

Sustainable Water Management Plan



Working together to share a common resource.

Executive Summary

MAY 13, 2015

Approved for general release by the Governing Board of ACF Stakeholders, Inc.

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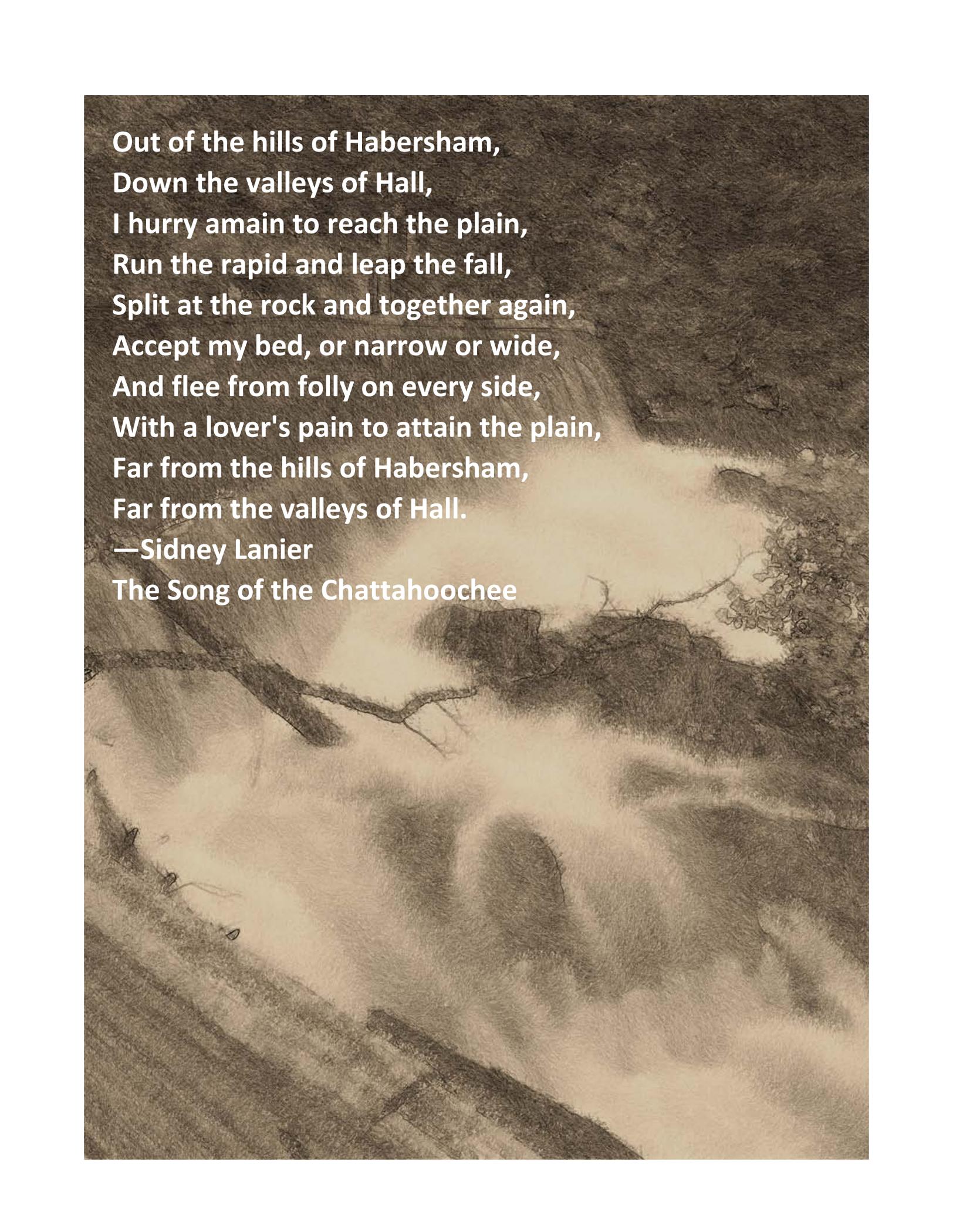
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A sepia-toned landscape painting of a river valley. The river winds through the center of the scene, surrounded by lush, textured vegetation. The hills in the background are rendered with soft, painterly strokes, creating a sense of depth and atmosphere. The overall tone is warm and nostalgic.

Out of the hills of Habersham,
Down the valleys of Hall,
I hurry a main to reach the plain,
Run the rapid and leap the fall,
Split at the rock and together again,
Accept my bed, or narrow or wide,
And flee from folly on every side,
With a lover's pain to attain the plain,
Far from the hills of Habersham,
Far from the valleys of Hall.

—Sidney Lanier

The Song of the Chattahoochee

Executive Summary

The ACFS Vision

The waters of the Apalachicola, Chattahoochee and Flint (ACF) Rivers and the Apalachicola Bay bind and divide both the geography of Alabama, Florida and Georgia and the users of the water.

This Basin is a water-rich region, yet one where attention to sustainable water resource management has become imperative. Although most needs are met in normal and wet years, the limits of the Basin's capacity to support competing water needs are being experienced under dry and drought conditions and more often in some locations and for some water uses. Improvements to the current conditions in the Basin are possible, however; and planning for dry and drought years is critical.

The economic well-being of the southern U.S. and the sustainability of the waters in the ACF Basin are intertwined. However, decades of conflict have set the stage for deeply held positions over the future of the region. The regulatory arena is in flux, and litigation casts a shadow of uncertainty. It is time to turn this around.

ACF Stakeholders, Inc. (ACFS) urges the citizens of this Basin to focus on that which unites, rather than divides, us. We can and must act with common purpose to manage our shared water resources sustainably. Water efficiency and conservation measures, creative alternatives to water control operations, predictive drought management, investment in scientific knowledge for future decisions, and transboundary coordination and cooperation offer real ways to improve environmental, social and economic conditions in this Basin.

ACFS began in August 2008 as a small group of people who live and work in the Basin. Soon after, ACF Stakeholders, Inc. was operating as a non-profit corporation with a Governing Board of 56 stakeholder members representing interests from all areas of the Basin extending through Alabama, Florida and Georgia. The ACFS mission is to change the operation and management of the ACF Basin to achieve equitable and viable solutions among stakeholders that balance economic, ecological, and social values and ensure that the entire ACF Basin is a sustainable resource for current and future generations.

ACFS members have sought to develop a mutual understanding of the diverse interests in the Basin, to explore how the Basin operates, and to reach consensus on recommendations that, taken as a whole, would improve conditions in the Basin. This Sustainable Water Management Plan (SWMP) incorporates what ACFS has learned so far about positive choices that can start now. It also lays the groundwork for the studies and dialogue needed to enhance water management in the future.



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The Audience

This SWMP recommends actions for the U.S. Army Corps of Engineers (USACE), other federal agencies, and the states of Alabama, Florida and Georgia, along with all public and private water users in the Basin.

USACE has a large influence in how water moves within the ACF Basin. The Master Water Control Manual, last updated in 1958, guides decisions regarding the ACF Basin operations for the five federal reservoir projects on the Chattahoochee and at its confluence with the Flint. A Revised Interim Operation Plan (RIOP) also sets release rules that specifically provide minimum flow guidance to the USACE based on Basin Inflow, time of year, and the amount of storage available in the federal projects to meet the various authorized purposes. While the USACE' influence is large, it is limited to the operation of federal reservoirs. The States of Alabama, Florida and Georgia also play critical roles in water resources management throughout the Basin. State permitting programs for wastewater discharges and water withdrawals affect most water users. Alabama, Florida and Georgia each have similar wastewater discharge permitting programs delegated from the federal Environmental Protection Agency (EPA). Water withdrawal permitting and regulation varies between the states.

Development of the Plan

ACFS worked closely with state and federal agencies to compile the best available water withdrawals and returns data in the ACF Basin and used this in modeling current and possible future conditions. ACFS also documented needs and concerns for different stakeholder groups and geographic areas of the Basin and incorporated these concerns in the Plan by developing performance metrics, linked in Appendix A, which were used in the modeling to assess Water Management Alternatives (WMAs).

Modelers used RES-SIM, developed by the USACE, and a river and reservoir model developed by the Georgia Water Resources Institute (GWRI) at the Georgia Institute of Technology called the ACF-DSS model to simulate the river and reservoir response under different hydrologic, development, and management scenarios. The Basin flow model was tailored to provide the outputs to enable results to be compared to the stakeholder developed performance metrics for the main stem flows. GWRI also conducted hydrodynamic modeling of the Apalachicola Bay to investigate the effects of river discharge on bay salinity. Atkins Global then utilized the outputs of the hydrodynamic model to help ACFS compare different water management alternatives on the Eastern oyster.

ACFS also worked with a consortium of universities in the region to assess transboundary water resource management institutions in the United States and around the world and to consider options appropriate for the ACFS Basin.

Recommendations

People benefit from healthy aquatic ecosystems, drawing on water resources for many needs. Sustainable water management requires attention to the challenges of maintaining a healthy aquatic ecosystem, particularly as the capacity of the system to meet all stakeholder needs becomes strained. ACFS members have concluded that improvements in meeting stakeholder needs and concerns in the ACF Basin, as compared to current conditions, are possible and that planning for dry and drought years has become critical.

The plan recommendations are grouped into five themes:

- Achieve Sustainable Use and Return
- Improve Water Storage and Control Operations
- Target Dry and Drought Years
- Advance Scientific and Technical Knowledge for Future Decisions
- Strengthen Basin Coordination

Ensuring reliable and sustainable water resources requires a combination of actions that, taken together, achieve greater benefits for the amount of water used. ACFS recommends that all water users contribute to this by identifying and implementing conservation measures and more efficient use of water. Recognizing that “what gets measured gets done,” tracking and reporting progress over time also must be a priority.

Given the complexity of water resource management under changing conditions, it is important to make adaptive management – or learning about what actions achieve desired results and why, and making adjustments based on lessons learned – a priority. Adaptive management does not mean creating additional conditions of uncertainty for stakeholders who depend on the results of management decisions. Rather, adaptive management, by definition, is a structured iterative process of robust decision-making in the face of uncertainty, with the aim of reducing uncertainty over time via system monitoring. Water managers in the ACF Basin are urged to track the results of their efforts, assess whether those results accomplish what Basin stakeholders are seeking to achieve, and consult stakeholders when considering changes in management decisions based on new information.

Ultimately, actions that result in increased water returns generally benefit all users of the system. While setting quantitative conservation and efficiency targets will require more analysis, in part because circumstances vary, this plan identifies numerous opportunities for more sustainable use and return, and ACFS urges each water user, and managers of water users, to take action.

Modeling done for this plan also demonstrates how changes in the storage and operations of the current federal reservoirs, in combination with water efficiency and conservation measures, could simultaneously improve the instream flows that sustain aquatic habitats in the Basin, Apalachicola Bay and

other instream uses, while providing for both current and future consumptive uses. These operational changes also result in improvements to instream uses in the Basin and the Bay at current consumptive uses.

Thus, based on the modeling conducted for this Plan, ACFS recommends that USACE adopt a policy of adaptive management in the revisions to the Water Control Manual, with the involvement of the states and stakeholders in the ACF Basin, implementing the following suite of actions taken together as a starting point to improve operations of the federal reservoirs on the Chattahoochee River:

- Raise the winter pool rule curve at West Point Lake from 628 ft to 632.5 ft.
- Define new zones to coincide with the USACE reservoir recreational impact zones and then only release water from an upstream reservoir when the downstream reservoir is in a lower zone.
- Adjust hydropower requirements to achieve more flexibility.
- Provide two pulsed water releases to achieve 9,000 cfs at Chattahoochee, FL for two weeks each, one in May and one in July.¹

It is important to consider this suite of actions as a package. Using a banking analogy, some of the changes add to system “savings” and others “spend” those savings on priorities for restoring instream flows and levels and for consumptive uses during droughts. Thus, each is interdependent on the other to achieve the intended results.

The sustainability of the package of recommendations, particularly under drought conditions, is based on technical modeling performed by ACFS consultants. Their adoption was predicated on three conditions: 1) the system storage during drier years is not worse than storage associated with conditions experienced currently under drier years, 2) instream flows during drier years do not become target flows in normal and wetter years, and 3) the assumption (not modeled) that flood control will not be adversely affected. The sustainability of the package of recommendations and consistency with these conditions should be confirmed by the Corps prior to implementation.

This adaptive management approach also should include a regular assessment of the effects of this package of operational rules and adjustments, as frequently as advances in science and the results of data collection to monitor desired outcomes warrant, but no less often than every five years and more often in the first years after this approach is adopted. Such assessments should consider increases and decreases in water use over time and should seek to achieve conjunctive instream flow benefits to the environment, navigation, hydropower, and recreation through pulse magnitudes and durations under dry conditions

¹ Pulses were modeled as 9000 cfs flows at Chattahoochee, FL (not as an additional 9,000 cfs) – as well as 14,000 cfs – and only during periods when flows fell below 9,000 cfs (thus not reducing flows to 9,000 cfs when flows otherwise would have been higher).

consistent with the conditions identified above. USACE should utilize the expertise of one or more of its centers of excellence in implementing this adaptive management approach to draw on lessons learned across the country and to enable lessons learned in this Basin to be shared more widely.

In addition, ACFS recommends that USACE study and implement, if feasible, an increase in the rule curve at Lake Lanier by two feet. Over time, this would add about 78,000 acre-feet of storage capacity to the system, or about seven percent of the original Lanier active storage, which is needed now during drought years and will be needed as conditions and needs change in the future. This SWMP does not address allocation of this capacity; however, ACFS members concur that the increased storage resulting from operational changes should be shared equitably and used in a manner that relieves the adverse impacts of drought conditions.

Further, ACFS also recommends that USACE add a flow control node in the WCM at Columbus. This recommendation is contingent on the implementation of the adaptive management recommendation package above and is not a standalone recommendation. The minimum flows for the proposed node should be developed to retain an approximation of the historical flow frequency while still achieving the benefits to upstream and downstream interests sought in that adaptive management recommendation package.

Clearly, the amount of water available to meet stakeholder interests is less during droughts. Given the adverse impacts in the Basin of recent droughts, ACFS urges local, state and federal decision makers to establish consistent drought management plans that trigger incremental and equitable actions as early as possible to avoid the more dramatic reductions that might be necessary if actions are taken later. Water users and water managers need to be more proactive and less reactive if we are going to manage the system sustainably.

Specifically, ACFS urges USACE to utilize predictive drought indicators in the revised Water Control Manual. Various combinations of predictive drought indicators can be used that allow operation decisions to be made in drought years that enhance system flows while still preserving adequate reservoir storage during the drought. As a starting point for discussion, drought management planning discussions should consider:

- Triggers based on drought conditions (antecedent inflow, areal precipitation, and soil moisture), streamflows, time of year, and remaining storage in federal reservoirs.
- The RIOP uses composite storage alone as a drought trigger. USACE should also consider the state of the Basin (how dry or wet) in triggering drought operations. A drought index should be developed to guide the decision based on the predictive drought indicators selected (e.g. antecedent Mean Areal Precipitation and/or soil moisture). In addition, USACE should use regional sub-basin drought indicators (e.g. for the Apalachicola River, Apalachicola Bay, the middle Chattahoochee or the Flint) to consider changes in operations rather than waiting for designation of drought in the entire ACF Basin.

Developing a common, scientifically valid understanding of the ACF Basin is an essential foundation for sustainable water resource management in this Basin. In the development of this SWMP, ACFS members gained a better understanding of the Basin, including the Apalachicola Bay, but also encountered challenging gaps in scientific and technical knowledge both for near term decisions and for future adaptive management. ACFS members recommend that investments in knowledge about the Basin be made in the following areas, with suggested specific studies listed in Chapter 6:

- Environmental and ecological studies
- Climate variability studies
- Shared real-time water use/return/storage/flow information
- Improvements in modeling

Finally, collaborative efforts are essential to finding sustainable water management solutions. We must sustain and enhance communication among stakeholders. Further, ACFS urges the states of Alabama, Florida and Georgia to participate in efforts to establish a transboundary water management institution for the ACF Basin. Such efforts could begin with a transitional entity, designed to provide a forum for discussing how best to structure a permanent transboundary water management institution. ACFS stands ready to assist in the formation of such a transitional process or entity.

These recommendations are detailed in the Plan, and ACFS urges decision makers and citizens in this Basin to take action to implement them.

Basin stakeholders' perspectives are presented in Appendix B. Stakeholders have described in their own words the interests and concerns that they are seeking to achieve. The consensus of ACFS is that stakeholders' diverse perspectives are important to understand. However, the perspectives expressed in Appendix B are not a consensus statement of ACFS as a whole nor are they necessarily a consensus of all the members associated with the various sub-basin or stakeholder interest group perspectives represented.

Figure 1-1 ACF Basin Map (Credit: Roy Ogles)

