
CREEK NATURE AREA,  
PEACHTREE CITY, GA,  
OCTOBER 2013  
PHOTO: BEN EMANUEL

**The Working Group has created the space for important conversations that have helped to advance key actions that are already improving the health and drought resilience of the upper Flint River system.**



In 2014, American Rivers collaborated with Working Group participants to produce and publish an **Upper Flint River Resiliency Action Plan**, which outlined specific strategies to restore resilience to some of the most stressed portions of the river basin, along with highlighting key needs in the areas of policy, research and information. Today, Working Group members can point to progress on multiple priority efforts identified in the Action Plan. These include efforts focused on:

- opportunities for return flows;
- green infrastructure in the river's uppermost headwaters in the airport area;
- water management in the Flat Creek watershed;
- basin-wide drought response communications;
- land protection strategies; and
- aligning resources for applied research on basin-wide hydrology and environmental flows.





# TAKING ACTION

**The Working Group has created the space for important conversations** that have helped to advance key actions that are already improving the health and drought resilience of the upper Flint River system. Certain efforts described below were conceived of prior to the creation of the Working Group, while others came about through this group's collaboration and the 2014 Action Plan. As Working Group participants have gained an

increased awareness of the critical nature of drought flows in the upper Flint, they have chosen to emphasize and accelerate the implementation of projects that support mutual Working Group goals.

The projects described below, some completed and some in progress, will improve drought resilience and water availability for people and nature in the upper Flint basin going forward.

THE WORKING GROUP  
AT BROOKS UNITED  
METHODIST CHURCH,  
BROOKS, GA, APRIL 2017  
PHOTO: JEREMY DINER

### **Clayton County Water Authority returns water to the Flint River**

As of this writing, construction is underway on upgrades to Clayton County Water Authority's (CCWA) W.B. Casey Water Reclamation Facility, off Flint River Road near Jonesboro. When operational in 2020, the facility will consistently return 2 million gallons of water per day (3 cubic feet per second) directly to the Flint River. These new return flows will reverse a portion of a significant interbasin transfer that has exported water from the Flint River basin in recent decades. (The volume of return flows may increase beyond 3 cubic feet per second in future years as overall water flows within the water and wastewater system increase.)

Informed by its participation in the Working Group, CCWA identified opportunities in its own strategic master planning to improve overall water and wastewater system efficiencies while also responding to basin-scale environmental concerns and

the needs of downstream communities and ecosystems. The new discharge to the Flint River from the Casey facility will help maintain base flow in the Flint, boosting river system resilience to future drought conditions.

### **Newnan Utilities protects low flows with pump station upgrades**

In 2015, Newnan Utilities made significant upgrades to its Line Creek pump station, located on this major headwater tributary of the Flint near Peachtree City. These upgrades make the pump station more efficient at withdrawing water from the stream during higher flows, therefore reducing the need to withdraw water at low flows. Furthermore, the new infrastructure is automated, and programmed to improve streamflow protection at times of low flow. This voluntary upgrade was motivated by observations of the increasingly variable and “flashy” hydrology in Line Creek—with higher peak flows during wet weather and

CLAYTON COUNTY WATER  
AUTHORITY'S E.L. HUIE,  
JR. CONSTRUCTED  
TREATMENT WETLANDS  
PHOTO: CCWA







no-flow conditions during extreme drought—and by a recognition, informed by Working Group dialogue, of the needs of communities and the river system downstream.

### **Fayette County Water System improves reservoir management on Flat Creek**

The Fayette County Water System (FCWS) has partnered with the U.S. Geological Survey to install new stream and lake gauges that have enabled better management of lake levels and stream flows in the Flat Creek watershed. In past droughts, flows to Flat Creek were periodically cut off completely—sometimes resulting in fish kills in the Flat Creek Nature Area in Peachtree City—but FCWS management improvements are keeping Flat Creek flowing while better managing lake levels in the Lake Kedron and Lake Peachtree reservoirs upstream.

### **Griffin Public Utilities leads research on regional water supply dynamics**

The City of Griffin's Public Works and Utilities Department, a regional water supplier throughout substantial portions of

the upper basin, has proactively undertaken multiple cost-benefit analyses as a part of its engagement with stakeholders through the Working Group. Griffin's various analyses seek to better understand the potential to reverse interbasin transfers, adjust reservoir releases or make other infrastructure modifications that could return flows to the Flint. Griffin's in-house research provides an important base of information that is useful to all Working Group participants and at the basin scale.

### **Working Group "drought calls" inform proactive drought response**

In 2016, drought struck Georgia and the Flint River basin yet again. This fourth drought since the turn of the 21st century mercifully did not span multiple years, but its impacts were severe nonetheless. As summer turned to a very warm fall and many areas went 100 days or more without rain, the water providers of the upper Flint basin watched reservoir levels drop precipitously, noting the increased evaporation associated with extended hot weather.<sup>4</sup>

HISTORIC STARR'S MILL  
IN FAYETTE COUNTY, GA,  
NOVEMBER 2017  
PHOTO: HANNAH PALMER

The 2016 drought provided a new road test for an idea that had emerged through the Upper Flint River Working Group during non-drought conditions in 2014: to convene monthly information-sharing conference calls among water providers in the basin, beginning before drought response actions were triggered by state law, and continuing cautiously after drought response actions were no longer mandated. Water providers in the basin found value in having an open phone line once per month to communicate with one another about drought response actions ongoing or expected in their respective water systems, as well as about the rapidly deteriorating conditions early in the year's drought event.

### **Atlanta's airport installs green stormwater infrastructure to promote infiltration**

Participation by Hartsfield-Jackson Atlanta International Airport (HJAIA) staff in the Working Group is uniquely important, given the 4,700-acre airport's location in the uppermost headwaters of the Flint River main stem. HJAIA Asset Management and Sustainability Division staff, with technical assistance from American Rivers and peer learning from other stormwater managers in the Working Group, have led efforts to install green stormwater infrastructure on-site at the airport. Although there are land-use challenges related to airport-specific regulations and management needs (for example, certain Federal Aviation Administration requirements), the airport has adopted the City of Atlanta's post-construction stormwater ordinance where feasible on-site. This ordinance focuses on runoff reduction methodology and green

infrastructure to infiltrate, evapotranspire and re-use runoff generated by a 1" rainfall event. In addition, next steps at the airport are included in the City of Atlanta's Green Infrastructure Strategic Action Plan (2017), and airport sustainability staff participate in the city's Green Infrastructure Task Force.

There are opportunities along roadways, in parking lots, and elsewhere on the grounds of the world's busiest airport for bio-swales, pervious paving, rainwater capture and similar measures to improve hydrologic conditions downstream. Initial pilot projects, such as bio-swales at a new park-and-ride facility on Sullivan Road, are already underway.

Over time and in concert with other management strategies, the installation of green stormwater infrastructure in the Flint's headwaters can help mitigate flooding during wet weather and restore base flow during dry weather. Improving hydrology in urbanized landscapes is one of many tools to increase water availability during drought in the Flint River basin.

### **Finding the Flint envisions restored urban headwaters**

In 2017, a collaboration of American Rivers, The Conservation Fund and the Atlanta Regional Commission launched the initiative known as Finding the Flint. Finding the Flint is an ambitious vision for restoring the Flint's urbanized headwaters to improve watershed conditions, connect communities to one another and to the river, and add a sense of place to the Atlanta airport area as redevelopment takes place there. Finding the Flint is quickly generating significant

4. Although essentially anecdotal, this experience raises the question of potential impacts in the Southeast of "hot drought," the concept that higher temperatures make droughts more severe, in part through increased evaporation and plant transpiration. See Udall, B. and J. Overpeck (2017), The twenty-first century Colorado River hot drought and implications for the future, *Water Resour. Res.*, 53, 2404–2418, doi:10.1002/2016WR019638.





traction with an impressive array of stakeholders to incorporate environmental and community benefits into airport-area redevelopment.

The effort is centered on the following six Headwaters Development Principles:

- Improve the health of the Flint River
- Connect people to the river physically and culturally
- Benefit the community equitably
- Provide solutions to the airport
- Add beauty and soul to any development
- Inspire the next generation of river advocates

As of this writing, stakeholders are discussing conceptual design for initial pilot projects aimed at restoring or enhancing urban greenspaces along the headwaters, as well as building capacity to engage existing

residents in planning for the area and in community-driven stream monitoring. Finding the Flint presents an important opportunity to work at the watershed scale, across several municipalities in the headwaters, to reduce the harmful effects of urban land development on water resources. Although influencing Flint River hydrology through green infrastructure interventions is a long-term prospect, the Finding the Flint vision presents important opportunities to improve the headwaters for the benefit of local communities and the river system downstream.

FLINT RIVER SOUTH OF  
HARTSFIELD-JACKSON  
ATLANTA INTERNATIONAL  
AIRPORT, MAY 2018  
PHOTO: HANNAH PALMER



# ONGOING CHALLENGES: CONSUMPTIVE WATER USE

Although a variety of water management actions are already improving drought resilience in the upper Flint basin, the Working Group recognizes that many threats to healthy flows and drought resilience continue.

For example, residential housing development has lately been expanding once again in many areas of the basin in a period of economic growth. Although some basin communities have sought to constrain sprawling residential development by limiting the expansion of sewer service, in many cases housing growth has continued regardless, utilizing septic systems rather than centralized sewer for wastewater treatment. Thus, this new growth has the combined effect of adding more impervious surfaces to the landscape of the basin, as well as increasing water supply demand without direct returns of that water to the river system.

Broadly speaking, water policy in Georgia is shifting away from encouraging various types of land application of wastewater in favor of direct discharges to streams. For example, as of this writing, the City of Senoia is planning to construct a wastewater treatment facility that will discharge directly to Keg Creek, in the Line Creek sub-basin. Although the wastewater discharge to Senoia's existing Land Application System will continue, the return flows via the new discharge to Keg Creek will benefit the Flint River system and communities downstream.

An additional legacy of past state policies encouraging land application of wastewater has been the development of "purple pipe" reuse of water for landscape irrigation, and there are multiple purple pipe systems within the upper Flint basin. Although this type of non-potable water reuse can conceivably reduce demands on environmental water supplies if developed and operated strategically with basin-wide water needs in mind, it also has the clear negative impact of denying much-needed direct return flows to the Flint River system. With increasing treatment capabilities, many wastewater systems can now discharge fully to streams and the river rather than to these largely consumptive reuse systems. Local water managers and State of Georgia decisionmakers have the opportunity to evaluate existing non-potable reuse systems to take advantage of modern-day treatment capabilities and address the need for return flows to the river system.







# MOVING FORWARD

In 2018, the Working Group convened for a day-long Drought Resilience Workshop to chart consensus-based goals and strategies for improving drought resilience for people and nature in the upper Flint River basin for the future. This workshop established consensus on goals and strategies for moving forward as a group, and it initiated a dialogue with research scientists in the areas of hydrology, ecology and fisheries to inform important work going forward on drought resilience and environmental flows. This scientist group presently includes research scientists from **the University of Georgia River Basin Center, the Jones Center at Ichauway, the U.S. Geological Survey and Auburn University**, in addition to science advisors of American Rivers and Flint Riverkeeper.

system that has the capacity to meet human and ecological water needs, now and in the future. In addition, the group agreed to the following goals to achieve the vision.

## CONSENSUS GOALS:

1. Ensure Water Availability for Public Water Supply
2. Protect and Restore Opportunities for Recreational Use
3. Protect the Ecological Function of the River System
4. Provide a Platform for a Healthy Regional Economy
5. Reduce Frequency and Duration of Extreme Main Stem Low Flows
6. Reduce Incidence of Zero Flow Conditions in Historically Perennial Tributaries
7. Reduce Flooding Damage

ABOVE:  
PASLEY SHOALS,  
JUNE 2018  
PHOTO: STACY  
FUNDERBURKE

OPPOSITE:  
PO BIDDY ROAD,  
NOVEMBER 2016  
PHOTO: JEREMY DINER

Over the course of the workshop, the Working Group agreed to an important overarching common vision: an upper Flint River



This set of goals reflects the group's collective vision to support all the diverse values that a healthy upper Flint River system provides. **Public water supply** is a core ecosystem service, fundamental to economic and community development, which the river system provides to hundreds of thousands of area residents. **Recreational use** of the river—chiefly for paddling, fishing, picnicking and hiking—is an important value with a long and meaningful tradition for communities in the area, especially in rural portions of the basin. The Working Group's desire to protect the river system's ecological function reflects a collective awareness that if that **ecological function**—which supports water quality, property values, sport fisheries, native species, recreational use and numerous other values—is significantly impaired, whether by severe drought impacts or otherwise, then all stakeholders in a healthy upper Flint River stand to be negatively impacted.

The group's desire for the river to support a **healthy regional economy** reflects the importance of the river-centered recreational economy to the area, as well as the bedrock role of reliable water supply in any local economic and community development. The recreational economy centered on the river includes sport fishing and paddling rental and guide services as well as the highly active Lawhorn Scouting Base at Camp Thunder, a Boy Scouts of America facility that hosts many thousands of visitors annually.

The group also identified three aspects of the river system's increasingly altered hydrology that have detrimental impacts for local communities. **Extreme low flows** in the main stem Flint River during all four recent droughts are cause for concern for the entire upper river system. Although low flows will almost certainly return in future droughts, there are opportunities to limit negative impacts on recreational use, property

## LOCALIZED FLOODING IN THE FLINT'S URBAN HEADWATERS

Although the Working Group's efforts focus on drought resilience, participants acknowledge that localized flooding is also a challenge in the Flint's urbanized headwaters. In fact, some of the same landscape changes that have deprived the river of some of its natural base flow—exacerbating low flows during drought—cause excessive runoff from developed areas during wet weather. The result is localized flooding at points downstream of highly impervious areas.

For example, the Upper Riverdale Road bridge over the Flint River near Riverdale, which connects Interstate 75 with Southern Regional Medical Center, is regularly inundated with floodwaters and closed to traffic following heavy rain. Meanwhile, rainwater that has not been allowed to soak into the ground and feed the river's tributary stream network—instead, rushing downstream quickly and in high volumes—is water that is unavailable to the river and its communities when drought arrives.



## In 2018, the group agreed on the value of particular water management strategies that aid in addressing mutual goals: pursuing water efficiency and conservation, increasing return flows of treated wastewater, and improving stormwater management.

owners and potentially riverine ecology by mitigating their frequency and duration. In parallel, important tributaries such as Line Creek and Flat Creek have seen **zero-flow conditions** in recent droughts; mitigating these impacts will improve water availability in some areas and contribute substantially to ameliorating basin-wide water scarcity concerns during drought. Finally, the group is aware that in addition to a focus on drought resilience, it is important to **reduce localized flooding damage**, especially in the urbanized main stem headwaters area (see sidebar).

The group also agreed in its 2018 workshop on the value of particular water management strategies—many of them already being implemented—that aid in addressing mutual goals. These include pursuing water efficiency and conservation, increasing return flows of treated wastewater, and improving stormwater management. Certain additional strategies already in progress by some participants include **efforts to improve reservoir management** and to develop a **land protection plan** and **landscape-scale green infrastructure vision** that help protect and restore healthy flows in the upper Flint.

In addition, the Working Group identified **key areas of research** to better inform water management going forward. One specific need is to evaluate the instream flow impacts of non-discharging wastewater

treatment methods: septic tanks, land application systems, and “purple pipe” reuse irrigation. More broadly, the group agreed on an important set of research strategies to improve collective understanding of ecological water needs, instream flow impacts and trends, and innovative management approaches to addressing mutual goals.

The Working Group recognizes the diversity of communities and the diversity of water management opportunities and challenges across the upper basin. Thus, the nature of the group’s collaboration includes identifying strategies that not all members will implement. Not every strategy applies for every group member.

**The following section describes specific strategies, efforts and initiatives identified by Working Group participants.** Group members are pursuing these strategies, often in collaboration with partners, in moving forward toward a resilient upper Flint River basin. Just as with actions over recent years, many of these strategies will have multiple benefits for water utilities, for land and water managers, for local communities, and for the river’s ecological health.

UPPER RIVERDALE  
ROAD, RIVERDALE, GA,  
AUGUST 2018  
PHOTO: HANNAH  
PALMER



# NEXT STEPS

## **Improve Understanding of Environmental Water Needs and Hydrologic Trends**

The research scientists interested in the upper Flint River seek to inform efforts at goal-setting for river flows and drought resilience, and their work will be highly valuable in this regard. In turn, the basin's water utilities have expressed interest in supporting the development of improved scientific information specific to the upper Flint. American Rivers serves to coordinate these cross-sector research efforts toward drought resilience in the upper Flint.

In addition to informing efforts at managing for resilience for the long term, this growing group of scientists is undertaking research on a variety specific, "real-time" questions to inform water management in the basin in the near term. For example, an initial collaboration is under way to refine hydrologic information in the basin. This will provide improved information to

water utilities, especially during drought, and improve the collective understanding of the hydrologic impacts of prospective management actions in the future. In addition, researchers are working to develop key indicators of ecological function, focused on main stem shoals, to improve understanding of the ecosystem impacts of hydrologic change in the basin.

These research efforts, meanwhile, will be enhanced by stakeholder-sourced information. The Flint's hydrology will continue to be altered by climate change, land development and water infrastructure. Given these factors and the work that the river will continue to do for communities into the future, adaptive management for resilience of key river-related values is likely to be more productive than relying only on historical flow regimes as a baseline for management goals.<sup>5</sup> Stakeholder engagement (led by American Rivers

FLINT RIVER SOUTH OF  
HARTSFIELD-JACKSON  
ATLANTA INTERNATIONAL  
AIRPORT, JUNE 2018  
PHOTO: STACY  
FUNDERBURKE

5. A guidepost in this effort is a 2017 paper published in the academic journal *Freshwater Biology* by N. LeRoy Poff, Ph.D., a faculty member in Colorado State University's Department of Biology and Graduate Degree Program in Ecology and a member of American Rivers' Science and Technical Advisory Committee: "Beyond the natural flow regime? Broadening the hydro-ecological foundation to meet environmental flows challenges in a non-stationary world."



and Flint Riverkeeper) will be important in identifying these riverine values—for example, recreation, fisheries, property values and ecosystem productivity—and the flow regimes needed to support them.

### **Pursue Water Efficiency and Conservation**

The Fayette County Water System (FCWS) is launching a water efficiency and conservation program that is far more robust than any past efforts in the county. Fayette County is an example of a community with a high proportion of new homes with large residential landscapes and irrigation systems. (Although other Metro Atlanta water utilities have made strides in water efficiency and conservation in recent years, those advances have been inconsistent across the metro area.) The water system's first area of focus will be on reducing "peak demand" on the water system, which coincides with high rates of landscape irrigation during the summer and early fall months. Far above industry standards, peak demand in this system's service area is often more than two times the wintertime baseline demand.

This high "peaking factor" creates significant opportunity to reduce strain on the water production and distribution system, reduce costs for water customers without detrimental impact on water-using activities, and reduce strain on reservoirs and the Flint River system when seasonal flows are at their lowest. FCWS is collaborating with American Rivers and Flint Riverkeeper under a grant from the National Fish and Wildlife Foundation to launch this peak demand management program.

### **Improve Reservoir Management: Flat Creek Watershed**

The Fayette County Water System, having managed dam releases in the Flat Creek watershed effectively for the past three years without ceasing flows to Flat Creek, intends to codify its new management regime for the long term. Further, aided by a hydrologic analysis of the Flat Creek watershed by American Rivers and Flint Riverkeeper, the water system hopes to improve environmental flows in this small watershed across a wide range of hydrologic conditions, not only during dry periods.

### **Protect Lands that Support Healthy Flows in the Flint**

The Conservation Fund, American Rivers and Flint Riverkeeper are collaborating to develop a GIS-based assessment to prioritize land protection opportunities and create a green infrastructure network design across the spectrum of urban, suburban and rural land uses in the basin. This assessment is designed in part to create a toolbox for attaining resources to protect critical landscapes in undeveloped portions of the basin. These include riparian areas especially at major shoal complexes, as well as in the rare montane longleaf pine habitats of the Pine Mountain ridges. In addition, the assessment will identify opportunities to connect critical greenspaces in developed areas with the large landscapes of the rural upper Flint basin—all with the goal of protecting the landscapes that are critical to maintaining, protecting and restoring healthy flows in the river system.

### **Improve Stormwater Management and Utilize Green Infrastructure at Multiple Scales**

As the Finding the Flint effort continues to grow, it will provide a platform not only to achieve multiple benefits in airport-area communities, but also to realize benefits for river health downstream. Success in this effort stands to create a national model for restoring urban headwaters of regionally significant rivers. The Flint headwaters cannot simply be written off due to the negative watershed impacts of urban land development. Rather, the prospect of “greening” stormwater management over time provides an exciting opportunity to improve river health and connect communities along the river corridor with a network of trails, greenspaces and green infrastructure upstream and down throughout the basin.

Clayton County Water Authority is assessing a variety of opportunities for watershed improvement projects especially in the northwestern portion of Clayton County,

near the Flint’s uppermost headwaters, to mitigate localized flooding and other impacts of intensive urban land uses on the watershed. With attention focused on this area through Finding the Flint and other airport-area redevelopment efforts, CCWA is in a lead role within its service area to implement innovative stormwater, water infrastructure and watershed improvement projects to address the multi-faceted challenges of urban runoff and water supply availability while benefiting watershed health. Certain types of projects could provide multiple benefits for water quality, flood protection, stream base flow and drought resilience in Clayton County as well as downstream.

Finally, Hartsfield-Jackson Atlanta International Airport continues to explore a variety of opportunities to become a steward of the Flint River. HJIAA is pursuing implementation of the City of Atlanta post-construction stormwater ordinance by designing development and redevelopment projects on airport property to retain runoff

## **SECURING RESOURCES FOR DROUGHT RESILIENCE**

The work of convening the Upper Flint River Working Group, in addition to certain research efforts and on-the-ground projects, has received generous support from many sources, as noted in this Status Report’s Acknowledgements. The on-the-ground management changes in the basin have been primarily, but not exclusively, funded by the entities that have implemented them.

Moving forward, executing critically important research tasks and further needed restoration projects calls for continued financial support, sourced both within the basin and externally. The Working Group will continue to make the case for resources to enhance drought resilience and water security for people and nature in the basin.



from 1-inch rainfall events, where feasible, with green stormwater infrastructure methods that rely on infiltration, evapotranspiration and reuse. In addition, HJAIA is a key supporter of Finding the Flint, which presents opportunities to leverage on-site improvements at the airport with watershed-scale efforts in the Flint River headwaters.

### **Assess Unique Opportunities: Still Branch Reservoir**

Background: As noted above, The City of Griffin's Public Works and Utilities Department serves as an important regional water supplier along Metro Atlanta's southern fringe, in large part through its ownership and operation of the Still Branch Reservoir in Pike County, which began operation in 2006. Distribution of water by Griffin to Coweta County Water Authority through a wholesale contract results in an interbasin transfer of water from the Flint River to the Chattahoochee River basin. The financial obligations associated with the reservoir itself (chiefly in the form of Griffin's long-term bond debt) and with this wholesale contract—which were originally geared to pre-Great Recession regional trends in water demand growth—today create financial obligations for Coweta that are in excess of its actual water needs. The present situation also places demands on the Flint River water stored at Still Branch that might otherwise be less than they are. However, recognizing the need to correct a difficult financial challenge to the extent it is able, Griffin re-negotiated its wholesale contract with Coweta in 2012, capping Coweta's purchase requirements at 5 million gallons per day (mgd) rather than 7.5 mgd. This re-negotiation, which did not come without cost to Griffin, mitigated a

challenging financial situation for Coweta and provided an opportunity to reduce long-term water demands on the Flint River at Still Branch.

Because Griffin's role is so important to the landscape of regional water supply in the basin, Flint Riverkeeper has begun exploring opportunities to seek external financial resources that could allow for further adjustments to the financial obligations associated with water stored in the Still Branch Reservoir—in particular, the Coweta County Water Authority wholesale purchase agreement with Griffin. Any changes to existing arrangements would need to meet all financial needs on Griffin's part without adding financial strain.

The potential benefit for water availability in the Flint River from this type of action would stem from the opportunity for Coweta to make use of its under-utilized storage and water treatment plant at its B.T. Brown Reservoir in the Chattahoochee River basin, which would reduce Coweta's water usage from the Flint River basin. This, in turn, would better balance water withdrawals and discharges across the Flint and Chattahoochee River basins, ideally with additional management benefits for the water utilities involved.

Beyond the analyses that Griffin has performed, the next step is a focused dialogue of a task force of key stakeholders. This group can begin by identifying mutual goals and exploring opportunities for creative problem-solving to seek external financial resources that could influence this key aspect of regional water management in the upper Flint basin going forward.





# CONCLUSION

Today, stakeholders in a healthy Flint River can point to numerous positive developments throughout the upper basin that are improving water security and drought resilience for future generations. There is, however, much more work to do. Meaningful relationships, honest collaboration and open dialogue have been critical to creating a landscape that accelerates and advances positive developments for the upper Flint and its communities. The Upper Flint River Working Group is committed to continuing its collective work and collaborative efforts toward meeting its vision of a healthy and drought-resilient Flint River for future generations.

SHOALS SPIDER-LILIES,  
HIGHTOWER SHOALS  
PHOTO: ALAN CRESSLER





## ABOUT THIS STATUS REPORT

This Status Report aims to communicate to a broad audience on behalf of the Upper Flint River Working Group as a whole. The report describes the consensus goals and strategies of the group, which are broadly applicable to conditions in the river basin, as well as a variety of actions by individual entities which participate in the Working Group that are enhancing water security in the basin.

Because Working Group participants each possess differing opportunities to address mutual goals, they are pursuing actions pertinent to their respective operations in support of a resilient upper Flint River system. In addition, this report describes certain forward-looking ideas for water management in the basin which will likely need further examination before being applied on the ground.





**American Rivers**  
RIVERS CONNECT US®

### **ABOUT AMERICAN RIVERS**

American Rivers believes every community in our country should have clean water and access to a healthy river. Since 1973, we have been protecting wild rivers, restoring damaged rivers and conserving clean water for people and nature. With headquarters in Washington, D.C. and offices across the country, we are the most effective river conservation organization in the United States, delivering solutions that will last for generations to come.

American Rivers - Georgia  
108 E Ponce de Leon Ave, Suite 212  
Decatur, Georgia 30030

Headquarters  
1101 14th Street, NW, Suite 1400  
Washington, DC 20005

[AmericanRivers.org](http://AmericanRivers.org)

COVER: FLINT RIVER NEAR  
THOMASTON, GA, JUNE 2018  
PHOTO: STACY FUNDERBURKE

INSIDE: FLAT CREEK,  
PEACHTREE CITY, GA,  
JUNE 2018  
PHOTO: TED WEBER