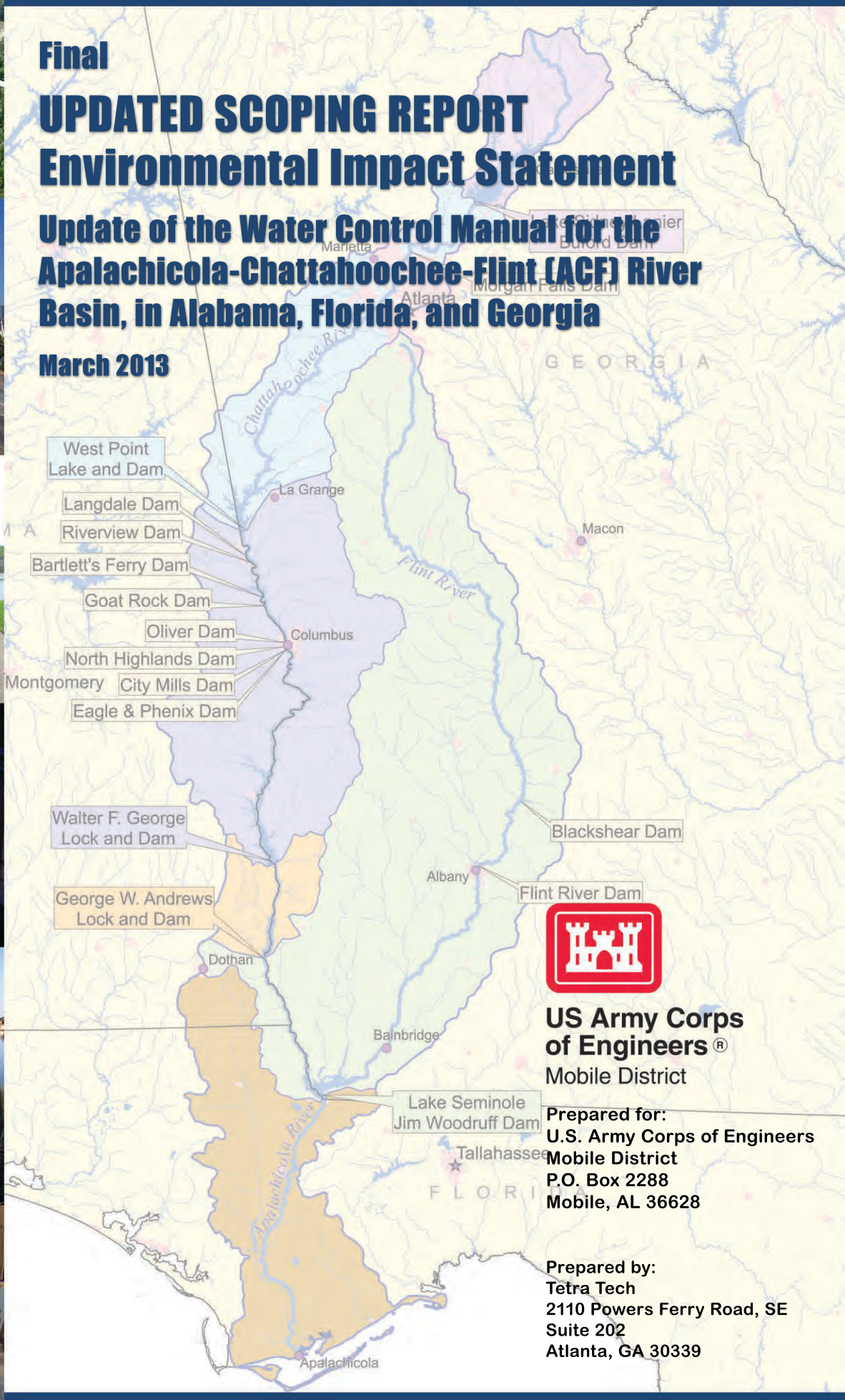
Exhibit A

Final

UPDATED SCOPING REPORT Environmental Impact Statement

Update of the Water Control Manual for the Apalachicola-Chattahoochee-Flint (ACF) River Basin, in Alabama, Florida, and Georgia

March 2013



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Contents

Executive Summary ES-1

1.0 Introduction 1
1.1 Background 2
1.2 Federal Authorizations 4
1.3 USACE Projects in the ACF River Basin 4
1.3.1 Lake Sidney Lanier and Buford Dam 5
1.3.2 West Point Lake and Dam 6
1.3.3 Walter F. George Lock and Dam 7
1.3.4 George W. Andrews Lock and Dam 8
1.3.5 Lake Seminole and Jim Woodruff Dam 8
1.4 Non-USACE-Owned Dams in the ACF River Basin 9
1.5 Litigation 13
1.5.1 The Alabama Case 13
1.5.2 Mediation 14
1.5.3 The D.C. Case 14
1.5.4 The Georgia I Case 15
1.5.5 The Georgia II Case 15
1.5.6 The Florida Case 16
1.5.7 The Consolidated Cases 16
1.6 The ACF Master Manual 17

2.0 Scoping Process Summary 20
2.1 Notices of Intent 22
2.2 Public Notices 23
2.3 Native American Indian Tribal Consultation 24
2.4 Federal Agency Web Conference 25
2.5 HEC-ResSim Technical Modeling Workshops 25
2.6 Public Scoping Meetings 26
2.7 Scoping Comments 28

3.0 Scoping Comment Analysis 29
3.1 Water Management Recommendations 30
3.1.1 Existing Water Management Practices 31
3.1.1.1 Initial Scoping Period—2008 31
3.1.1.2 Reopened Scoping Period—2009 32
3.1.1.3 Reopened Scoping Period—2012 33
3.1.2 Water Management Suggestions 34
3.1.2.1 Initial Scoping Period—2008 34
3.1.2.2 Reopened Scoping Period—2009 36

3.1.2.3 Reopened Scoping Period—2012 37
3.1.3 Demands and Needs 38
3.1.3.1 Initial Scoping Period—2008 38
3.1.3.2 Reopened Scoping Period—2009 38
3.1.3.3 Reopened Scoping Period—2012 38
3.1.4 Conservation 39
3.1.4.1 Initial Scoping Period—2008 39
3.1.4.2 Reopened Scoping Period—2009 39
3.1.4.3 Reopened Scoping Period—2012 39
3.1.5 Alternatives 39
3.1.5.1 Initial Scoping Period—2008 39
3.1.5.2 Reopened Scoping Period—2009 40
3.1.5.3 Reopened Scoping Period—2012 40
3.1.6 Other 41
3.1.6.1 Initial Scoping Period—2008 41
3.1.6.2 Reopened Scoping Period—2009 41
3.1.6.3 Reopened Scoping Period—2012 41
3.2 Socioeconomics and Recreation 42
3.2.1 Economics and Recreation 42
3.2.1.1 Initial Scoping Period—2008 42
3.2.1.2 Reopened Scoping Period—2009 45
3.2.1.3 Reopened Scoping Period—2012 45
3.2.2 Safety Hazards 46
3.2.2.1 Initial Scoping Period—2008 46
3.2.2.2 Reopened Scoping Period—2009 46
3.2.2.3 Reopened Scoping Period—2012 46
3.2.3 Environmental Justice 47
3.2.3.1 Initial Scoping Period—2008 47
3.2.3.2 Reopened Scoping Period—2009 47
3.2.3.3 Reopened Scoping Period—2012 47
3.2.4 Other Socioeconomic Issues 48
3.2.4.1 Initial Scoping Period—2008 48
3.2.4.2 Reopened Scoping Period—2009 48
3.2.4.3 Reopened Scoping Period—2012 49
3.3 Biological Resources 49
3.3.1 Threatened and Endangered Species 50
3.3.1.1 Initial Scoping Period—2008 50
3.3.1.2 Reopened Scoping Period—2009 50
3.3.1.3 Reopened Scoping Period—2012 51
3.3.2 Fisheries 51
3.3.2.1 Initial Scoping Period—2008 51

3.3.2.2 Reopened Scoping Period—2009 52
3.3.2.3 Reopened Scoping Period—2012 53
3.3.3 Flow Concerns for Apalachicola Bay 53
3.3.3.1 Initial Scoping Period—2008 53
3.3.3.2 Reopened Scoping Period—2009 53
3.3.3.3 Reopened Scoping Period—2012 53
3.3.4 Other Biological Issues 54
3.3.4.1 Initial Scoping Period—2008 54
3.3.4.2 Reopened Scoping Period—2009 55
3.3.4.3 Reopened Scoping Period—2012 55
3.4 Drought Operations 56
3.4.1 Initial Scoping Period—2008 56
3.4.2 Reopened Scoping Period—2009 57
3.4.3 Reopened Scoping Period—2012 57
3.5 Water Quality 58
3.5.1 Initial Scoping Period—2008 58
3.5.2 Reopened Scoping Period—2009 58
3.5.3 Reopened Scoping Period—2012 59
3.6 Water Supply 59
3.6.1 Initial Scoping Period—2008 60
3.6.2 Reopened Scoping Period—2009 60
3.6.3 Reopened Scoping Period—2012 61
3.7 National Environmental Policy Act 62
3.7.1 Scoping and Public Involvement 62
3.7.1.1 Initial Scoping Period—2008 62
3.7.1.2 Reopened Scoping Period—2009 63
3.7.1.3 Reopened Scoping Period—2012 64
3.7.2 Baseline Conditions 64
3.7.2.1 Initial Scoping Period—2008 64
3.7.2.2 Reopened Scoping Period—2009 65
3.7.2.3 Reopened Scoping Period—2012 66
3.7.3 Proposed Action and Alternatives 66
3.7.3.1 Initial Scoping Period—2008 66
3.7.3.2 Reopened Scoping Period—2009 68
3.7.3.3 Reopened Scoping Period—2012 70
3.7.4 Additional NEPA Topics 72
3.7.4.1 Initial Scoping Period—2008 72
3.7.4.2 Reopened Scoping Period—2009 73
3.7.4.3 Reopened Scoping Period—2012 75
3.8 Data, Studies, and Analytical Tools 75
3.8.1 Initial Scoping Period—2008 76

3.8.2 Reopened Scoping Period—2009 77
3.8.3 Reopened Scoping Period—2012 77
3.9 Navigation 78
3.9.1 Initial Scoping Period—2008 78
3.9.2 Reopened Scoping Period—2009 78
3.9.3 Reopened Scoping Period—2012 79
3.10 Hydropower 79
3.10.1 Initial Scoping Period—2008 79
3.10.2 Reopened Scoping Period—2009 80
3.10.3 Reopened Scoping Period—2012 80
3.11 Flood Risk Management 80
3.11.1 Initial Scoping Period—2008 81
3.11.2 Reopened Scoping Period—2009 81
3.11.3 Reopened Scoping Period—2012 81
3.12 Other Resources 81
3.12.1 Air Quality 82
3.12.1.1 Initial Scoping Period—2008 82
3.12.1.2 Reopened Scoping Period—2009 82
3.12.1.3 Reopened Scoping Period—2012 82
3.12.2 Cultural Resources 82
3.12.2.1 Initial Scoping Period—2008 82
3.12.2.2 Reopened Scoping Period—2009 82
3.12.2.3 Reopened Scoping Period—2012 82
3.12.3 Geology and Soils 83
3.12.3.1 Initial Scoping Period—2008 83
3.12.3.2 Reopened Scoping Period—2009 83
3.12.3.3 Reopened Scoping Period—2012 84
3.12.4 Hazardous, Toxic, and Radioactive Waste 84
3.12.4.1 Initial Scoping Period—2008 84
3.12.4.2 Reopened Scoping Period—2009 84
3.12.4.3 Reopened Scoping Period—2012 84
3.13 Petitions 84
3.13.1 Initial Scoping Period—2008 84
3.13.2 Reopened Scoping Period—2009 85
3.13.3 Reopened Scoping Period—2012 85

4.0 Federal, State, and Local Agency Responses 86
4.1 Federal Agencies 86
4.1.1 EPA Region 4 86
4.1.1.1 Initial Scoping Period—2008 86
4.1.1.2 Reopened Scoping Period—2009 87

4.1.1.3 Reopened Scoping Period—2012 87
4.1.2 Southeastern Power Administration 88
4.1.2.1 Initial Scoping Period—2008 88
4.1.2.2 Reopened Scoping Period—2009 88
4.1.2.3 Reopened Scoping Period—2012 89
4.1.3 U.S. Fish and Wildlife Service 89
4.1.3.1 Initial Scoping Period—2008 89
4.1.3.2 Reopened Scoping Period—2009 90
4.1.3.3 Reopened Scoping Period—2012 91
4.1.4 National Park Service, Chattahoochee River National Recreation Area 92
4.1.4.1 Initial Scoping Period—2008 92
4.1.4.2 Reopened Scoping Period—2009 93
4.1.4.3 Reopened Scoping Period—2012 94
4.1.5 National Oceanic and Atmospheric Administration – National Marine Fisheries Service 96
4.1.5.1 Initial Scoping Period—2008 96
4.1.5.2 Reopened Scoping Period—2009 97
4.1.5.3 Reopened Scoping Period—2012 97
4.2 Political Entities 97
4.2.1 U.S. Congress: Georgia Delegation 97
4.2.1.1 Initial Scoping Period—2008 97
4.2.1.2 Reopened Scoping Period—2009 97
4.2.1.3 Reopened Scoping Period—2012 97
4.2.2 U.S. Congress: Florida Delegation 98
4.2.2.1 Initial Scoping Period—2008 98
4.2.2.2 Reopened Scoping Period—2009 98
4.2.2.3 Reopened Scoping Period—2012 98
4.2.3 U.S. Congress: Alabama Delegation 99
4.2.3.1 Initial Scoping Period—2008 99
4.2.3.2 Reopened Scoping Period—2009 99
4.2.3.3 Reopened Scoping Period—2012 99
4.2.4 Georgia House of Representatives 99
4.2.4.1 Initial Scoping Period—2008 99
4.2.4.2 Reopened Scoping Period—2009 100
4.2.4.3 Reopened Scoping Period—2012 100
4.2.5 Georgia Senate 101
4.2.5.1 Initial Scoping Period—2008 101
4.2.5.2 Reopened Scoping Period—2009 101
4.2.5.3 Reopened Scoping Period—2012 101
4.2.6 Georgia Office of the Governor 101

4.2.6.1 Initial Scoping Period—2008 101
4.2.6.2 Reopened Scoping Period—2009 101
4.2.6.3 Reopened Scoping Period—2012 101
4.3 State Agencies 102
4.3.1 Alabama Office of Water Resources 102
4.3.1.1 Initial Scoping Period—2008 102
4.3.1.2 Reopened Scoping Period—2009 102
4.3.1.3 Reopened Scoping Period—2012 104
4.3.2 Florida Department of Environmental Protection 107
4.3.2.1 Initial Scoping Period—2008 107
4.3.2.2 Reopened Scoping Period—2009 108
4.3.2.3 Reopened Scoping Period—2012 110
4.3.3 Georgia Department of Natural Resources, Environmental Protection Division 112
4.3.3.1 Initial Scoping Period—2008 112
4.3.3.2 Reopened Scoping Period—2009 114
4.3.3.3 Reopened Scoping Period—2012 114
4.3.4 Georgia Department of Natural Resources, Wildlife Resources Division 115
4.3.4.1 Initial Scoping Period—2008 115
4.3.4.2 Reopened Scoping Period—2009 115
4.3.4.3 Reopened Scoping Period—2012 116
4.4 Local Agencies 116
4.4.1 Metropolitan North Georgia Water Planning District 116
4.4.1.1 Initial Scoping Period—2008 116
4.4.1.2 Reopened Scoping Period—2009 117
4.4.1.3 Reopened Scoping Period—2012 117
4.4.2 Atlanta Regional Commission 118
4.4.2.1 Initial Scoping Period—2008 118
4.4.2.2 Reopened Scoping Period—2009 119
4.4.2.3 Reopened Scoping Period—2012 120
4.4.3 Franklin County, Florida, Board of County Commissioners 124
4.4.3.1 Initial Scoping Period—2008 124
4.4.3.2 Reopened Scoping Period—2009 124
4.4.3.3 Reopened Scoping Period—2012 124
4.4.4 Hall County, Georgia, Board of Commissioners 124
4.4.4.1 Initial Scoping Period—2008 124
4.4.4.2 Reopened Scoping Period—2009 125
4.4.4.3 Reopened Scoping Period—2012 125
4.4.5 Troup County, Georgia, Board of Commissioners 125
4.4.5.1 Initial Scoping Period—2008 125

4.4.5.2 Reopened Scoping Period—2009 126
4.4.5.3 Reopened Scoping Period—2012 126
4.4.6 City of LaGrange and Troup County, Georgia....126
4.4.6.1 Initial Scoping Period—2008....126
4.4.6.2 Reopened Scoping Period—2009 127
4.4.6.3 Reopened Scoping Period—2012 127
4.4.7 Gwinnett County, Georgia, Board of Commissioners and Department of Water Resources 128
4.4.7.1 Initial Scoping Period—2008....128
4.4.7.2 Reopened Scoping Period—2009 129
4.4.7.3 Reopened Scoping Period—2012 130
4.4.8 City of Cumming, Georgia....132
4.4.8.1 Initial Scoping Period—2008....132
4.4.8.2 Reopened Scoping Period—2009 132
4.4.8.3 Reopened Scoping Period—2012 133
4.4.9 Columbus Consolidated Government 133
4.4.9.1 Initial Scoping Period—2008....133
4.4.9.2 Reopened Scoping Period—2009 134
4.4.9.3 Reopened Scoping Period—2012 134
4.4.10 Douglasville-Douglas County Water and Sewer Authority....134
4.4.10.1 Initial Scoping Period—2008....134
4.4.10.2 Reopened Scoping Period —2009 134
4.4.10.3 Reopened Scoping Period —2012 134
4.4.11 Forsyth County Board of Commissioners....134
4.4.11.1 Initial Scoping Period—2008....134
4.4.11.2 Reopened Scoping Period —2009 134
4.4.11.3 Reopened Scoping Period —2012 135
4.5 Tribal Response....135
4.5.1 Initial Scoping Period—2008....135
4.5.2 Reopened Scoping Period—2009 135
4.5.3 Reopened Scoping Period—2012 135
4.6 Federal Interagency Response....135

5.0 Summary of Public Scoping 137
5.1 Recommendations 138
5.2 EIS Schedule 139

6.0 Literature Cited....140

7.0 Acronyms and Abbreviations 141

Tables

Table ES-1. Participants by Scoping Meeting Location ES-2
Table ES-2. Distribution of Comments ES-3
Table 1. Projects in the ACF River Basin 11
Table 2. Newspapers that Received Press Releases 23
Table 3. Television and Radio Stations that Received Press Releases 24
Table 4. Participants by Scoping Meeting Location 27
Table 5. Comments Categorized by Segment 30

Figures

Figure ES-1. Distribution of comments by major category. ES-3
Figure 1. Apalachicola-Chattahoochee-Flint (ACF) River Basin. 3
Figure 2. Distribution of comments among Water Management Recommendations subcategories. 31
Figure 3. Distribution of comments among Socioeconomics and Recreation subcategories. 42
Figure 4. Distribution of comments among Biological Resources subcategories. 49
Figure 5. Distribution of comments among NEPA subcategories. 62

Appendixes

Appendix A *Federal Register* Notice
Appendix B Press Releases
Appendix C Newsletters
Appendix D Tribal Consultation Notices
Appendix E Agency Scoping Meeting
Appendix F HEC-ResSim Technical Modeling Workshop Announcement and Agenda
Appendix G Public Scoping Meeting Displays
Appendix H Public Scoping Meeting Handouts
Appendix I Oral Comment Roster
Appendix J 2008 Original Scoping Comments
Appendix K 2008 Scoping Comments by Issue Area
Appendix L 2008 Petitions
Appendix M 2009 Original Scoping Comments
Appendix N 2009 Scoping Comments by Issue Area
Appendix O 2012 Original Scoping Comments
Appendix P 2012 Scoping Comments by Issue Area

Executive Summary

The U.S. Army Corps of Engineers (USACE), Mobile District, conducted public scoping in fall 2008, fall 2009, and again in fall 2012 to initiate preparation of an Environmental Impact Statement (EIS) regarding development and implementation of an updated *Master Water Control Manual for the Apalachicola-Chattahoochee-Flint (ACF) River Basin* (Master Manual) in Alabama, Florida, and Georgia. The reinitiation of public scoping in 2009 and 2012 was the direct result of federal court decisions that would have a direct effect on the scope of the update of the ACF Master Manual and the associated EIS. A Notice of Intent to prepare an EIS was released February 22, 2008; a *Federal Register* notice to announce public scoping meetings was published September 19, 2008; a *Federal Register* notice to revise the scope of the Draft EIS was published November 19, 2009; a third *Federal Register* notice to revise the scope of the Draft EIS was published September 22, 2012. An interagency meeting was held October 9, 2008, and public scoping meetings were held at five strategic locations within the ACF River Basin between October 20 and 29, 2008. The USACE also contacted Native American Indian tribal leaders with interests in the ACF River Basin as part of the scoping efforts.

The purpose of scoping is to determine the range of issues to be addressed and to identify the significant issues to be analyzed in depth with respect to the proposed action. The process also helps to deemphasize insignificant issues, thereby narrowing the scope of the EIS process. Through the scoping process the USACE will identify the range of actions, alternatives, and impacts to be considered in the EIS for the update of the Master Manual. The EIS will provide supporting documentation for a decision on implementing a Master Manual update, as well as updating reservoir-specific water control plans to be included as appendixes to the Master Manual.

This scoping report provides background regarding USACE's role in managing the ACF River Basin and the need to update the Master Manual (Section 1); describes the scoping activities conducted by USACE (Section 2); categorizes the issues raised in the scoping comments (Section 3); summarizes the comments submitted by federal, state, and governmental agencies (Section 4); and provides the framework for preparing an EIS to address the potential for significant impacts on the human and natural environment resulting from implementation of an updated Master Manual (Section 5).

The appendixes to this report contain copies of all USACE's public communication and documentation about the scoping process; copies of all comments received during scoping (in their original format); and a report containing all the comments, broken down into segments and categorized by issues.

In 2008 a total of 1,018 stakeholders participated in the five public scoping meetings. Table ES-1 shows a breakdown of participation by meeting location.

Table ES-1. Participants by Scoping Meeting Location

Date	Location	Attendance
October 20, 2008	Apalachicola, Florida	135
October 21, 2008	Dothan, Alabama	24
October 22, 2008	LaGrange, Georgia	365
October 23, 2008	Marietta, Georgia	93
October 29, 2008	Gainesville, Georgia	401
	Total	*1,018*

The 2008, 2009, and 2012 public scoping effort for updates to the ACF River Basin Master Manual resulted in a total of 3,621 comments from 965 individuals, organizations, and agencies (this includes comments received from all three scoping efforts). The agencies included federal, state, and local governments. Federal agencies that submitted comments were the U.S. Environmental Protection Agency (EPA) Region 4, the Southeastern Power Administration (SEPA), and the U.S. Fish and Wildlife Service (USFWS). Leaders from the Georgia and Florida congressional delegations submitted comments, along with the Georgia State House of Representatives. The three states—Alabama, Georgia, and Florida—submitted comments from their respective state agencies. Other local governmental agencies, including the Metropolitan North Georgia Water Planning District; Atlanta Regional Commission; Franklin County, Florida; Hall County, Georgia; Troup County, Georgia; Gwinnett County, Georgia; the City of LaGrange, Georgia; and Douglas County, Georgia, submitted comments as well.

Three petitions were received during scoping. Two petitions were received during the scoping process in 2008. One was from "West Point Lake Advisory Council Needs Your Show of Support," and it had been signed by 2,809 people. The second petition received included comments on the "Potential for the Turkey Run Landfill to Pollute Groundwater and Surface Waters in Violation of Georgia Environmental Protection Division Solid Waste Management Rules and Landfill Permit," and it had been signed by 58 people. In 2012 a petition with the subject "Guide Curve Change at West Point Lake" was received from the LaGrange-Troup County Chamber of Commerce. This petition was received through electronic mail, U.S. mail, and original signature pages resulting in a total of 2,985 signatures.

All the comments from scoping were reviewed, analyzed, and organized into the 12 categories shown in Table ES-2. The table also shows the number of comments by category. Figure ES-1 shows the distribution of comments by category.

Table ES-2. Distribution of Comments

Category	Number of Comments
Water Management Recommendations	1,228
Socioeconomics and Recreation	706
Biological Resources	584
Drought Operations	208
Water Quality	189
National Environmental Policy Act	241
Water Supply	149
Data, Studies, and Analytical Tools	97
Other Resources	65
Navigation	41
Hydropower	31
Flood Risk Management	82
Total	*3,621*

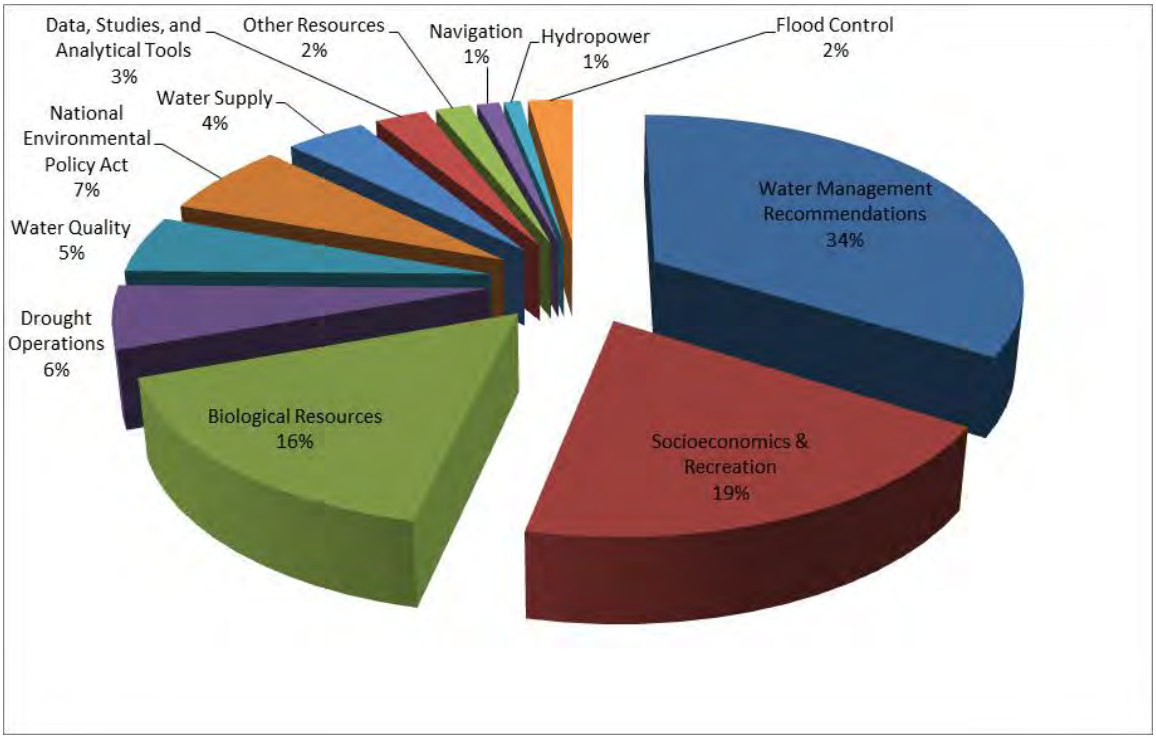

Figure ES-1. Distribution of comments by major category.

As shown in Table ES-2 and Figure ES-1, most of the comments (1,228) were related to water management recommendations, which include the authorized project purposes and USACE's ability to balance needs throughout the ACF River Basin. Other comments in this category addressed alternatives to consider (or mitigation), demand projections as they relate to downstream and future needs, and overall water conservation in the basin.

Issues and concerns regarding socioeconomics and the tie between water levels, recreation, and regional economics received the second-largest number of comments (706). Most of the comments received in this category pertained to the adverse socioeconomic impacts that have occurred in the northern portions of the ACF River Basin due to extremely low water levels in Lake Lanier and low or inconsistent water levels in West Point Lake. Similar comments were made by stakeholders in the middle and lower reaches of the basin, who attributed adverse economic conditions to low water flows. Comments were also made regarding the need to address adverse impacts on low-income and minority populations resulting from low lake levels; the potential for collapse of the seafood and fishing industry in the Apalachicola Bay region; safety hazards due to low water levels; concerns regarding property values, aesthetics, and quality of life; and myriad other concerns over the direct and indirect impacts of basin water management practices on socioeconomics. The primary message stakeholders have conveyed is that USACE should fully assess in the EIS the socioeconomic impacts of water management practices at the individual projects and in the overall system.

The next three categories were biological resources (584), drought operations (208), and *National Environmental Policy Act*, or NEPA, (241 comments). Biological resources comments pertained to fisheries; threatened and endangered species; flow concerns for Apalachicola Bay; and other biological issues such as habitat, research, and monitoring. The drought operation comments usually referenced drought conditions in the Lake Lanier watershed over the past decade. Some comments suggested that during periods of extreme drought conditions, USACE needs to redirect and optimize its operational practices to balance project purposes by establishing management triggers, conservative reservoir operations, emergency drought measures, and water supply conservation measures and/or by prioritizing reservoir purposes. NEPA-related comments discussed public involvement, the schedule, the baseline, the proposed action and alternatives, mitigation measures, compliance with other regulations, and cooperating agencies.

Water quality (189) and water supply (149 comments) were the next two categories. Water quality concerns were related to wastewater dilution, recreational uses, impacts of low lake levels and low flows, reevaluation of low-flow requirements, salinity in Apalachicola Bay, monitoring, effects of population growth, industrial discharges, maintaining existing minimum flows, the effect of the Revised Interim Operating Plan, and Total Maximum Daily Loads. The water supply comments pertained to importance compared to downstream uses, public water supply, real-time monitoring at the City of Atlanta's intake, concern over future availability, consideration of the Metropolitan North Georgia Water Planning District's plans, lack of congressional authority, cumulative effects, population growth, and monitoring of the use of storage. The remaining comment categories, with a total of 316 comments, were data, studies, and analytical tools; other resources; navigation; hydropower; and flood risk management.

Throughout this process, the public can obtain information on the status of the Master Manual update and the EIS by checking the Mobile District website at www.sam.usace.army.mil. The scoping report will be posted at http://www.sam.usace.army.mil/Missions/PlanningEnvironmental/ACFMasterWaterControlManualUpdate.aspx, and it can be downloaded with or without the appendixes.

1.0 Introduction

In fall 2008 the U.S. Army Corps of Engineers (USACE) Mobile District, initiated public scoping for preparation of an Environmental Impact Statement (EIS) regarding development and implementation of an updated *Master Water Control Manual for the Apalachicola-Chattahoochee-Flint River Basin* (Master Manual) in Alabama, Florida, and Georgia. The purpose of scoping, in accordance with the requirements of the *National Environmental Policy Act of 1969* (NEPA), is to solicit input from other agencies and the public to help identify all the relevant issues and alternatives that should be addressed in an Environmental Impact Statement (EIS). The EIS will provide documentation supporting a decision on implementing a Master Manual update, as well as updating reservoir-specific water control plans to be included as appendixes to the Master Manual.

On July 17, 2009, the U.S. District Court for the Middle District of Florida issued a memorandum and order in the case *In re Tri-State Water Rights Litigation* addressing USACE's authority to provide water supply benefits through its operation of the Buford Dam/Lake Sidney Lanier project. The court's ruling introduced new information and circumstances that affected some of the assumptions reflected in USACE's January 2009 Final Scoping Report. On November 19, 2009, the USACE reopened public scoping to account for the court's ruling. The reopened scoping period provided the public an opportunity to submit comments on the significant new information and circumstances introduced by the July 17, 2009, court order.

In June 2011, the U.S. Court of Appeals for the Eleventh Circuit vacated that 2009 district court order in the case *In re Tri-State Water Rights Litigation* and directed USACE to determine its legal authority to operate the Buford Dam/Lake Lanier Project to accommodate water supply withdrawals. In compliance with the Eleventh Circuit's order, USACE's Chief Counsel issued a legal opinion on June 25, 2012, concluding that USACE has the legal authority to accommodate both current and increased levels of water supply withdrawals from Lake Lanier and downstream at Atlanta. In light of this legal opinion and the Eleventh Circuit's ruling, the USACE reopened scoping on October 12, 2012, to propose to expand the scope to include additional water supply alternatives, and to provide the public an opportunity to submit comments on the new circumstances resulting from the ruling.

This scoping report provides background regarding USACE's role in managing the Apalachicola-Chattahoochee-Flint (ACF) River Basin and the need to update the Master Manual (Section 1); describes the scoping activities conducted by USACE in both 2008, 2009, and 2012 (Section 2); categorizes the issues raised in the scoping comments (Section 3); summarizes the comments submitted by federal, state, and local government agencies (Section 4); and provides the framework for preparation of an EIS to address the potential for significant impacts on the human and natural environment resulting from implementation of an updated Master Manual (Section 5). The appendices to this report contain copies of all USACE's public communication and documentation about the scoping process; copies of all comments received during scoping (in their original

format); and a report containing all the comments, broken down into segments and categorized by issues.

1.1 Background

The ACF River Basin drains 19,800 square miles in parts of southeastern Alabama, northwest Florida, and central and western Georgia. About 74 percent of the basin lies in Georgia, 15 percent in Alabama, and the remaining 11 percent in Florida. The basin extends approximately 385 miles from the Blue Ridge Mountains to the Gulf of Mexico and has an average width of approximately 50 miles. It covers 50 counties in Georgia, 8 in Florida, and 10 in Alabama. The headwaters of the Chattahoochee River are in north Georgia, and the river flows along the Georgia-Alabama state line. The Chattahoochee joins the Flint River at Lake Seminole. Downstream of the lake, the Apalachicola River ultimately flows into the Gulf of Mexico via Apalachicola Bay in Florida (Figure 1).

The ACF River Basin is a dynamic hydrologic system characterized by interactions between aquifers, streams, reservoirs, floodplains, and estuaries. Water resources in the basin have been managed to serve a variety of purposes, including navigation, hydroelectric power, flood risk management, water supply, and recreation. There are 16 projects on the main stems of the Apalachicola, Chattahoochee, and Flint Rivers (5 federal and 11 non-federal projects), which have altered the natural stream flow and provided water supply improvements and recreational opportunities for the public in these resource areas. The interrelationship between operation of the dams and the resulting river flows has resulted in a highly regulated system over much of the basin. The principal rivers, particularly in the lower half of the basin, receive a substantial contribution of water from groundwater baseflow during dry periods (Comprehensive Water Resources Study Partners, 1995).

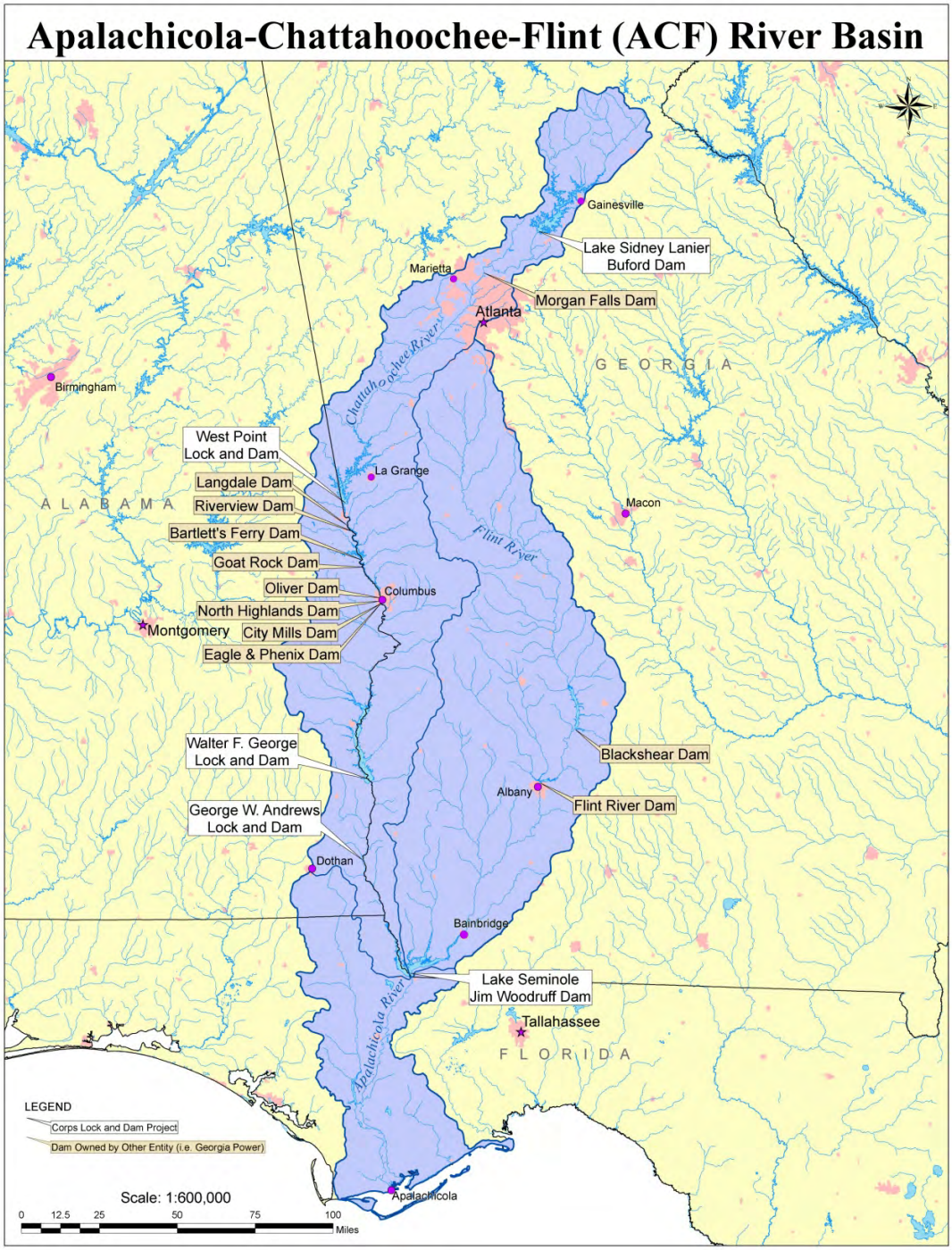

Figure 1. Apalachicola-Chattahoochee-Flint (ACF) River Basin.

1.2 Federal Authorizations

Several pieces of authorizing federal legislation affect the ACF River Basin. Section 2 of the *River and Harbor Act of 1945* (Public Law [P.L.] 79-14) approved the general plan recommended in House Document 342, 76th Congress, for development of the Apalachicola, Chattahoochee, and Flint Rivers, Georgia and Florida, for the multiple purposes of navigation, hydroelectric power generation, flood risk management, and water supply. A modification to the 1945 general plan was authorized by Section 1 of the *River and Harbor Act of 1946* (P.L. 79-525), in accordance with the report of the Chief of Engineers dated May 13, 1946 (House Document 300, 80th Congress), to include Buford multipurpose reservoir (Lake Lanier), the Fort Benning Lock and Dam, and the Upper Columbia and Jim Woodruff multipurpose developments. The navigation feature of the project was to be provided by dredging, channel contraction works, construction of a series of locks and dams, and flow regulation by the upstream reservoirs. In the Apalachicola River portion of the project, the 1946 amendment provided that "…local interests furnish free of cost to the United States, as and when required, all rights-of-way, spoil-disposal areas, easements and other lands required for the provision and maintenance of a navigation channel in the Apalachicola River…." The Chief of Engineers proposed revised plan for a low dam at the Columbia (now called George W. Andrews Lock and Dam) site rather than the previously considered high dam, and a high dam at the Ft. Gaines (now called Walter F. George Lock and Dam) site rather than a low dam at the more upstream Ft. Benning site. These modifications were authorized by Congress in 1953 (House Committee Public Works Resolution adopted May 19, 1953). The *Flood Control Act* of 1962 authorized West Point Lake, in accordance with House Document No. 570, 87th Congress.

Other authorities generally applicable to USACE reservoir projects may affect operation of the ACF system. Such authorities include the Flood Control Act of 1944 (P.L. 78-534), which provides authority to construct, operate or allow recreational facilities (Section 4) and to make contracts for the use of surplus water for domestic, municipal and industrial purposes (Section 6) at any USACE reservoir; the *Water Supply Act of 1958* (P.L. 85-500, Title III), which provides the authority to include storage for municipal and industrial water supply; the *Fish and Wildlife Coordination Act of 1958* (P.L. 85-624). which provides the authority to modify projects to conserve fish and wildlife; the *Federal Water Pollution Control Act Amendments of 1972* (P.L. 92-500), which establish the goal to restore and maintain the quality of the nation's waters; and the *Endangered Species Act of 1973* (ESA; P.L. 93-205), which provides the authority for operating projects to protect threatened or endangered fish and wildlife.

1.3 USACE Projects in the ACF River Basin

The USACE operates five dams in the ACF River Basin (in downstream order): Buford, West Point, Walter F. George, George W. Andrews, and Jim Woodruff. All but one is located wholly on the Chattahoochee River arm of the basin. The exception is the furthest downstream dam, Woodruff, which is immediately below the confluence of the Chattahoochee and Flint rivers and marks the upstream extent of the Apalachicola River. Buford, West Point, George, and Woodruff dams are reservoirs (Lakes Lanier, West

Point, George, and Seminole, respectively) with a combined conservation storage capacity (relative to the top of each reservoir's full summer pool) of about 1.6 million acre-feet. Because George W. Andrews and Jim Woodruff Dam/Lake Seminole are operated as a run-of-river projects, only very limited storage is available to support project purposes. The USACE projects in the ACF River Basin and their authorized project purposes are described in more detail in the following subsections.

1.3.1 Lake Sidney Lanier and Buford Dam

The USACE's Buford Dam on the Chattahoochee River is a multipurpose project that provides benefits including flood risk management, hydroelectric power generation, navigation, recreation, water supply, water quality, and fish and wildlife conservation. Section 2 of the *River and Harbor Act of 1945* (P.L. 79-14) approved the general plan recommended in House Document 342, 76th Congress, for development of the Apalachicola, Chattahoochee, and Flint Rivers, Georgia and Florida, for the multiple purposes of navigation, hydroelectric power generation, and flood risk management. A modification to the 1945 general plan was authorized by Section 1 of the *River and Harbor Act of 1946* (P.L. 79-525), in accordance with the report of the Chief of Engineers dated May 13, 1946 (House Document 300, 80th Congress), and it included Buford multipurpose reservoir (Lake Sidney Lanier, or Lake Lanier). On July 30, 1956, Congress enacted P.L. No. 84-841 (70 Stat. 725) modifying the Buford Project by authorizing the Secretary of the Army to contract with Gwinnett County, for up to 50 years on terms that the secretary deems reasonable, "for the use of storage space in the Buford Reservoir for the purpose of providing . . . a regulated water supply in an amount not to exceed eleven thousand two hundred acre-feet of water annually."

The authorized project provides for a rolled-earth dam 1,630 feet long with crest at elevation 1,106 feet National Geodetic Vertical Datum of 1929 (NGVD), or about 192 feet above streambed elevation; three earthen saddle dikes with a total length of 5,406 feet; a chute spillway with crest at elevation 1,085 feet; a powerhouse in a deep cut, with steel penstocks in tunnels and concrete intake structure at the upstream end of the tunnels; and a flood control sluice tunnel paralleling the power tunnels.

Lake Lanier has a total storage of 2,515,800 acre-feet, composed of flood storage and is a dedicated space in a reservoir that temporarily holds flood waters. Flood storage is normally empty and can vary seasonally. Conservation storage is a volume represented by total storage minus inactive storage and flood storage, and inactive storage is a dedicated volume within a reservoir to maintain design integrity of the project and serve as a sediment reserve. The minimum conservation pool elevation is 1,035 feet, and the maximum conservation pool elevations are 1,071 feet in the summer and 1,070 feet in the winter. At the top of the conservation pool—elevation 1,071 feet, in summer—the reservoir storage is 1,917,000 acre-feet, of which 1,087,600 acre-feet (in summer) is conservation storage and 867,600 acre-feet are inactive storage. In winter, conservation storage is 1,049,400 acre-feet, between elevations 1035 and 1070. In addition, 637,000 acre-feet (598,800 acre-feet in summer) is reserved for flood storage between elevations 1,071 (1070 in summer) and 1,085. The total usable storage, consisting of flood control

and conservation storage, is 1,686,400 acre-feet at all times. Lake Lanier has a surface area of 40,133 acres at elevation 1,071 feet.

The power installations consist of one 7-MW generating unit and two units of 60 MW each, for a total of 127 MW. The penstock capacity is 12,000 cfs. The project is typically operated for peaking power on a 5-days-a-week schedule, with occasional peaking on Saturdays and Sundays. The number of hours of generation per day depends on the available storage, conditions in the basin, and electrical demand. The 7-MW unit runs continuously (at 600 cfs) to help meet downstream minimum flow requirements.

Since the mid-1970s, USACE has, at times, made additional releases from the larger generating units during off-peak periods to accommodate downstream water supply withdrawals and to assist with maintaining a 750 cubic feet per second (cfs) minimum flow target established by the State of Georgia at Peachtree Creek. Such releases have been made in conjunction with the Georgia Power Company's operation of the Morgan Falls reservoir, which serves to reregulate releases from Buford Dam, and according to understandings among multiple parties, memorialized in a series of interim plans and agreements (e.g., an interim plan in 1975, a modified interim plan in 1979, and a short-term plan in 1986). The USACE's operation of Buford Dam to accommodate water supply withdrawals from the reservoir and downstream has been the subject of litigation, culminating in a decision by the U.S. Court of Appeals for the Eleventh Circuit and a technical analysis and legal opinion by the Corps on remand. This litigation and the Corps' determinations upon remand are discussed in more detail in Section 1.5.

1.3.2 West Point Lake and Dam

The USACE's West Point Dam and Lake were authorized by the *Flood Control Act* of October 23, 1962 (P.L. 87-874). The authorized project purposes for the reservoir are flood risk management, hydroelectric power generation, navigation, recreation, water quality, and fish and wildlife conservation.

The authorized project provides for a gravity-type concrete dam 896 feet long with earthen embankments at either end—1,111 feet long on the east end and 5,243 feet long on the west end. The total length of the dam and spillway is 7,250 feet. The main dam consists of a concrete non-overflow section, 185 feet long on the west side, and an earthen embankment retaining wall on the east side. The main dam has a gravity concrete spillway 390 feet long, including piers and abutments, with six tainter gates, each 50 feet by 41 feet. A monolith intake-powerhouse section and erection bay 321 feet long are constructed directly west of and adjacent to the spillway.

At the top of conservation pool (elevation of 635 feet), the reservoir provides a total storage of 774,800 acre-feet, of which 306,100 acre-feet is available conservation storage (elevation 635 feet to 620 feet) and 298,400 acre-feet is inactive storage. The total storage at maximum flood pool (elevation 641 feet) is 1,379,320 acre-feet. During the critical flood season, the reservoir is operated with a maximum conservation pool elevation of 628 feet to provide additional flood damage reduction storage. West Point Lake has a

surface area of 25,900 acres at elevation of 635 feet. The power installations consist of one 3 MW generating unit and two units of 42 MW each, for a total of 87 MW.

At the full pool elevation of 635 feet NGVD, the reservoir provides a total storage of 605,000 acre-feet, of which 307,000 acre-feet is usable. Flood risk management storage of 85,200 acre-feet is provided between pool elevations 635 feet and 641 feet. During the critical flood season, the reservoir is operated with a maximum conservation storage elevation of 625 feet to provide additional flood risk management storage of 221,000 acre-feet. West Point Lake has a surface area of 25,900 acres at an elevation of 635 feet. The power installations consist of one generating unit of 3 MW and two units of 42 MW each, or a total of 87 MW.

When peaking generation is not occurring, the 3 MW unit is run continuously, releasing 675 cfs to the Chattahoochee River. It operates in a peaking mode, generating power between two and six hours during normal operations each weekday depending on the conservation pool elevation. Weekend generation may occur if required to meet customer needs. Lake levels vary during high inflows to the basin and during flood storage drawdown in the winter. Flood flows captured in the reservoir are usually released slowly over the subsequent weeks, unless additional flood flows are expected. Power releases during the low-flow season augment flows at the Georgia Power Company projects along the Chattahoochee River. The releases also provide water for navigation on the Apalachicola River below Jim Woodruff Lock and Dam during the winter.

1.3.3 Walter F. George Lock and Dam

Walter F. George Lake, also known as Lake Eufaula, is created by the Walter F. George Lock and Dam on the Chattahoochee River about 183 miles upstream of Apalachicola Bay. The authorized project purposes are hydroelectric power generation, navigation, recreation, water quality, and fish and wildlife conservation. The existing project provides for a concrete dam, gated spillway, and single-lift lock, with earthen embankments at either side. The non-overflow section of the dam includes a powerhouse and an intake structure. The gated spillway is 708 feet long with a fixed crest at elevation 163 feet NGVD. The two earthen embankments, almost equal in length, have a total length of 12,128 feet, with crest elevation at 215 feet and a maximum height of about 68 feet. The non-overflow section of the concrete dam is 200 feet long, with the deck of the powerhouse section at elevation 208 feet. A lock 82 feet wide and 450 feet long, along with a 9-foot-deep, 200-foot-wide navigation channel extending to Columbus, Georgia, is authorized for navigation use. The lock has a lift of 88 feet with the normal upper pool elevation at 190 feet. Depths are 13 feet over the lower sill and 18 feet over the upper sill at normal pool elevation.

At the full pool elevation of 190 feet, the reservoir provides a total storage of 934,400 acre-feet, of which 244,400 acre-feet is reserved for conservation storage and 690,000 acre-feet is inactive storage. There is no dedicated flood storage is at this project. Walter F. George Lake has the largest reservoir surface area of any USACE project in the ACF River Basin; it has a surface area of 45,180 acres at elevation 190 feet. The power installation at the lake has been rehabilitated. The installation consists of four generating

units of 42 MW, for a total of 168 MW. A lock 82 feet wide and 450 feet long, along with a 9 feet-deep navigation channel extending to Columbus, Georgia, is authorized for navigation use.

1.3.4 George W. Andrews Lock and Dam

The George W. Andrews Lock and Dam is a navigation project on the Chattahoochee River, 154 miles upstream of Apalachicola Bay. Its authorized project purposes are navigation, recreation, and water quality. It consists of a concrete fixed-crest spillway 340 feet long extending into the right bank with crest at elevation 102 feet NGVD, a concrete gate spillway adjacent to the lock 280 feet long with crest at elevation 82 feet NGVD, a single-lift lock with usable chamber dimensions of 82 feet by 450 feet, and a maximum lift of 25 feet. Depths are 13 feet over the lower sill and 19 over the upper sill at a normal pool elevation of 102 feet. The Andrews project reregulates inflows caused by peaking power operations at Walter F. George Powerhouse.

1.3.5 Lake Seminole and Jim Woodruff Dam

The Jim Woodruff Lock and Dam are on the Apalachicola River 107.6 miles above its mouth, about 1,000 feet below the confluence of the Chattahoochee and Flint Rivers and 1.5 miles northwest of Chattahoochee, Florida. The reservoir, Lake Seminole, extends about 46.5 miles upstream along the Chattahoochee River to the vicinity of Columbia, Alabama, and about 47 miles upstream along the Flint River, or 17 miles above Bainbridge, Georgia. The authorized project purposes are hydroelectric power generation, navigation, recreation, water quality, and fish and wildlife conservation.

The existing project provides for a concrete open-crest spillway 1,634 feet long on the right bank, with crest at elevation 79 feet NGVD; a single-lift lock with usable chamber dimensions of 82 feet by 450 feet constituting a portion of the dam; an earthen section 506 feet long, with a maximum lift of 33 feet and a depth over the sills of 14 feet; a gated spillway 766 feet long with the bridge at elevation 107 feet NGVD, or about 67 feet above the streambed elevation; a powerhouse with an intake section constituting a portion of the dam; an earthen section 506 feet long to accommodate the switchyard and substation; and an overflow dike section 2,130 feet long on the left bank, with crest at elevation 85 feet.

At the normal pool elevation of 77 feet, the reservoir has a total capacity of 367,320 acre-feet. Lake Seminole has a surface area of 37,500 acres. The power installation consists of three units of 14.45 MW, or a total of 43.35 MW. The reservoir level is normally maintained near elevation 77 feet. Pondage of one-half foot above and below this elevation is used to reregulate flows into the reservoir from upstream projects that operate as peaking plants. Because there is no flood risk management storage at this project, the reservoir level is maintained at elevation 77 feet by passing inflows through the spillway gates or through the powerhouse.

On March 7, 2006, the USACE initiated formal consultation with the USFWS, pursuant to Section 7 of the Endangered Species Act, regarding the effects of existing operations at

Jim Woodruff Dam and releases to the Apalachicola River on endangered and threatened species and associated critical habitat. Specific species/critical habitat affected include: the threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*) and critical habitat for the Gulf sturgeon; the endangered fat threeridge mussel (*Amblema neislerii*); the threatened purple bankclimber mussel (*Elliptoideus sloatianus*); and the threatened Chipola slabshell mussel (*Eliptio chipolaensis*). The formal consultation on what was termed the Interim Operation Plan was completed with the issuance of a Biological Opinion on September 5, 2006.

Over the 2006-2008 timeframe, the USACE and USFWS continued to consult resulting in additional modifications to the IOP. Formal consultation was again requested by USACE on April 15, 2008, to consider further revising the IOP (RIOP) to include a drought contingency plan that allows for additional storage conservation and system recovery during periods of extreme drought and providing additional opportunities to conserve storage when entering and exiting drought conditions while still providing support for federally listed species and their critical habitat in the Apalachicola River. A final BO was issued by the USFWS on June 1, 2008, determining that the RIOP would not significantly impact the federally listed species.

On the basis of new information about the distribution and mortality of endangered fat threeridge mussels in the Apalachicola River, USACE reinitiated consultation on the RIOP in November 2010 to consider modifications to the RIOP. These modifications include (1) elimination of the use of volumetric balancing; (2) minimum flow releases will match basin inflow when basin inflow is between 5,000 and 10,000 cubic feet per second (cfs) in June through November (this provision is suspended during drought contingency operations); (3) drought contingency operations are not suspended and normal operations reinstituted until such a time as the composite conservation storage has recovered above Zone 2 into Zone 1; (4) when releases are within powerhouse capacity and less than 10,000 cfs the maximum fall rate is limited to 0.25 feet per day (ft/day) or less; and (5) in accordance with RPM 2008-4 of the RIOP BO (USFWS 2008), formal adoption of an additional Gulf sturgeon spawning season (March-May) provision which ensures that river stage declines of 8 feet or more will not occur in less than 14 days when river flows are less than 40,000 cfs (under both normal and drought operations). The RIOP is intended to govern releases from Jim Woodruff Dam until revised or replaced with a new Water Control Plan.

1.4 Non-USACE-Owned Dams in the ACF River Basin

Eleven additional dams are in the ACF River Basin that the USACE does not own and operate. Brief descriptions of the dams are provided below. Table 1 provides an overview of all the dams (USACE and non-USACE) in the ACF River Basin. The Morgan Falls project is on the Chattahoochee River 30 miles below Buford Dam at river mile 312.6. The dam impounds a 7-mile reservoir that has a surface area of 637 acres at elevation 866 feet. The total reservoir storage volume is about 2,450 acre-feet, of which 2,250 acre-feet is usable. The maximum generating capacity of the project is 16.8 MW. Georgia Power operates the Morgan Falls Project as a modified run-of-river project to reregulate peaking

flows from USACE's upstream Buford Dam for power generation, drinking water supply, and assimilation of treated wastewater in the Atlanta region.

Below West Point Dam are a series of eight hydropower dams along approximately 32 miles of river. Six of these dams are part of Georgia Power's Middle Chattahoochee Hydro Group; they are known individually as Langdale, Riverview, Bartlett's Ferry, Goat Rock, Oliver, and North Highlands. The first two, Langdale Dam and Riverview Dam, have very small, unnamed reservoirs. The larger projects at Bartlett's Ferry, Goat Rock, Oliver, and North Highlands are described below. The Middle Chattahoochee projects operate in a run-of-river-with-pondage mode, based on the outflow from USACE's West Point Dam upstream.

Table 1. Projects in the ACF River Basin

Basin/River/Project Name	Owner/State/ Year Initially Completed	Drainage Area (Sq Mi)	Reservoir Size (Ac)	Total Storage (Ac-Ft)[a]	Conservation Storage (Ac-Ft)	Power Capacity (kW)	Normal (Summer) Lake Elev (Ft)	Authorized Purposes for USACE-Owned Projects[b]
Chattahoochee River	*8,770*							
Habersham Mill Dam	Habersham Mills/GA/1925		NA[c]	NA[c]	0	0		Inoperative
Buford Dam/Lake Lanier	USACE/GA/1957	1,040	40,133	2,515,800	1,087,600	127,000	1,071	FDR, HP, NAV, REC, WQ, WS, FW
Morgan Falls Dam (Bull Sluice Lake)	GPC/GA/1903	1,340	673	2,450	0	16,800	866	
West Point Dam and Lake	USACE/GA/1975	3,243	25,900	1,379,320	306,100	87,000	635	FDR, HP, NAV, REC, WQ, WS, FW
Langdale Dam	GPC/GA/1860	3,600	152	NA[c]	0	1,040	548	
Riverview Dam	GPC/GA/1902	3,600	75	NA[c]	0	480	531	
Barletts Ferry Dam	GPC/GA/1926	4,260	5,850	181,000	0	173,000	521	
Goat Rock Dam	GPC/GA/1912	4,500	940	11,000	0	26,000	404	
Oliver Dam	GPC/GA/1959	4,630	2,150	32,000	0	60,000	337	
North Highlands Dam	GPC/GA/1900	4,630	131	1,500	0	29,600	269	
City Mills Dam[d]	City Mills/GA/1863	4,630	110	684	0	0[d]	226	Inoperative
Eagle and Phenix Dam[d]	Consolidated Hydro/GA1834	4,640	52	260	0	0[d]	215	Inoperative
W. F. George Lock, Dam, and Lake (Lake Eufaula)	USACE/GA/1963	7,460	45,180	934,400	244,400	168,000	190	HP, NAV, REC, WQ, FW
George W. Andrews Lock, Dam, and Lake	USACE/GA/1963	8,210	1,620	18,180	0	None	102	NAV, REC, WQ
Flint River	*8,468*							
Crisp County Dam (Blackshear Dam and Lake)	Crisp Co./GA1930	3,800	8,700	144,000	0	15,200	237	
Flint River Dam(Albany Dam, Lake Worth)	GPC/GA/1920	5,310	1,400	NA[c]	0	5,400	182	
Apalachicola River	*3,235*							
Jim Woodruff Lock and Dam/ Lake Seminole	USACE/FL/1954	17,230	37,500	367,320	NA[c]	43,350	77	HP, NAV, REC, WQ, FW

[a] Measured at top of storage for flood damage reduction.
[b] As used in this table, the term authorized purposes includes purposes expressly identified in the project authorizing documents; incidental benefits recognized in projection authorizations; and objectives that result from other authorities, such as general authorities contained in congressional legislation, for which the USACE operates each listed project as of 2012. FDR = flood damage reduction; HP = hydropower; NAV = navigation; REC = recreation; WQ = water quality; WS = water supply; FW = fish and wildlife conservation.
[c] NA = not available. [d] Inoperative and planned for removal under the USACE section 206 ecosystem restoration program.

- Bartlett's Ferry Dam is on the Chattahoochee River upstream of Columbus, Georgia. The dam impounds Lake Harding, which has a surface area of 5,850 acres at elevation 521 feet. The project includes a powerhouse composed of six units, which have a total generating capacity of 173 MW.
- Goat Rock Dam is at mile 172.2 on the Chattahoochee River. It impounds Goat Rock Lake, which has a surface area of 940 acres at elevation 404 feet. The powerhouse consists of six units with a total generating capacity of 26 MW. The project provides an instantaneous target minimum flow release of 800 cfs, or inflow, whichever is less, downstream of the dam.
- Oliver Dam, which impounds Lake Oliver, is at mile 163.5 on the Chattahoochee River downstream of Goat Rock Dam. The lake has a surface area of 2,150 acres at elevation 337 feet. The powerhouse consists of three 18-MW generating units and one small 6-MW generating unit, for a total capacity of 60 MW. The project provides an instantaneous target minimum flow release of 800 cfs, or inflow, whichever is less, downstream of the dam
- The North Highlands project is at mile 162.5 on the Chattahoochee River downstream of Oliver Dam. The impoundment has a water surface area of 131 acres at elevation 269 feet. It has four units with a total generating capacity of 29.6 MW. The project is operated in a run-of-river-with-pondage mode, based on the outflow from the West Point Dam upstream. It provides an instantaneous target minimum flow release of 800 cfs, or inflow, whichever is less, downstream of the dam; a daily average target minimum flow of 1,350 cfs, or inflow, whichever is less, downstream of the project; and a weekly average target minimum flow of 1,850 cfs, or inflow, whichever is less, downstream of the project.

Two other dams, City Mills Dam and Eagle and Phenix Dam, are located downstream of Georgia Power's Middle Chattahoochee Hydro Group. These dams are inoperative, and the USACE is removing them under the authority of Section 206 of the *Water Resources Act of 1996*, as amended, in the interest of aquatic ecosystem restoration. Removal of Eagle and Phenix Dam took place in March 2012 and the City Mills Dam removal began in January 2013.

Lake Blackshear Dam, owned and operated by the Crisp County Power Commission, impounds the Flint River near Warwick, Georgia, at river mile 134.7. The power plant consists of four units with a total licensed capacity of 15.2 MW. The project consists of two earthen dams, each 30 feet high. The North Dam is 3,400 feet long, and the South Dam is 650 feet long. The drainage basin is approximately 3,764 square miles and begins at Hartsfield Airport just south of Atlanta, Georgia. The normal full pool elevation is 237 feet above mean sea level (msl).

Lake Worth is formed by the Lake Worth Dam on the Flint River, at its confluence with Muckalee Creek and Kinchafoonee Creek. The Georgia Power Company owns and operates the project. The lake covers 1,400 acres and has 36 miles of shoreline. It is in

Dougherty County just upstream of Albany, Georgia. The power installation consists of three units with a capacity of 5.4 MW.

1.5 Litigation

In 1989 two proposals caused controversy among water user groups, the states of Alabama, Florida, and Georgia, and various federal agencies. The USACE proposed to reallocate storage to municipal and industrial water supply at three reservoirs in the Alabama, Coosa, Tallapoosa (ACT) and ACF River Basins—Lake Lanier, Lake Allatoona, and Carters Lake—and Georgia proposed to develop a regional reservoir near the Alabama state line (West Georgia Regional Reservoir). A draft Reallocation and Post-Authorization Report and draft Environmental Assessment had been prepared for the Lake Lanier proposal. A draft ACF River Basin Master Water Control Plan, dated October 1989, was included as an appendix to the post-authorization change report.

1.5.1 The Alabama Case

Alabama filed a lawsuit against the USACE in June 1990 to halt these proposed actions. As a result of the litigation, the proposed revisions to the Master Manual were deferred while the parties negotiated. Accordingly, the USACE has been operating under the Draft 1989 Master Water Control Plan pending the update of the Master Manual and individual project water control plans.

After a period of negotiation, the governors of Alabama, Florida, and Georgia and the Assistant Secretary of the Army/Civil Works addressed the issues of concern by signing a Memorandum of Agreement (MOA) on January 3, 1992. The MOA specified that a comprehensive study of the water resources of the basins would be conducted, in partnership among the states and the USACE, to develop the needed water resources data and to investigate the feasibility of implementing an interstate coordination mechanism (compacts) for resolving water resources issues in the ACT and ACF River Basins. The MOA contained a live-and-let-live provision for water use in the basins while the ACT/ACF Comprehensive Study and negotiations were conducted. This approach permitted existing water users to reasonably increase water withdrawal amounts for the period necessary to negotiate a solution to the water issues. The MOA also specified that the USACE would operate the federal reservoirs in the ACT and ACF River Basins, within its statutory and contractual obligations, to maximize water resource benefits to the basins as a whole while taking into account the needs of existing water users and the need to maintain the historical flow regime in the rivers within the basins.

Subsequent supplemental MOAs extended the term of these agreements and continued to include the live-and-let-live provisions. The Comprehensive Study partners recommended river basin compacts between the states as the mechanism for negotiating storage allocation formulas and manageing the basins. The live-and-let-live provisions were incorporated into the Interstate River Basin Compacts for each basin, signed into law by the President in November 1997; the MOAs were allowed to expire in September 1998.

It was envisioned that the Comprehensive Study would recommend, among other things, a conceptual plan for management of water resources in the ACT and ACF River Basins, including management of the federal and non-federal reservoirs within the basins; an assessment of existing and future water resource needs; the extent of water resources available within the basins to serve such needs; and an appropriate mechanism to implement management of the basins. The Comprehensive Study reports were never finalized, although much useful data on water resource needs and availability was generated and assessment and modeling tools were developed to assist in resource assessment and management of the basins.

Compact negotiations began in early 1998, with a December 31, 1998, deadline for reaching agreement on the storage allocation formulas. By mutual agreement and in accordance with the provisions of the Compacts, the states extended the deadline numerous times. Nevertheless, the State Commissioners (governors of each state) were unable to reach an agreement on an equitable apportionment of the waters in either basin, and the Compacts were allowed to expire in August 2003 (ACF River Basin) and in July 2004 (ACT Basin). Upon expiration of the ACT and ACF Compacts, Alabama and Florida reactivated their previous litigation and filed new litigation, resulting in a stay of any action by the USACE related to implementation of any new water supply contracts or changes in reservoir storage or water control operations. The states asserted in the litigation that water control operations in the ACF River Basin were not being conducted in accordance with approved water control plans, USACE regulations, and federal law. The ACF claims were consolidated as Multiple District Litigation to be heard by one judge in the District Court for the Middle District of Florida—*In re Tri-State Water Rights Litigation* (M.D. Fla. No. 3:07-md-01).

1.5.2 Mediation

Court-ordered mediation between the parties was initiated in March 2006 for both the ACT and ACF litigation. It expired in March 2007 (ACF River Basin) and in September 2007 (ACT Basin). On November 1, 2007, the governors of Alabama, Florida, and Georgia met with executive branch leaders (Secretary of the Department of the Interior, Chairman of the Council on Environmental Quality [CEQ], Chief of Engineers) to discuss strategies for developing solutions to the decades-long *water wars* among the three states. The resulting discussions focused primarily on the ACF system and the need for the states to agree on a drought water-management plan. The mutually agreed-upon deadline was March 1, 2008. The parties did not reach an agreement, and negotiations ended on the agreed deadline.

1.5.3 The D.C. Case

Water supply issues in the ACF River Basin were also the subject of litigation in the Federal District Court for the District of Columbia (D.C. Court) in December 2000, when the Southeast Federal Power Customers, Inc. (SeFPC) sued the USACE, alleging that use of water from Lake Lanier for water supply was not authorized and that the power customers were not receiving appropriate credit for hydropower losses. A Settlement Agreement in that lawsuit between the USACE and the SeFPC and Lake Lanier Water

Supply Providers was reached in January 2003 and approved by the D.C. Court on February 8, 2004. The Settlement Agreement included a proposal for the USACE to enter into interim water storage contracts at Lake Lanier for several municipalities and local governments, with the potential for the interim water storage contracts to roll over to permanent reallocation storage contracts in the future. Efforts to implement the Agreement, however, could not proceed because of an injunction obtained by Alabama in another federal court. That injunction was dismissed, and on December 21, 2005, the SeFPC filed a motion with the D.C. Court to stay proceedings in the case pending completion of the NEPA process contemplated by the Settlement Agreement.

In January 2006, the D.C. Court issued an order granting the stay and specifically stating that the stay of the litigation would not release the USACE from its existing legal obligation to implement the Settlement Agreement as expeditiously as practicable. On June 16, 2006, the Mobile District published in the *Federal Register* an NOI to prepare an EIS to address the proposed interim storage contracts. Public scoping meetings were held in November 2006, and a final Scoping Report was published in February 2007. Alabama and Florida appealed the SeFPC D.C. Court decision to the D.C. Circuit, and arguments were heard in November 2007. On February 5, 2008, the D.C. Circuit held the Settlement Agreement invalid because it constituted an amount that required congressional approval. Georgia filed a petition for a writ of certiorari with the Supreme Court on the decision by the D.C. Circuit. The Supreme Court denied the petition January 12, 2009.

1.5.4 The Georgia I Case

In 2000 the governor of Georgia made a written request for a water supply reallocation study asking the USACE to commit to making increased releases of water from the Buford Dam until the year 2030 to ensure a reliable municipal and industrial water supply to the Atlanta region. In 2001 after 9 months without a reply to the request, Georgia sued the USACE to increase its water supply. The USACE subsequently denied Georgia's request, claiming that it lacked the "legal authority to grant Georgia's request without additional legislative authority, because the request would involve substantial effects on project purposes and major operational changes." The federal district court, noting the similarity of the parties and the subject matter, found the case to be parallel to the Alabama case that was filed in 1990. The court suspended the proceedings in the Georgia I case pending resolution of the Alabama case.

1.5.5 The Georgia II Case

In 2006 the USACE issued an Interim Operating Plan (IOP) for Jim Woodruff Dam for the purpose of protecting federally protected species in the Apalachicola River. Georgia sued the USACE to challenge the IOP, claiming that it constituted a change from the only approved water control plan (which had been adopted in the late 1950s) and that the USACE was jeopardizing the state's future water supply. The suit also alleged that water supply was a contemplated purpose of the USACE's water project.

1.5.6 The Florida Case

In 2006 USFWS issued a biological opinion regarding the impact of the IOP for Woodruff Dam on protected species downstream. The biological opinion concluded that the USACE's operations under the IOP were not likely to jeopardize the species or their habitat. Florida filed a lawsuit to review the biological opinion, and the NEPA supporting the IOP. Furthermore, Florida alleged that the municipal and industrial water uses for which Georgia sought water were not authorized purposes.

1.5.7 The Consolidated Cases

In March 2007 the Alabama, Georgia I, Georgia II, and Florida cases were consolidated and transferred to the federal district court for the Middle District of Florida "to serve the convenience of the parties and witnesses and promote the just and efficient conduct of the litigation." The SeFPC case was also transferred after remand following the 2008 D.C. Circuit decision. With the agreement of the parties involved, the court split the litigation into two phases, the first phase dealing primarily with water supply issues at the Buford project and the second phase dealing with environmental issues associated with operation of Jim Woodruff Dam.

On July 17, 2009, the U.S. District Court for the Middle District of Florida issued the phase one ruling. Basic provisions of the ruling included the following:

- The USACE lacked the authority to continue to support the present levels of water supply withdrawals at Lake Lanier and downstream of Buford Dam or to reallocate storage to accommodate those or additional withdrawals. Accordingly, such water supply operations and most withdrawals from Lake Lanier must cease in July 2012. The USACE would be required to update its plans and manuals to implement the operations necessary to comply with the Court's order, which will require a reduction in water supply withdrawals "at the end of three years, absent [c]ongressional authorization or some other resolution of this dispute," or unless the order is overruled on appeal or otherwise modified.
- As of July 17, 2012, water supply withdrawals from Lake Lanier would be limited to the amounts authorized by relocation agreements with the cities of Gainesville and Buford, Georgia. Those agreements, which were executed at the time of the reservoir's construction, authorize withdrawals of 8 million gallons per day (mgd) for Gainesville and 2 mgd for Buford, a combined 10 mgd.
- As of July 17, 2012, "the required off-peak flow [at Buford Dam] will be 600 cfs."

One year later, July 21, 2010, the Middle District of Florida issued a second phase order in *In re Tri-State Water Rights Litigation*, which upheld the RIOP as the Jim Woodruff Dam operation in support of endangered species in the Apalachicola River but determined the NEPA for the RIOP was inadequate. However, because the USACE was already updating its manuals to replace the RIOP and drafting an EIS, the NEPA inadequacies were moot. Both orders were appealed to the U.S. Court of Appeals for the Eleventh Circuit. These appeals were eventually dismissed.

On June 28, 2011, the U.S. Court of Appeals for the Eleventh Circuit issued an opinion that the authorizing documents for the Buford Dam project include water supply as an authorized purpose. The opinion reversed the judgment of the District Court on the phase one ruling, vacated its findings and conclusions of law, and remanded the case *In re Tri-State Water Rights Litigation* to the district court with instructions to remand to the USACE for further proceedings "not inconsistent with this order." This decision set aside the Army's 2002 decision to deny Georgia's 2000 request and ordered a remand to the USACE to reconsider whether it has the legal authority to operate the Buford Project to accommodate Georgia's request, in light of the legal authority conferred by Congress in the Rivers and Harbors Act of 1946, P.L. No. 84-841 (July 30, 1956) (1956 Act), and the Water Supply Act of 1958. The court of appeals also directed the USACE to consider a number of other issues related to the legal authority to accommodate Georgia's request, including how to measure the impacts of Georgia's projected withdrawals and return flows on authorized purposes, and whether compensation to hydropower users is appropriate.

An appeal by Alabama, Florida, and the SeFPC for the case to be heard by the full panel of the U.S. Court of Appeals for the Eleventh Circuit was denied on September 16, 2011. On October 5, 2011, the district court remanded the matter to the USACE in accordance with the appeals court's instructions. Limited jurisdiction was retained by the Eleventh Circuit pending the submittal by the USACE of its position regarding authority to grant Georgia's 2000 request. The USACE submitted its Legal Opinion on June 25, 2012, and on July 10, 2012, the appeals court remanded any remaining jurisdiction in the cases to the district court.

The U.S. Supreme Court denied petitions by Alabama, Florida, and SeFPC for *certiorari* to review the Eleventh Circuit's phase one decision on June 25, 2012.

On January 24, 2013, the district court vacated its phase two ruling on the grounds that the USACE and the service reinitiated consultation while the appeal was pending, thus rendering the appeal moot and making it proper to vacate the underlying order.

Accordingly, there is no active litigation regarding the USACE operation of the ACF Basin.

1.6 The ACF Master Manual

In January 2008 Secretary of the Army Pete Geren directed the USACE to update the Master Manual. The Master Manual was completed in 1958, and while reservoir regulation manuals for the later-constructed projects of West Point Dam, Walter F. George Lock and Dam, and George W. Andrews Lock and Dam were subsequently appended and some reservoir manuals were updated, the Master Manual has not been comprehensively revised since 1958.

The appendices to the Draft 1989 Master Water Control Plan include federal-reservoir-specific water control plans that outline the regulation schedules for each of the five

projects, including operating criteria, guidelines, guide curves, and specifications for storage and releases from the reservoirs.

The operation of federal reservoirs in the ACF system provides benefits including flood risk management (previously referred to as flood control), fish and wildlife conservation, navigation, hydroelectric power generation, water supply, water quality, and recreation. To accomplish the authorized project purposes and to operate the system efficiently to maximize these and other benefits, water must be stored during the wetter times of each year and released from storage during drier periods. Generally, this means that water is stored in the lakes during the spring and released in the summer and fall. However, some benefits such as lakeside recreation, water supply, and lake fish spawning are achieved by retaining water in the lakes throughout the year or during specified periods. The complex hydrology and varied uses of the ACF system require that the USACE operate the system in a balanced operation in an attempt to meet all the authorized purposes while continuously monitoring the total system's water availability to ensure that minimum project purposes can be achieved during critical drought periods.

To help do this, the USACE has defined four Action Zones in the three ACF storage projects—Buford, West Point, and Walter F. George. Action Zone 1, the highest in each lake, defines a reservoir condition in which all authorized project purposes should be met. As lake levels decline, Action Zones 2 through 4 define increasingly critical system water shortages and guide the USACE in reducing flow releases as pool levels drop as a result of drier-than-normal or drought conditions. The Action Zones also provide a guide to the USACE to help balance the remaining storage in each of the three major storage reservoirs.

USACE regulations require developing a water control plan for each reservoir project, as well as a basin Master Water Control Manual (Master Manual) for the coordinated operation of multiple projects within a river basin. Regulations further require that these water control plans and manuals be updated or revised as necessary to conform with changing requirements due to developments in the project area and downstream, improvements in technology, new legislation, and other relevant factors, provided such revisions comply with existing federal regulations and established USACE policy. The water control plans and manuals for the USACE reservoir projects in the ACF River Basin are out-of-date and need to be updated. The last approved Apalachicola River Basin Reservoir Regulation Manual is dated 1958. Although separate water control plans for each federal reservoir project in the ACF River Basin have been prepared and updated since that time, many of them need to be updated. As stated previously, the Draft Water Control Plan for the ACF River Basin was updated in 1989 but never finalized. Although the 1989 draft plan was never finalized, the USACE has continued to operate the ACF in accordance with it, making small changes or adjustments as circumstances required. Coordination and consultation under the ESA has been accomplished for project operations as the need arose, although formal consultation for the basin-wide manual operations has not been completed.

The USACE now intends to proceed with updating those water control plans and the basin manual for the ACF. The proposed updates of the water control plans and manual

are intended to reflect operations as they have evolved due to changing conditions in the basin and will fully comply with agency regulations, federal laws, and the Eleventh Circuit Court of Appeals' order. The states and other stakeholders will be involved in developing the plans. The process of updating the water control plans, subject to the availability of funds, is estimated to take approximately 2½ years. It will include public involvement and analysis under NEPA and consultation under the ESA. Furthermore, to satisfy its obligations under NEPA, the USACE will evaluate present circumstances as part of its EIS, along with operations for all authorized purposes, an expanded range of water supply alternatives associated with the Buford Dam/Lake Lanier project, including current levels of water supply withdrawals and additional amounts that Georgia has requested from Lake Lanier and downstream at Atlanta. Updating the water control plans and manuals will provide a way to capture the USACE's operating environment.

2.0 Scoping Process Summary

The *National Environmental Policy Act* is a full disclosure law that allows public involvement in the federal agency decision making process. All persons and organizations that have a potential interest in major action proposed by a federal agency—including other federal agencies, state and local agencies, federally recognized Native American Indian tribes, interested stakeholders, and minority, low-income, or disadvantaged populations—are encouraged to participate in the NEPA process.

The CEQ regulations implementing NEPA direct federal agencies that have decided to prepare an EIS to engage in a public scoping process. The purpose of scoping is to determine the range of issues to be addressed and to identify the significant issues to be analyzed in depth with respect to the proposed action and alternatives.

Following the decision to prepare an EIS for implementation of an updated Master Manual, the USACE initiated the scoping process. The USACE 's objectives for scoping were to identify public and agency concerns; clearly define the significant environmental issues and alternatives to be examined in the EIS, including the de-emphasis of insignificant issues; identify related issues that originate from separate legislation, regulations, or Executive Orders (e.g., endangered species or environmental justice concerns); identify state and local agency requirements that must be addressed; and identify available sources of data, studies, or tools that could provide information valuable in preparing the EIS.

In 2008, the USACE's scoping process consisted of the following elements:

- Publishing an NOI to prepare an EIS in the *Federal Register*
- Publishing an announcement of the dates and locations of five public scoping meetings in the *Federal Register*
- Updating the existing mailing list by means of an initial postcard requesting accurate contact information
- Distributing a newsletter and a public notice announcing public scoping meetings and locations to federal, state, and local agencies and officials; stakeholders; and other interested parties
- Preparing and launching a website that described the NEPA process and all the public involvement activities planned during EIS preparation and served as a tool for collecting public comments and updating the project mailing list
- Distributing a press release to media outlets
- Sending agency scoping and tribal consultation letters by email
- Sending agency scoping and tribal consultation letters by the U.S. Postal Service
- Holding a federal agency meeting and web conference to inform the agencies and solicit comments

- Hosting a Stakeholder's Workshop to share the new and improved version of reservoir simulation software called *Hydrologic Engineering Center (HEC)-ResSim* with all stakeholders groups involved with water management issues in the basin
- Holding five public scoping meetings to inform the public about the proposed action and to solicit oral and written comments on the issues that should be addressed in the EIS
- Reviewing and evaluating the oral and written comments received during the open comment period
- Publishing the scoping report on a website
- Distributing a newsletter announcing publication of the scoping report to federal, state, and local agencies and officials; stakeholders; tribes; and other interested parties.

The USACE reopened the scoping process in 2009. The second round of scoping included the following additional elements:

- Publishing an announcement to reopen public scoping in the *Federal Register*
- Distributing a public notice announcing the reopening of public scoping by email and through the U.S. Postal Service for those who did not have an email address or who requested hard-copy notices
- Preparing and launching a website that described the NEPA process and all the public involvement activities planned during EIS preparation and served as a tool for collecting public comments and updating the project mailing list
- Distributing a press release to media outlets
- Reviewing and evaluating the written comments received during the open comment period
- Publishing the scoping report on a website at http://www.sam.usace.army.mil/Missions/PlanningEnvironmental/ACFMasterWaterControlManualUpdate.aspx
- Distributing a newsletter announcing publication of the scoping report to federal, state, and local agencies and officials; stakeholders; tribes; and other interested parties.

The USACE's reopened the scoping process a third time in 2012. The third round of scoping included the following additional elements:

- Publishing in the *Federal Register* an announcement to reopen public scoping
- Distributing a newsletter announcing the reopening of public scoping by email and through the U.S. Postal Service for those who did not have an email address or who requested hard-copy notices

- Updating the project website to reflect the 2011 decision and to serve as a tool for collecting public comments and expanding the project mailing list
- Distributing a press release to media outlets
- Reviewing and evaluating the written comments received during the open comment period
- Distributing a newsletter during the public scoping process notifying the public of an extension of the comment period end date by email and through the U.S. Postal Service for those who did not have an email address or who requested hard-copy notices
- Publishing the updated scoping report on the website
- Distributing a newsletter announcing publication of the scoping report to federal, state, and local agencies and officials; stakeholders; tribes; and other interested parties.

2.1 Notices of Intent

On February 22, 2008, the USACE published in the *Federal Register* an NOI to prepare an EIS for the proposed implementation of the updated ACF Master Manual. On September 19, 2008, a supplement to the NOI was published in the *Federal Register* to invite the public to participate in the NEPA scoping process. The supplemental NOI in 2008 provided details on the dates and locations of the five open-house-style public scoping meetings scheduled at various locations throughout the ACF River Basin, and information explaining the various methods to be used to collect comments from the public for consideration in preparing the Draft EIS.

The scoping process has been reopened twice after the initial effort to collect comments in 2008. On November 19, 2009, an NOI was published in the *Federal Register* to reopen scoping to revise the scope of the Draft EIS to account for a July 2009 federal court ruling addressing the USACE's authority to provide water supply benefits through its operation of the Buford Dam/Lake Sidney Lanier project. On October 12, 2012, an NOI was published in the *Federal Register* reopening the public scoping process to revise the scope of the EIS in light of a June 28, 2011 Decision of the United States Court of Appeals for the Eleventh Circuit and a June 2012 legal opinion of the USACE's Chief Counsel regarding authority to accommodate municipal and industrial water supply from the Buford Dam/Lake Lanier project.

All the 2008, 2009 and 2012 notices listed Mr. Brian Zettle (USACE Mobile District) as the point of contact for questions regarding the manual update or the NEPA process. Copies of the *Federal Register* notices are provided in Appendix A.

2.2 Public Notices

The USACE posted press releases on the USACE website, which is at http://www.sam.usace.army.mil/Missions/PlanningEnvironmental/ACFMasterWaterControlManualUpdate, to announce all three scoping opportunities (2008, 2009, and 2012). The press releases were also delivered to newspapers and radio and television stations throughout the basin (Tables 2 and 3). In addition to providing information on the USACE website, the USACE also launched a project-specific website in 2008 to provide another avenue for communicating information to stakeholders about the EIS and Master Manual update, as well as to provide for Web-based comment submission during the scoping period. In 2009 the USACE website was used to collect public comments and provide updates on the status of the EIS. In October 2012 the website text was updated to reflect the third round of scoping comment collection and related information and was again used to collect comments http://www.sam.usace.army.mil/Missions/PlanningEnvironmental/ACFMasterWaterControlManualUpdate.aspx.

The September 2008 press release summarized the proposed action and the dates, times, and locations of the public scoping meetings held in October 2008. The November 2009 press release announced the revisions that the USACE was making to the EIS according to the July 17, 2009, federal court ruling. The 2012 press release announced the intent to revise the scope of the EIS in light of the June 2011 Decision (Appendix B).

Table 2. Newspapers that Received Press Releases

Publication	Location
Abbeville Herald	Abbeville, Alabama
Albany Herald	Albany, Georgia
Atlanta Journal Constitution	Atlanta, Georgia
Columbus Ledger-Enquirer	Columbus, Georgia
The Decatur Daily	Decatur, Alabama
Dahlonega Nugget	Dahlonega, Georgia
Dothan Eagle	Dothan, Alabama
Eufaula Tribune	Eufaula, Alabama
Forsyth County News	Cumming, Georgia
Georgia Outdoor News	Madison, Georgia
Gainesville Times	Gainesville, Georgia
Gulf County Breeze	Gulf Breeze, Florida
Gwinnett Daily Post	Gwinnett County, Georgia
Jackson County Floridian	Marianna, Florida
LaGrange Daily News	LaGrange, Georgia
Lanette Valley Times	Lanette, Alabama
Montgomery Advertiser	Montgomery, Alabama
Mundo Hispanico	Atlanta, Georgia
Opelika Auburn News	Opelika, Alabama
Pensacola News Journal	Pensacola, Florida
Tallahassee Democrat	Tallahassee, Florida

Table 3. Television and Radio Stations that Received Press Releases

Name	City
WRBL TV (Channel 3, CBS)	Columbus, Georgia
WSB TV (Channel 2, ABC)	Atlanta, Georgia
WTVM TV (Channel 9, ABC)	Columbus, Georgia
WXIA TV (Channel 11, NBC)	Atlanta, Georgia
WGCL TV (Channel 46, CBS)	Atlanta, Georgia
WDUN (550 AM)	Gainesville, Georgia
WMJE (102.9 FM)	Gainesville, Georgia
WGST (640 AM)	Atlanta, Georgia
WSB Radio (98.5 FM)	Atlanta, Georgia

A newsletter containing the same information as the press release (Appendix C) was sent to more than 3,800 stakeholders, including federal agencies, state agencies, federally recognized Native American Indian tribes, local agencies and officials, public interest groups, private organizations, individuals, and other interested parties in 2008. In 2009 a newsletter containing the relevant content of the November 19, 2009, *Federal Register* was distributed to stakeholders. In 2012 a newsletter containing the relevant content of the October 12, 2012 *Federal Register* was distributed to stakeholders. The newsletters were distributed through the U.S. Postal Service and electronically, if an email address had been provided.

The project mailing list was developed from an existing USACE -maintained database of stakeholders with an interest in activities within the ACF River Basin. In 2008, a postcard was sent to stakeholders to give them an opportunity to update their information to include an email address, provide an alternative contact's email address, state whether they would like to continue to receive mail through the U.S. Postal Service, or remove their name from the mailing list.

At this time, there are more than 11,000 stakeholders on the mailing list. As other interested parties have been identified, they have been added to the mailing list, which will be updated continually throughout the development and finalization of the EIS. Anyone requesting information or notice regarding the EIS will be added to the mailing list. Participants in the public and interagency scoping meetings have been added to the project mailing list as well. Requests to be added to the mailing list can be made at http://www.sam.usace.army.mil/Missions/PlanningEnvironmental/ACFMasterWaterControlManualUpdate.aspx.

2.3 Native American Indian Tribal Consultation

Government-to-government tribal consultation notices (Appendix D) were sent electronically on October 1, 2008, and through the U.S. Postal Service on October 15, 2008, to 26 federally recognized Native American Indian tribes in the United States. The consultation letters contained information regarding the update of the Master Manual, as well as announcements of the interagency and public scoping meetings. The letters also requested a response with respect to interest in participating in a consultation meeting

regarding the EISs for both the ACF and ACT River Basins. The meeting was planned for November 13, 2008, in Spanish Fort, Alabama, outside Mobile. Mr. Tommy Birchett, an archaeologist with the Mobile District, was identified as the point of contact for responses.

Seven of the 26 tribes responded to the initial electronic mailing, several of which mentioned schedule conflicts. Ultimately, only the Choctaw Nation of Oklahoma expressed interest in attending the meeting November 13, 2008.

A final mailing was sent electronically as a follow-up to ensure that no other tribes were interested in participating in government-to-government consultation at the time. Because of the limited response, the USACE chose to coordinate with the tribes via email and referred the tribes to the various resources available online to find out more about the proposed USACE action.

2.4 Federal Agency Web Conference

On September 26, 2008, the USACE sent an electronic invitation to attend a federal agency web conference to the points of contact previously identified in the ACF River Basin. A follow-up announcement was distributed October 6, 2008, to remind agencies of the meeting and request their participation in a pre-meeting agenda planning tool. An online survey was created to collect input from the agencies, and it was later used to establish the web conference agenda. The web conference was held October 9, 2008, at the Mobile District office in Mobile, Alabama. The purpose of the meeting was to provide background information on and an open discussion about updating the Master Manual. The meeting was also used to gather existing data and additional information that can be used in developing the Draft EIS.

Thirty representatives from 11 federal agencies participated in the web conference. In addition to presenting background information on the update of the Master Manual, the USACE provided information on the NEPA process and discussed the resource areas that would likely be considered in the EIS. A summary of the issues raised during the web conference is provided in Section 4.6 of this report. The meeting agenda and presentation are in Appendix E.

2.5 HEC-ResSim Technical Modeling Workshops

The HEC has developed a new and improved version of its reservoir simulation software called *HEC-ResSim*. Recognizing *HEC-ResSim*'s sophisticated computational abilities and maturity as a generalized model, the Mobile District began working with HEC to modernize its ACT and ACF reservoir modeling applications using *HEC-ResSim*. The more powerful system modeling functions and ability to incorporate custom logic into water management decisions provide improved capability to actual operations and allow greater flexibility for evaluating alternatives.

In the interest of transparency and cooperation, the Mobile District and HEC hosted a workshop to share the new tools and data with all stakeholders groups involved with

water management issues in the basin. The workshop took place at Jim Woodruff Lock and Dam from September 30 to October 2, 2008, and it focused entirely on technical topics. Twenty-eight modelers attended the workshop. Twenty-three of the modelers represented three federal agencies, three state agencies, and one university; the five remaining modelers were private consultants representing the stakeholders.

The session proved very successful in terms of its objectives:

- Introduce the participants to the HEC-ResSim software.
- Initiate technology transfer by providing the participants with a copy of the software and the ACT/ACF models, walk the participants through the model, and answer questions.
- Foster relationships by continuing longstanding technical working relationships with the stakeholders.

Copies of the workshop announcement, agenda, and attendees are in Appendix F. Mobile District and HEC continued to refine the HEC-ResSim models of the ACF system.

On May 3-5, 2011, the Mobile District hosted a follow-up HEC ResSim technical workshop. Representatives from all three states (AL, GA, and FL), Federal agencies, and technical experts from other stakeholders, academia, and consulting firms attended the workshop. The purpose of the workshop was to update the participants on further development and refinement of the HEC ResSim model for specific application to the ACF and to present model results for runs of the baseline (existing) project operations. The workshop served as an excellent vehicle for continued technology transfer and relationship building among the technical experts.

Copies of the workshop announcement, agenda, and attendees are provided in Appendix F.

2.6 Public Scoping Meetings

Public scoping meetings for the ACF River Basin were held on the following dates at the times and locations:

- Monday, October 20, 2008: Franklin County Courthouse, Apalachicola, Florida, 5:00 p.m.–8:00 p.m.
- Tuesday, October 21, 2008: Dothan Convention Center, Dothan, Alabama,
- 5:00 p.m.–8:00 p.m.
- Wednesday, October 22, 2008: Callaway Center at West Georgia, LaGrange, Georgia, 5:00 p.m.–8:00 p.m.
- Thursday, October 23, 2008: Cobb County Government Civic Center, Hudgins Hall, Marietta, Georgia, 4:00 p.m.–7:00 p.m.
- Wednesday, October 29, 2008: Georgia Mountain Center, Gainesville, Georgia,
- 5:00 p.m.–8:00 p.m.

The venues were chosen on the basis of accessibility to the public throughout the ACF River Basin. An open house format was used at each meeting, and information stations with displays (Appendix G) and handouts (Appendix H) were available for viewing. Subject matter experts from the USACE and environmental contractors staffed each station, where information about the following was provided:

- The ACF River Basin Master Manual and federal-reservoir-specific water control plans
- Water management and federally authorized project purposes
- Modeling tools
- The NEPA process and EIS development
- Environmental resources
- Socioeconomics

In addition, a welcome station, media station, written comments station, and court reporter were available to provide information and accept oral and written comments.

A total of 1,018 stakeholders participated in the 5 public scoping meetings. Table 4 shows a breakdown of the participation by meeting location.

Table 4. Participants by Scoping Meeting Location

Date	Location	Attendance
October 20, 2008	Apalachicola, Florida	135
October 21, 2008	Dothan, Alabama	24
October 22, 2008	LaGrange, Georgia	365
October 23, 2008	Marietta, Georgia	93
October 29, 2008	Gainesville, Georgia	401
	Total	*1,018*

Following sign-in, a USACE representative offered a brief presentation to introduce participants to the format of the public scoping meeting and to clarify the purpose of the meeting. USACE experts and environmental contractors were available at stations to answer questions and accept comments. Laptop computers were set up to accept comments electronically through the project website; a staff member was on hand to help participants to use the computers. Comment forms were also available at the written comments station. In addition, a court reporter was available at each meeting to accept oral comments. Appendix I contains the oral comment roster. Transcripts of the oral comments are included in Appendix J, which contains all the comments the USACE received during scoping (in their original format).

2.7 Scoping Comments

The public scoping effort for updates to the Master Manual in the ACF River Basin resulted in a total of 3,621 comments from 965 individuals, organizations, and agencies. A total of 2,269 comments were submitted during the formal scoping period that ended November 21, 2008, and 234 during the formal scoping period that ended January 4, 2010. In the 2012 scoping period ending January 14, 2013, an additional 1,118 comments were received. During the 2008 initial scoping period, comments were submitted to the USACE through all available options—U.S. Postal Service, email, website, fax, verbal transcription, or in person at one of the scoping meetings held in 2008. In the 2009 and 2012 scoping periods, comments were submitted to USACE through U.S. Postal Service, email, website, and fax. Copies of all the public and agency comments received in the scoping process are in appendices.

Scoping continues throughout the preparation of an EIS. The USACE will accept and consider all comments regardless of when they are submitted. Comments submitted outside formal scoping periods, however, are not represented in this scoping report.

3.0 Scoping Comment Analysis

The scoping process for the EIS for implementation of an updated Master Manual resulted in the submission of comments from 958 individuals, organizations, and agencies and three petitions. As described in Section 2 of this report, the USACE received oral and written comments by U.S. Postal Service, email, on website forms, and at public scoping meetings. In the next stages of the EIS process, the USACE will use these comments to determine the scope and content of the Draft EIS. Note that the USACE does not endorse or validate the content of the comments received.

During the 2008 initial scoping period, 2,269 comments were received. An additional 234 comments were received in the 2009 reopened scoping period, and an additional 1,118 were received in the 2012 scoping period for 3,621 total comments. The comments were categorized into 12 categories: Water Management Recommendations; Socioeconomics and Recreation; Biological Resources; Drought Operations; Water Quality; Water Supply; NEPA; Data, Studies, and Analytical Tools; Navigation; Hydropower; Flood Risk Management; and Other Resources. Some of the categories were further divided into subcategories to present the stakeholders' issues and recommendations more clearly. Table 5 provides the total number of comments broken down into segments and categorized by issue. All comment letters received were sorted and segmented by comment category. These are in the appendices of the Scoping Report. Each appendix contains all comments from a single round of scoping: 2008 is in Appendix K, 2009 is in Appendix N, and 2012 is in Appendix P.

When considering the numbers represented in Table 5, it is important to note that some comments might be defined by more than one category. Also important to note is that some of the comments received were submitted by entities or organizations representing a specifically identified number of individuals. These letters are accounted for in the same manner as correspondence received from elected officials written on behalf of their constituents; that is, each letter is counted as one submission. Statistically, the petitions were accounted for separately and were not incorporated into the numbers presented in Table 5, as presented in Section 3.13.

Table 5. Comments Categorized by Segment

Category	2008	2009	2012	Total number of comments
Water Management Recommendations	868	53	307	1,228
Socioeconomics and Recreation	404	14	288	706
Biological Resources	284	35	265	584
Drought Operations	191	5	12	208
Water Quality	155	12	22	189
National Environmental Policy Act	79	80	82	241
Water Supply	117	19	13	149
Data, Studies, and Analytical Tools	56	4	37	97
Other Resources	52	6	7	65
Navigation	28	4	9	41
Hydropower	26	0	5	31
Flood Risk Management	9	2	71	82
			Total	*3,621*

3.1 Water Management Recommendations

Operation of federal reservoirs in the ACF River Basin for their authorized project purposes provides multiple benefits, including: fish and wildlife conservation, flood risk management, hydroelectric power generation, navigation, recreation, water supply, and water quality. In the 2008 scoping period, 868 comments related to the management of project purposes and USACE operations of the ACF River Basin were received, in the 2009 reopened scoping period, 53 comments were received, and in the 2012 reopened scoping period, 307 comments were received for 1,228 total comments. These comments were further divided into six subcategories: (1) Existing Water Management Practices, (2) Water Management Suggestions, (3) Demands and Needs, (4) Conservation, (5) Alternatives, and (6) Other. Figure 2 shows the distribution of comments regarding water management recommendations.

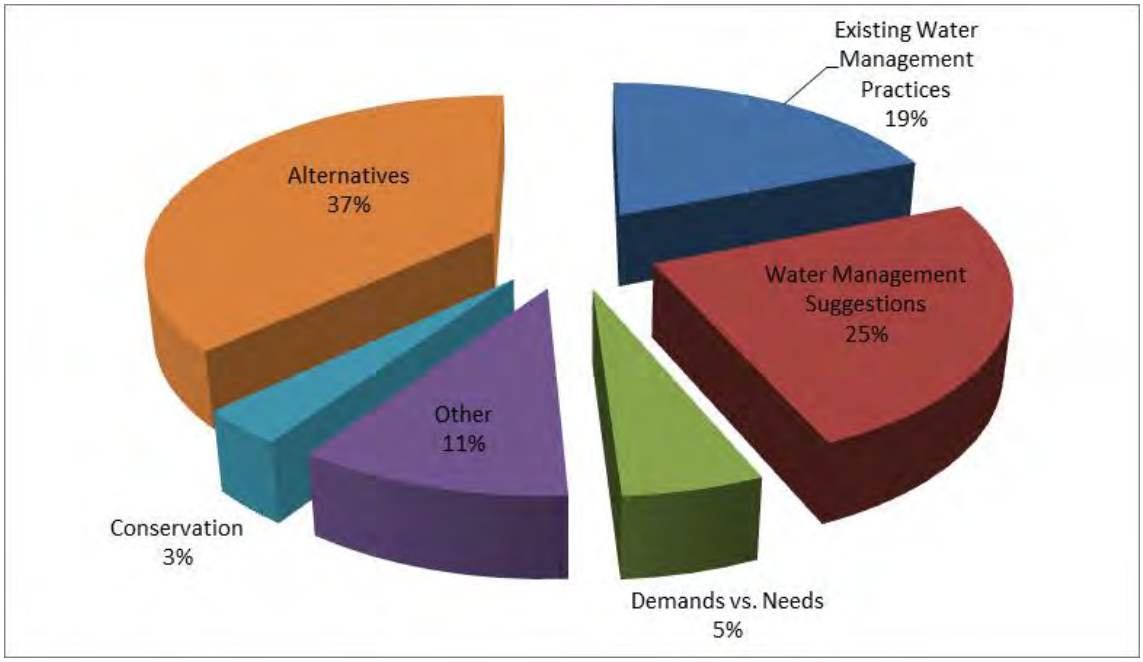

Figure 2. Distribution of comments among Water Management Recommendations subcategories.

3.1.1 Existing Water Management Practices

3.1.1.1 Initial Scoping Period—2008

The USACE received 103 comments critiquing the manner in which the water management activities in the ACF River Basin are carried out. The comments regarding Lake Lanier addressed the low lake levels and their effects on recreation, safety, property values, the environment, and aesthetics. One commenter stated, "Sometimes it's embarrassing. I have relatives that call from all over the United States and make jokes about do I have water in my lake." Another said, "We also had dead mussels on the dry land at our house when the water was down." Others called attention to a gauge error that occurred in 2006, citing the error as a contributor to the low lake levels that followed. Some questioned the USACE's decisions to make releases from Lake Lanier at the beginning of the drought, given the small drainage area upstream and the known difficulty in refilling. Others questioned why water continues to be released from Lake Lanier even when the pool elevation is 22 feet below normal. A few commenters expressed their perception of preferential treatment of upstream users to the detriment of downstream users. A representative of Gwinnett County, citing paragraph 6d of Engineer Regulation (ER) 1110-2-240, stated, "We do not believe that the present Interim Operations Plan and its modifications follow this USACE rule." Another commenter stated that downstream lakes have recovered from their low levels, but continued releases from Lake Lanier in excess of inflow have not allowed its recovery.

Those commenting about West Point Lake complained primarily of low lake levels and the impact on recreation and recreational safety. One commenter stated that "[c]onditions

of a low pool are extremely hazardous to those who use the lake for recreation and as a means of daily sustenance." Others questioned whether the USACE is operating West Point Lake in accordance with the congressional authorization. The West Point Lake Coalition, for example, stated that "the USACE operates West Point Lake specifically and the ACF system in general in a way that ignores the original, PRIMARY congressional authorizations as a group and focuses extensively on flood risk management as well as downstream and upstream demands that do not meet the purposes set forth by Congress. It appears that the USACE has established the flood risk management authorization as THE primary purpose …." Some suggested that the USACE needs to take a more proactive approach to the creeks that feed into the lake by dredging them to prevent flooding of low-lying areas.

Some commenters were concerned about flows in the open-river sections downstream of the reservoirs. Some, such as the Alabama Department of Conservation and Natural Resources (ADCNR), expressed concern that "the water management policies of the past have often resulted in a degradation of the ecological integrity of a river ecosystem, which in the case of wildlife has led to a decrease in biodiversity and species sustainability." ADCNR added, "To protect ecological integrity, we need to mimic components of natural flow variability, taking into consideration the magnitude, frequency, timing duration, rate of change and predictability of flow, and sequencing of such conditions." Others were concerned that growth in the Atlanta region will cause the USACE to modify its operations of Lake Lanier to the detriment of the downstream uses of water supply and waste assimilation. The Columbus Water Works expressed concern that current operations do not pay adequate attention to Chattahoochee River flows in the middle stretch of the river and the minimum flow obligations of Georgia Power Company projects operating under a Federal Energy Regulatory Commission (FERC) license. A number of commenters were concerned that current operations favor endangered species (mussels) over people.

3.1.1.2 Reopened Scoping Period—2009

During the 2009 reopened scoping period, the USACE received an additional 12 comments pertaining to existing water management practices. Regarding Lake Lanier, one commenter stated that "Hall County is being severally restricted from using the water right here in our county so that people downstream of us can use the water from Lake Lanier." Another commenter opposed using the RIOP as the basis for a new Water Control Plan because it relies solely on augmentation flows from Lake Lanier as the solution to the concerns identified in the Apalachicola River and vicinity. Three commenters provided similar comments regarding existing water management practices at West Point Lake. They suggested that the Flood Control purpose has been overemphasized in the current operations manuals as compared to the other authorized uses such as recreation, and releases are made from West Point Dam at a flow rate that is higher than what would occur naturally in order to satisfy downstream needs such as municipal waste assimilation and "thermo-electric" power. One commenter urged the USACE to abandon its current methodology of calculating basin inflow because the methodology does not accurately reflect inflows to the basin. Another commenter suggested that water management practices should account for following reasonably

foreseeable actions and that "special attention should be paid to USACE policies to hold reservoirs high, operational changes that redistribute and/or store water previously released for navigation support and the effects of thousands of small reservoirs (current and future) in the ACF Basin."

3.1.1.3 Reopened Scoping Period—2012

In the 2012 reopened scoping period, the USACE received an additional 119 comments pertaining to existing water management practices. These comments are consistent with previous scoping efforts; parties at Lake Lanier and West Point Lake believe lake levels are too low and too much water is released from their reservoirs; users of Apalachicola River and Bay describe how they have been affected by extreme low flows. The comments by basin region follow:

- *Lake Lanier* user comments were focused on the following five points:
    - The 5,000 cfs minimum flow required at the state line is not representative of the true lowest historical flows in the ACF and is not sustainable.
    - Lanier was never designed to support all downstream demands and cannot be expected to because the dams originally proposed on the Flint River were never built.
    - The USACE's operating rules require more water to be released from Lanier than is necessary and do not allow as much to be stored as is possible. These draw the lake down more than necessary and make it less likely to refill to full pool under contemporary climatic conditions.
    - The Endangered Species Act does not require the USACE to augment Apalachicola River flows above run-of-river levels, and the practice should not be required because it depletes Lake Lanier unnecessarily.
    - Regular navigation is no longer feasible on the ACF, and the USACE should not try to support it in view of the other demands on Lake Lanier as a resource of last resort.
- *West Point Lake* comments described personal accounts of frustration with fluctuating water levels, low lake levels, effects on personal property (particularly docks), and fisheries because of increased shoreline erosion.
- *Middle Chattahoochee River* comments reminded the USACE of minimum flows necessary for assimilative capacity. In some letters, requests were made to maintain these flows even during droughts and when flow in the Flint River are sufficient enough to lessen the pressure for releases from the Chattahoochee River reservoirs to meet prescribed flow requirements below Jim Woodruff Lock and Dam. The operation of Plant Farley, providing 19 percent of total electricity generated for Alabama Power Company, also depends on adequate flows in-stream.
- *Apalachicola River and Bay* interests were represented by Florida Department of Environmental Protection (FDEP) comments on effects of operations on the Apalachicola River; more detail on its comments is provided in Section 4.3.2.3.

3.1.2 Water Management Suggestions

3.1.2.1 Initial Scoping Period—2008

A total of 132 comments provided suggestions regarding potential modifications to current water management practices and water control plans. The comments from federal, state, regional, and local agencies are discussed in more detail in Section 4. EPA identified a number of issues for inclusion in the updated water control plans, including a discussion of how operations have changed historically, drought contingency operations, compliance with new environmental requirements for water quality and endangered species, use of real-time data, and streamlining data exchange between agencies. The USFWS provided a number of suggestions for consideration in updating the water control plans. The USFWS requested that the USACE develop a summary of the current operating rules for each project, an explanation of their basis in congressional authorization, and a description of the USACE's discretion to change the operating rules. The USFWS recommended a comprehensive process for determining how ecological and social benefits could be increased by modifying the operation of the federal projects and suggested that the USACE consider the impacts of increasing consumptive demands in the ACF River Basin.

The Alabama Office of Water Resources (AOWR) stated that "[u]nless the USACE undertakes the revision to the Water Control Manuals in a manner that is consistent with federal law, including the recent decision of the United States Court of Appeals for the D.C. Circuit, the current effort will not help resolve the long-running controversy over the ACF River Basin." AOWR further suggested that the update of the Master Manual focus on authorized purposes by assessing whether any changes in baseline conditions are necessary to comply with existing laws and regulations. FDEP stated, "The master manual must clearly describe not only the relative priorities of each of the ACF reservoirs, but also how those priorities and additional uses and demands will be accommodated." FDEP also suggested that the NEPA process evaluate USACE operations throughout the ACF River Basin. The Georgia Environmental Protection Division (GAEPD) stated, "It should be noted that the issuance of water withdrawal permits from Lake Lanier and the withdrawal and consumption of water from the ACF River Basin are state and local actions, not federal actions, and therefore should not be addressed within the scope of connected, cumulative, and similar federal actions." The Atlanta Regional Commission (ARC) suggested that the USACE consider all reasonable alternatives; operate the ACF projects in accordance with their congressionally authorized purposes; and address the needs of the middle and lower portions of the basin. Hall County, Georgia, suggested that the updated manuals rely on the most up-to-date factual information examining new and different ways of operating the ACF projects.

The Students of River Basin Management at Florida State University provided several suggestions, including potentially revising the Action Zones, incorporating the RIOP into the updated manuals, defining the process of balancing the reservoirs, and incorporating adaptive management. One commenter was concerned that net local inflow accounts for not only stream flow into the reservoir but also consumptive depletions and evaporation from the reservoirs, which could adversely affect the computed inflows used in the RIOP.

Another commenter encouraged further revision of the RIOP to limit the adverse effect on Lake Lanier. One commenter encouraged the use of HEC-ResSim to assist in developing new operating rules for the ACF projects and suggested that the water control plan consider effects on the Apalachicola River and Bay. The West Point Lake Coalition requested that the "winter drawdown" be no lower than elevation 633 feet.

One commenter suggested that the USACE's updated Master Manual could be a critical tool in achieving joint agreement in interstate water management. Some commenters suggested that the updated Master Manual must be scientifically based and establish an equitable distribution of the waters of the ACF River Basin. One commenter suggested reducing releases from Lake Lanier when rain occurs in downstream portions of the ACF River Basin. Another commenter observed that the Flint River has not been developed in accordance with the original comprehensive plan for the ACF River Basin and that additional reservoirs would be helpful in solving the interstate water issues.

The Association of County Governments of Georgia (ACCG) stated, "Updating the plan should include new methods of forecasting runoff and modeling to ensure that the USACE ACF reservoirs, particularly Lake Lanier, are allowed to reach full pool no later than June 1st of each year and are as full as practical during drought conditions while still meeting downstream, legally-required flows." Numerous other commenters agreed with the idea of refilling Lake Lanier by June 1 of each year. Sixty-six comments encouraged balancing of project purposes. They indicated that all interests should be considered and evaluated and that upstream and downstream needs are equally important. One commenter suggested that "[t]here is sufficient water in the basin to meet reasonable needs for municipal and industrial water supply without causing harm to the environment or to other users if, but only if, the reservoirs are managed wisely."

Fifteen comments encouraged a reduction in dependence on West Point Lake for meeting downstream needs. The Mayor of LaGrange, the West Point Lake Coalition, and the Troup County Chamber of Commerce all stated that "the project has been used as, using the USACE terms, 'the workhorse' of the basin. Nowhere in the congressional authorization does Congress empower the USACE to take the resources at West Point and to use them exclusively for purposes other than those set by Congress." A similar sentiment was expressed by 12 other commenters. One commenter suggested that faster reaction to changing conditions is needed and that there is no time for "lots of studies." Five comments regarding monitoring were received. EPA suggested that "employing this same type of concept [referring to GAEPD's process for monitoring water quality] in other areas would greatly enhance the ecological sustainability of the aquatic systems affected by construction, maintenance and operation of federal projects within the ACF watershed basin." Another commenter suggested real-time monitoring for river flows in the Atlanta area to tailor releases to exactly what is needed. ACCG urged that "any new Water Control Plan not simply tweak or replicate the USACE existing operations. Instead, alternative operating plans must be developed using modern inflow forecasting and modeling to meet the agreed upon performance measures that will manage our shared water resources much more effectively both now and into the future."

There were five comments regarding sharing the effects of drought throughout the ACF River Basin. One commenter expressed the opinion that "[a]ll communities benefiting from the Lanier withdrawals should be on the same water restrictions as those at Lake Lanier even if they have sufficient water while we are in a draught [sic]!" Another commenter described this notion as "sharing the pain." Two comments encouraged conservative operations of the reservoirs to maintain higher pool levels. Seventeen commenters suggested conserving storage by reducing releases and withdrawals during drought times. One commenter stated, "Too much water has been allowed to flow downstream. Lake Lanier has been adversely affected by the drought and excessive outflow of lake water." Another commenter suggested that releases above natural river flows should not be made when the lakes are in Action Zones 2–4. All 17 commenters shared the view that releases should be reduced until Lake Lanier has recovered.

3.1.2.2 Reopened Scoping Period—2009

A total of 16 comments provided during the 2009 reopened scoping period offered suggestions regarding potential modifications to current water management practices and water control plans. Two commenters suggested keeping Lake Lanier as full as possible. Another commenter suggested that the critical yield analysis should acknowledge that the entire conservation pool (from 1,035 to 1,070 msl) at Lake Lanier is available to meet hydropower and other downstream demands. The National Park Service (NPS) stated that the preservation of base flows in the Chattahoochee River is critical for ecological and recreational purposes and that a minimum flow in the river of no less than 1,000 cfs would preserve water quality and ecological and recreational uses of the river below Buford Dam. The NPS also suggested that the USACE consider modifying the release schedule from Buford Dam to allow for more gradual increases and decreases in water levels to mitigate the effects of sudden and dramatic changes in river levels.

One commenter suggested that the USACE consider the ongoing FERC relicensing of the Bartlett's Ferry facility and the operations of other non-USACE facilities during the Master Manual update. The Lake Lanier Association suggested that the water control plans include remediation measures rather than relying on augmentation flows as the solution to the system's problems. To accomplish this, the Association suggested that the USACE not use the RIOP as the presumptive basis for the new WCP and that mitigation factors be considered as alternatives to minimum flows for support of threatened and endangered species. Such factors include remediating the Apalachicola River channel, modifying or closing flows in the Chipola Cutoff, and modifying or closing Sikes Cut. The Association also suggested that the USACE consider alternatives to certain provisions of the RIOP, including the required minimum flows of 5,000/4,500 cfs and existing trigger criteria, prescribed storage/release thresholds, determining minimum flows on the basis of composite storage zones and "basin inflow," rise rates and fall rates, minimum seasonal flows and begin/end dates (e.g., for spring spawning), and percentage of Basin Inflow available for storage.

With regard to West Point Lake, one commenter encouraged the USACE to manage West Point Lake consistent with the congressional authorization for recreation and sport fishing and wildlife development and to manage the ACF System in a truly balanced

manner based on the latest science and technology available. The commenter suggested that a revised rule curve should be implemented with action zones limited to a 3-foot variance from full pool.

The Apalachicola Riverkeeper provided information in a comment letter regarding pre-dam flows in the Apalachicola River. The Riverkeeper suggested that the unimpaired flow data set should be calibrated to achieve a comparable representation of the pre-dam flows to ensure that the data accurately reflect what would occur under natural conditions. The Riverkeeper also commented that the USACE must analyze whether and how the proposed alternative management regimes could affect past, present, and reasonably foreseeable future reservoir and dam operations. The Riverkeeper further urged the USACE to fully consider increasing storage capacity by such means as dredging sediments captured by the lakes, raising the tops of the dams, and acquiring flood-prone areas and reducing flood control. One commenter suggested that the WCP update should comply with ER 1110-2-240.

3.1.2.3 Reopened Scoping Period—2012

In the 2012 reopened scoping period, the USACE received an additional 153 comments pertaining to water management suggestions. The comments by basin region follow:

- *Lake Lanier* should be kept at 1,071 feet or increased to 1,073 feet.
- *Chattahoochee River National Recreation Area* comments along this reach focused on decreasing peaking discharges to improve public safely, decrease sediment transport, and maintain a water level in Morgan Falls Dam of 864 feet.
- *West Point Lake* levels should be maintained between 632.5 and 630.0 msl and the guide curve raised to 632.5 msl in the winter.
- *Middle Chattahoochee River* minimum flows should be maintained as follows: weekly average 1,850 cfs and a daily average 1,350 cfs at Columbus, Georgia, and a daily average of 2,000 cfs at the Columbia, Alabama. SeFPC also asked USACE to consider operational improvements that would resolve head limits at the Walter F. George and Jim Woodruff Projects. A request was made to maintain Walter F. George Lake at 187 feet or greater.
- *Apalachicola River and Bay* should be receiving sufficient flows to inundate floodplains for 3 to 6 weeks per year, and USACE should establish ecological flows to the system considering studies and modeling work performed by others.

Other comments that described broader basinwide actions were provided by federal, local, and state agencies including EPA, NPS, GAEPD, FDEP, ARC, and the Gwinnett County Board of Commissioners. These comments are summarized in Section 4. One comment suggested that the USACE should explore interbasin transfers from the Tennessee or Tallapoosa Rivers.

3.1.3 Demands and Needs

3.1.3.1 Initial Scoping Period—2008

Forty-six comments fell into the Demands and Needs category. Of these, 31 comments expressed concern regarding the ability of the federal projects in the ACF River Basin to meet downstream needs. Among the needs identified were minimum flow needs in the middle Chattahoochee portion of the basin; the needs of industry, such as the Farley Nuclear Plant; and ecosystem needs in the Apalachicola River and Apalachicola Bay. Some commenters believed that upstream needs for water supply and recreation should receive greater emphasis than downstream needs. Others were concerned that the Apalachicola River and Apalachicola Bay should be protected with adequate water flow.

Twelve commenters were concerned about the adequacy of water resources to meet future water needs. One commenter stated, "The new Water Control Plan should be designed to accommodate withdrawals consistent with projections contained in the Metropolitan North Georgia Water Planning Districts Water Supply and Conservation Plan." Another suggested, "Consideration should be given [to] looking at future population projections and water demands from the river." Three comments addressed the subject of growth management. One commenter observed that "[t]he man made problems of uncontrolled development which requires more water than is available without the least bit of concern for others in continuing development is more than we should or can be expected to swallow." Another commenter asked "future growth and development in Atlanta to demonstrate where water supply will come from to support planned growth."

3.1.3.2 Reopened Scoping Period—2009

Three comments from two commenters regarding demands and needs were provided during the 2009 reopened scoping period. Both commenters suggested that the USACE analyze the impacts of the proposed alternative management regimes together with reasonably foreseeable future water withdrawals from the Apalachicola, Chattahoochee, and Flint Rivers from federal, non-federal, and private projects and actions.

3.1.3.3 Reopened Scoping Period—2012

In the 2012 reopened scoping period, the USACE received 18 comments pertaining specifically to demands and needs. AOWR indicated that the Draft EIS must consider the municipal, industrial, and agricultural water supply needs of Alabama. Comments were also received from homeowners in the Middle Chattahoochee River reminding the USACE to address homeowner needs for water in the water control manual (WCM) update. FDEP comments indicate that the WCM must recognize the limits on reduced inflows to the Apalachicola River. The Apalachicola Riverkeeper recommended that USACE first establish ecological flow requirements before determining storage allocations. In its view, continuously increased water use upstream will occur if there is no determination on limits to that use. Comments of many private citizens expressed concern about the ever-increasing demand for water in light of limited supplies in the basin. Georgia Power also recommended that USACE assess water use, with the focus on

maintaining power generation, as the need for electricity increases as growth in the region continues to occur. Other private citizens recommend that USACE provide advocacy and leverage to influence demands for water conservation and distribution of water for equitable balance, and that it consider opportunities in the Flint River.

3.1.4 Conservation

3.1.4.1 Initial Scoping Period—2008

The USACE received 27 comments related to water conservation. One commenter observed that conservation measures in the Atlanta area were effective. Another suggested that the "Metropolitan North Georgia Water Planning District is far ahead of the rest of the basin in these efforts and is currently revising its Water Supply and Conservation Plan to be even more aggressive." Several commenters encouraged implementation of basin-wide conservation measures. Another commenter suggested that conservation measures should be developed for water uses in addition to water supply. According to one commenter, conservation measures should be incorporated into the Master Manual update.

3.1.4.2 Reopened Scoping Period—2009

During the 2009 reopened scoping period, the USACE received five comments related to water conservation. One commenter questioned whether the citizens downstream in Alabama and Florida are under the same water use restrictions as those in the Atlanta region. Another commenter observed that the Atlanta region is reluctant to "embrace" water conservation. A further commenter urged the USACE to require implementation of aggressive conservation measures that could reduce withdrawals and depletions from the ACF system.

3.1.4.3 Reopened Scoping Period—2012

During the 2012 reopened scoping period, the USACE received 10 comments specific to conservation. EPA recommended that before new water supply sources or storage contracts are issued, the applicant be required to demonstrate water efficiency/ conservation implementation (including water reuse). FDEP asked USACE to promote conservation in the basin. Metropolitan North Georgia Water Planning District (MNGWPD) describes existing conservation measures in place in its planning district.

3.1.5 Alternatives

3.1.5.1 Initial Scoping Period—2008

There were 440 comments that suggested alternatives to be considered as part of the update of the Master Manual. Many of the comments received were associated with maintaining or raising full pool water levels at Lake Lanier and West Point Lake. Specifically, commenters would like Lake Lanier to remain at 1,071 feet or to be raised to 1,073 feet. Comments regarding West Point Lake requested eliminating the winter drawdown and maintaining the lake at between 633 and 635 feet. Other commenters

suggested adopting “management triggers” for Lake Lanier, stating that “[t]he new WCP should incorporate specialized provisions for managing Lake Lanier that reflect its distinctive characteristics and management needs. Without them, Lake Lanier is destined to be disproportionately impacted by draw-downs for downstream management, without an ability to remain near full pool or to refill.”

Twenty-four commenters suggested construction of additional reservoirs to meet future water supply and other water resources needs. Five commenters encouraged restoring a historical flow regime to the Apalachicola River. One commenter suggested that some control of inter-basin transfers is needed. Four commenters suggested desalination as a potential source for future water supply, and four suggested a pipeline to bring Tennessee River water to the Atlanta area as a potential solution. Three commenters suggested that closing Bob Sikes Cut should be part of a solution to salinity problems in Apalachicola Bay.

Many of the alternatives suggested are outside the existing authority of the USACE and could not be implemented without additional congressional authority. Suggestions that are outside the existing USACE authority may be considered by conducting a feasibility study and making appropriate recommendations to Congress for their authorization. One authority for conducting such a feasibility study is Section 216 of the *Flood Control Act of 1970*, which authorizes studies to review the operation of completed federal projects and recommend project modifications "when found advisable due to significantly changed physical or economic conditions ... and for improving the quality of the environment in the overall public interest." Such studies are conducted under the USACE’s General Investigation program and require cost-sharing from a local sponsor.

3.1.5.2 Reopened Scoping Period—2009

Comments on water management alternatives received during the 2009 reopened scoping period were very similar to those received during the 2008 scoping period. Four of the 12 comments received suggested raising the level of Lake Lanier to 1,073 feet as a means of obtaining additional water supply in the Atlanta region. Two commenters again suggested eliminating the winter drawdown at West Point Lake and maintaining the lake at between 633 and 635 feet. One commenter pointed out that constraints on water management in the ACF system stem from the lack of sufficient water storage capacity (or infrastructure) in the Flint River Basin and suggested broadening the scope of the EIS to encompass a preliminary engineering study that would define the benefits of additional storage facilities on the Flint River. Other water management alternatives suggested include refurbishing Jim Woodruff Lock and Dam to increase the "head limit" and operating Lake Lanier to provide water supply for the 2035 demand as defined in the MNGWPD *Water Conservation and Water Supply Plan of 2009*.

3.1.5.3 Reopened Scoping Period—2012

In the 2012 reopened scoping period, the USACE received two comments specific to water management alternatives that were not otherwise categorized as water management

suggestions. AOWR provided comments that asked USACE to consider adjusting action zones so that a lower percentage of conservation storage is in Action Zone 4.

3.1.6 Other

3.1.6.1 Initial Scoping Period—2008

The USACE received 119 comments regarding water management that did not clearly fall within other subcategories and therefore were categorized as "Other". These comments were wide-ranging and cannot be easily summarized. A couple of commenters encouraged the USACE to conduct a thorough update, stating that "[o]nly the most thorough study and vetting resulting in a cultural change in the USACE understanding and management of the system will assure a basin that meets the needs for future generations." Another commenter expressed frustration with the time required to update the Master Manual. Other commenters described the scoping process as a waste of time and money.

3.1.6.2 Reopened Scoping Period—2009

During the 2009 reopened scoping period, five comments regarding water management were categorized as *Other*. One commenter suggested that the USACE host a watershed summit to present good, better, best options for water management. Another commenter stated that the baseline in the EIS should document and evaluate the historical changes in the ACF River Basin with respect to changes in stream flows, including the amount, timing, and quality of flows in pre-dam and reservoir flow regimes. Another commenter stated that an accurate critical yield is an essential component of the Master Manual and water control plans for federal reservoirs and encouraged the USACE to seek public comment before finalizing its new critical yield analysis.

3.1.6.3 Reopened Scoping Period—2012

The USACE received five comments regarding water management that did not clearly fall within other subcategories and therefore were categorized as Other. AOWR defines flaws in modeling assumptions that account for water returns and for how those return flows affect modeling at Peachtree Creek. AOWR asked the USACE to not assume direct returns from water withdrawals at Lake Lanier and indicated that the USACE must consider allocation of conservation storage at Lake Lanier if releases are made for downstream water supply. AOWR also described the effects of increased water supply on hydropower and indicated that unless the USACE lowers elevations at Lake Lanier, effects on hydropower will be much greater during critical drought periods. AOWR goes on to calculate an expected change to conservation storage at Lake Lanier and recommended that USACE should not proceed with the assumption that congressional approval will not be required.

The Douglasville-Douglas County Water and Sewer Authority also commented on its concern for the effects of the WCM update on its future water, wastewater, and watershed management plans.

3.2 Socioeconomics and Recreation

Socioeconomics (the study of the relationship between economic activity and social life) and Recreation received 404 comments during the 2008 initial scoping period, 14 comments during the 2009 reopened scoping, and 288 in the 2012 reopened scoping period, for 706 total comments. The comments were sorted into six subcategories: (1) Economics and Recreation; (2) Safety Hazards; (3) Environmental Justice; (4) Population Growth; (5) Shoreline Management; and (6) General Socioeconomic Issues. The percentage of comments assigned to each subcategory is shown in Figure 3.

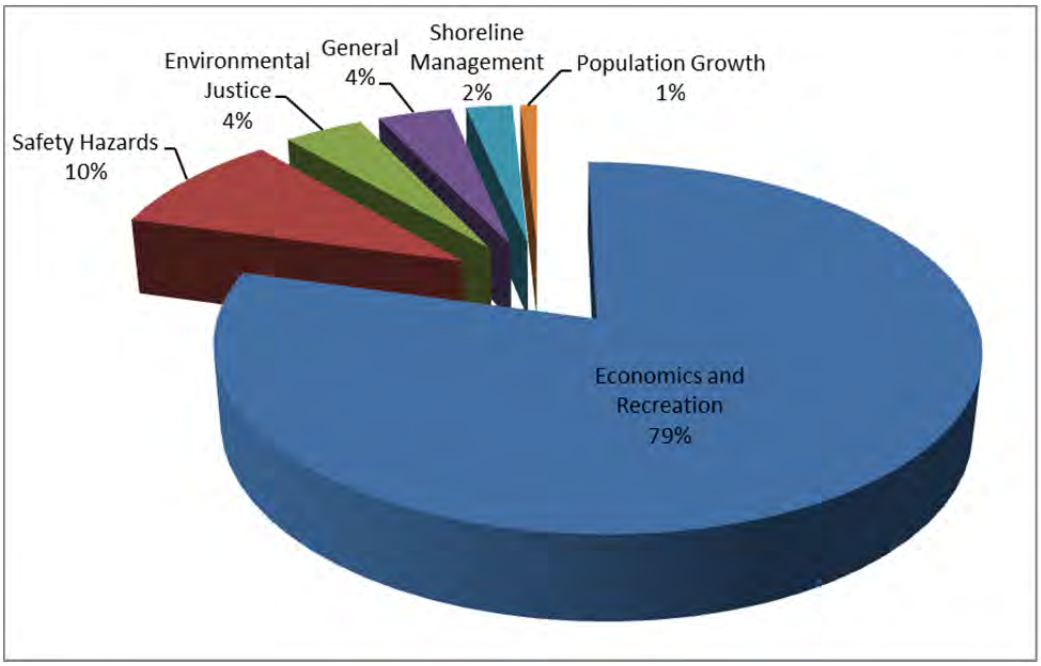

Figure 3. Distribution of comments among Socioeconomics and Recreation subcategories.

It is important to note that concerns regarding socioeconomics—employment, lost revenue, economic growth, property values, recreation, environmental justice, public safety—are the underlying message in far more than the 706 comments directly attributed to this category. Though more comments were assigned to the Water Management Recommendations category than to this category, a large percentage of those recommendations were centered on achieving more favorable socioeconomic conditions for stakeholders throughout the ACF River Basin. Summaries of the issues raised, by subcategory, are provided in the following subsections.

3.2.1 Economics and Recreation

3.2.1.1 Initial Scoping Period—2008

Recreation is a major economic driver for many of the communities in the ACF River Basin. In fact, recreation and economics are so closely intertwined in the comments

provided by stakeholders that the two topics could not be disentangled. Of the 293 comments assigned to this subcategory, about 80 percent regarded the effects of low water levels in Lake Lanier and West Point Lake; the remaining 20 percent addressed the effects of low water flows in the Chattahoochee River south of West Point Dam. Stakeholders in Georgia raised numerous issues regarding the adverse impacts that prolonged low and inconsistent water levels in lakes Lanier and West Point have had on the local, regional, and state economies. The issues raised include job and income losses for water-dependent and recreation/tourism-based businesses, sharp declines in property values, lost recreation opportunities and declining quality of life, and lost opportunities for economic growth. Many contended that the USACE has failed to take socioeconomic impacts into account in its water management practices. Several comments expressed a belief that the USACE is knowingly managing its dams to meet the downstream water flow needs of natural resources without regard for the socioeconomic impacts on the people of Georgia. Many of the comments were submitted on behalf of large organizations or associations that represent the concerns of thousands of stakeholders.

Stakeholders in the middle and lower regions of the ACF River Basin submitted more than 30 comments, which addressed the adverse economic and recreation impacts of low river flows in the Chattahoochee River south of West Point Dam. Alabama stakeholders raised issues regarding downstream flow requirements to meet hydropower project purposes and industrial users—critical components of the regional and state economy. Recreation is also a large economic driver in the eastern regions of the state, and low reservoir levels and river flow have affected the economy and quality of life for Alabamians. Florida stakeholders expressed great concern for the future of their seafood- and fishing-based economy, as well as the businesses that support that economy, including tourism, if adequate water flow into Apalachicola Estuary and Bay is not maintained. Florida stakeholders expressed grave concerns that if minimum flows for the survival of the Apalachicola estuarine ecosystem are not maintained, the economy of the Apalachicola Bay region will collapse, with no possibility for recovery.

Stakeholders offered an extensive list of basin-wide recommendations and actions that they believe the USACE should consider in updating the Master Manual and supporting EIS. The recommendations include the following:

- Develop an economic study on the impact of various water levels on each region of the ACF River Basin.
- Update the reservoir fisheries performance measures developed for the 1998 draft EIS for ACF storage allocation (based on the findings of Ryder et al. [1995]) in light of any new information developed in the past 10 years, and use them to evaluate the relative impacts on reservoir sport fisheries of alternative operating plans.
- Fully analyze the relationship between recreational use of the lakes and the direct and induced economic impacts.
- Show scientific and economic facts to support flow requirements for downstream hydropower, endangered species habitat, and health of the seafood/oyster industry.

- Charge market-based fees for the use of USACE -owned recreational facilities and retain the revenues to fund project operation and maintenance.

Recommendations regarding Lake Lanier include the following:

- Assess the negative impact of questionable water supply on future economic development efforts in Atlanta.
- Provide federal assistance to lake property owners affected by cove erosion due to low lake levels.
- Consider all options for alleviating adverse economic impacts on water-dependent businesses in the Lake Lanier/Atlanta region.
- Develop a new water control plan that ensures the best and highest use of Lake Lanier to protect the regional economy.

Recommendations regarding West Point Lake include the following:

- Do not consider use of West Point Lake to support downstream navigation in any alternative operation plans without adequate study of the environmental and socioeconomic damages that could occur due to fluctuating water levels in the lake.
- Include the results of the West Point Lake independent economic study in the EIS as support for developing alternative water control operations at the lake.
- Restore and maintain all USACE -owned and -operated recreational facilities at West Point Lake.
- Maintain West Point Lake at full pool during peak recreational times.
- Perform a risk/benefit analysis of economics versus flood control for West Point Dam management practices.
- Change the start of winter drawdown of West Point Lake from November to January to improve the economic situation.
- Install mooring balls in West Point Lake for overnight fishing or camping as another source of revenue for the USACE. Lease the areas where mooring balls are located to local marinas to develop this resource.

Recommendations regarding economic and recreation issues in the middle and lower reaches of the Chattahoochee River and Apalachicola Bay include the following:

- Monitor boating access sites and strive to maintain water levels for recreational boating access.
- Consider the positive socioeconomic and environmental benefits to the Apalachicola River and Bay that would result from maintaining flows in the Chattahoochee River to support navigation.
- Include in the EIS an analysis of the economic value of the vast ecosystem services and cultural values provided by adequate flow to Apalachicola Bay.

- Conduct a comprehensive analysis of the economic, environmental, and social and cultural impacts tied to the loss of the traditional livelihoods of rural riparian counties and communities.
- Examine the irreversible adverse economic impacts of the loss of the oyster fishery due to low river flows.

3.2.1.2 Reopened Scoping Period—2009

Three comments were received during the 2009 reopened scoping period. The commenters reiterated the importance of the benefit to local and regional economies from recreational use of the lakes. Because of the mild climate in the south, recreational use of the lakes occurs in all seasons, so the communities around the lakes can receive economic benefits year-round if the lake water levels are maintained at recreational-use levels. One commenter pointed out that the "economic benefit of West Point Lake has been estimated at approximately five times the economic benefit" of an automaker's manufacturing plant in the same county.

A Florida stakeholder requested that the EIS address the economic impact of Apalachicola Bay salinity and nutrient composition on the bay's seafood industry.

3.2.1.3 Reopened Scoping Period—2012

Two hundred sixty-four recreation or economic comments were received in the 2012 reopened scoping period. Stakeholders throughout the system describe the devastating impacts of low water levels on recreation and the regional economy. They asked the USACE to honor the congressionally authorized project purposes at West Point Lake for Recreation and Sport Fishing/Wildlife Development and recommend the need for dependable and reliable lake levels to provide for economic development. Commenter's documented specific events canceled because of low lake levels and associated economic effects on small business owners. Boat owners and property owners expressed frustration over declines in property values associated with dramatically fluctuating water levels, asserting that a lake with normal fluctuations and generally higher levels maintains higher property values and results in more public use. Higher property values increases the tax base, and more use equates to increased revenues for area businesses and more tax revenue for state and local governments.

Economic concerns were also expressed by water suppliers and the effect that future regulations might have on the current or future properties in their service area and tributaries of the Chattahoochee River.

Users of the Chattahoochee River National Recreation Area (CRNRA) described the economic value of the area to recreational fisheries, including trout, and rowing, where the largest rowing regatta in the Southeast is held. The 2012 two-day, "Head of the Hooch" regatta hosted more than 7,000 rowers of all ages, from 30 states and four foreign countries.

Comments and information on the regional economic benefits of lake and river recreation were offered by some stakeholders. Each year more than 2.2 million visitors come to

West Point Lake for recreational purposes, accounting for $112 million in local economic impact. According to comments, USACE estimated the economic impact of the recreation industry at Walter F. George as more than $25 million a year and at West Point Lake as more than $16 million a year. Alabama has invested in the Lakepoint Resort State Park on Walter F. George, and Georgia has made similar investments there. Low pool levels in that reservoir have a negative impact on tourism at the facilities in that state park. The Apalachicola Bay is identified one of the most productive estuaries in the northern hemisphere, and its commercial fishing industry contributes $200 million annually to the regional economy and directly supports up to 85 percent of the local population according to comments received. Recreational fishing in the Apalachicola River and Bay contributes an additional $191 million to the local economy each year. The ecosystem services provided by the river and bay have been valued at $5 billion a year.

Generally, scoping comments strongly recommended that the USACE incorporate and evaluate all the potential economic impacts associated with the alternatives that it considers, including those related to recreation, tourism, property values, providing for adequate water supply, commercial fishing in the bay, and others.

3.2.2 Safety Hazards

3.2.2.1 Initial Scoping Period—2008

Stakeholders submitted about 50 comments regarding the safety hazards encountered by recreational users when reservoir levels are not maintained at adequate levels. Commenters point out that low water levels result in exposed or near-surface objects that pose great danger to boaters, as well as damage to recreational equipment. Some commenters also state that low water levels are to blame for drowning due to sudden drop-offs or changes in terrain. Commenters recommended that the USACE keep the reservoirs at full pool to avoid recreational safety hazards. One commenter suggested that the USACE "[p]ermit dredging and removal of hazardous shallows/shoals in the primary thoroughfares, thereby adding additional water capacity to the lake and making the lake safer for navigation."

3.2.2.2 Reopened Scoping Period—2009

One comment on safety hazards was received during the 2009 reopened scoping period. The commenter noted that "[a]dditionally, low flows restrict the ability of law enforcement and emergency personnel to utilize the river for patrol and rescue operations."

3.2.2.3 Reopened Scoping Period—2012

Sixteen comments on safety hazards were received in the 2012 reopened scoping period. Comments described concerns for public safety because of low lake levels at Lake Lanier, West Point Lake, and Walter F. George Lake. They also described safety concerns because of peaking discharges downstream of Buford Dam. EPA recommended that the USACE improve warning systems to enhance the recreation and public safety of regulated rivers.

3.2.3 Environmental Justice

3.2.3.1 Initial Scoping Period—2008

Approximately 25 comments regarding socioeconomic impacts on low-income and minority populations were submitted. Individuals and organizations in and around West Point Lake expressed concern for the low-income and minority populations and communities that rely on the lake for recreation as well for supplemental sustenance. Comments from the nonprofit organization 100 Black Men of West Georgia stated that "[a]ctions which result in lower elevations of West Point Lake represent a potential or threat of denial of access to recreational resources for minority and low income populations in the West Georgia and East Alabama." The organization further stated that the USACE is ignoring the original authorized purpose of recreation "[a]nd the needs and expectations of minority and lower income households in west Georgia and east Alabama."

The 100 Black Men of West Georgia asked the USACE to "[e]ngage far more intensely and with a great deal more thoroughness in addressing environmental justice issues at West Point Lake." The West Point Lake Advisory Council requested that the USACE ensure recreational access for low-income families. One commenter contended that the "[i]ssue of ensuring recreational access for low income and minority families that the West Point Lake Advisory Council is attempting to push is ridiculous." The comment went on to say that the population affected is those wealthy enough to own a house with boat dock on the lake, not the poor, and the rich are trying to use the Environmental Justice issue to help themselves. In addition, several comments were made regarding the loss of income for many low-income families that rely directly on the lakes and rivers for their income. Commenters raised concern that decreased water flow in the middle regions of the ACF River Basin and in Apalachicola Bay could have severe economic impacts for entire low-income or minority communities.

3.2.3.2 Reopened Scoping Period—2009

Environmental justice comments received during the 2009 reopened scoping period focused on the use of the USACE lakes by low-income and minority populations for sustenance and recreation. Several comments were specific to West Point Lake. In general, the commenters stated that low lake levels result in muddy shorelines or even closed parks, limiting or restricting access to the water, which make the lakes undesirable for recreational use and hampers the ability to catch fish for food. One commenter requested that "Any contemplation of a revised or new operations manual must provide for stable, higher lake elevations to satisfy the needs of these populations and this must be studied and understood as required by Executive Order 12898."

3.2.3.3 Reopened Scoping Period—2012

Two comments were received from EPA in 2012 regarding environmental justice and use of the USACE lakes by low-income and minority populations for sustenance and recreation.

3.2.4 Other Socioeconomic Issues

3.2.4.1 Initial Scoping Period—2008

Population Growth. Six commenters addressed the issue of future population growth as a factor the USACE must consider in the Master Manual and supporting EIS. Commenters want the USACE to include population projections in any consideration of alternative operational practices and to consider them a factor in management of the ACF River Basin as a whole.

Shoreline Management. Thirteen comments were submitted by individual stakeholders requesting that the USACE consider revisions to dock permitting policies, better manage shoreline debris, perform annual shoreline allocation reviews, and provide for better enforcement of existing shoreline management policies.

General Comments. About 20 comments addressed socioeconomics but did not clearly fit into the other subcategories. These comments include a number of statements regarding the personal enjoyment of living on the water, the importance of ensuring that the resources in the ACF are protected for future generations, and the disappointment and anger many stakeholders feel about the current low water levels in Lake Lanier and West Point Lake.

3.2.4.2 Reopened Scoping Period—2009

Population Growth. No comments were received.

Shoreline Management. One shoreline management comment was received during the 2009 reopened scoping period, noting that an increase in Lake Lanier's water level could adversely affect the shoreline and structures close to the shoreline. The commenter suggested that "Stimulus money could be used to make shoreline improvements to adjust for the rise in water level."

General Comments. Of the seven general comments received during the 2009 reopened scoping period, three comments were directed toward the use of Lake Lanier water supply and how it should be addressed in the EIS. Two commenters said the issue must be addressed in the EIS, whether it be as indirect or cumulative effects, because of the enormous impact (including economic and social impacts) that would result from stopping the use of Lake Lanier for water supply. One commenter said that "the USACE cannot ignore the enormous environmental, social, and economic costs that would result from ceasing to provide water supply to the millions of Georgians that have depended on Lake Lanier for decades by merely declaring that its 'no action' alternative will not include water supply." However, an Alabama stakeholder said the USACE should not base ACF operational decisions on the potential economic impact from uses that are not congressionally authorized: "To the extent economic factors exist that are unrelated to the [c]ongressionally authorized purposes of these revisions, Alabama believes they are irrelevant and cannot be considered as a basis for operational changes in the [b]asin."

Other general comments of a socioeconomic nature were related to West Point Lake and adverse impacts on low-income and minority populations; the social and economic

importance of the ability to continue to fish the Apalachicola River and Bay Basin; the need to address reasonably foreseeable commercial, residential, and road construction in the cumulative impacts analysis; and the opinion that the EIS should assess impacts such as the effect on human and commercial resource services.

3.2.4.3 Reopened Scoping Period—2012

Population Growth. No comments were received.

Shoreline Management. Three comments were submitted by individual stakeholders describing the effects of low lake levels on exposed shorelines.

General Comments. Three comments addressed socioeconomics but did not clearly fit into the other subcategories. The Atlanta Junior Rowing Club comments describe the benefits of the club to middle and high school students in the Atlanta area. W.C. Bradley Farms provided comments on the importance of water supply for agricultural use in the basin. The Apalachicola Riverkeeper reiterated the need for the Draft EIS to include the socioeconomic effects on specific users and ecosystems in the ACF Basin.

3.3 Biological Resources

The USACE received 284 comments in the Biological Resources category in the initial 2008 scoping period. An additional 35 comments were submitted in the 2009 reopened scoping period, and an additional 265 were submitted in the 2012 reopened scoping period for 584 total comments. The Biological Resources comments were divided into four subcategories: Fisheries, Threatened and Endangered Species, Flow Concerns for Apalachicola Bay, and Other Biological Issues. Figure 4 shows the distribution of comments categorized as Biological Resources.

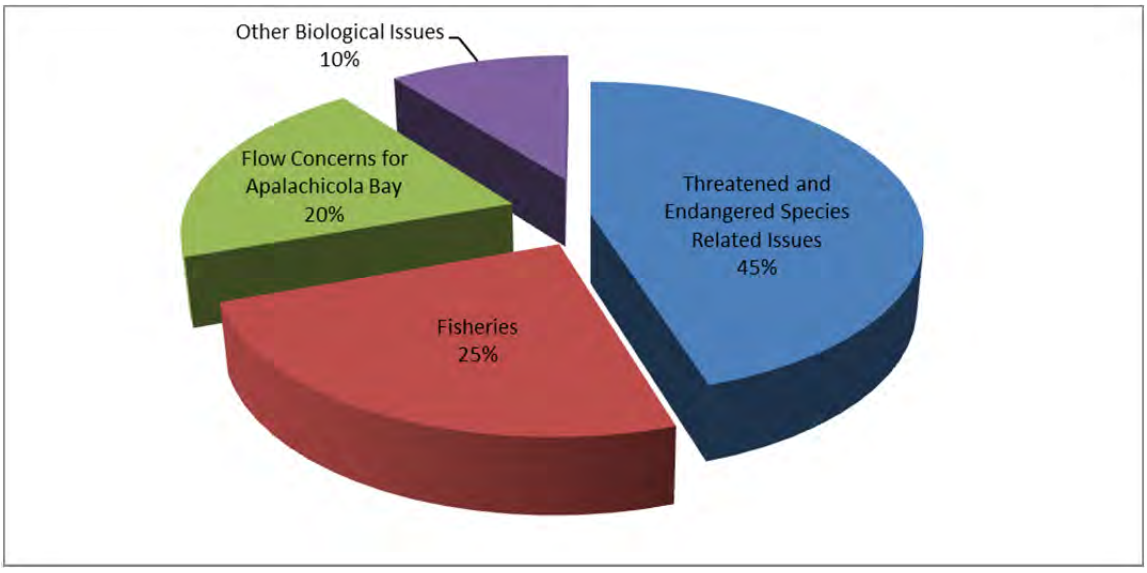

Figure 4. Distribution of comments among Biological Resources subcategories.

3.3.1 Threatened and Endangered Species

3.3.1.1 Initial Scoping Period—2008

The USACE received 165 comments related to threatened and endangered species. Commenters noted that water availability for people should be considered a priority over the protection of mussels and that Lake Lanier should not be drawn down to provide for this species. Others stated that navigation should be abandoned as a project purpose because of its detrimental effect on endangered species. Commenters stated that the Interim Operating Plan (IOP) and RIOP are "flawed" because of a lack of studies on the endangered species at West Point Lake. Some commenters said that more research needs to be conducted on endangered wildlife in the ACF River Basin. EPA recommended that the USACE address and fully document the effects of any proposed actions on threatened and endangered species when considering alternatives for the EIS.

Comments with recommendations for threatened and endangered species in the ACF River Basin include:

- Revisit the list of threatened and endangered species periodically during the planning process and verify the accuracy of the species/habitats list when beginning to prepare a Biological Assessment.
- Participate with the USFWS and other federal and state agencies in efforts to locate and monitor extant populations in the remaining un-impounded portions of the Chattahoochee River and its tributaries.
- Conduct an EIS to determine the amount of water needed for mussels and other endangered species downstream to survive.
- Address the same ESA-protected resources for the Master Manual update as for the RIOP—the Gulf sturgeon (*Acipenser oxyrinchus desotoi*), fat three ridge (*Amblema neislerii*), Chipola slabshell (*Elliptio chipolaensis*), and purple bankclimber mussel (*Elliptoideus sloatianus*), all of which have designated critical habitat within the action area.
- Ensure that a sufficient quality and quantity of water is provided in such a manner as to resemble the natural riverine flow regime. This flow regime should provide aquatic habitat conditions that support a diversity of endemic aquatic species (including fish, plants, mussels, and other invertebrates) and their life-cycle requirements. As a function of the natural flow regime, both intra- and inter-annual variations of flows should be implemented to sustain biological diversity and a balanced community of organisms.

3.3.1.2 Reopened Scoping Period—2009

The USACE received 10 comments related to threatened and endangered species during the 2009 scoping period. Comments with recommendations for threatened and endangered species in the ACF River Basin include:

- A minimum flow of 5,000 cfs is more than necessary to protect endangered species; it should be 2,500 cfs or less. USFWS should be required to document the minimum flow required for endangered species. The USACE used what it called a "baseline" flow, which was actually flow produced by reservoir operations from 1975 to 2007. The correct baseline flow for endangered species protection is run-of-the-river flows. Augmentation flows that disproportionately affect Lake Lanier are not required by the ESA and should not be imposed by the new WCP. As a result of using the wrong environmental baseline to evaluate the RIOP, USFWS confused natural mortality with "take" caused by the RIOP.
- Analyze threats to endangered and threatened species, critical habitat, Apalachicola Bay-specific threats, and threats to fisheries in the Apalachicola River. Also, evaluate all available means to maximize the likelihood that endangered and threatened species will recover to the point of de-listing by implementing recommendations in recovery plans.
- The manual update process should also evaluate the USACE's compliance with existing environmental laws because since the reservoirs were constructed, Congress and the affected states have enacted new environmental protection laws and regulations.

3.3.1.3 Reopened Scoping Period—2012

The USACE received 88 comments related to threatened and endangered species. A large percentage of these comments were received from citizens with an interest in West Point Lake. They indicate the need to study the necessity of a 5,000 cfs minimum flow requirement for endangered species in the Apalachicola River; questioning the listing of species, if they exist in deeper waters than previously thought, and if they could be relocated to other areas.

3.3.2 Fisheries

3.3.2.1 Initial Scoping Period—2008

The 60 Fisheries comments were further divided into the following subcategories: Wildlife and Fisheries, Improvement of Lake Fisheries, Commercial Fisheries, and the Facilitation of Migratory Fish Passage. Most comments about fisheries in the ACF River Basin were related to the drawdown of freshwater throughout the entire system. Commenters noted that at Lake Lanier, fish, clams, mussels, and the like are suffering because of the low water levels. At West Point Lake, bald eagles and other wildlife are being injured because of the low water levels. Trees and fish habitat in the lower Apalachicola River and Bay are being affected by low water flow and an increase in salinity, which could cause long-term ecological damage. Commercial fisheries are in a decline, and mortality rates could be directly related to a reduction of freshwater inflow.

The USFWS commented that when considering alternatives for an EIS, the USACE should consider the major wildlife presence at Eufaula National Wildlife Refuge and all migratory species inhabiting that area during certain seasons. Recreational users

commented that critical recreational species directly affected by changes in water level, as well as by potential storage allocation changes, should be identified when evaluating alternatives in the EIS. Commenters noted that trout fisheries, which are not part of the natural habitat of the ACF River Basin, should not be accommodated by releasing water out of the lake to maintain a specific water temperature. Commercial fisheries, such as oysters, crab, shrimp, pinfish, and the like, should be protected when addressing freshwater needs in an EIS, and impacts on these species should be taken into careful consideration.

Commenters strongly encouraged fish passage operations at Jim Woodruff Lock and Dam. ADCNR recommended that the USACE establish a goal to develop a fish passage plan for all USACE locks and dams in the ACF River Basin. The fish passage plan should identify key species that need upstream and downstream movement. A lock passage program similar to the one currently employed by the USACE at Woodruff Lock and Dam would be a good starting point. Potential impacts on migratory fishes related to USACE operations also should be considered.

Recommendations for fisheries in the ACF River Basin include the following:

- Conduct an assessment alongside the EIS to study the effects of low water flows on fisheries in the ACF River Basin.
- Apply a spatially explicit hydrodynamic model of the Apalachicola Bay to assess the effects of alternative operations on salinity regimes and, in turn, on the relative distribution of salt marshes, submerged grass beds, and oyster beds in the bay (USFWS suggestion).
- Conduct monitoring studies to determine the present state of aquatic life and to develop new water control plans that reflect the wildlife conservation actions identified in Alabama's Comprehensive Wildlife Conservation Strategy (ADCNR suggestion).
- Coordinate with wildlife agencies from Alabama, Georgia, and Florida to explore ways to incorporate the draft Standard Operating Procedures with new alternatives.
- Conduct an assessment with the EIS to evaluate species reductions in crab, shrimp, and oyster populations in Apalachicola Bay.

3.3.2.2 Reopened Scoping Period—2009

Five comments were received during the 2009 reopened scoping period. The commenters' recommendations for fisheries in the ACF River Basin include the following:

- Establish the proper baseline to examine the effects of varying flow regimes on fish species.
- In the EIS, analyze flow impacts on marine species and habitats, including the Gulf striped bass and sturgeon.

3.3.2.3 Reopened Scoping Period—2012

The USACE received 78 comments related to fisheries in the ACF Basin. Numerous comments described the negative effects of fluctuating lake levels on fish spawning in West Point Lake. Other comments focused on the importance of the trout fishery below Buford Dam. One comment asked that natural warm water habitats be restored to the Chattahoochee River below Buford Dam. A number of comments identified factors affecting fisheries throughout the ACF Basin, including Apalachicola Bay: adequate (or inadequate) flows, dissolved oxygen, water temperature and sedimentation from erosion. The Georgia Department of Natural Resources, Wildlife Resources Division, also encouraged the USACE to continue operating the lock at Jim Woodruff Lock and Dam to support spring passage of migratory fish.

3.3.3 Flow Concerns for Apalachicola Bay

3.3.3.1 Initial Scoping Period—2008

Thirty-six comments were related to flow concerns for Apalachicola Bay. Salinity in the bay has increased and is affecting the species in the bay, allowing saltwater predators to move into the estuary. Commenters noted that the contributions of the Apalachicola estuary to the commercial seafood industry are significant and should be protected. Sustained minimum flows, as defined by the RIOP, will not sustain the commercial seafood industry in Apalachicola Bay. Dredging and shipping interests have created more avenues for salt water to enter the estuary. Statistical data available through the Florida Fish and Wildlife Service show reduced landings of crab, shrimp, oysters, pinfish, and the like, and the data should be taken into consideration when evaluating alternatives for the EIS.

3.3.3.2 Reopened Scoping Period—2009

During the 2009 reopened scoping period, eight comments were received regarding Apalachicola Bay flow concerns. Commenters expressed the need for the USACE to conduct a comprehensive and robust analysis of the environmental consequences of potential management regimes and to establish ecologically sound in-stream flows. One commenter stated that the USACE needs to develop and implement a fundamentally new approach to managing the ACF that will protect and restore the ecological health of the entire ACF system to make up for the degradation that has resulted from the construction and operation of the ACF reservoirs, the impoundment of water, consumptive water uses, and navigational dredging.

3.3.3.3 Reopened Scoping Period—2012

In the 2012 reopened scoping period, 73 comments were received concerning flow in Apalachicola Bay. The following three requests were made by several private citizens:

1. An assessment and consideration of the freshwater needs that will sustain the health of the Apalachicola River and Bay

2. Increased water release from Woodruff Dam at appropriate timing and duration to sustain Apalachicola River and Bay
3. An ACF basinwide sustainable water management plan that protects the Apalachicola River and Bay and equitably shares the water of this basin

FDEP asked that the USACE consider flow metrics to establish a holistic approach to protecting the river-floodplain-estuarine ecosystem of the Apalachicola. It described the negative effects of low flows last year on the lowest recorded oyster harvest in the Apalachicola Bay. Private citizens also commented on the importance of freshwater flows for oysters, critical to the economy surrounding Apalachicola Bay.

3.3.4 Other Biological Issues

3.3.4.1 Initial Scoping Period—2008

Twenty-three comments were categorized as Other Biological Issues. Commenters noted that the potential impact of increased municipal and agricultural withdrawals for future management of the reservoirs should also be included in the EIS. The USACE must avoid operations that will violate or lead to violations of water quality standards. The USACE should ensure that even under drought conditions, sufficient flow is maintained below each dam so that water quality standards and endangered species are protected. The USACE should coordinate with the USFWS, EPA, and appropriate state agencies in Alabama, Florida, and Georgia to ensure that the Master Manual and water control plans are compliant with the ESA and the *Clean Water Act*.

Comments with recommendations for other biological resource areas in the ACF River Basin include the following:

- The EIS should include a discussion of secondary effects (actions that happen later in time) on major water chemical, physical, and biological characteristics. The discussion on the chemical characteristics could relate both the water velocity and volumes to, at least, temperature, dissolved oxygen, and conductivity. Detailed discussions on major physical characteristics could include the frequency of riparian habitat inundation, the distribution or redistribution of sediment particles based on sediment particles and flow energy (size/load related to velocity), and maintenance of benthic habitat.
- Include a Biological Assessment of effects on these species and their designated critical habitats, as required by the implementing regulations (at Title 50 of the *Code of Federal Regulations* [CFR], section 402.12) for Section 7 of the ESA.
- Noxious growths of various exotic species, such as hydrilla and Eurasian milfoil, have become a constant management concern at the ACF federal reservoirs, especially at Lake Seminole and Lake Eufaula. The USACE should investigate the feasibility of occasional drawdowns for controlling aquatic plants.
- The USACE should evaluate the effects of past and proposed project operations on flood durations and floodplain habitats.

- ADCNR recommended the development of a new Master Manual for the ACF that reflects the wildlife conservation actions identified in Alabama's Comprehensive Wildlife Conservation Strategy where appropriate.
- ADCNR recommended that the USACE establish a goal to develop a fish passage plan for all USACE locks and dams in the ACF. The fish passage plan should identify key species that need upstream and downstream movement. With those species in mind, evaluate viable fish passage methods. A lock passage program similar to the one employed by the USACE at Woodruff Lock and Dam would be a good starting point. This would greatly benefit adult migratory fish such as striped bass, Alabama shad, American eel, Gulf sturgeon, and many other fish species.

3.3.4.2 Reopened Scoping Period—2009

Twelve comments were received during the 2009 reopened scoping period. The commenters' recommendations for other biological resources in the ACF River Basin include the following:

- The USACE should evaluate the effects of past and proposed project operations on flood durations and floodplain and wetland habitats.
- The EIS should document and evaluate the historical changes in the ACF River Basin to establish the proper baseline.

3.3.4.3 Reopened Scoping Period—2012

Twenty-three comments were received in the 2012 reopened scoping period that did not clearly fit in other subcategories and therefore were categorized as Other. The following comments were received:

- AOWR commented on the importance of the Eufaula National Wildlife Refuge and asked the USACE to account for its needs in the Draft EIS
- A call to improve management of oyster harvesting in Apalachicola Bay
- Consideration should be given to effects on bird populations at
    - West Point Lake and their ability to nest during low lake levels
    - Apalachicola Bay where the state-listed American oystercatcher, and other shorebirds, dependent on oysters and similar species as a food source
- A lack of seasonal flooding is affecting biological resources in the Apalachicola River
- EPA pointed to the need for the USACE to manage flows for magnitude, seasonality and variability to mimic natural conditions to allow rivers access to floodplains

3.4 Drought Operations

Management of water resources during the current drought conditions—specifically, water releases to achieve certain project purposes or benefits at the potential expense of other project purposes or benefits—is of major concern to the commenters throughout the ACF River Basin. Current drought conditions in the Lake Lanier watershed, along with drought conditions in previous years throughout the basin, make the allocation of water difficult. The USACE received 191 comments in the 2008 initial scoping period related specifically to drought operations and 5 more comments in the 2009 reopened scoping period, and 12 more in the 2012 reopened scoping period for 208 total comments.

3.4.1 Initial Scoping Period—2008

The commenters made the following recommendations applicable to the basin:

- Prioritize reservoir purposes during extreme drought events by defining which project purposes are most important.
- Update the critical yield analysis with an opportunity for public input.
- Use conservative reservoir operations during drought by reducing releases to a minimum (inflow equal to outflow).
- Include in the Master Manual emergency drought measures that provide for reducing releases during drought.
- Water supply conservation measures are necessary during drought.
- In extreme drought, let the flow of the river determine flows into Apalachicola Bay. Do not support Apalachicola River flows by releases from reservoirs above the inflows.

Some recommendations were specific to Lake Lanier:

- Establish and use management triggers (pool elevations at which predetermined actions would be taken) during drought, especially at Lake Lanier.
- Draw down Lake Lanier last when drought occurs, recognizing the small drainage area supplying the lake.
- During drought, reduce the releases from Lake Lanier in the winter to meet the reduced flow target at Peachtree Creek, 650 cfs.

Commenters in the headwaters maintained that to protect Lake Lanier during droughts to preserve its utility for water supply and recreation, the lake should be disengaged from the current practice of operating with all reservoirs as part of a system. Commenters in the lower portion of the basin, on the other hand, stated that too much water is being retained upstream and that natural flows are not being adequately mimicked to protect species and the Apalachicola Bay. There were six comments regarding sharing the effects of drought. Some suggested that water conservation measures, such as water use restrictions, should be implemented throughout the ACF River Basin so that the effects of drought are not focused on one region or part of the basin.

EPA encouraged the development of an adaptive management plan to address the uncertainty associated with in-stream flow. The need to evaluate future climate changes in climate was specifically referenced in eight of the comments received. Commenters asked that the USACE recognize that the dry weather patterns that the Southeast has experienced in recent years will likely continue in the future and that management of water systems within the ACF River Basin must take that into account. One commenter recommended that predictions for both increased drought and increased heavy rain events be factored into the USACE's Master Manual planning process. The USFWS recommended that the USACE consider how climate change might affect ACF flow regimes and how to best adapt reservoir operations to the most likely foreseeable changes. The effects of a given set of operating rules will vary depending on whether the basin's climate becomes drier, wetter, more variable, or less variable. In particular, it is vitally important to adapt the level set as the top of conservation pool to the long-term hydrology of the basin and the essential purposes the projects serve. The USACE already practices this concept, with occasional variances from the guide curves to store water above the top of conservation pool elevation during dry periods. The USFWS recommended that the USACE explicitly address climate-based operational flexibility in the Master Manual update and in the analyses of the EIS.

3.4.2 Reopened Scoping Period—2009

During the 2009 reopened scoping period, the USACE received five comments pertaining to drought operations. The Apalachicola Riverkeeper observed that Apalachicola River flows during recent droughts were significantly reduced even though the droughts were no worse than the previous droughts. Another commenter suggested that the USACE should evaluate the impacts of more severe and/or extended droughts in the future and should consider implementing drought management plans with reasonable triggers to declare drought conditions. Another commenter stated that the USACE must consider the amount of water that might be lost from the basins through inter-basin transfers and consumptive uses and should consider appropriate limitations on any such losses, particularly under drought conditions. This commenter further suggested that Lake Lanier operations should take advantage of the entire conservation pool down to elevation 1,035 feet, consistent with the critical yield analysis.

3.4.3 Reopened Scoping Period—2012

In the 2012 reopened scoping period, the USACE received 12 comments pertaining to drought operations. The comments received regarding drought operations varied across the basin. Users expressed concern that selected portions of the basin suffer more than others during drought conditions. Comments requested USACE reconsider conditions that define Emergency Drought Operations; proposed approaches including using adaptive management practices, planning ahead with drought prediction information and tools, and balancing flows to the Apalachicola River from the Chattahoochee and Flint Rivers.

3.5 Water Quality

The USACE received 155 comments during the 2008 initial scoping period addressing water quality issues in the ACF River Basin. Drinking water throughout the entire basin is an extreme concern to citizens and to local, state, and federal government agencies. Twelve more comments regarding water quality issues were received during the 2009 reopened scoping period, and 22 were received in the 2012 reopened scoping period for 189 total comments.

3.5.1 Initial Scoping Period—2008

Comments from citizens near West Point Lake stated that "[w]ater quality has suffered greatly as a result of frequent fluctuations in West Point Lake, which supplies water to the City of LaGrange." Record low water levels at West Point Lake were also cited as causing algae blooms due to high nutrient levels in the water. The need for improved treatment of sewage from Atlanta to prevent pollution of waters downstream and to ensure that water quality standards are met was also expressed in the comments received. These concerns are associated with the need to maintain water quality for recreational activities, such as swimming and fishing. There is also a concern that reductions in stream flow would result in MeadWestvaco's shutting down operations to avoid violations of its National Pollutant Discharge Elimination System permit. Commenters also expressed concern regarding poor water quality due to raw sewage being released from houseboats directly into the river. Above all, citizens expressed the need for the USACE to avoid operations that will violate or lead to violations of water quality standards. Specifically, they recommended the following:

- Examine the effects of reservoir operations on water quality, at projects and in the tailrace, in the Master Manual update, including ongoing and potential future effects on dissolved oxygen, temperature, pH, conductivity, nutrient and organic material dynamics, and various industrial and municipal discharges.
- Maintain water quantity stations above and below all dams, and support flow stations below each lock and dam (ADCNR recommendation).
- Adjust West Point Lake operations to ensure adequate inflow of water and lake elevations to dilute nutrient loading into the lake.
- Adopt a permanent water quality minimum flow of 650 cfs at Peachtree Creek, where the USACE has already granted this flow reduction based on water quality data and assurances from GAEPD.

3.5.2 Reopened Scoping Period—2009

Recommendations made during the 2009 reopened scoping period regarding water quality in the ACF River Basin included the following:

- The USACE should ensure that operational changes meet water quality standards, "even under drought conditions."

- The effects on water quality from erosion caused by exposed shoreline should be analyzed.
- Adopt a permanent water quality minimum flow of 650 cfs at Peachtree Creek, where the USACE has already granted this flow reduction based on water quality data and assurances from GAEPD.

  This comment was based on assumptions prior to the July 17, 2009, court ruling. In the reopened scoping based on changes due to the court ruling, commenters requested that the current minimum flow target of 750 cfs at Peachtree Creek not be abandoned. Specifically, water quality below Buford Dam should be analyzed to ensure water quality standards are not violated. Results of the BacteriALERT program "highlight the importance of releases from Buford in maintaining water quality in the Chattahoochee River National Recreation Area."
- All reasonably foreseeable actions associated with changes in point source and nonpoint source discharges and their assimilation due to changes in stream flow should be included in the analysis.
- Analyze the impacts on water quality and salinity in the Apalachicola River and Bay and in surrounding floodplain habitats and sloughs.

3.5.3 Reopened Scoping Period—2012

Twenty-two comments were received regarding water quality. Recommendations made in the 2012 reopened scoping period included the following:

- Maintaining flow for assimilative capacity of wastewater discharges at locations throughout the basin Peachtree Creek in Atlanta, Georgia; Douglas County, Georgia; between West Point Dam and Walter F. Georgia Lake; Columbus, Georgia; and Columbia, Alabama
- Considering management practices in lake operations to manage shoreline erosion and stormwater
- Improving operations to meet water quality standards for dissolved oxygen downstream of dams, even in drought conditions.
- Operations to improve water temperatures for trout in critical summer months
- Considering the effect of turbidity on the cost of water supply and to fishery habitats
- Considering public health of recreational uses and the effects of bacteria
- Suggested using water quality parameters in establishing endpoints or performance measures in assessing alternatives

3.6 Water Supply

Several suppliers of municipal and industrial water supply rely on operations throughout the ACF River Basin to meet their water supply needs. The USACE received 117

comments regarding water supply within the ACF River Basin in 2008, 19 comments during the 2009 reopened scoping period, and 13 during the 2012 reopened scoping period for 149 total comments.

3.6.1 Initial Scoping Period—2008

During the 2008 scoping period, 19 commenters expressed the opinion that water supply is more important than downstream uses. These commenters tended to live in the upstream portions of the ACF River Basin. They depend on a reservoir or river flow for their drinking water, and they pointed out that there are no alternative sources of supply. These commenters consider drinking water for human consumption and survival of greater importance than fish and wildlife concerns.

Thirty of the comments received discussed the socioeconomic importance of water supply to the Atlanta region. These commenters, who live in the upstream portion of the basin, expressed concern regarding future economic development efforts if water supplies are uncertain. Sixteen comments were related to concerns over the future availability of water supply in the Atlanta region. GAEPD, for example, pointed out that water supply options are limited almost exclusively to surface water. Others who live in the lower portions of the basin expressed the opinion that continued population growth in the Atlanta region should not occur if adequate water supplies are not available. Commenters also called upon the USACE to consider the water conservation measures that can be taken or have already been taken, as well as to include considerations from the MNGWPD's Water Supply and Water Conservation Plan. Four commenters pointed out that water supply is not an authorized purpose for Lake Lanier and that only Congress may change the original authorized purposes. One of the comments received expressed concern over contaminants (oil) in the water supply due to piping water during times of drought.

Some alternatives for water supply other than Lake Lanier were suggested:

- Adding storage capacity on the Flint River, which would increase the total water storage capacity in the ACF River Basin
- Desalination
- Additional groundwater
- Tennessee River.

Two comments on water supply were received from the LaGrange area. They stated that releasing water from West Point Lake to supplement lost or reduced flows from agricultural demands in the Flint River Basin is not a congressionally authorized function of West Point Lake.

3.6.2 Reopened Scoping Period—2009

The comments received in 2009 regarding water supply were focused on different areas from the comments received in 2008, although some of the suggested alternatives for

water supply remained the same. Comments in 2009 asked that the USACE assess the impact of potential new reservoirs on existing federal reservoirs, as well as regulate restrictions on water withdrawals for a variety of uses. The State of Georgia also noted that "since the NEPA regulations instruct the USACE to consider alternatives that are beyond its authority, a federal district court ruling that the USACE lacks authority to operate Lake Lanier for water supply should not alter the scope of the EIS." It was also pointed out that studies completed by the ARC, Metro Water Planning District, and Georgia's Water Contingency Task Force found "that there is no reasonable replacement water source available to metro Atlanta." Other options presented by Georgia's Water Contingency Task Force include:

- Pump-storage reservoirs along tributaries to the Chattahoochee River
- Deviation from Georgia's interim in-stream flow policy and Peachtree Creek flow target
- Inter-basin, intra-basin, and interstate water transfers
- Aquifer storage and recovery.

Upstream water users are very concerned about how the Court's order will affect their water supply. The City of Cumming is "vehemently opposed to the revisions to the Master Water Control Manual, especially as disclosed in subsection (b) on the Notice received on November 24, 2009," after the investment made in expansions approved through various permitting agencies. Forsyth County described its claimed right to water from the Chattahoochee River, which has been restricted by the construction of Buford Dam, and requested that consideration be given to the County's obtaining a "reasonable share of water from the lake equal to the supply that would have been available from the river" (if the dam had not been built). Forsyth County also associates growth in the area with the presence of the lake and believes that water supply from Lake Lanier should be allowed to support the water demands the lake's presence has created.

3.6.3 Reopened Scoping Period—2012

Thirteen comments were received specific to water supply; many were from state and local agencies. Forsyth County reiterated its needs to use an updated water intake and, as an existing user, be allowed an updated storage allocation contract. Douglasville-Douglas County Water and Sewer Authority expressed concern over the effects of USACE action on flow releases from its water supply reservoir and its future withdrawal and discharge permits. Several comments defined Georgia's water supply needs on the basis of its 2000 request and for the USACE to consider the return flows in the WCM update. Comments also requested that the USACE perform a full analysis (including national and regional economic development benefits) of alternative sources to meet Georgia's water supply needs if Lake Lanier and the Chattahoochee River cannot meet those needs.

Governor Nathan Deal of Georgia also sent comments to the Honorable Jo-Ellen Darcy referencing the USACE 2012 legal opinion. The governor noted that operating Lake Lanier as Georgia has requested represents the highest and best use of the lake and included an affidavit by the director of the GAEPD. The affidavit contained updated

demographic and water demand data confirming the continued need for Georgia's water supply request; 705 mgd would be sufficient to meet Georgia's water needs from Lake Lanier and the Chattahoochee River to approximately 2040.

3.7 National Environmental Policy Act

The USACE received 79 comments related to the NEPA process during the initial scoping period in 2008. The comments were further sorted into the following subcategories: (1) Scoping and Public Involvement, (2) Baseline Conditions, (3) Proposed Action and Alternatives, (4) Mitigation, (5) Schedule, (6) Other Applicable Regulations, (7) Cooperating Agencies, and (8) General. In the reopened scoping period in 2009, the USACE received another 80 comments regarding the NEPA process, and 82 were received in the reopened scoping period in 2012. Those comments were sorted in the same subcategories. The percentage of comments assigned to each subcategory during both scoping periods is shown in Figure 5. The USACE received a combined total of 240 comments related to the NEPA process during the 2008, 2009, and 2012 scoping periods: 79 in 2008, 80 in 2009, and 82 in 2012.

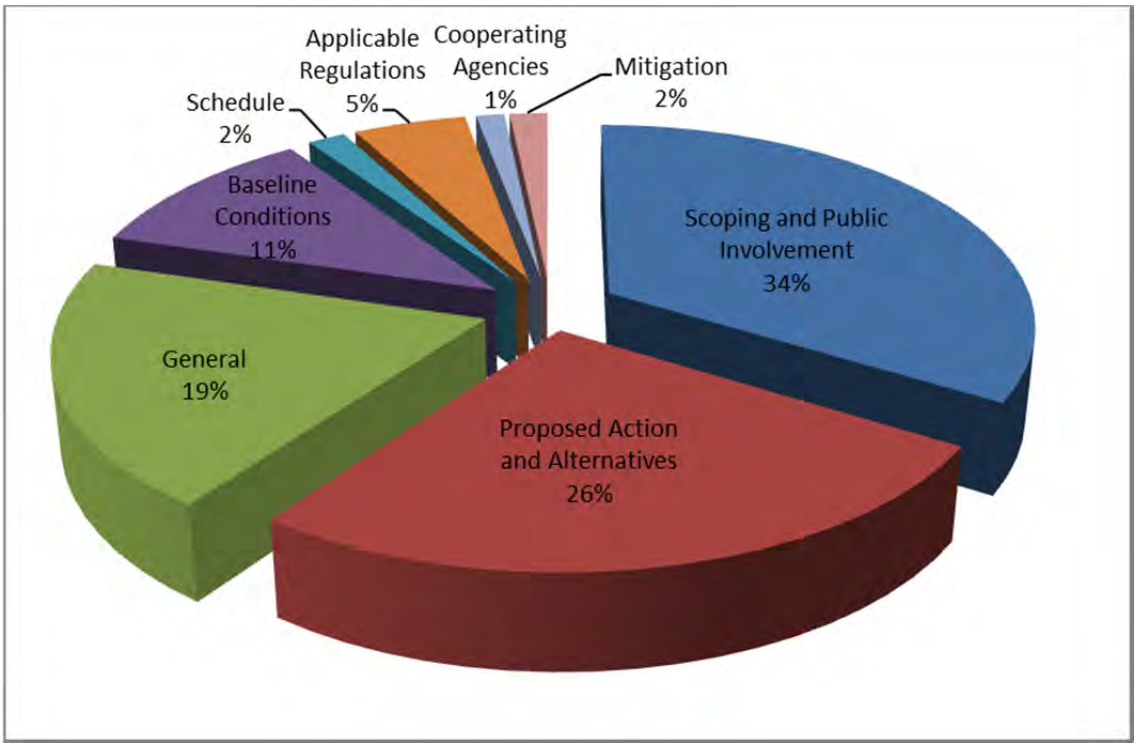

Figure 5. Distribution of comments among NEPA subcategories.

3.7.1 Scoping and Public Involvement

3.7.1.1 Initial Scoping Period—2008

Twenty-five comments focused on issues related to the scoping process and public involvement opportunities were submitted. Several stakeholders said they welcomed the

opportunity to work with the USACE. Opinions concerning the single scoping meeting in Florida were mixed: Some commenters expressed dissatisfaction with the size of the meeting facility (too crowded to allow interaction with USACE representatives), whereas others were grateful for the opportunity to gain more information about the ACF River Basin and NEPA process. One commenter noted that many people in the Apalachicola Bay area feel there is a bias in favor of upper-basin needs. Some commenters expressed dissatisfaction with the scoping meeting format (no opportunity for public hearing-type comments); others found the meetings informative and professionally conducted. One commenter expressed dissatisfaction with the Web-based comment tool. Several stakeholders criticized the USACE for not providing more information to the public at the scoping stage, claiming that the paucity of details about the proposed action, alternatives, and identified issues hampered meaningful opportunity to provide input. Some commenters asserted that the scoping process conducted by the USACE was inadequate and did not meet the guidelines for scoping under NEPA, the public participation requirements of the *Water Resources Development Act* (WRDA), or the USACE's own implementing regulations for either act. (Refer to agency comment summaries in Section 4.0.)

Stakeholders offered the following recommendations that the USACE should consider to provide more meaningful communication and cooperation between the USACE and stakeholders as the project moves forward:

- Provide a clear statement of the purpose of and need for the proposed action.
- Provide a summary of the current operating rules for each project, an explanation of their basis in congressionally authorized purposes, and a description of how much discretion the USACE has to change the rules. Post the summary on the District's website for use by other agencies and the public early in the Master Manual update work schedule.
- Develop a flowchart or some other form of audit trace to demonstrate the influence of the stakeholder concerns on the Master Manual.
- Hold a joint meeting with all stakeholders to discuss the findings of the scoping process.
- Implement scoping and alternatives development procedures similar to those used by the USACE to update the WCMs in the Missouri River Basin.
- Provide for a more formalized stakeholder process to work through the goals of the basin study and alternatives to be considered.
- Provide a third-party mediator at future public meetings.
- Establish a Lake Lanier *crisis team* of USACE employees who are clearly available to stakeholders.

3.7.1.2 Reopened Scoping Period—2009

Twenty-seven comments pertaining to the scoping process and public involvement were submitted during the reopened scoping period. Many of the comments contained general

introductory remarks regarding the submission of comments and reiteration of the general requirements for scoping and public involvement required under NEPA. Several commenters, including the USFWS, GAEPD, Upper Chattahoochee Riverkeeper, Apalachicola Riverkeeper, Tri-Rivers Waterway Development District, and Lake Lanier Association, stated that comments submitted by their respective agencies/organizations during the 2009 scoping period were in addition to their original scoping comments provided in 2008. A couple of commenters provided additional documents to be considered in the EIS and Master Manual development process.

GAEPD commented that "the revised scope is neither a necessary nor appropriate reaction to the July 17, 2009 ruling. Moreover, the revised scope violates the letter and spirit of NEPA and is contrary to the public interest and common sense." FDEP contended that current scoping efforts do not meet WRDA and NEPA requirements and that the USACE must provide additional scoping once the proposed action is more adequately defined. FDEP also stated that "the USACE should release its draft critical yield analysis for the ACF Basin, transparently describe the critical yield formula, the underlying data, and its corresponding methodologies and assumptions, and afford opportunity for public review and comment." The AOWR commented on the requirement to choose a resource area from those on the online comment form, which it felt was overly restrictive.

The Apalachicola Riverkeeper requested "a peer review by the National Academy of Sciences for the Draft EIS and Water Control Manuals [water control plans] for the ACF [River] Basin pursuant to 33 U.S.C. § 2343(a)(3)(A)(iii)." He also commented that "The Draft EIS must ensure that high quality environmental information is available to public officials and citizens before decisions are made and actions are taken so that information can help the USACE make decisions regarding the Water Control Manuals [water control plans] that are based on an understanding of environmental consequences, and take actions that protect, restore, and enhance the environment."

3.7.1.3 Reopened Scoping Period—2012

Many of the 30 comments contained general introductory remarks regarding the submission of comments and reiteration of the general requirements for scoping and public involvement required under NEPA. Specific comments encouraged opportunities to engage the public throughout the NEPA process to ensure all stakeholder interests are represented and allow for completion of the public process before substantive changes are made to operations. A request was also made to allow for independent external peer review by the National Academy of Sciences.

3.7.2 Baseline Conditions

3.7.2.1 Initial Scoping Period—2008

Eight comments pertained to establishing a *baseline* set of conditions against which the USACE will analyze the proposed action and alternatives in the EIS.

FDEP believes that the 1958 Water Control Manual should be used as the baseline (as opposed to the 1989 draft plan or current existing operations) and that the NEPA process must evaluate all changes in the USACE's reservoir operations and their impacts since that time. This opinion was echoed in the comments provided by both Representative Allen Boyd and the Apalachicola Riverkeeper.

The AOWR asserted that the USACE must use the currently approved water control plans for each reservoir to establish a baseline. The AOWR stated that "draft manuals, the use of action zones or other proposed operations that have never been subject to the public scrutiny demanded under NEPA and the USACE's implementing regulations should not be used as a starting point of the USACE's review or effort to update the manuals." Similar comments were made by Georgia Power and on behalf of the SeFPC customers.

Comments submitted on behalf of West Point Lake stakeholders contended that "the USACE cannot select the Interim Operating Plan, the Revised IOP, or designate any baseline year as the foundation for development of the new WCMs and associated EIS." They continued by recommending that the USACE begin the Master Manual process with a "clean slate."

3.7.2.2 Reopened Scoping Period—2009

Three comments regarding the baseline were submitted. The Apalachicola Riverkeeper commented that

> [t]o establish the proper baseline, the Draft EIS should document and evaluate the historical changes in the ACF Basin with respect to the following indicators:
>
> - Historical flows
> - Acres of river and floodplain wetlands lost
> - Acres of native upland habitats lost
> - Miles of streambed lost or modified
> - Changes in stream flows
> - Changes in ground water elevations
> - Changes in the concentrations of indicator water quality constituents
> - Changes in the abundance, distribution, and diversity of indicator fish communities
> - Changes in rainfall, and reasonably foreseeable future changes

FDEP commented that "[a]n analysis that compares proposed WCM revisions to anything other than a baseline that does not include water supply withdrawals and releases from Lake Lanier would be inappropriate, unlawful and in direct contravention of the Phase 1 Order." The Tri Rivers Waterways Development Association echoed FDEP's sentiment that the water supply withdrawals from Lake Lanier are not authorized and therefore must not be considered in the baseline.

3.7.2.3 Reopened Scoping Period—2012

Fifteen comments were received on the baseline used in evaluating alternatives in the WCM update. These comments varied in requests to define baseline conditions as run-of-river, 1958 operations from the last manual update, or to account for key operational assumptions (existing operations, storage needed for water supply, and such). Interests focused on conditions in the Apalachicola River and Bay suggested that baseline should not include interim operating procedures at Woodruff Dam, but should instead be based on observed inflows or mimic historic flows. Comments requested that the USACE update data, including the unimpaired flow data set to an October 2012 data set developed for the ACF stakeholders.

3.7.3 Proposed Action and Alternatives

3.7.3.1 Initial Scoping Period—2008

Nineteen comments were assigned to this subcategory, but the proposed action and alternatives to be considered were at the heart of a vast number of comments assessed in other categories. Comments regarding the proposed action were somewhat general in nature, with most of the comments focused on the alternatives to be considered. Comments provided by several Georgia stakeholders (GAEPD, ARC, Association of County Commissioners of Georgia, MNGWPD, Hall County Government Board of Commissioners, and one individual) expressed concern that the revised water control plans and EIS would merely document existing operations and not consider potentially viable alternatives. One commenter pointed out that the USACE must show that the EIS actually informed decision-making rather than justifying a decision already made. GAEPD expressed opposition to making any version of the IOP and RIOP part of the proposed action, noting that instead there should be a range of reasonable and feasible alternatives for the continued operation of the federal reservoirs.

Comments provided by Tri-Rivers Waterway Development District and MeadWestvaco urged the USACE to include in its environmental documentation "a clear explanation of the federal 'action' which the USACE is evaluating for purposes of NEPA" and that the proposed action "should be defined as the operation of ACF reservoirs according to their authorized purposes." FDEP reminded the USACE to "clearly describe all decisions, particularly in the water control plans and their reservoir regulation schedules, so that all parties can easily understand the USACE's proposed action and that action can be reasonably evaluated under NEPA."

The issue of what alternatives the USACE should consider is complex, as demonstrated by the very wide array of comments and recommendations made by stakeholders at every level of state and local government, public interest groups and organizations, private citizens, and other federal agencies. Many of the comments and recommendations were captured in Section 3.1, Water Management Recommendations. In addition, summaries of the detailed comments and recommendations made by federal, state, and local government agencies with regard to the proposed action and alternatives are also provided in Section 4 of this report. The following discussion addresses the comments categorized under NEPA during the comment-sorting process.

Some of the more general comments made regarding alternatives included requests that the USACE consider alternative operating plans to balance water supply needs and economic impact with downstream needs. The Cobb Chamber of Commerce urged the USACE to consider making changes to improve the balance among project purposes, even if doing so requires congressional approval. Another commenter urged that the USACE not limit itself to considering alternatives believed to be within its current authority because doing so could overlook alternatives that would achieve the highest and best use of the federal projects. Several comments urged the USACE not to limit alternatives to only those that mimic the manner of operations of the RIOP. One organization suggested that the USACE prioritize reservoir purposes during extreme drought events, making the protection of wildlife the top priority.

FDEP recommended that the USACE assess an alternative based on true basin inflow, an alternative that uses the entire conservation pool in Lake Lanier, a strong water conservation alternative, and a species recovery-based alternative.

GAEPD recommended consideration of separate alternatives based on reallocation of storage for water supply, rule curve changes at all projects in the ACF River Basin, different methods for optimizing the ACF system, and optimal operations for meeting endangered species needs other than those in the RIOP. They also reminded the USACE that the "no-action" alternative should be interpreted to mean "no change" from the current management direction or level of management intensity; consequently, it would be “a useless academic exercise” to consider as the no-action alternative returning a resource to its earlier, unaltered state.

The USFWS would like the USACE to consider changes to minimum releases and winter drawdown windows for the benefit of downstream species; an alternative that addresses increases in consumptive water demands in the basin; ways that standard operating procedures for fish spawning could be included among the mix of alternatives; and an alternative that allows Lake Eufaula (Walter F. George Lake) to behave more like a river and then compare these with the existing operating regime and other alternatives.

Comments submitted on behalf of West Point Lake stakeholders asked that the USACE assess a full-pool (633–635 feet msl) “run of the river” alternative; an alternative that eliminates or significantly reduces Action zones at West Point Lake; and an operations alternative that ensures that water quality standards are met and that the standards are at proper levels for the project. The stakeholder also stated that the USACE should not

consider any alternative that uses the water in West Point Lake to provide minimum flows for waste assimilation or municipal or industrial needs downstream, or support downstream navigation without an adequate study of the ecological and environmental damages caused by lake fluctuations to support that activity.

Tri-Rivers Waterway Development District and MeadWestvaco noted that the USACE should begin by "setting forth a set of operations that fulfills the authorized purposes of the reservoirs, according to the primary legal authorities." They added that [a]ny alternative that differs from optimal operation of the reservoirs for primary authorized purposes should be clearly identified as such; the need and/or legal basis to deviate from operation of the reservoirs for optimal fulfillment of the primary authorized purposes should be clearly explained; and that the USACE should clearly explain applicable limitations on any deviation from operations for primary project purposes, such as a time limit and the circumstances under which the USACE will restore primary operating parameters."

3.7.3.2 Reopened Scoping Period—2009

During the 2009 reopened scoping period, 23 comments were submitted regarding the proposed action and alternatives. In its comments, the USFWS asserted that "alternative sources of water supply for the Atlanta metro area need to be considered including the anticipated short and long-term impacts to surface and groundwater resources as a consequence of the revised scope. We recommend that the USACE's alternatives analysis include the cumulative effects of the proposed action and the expected proliferation of multiple surface and groundwater projects that may also affect the operation of the federal reservoirs and ultimately flows to the Apalachicola River."

FDEP provided the following comments with respect to the proposed action and alternatives:

- Fully examine direct, indirect, and cumulative impacts to Apalachicola River and Bay.
- Consider all reasonable alternatives, even those outside the agencies' jurisdiction, and clearly explain in the EIS any alternatives that were considered but eliminated from detailed analysis.
- Review alternatives to maintaining reservoir levels for recreation/sportfish management.
- When considering alternative plans, assume that the entire conservation pool of ACF reservoirs is available.

The AOWR stated, "Alabama does not believe the USACE can, or should, make any assumptions in the manual update process regarding possible future [c]ongressional action that might expand its current authority." AOWR further stated that the USACE must focus the EIS and Master Manual on only the authorized purposes within its authority, noting that to do otherwise would be a waste of time and taxpayer money.

AOWR identified a number of objectives that the scope of the Master Manual should address the following:

- Determination of the critical yield of each reservoir using the most current hydrologic and climatic conditions
- Adherence to the operational baseline as set forth in detail in the July 17, 2009, court order
- Use of the agreed-upon HEC-5 model or development of a new model that is agreed upon by the USACE and the states
- Assessment of whether any changes in the baseline conditions are necessary to comply with existing laws and regulations
- Analyses of any proposed modifications against the baseline set forth in the court order and other legal requirements to develop the proposed operations for Lake Lanier, West Point Lake, and Lake Walter F. George (Lake Eufaula)

AOWR also expressed concern "that some proposed reservoir projects under consideration in Georgia may have impact upon inflows into the federal reservoirs in the ACF Basin, including inflows from the Flint River," and requested that the USACE fully assess within cumulative impacts any water that might be lost through transfers or consumptive uses.

GAEPD, the ARC, and Gwinnett County Department of Water Resources submitted separate letters that reflected similar comments. The comments contended that the USACE must include water supply in Lake Lanier as an alternative, noting that to do otherwise would be "arbitrary and capricious." Gwinnett County Department of Water Resources said "At minimum, the USACE should study whether and to what extent water supply impacts reservoir operations at various levels to accommodate whatever ruling may ultimately issue in the pending litigation." Other alternatives requested for consideration included "water supply at the current levels," "water supply being provided to Buford and Gainesville (10 mgd) with the off-peak flow at 600 cfs," and "water supply being authorized at the level of yield for the year 2035 found in the Metropolitan North Georgia Water Planning District's Water Conservation and water Supply Plan of 2009." The ARC further contended that the EIS "should assist decisionmakers in determining whether to seek additional authority for water supply operations at Lake Lanier." The ARC also stated that "[t]he EIS should therefore be broad enough to acknowledge the current legal reality while, at the same time, accommodating the possibility that the current reality might change." GAEPD asserted that the no-action alternative must be based on current conditions, which include water supply in Lake Lanier.

The Apalachicola Riverkeeper commented that the EIS must rigorously explore and objectively evaluate all reasonable alternatives, even those outside the agencies' jurisdiction. In addition, the Riverkeeper requested that the EIS consider an alternative that "manages the ACF system to ensure the maintenance of ecologically sound in-stream flows that will protect and restore the chemical, physical, and biological integrity of the Apalachicola River and its floodplain, the Chattahoochee River, the Flint River, and the

Apalachicola Bay; and will recover threatened and endangered species and species at risk in those waters." Last, the Riverkeeper reminded the USACE that the "recommended alternative must protect and restore the ecological health of the Apalachicola River and Bay and the entire ACF system and comply with environmental protection laws."

The Upper Chattahoochee Riverkeeper asked that the USACE consider an alternative that integrates non- USACE, federally licensed reservoirs into a meaningful drought contingency plan.

Other comments included a request that the EIS address the freshwater needs of the Apalachicola River, estuaries, and bay.

3.7.3.3 Reopened Scoping Period—2012

In the 2012 reopened scoping period, 21 comments were submitted regarding the proposed action and alternatives. Some of these comments included explicit detail of alternatives developed by their agency or in support of another agency's alternatives. A summary of comments follows:

- EPA comments recommended alternatives to maximize the use of existing infrastructure to minimize effects on aquatic resource including wetlands and streams; require the implementation of water efficiency or conservation measures; and analyzes the effects of the WCM operations on water quality standards. EPA also recommended that the socioeconomic, environmental, and human health impacts on low-income and minority populations be identified, analyzed, and addressed. Innovative procedures to enhance warning systems to improve public safety and recreation throughout the system should be considered.
- USFWS provided an alternative for monthly target and minimum flow support. The alternative would avoid or minimize some adverse effects of the current Revised Interim Operating Plan (RIOP), which uses system storage primarily to support the 5,000 cfs minimum release. An outline of this alternative is presented in Section 4.1.3.3.
- AOWR commented that Atlanta-area interests should not drive the evaluation of alternatives. The USACE must also recognize that water supply accommodation for the Atlanta area is not an all-or-nothing proposition where all the area's water supply needs are met from the federal reservoirs or none at all.
- MNGWPD offered four key recommendations for the USACE to consider in the WCM update:
    1. Evaluate of alternative levels for the rule curves and action zones in the ACF projects
    2. Reconsider its policy of balancing the volume of water stored among the reservoirs based on percent of action zone
    3. Reconsider Woodruff Dam release requirements, including minimum flows

4. Develop forecast-based operating rules that can improve the benefits derived from reservoir operating rules for all purposes

- The Chattahoochee Riverkeeper provided a report defining conservation and other measures for consideration in the WCM update. The comments asked the USACE to consider options that are more equitable in terms of drought mitigation by considering emergency conservation measures or reallocating more composite conservation storage to West Point Lake and other downstream reservoirs to alleviate the adverse effects of drought. It also asked USACE to place public safety at the forefront in its reevaluation of operations.
- The Apalachicola Riverkeeper commented that the Draft EIS must evaluate alternatives that will maintain ecological flows for the ACF system, including establishing minimum stream flow necessary to address water quality, fish and wildlife, recreation, and aesthetic considerations when developing WCMs, even where maintenance of minimum flows is not an authorized project purpose. These comments were reiterated by the National Wildlife Federation.
- ARC comments support the Georgia water supply request and suggest an evaluation of the national and regional economic development benefits in granting that request. They also reiterated comments received earlier to consider structural alternatives in updating the WCMs. These include either closing Sikes Cut or installing a lock at Sikes Cut, restoring the channel below Woodruff Dam, refurbishing the intake at Plant Farley, and renovating projects to reduce releases necessitated by head limits.
- The Chattahoochee RiverWarden documents flow regimes for the FERC Middle Chattahoochee Project License (P-2177-053) and indicate that they should be part of the WCM update.
- The ACFS identified 14 areas of stakeholder interest in the ACF system and have identified six major objectives to be considered in the WCM update:
    1. Maintain adequate water supplies for public supply, municipal uses, and wastewater assimilation.
    2. Maintain existing, and promote future, water availability and access for water-dependent industries, power generation and recreational interests.
    3. Promote optimizing the use of water for agricultural irrigation including types of irrigation technology, selection of crops, sustainable and resource-based permitting and water withdrawal monitoring.
    4. Determine the nature and extent of commercial navigation that the ACF Basin can effectively support.
    5. Protect the natural systems and ecology of the ACF Basin by defining and implementing desired flow regimes and lake levels, water quality enhancements, including wastewater and storm water management and best management practices to maintain a healthy natural system and support a productive aquatic ecosystem in the basin and estuary.

6. Create and support relationships with local governmental institutions and other public bodies in the ACF Basin to promote sustainability of the water resources and to enhance the historical and cultural resources of the basin related to managing its water resources.

- Comments from Georgia Power indicate its support of an expanding range of water supply alternatives associated with Buford Dam.
- Other private citizens suggested that the USACE consider alternatives that would raise lake levels (to 1,072 at Lake Lanier) and to make no changes, a *no change of action*.

3.7.4 Additional NEPA Topics

3.7.4.1 Initial Scoping Period—2008

Mitigation. FDEP stated that key mitigation elements must include conservation and water transfers.

Schedule. The USACE received three comments regarding the timeline for completing the Master Manual update and the accompanying EIS. The commenters stressed that time is of the essence, and one added that the EIS cannot be "all things to all people."

Compliance with Other Regulations. Three comments were made regarding the requirement that the USACE meet all applicable laws in its water management operations. Specific laws mentioned include the *Coastal Zone Management Act*, *Clean Water Act*, and ESA.

Cooperating Agencies. A comment from the Apalachicola Riverkeeper suggested that the USACE consider engaging EPA as lead agency—with the U.S. Geological Survey (USGS), the National Oceanic and Atmospheric Administration, the National Marine Fisheries Service, USFWS, the USACE, and others in cooperating roles— all overseen by the National Research Council. A comment from Representative Boyd encouraged the USACE to continue working with the National Research Council as the project moves forward.

General NEPA Comments. Eighteen of the comments submitted addressed NEPA but did clearly not fit within the defined NEPA subcategories. Some of the comments were included in the general introductory language provided as a lead-in to more specific comments that have been addressed elsewhere in this report. Several commenters thanked the USACE for the opportunity to participate in the process or offered their assistance as the project moves forward. Some comments were pleas to the USACE s to help their communities, "do the right thing," and ensure the protection of both the human and natural environment for future generations. A few commenters expressed doubt that the long-standing battle over water can be resolved, admonished politicians and "big government;" or conveyed an overall tone of disappointment or disgust with management of the ACF River Basin.

3.7.4.2 Reopened Scoping Period—2009

Mitigation. Three comments were submitted regarding mitigation. The ARC asserted that the USACE needs to consider mitigation measures to mitigate the catastrophic environmental and economic impact of the operational alternative defined in the November 19, 2009, *Federal Register* notice. The ARC further stated that the EIS should assess various mitigation options proposed by Gwinnett County to address Florida's concerns in the Apalachicola River and Bay.

FDEP contended that "the USACE should consider additional system-wide mitigation with regard to water quantity and flows in the ACF Basin." It further stated that the USACE should "analyze increased wastewater recycling and reuse, coupled with wastewater treatment and water conservation measures, as an alternative and as a means to mitigate any impacts associated with the USACE's proposed action and cumulative impacts of new sources of water supply in the ACF Basin."

Schedule. One commenter requested that the USACE get the Master Manual update done "soon."

Compliance with Other Regulations. Five comments were made regarding the requirement that the USACE meet all applicable laws and regulations in the development of the updated Master Manual and EIS. Gwinnett County Department of Water Resources asserted that NEPA, properly applied, requires the USACE to include water supply at and above current uses in its EIS. FDEP reminded the USACE that "the Apalachicola River and Bay—and indeed, the entire State of Florida—are protected by the enforceable policies of the federally approved Florida Coastal Management Program." FDEP further stated that regardless of the Phase 1 Order, the USACE must comply with NEPA, the Water Supply Act of 1958, the Flood Control Act, the ESA, and the Coastal Zone Management Act. The Apalachicola Riverkeeper echoed a similar sentiment, reminding the USACE that the alternative ultimately recommended by the Draft EIS must also comply with the full suite of federal laws and policies designed to protect the environment. The NPS made the USACE aware that the EIS must be mindful of the Chattahoochee River National Recreation Area and the protections it is afforded by various laws and regulations.

Cooperating Agencies. No comments were received.

General NEPA Comments. Eighteen comments were categorized within this subcategory. FDEP commented that the EIS should assess a full range of alternatives and associated impacts on Florida and the Apalachicola River and Bay. The USACE also should make any updated critical yield analysis and new model for the ACF River Basin available to Florida for review and comment. In addition, cumulative impacts analysis must consider the following reasonably foreseeable actions:

- All depletion of water within the entire ACF River Basin, including metro Atlanta uses, irrigation in the Flint River Basin, and reservoir evaporation
- Depletion of water from population growth in metro Atlanta

- Modifications to seasonal or altered timing of flows caused by federal and non-federal reservoir operations
- Point and large-scale nonpoint source pollutant discharges
- Effects of flow alterations and continued loss of aquatic habitats in Apalachicola River and Bay
- Implementation of drought management plans and triggers
- Occurrence of more severe and extended droughts in the future.

FDEP further stated that "the cumulative impacts of proposed reservoirs [in Georgia], and any additional water supply sources or diversions necessitated by the Phase 1 Order, must be evaluated by the USACE as part of the WCM EIS process." It added, "The USACE also should evaluate the impacts of growth induced by providing new sources of water supply in the ACF Basin."

The AOWR echoed FDEP's concerns, stating that "in assessing the cumulative impacts associated with the operation of the ACF Basin, the USACE must consider the amount of water that may be lost from the basins through inter-basin transfers and consumptive uses and should consider appropriate limitations on any such losses, particularly under drought conditions."

The ARC **"**firmly believe[s] that any objective analysis will show that there is enough water in the ACF Basin to meet the reasonable needs of all stakeholders if the reservoirs are operated properly." GAEPD commented that to not consider water supply in the EIS would be a waste of resources and taxpayer dollars. GAEPD further stated that "the USACE cannot ignore the enormous environmental, social, and economic costs that would result from ceasing to provide water supply to the millions of Georgians that have depended on Lake Lanier for decades by merely declaring that its 'no action' alternative will not include water supply."

The Apalachicola Riverkeeper made several comments including the following:

- Define and utilize the historical flow conditions of the Apalachicola, Chattahoochee, and Flint rivers as the baseline, with particular attention to the historical flow regime of the Apalachicola River.
- Comprehensively analyze the direct, indirect, and cumulative impacts of the proposed alternatives. As CEQ has made clear, in situations like those in the ACF where the environment has already been greatly modified by human activities, it is not sufficient to compare the impacts of the proposed alternative against the current conditions. Instead, the baseline must include a clear description of how the health of the resource has changed over time to determine whether additional stresses will push it over the edge.
- "Cumulative effects analysis must address impacts from past, present and future actions through the basin including, but not limited to water withdrawals through basin from federal and non-federal activities; reservoir and dam operations;

navigational dredging activities; commercial, residential, and infrastructure development; changes in rainfall, water quantity, salinity, wetland losses, sea level rise, and storm events from climate change; and improvements in water conservation."

- Evaluate alternatives that will protect and restore the ecological health of the Apalachicola River and Bay, and the entire ACF system. The EIS must also state how alternatives considered in it and decisions based on it will or will not achieve policy goals established under NEPA and other applicable environmental laws and policies.

One commenter urged the USACE to include in the Record of Decision a thorough explanation of its modeling and analysis of proposals and alternatives, as well as its reasons for accepting or rejecting them. Another commenter urged the USACE to consider the impacts of its actions basin-wide, including the Apalachicola Bay. Gwinnett County Water Department restated the USACE's legal obligations under NEPA.

3.7.4.3 Reopened Scoping Period—2012

Mitigation. No comments were received.

Schedule. No comments were received.

Compliance with Other Regulations. Four comments were made regarding the requirement that the USACE meet all applicable laws and regulations in developing the updated Master Manual and EIS. EPA submitted three comments that made reference to Clean Water Act sections 401 and 404. The comments indicate that holistic management should be considered to minimize effects on entities seeking storage allocations with the least environmental damage. Gwinnett County indicated that Section 1.2 of this report be updated to include the 1956 Act per the Eleventh Circuit decision.

Cooperating Agencies. The National Park Service indicated that it welcomes the opportunity to work as a cooperating agency in the WCM update.

General NEPA Comments. Eleven comments were categorized in this category. They were generally related to direct, indirect, and cumulative effects. Chattahoochee Riverkeeper and the Southern Environmental Law Center encourage the USACE to coordinate with other agencies to consider direct, indirect, and cumulative effects. Comments focused on cumulative effects indicate that the USACE should evaluate the effects of planned water supply sources and consider effects that would occur without the availability of storage at Lake Lanier for water supply. These comments generally indicate a need to cover a full range of effects from headwaters to the mainstem considering past, present, and reasonably foreseeable future conditions.

3.8 Data, Studies, and Analytical Tools

Fifty-six comments received during the 2008 initial scoping period were assigned to the category Data, Studies, and Analytical Tools. Four more comments were received in the

2009 reopened scoping period and 37 were received in the 2012 reopened scoping period for 97 total comments. The comments are summarized below.

3.8.1 Initial Scoping Period—2008

The highest number of comment submissions requested that impact analysis and studies be conducted for the ACF River Basin. Commenters stated that the USACE's EIS should address the accumulation of scientifically based data on the available water and current water withdrawals along the ACF system. The EIS should quantify the relationship between increasing consumptive demands in the ACF River Basin and the benefits from various project purposes. In assessing the cumulative impacts associated with the operation of the ACF River Basin, the USACE needs to consider the amount of water that might be lost from the basins through inter-basin transfers and consumptive uses and should consider appropriate limitations on any such losses, particularly under drought conditions. Any raw data input should be measured using modern technology.

Commenters asked that a clear discussion and delineation of the pertinent water management responsibilities of federal and state agencies be included as a part of the EIS. The USACE has no authority to make decisions on matters of water supply planning and must defer to the states on such issues. However, commenters saw the need for the USACE to examine water supply withdrawals (or the lack thereof), and the consequences of them, as impacts of the proposed federal action. Furthermore, the EIS should document the volume of storage that has been contracted for water supply or has been proposed in each project and any limitations due to the hydrologic conditions of meeting the contracts.

Commenters asked that when compiling an EIS, the USACE use the new HEC-ResSim model software to the maximum advantage in developing new operating rules and that data from other modeling software be accepted or rejected but not ignored. Commenters also asked the USACE to examine the location of water withdrawals and discharges along the Chattahoochee River to ensure their accuracy: "The HEC-ResSim model places certain water withdrawal and wastewater discharge points in the wrong location along the Chattahoochee River. Because of these errors, the predicted release from Lake Lanier necessary to meet the 750 cfs flow requirement at Peachtree Creek is less than what is actually needed."

Additional studies and analyses recommended by commenters include the following:

- Interagency technical workgroups could assist the USACE in compiling the information necessary to craft a balanced set of alternatives and to analyze their effects on resources.
- The National Research Council should be permitted to do a study of all basins throughout the three states so that science, rather than politics, can dictate appropriate water policy.
- An assessment of water availability, supply options, demand-management alternatives, and socioeconomic factors that influence uses in the ACF system would be useful.

- EPA encouraged including in the EIS a discussion that connects management plans to reallocation of water storage. Of special interest are the effects of management plans on discharge rates (including velocities) and river elevations (including volume).
- The USACE should evaluate the effects on Apalachicola Bay and Estuary salinity and nutrient composition (to evaluate salt marshes, submerged grass beds, oysters, floodplain habitats, channel morphology, and bank erosion).
- A thorough evaluation of project-related flow regime alterations and the potential benefits of restoring features of the pre-project flow regimes, specifically the approach described by Richter and Thomas (2007), should be conducted.

3.8.2 Reopened Scoping Period—2009

In the initial scoping period, commenters asked that when compiling an EIS, the USACE use the new HEC-ResSim model software to the maximum advantage in developing new operating rules and that data from other modeling software be accepted or rejected but not ignored. In the 2009 reopened scoping period, state agencies asked that all three states (Alabama, Florida, and Georgia) have the opportunity to become acquainted with HEC-ResSim and requested that it be used only if the three states and the USACE agree on its use in modeling updates.

3.8.3 Reopened Scoping Period—2012

Thirty-seven comments were received regarding data, studies, and analytical tools in the 2012 reopened scoping period. These comments provided reference to studies covering a range of resource areas to be more fully considered in the NEPA analysis including economic studies, biological studies, environmental justice analyses focused on areas with higher concentrations of minority or low-income populations, drought studies, and a study supporting raised pool levels in the winter in West Point Lake. Stakeholders suggested using updated population and land use data with more recent technology in storm tracking to improve the flexibility of water management. States, private citizens, and special interest groups presented data analysis and the results of their modeling effects for consideration in developing alternatives.

Commenters conducted alternative analyses using HEC-ResSim and provided those results with suggested alternatives to the USACE. AOWR provided comments on the HEC-ResSim modeling and suggested updates to the model to improve its ability to match historical flows. Stakeholders requested critical flows to be recalculated, a recalculation of unimpaired flows, model sensitivity analysis, refinements of HEC-ResSim in modeled segments in the Atlanta area to better represent water withdrawals, and consideration of water lost from evaporation in reservoirs. Models representing salinity in Apalachicola Bay were referenced and provided for use in evaluating necessary basin inflows. Several stakeholders provided performance measures for the USACE to use in WCM updates. Hydropower interests provided suggestions to updates used in calculating benefits to hydropower.

3.9 Navigation

The USACE received 28 comments on navigation during the 2008 initial scoping period. Four more comments were received during the 2009 reopened scoping period, and 9 more comments were received in the 2012 reopened scoping period for 41 total navigation comments. Navigation comments are summarized below.

3.9.1 Initial Scoping Period—2008

Of the 28 comments the USACE received regarding navigation, there were an equal number of those in favor and those opposed to navigation. One comment also focused on the environmental impacts of dredging in the Apalachicola River. The following is a summary of the comments regarding navigation:

- Navigation is no longer a high priority and might be altering the natural environment.
- Navigation is no longer a viable means of transportation.
- Revisions to the manual must recognize navigation as a primary project purpose and reflect the statutory intent to support downstream communities by resuming channel maintenance in the Apalachicola River acceptable to FDEP and by providing adequate flow to support navigation.
- Navigation is an important economic driver in this region, but releases should not be made from Lake Lanier to support navigation.
- The USACE is responsible for operating and maintaining the authorized navigation channel. Commenters urged the USACE to "explain in its revised manual and the accompanying environmental documentation how it intends to provide for the needs of the communities and industries located in the middle and lower portions of the ACF River System."

The Tri-Rivers Waterway Development Association and industries located on the Chattahoochee River, such as MeadWestvaco, encouraged the USACE to continue to support navigation on the system by pursuing water quality certification from FDEP for maintenance dredging and by managing reservoir releases to support navigation. Such commenters cite the original congressional authorization as the basis for their position. Those who do not favor continued support of navigation point to the lack of navigation traffic on the system and the adverse environmental effects of dredging in the Apalachicola River. One such commenter suggested that the USACE abandon navigation as a function of the ACF system.

3.9.2 Reopened Scoping Period—2009

The USACE received four comments regarding navigation during the 2009 reopened scoping period—three supportive of navigation and one focused on the environmental impacts of dredging in the Apalachicola River. The themes of the comments were very similar to those of the 2008 scoping period. One commenter mentioned the importance of the USACE providing navigation support for businesses and industries on the

Chattahoochee River, for transportation purposes and for meeting water elevation and flow needs. That commenter stated he has no objection to the use of "action zones" as long as those zones adequately provide for the flood control, navigation, and hydropower authorized purposes of the ACF system. The commenter further stated that drought contingency operations factored into the development of action zones must not unduly burden West Point Lake and Walter F. George Lake in favor of excess conservation upstream in Lake Lanier. Two commenters suggested that the USACE revise the scope of its EIS to ensure that reliable, year-round navigation on the ACF system is a required alternative and is fully provided for in the revision of water control plans and manuals. One of these commenters urged the USACE to work cooperatively with FDEP and other appropriate stakeholders, including navigation interests, environmental interests, and local governments, to obtain state water quality certification. Should those efforts not be successful, this commenter suggested, the USACE has sufficient federal preemptive authority to maintain the federal navigation project in the absence of state water quality certification.

3.9.3 Reopened Scoping Period—2012

The USACE received nine comments regarding navigation in the 2012 reopened scoping period. These comments requested that the USACE maintain the project purpose and support navigation on the Apalachicola, Chattahoochee, and Flint rivers. They suggest consideration of seasonal navigation that coincides with high spring releases for aquatic species and for the Draft EIS to include the economic effects of navigation-based facilities. Those facilities made it possible for local communities to sell and ship products (agricultural, silvicultural, mineral, and such), supply raw materials for industry along the river, and move oversized equipment to Plant Farley.

3.10 Hydropower

The USACE received 26 comments on hydropower during the 2008 initial scoping period. No more comments were received in the 2009 reopened scoping period, but 5 more comments were received in the 2012 reopened scoping period for 31 total hydropower comments. Hydropower comments are summarized below.

3.10.1 Initial Scoping Period—2008

The USACE generates power at dams on the Chattahoochee River and markets the power through the Southeastern Power Administration. Of the 26 comments received related to management for hydropower during the 2008 initial scoping period, the number of comments that called for hydropower production as a priority was the same as the number that called for hydropower production to be reduced in times of drought conditions. The following is a summary of the comments regarding hydropower:

- Hydropower customers are willing to forego their authorized storage as long as proper compensation is provided.
- Hydropower is one of the original authorized project purposes for Lake Lanier, and it provided the economic justification for the project.

- Any changes in the plan that creates operational restrictions, or redistributes project benefits, should be accompanied by a reallocation of project costs and compensation to the affected [project] purpose.

The commenters that favored hydropower operations at the ACF projects tended to be marketers or users of power, such as SEPA, power cooperatives, Georgia Power Company, or industries. These commenters cited the original congressional authorization, together with the fact that sale of hydropower repays a portion of project costs, as justification for their position. According to SEPA, "[a]ny change in the plan which creates operational restrictions, or redistributes project benefits, should be accompanied by a reallocation of project costs and compensation to the impacted purpose." A representative of the SeFPC suggested that "the hydropower customers are willing to forego their authorized storage at the projects as long as there is proper compensation." Those commenters who did not favor hydropower operations at the ACF projects believe that other purposes, such as water supply, are of higher priority. Those holding this viewpoint tended to reside in the upstream portion of the basin.

3.10.2 Reopened Scoping Period—2009

No hydropower-related comments were received during the 2009 reopened scoping period.

3.10.3 Reopened Scoping Period—2012

Five hydropower-related comments were received from SeFPC, SEPA, Atlanta Rowing Club, and a private citizen. The private citizen requested hydropower releases during drought. The Atlanta Rowing Club requested operational consideration to maintain daily average power generation while reducing the peak of discharges from Buford Dam. SEPA indicated that power customers have expressed concern about the increasing cost of federal power and the reduction of benefits due to competing purposes. They suggested that the WCM updates consider a methodology to minimize the effects on power production, or equitably redistribute, project costs to other purposes benefiting from operational changes and storage use. SeFPC comments focused on USACE calculations hydropower effects, suggesting the USACE should not limit the analysis to lost energy on a project-by-project basis. They suggested the loss of hydropower in the Draft EIS should focus on identifying the lost peak hydropower production rather than a generalized decrease in energy production.

3.11 Flood Risk Management

In cases of extreme wet-weather conditions, the USACE manages operations at federal reservoirs to reduce damage caused by flooding. Given the drought conditions, only a limited number (nine) of the comments received during the 2008 initial scoping period were related to flood risk management. Only two more comments concerning flood risk management were received during the 2009 reopened scoping period but 71 more were received during the 2012 reopened scoping period for 82 total comments. The comments are summarized below.

3.11.1 Initial Scoping Period—2008

Comments regarding flood risk management came primarily from residents near West Point Lake. The flood risk management operation of this lake involves lowering the pool level during the winter months to provide additional flood storage. There were comments on both sides of this issue. Those residing on the lake or using it for recreation generally supported reductions in the drawdown of the reservoir in winter to provide flood risk management in the future. The West Point Lake Association and the City of LaGrange, for example, supported drawing West Point reservoir no lower than elevation 633, as opposed to the current operation of drawing down to 628. The larger response associated with flood damage reduction requested the removal of this project purpose in favor of higher water levels to support recreation, citing the greater perceived economic impact associated with recreation as compared to flood damage reduction. Those residing downstream, however, predictably held a different viewpoint, citing their dependence on West Point Lake for flood protection. These commenters pointed out that flood risk management was an original purpose for constructing the reservoir and that downstream residents still rely on that protection.

3.11.2 Reopened Scoping Period—2009

During the 2009 reopened scoping period, the USACE received two comments regarding flood risk management. The City of Lagrange, Georgia, commented that flood concerns north of West Point should be addressed by providing additional flood storage in Lake Lanier along with reduced lake elevations there for winter flood storage, not by relying on increased storage capacity in West Point Lake. With reference to a flood event in fall 2009, the City suggested that practices used by the USACE during that event worked well and should be incorporated into operating plans and that "set aside" flood storage at West Point should be reduced accordingly, especially during winter months.

3.11.3 Reopened Scoping Period—2012

In the 2012 reopened scoping period, the USACE received 71 comments regarding flood risk management. These comments were from citizens surrounding West Point Lake requesting that West Point Lake be maintained at a minimum 632.5 msl year round. They believe that increased storage, along with better management would reduce flooding. The Columbus Water Works encouraged the USACE to review its flood management procedures to consider modifications to take advantage real time USGS gages to improve reservoir release response times.

3.12 Other Resources

In the 2008 initial scoping period, 52 comments related to other resource areas—air quality, cultural resources, geology and soils, and hazardous, toxic, and radioactive waste—were received. Six more comments were received in the 2009 reopened scoping period, and seven more were received in the 2012 reopened scoping period for 65 total comments. These comments on other resource areas are summarized below.

3.12.1 Air Quality

3.12.1.1 Initial Scoping Period—2008

Three comments were related to air quality. They noted that the USACE should address and fully document the effects of proposed actions on air quality. The commenters noted that trees are dying due to drought conditions. The absence of trees can significantly affect the natural cycle, which (when functioning properly) can chemically break down air pollution. More water would ensure the ecological balance needed for better air quality.

3.12.1.2 Reopened Scoping Period—2009

No comments were received.

3.12.1.3 Reopened Scoping Period—2012

No comments were received.

3.12.2 Cultural Resources

3.12.2.1 Initial Scoping Period—2008

Seven comments regarding cultural resources were submitted. According to the commenters, Florida's historical heritage is at risk due to declining environmental conditions and the toll taken on the commercial fisheries industry for which the Apalachicola River is known. The community of Franklin County is dependent on the Apalachicola River and Bay for its livelihood and culture. Commenters asked that the USACE consider the loss of the cultural heritage of the Apalachicola oysterman if river flows are too low to maintain the fishery at adequate levels to make it economical for oyster harvesting to continue, and they asked that the USACE provide a better guide for protecting cultural resources in the Master Manual.

3.12.2.2 Reopened Scoping Period—2009

One cultural resources comment was received during the 2009 reopened scoping period. The commenter stated that the EIS should consider the impacts of "rapidly fluctuating water levels" on archaeological and historic sites within the Chattahoochee River National Recreation Area. The commenter is concerned that accelerated erosion due to bank scouring caused by the fluctuating releases from Buford Dam negatively affect the Ivy Mill ruins in Roswell, Georgia, which are listed on the National Register of Historic Places, as well as other archaeological sites in the Chattahoochee River National Recreation Area.

3.12.2.3 Reopened Scoping Period—2012

One cultural resources comment was received in the 2012 reopened scoping period from the National Park Service reiterating its comments from 2009 in Section 3.12.2.2.

3.12.3 Geology and Soils

3.12.3.1 Initial Scoping Period—2008

Twenty-nine of the comments received were related to geology and soils. Commenters expressed concern about bank erosion at Lake Lanier and how it could diminish the future storage capacity of Lake Lanier. Some commenters pointed out that bare soil near the banks will eventually wash into the nearby creeks and tributaries, creating a water quality issue. A few commenters feel that development should be limited around Lake Lanier to prevent erosion and to control the drawdown of the lake for drinking water.

Other commenters pointed out that West Point Lake has severely eroded along the shoreline and caused silt buildup near private docks. The commenters feel the USACE could minimize erosion and soil deposition in the lake by keeping lake levels at or above 633 feet msl.

3.12.3.2 Reopened Scoping Period—2009

Five comments on geology and soils were received during the 2009 reopened scoping period. They concerned changes in flow and the corresponding impact on the riverbeds, erosion, and siltation. One commenter requested that the EIS address the "significant physical impacts" resulting from the abrupt water level changes in the Chattahoochee River due to releases from Buford Dam. The commenter said the abrupt changes in flow result in bank erosion and siltation in the Chattahoochee River and its tributaries.

Three of the geology and soils comments were related to the Apalachicola River. One commenter said that the construction and operation of the Jim Woodruff Dam has deepened and widened the Apalachicola River channel below the dam through the deposition of dredged material in the floodplain, degrading the condition of the riverbed. The commenter asked that the USACE consider repairing the riverbed below Woodruff Dam and suggested non-flow measures such as the "mechanical removal of vegetation on the banks, the reshaping of the riverbed and banks, and the placement of appropriately sized gravel." The second commenter asked that the EIS address changes in the river channel morphology due to altered flows, including bank erosion. The third comment about the Apalachicola River concerned Swift Slough and Chipola Cutoff, two of the river's distributaries (streams that branch off and flow away from the main stream channel). The commenter expressed concern that Swift Slough is threatened due to channel incising and sedimentation, whereas Chipola Cutoff is increasing in size and is "claiming an ever-increasing share of the mainstream of the river, now up to 40 percent." The commenter asked that the USACE study alternatives to address these problems.

One comment pertained to geology and soils in the ACF River Basin as a whole. The commenter requested that the EIS document, as part of the baseline conditions, the miles of streambed lost or modified due to the historical changes that have occurred in the ACF River Basin.

3.12.3.3 Reopened Scoping Period—2012

Three comments on geology and soils were received from the Atlanta Rowing Club and National Park Service. These comments focus on turbidity and sedimentation in the CRNRA and Bull Sluice Lake. The NPS comment that the Draft EIS should quantify the environmental, social, and economic effects of stream banks erosion. Bank undercutting and erosion increase siltation having long-term effects on aquatic habitats. The Draft EIS should evaluate the effect of operations on species that benefit from gravel or rocky substrate. The Draft EIS should include economic effects from the loss of property from eroding bank along with considering the future effects of stream bank erosion.

3.12.4 Hazardous, Toxic, and Radioactive Waste

3.12.4.1 Initial Scoping Period—2008

The USACE received 13 comments regarding the recently permitted Turkey Run Landfill, which will be constructed near a tributary that feeds into West Point Lake. Commenters expressed concern that contaminants from the proposed landfill could leach into West Point Lake and groundwater supply sources, thereby polluting their drinking water. Commenters also pointed out that recreation on West Point Lake could be adversely affected if the landfill were to reduce the water quality and cleanliness of the lake.

3.12.4.2 Reopened Scoping Period—2009

No comments on hazardous, toxic, and radioactive waste were received.

3.12.4.3 Reopened Scoping Period—2012

No comments on hazardous, toxic, and radioactive waste were received.

3.13 Petitions

3.13.1 Initial Scoping Period—2008

Two petitions were received:

- West Point Lake Advisory Council Needs Your Show of Support (SOS)
- Comments on the Potential for the Turkey Run Landfill to Pollute Groundwater and Surface Waters in Violation of GAEPD Solid Waste Management Rules and Landfill Permit.

The West Point Lake Advisory Council submitted a petition signed by 30 persons at the LaGrange public meeting and later mailed in an additional 2,779 signatures. The petition calls for all levels of government to ensure that five concerns are heard:

1. Maintain a minimum lake level of 633–635 feet msl.
2. Maximize positive economic impact.

3. Return to managing the lake consistent with congressionally authorized purposes.
4. Restore and maintain recreational facilities.
5. Ensure recreational access for low-income and minority families.

These comments were also received in conjunction with other comments and were categorized appropriately in previous sections of this report.

The second petition, related to the Turkey Run Landfill, had been signed by 58 persons. The area of concern is adjacent to West Point Lake, and the comments indicate a need to address adverse water quality impacts on the City of LaGrange's water supply that might occur because of the landfill. Although the landfill is not within the USACE's regulatory authority for the Master Manual, under the NEPA process it may be considered in various aspects of documenting activities within the area of influence of the USACE's reservoirs. Copies of the petitions are provided in Appendix L.

3.13.2 Reopened Scoping Period—2009

No petitions were received.

3.13.3 Reopened Scoping Period—2012

The LaGrange-Troup County Chamber of Commerce distributed a petition "U.S. Army Corps of Engineers: Change operation rule curve for West Point Lake" signed by 2,985 individuals. The petition described the local economic effect of West Point Lake and the economies dependence on lake water levels. They request that the USACE change the guide curve at West Point Lake in the late summary/early fall. These petitions were received in conjunction with other comments categorized appropriately in previous sections of this report.

4.0 Federal, State, and Local Agency Responses

This section summarizes the comments that federal, state, and governmental agencies submitted through letters to the USACE Mobile District during the 2008, 2009, and 2012 scoping periods. Comments from the federal agencies (EPA, SEPA, and the Department of the Interior's USFWS) are summarized first, followed by state agency comments (in alphabetical order) and finally local government input. Copies of all the public and agency comments received during the scoping process are provided in Appendixes J (2008 comments), M (2009 comments), and Appendix P (2012 comments).

4.1 Federal Agencies

4.1.1 EPA Region 4

4.1.1.1 Initial Scoping Period—2008

Comments from EPA Region 4 were received December 8, 2008, in a letter signed by Mr. Heinz Mueller. EPA noted that it understands that the updated Master Manual will identify all constraints, including authorized project purposes, power contract commitments, hydrologic and climatologic factors, downstream lake and basin-wide conditions, and potential threats of flood and drought, and will include the resultant lake levels required to satisfy all these various requirements.

Master Manual. In comments regarding the Master Manual update, EPA suggested that the manual include sections on current project operations and a historical review; operational changes necessitated by drought contingency requirements and data supporting such changes; updated data reflecting current basin conditions; proposed new environmental requirements for meeting water quality standards; how compliance with endangered species law/fish spawning needs will be accomplished; procedures for capturing/using real-time data provided by additional gauges; results of recent computerized modeling; and proposed improved streamlining of data exchange between agencies.

NEPA. With respect to NEPA, EPA noted that adverse impacts from any proposed action should be avoided, minimized, and/or mitigated. EPA's specific recommendations follow:

- Address and fully document effects on threatened or endangered species, cultural resources, air quality, and wetlands. Ensure that the proposed action complies with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. Fully document that no unacceptable adverse cumulative or secondary impacts will result.
- Address and fully document the effects of the proposed action on water quality, including effects on Total Maximum Daily Load implementation and impaired waters. Include information on the impairment status and Total Maximum Daily Loads of all ACF system water bodies.

- Consider the consequences of any major changes to conservation storage at lakes Lanier, West Point, and Walter F. George.
- Make the best management practices that will be implemented to control sediment runoff and manage stormwater at the lakes part of the Master Manual.

Water chemical, physical, and biological characteristics. EPA comments related to water chemical, physical, and biological characteristics noted that the EIS should

- Include discussion connecting management plans to reallocation of water storage. Of special interest are effects of management plan changes on discharge rates and river elevations. Discuss the secondary effects on major water chemical, physical, and biological characteristics.
- Discuss major biological characteristics, including potential alterations to aquatic species that require flow in their habitat. In evaluating alternatives, describe their impact on the sustainability of the aquatic environment and related human benefits.
- Discuss ACF adaptive management plans (AMPs), which should address the uncertainty associated with in-stream flow prescriptions and should include conservation and resource-protective flow standards based on available information; identify monitoring programs; and identify an effective revision procedure.
- Employ in the ACF River Basin a concept similar to that described in the GAEPD request for flow reductions in the Chattahoochee River, which relies on a series of predictive models. Monitor identified flow-related sensitive endpoints and use a notification procedure when certain conditions that require flow change exist.

4.1.1.2 Reopened Scoping Period—2009

No comments were received.

4.1.1.3 Reopened Scoping Period—2012

EPA Region 4 submitted comments in a letter signed by Mr. Heinz Mueller and dated January 14, 2013. Comments were organized in five categories.

- ***Wetlands and Streams.*** EPA recommended that management activities focus on using existing infrastructure to meet the needs of water supply. Its comments describe concern that additional water supply infrastructure could fragment aquatic ecosystems and by maximizing the use of existing infrastructure these effects could be avoided. EPA also recommends management for variable flows to ensure connectivity between riverine, wetland, and floodplain environments.
- ***Water Supply Efficiency/Conservation.*** EPA requested that, in review of permit requests, the USACE consider demonstrated compliance with mitigation sequencing and that applicants consider a range of alternatives. One such alternative should demonstrate water efficiency and conservation measures without consideration of changes to storage use. Further, USACE should consider

efficiency and conservation measures in the reservoirs to minimize effects on quality resources. Analysis should also consider future trends in basin inflow.

- ***Water Quality.*** EPA recommended that operational changes consider water quality endpoints like dissolved oxygen, biological endpoints that effect sensitive aquatic species and physical endpoints that protect designated aquatic life use. USACE activities should provide reasonable assurance that water quality standards will not be violated and the flows will be provided to protect aquatic life. The latest science should be considered in alternative development; understanding that a range of flows is important for maintaining "aquatic ecosystems rather than regulating a river to meet a static low flow target."
- EPA also recommended that drought contingency plans be formally coordinated with dischargers and water withdrawalers and that best management practices for sediment and stormwater be included when analyzing management activities.
- ***Public Safety and Recreation.*** EPA recommended that USACE consider procedures to improve public safety through warning systems and to improve recreation in the entire system. It cited use of warning safety enhancement plans and recreational flow releases in other areas of the Southeast.
- ***EJ/Socioeconomic.*** EPA recommended that the EIS include the effect of actions on minority and low-income populations. It also indicated that USACE should continue to engage the community throughout the NEPA process.

4.1.2 Southeastern Power Administration

4.1.2.1 Initial Scoping Period—2008

Comments from SEPA were received November 21, 2008, in a letter signed by Mr. Herbert R. Nadler. The comments included the following points:

- Project repayment costs were developed and assigned based on authorized purposes receiving certain benefits from the projects. Such costs are to be repaid by the purposes through the use of project features, such as available storage.
- Plan changes that create operational restrictions or redistribute project benefits should be accompanied by reallocating project costs and compensating the affected purpose. It is not fair or equitable to expect an authorized purpose to be responsible for costs that do not correspond to the level of benefits received. Reduction in the availability of power affects SEPA's preference customers.
- Municipalities and cooperatives that benefit from project generation depend heavily on their government allocation of capacity and energy to meet their peak loads. Reductions in the level of benefits available should be accompanied by appropriate compensation.

4.1.2.2 Reopened Scoping Period—2009

No comments were received.

4.1.2.3 Reopened Scoping Period—2012

A letter dated November 28, 2012, and signed by Mr. Herbert R. Nadler was submitted with comments from SEPA. The comments reiterated points made in 2008 with the following additions:

- Power customers have expressed concern about the increasing cost of federal power and the reduction of benefits from competing purposes.
- WCM updates should adopt a methodology that minimizes effects on power production or equitably redistributes project costs to other purposes benefiting from operational changes and storage use.

4.1.3 U.S. Fish and Wildlife Service

4.1.3.1 Initial Scoping Period—2008

Comments from USFWS were received November 21, 2008, in a letter signed by Ms. Gail A. Carmody. Regarding the Master Manual, USFWS requested a summary of the current operating rules for each project, an explanation of their basis in congressionally authorized purposes, and a description of how much discretion the USACE has to change the rules. USFWS recommended posting the summary on the District's website. Regarding resources, USFWS recommended the following:

- *Threatened and endangered species.* Address the same ESA-protected resources for the manual update as for the RIOP. The EIS should include a Biological Assessment of effects on these species and their designated critical habitats.
- Contact the states directly and obtain current lists of resources of concern to the state fish and wildlife agencies that could be affected by project operations. Participate with USFWS and other federal and state agencies in efforts to locate and monitor extant populations in the unimpounded portions of the Chattahoochee River and its tributaries.
- *Reservoir fisheries.* USFWS cooperated with the USACE for the 1998 draft EIS for ACF storage allocation to develop a reservoir fisheries performance measure. USFWS recommends that the USACE update this performance measure and use it to evaluate the relative impacts of alternative operating plans on reservoir sport fisheries.
- *Fish passage*. Continue to support and facilitate research on fish passage at Jim Woodruff Dam, and at other ACF federal dams as appropriate, with a goal of identifying and implementing operations that would allow riverine species to travel their historic migratory pathways. Incorporate such procedures into the manual, as appropriate.
- *Water quality*. In the manual, closely examine the effects of reservoir operation on water quality, including ongoing and potential future effects on dissolved oxygen, temperature, pH, conductivity, nutrient and organic material dynamics, and various industrial and municipal discharges.

- *Invasive aquatic plants*. Investigate the feasibility of occasional drawdowns for controlling aquatic plants as part of the manual update.
- *Floodplain habitats.* Evaluate the effects of past and proposed project operations on flood durations and floodplain habitats.
- *Apalachicola Bay habitats and fisheries.* Apply a spatially explicit hydrodynamic model of the bay to assess the effects of alternative operations on salinity regimes and, in turn, on the relative distribution of salt marshes, submerged grass beds, and oyster beds in the bay.

With respect to the alternatives, USFWS recommended the following:

- *Minimum releases*. Use the Master Manual update to comprehensively evaluate storage options in the context of the impacts of altered flow regimes at the ACF dams and the benefits of restoring more natural patterns to the monthly, daily, and instantaneous releases from the ACF dams. Consider how providing windows of more stable flows during critical periods might increase the abundance and diversity of native fishes and other aquatic resources in tailwaters.
- *Winter drawdown.* Consider the potential risks and benefits of reducing the magnitude of the autumn drawdown and/or of beginning the spring refill earlier, especially during dry periods. Consider other alternatives to achieving flood protection.
- *Climate change.* Consider how climate change might affect ACF flow regimes and how to best adapt reservoir operations to the most likely foreseeable changes. Address climate-based operational flexibility in the manual update and in the analyses of the EIS.
- *Consumptive water demands.* Consider the impacts of increasing consumptive water demands in the basin.
- *Fisheries management.* With USFWS and the wildlife agencies of the three states, explore ways to incorporate the draft standard operating procedures into the mix of alternatives evaluated in the manual update.
- *National wildlife refuge.* Use an annual pattern cycling between the highest levels in late winter/early spring and the lowest levels in the late summer. Consider how the benefits and impacts of such a scheme compare with the existing operating regime and other alternatives.

In addition, USFWS noted that it strongly supports the idea of organizing interagency technical workgroups, which would assist the USACE in compiling the information necessary to craft a balanced set of alternatives and to analyze their effects. USFWS is willing to participate in such workgroups.

4.1.3.2 Reopened Scoping Period—2009

Comments from USFWS were received December 17, 2009, in a letter signed by Ms. Sandra Tucker. The comments included the following points:

- The cover letter stated that the previous comments submitted (November 21, 2008) are still relevant and should be addressed under this revised scope.
- In addition, alternative sources of water supply for the Atlanta metro area, including the anticipated short- and long-term impacts on surface and groundwater resources as a consequence of the revised scope, need to be considered.
- USFWS recommended that the USACE's alternatives analysis include the cumulative effects of the proposed action and the expected proliferation of multiple surface and groundwater projects that also affect the operation of federal reservoirs and ultimately flows to the Apalachicola River.
- The previous comments from November 21, 2008, were attached to the USFWS' cover letter.

4.1.3.3 Reopened Scoping Period—2012

Comments from USFWS were received January 11, 2013, in a letter signed by Ms. Sandra Tucker. The letter notes that the recommendations provided in the June 2011 *Draft Fish and Wildlife Coordination Act Report* are still relevant and should continue to inform the scope of the Draft EIS. Comments included the following:

- USFWS submitted a concept for an alternative to receive full consideration in the Draft EIS. This alternative would support flows in the Apalachicola and Chattahoochee Rivers for the fish and wildlife purpose of the ACF projects. USFWS' primary interest is in improving flows and levels for fish and wildlife resources, for which this alternative appears promising.
- The alternative supports monthly target and minimum releases from the system in a manner that is balanced with other project purposes and that avoids or minimizes some. The USFWS indicate its intent to minimize adverse effects of the RIOP. The alternatives includes 11 governing features:
    - Operate the system for target and minimum releases from Buford and Woodruff Dams, consistent with project-specific rules for flood-control, hydropower generation by storage zone, head limits, and maximum fall rates.
    - The targets and minimum releases are month- and zone-specific (Tables 1 and 2).
    - Target releases are subject to zone-specific augmentation limits (Table 3).
    - Storage zones (1-4) are redefined for Lanier, West Point, and George, relative to the authorized top and bottom of the conservation pool.
    - Each storage zone contains a consistent year-round percentage of the total conservation storage at a project, but these percentages vary among the projects (Table 4).

  - Release decisions for Buford and Woodruff Dams are based on the composite storage zone (sum of storage in Lanier, West Point, and George), month, and the previous 7-day basin inflow.
  - If basin inflow exceeds the month/zone target, release the target flow from Buford and Woodruff Dams. Basin inflow exceeding the target is available for storage.
  - If basin inflow does not exceed the month/zone target minus the zone augmentation limit, the release from Buford and Woodruff Dams are the greater of (a) the month/zone minimum, or (b) basin inflow plus the zone augmentation limit.
  - Each project makes daily releases to support its local operating requirements or to replenish storage in the project downstream, whichever is greater, so that all projects remain in the same operating zone.
  - Maximum fall rates and flow support for Woodruff Dam releases greater than 5,000 cfs are suspended when storage declines to zone 4, and resumed when storage returns to a specified zone (drought relief end zone).
  - When flows at Woodruff Dam have been less than 7,000 cfs for more than 30 days, maximum fall rates are suspended and resumed when flows have been greater than 10,000 cfs for 30 days.

- The alternative was tested with a hydrologic model of the basin comparable to the ACF HEC-ResSim model using the USACE's 1939–2008 unimpaired flows and existing consumptive water demands.
- The USFWS comments describe analysis it has done on the above alternative and its issues with an alternative developed by GAEPD and the Atlanta Regional Commission. USFWS indicate that it is conducting a mussel sampling program using side-scan sonar and bathymetry data to determine mussel distribution.

4.1.4 National Park Service, Chattahoochee River National Recreation Area

4.1.4.1 Initial Scoping Period—2008

Ms. Denesia Cheek, NPS Southeast Regional Hydrologist, submitted comments in an e-mail on November 21, 2008. The comments included the following points:

- Manage water and balance the lakes in the ACF system during times of drought, navigation, hydropower, recreation, water supply, water quality, and other project purposes.
- The NPS expressed concerns regarding any decision to reduce flows at Peachtree Creek to less than 750 cfs, the level the NPS sees as a meaningful threshold for preserving water quality and biological health in the river. Historical research indicates that 750 cfs provides better support for recreation and resources than would lower flows. As a federal land management agency responsible for managing a significant percentage of the Chattahoochee River, the NPS continues

to recommend an instantaneous flow of 750 cfs at Peachtree Creek under drought conditions; such a flow is needed to protect resources (fish, wildlife, and recreation) within the Chattahoochee park unit.

4.1.4.2 Reopened Scoping Period—2009

Mr. Daniel Brown submitted comments in a letter on behalf of the NPS and CRNRA with comments on the planned update to the USACE's water control plan for Buford Dam. The comments included the following points:

- In summary, the national importance of the Chattahoochee River corridor as an ecological, recreational, and historic resource has been established by its inclusion in the National Park system. To ensure park resources are "preserved and protected from developments and uses which would substantially impair or destroy them," the NPS would like to work cooperatively with the USACE to manage flows within the Chattahoochee River. The preservation of base flows in the Chattahoochee for ecological and recreational purposes is critical. The NPS would like to see a minimum flow in the river established at no less than 1,000 cfs to ensure that both ecological and recreational uses of the river are preserved. In addition, the NPS encourages the USACE to evaluate the possibility of establishing a flow standard within the central reach of the park (i.e., at the Norcross or Roswell gauge) to ensure that water quality and minimum flows are preserved throughout the recreation area. Finally, the USACE should consider modifying the release schedule from Buford Dam to allow for more gradual increases and decreases in water levels to mitigate the effects of sudden and dramatic changes in river levels. As the USACE prepares the EIS and updated Master Manual, the NPS requests that NPS input and impacts on the CRNRA be fully evaluated and considered.
- *Ecological issues*. The Chattahoochee River supports many species of fishes, including both rainbow and brown trout. Several past scientific studies examined the effects of varying flow regimes on fish species. One study on trout reproductive success (Nestler 1985) was completed by the USACE during an evaluation of a proposed reregulation dam at river mile 342. The report found that rainbow and brown trout habitat was optimal at flows of 1,000–1,500 cfs. A more recent report by Peterson and Craven (2007) stated that "discharge characteristics affected riverine fishes recruitment … during both spawning and rearing periods." The study found that during the spring spawning period, higher discharges (> 3,500 cfs) positively influenced reproductive success and concluded that reproductive success could be increased if suitable discharges were maintained during critical periods. The report also found, however, that high flow pulses that do not mimic natural seasonal precipitation events have substantial negative influence on fish species, particularly during the summer rearing period. The high velocity of currents created by the pulses of water is detrimental to the survival of juvenile and young-of-year fishes because of the increased metabolic rate associated with swimming in these currents.

- *Recreational issues*. Recreation and navigational uses of the river benefit from moderate and more consistent flows. According to a Recreation Flow Preference Report completed by CH2MHILL in 2000, the preferred recreation flows for wade/float fishing, rowing, and power boating is 1,000–1,200 cfs. This report further documented that the ideal recreational flow of 1,000–1,200 cfs was available less than 1 percent of the time during the summers of 1997 and 2000 (period studied). The Nestler report (1985) identified optimal canoeing conditions for all user levels as occurring at between 1,250 cfs and 7,000 cfs. Both of these studies provide strong support for considering baseline flows above 1,000 as crucial to support the recreational uses envisioned by Congress when the CRNRA was established.
- *Cultural resource issues*. Cultural resources in the CRNRA are similarly affected by water releases from Buford Dam. The Ivy Mill ruins in Roswell date back to the 1830s and are on the National Register of Historic Places. Ivy Mill is prone to flooding during protracted high water releases from Buford Dam, and the flooding has contributed to site degradation. In addition to Ivy Mill, the NPS has documented dozens of archaeological sites within the CRNRA, many of which occur adjacent to the Chattahoochee River and its tributaries. These archaeological sites are at high risk of damage from accelerated erosion due to the bank-scouring effects caused by fluctuating releases from Buford Dam. A number of historic fish weirs within the CRNRA are also threatened or have been lost because of siltation, erosion, and flooding related to the current water regime (Gerdes and Messer 2007). The EIS should consider the impacts of rapidly fluctuating water levels on archaeological and historic sites within the CRNRA.

4.1.4.3 Reopened Scoping Period—2012

Comments were received from Mr. Gorgon Wigginger, Acting Regional Director for the NPS Southeast Region, by letter dated January 14, 2013. The cover letter requested to participate as a cooperating agency in developing the Draft EIS for all phases of the study that could affect the CRNRA. Specifically, NPS would like cooperating agency status in developing the Draft EIS and WCM to ensure that pertinent NPS mission statements, legislative authorities, and policies are duly considered when developing any alternatives, related management actions, or options that could affect units of the NPS. These comments are intended to be supplementary to the comments submitted in 2008 and 2009. In general, NPS feels that preserving base flows in the Chattahoochee River for ecological and recreational purposes is critical. NPS encouraged USACE to evaluate the possibility of establishing a flow standard in the central reach of CRNRA to ensure that water quality and minimum flows are preserved. USACE should also fully consider changes to Buford Dam operation to allow for more gradual increases and decreases in water levels or to mitigate the effects of sudden and dramatic changes in river levels. NPS requests that impacts of the updated WCM on CRNRA be fully evaluated and considered.

CRNRA Legislation and Authority. The Chattahoochee River forms the backbone of the park, and CRNRA has a vested interest in Buford Dam operations because the timing of the water releases and related flows in the river directly affect the park managers' ability

to preserve the natural, scenic, recreation, historic, and other values of the park as mandated by Congress when the park was created in 1978. NPS has identified and defined values of special significance in the recreation area that serve as priorities for management action and protection. These encompass seven categories of resources, many of which are directly affected by the operation of Buford Dam. NPS provided scoping comments in six of its categories of resources.

Water Quantity. NPS seeks to optimize flows below Buford Dam to protect and enhance the entire riverine ecosystem. The primary interests of NPS with respect to developing the new WCM are to seek and evaluate operational alternatives that mitigate the extreme nature of short-term (daily/hourly) flow fluctuations and ensuring ample minimum flows to maintain water quality, waste assimilation, and improve conditions for aquatic flora and fauna. NPS would also like the Draft EIS to evaluate operational measures that could be adopted to ensure that increasing incidence of regional drought or growing demand for water in the Chattahoochee Basin does not result in unexpected or unavoidable dips in flow in the CRNRA. NPS recommends that the Draft EIS evaluate establishing a flow standard or modeling node in the central reach of the CRNRA to ensure that Buford Dam is operated to maintain sufficient flows throughout the recreation areas.

Ecology. The Draft EIS should evaluate opportunities for varying discharges from Buford Dam to support a broad range of species in CRNRA. Shoal bass, for examples, are native in the Chattahoochee and Flint rivers only and have been reduced to a handful of isolated populations mainly from developing and operating dams throughout the basin that have fragmented habitat and altered flows. Low temperatures correlated with releases from Buford Dam have a negative effect on recruitment and survivorship of young shoal bass.

Water Quality. Any alternative contemplating a reduction of the current mandated minimum flow of 750 cfs at Peachtree Creek should clearly and credibly evaluate the effects on water quality in CRNRA. If dam operations are modified to institute or accommodate lower base flows (Buford Dam, for instance, has historically been managed to release base flows of up to 1,500 cfs) water quality in CRNRA would likely deteriorate (because of a reduction in positive influence of clean water release from Buford Dam). This would damage already struggling waters such as the portion of the CRNRA that is 303(d)-listed for fecal coliform.

Other water quality concerns include the increasing number and capacity of wastewater treatment plants operating in the boundaries of CRNRA. If the Draft EIS considers the potential for lower baseline releases, there needs to be a corresponding evaluation of the potential negative effects of wastewater discharges on water quality in CRNRA.

Dissolved oxygen levels downstream of Buford Dam are also a concern—this area is designated as a secondary trout stream, and the state water quality standard for dissolved oxygen must be maintained. At a downstream trout hatchery, dissolved oxygen levels have been lower than the state standard in periods of low or minimum flows. These low levels of dissolved oxygen can negatively affect the health of fish and other aquatic organisms. These have secondary effects on recreational users and local economies. The Draft EIS should analyze the impact of low dissolved oxygen on recreational and

ecological conditions in the upper Chattahoochee River and evaluate operational changes that could elevate seasonal dissolved oxygen levels in the tailwater.

Recreation. NPS' principal concern related to recreational use of the river is public safety. CRNRA attracts more than 3 million visitors a year, approximately a third of whom engage in some form of water-based recreation. USACE and NPS have worked together with other stakeholders to improve safety in CRNRA by raising awareness of the hazards associated with the release of high flows from Buford Dam. A decrease in documented incidents and accidents in 2012 suggests that this effort might be working. The Draft EIS should address the safety of water-based recreation in CRNRA, including an evaluation of alternatives for modifying dam operations to improve public safety. Past studies have provided strong support for higher baseline flows (during summer season especially) would enhance the recreational values envisioned by Congress when CRNRA was established. It is also important for the Draft EIS to evaluate the possibility of supplemental releases to support weekend recreational activities.

Geology. The operation of Buford Dam results in abrupt and dramatic changes in water levels for short periods. This has resulted in severe bank erosion and collapse along the mainstem of the Chattahoochee River and in tributary confluences because of backwash effects. The Draft EIS should evaluate the geomorphological effect of frequent but short-term, high-flow conditions with emphasis on accelerated erosion of river and tributary banks. The environmental effects of severe bank undercutting and erosion include increased siltation, which can lead to long-term habitat alterations that can negatively affect aquatic species. The Draft EIS should evaluate the effects of dam operations on organisms that benefit from a gravel or rocky substrate. Rapid bank erosion has socioeconomic effects—CRNRA has worked with a growing number of municipalities, businesses, homeowner associations, and individual property owners to stabilize banks along the Chattahoochee River and its tributaries to prevent loss of property. The Draft EIS should consider future impacts of bank erosion and the growing cost of measures taken to protect private and public property and facilities.

Culture and History. Cultural and historic resources in the CRNRA are affected by water releases from Buford Dam. Cultural and archaeological sites along the Chattahoochee River and its tributaries are at high risk of damage from accelerated erosion caused by the fluctuating releases from Buford Dam. Historic fish weirs are also threatened or lost because of siltation, erosion, and flooding related to the current water regime. The Draft EIS should consider the effects of rapidly fluctuating water levels on archaeological and historic sites in the CRNRA.

4.1.5 National Oceanic and Atmospheric Administration – National Marine Fisheries Service

4.1.5.1 Initial Scoping Period—2008

No comments were received.

4.1.5.2 Reopened Scoping Period—2009

No comments were received.

4.1.5.3 Reopened Scoping Period—2012

Comments were received from NOAA's National Marine Fisheries Service out of the Southeast Regional Office on January 14, 2013. The letter was signed by Ms. Virginia M. Fay, Assistant Regional Administrator of the Habitat Conservation Division. NMFS supports the recommendations by the USFWS and other agencies presented in the 2011 *Draft Fish and Wildlife Coordination Act Report* to increase flows in the Apalachicola River above the minimum 5,000 cfs. NMFS believes this could be done by developing a water control plan that more fully integrates all water storage projects in the ACF Basin rather than relying almost exclusively on Lake Lanier. The greater flows would be more supportive of essential fish habitat in the Apalachicola estuary. Additionally, improved river flows during the migratory season for diadromous fish species (January to May) would also support restoration of spawning areas used by Alabama shad, Gulf sturgeon, and striped bass.

4.2 Political Entities

4.2.1 U.S. Congress: Georgia Delegation

4.2.1.1 Initial Scoping Period—2008

Representatives Tom Price, John Linder, Paul Broun, and Nathan Deal submitted a letter dated September 18, 2008, to Secretary John Paul Woodley. The letter states the following:

- Water quality and supply should be an expressed priority of the USACE in this process.
- The Master Manual should be made current, taking into account the water supply shortage many Georgia communities face. Consider a plan that accounts for the complex dynamics of the 3.5 million people in metro Atlanta that depend on Lake Lanier for drinking water, and keep in mind that Lake Lanier provides the bulk of the storage for the entire ACF River Basin.
- The USACE should conduct a thorough analysis of operation of the ACT and ACF basins, looking for alternative methods to improve water management of these precious water resources.

4.2.1.2 Reopened Scoping Period—2009

No comments were received.

4.2.1.3 Reopened Scoping Period—2012

No comments were received.

4.2.2 U.S. Congress: Florida Delegation

4.2.2.1 Initial Scoping Period—2008

Senator Bill Nelson and Representative Allen Boyd from Florida submitted comments in a letter received November 21, 2008. The comments included the following:

- The EIS must be truly comprehensive and must affect the Master Manual.
- The CEQ's guidance states that real problems should be identified early and properly studied. Appropriate related analyses should be identified and considered. The scoping process should consider all aspects of the "affected environment" in the ACF.
- The updated manual must establish a scientifically based and equitable distribution of the waters of the ACF system. Accumulate data on the available and current water withdrawals.
- In-stream flow requirements should be sufficient to fulfill authorized uses. Assess the impact of variations of freshwater flow on the ecology of the Apalachicola River and downstream coastal ecosystems. In the assessment, compare the unimpaired flow regime, historical flow records, and flows imposed in the current RIOP.
- Assess water availability, supply options, demand-management alternatives, and socioeconomic factors.
- Continue working with the National Research Council to facilitate a complementary study to the USACE's EIS.

4.2.2.2 Reopened Scoping Period—2009

No comments were received.

4.2.2.3 Reopened Scoping Period—2012

Senator Bill Nelson of Florida and Senator Richard Shelby of Alabama cosigned a letter to the Honorable Jo Ellen Darcy and Lt. General Thomas P. Bostick received October 12, 2012. The letter contained the following points:

- Expectance that the USACE to adhere to its pledge of neutrality in this process and believe that the responsibility for achieving a permanent resolution of the controversy rests with the three governors.
- Concern that the USACE is increasingly exceeding the limits of its discretion to reprioritize water project purposes without Congress' involvement. In updating the manual, the USACE must not make material changes to the uses for specific purposes of water resources projects. That is the proper domain of the Congress, not the USACE.

- Encouragement to hold a robust public notice and comment process and to give full and careful consideration to the comments and concerns of the states and other stakeholders who depend on reliable downstream flows.
- Expectance of no substantive changes to the operation of the ACF system until the USACE completes the public process.

4.2.3 U.S. Congress: Alabama Delegation

4.2.3.1 Initial Scoping Period—2008

No comments were received.

4.2.3.2 Reopened Scoping Period—2009

No comments were received.

4.2.3.3 Reopened Scoping Period—2012

Senator Richard Shelby and Jeff Sessions signed comments shared with Florida's Senator dated October 12, 2013. These are summarized in Section 4.2.2.3.

4.2.4 Georgia House of Representatives

4.2.4.1 Initial Scoping Period—2008

Mr. Carl Von Epps of the Georgia House of Representatives submitted comments in a letter received June 2, 2008. His comments focused on Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, and included the following:

- Lowering lake levels at West Point Lake represents a potential for denial of access to recreational resources for minority and low-income populations in West Georgia and East Alabama. Potential impacts on "consistent consumption of fish and wildlife" also must be considered. A significant amount of shoreline used for recreational activities has been affected. Mr. Von Epps questioned the magnitude of the study and suggested managing the project in a manner that would ensure minimal impact on the affected communities.
- West Point Lake was assigned a cost allocation of 44.3 percent of its allocated investment to recreation and sportfishing and wildlife development. This is the highest cost allocated to any of the congressional purposes authorized for the lake.
- The USACE uses West Point Lake "as its workhorse" to provide for other demands throughout the river basin, while ignoring the original authorized purpose of recreation, as well as the needs and expectations of minority and low-income residents.

- The USACE is required to determine the effects on minority and low-income populations, to coordinate research and data collection, to conduct public meetings, and to develop inter-agency model projects.
- The USACE should reconsider and fully address the impacts that have resulted thus far under the IOP, especially during the summers of 2006 and 2007.
- The project should be managed so usable winter and summer pool elevations more closely approximate the initial recreational impact level of 632.5 feet msl, ensuring recreational use of the lake.

4.2.4.2 Reopened Scoping Period—2009

No comments were received.

4.2.4.3 Reopened Scoping Period—2012

Representative Randy Nix of District 69 wrote as the Georgia General Assembly member who represents most of West Point Lake. Representative Nix noted that the current management plan is destroying West Point Lake and requested that the USACE reconsider and be fair to all stakeholders, businesses, residents, and species in the new plan. Representative Nix submitted comments on behalf of LaGrange, Georgia, making the following points:

- West Point Lake is a key and critical economic driver for LaGrange, and all of Troup County and surrounding area. Without adequate lake levels, economic opportunities are lost. There is direct economic damage through low fish spawns and lost fish tournaments. But the larger economic damage to the area is evident in the lack of any new developments that are in any way dependent on the lake.
- West Point Lake was the first USACE project to have a specific authorization by Congress for recreation, sport fishing, and wildlife development. The constant fluctuation of winter and spring lake levels over the past several years has had devastating effects on the annual bass spawn and other fish populations. The reduction of fish spawn directly affects the fish take and, therefore, the reputation of West Point Lake as a sport fishing destination.

A change to the West Point Lake rule curve for the winter to an elevation of 632.5 msl would provide many advantages for the region, and ACF Basin as a whole. The additional storage provided would enhance and support the congressional authorizations of the lake, in particular recreation, sport fishing, and wildlife development. The availability of additional water could also support navigation windows as deemed necessary by the USACE.

- Further study is requested for the requirement of 5000 cfs at the Florida line, as is mandated by the Endangered Species Act and USFWS. This study should include accurate population counts of the three endangered species of mussels to determine if each should still be included on the endangered species list. If inclusion is still directed, a comprehensive recovery plan for each should be an integral part of the study.

- Congressional authorizations for West Point Lake should be carefully and thoroughly considered. West Point Lake has been consistently used as the *work horse* of the ACF Basin to the detriment of any lake-related economic development in Troup County for many years.

4.2.5 Georgia Senate

4.2.5.1 Initial Scoping Period—2008

No comments received.

4.2.5.2 Reopened Scoping Period—2009

No comments received.

4.2.5.3 Reopened Scoping Period—2012

On December 12, 2012. Georgia State Senator Mike Crane of District 28 submitted comments stating that he was in full support of the comments submitted by Representative Randy Nix on behalf of LaGrange. He specifically requested information regarding the 5,000 cfs requirement at the Florida line because he felt the requirement extremely detrimental to water levels at West Point Lake and wanted to see data that supports that continued flow demand.

4.2.6 Georgia Office of the Governor

4.2.6.1 Initial Scoping Period—2008

No comments received.

4.2.6.2 Reopened Scoping Period—2009

No comments received.

4.2.6.3 Reopened Scoping Period—2012

On January 11, 2013, Nathan Deal, Governor of Georgia, sent comments to the Honorable Jo-Ellen Darcy referencing the USACE 2012 legal opinion that the USACE has the legal authority to grant Georgia's request to allow withdrawals and make release from Lake Lanier to meet Georgia's projected water supply demands of 705 mgd. The governor noted that operating Lake Lanier as Georgia has requested represents the highest and best use of the lake. The governor included an affidavit by Judson H. Turner, director of the GAEPD, containing the updated demographic and water demand data that confirm the continued need for the action Georgia has requested. The letter also contained an updated analysis of the impact of granting Georgia's request on other project purposes and waters downstream. Georgia believes that 705 mgd would be sufficient to meet Georgia's water needs from Lake Lanier and the Chattahoochee River to approximately 2040.

4.3 State Agencies

4.3.1 Alabama Office of Water Resources

4.3.1.1 Initial Scoping Period—2008

Mr. Brian Atkins, director of the AOWR, on behalf of the State of Alabama, submitted comments by email November 21, 2008. The comments included the following:

- To satisfy the USACE's obligations under federal law, including NEPA, the USACE must focus on the authorized purposes of Lake Lanier (hydropower, navigation, and flood control) and establish a scope for the manual update that addresses five objectives:
    1. The USACE should determine the critical yield of each reservoir using the most current hydrologic and climatic conditions.
    2. The USACE should establish the baseline for any proposed changes to the water control or master manuals, and the baseline should be based on authorized project purposes.
    3. The USACE should use the agreed-upon HEC-5 model developed during the Comprehensive Study or develop a new model that is agreed upon by the USACE and the states.
    4. The USACE should assess whether any changes in the baseline conditions are necessary to comply with existing laws and regulations, including those designed to protect the environment.
    5. The USACE should analyze any proposed modifications to the baseline and other legal requirements to develop the proposed operations for Lake Lanier, West Point Lake, and Lake Walter F. George.
- Each objective is critical to the update process, and the order in which the steps are completed is significant. It is impossible to evaluate and assess proposed changes to the water control plans unless the critical yields have been calculated and the baseline is established. Refusing to undertake a complete review and assessment of these objectives will ensure that valid water control plans will never be developed and that additional conflicts over the USACE's operations of the federal reservoirs in the ACF River Basin will follow.

4.3.1.2 Reopened Scoping Period—2009

Mr. Brian Atkins, Director of the AOWR, on behalf of the State of Alabama, submitted additional comments on December 31, 2009. These comments are summarized below:

- Alabama agrees with the USACE's decision to reopen the EIS scoping process for the Master Manual update in the ACF River Basin in light of the July 17, 2009, federal court order. The USACE should strictly adhere to the operational directives contained in the order in revising the Master Manual.

- Per the court order, the USACE should focus on the authorized purposes of Lake Lanier—(hydropower, navigation, and flood control. The scope for the manual update should address the following objectives: Determine the critical yield of each reservoir using the most current hydrologic and climatic conditions; adhere to the operational baseline as set forth in the July 17, 2009, order; use the agreed-upon HEC-5 model developed during the Comprehensive Study and used in the negotiations under the ACF River Basin Compact or develop a new model that is agreed upon by the USACE and the states; assess whether any changes in the baseline conditions are necessary to comply with existing laws and regulations, including those to protect the environment; and analyze any proposed modifications against the baseline set forth in the court order and other legal requirements to develop the proposed operational updates.
- Thorough and accurate revised critical yield analyses are essential to determine the amount of water that is available to address competing demands for water and water storage in the driest of conditions and to develop water control plans that satisfy the authorized project purposes. The USACE should use the existing droughts of record to calculate the critical yields, including the most recent drought of record. Critical yield calculations should consider all water withdrawals and returns, as well as downstream minimum flow requirements.
- The critical yield should be determined in an open and public process that includes input from stakeholders throughout the ACF River Basin. Before the critical yields are finalized, the USACE should provide opportunities for public input, particularly any modeling or operating assumptions used to make such calculations.
- After critical yields of the federal reservoirs are determined, the USACE must evaluate proposed modifications to the water control plans against an appropriate baseline, which is operation as outlined in the July 17, 2009, order. Proposed modifications to the baseline condition must address whether, and to what extent, such modifications would prevent the USACE from fully satisfying the authorized project purposes.
- The scoping notice states that the USACE will "evaluate present circumstances as part of its EIS, while acknowledging that it currently lacks authority to continue to accommodate present levels of water supply at Lake Lanier beyond July 17, 2012." The USACE should not evaluate operations that have been found to exceed its legal authority. The USACE should not make any assumptions in the manual update process regarding possible future congressional action that might expand its current authority.
- The manual update process should evaluate the USACE's compliance with existing environmental laws. The USACE should ensure that, even under drought conditions, sufficient flow is maintained below each dam, so that water quality standards are met and endangered species are protected.
- The USACE and the states should agree upon the computer model that will be used to evaluate the impact of any changes to the baseline operations. Alabama

understands from previous scoping efforts that revisions to the Master Manual will be evaluated using the HEC-ResSim model. The HEC-ResSim model should replace the HEC-5 model only after the technical staffs of the three states and the USACE agree that it is a better tool to evaluate the ACF system. The USACE should not use the HEC-ResSim model without input from the states on the assumptions underlying the model and sufficient time for each of the states to develop the experience and expertise required to evaluate the model results.

- The USACE must assess any potential reservoir construction within the ACF River Basin that might affect inflows into those federal reservoirs. The USACE should evaluate whether the potential efforts in Georgia to increase the amount of water storage available for water supply would require reallocation of storage in federal reservoirs.
- Some proposed reservoir projects in Georgia might affect inflows into the federal reservoirs in the ACF River Basin, including inflows from the Flint River. A detailed assessment of the environmental and operational impacts of such proposed projects on future operations of federal and non-federal projects in the basin is needed. Both the individual and cumulative effects of such projects, along with other foreseeable projects, should be addressed. Losses due to inter-basin transfers and consumptive uses and appropriate limitations on any such losses, particularly under drought conditions, should be considered.
- The updated manuals should establish some degree of certainty in drought conditions. The update should recognize that releases from conservation storage at Lake Lanier for protection of downstream flows and water quality are necessary and expected and that impacts on recreation and recreation facilities are temporary but unavoidable during dry conditions.
- The USACE should not base any operational decisions in the ACF on projections of economic impacts related to reductions in water supply or recreation opportunities.

4.3.1.3 Reopened Scoping Period—2012

Mr. Brian Atkins, Director of AOWR, on behalf of Alabama, submitted additional comments on January 14, 2013. These comments supplement the previous comments submitted by AOWR. The new comments are summarized below:

- It is essential that the USACE use an accurate model, accurate data, and an accurate critical-yield calculation. If any of these are flawed, the outcome of the process will be flawed. Alabama is concerned that there are major problems with the model, the underlying data, and the critical-yield calculation. Alabama's analysis of the output of the HEC-ResSim model USACE is using raises serious concerns about its accuracy. Alabama believes that there are issues in the model between Buford and Atlanta either with the unimpaired flows or with data related to demands in ACFHEC_1 O.dss that were used as model inputs. Once these serious discrepancies with the model are resolved, a similar analysis would need to be done to assess the model's accuracy for the areas downstream of Atlanta.

- Alabama has significant concerns about the USACE's preferred method to calculate critical yield in the USACE's *2010 Critical Yield Report. Method B,* which the USACE has identified as its preferred manner of calculating critical yield for the ACF projects, removes water withdrawals from the system, even if those withdrawals require augmentation from the federal projects.
- To develop a valid EIS under NEP A, the USACE must use an appropriate baseline for purposes of determining the effects of the proposed action and any alternatives. The only baseline that is appropriate is one based on the existing ACF manual promulgated in 1958.
- The manual update process should also evaluate the USACE's compliance with existing environmental laws.
- It is essential that USACE include in the EIS a complete assessment of the impacts of operations pursuant to the revised manual on the Middle Chattahoochee region. That region has often been given little attention in determining USACE operations in the ACF Basin. Any operating regime must be created to ensure that certain minimum flows are maintained at all times in the Middle Chattahoochee region.
- The EIS must consider the municipal and industrial water-supply needs of entities in the Alabama portion of the basin. Domestic water supply in southeast Alabama that is part of the basin will be a growing water-resource demand, and industrial needs will grow in the future. Reductions in elevation or flow rates of the river adjacent to Farley Nuclear Plant in Columbia, Alabama, could adversely affect the ability of the plant to maintain regular operations. Such restrictions on operations could impose significant costs in terms of replacement electric power and could cause environmental concerns. The ability of other industries in the region to operate normally is also imperiled by reduced flows because of a reduction in wastewater assimilative capacity. Such a reduction also limits the ability of the region to meet its industrial-development potential.
- Alabama's needs related to agricultural water supply must also be taken into account in the EIS. Agricultural water use in the ACF Basin is expected to steadily increase, but it is expected to increase most rapidly in the Alabama portion of the basin.
- The EIS must take account of impacts of USACE operations on navigation in the Chattahoochee River. Navigation is one of the purposes for which Lake Lanier was constructed, but the action-zone regime under which Buford Dam is operating largely ignores navigation interests except when the reservoir is nearly full.
- It is essential that the EIS and WCM account for the effects of fluctuating and declining pool levels on recreation at the reservoirs below Lake Lanier in the ACF Basin. Recreation at Lake G.W. Andrews, Lake Walter F. George, and West Point Lake is a major industry. Lower pool levels will have a negative effect on tourism at Lake Walter F. George. Water level fluctuations at West Point Lake and Lake Walter F. George could damage fish habitat and affect sport fishing. Alabama

believes that it is critical for the USACE to focus on the adverse effects of wildly fluctuating pool levels and catastrophic drawdowns at Lake Walter F. George.

- The USACE must also consider public safety needs as part of the EIS. Alabama maintains a marine patrol in the portion of West Point Lake in the state. The ability of the patrol to reach several areas of the lake is precluded if lake levels drop because of low inflows.
- The EIS needs to take into account the impact of USACE operations in the basin on the Eufaula National Wildlife Refuge.
- The EIS must evaluate the cumulative impacts of other planned sources for water supply in the basin, especially in the Atlanta area.
- An important aspect of the NEPA process is the evaluation of alternatives. Atlanta-area interests should not drive the process. The USACE must also recognize that water supply accommodation for the Atlanta area is not an *all-or-nothing* proposition where all the area's water supply needs to be met out of the federal reservoirs or none at all.
- USACE must consider the action zones used at the federal projects. The actions zones have approximately 80 percent of the conservation storage pool at Lake Lanier in zone 4. In zone 4, the emphasis is placed on water supply, and hydropower is typically generated only when releases are made for water supply purposes. This is not appropriate in light of the Eleventh Circuit's recognition that any accommodation of water supply must be balanced with the hydropower purpose. USACE must consider alternative action zones that reflect a more balanced pursuit of the project's multiple purposes. In addition, USACE must consider adjusting the action zones so that a significantly lesser percentage of the conservations storage pool is in zone 4.
- Alabama believes that several fundamental errors are in the legal opinion, especially with regard to its analysis of USACE authority to accommodate current and increased levels of water withdrawals from Lake Lanier and downstream at Atlanta.
- The legal opinion incorrectly concludes that no reallocation of storage would be required for current and increased releases from Buford Dam to accommodate downstream water supply. USACE must proceed on the basis that an allocation of part of the conservation storage pool at Lake Lanier would be required if releases from the dam are going to be made for downstream water supply.
- The legal opinion contains a flawed evaluation of the effects on hydropower from increased water-supply operations at Lake Lanier. There are also serious methodological flaws in the legal opinion's evaluation of the system impacts, and those flaws result in a significant understatement of the system impacts.
- The legal opinion's analysis of the Water Supply Act of 1958 cannot be reconciled with the plain language of the statute. The plain language of the statute does not support the interpretation that the assessment of whether major operational changes would occur with a modification should be based on system

operations. If the modification would involve major operational changes at the project in question, the act requires congressional approval.

- The legal opinion also uses an incorrect baseline in determining whether either of the water supply authority triggers for congressional approval of a reallocation requires such approval in this case. The D.C. Circuit's opinion made clear that the correct baseline at Lake Lanier for purposes of performing the trigger analysis is the amount of storage originally allocated to water supply at Lake Lanier, which is zero. 514 F.3d at 1324. The D.C. Circuit rejected USACE's position that any prior water supply accommodations could be included in the baseline.
- In evaluating USACE authority to allow direct withdrawals from Lake Lanier, the legal opinion assumed that 107 mgd out of the withdrawals of 297 mgd would be returned to Lake Lanier. The legal opinion concedes that, if those returns are not made, the direct withdrawals could exhaust all Lake Lanier's conservation storage pool in a critical drought. Alabama is concerned that the assumption of 107 mgd in returns indefinitely into the future is unrealistic.
- Alabama also has a concern about USACE's ability to enforce the assumed level of returns. The USACE should not assume that any direct withdrawals will be returned to Lake Lanier.
- Alabama does not believe it is credible to assume that the USACE would allow Lake Lanier's elevation to fall to 1,040. Because that water-supply has been the preeminent concern during past drought conditions at Lake Lanier, Alabama believes that other project purposes would likely be sacrificed rather than allow the elevation to drop that low. In preparing the EIS and the WCM, USACE must rely on realistic assumptions concerning how far the reservoir's elevation would be allowed to drop during the drought of record, rather than the unrealistic assumptions reflected in the legal opinion.

4.3.2 Florida Department of Environmental Protection

4.3.2.1 Initial Scoping Period—2008

FDEP submitted a letter received November 20, 2008, signed by Ms. Janet Llewellyn. The comments are summarized below:

- Florida contends that the USACE's current process is inconsistent with federal laws and inadequate for both NEPA and the WRDA.
- The ongoing litigation, and subsequent judicial determinations, between the USACE and the States of Florida, Alabama, and Georgia and various stakeholders, must be incorporated into the manual revision process.
- For NEPA analysis the USACE must use the appropriate environmental baseline, which is the 1958 Master Manual prepared for the ACF, not the 1989 draft water control plan or existing conditions. The draft manual established Action Zones and the 5,000 cfs flow requirement to the Apalachicola River, both of which the USACE unilaterally adopted without compliance with the Flood Control Act, its

own regulations, NEPA, or the ESA. NEPA does not allow the USACE to grandfather changes in water control operations that have not been subject to final NEPA review. All changes in reservoir operations since that time and their environmental impacts must be analyzed under NEPA as part of the proposed action.

- Effective scoping requires a more detailed proposal from the USACE.
- The USACE must provide a meaningful opportunity to obtain informed public comments. The scoping meetings did not provide meaningful participation or the ability to answer direct questions. The current process does not meet the general guidelines for scoping under NEPA. The USACE has failed to provide fundamental information that is critical to the scoping process. For example, the USACE must include a Drought Contingency Plan.
- Effective scoping requires a revised scope for the proposed action. The Master Manual must clearly describe all decisions so all parties can easily understand the proposed action, and it must be evaluated under NEPA.
- Alternatives that should be considered include an alternative based on true basin inflow, an alternative that uses the entire conservation pool in Lake Lanier, a strong conservation alternative, and a recovery-based alternative.
- Impacts that should be analyzed include effects on Apalachicola Bay salinity and nutrient composition, and the corresponding economic impact on Apalachicola Bay and surrounding region; effects on Apalachicola River floodplain habitats; effects on the Apalachicola River's channel morphology due to altered flows and changes in operation; and relevant cumulative impacts.
- Potential mitigation measures to be explored must include measures within and outside the USACE's jurisdiction. The key mitigation measures must include conservation and water transfers.
- With respect to compliance with the *Coastal Zone Management Act*, USACE actions that affect the Apalachicola River and Bay must be consistent to the maximum extent practicable with the Florida Coastal Management Plan. The *Coastal Zone Management Act* further obligates the USACE to provide Florida with a consistency determination before undertaking activities that affect the state's coastal resources, including implementation of the new Master Manual.

4.3.2.2 Reopened Scoping Period—2009

FDEP provided additional comments in a letter on January 4, 2010. The comments focused on the scope and elements of the USACE's EIS review for the Master Manual updates and revisions, including the calculation of an updated critical yield for each reservoir in the ACF River Basin and a broad review of alternatives and impacts of the proposed action. In particular, FDEP encouraged the USACE to carefully evaluate the impact of the USACE's operation of its ACF reservoirs on the citizens, ecology, and economy of Florida, especially on the unique and extraordinary Apalachicola River and Bay.

FDEP expressed the following concerns and comments:

- *Scope of the* USACE*'s EIS Review*. Florida agrees with the USACE that the Water Control Manual for the ACF River Basin and the water control plans for each of the five federal reservoirs on the Chattahoochee River must be consistent with the Court's legal rulings in the Phase 1 Order. The USACE's operation of the ACF reservoirs significantly affects the citizens and environment of Florida. In addition, Florida has always maintained that the USACE must review and revise its operations and water Control plans to be consistent with federal law, including NEPA, the *Water Supply Act of 1958*, the *Flood Control Act*, the ESA, and the *Coastal Zone Management Act*. Irrespective of the Phase 1 Order, NEPA has always required a broad review of alternatives, impacts and mitigation measures.
- *Elements of the EIS*. The EIS for the Water Control Manual revision should include an accurate and updated critical yield based on the actual drought of record; should use an appropriate and agreed-upon modeling approach; should analyze a full range of alternatives; and should carefully consider associated impacts and mitigation measures, as well as appropriate state and federal environmental laws.
    1. *Critical Yield*. An important element of the WCM revision, and its NEPA review, is an accurate critical yield for the ACF River Basin and each of the USACE's reservoirs. Currently, the USACE is in the process of analyzing and updating the critical yield for the ACF River Basin and must complete this analysis by the end of February 2010, as mandated by Congress in the FY 2010 Senate energy and water development appropriations bills The USACE should reopen the scoping process or otherwise seek public comment before finalizing its new critical yield analysis.
    2. *Modeling*. Modeling is a crucial component of both the NEPA review process and the development of a new WCM. The 2009 Final Scoping Report indicated the USACE's intent to evaluate revisions to the Master Manual using the HEC-ResSim model. Previous analyses, such as the 1998 draft EIS on the ACF Compact, have used the HEC-5 model, and the technical staffs of each of the three states are familiar with the HEC-5 model. Development and use of a new model, such as HEC-ResSim, should occur only with input and approval from all three states. The USACE should afford the states' technical staff adequate opportunity to review, become acquainted with, comment on, and endorse the assumptions underlying a new model.
    3. *Review of Alternatives*. NEPA requires the USACE to study, develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources. The evaluation of alternatives is "the heart of the environmental impact statement." The USACE must rigorously explore and objectively evaluate all reasonable alternatives and, for alternatives

that were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.

- The USACE should review and consider a full range of alternatives, including operating plans or action zones that differ from current operations.
- The USACE should evaluate all available means to maximize likelihood that endangered and threatened species in the Apalachicola River will recover to the point of de-listing.
- The USACE must include cumulative impacts from other water supply options that the State of Georgia will develop.

4. *Review of Impacts.* The USACE at a minimum should evaluate the following impacts:
   - The USACE must evaluate impacts to Apalachicola River and Bay ecosystem.
   - An analysis that compares proposed WCM revisions to anything other than a baseline that does not include water supply withdrawals and releases from Lake Lanier would be inappropriate, unlawful and in direct contravention of the Phase I court order.
   - The USACE must evaluate incremental changes that have occurred since the 1970s.
   - The USACE should evaluate its WCM revision in conjunction with proposed new sources for water supply or diversion.
   - The USACE should evaluate the impacts of growth induced by providing new sources of water supply in the ACF Basin.
5. *Consideration of Mitigation.* The USACE should consider additional system-wide mitigation with regard to water quantity and flows in the ACF Basin.

4.3.2.3 Reopened Scoping Period—2012

FDEP provided additional comments in a letter of January 14, 2013. The comments note that Florida's earlier predictions about the impact of low flows in the Apalachicola River on the surrounding environment and way of life in the river and Apalachicola Bay turned out to be correct. Low amounts of water released to the bay have also corresponded to the lowest recorded oyster harvest in the bay; this has prompted Florida's governor to request a disaster declaration in the bay.

Florida feels the update of the WCM is timely and necessary. FDEP states that the USACE must be less conservative in maintaining upstream reservoir levels at the expense of downstream river flows. The USACE can no longer assume that all needs can be met without proactively insisting on more aggressive upstream conservation—upstream use has compromised the ability to meet obligations and contributed to the steady drop in river levels over the past three decades. These comments are intended to identify what the

USACE can do to help arrest degradation in the Apalachicola River and Bay ecosystem. FDEP included its earlier comments with these comments.

Because the upstream consumption and related depletions have rendered a complete return to the pre-dam hydrograph infeasible, Florida has developed an alternative reservoir operating regime, which it presented last November at the USFWs workshop in Eufaula, Alabama.

Summary of Florida's Findings. Increasing consumption and drought frequency have reduced inflows to USACE reservoirs, and USACE operations have favored elevated lake levels at the expense of river flows. Continued insistence on elevating storage levels, irrespective of increasing demands, and without regard to empirical evidence that such operations devastated Apalachicola Bay and its oyster population is unacceptable. Florida's modeling with the USACE's own HEC-ResSim model indicates that increased demands have taken the reservoir system to its limits.

The Problem of Upstream Consumption. Florida modeling has demonstrated that increasing demands can have a disproportionately large negative effect on lake storage in severe droughts. The USACE must draw substantially on reservoir stage to make up for upstream depletions simply to meet the minimum flow floor at the Chattahoochee gage. The USACE must take a proactive role to promote conservation in the basin instead of leaving the matter entirely up to Georgia.

Florida's Alternative Operations. Florida has developed an alternative operating regime based on five core principles:

- Release triggers based on Revised Basin Inflow instead of the USACE's net Basin Inflow, which is quantified only after all consumptive use is made upstream
- Rather than a handful of minimum flow floors, a full suite of minimum flows based on historic exceedance values that vary with seasons, lake storage zones, and general inflow conditions (dry or normal/wet)
- A sharing of Revised Basin Inflow in the form of additional releases of 50 percent of available Revised Basin Inflow over the minimum release, unless storage is in drought zone (except under certain conditions when storm spillage is available)
- Elimination of *Drought Operations* (5,000 cfs minimum) and *Exceptional Drought Operations* (4,500 cfs minimum)
- Full use of conservation storage, according to the design operating range for the project

Florida contended that the USACE, while meeting its various obligations, must draw more heavily on storage to minimize departures from the natural hydrograph. Modeling demonstrates that upstream consumption precludes the USACE from obtaining pre-dam flows solely through modified reservoir operations. Florida urged the USACE to carefully study the proposed alternative operating regime and evaluate all available authorities the USACE has to use substantially more of its available conservation storage

to augment flows during droughts and promote additional conservation upstream so that both river flows and reservoir levels can be adequately protected.

The USACE*'s Remand Analysis and Future Depletions.* A major question the USACE must address is the extent to which it should serve further water supply demands in the Atlanta metro region. In light of its extensive modeling efforts, Florida has concluded further upstream consumption unchecked by aggressive conservation efforts will continue to reduce both river flows and reservoir levels. This raises serious concerns about the analyses in the USACE's *ACF Remand Modeling Technical Report* (June 2012), prepared to support the counsel's opinion. Current demands have already resulted in devastatingly low river flows, and reservoir levels will also drop to unacceptably low levels if demands continue to increase as projected. Aggressive conservation efforts are essential to maintaining the integrity of the river and reservoir system.

The USACE's ability to maintain the reservoir system is at risk, yet this issue was not addressed in the remand analysis. Possible strategies to require or encourage aggressive conservation should have been discussed. Because the river system is overallocated, any serious analysis of ACF reservoir operations must address this challenge and evaluate available mechanisms to protect inflows to federal reservoirs.

Additional Concerns. In determining the appropriate flow regime in the Apalachicola River, some basin interests are advocating operations designed solely to meet arbitrarily selected habitat metrics such as the amount of spawning habitat for a single species inundated at a particular flow. This approach is untenable. Arbitrarily selected species-specific metrics can be misused to justify even greater departures from the natural flow regime with even less water being provided to an already distressed environment. Better flow metrics are needed that protect the system as a whole.

Georgia's Proposal. Florida takes exception to Georgia's presentation at the Eufaula workshop because it included a proposed operation based on narrowly considered metrics for limited species. Simply stated, Georgia misused Apalachicola River and Bay metrics to support a proposed operating regime that resulted in Lake Lanier levels about 3–4 feet higher than current operations most of the time, and lower flows in the Apalachicola River nearly half the time with the duration of flatline minimum flows almost doubled. It is clear that the Apalachicola River needs more flow, not less, to help recover from the devastating mortality in the bay that occurred this summer and previous massive die-offs of endangered mussels, decline in fisheries, and drying of the floodplain forest that has occurred in recent years.

4.3.3 Georgia Department of Natural Resources, Environmental Protection Division

4.3.3.1 Initial Scoping Period—2008

Comments from GAEPD were received November 21, 2008, in a letter signed by Dr. Carol Couch. The letter noted the following:

- GAEPD recommended strongly that the USACE not make the IOP, including the RIOP, the proposed action. The USACE should analyze a range of reasonable and feasible alternatives.
- Issuing water withdrawal permits is a state and local action, and therefore it should not be addressed within the scope of connected, cumulative, and similar actions. The USACE has no authority to make decisions on water supply and must defer to the State of Georgia on such issues. Water supply withdrawals should be examined as an impact of the proposed federal action.
- The USACE is required only to examine reasonable and feasible alternatives.
- The No Action Alternative should be interpreted to mean no change from current management operations. Operating according to water supply needs in the past would require a new action and thus would not constitute "no action."
- The USACE should coordinate with state and local interests to analyze water demands at Lake Lanier over the past several years for current water supply.
- The RIOP is interim until the Master Manual is updated, and it is not the appropriate choice for the No Action Alternative. The USACE must conduct a detailed study on the RIOP's long-term effects.
- Limiting the scope of the Master Manual and EIS because of budget constraints will be in direct conflict with NEPA and the regulations in the Master Manual.
- The USACE should not limit alternatives to only its own authorities.
- The USACE should obtain the necessary authority to operate with the best use of resources. Georgia believes the USACE has the authority to operate Lake Lanier to meet the 2030 projected municipal and industrial needs.
- The RIOP is not the only alternative. Georgia provides several possible alternative options to be considered: reallocation of storage for water supply, rule curve changes at all projects in the ACF (different configurations), different methods for optimizing the system, and optimal operations for meeting endangered species' needs.
- The HEC-ResSim model is inconsistent with the established HEC-5 Existing Conditions model. The USACE must explain the discrepancies and correct apparent errors. For example, Atlanta's water intake is upstream of Peachtree Creek, but the model has it downstream; Cobb County/Marietta Water Authority has two wastewater returns below Peachtree Creek, but the model has them upstream. Consequently, HEC-ResSim's prediction of flow at Peachtree Creek is greater than what would actually occur; the Lake Lanier levels would actually be lower than those predicted by the model. There are also discrepancies between HEC-5 and HEC-ResSim regarding certain physical characteristics of some of the projects in the ACF River Basin.

4.3.3.2 Reopened Scoping Period—2009

GAEPD provided comments in a letter from Mr. Allen Barnes on December 31, 2009. The comments are summarized below.

- The USACE must consider alternatives beyond its current authority. Georgia has appealed the holding in the July 17, 2009, ruling. Even if the July 17, 2009, ruling is affirmed on appeal, however, the USACE can and should study as alternatives reservoir operations that allocate storage to meet existing and future municipal and industrial water supply needs.
- The USACE must consider the impact on the human environment of water supply alternatives to Lake Lanier. If the USACE intends to include within the scope of the EIS for the WCM a scenario in which Lake Lanier would not be used meet water supply needs, it must fully consider the effects on the human environment of operating Lake Lanier in that manner. That would include consideration of the effects of the alternative means by which the approximately 3 million people that previously relied on Lake Lanier as their sole source of water supply would then be supplied with water. The EIS must consider the cumulative impact of the no action alternative and other reasonable alternatives. Cumulative impact is defined to include the effects of not only the agency's actions but also the actions of third parties that will result from the agency's actions.
- Failing to consider water supply in the current EIS process would result in a waste of USACE resources and taxpayer dollars. Although by no means assured, it is at least a reasonably plausible scenario that, either by reversal of the July 17, 2009, ruling or an act of Congress with or without a prior agreement among the three states, the current legal impediments to the USACE's authority to operate Lake Lanier for water supply will be removed before July 17, 2012. In that event, if the USACE has not studied water supply as an alternative, it will have to redo the EIS.

4.3.3.3 Reopened Scoping Period—2012

Comments were received on January 14, 2013, from Judson H. Turner. The comments are directed at the revised scope proposed in the October 2012 NOI.

In Assessing All Alternatives, the USACE Must Take into Account Georgia's Future Water Supply Needs. The NEPA analysis for the WCM update and Georgia's Water Supply request should be consolidated in one EIS. To avoid delay and unnecessary expenditure of resources associated with serial updates to the WCM; the EIS should look at modifications of reservoir operations over time to meet water supply needs well into the future. Meeting Georgia's future water supply needs should be identified in the EIS as an element of the purpose and need for the updated WCM. All alternatives should be evaluated against the criterion of whether and how they accomplish the purpose of meeting Georgia's projected water needs.

Georgia Has Submitted Updated Information in Support of the Georgia Water Supply Request. The request included the best available information as of May 2000; Georgia

has since collected updated data that confirms water demands from Lake Lanier will reach 705 mgd, including 408 mgd river withdrawal and 297 withdrawal from Lake Lanier, within a reasonable planning horizon of approximately 25–30 years. This information was presented to the Secretary of the Army on January 11, 2013. An economic analysis of the Georgia Water Supply Request should be available by the end of the first quarter of 2013.

The USACE Should Study Alternatives to the RIOP. Recent science demonstrates that the flow requirements and thresholds used in the RIOP are based on overestimations of the biological needs of the protected species in the Apalachicola River at the expense of needs upstream. Georgia requests the USACE at least carefully reexamine the RIOP using better refined performance measures. Georgia suggests the following principles in evaluating the RIOP and alternatives:

- Develop objective, direct, measureable quantifiable and scientifically defensible performance measures
- Consider performance measures in the entire ACF Basin, instead of just those in the Apalachicola River, when evaluating alternatives
- Use these performance measures to compare and evaluate all alternatives consistently
- Favor alternatives that demonstrate improved performance related to multiple purposes or interests while also achieving performance measures with the greatest efficiency of individual project and system reservoir storage
- Restrain from drawing conclusions or formulating operations on the basis of incomplete data or insufficient scientific understandings

Georgia's alternative to the RIOP, the *Georgia Contemplation* reflects the goal of targeting the highest amount of sustainable Gulf sturgeon spawning habitat and largest amount sustainable floodplain connectivity during the Gulf sturgeon spawning period; optimizing the amount of preferred habitat for the fat threeridge mussel; and conserving system storage to meet water supply and other authorized reservoir purposes.

4.3.4 Georgia Department of Natural Resources, Wildlife Resources Division

4.3.4.1 Initial Scoping Period—2008

No comments were received.

4.3.4.2 Reopened Scoping Period—2009

No comments were received.

4.3.4.3 Reopened Scoping Period—2012

Comments were received on January 11, 2013 from the Georgia Wildlife Resources Division (WRD) Fisheries Management Section.

Lake Lanier and Chattahoochee River Tailwater. The maintenance of adequate water quality regimes in the reservoir and its tailwater is critical to the continued success of Lake Lanier's striped bass fishery, trout production at Buford hatchery, and the Chattahoochee River trout fishery. Water temperature and dissolved oxygen levels are extremely important to sustaining important species. Potential effects on water temperatures in designated trout waters should be considered when making water control decisions. To ensure the success of the Lake Lanier striped bass fishery, it is important that this summer coolwater refuge be maintained in the reservoir. Buford trout hatchery draws cold water from the Chattahoochee River downstream from Buford Dam, so maintenance of adequate river elevation at the hatchery's intake is of prime importance. Georgia would like the opportunity to formulate a protocol regarding special releases for the hatchery when needed to mitigate warm water runoff associated with tropical storm events. Depressed dissolved oxygen concentrations below Buford Dam from August through December adversely affect trout activity, angler success, and hatchery trout production in the upper tailwater. Enhancing dissolved oxygen at Buford Dam would benefit the hatchery operation and the sport fishery for both stocked and naturally reproducing trout in this upper river reach.

West Point Reservoir and tailwater. The tailwaters of West Point Dam provide recreational fishing opportunities that can be significant at certain times of the year. However, water quality in the tailwater, specifically dissolved oxygen, is poor in the summer. Georgia suggests that the USACE consider operational or design criteria that would improve dissolved oxygen conditions in the tailwater.

Reservoir Fish Spawn. Georgia recommends that the fish spawn period (an 8-week window in the spring) be retained and look forward to continued coordination with USACE offices during the bass spawn.

Fish Passage. Since 2005, the USACE has operated the lock at Jim Woodruff Lock and Dam twice a day in the spring to pass migratory fish. This practice has resulted in a substantial increase in the population of juvenile and adult Alabama shad in the ACF River. Georgia encourages the USACE to continue to support and facilitate fish passage via conservation locking at this facility.

4.4 Local Agencies

4.4.1 Metropolitan North Georgia Water Planning District

4.4.1.1 Initial Scoping Period—2008

Ms. Kathryn Dunlap of the MNGWPD submitted comments in a letter received October 28, 2008. She stated that she hopes the USACE will truly update the Master

Manual and not just replicate existing operations that have caused concern over the sustainability of Lake Lanier. She also noted the following:

- The USACE must consider alternative operating plans to balance water supply needs and economic impact with downstream needs before adopting a new Master Manual.
- The USACE should consider the water supply needs of the region as identified in the MNGWPD's long-range plans.
- The net amount of water withdrawn for water supply (in Lake Lanier and the river downstream) is 1 percent of the flows at the Florida line in normal years and 2 percent in drought years.
- Lake Lanier's recreational value should also be an important consideration. The lake receives 8 million visitors a year, resulting in $5.5 billion annually.

4.4.1.2 Reopened Scoping Period—2009

Ms. Dunlap submitted additional comments on December 29, 2009. In the comment letter, MNGWPD recommended the following items for inclusion in the EIS:

- The USACE should provide a full assessment of the environmental, social, and economic impacts of the proposed revision. The USACE needs to consider the impacts of cutting off the water supply to 3 million people and 600,000 businesses, along with the flows used to assimilate the 325 million gallons per day of wastewater.
- The USACE should provide an assessment of all reasonable alternatives to the proposed action. The USACE should consider (1) continued operation at current water supply levels and (2) operation at the 2035 water supply levels contained in the Water Supply and Water Conservation Plan [copy was enclosed] adopted by the MNGWPD.
- The USACE should consider mitigation measures that are not already included in the proposed action or alternative. The USACE needs to consider mitigation measures such as increasing the level of Lake Lanier to offset the lake withdrawals and alternative operations that provide peaking power coincidental with water supply needs downstream of Buford Dam.

4.4.1.3 Reopened Scoping Period—2012

Mayor Boyd Austin submitted comments on January 11, 2013. The district respectfully requested that the USACE consider the full Georgia water supply request when evaluating an expanded range of water supply alternatives associated with the Buford Dam/Lake Lanier project. This analysis should include a full and complete analysis of alternative supply sources available to meet water supply needs in the district, and a robust analysis of shortages to the metro Atlanta area that would result from granting anything less than the full request. In addition, the USACE should perform a complete economic analysis to determine the NED and RED benefits of granting the Georgia request.

Some of the key considerations that the district recommended the USACE include in its WCM development were (1) evaluation of alternative levels for the rule curves and action zones in the ACF projects; (2) reconsideration of its policy of balancing the volume of water stored among the reservoirs on the basis of percent of action zone; (3) reconsideration of Woodruff Dam release requirements, including minimum flows; and (4) the development of forecast-based operating rules that can improve the benefits derived from reservoir operating rules for all purposes.

All potential operational alternatives should be evaluated using a set of basinwide performance measures that is as complete as possible to demonstrate tradeoffs and help ensure that additional gains for one purpose cannot be achieved without substantial impact on other management objectives. The district strongly encouraged the USACE to focus on developing alternative performance measures that can assess the direct measures of benefits rather than rely on surrogates of impact. The district also asked that specific performance measures be included that can evaluate the performance of various alternatives for water supply in the metro Atlanta area.

4.4.2 Atlanta Regional Commission

4.4.2.1 Initial Scoping Period—2008

Mr. Charles Krautler of the ARC submitted comments in a letter received November 21, 2008. He noted the following:

- *Proposed action and alternatives.* The USACE has not adequately defined the proposed action or alternatives. It must consider all reasonable alternatives. The new water control plan must be based on facts and sound science. Historical operations are not realistic or reasonable alternatives. The alternatives must include water supply for metro Atlanta; metro Atlanta relies on Lake Lanier, and there are no alternative sources. The alternatives should not be constrained by perceived limits on the USACE's authority.
- *Flow requirements.* Flow requirements should be optimized, flexible, and tied to actual needs, and operating plans should recognize Lake Lanier's unique character.
- *Curve rule changes*. The USACE should consider and analyze potential rule curve changes to maximize the available storage and optimize operations for all purposes.
- *Head limits.* The USACE frequently cites head limits as the controlling reason for excess releases from Woodruff Dam. Ramp-down restrictions compound this problem by requiring releases from storage to artificially slow the Apalachicola River's rate following these excess releases. In combination, these factors often result in releases greater than 1,000 cfs—more than Georgia's entire average consumptive water use in the ACF River Basin.
- *Hydropower scheduling.* The USACE should also consider alternative mechanisms for developing hydropower generation schedules. It now uses

relatively rigid power generation schedules that assume a certain number of hours of generation when a project is in a certain zone. By incorporating into its operating plans more flexible, forecast-based mechanisms that anticipate energy spot market prices, the USACE could maximize the value of the hydropower produced while making storage available to serve other project purposes. This approach has had great success in other projects and is employed in the Sustainable Release Rule.

- *Sikes Cut.* The USACE should consider alternatives that mitigate the salinity increases in other ways. The USACE should consider alternatives that reduce or eliminate saltwater inflow through Sikes Cut, a major salinity contributor.
- *Channel degradation.* The USACE should be concerned about the areal extent of flooding or the inundation and connectivity of certain habitat. It must acknowledge that the real causes of these problems have more to do with channel degradation than with the quantity of flow in the river.
- *Hydrological forecasting.* A large body of literature on forecasting techniques has been developed. The USGS has been using such methods for decades. The USACE should consider alternative operating plans that use these tools, with appropriate margins of error, to optimize reservoir operations.

4.4.2.2 Reopened Scoping Period—2009

A letter was submitted on December 30, 2009, by Ms. Patricia Barmeyer at King & Spalding on behalf of the ARC; Atlanta, Georgia; the Cobb County Marietta Water Authority; Fulton County; DeKalb County; and Gainesville, Georgia (collectively, the Water Supply Providers). The major points of the letter follow:

- The Water Supply Providers are deeply concerned that the scope of the new Water Control Plan and the new EIS has been drawn so narrowly as to render them meaningless. The stakeholders need and deserve a full and fair study of all alternatives to the current operating plans for the ACF River Basin. Therefore the EIS should not be limited to alternatives consistent with the USACE's existing authority. To the contrary, the decisionmakers in Congress and within the USACE need to know that much better alternatives exist.
- The tragedy of this controversy is that there is plenty of water in the ACF River Basin to meet the reasonable needs of all stakeholders, but only if the reservoirs are operated properly. Lake Lanier provides ample storage to meet future water supply needs for metropolitan Atlanta and North Georgia at minimal cost to the environment or downstream stakeholders. Indeed, the Water Supply Providers have proposed an alternative operating plan for the ACF Reservoir system that meets future water demands while also performing at least as well or better for all other stakeholders. The Water Supply Providers' plan would be to meet future water supply needs while also producing more valuable hydropower and it would also be better for the species in the Apalachicola River based on the metrics developed by the Fish and Wildlife Service in the Biological Opinion. These and other alternatives to the current operations should be included in the EIS: The

USACE is required by NEPA to study all reasonable alternatives, including alternatives that exceed the USACE's current authority; the EIS should assist decision-makers in determining whether to seek additional authority for water supply operations at Lake Lanier; the USACE must also consider alternatives to accommodate water supply within the confines of the July 17, 2009 order of the U.S. District Court for the Middle District of Florida; the USACE must consider the indirect and cumulative effects of its operations; and the USACE should consider alternatives to address problems created by channel degradation and other issues.

- "In conclusion, the Water Supply Providers have long supported the USACE's efforts to update the Water Control Manuals [water control plans] for the ACF River Basin. We support this effort because we firmly believe that any objective analysis will show that there is enough water in the ACF River Basin to meet the reasonable needs of all stake holders if the reservoirs are operated properly. Therefore, we urge you to embrace the NEPA process as an opportunity, finally, to insert facts into a discussion that for years has been dominated by misinformation and political posturing."

4.4.2.3 Reopened Scoping Period—2012

A letter was submitted on January 14, 2013, by Douglas R. Hooker, the Executive Director of ARC. The comments supplement the comments ARC submitted on November 28, 2008, and December 30, 2009. ARC strongly supports the Water Supply Request submitted by Georgia in 2000 and stated that metro Atlanta lacks any economically and environmentally viable alternative source of water supply to replace Lake Lanier.

The purpose and need for the federal action should include meeting metro Atlanta's water supply demands through 2040, as stated in Georgia's Water Supply Request. Multiple studies have concluded reallocating storage in Lake Lanier and operating Buford Dam to facilitate Chattahoochee River withdrawals is the best available alternative for meeting the region's water needs.

The Eleventh Circuit has established that water supply is a fully authorized purpose of Lake Lanier and that Congress intended for the project to meet the increasing needs of metro Atlanta as the region developed. The opinion issued by the USACE's General Counsel, Earl Stockdale, confirms this broad authority to operate Buford Dam and Lake Lanier for water supply, finding that the USACE has ample authority to accommodate the increased levels of water supply withdrawals contemplated by Georgia's Water Supply Request. Completing the required NEPA review, therefore, is the final remaining step for the USACE to determine whether and how it will meet Atlanta's water needs as Congress intended.

The alternatives analysis for the EIS should include a variety of operating rules designed to meet Georgia's Water Supply Request. Even with aggressive water conservation, however, additional water supply will be needed from Lake Lanier and the Chattahoochee River as the region continues to add population and jobs. In analyzing this

request, the USACE should evaluate operational rules that accommodate metro Atlanta's future water supply needs to the fullest extent. The USACE's previous NEPA studies show that using Lake Lanier for this purpose carries the fewest environmental impacts and provides the greatest net economic benefits.

The USACE should evaluate the national and regional economic development benefits that would result from granting Georgia's Water Supply Request.

The USACE's analysis of water supply operations must include full and complete consideration of the reasonably foreseeable indirect effects of granting anything less than the entire Georgia Water Supply Request. Under NEPA, the USACE must fully evaluate the direct and indirect impacts of requiring metro Atlanta to meet its needs through any other means. The USACE must also fully evaluate the economic, social, and public health impacts that would result from any shortages resulting from unmet future needs.

The proper baseline should be continuing existing operations. ARC believes that the proper no action alternative should be continuing existing operations. This would include continued operations under the USACE's RIOP, as addressed in the USFWS February 2012 biological opinion, and existing levels of water supply withdrawals.

The USACE should provide flexibility for a range of water quality flow targets. The flow target of 750 cfs was designed in the early 1970s and still might be appropriate under normal conditions, but recent studies have shown that that water quality standards will still be met at flows less than 750 cfs. ARC requests that this issue be addressed in the EIS and the WCM update, and that flexibility be provided for a range of flow targets to meet water quality considerations as determined by GAEPD.

The USACE should consider new performance measures and operating rules to manage the system more efficiently. ARC encourages the USACE to look beyond the RIOP and to consider creative new operating rules and scenarios that manage the system more efficiently. In addition, the USACE should identify specific, direct measures of performance on the basis of actual stakeholder needs to evaluate operational alternatives. It should also consider more creative and flexible operational rules that take account of advances in hydrologic forecasting, rather than rigid release schedules that focus merely on the quantity of water delivered downstream.

Operating rules should be developed to meet specific objectives and evaluated using direct measures of their performance. The USACE should use the NEPA process to develop performance measures that are based on the actual identified needs of stakeholders in the ACF Basin, which would be used to evaluate various operating rules under consideration. Recommendations include:

- Performance measures for water supply and reservoir levels.
    - Probability of Refill and System Reliability. Lake Lanier should be allowed to refill in as many years as possible to minimize the possibility of entering a severe, multiyear drought with low reservoir levels and the corresponding risk to water supply security.

  - Lake Levels, Sustainable Releases, and Rate of Drawdown. Levels in Lake Lanier should be evaluated against the risk to water supply and other uses in the ACF Basin, all of which rely on Lake Lanier storage in severe drought.
  - Equity Among Projects. ARC believes that equity among the ACF projects in terms of project refill and recreation impacts (as defined by USACE criteria) should be evaluated during the EIS process as seen in performance measures 8 through 10 in the Attachment.Absence of Shortages. Operating rules should be evaluated to ensure that no water supply shortages occur (both measures should be zero, such that there are no shortages or minimum water quality flow target deficiencies).

- Environmental performance measures. The USACE should use the NEPA process to work with the USFWS and other stakeholders to develop direct measures of performance to evaluate impacts to protected species, the health of Apalachicola Bay and other environmental considerations.
  - Protected Species. USFWS has developed a range of performance measures in its biological opinions to assess potential impacts of operating policies on threatened and endangered species. While some of these are more direct measures of performance, many focus solely on the magnitude of flow and are not sufficiently tied to benefits or effects on protected species. Because of the demands on storage that they impose, minimum flows must be carefully tailored to meet distinct, actual needs. Without this, a minimum flow, in and of itself, does nothing to ensure that scarce water resources are used efficiently to meet real needs in the ACF Basin.
  - Apalachicola Bay Salinity. Some stakeholders suggest that Lake Lanier be managed to control salinity in Apalachicola Bay. In the past, the USACE has used a flow-based proxy of 16,000 cfs as a measure of potential salinity effects on Apalachicola Bay. This should be abandoned in favor of more accurate, direct measures of salinity performance. We urge the USACE to use salinity models to evaluate the impacts of alternative operating rules on Apalachicola Bay salinity. Through these models, the USACE should examine how its operations could (or could not) alter bay salinities to achieve specific management objectives.
- More creative and flexible operating rules should be considered. ARC urges the USACE to look beyond the RIOP and to consider creative new operating rules and scenarios that manage the system more efficiently. Models have shown through our own work in conjunction with Georgia that the system can perform more efficiently and satisfy most of the stakeholders needs through innovative approaches to reservoir operations and system management—this includes the Georgia Contemplation. Some components include:
  - Forecasting. Forecast-based operating rules can improve the benefits derived from reservoir operating rules for all purposes. Forecasts, particularly ensemble forecasts, can and should be used in rules that set real-time variable targets for flows throughout the system. When

combined with storage levels, forecasts can be used to determine the appropriate levels of flow support from storage. This will allow better performance for hydropower, navigation, water supply, recreation, environment, and other purposes.

- Rule curves and action zones. The USACE should evaluate alternative levels for the rule curves and action zones. It should also consider abandoning rule curves and action zones in favor of setting operating targets that vary continuously by the values of current storage and inflow forecasts.
- Reservoir balancing. The USACE should reconsider its policy of balancing the volume of water stored among the ACF reservoirs so that all projects are in the same action zone. Balancing releases of this sort are not the most efficient use of upstream storage and do not adequately account for the disparity in refill potential of the USACE's projects.
- Woodruff Dam release requirements. The USACE should reconsider its Woodruff Dam release schedules, including a full analysis and evaluation of minimum flow requirements. Releases to support downstream flows must be balanced against the costs to other users and purposes. The USACE should therefore carefully examine and estimate the tangible benefits of maintaining arbitrary and fixed minimum flows, particularly in extreme droughts, and consider more targeted performance measures as described. The USFWS is also discussing that RIOP ramping requirements could be suspended during low-flow periods, and releases made for flow targets could be limited by their draw on storage.
- Hydropower. The USACE's remand modeling and ARC's analyses indicate that modifying operations to improve performance in terms of other objectives usually has an extremely minor impact on hydropower generation and hydropower revenue. ARC urges the USACE to use the methodology employed in the remand modeling to evaluate the impact of alternative rules and system operations on hydropower and to appropriately balance the substantial other benefits that might be achieved against the potentially small effects on hydropower.

- Structural alternatives should be evaluated and considered. ARC urges the USACE to consider structueral alternatives to reduce release requirements and downstream demands.
- ARC suggested the following technical modeling assumptions and considerations.
  - The USACE should use return rates calculated from Georgia's Water Supply Request for modeling to be performed under the EIS and manual update.
  - The USACE should partition the Chattahoochee River demands into three, or at the very least two, withdrawal points to appropriately evaluate the metro Atlanta reaches.

- There appears to be an additional 20 mgd included in the Lake Lanier withdrawals, shown by a sum of two time-series in defining lake withdrawals.
- Some of the simulations reduce system storage below the level of the Exceptional Drought Operations zone, but the minimum flow requirement at Woodruff Dam is not reduced to 4,500 cfs. While this could be caused by timing, as Exceptional Drought Operations operations are changed only on the first of the month, the USACE should verify the reason for this discrepancy.

4.4.3 Franklin County, Florida, Board of County Commissioners

4.4.3.1 Initial Scoping Period—2008

Mr. Noah Lockley of the Franklin County Board of County Commissioners submitted comments in a letter received October 17, 2008. The Board believes that the Master Manual is fundamentally flawed because it does not adequately take into account the freshwater needs of Apalachicola Bay. The Board requests that the EIS include the ecosystem of the bay. Specifically:

- The EIS should include the harvestable resources, including shrimp, blue crab, mullet, and oysters. All these resources have seen their landings plummet over the past few years because of the lack of freshwater reaching the bay.
- The state has spent millions of dollars protecting the bay, and now the Master Manual needs to be expanded to protect this environmental resource.

4.4.3.2 Reopened Scoping Period—2009

No comments were received.

4.4.3.3 Reopened Scoping Period—2012

Comments were received on December 11, 2012, from Mr. Alan Pierce for the Franklin County Board of County Commissioners. Mr. Pierce notes that the Apalachicola Bay in Florida is in desperate need of fresh water. The ACF water supply plan must take into account the needs of the bay. The most productive oyster industry in the south eastern United States is being wiped out because of a lack of water.

4.4.4 Hall County, Georgia, Board of Commissioners

4.4.4.1 Initial Scoping Period—2008

Mr. Tom Oliver, Mr. Billy Powell, Mr. Deborah Mack, Mr. Bobby Banks, and Mr. Steve Gailey of the Hall County Government Board of Commissioners submitted comments in a letter received November 14, 2008. They noted the following:

- Lake Lanier will be at an all-time record low in the coming months.

- The Board is confident that the river system can be managed such that all needs are met. The Board believes there is sufficient water for both upstream and downstream environmental, economic, and human needs.
- Sound science and engineering study must prevail to determine how best to operate the river system. The system operations cannot use an antiquated management plan with simple documentation of existing trends. Updated conditions should be considered.
- Alternative methods of creating water quality in downstream basins should be considered (that is, not taking Lake Lanier flows to enhance downstream estuaries).

4.4.4.2 Reopened Scoping Period—2009

No comments were received.

4.4.4.3 Reopened Scoping Period—2012

No comments were received.

4.4.5 Troup County, Georgia, Board of Commissioners

4.4.5.1 Initial Scoping Period—2008

Mr. Richard Wolfe, Mr. Richard English Jr., Mr. Buck Davis, Mr. Kenneth Smith Sr., Mr. Julian Morris Jones III of the Troup County Board of Commissioners submitted comments in a letter received November 24, 2008. Noting that their past requests had seemingly been ignored, they asked the USACE to consider the following:

- Consider six critical issues, identified through study groups, that are vital to West Point Lake: Maintain a minimum lake level of 633–635 feet msl, maximize positive economic impact, return to managing the Lake consistent with congressionally authorized purposes, restore and maintain recreational facilities, ensure recreational access for low-income and minority families, and protect water quality.
- Low lake levels adversely affect economic opportunities.
- The action zones established by the USACE are not in keeping with and were not part of the original authorization by Congress.
- The USACE should fill and stabilize West Point Lake as a "run of the river lake" with flows that mirror a more natural flow during drought and flood conditions.
- The USACE has not funded or maintained many of the recreational areas paid for or established by Congress.
- Action zones are much worse than other USACE projects and make recreational use quite difficult, if not impossible, to achieve.

- Rapid and frequent fluctuations in lake levels cause issues of compliance with the Clean Water Act, which affect the quality of recreation.

4.4.5.2 Reopened Scoping Period—2009

No comments were received.

4.4.5.3 Reopened Scoping Period—2012

No comments were received.

4.4.6 City of LaGrange and Troup County, Georgia

4.4.6.1 Initial Scoping Period—2008

Mr. Jeff Brown of Troup County and Mr. Jeff Luken, Mayor of LaGrange, submitted comments in identical letters received October 28, 2008, and October 30, 2008, respectively. A summary of the comments follows:

- Congress established five specific primary authorized uses for this project: hydropower, sportfishing and wildlife development, general recreation, navigation, and flood control.
- New influences have taken over and control the environmental and socioeconomic factors related to utilization of the lake. Many factors have not been addressed or have been ignored by the USACE in its operations. These include massive urbanization and growth of the area and counties surrounding the lake, industrial development, and growth of the Fort Benning complex and its contingent of citizens and soldiers, who often rely on West Point Lake's facilities for recreation and sportfishing and wildlife.
- The USACE operates the lake and the system in its own way, which ignores the original *primary* congressional authorizations. Recreation and sportfishing and wildlife development are sacrificed—almost in their entirety—to meet the purpose of a lower winter pool of 625–628 feet msl.
- The USACE arbitrarily assigned to the lake Action Zones that were not set up in the enabling legislation. This needs to be corrected, and a maximum drawdown level of 633 feet msl for winter pool and a stable 635-foot summer pool must be established.
- It is the responsibility of the downstream wastewater treatment discharge permit holders to design and operate their discharge systems in a manner that ensures compliance with water quality standards without using the limited waters available.
- Raise the lake levels and stabilize them at the 633–635-foot level. The low lake levels and aesthetic damage caused by winter drawdowns have a *direct* correlation with the low number of visitors. The lake level should never be lower than 633 feet msl, except in dire emergencies.

- Stakeholders in the area have observed massive kills of native mussels in the project boundaries when the USACE operates the dam to provide massive rapid drawdowns for downstream flows.
- The USACE's compliance with the *Clean Water Act* under current operations is at best highly questionable, if in fact it is being achieved. The chlorophyll level is set at an artificially high level of 27 milligrams per liter. Total nitrogen south of the Franklin exceeds the standards with a reading of 6 milligrams per liter.
- "Demographics, development patterns, climate changes, and other factors have brought forth an entirely new reality the USACE must contemplate and address in a new Master Manual for the basin."

4.4.6.2 Reopened Scoping Period—2009

Mr. James Emery, Jr. provided comments during the 2009 reopened scoping period on behalf of Troup County. The comments included the following points:

- West Point Lake's elevation is intentionally managed at a level that is too low during the winter. The current guide curves provide disproportionately large amounts of flood storage during the winter as compared to all other federal projects on the basin. The 628-foot MSL zone 1 winter pool elevation does not allow adequate utilization of the lake for other congressionally authorized purposes such as "recreation" and "sport fishing and wildlife development." The low elevation also has tremendous negative economic impacts on the region. The low lake levels also cause over 500 miles of shoreline to become exposed, causing erosion and extremely high turbidity during rain events. During this time of re-assessment of the USACE's operations manuals, this error can (and should) be corrected.
- There are two primary reasons for West Point Lake's lower-than-necessary elevations: (1) the flood control authorized use of West Point Lake has been overemphasized in the current operations manuals as compared to the other authorized uses, and the necessary winter flood storage capacity has been overestimated. (2) Water is being supplied to downstream interests at a flow rate that is higher than what would occur naturally and is higher than these downstream interests have any right to.
- There is no question that the USACE has done a tremendous job of providing flood control and hydropower, as authorized by Congress, but there needs to be a better balance of other authorized uses such as recreation and sport fishing and wildlife development. The management of the lake seems severely weighted toward some uses with little regard for the others.

4.4.6.3 Reopened Scoping Period—2012

On January 4, 2013 comments were provided by Mike Criddle on behalf of LaGrange's Department of Economic Development. These comments are summarized below:

- The importance of adequate lake levels in West Point Lake to the local economy. Low levels affect fishing and fisheries industries and the ability for developing the tourism industry.
- The constant fluctuation of winter and spring lake levels over the past several years has had devastating impacts on the annual bass spawn and other fish populations that directly affect fish take and the sport fishing industry. The city feels that the USACE has not upheld sport fishing and wildlife development authorizations.
- The city requests a change to the West Point Lake rule curve for the winter months to an elevation of 632.5 msl.
- Further study is requested for the requirement of 5,000 cfs at the Florida line, as mandated by the Endangered Species Act. This study should include accurate population counts of the three endangered species of mussels to determine if each should still be included on the endangered species list. If inclusion is still directed, a comprehensive recovery plan for each should be an integral part of the EIS.

4.4.7 Gwinnett County, Georgia, Board of Commissioners and Department of Water Resources

4.4.7.1 Initial Scoping Period—2008

Mr. Charles Bannister of the Gwinnett County Board of Commissioners submitted comments in a letter received October 20, 2008. In his letter he states:

- The IOP and modifications have not resulted in the most efficient operation of the system to serve its designated use and the public interest. The Board believes that a more conservative and equally effective operation of the ACF system could have saved millions of gallons of storage in Lake Lanier and still met the downstream requirements throughout this prolonged drought.
- The USACE's EM 1110-2-3600, Section 3-3 b.(I), states, "Furthermore, for many projects that have been operational for a number of years, the water control plans and water control manual are out-of-date, and there is a need for revising them to make them applicable to current conditions."
- The water control plans and the Master Manual need to address the current conditions, in which some 3 million people in the metro Atlanta area rely on the ACF River Basin for drinking water for their health and safety.
- The droughts of 1988 and 2001 and the present drought should surely suggest that the USACE should make every effort to conserve storage in the uppermost lake in the system to the maximum extent to enable the system to meet its downstream requirements in times of severe drought. Composite storage for the entire system should not be used to justify releases from Lake Lanier; Lake Lanier represents almost half of the storage for this basin as its uppermost reservoir, but that reservoir has only 6 percent of the basin's drainage area and controls only 9 percent of the flow in the basin.

- The board highly recommends that the USACE use the methods of hydrological forecasting developed by USGS and recommended to the USACE by the ARC.
- An ARC letter titled *Proposed Modifications to Interim Operations Plan for ACF Reservoirs* is attached. The Board suggests that keeping Lake Lanier as full as possible meets these goals and helps protect the environment and the economy of north Georgia. It does not believe that the Mobile District's IOP and its modifications meet these goals as required by the USACE's rules. Had the rules been followed in developing the IOP, the USACE could have met the downstream needs and preserved the storage in Lake Lanier to a much greater extent than has been done in the past 2 years.
- The board believes that the technical expertise exists to enable the Mobile District to craft a water control plan that meets all the needs of the basin and allows the reservoirs to be full or near full each spring in order to allow the system to be able to provide drought sustainability when needed. Such conservation of storage serves the public interest and sustains the environment and population dependent on this vital resource.
- The board strongly urges the Mobile District to seriously consider the methodologies suggested by the ARC and its consultant, Hydrologics, Inc., for alternative methods of operating the system. Hydrologics has shown that alternative operating scenarios can meet all downstream requirements and at the same time maximize reservoir storage during the wet season to ensure the maximum storage in the spring of each year, particularly in Lake Lanier, to provide for water conservation, drought contingency, and the needs of fish and wildlife, recreation, and environmental improvement/protection of Lake Lanier and the downstream basin.

4.4.7.2 Reopened Scoping Period—2009

Ms. Lynn Smarr, Acting Director for Gwinnett County Department of Water Resources, provided comments on December 21, 2009. In her letter she states:

- We believe that preparing an EIS for a WCM for the ACF Basin must include water supply analysis and that failure to consider alternatives for water supply, at several levels, is unwise and a waste of limited public funds. The USACE EIS consideration must include alternatives, such as operations for water supply, even if they are deemed to exceed the agency's jurisdiction. 40 CFR 1502.14(c). The EIS must include alternatives that exceed the USACE's authority because this information might be useful to the President, to Congress, and to the public in shaping policy on a larger scale. See *Natural Res. Defense Council, Inc. v. Morton*, 458 F.2d 827, 836-37 (D.C. Cir. 1972). We set forth in this comment various alternatives which require study by the USACE deemed necessary for compliance with NEPA. In addition, to the extent that the USACE anticipates obtaining a biological opinion from the USFWS in connection with its analysis, we offer comment relative to that process as well.

- *Scope of NEPA*. The regulation at 40 CFR 1502(c), properly applied, requires the USACE to include water supply at and above current uses in its EIS, particularly since the historical practice has been to support this water supply use.
- *Alternatives Required*. Many alternatives not presently presented in the EIS process, or purposefully omitted such as water supply, deserve and demand study by the USACE if it is to fulfill its NEPA responsibilities.
- *Selection of an Appropriate Environmental Baseline*. In two prior Biological Opinions issued in conjunction with ACF River Basin operations, the USFWS used an improper baseline for purposes of its analysis. In its prior analysis, USFWS used hydrological modeling to compare flows produced by the existing RIOP to what it called a baseline consisting of the actual flows produced by reservoir operations from 1975 to 2007 (the Regulated Condition). The decision to use the Regulated Condition from 1975 to 2007 as the baseline for this comparison is unlawful and arbitrary, however. The Regulated Condition cannot be used as the baseline because the Regulated Condition is the result of numerous discretionary actions by the USACE related to historic reservoir operations. Another reason that the Regulated Condition cannot be used to measure the effects of the RIOP is that it is impossible to associate the Regulated Condition from 1975 to 2007 with anyone operating plan. The USACE modified its operations many times, in many ways, during those years.

4.4.7.3 Reopened Scoping Period—2012

Comments were received January 9, 2013, from Ms. Charlotte J. Nash, Chairman of the Gwinnett County Board of Commissioners. Comments include the following:

- Update federal authorities: Per the Eleventh Circuit decision, Public Law No. 84-841 (July 30, 1956) (1956 Act), the USACE is authorized to contract with Gwinnett County for withdrawals from Lake Lanier at a rate of 11,200 acre-feet (10 mgd) annually and has additional authority by which the USACE may authorize water storage for withdrawals by the county for a secure and regulated water supply. The USACE should update the list of federal authorizations in Section 1.2 of the 2010 Scoping Report to include the 1956 Act and note that such withdrawals are within the baseline established by Congress.
- Update Models with Representative Basin Conditions: The USACE should update its modeling data to take into account recent shifts in rainfall and temperature patterns in the ACF Basin rather than relying on older, less representative data regarding basin conditions.
- Alternatives Analysis
    - Increase winter pool storage to 1,071 (msl): The USACE should evaluate an alternative that increases winter pool storage to 1,071 (msl) to be consistent with the summer storage amount; as discussed above, to the extent that recent shifts in rainfall and temperature patterns suggest that more water must be available for releases, a consistent full pool operational measure should be taken into account and incorporated as an

alternative rather than curtailing storage and ignoring, availability of congressionally authorized flood control storage above 1071 (msl).

- Remove 5,000 cfs operating policy as the floor for the ACF Basin: The 5,000 cfs floor is merely a parameter in the 2006 IOP and is based on an incorrect analysis of the baseline conditions in the ACF Basin and should not be the driver for the USACE's operation of the reservoirs in the basin. Basinwide performance measures should be considered instead.
- Reexamine 750 cfs requirement at the Chattahoochee River below the Atlanta withdrawal point: the 750 cfs operational flow criteria the USACE used should be reexamined in light of permit requirements and assimilative capacity to determine whether alternatives to that flow might exist. In developing its alternatives, the USACE should deemphasize use of any discretionary operational policy in favor of operating to maximize water supply, an authorized purpose of the project.
- Maximize water supply at the Buford Dam/Lake Lanier project: The USACE should include in its alternatives analysis an alternative that maximizes the authorized purpose of water supply at Lake Lanier. Applying the Eleventh Circuit decision and the project purposes outlined in the 2010 Scoping Report, the Buford Dam/Lake Lanier project is the only reservoir in the ACF Basin that has water supply as an authorized project purpose and, as such, this purpose should be prioritized in USACE's operational policy. Supporting downstream project purposes at the expense of an authorized project purpose at the Buford Dam/Lake Lanier project would be inappropriate.

- Facilitate return flows: the USACE's operations should encourage and facilitate return flows to Lake Lanier, including providing direct 1:1 credit to entities providing return flows to the lake. Return flows mitigate the impact of withdrawals and releases made for all purposes on the lake levels, provide a level of assurance of water availability not provided by general basin inflow, and support principles of conservation and reuse. Moreover, to the extent any wastewater provider incurs additional treatment costs to satisfy wastewater permitting requirements for Lake Lanier, direct credit for return flows for each such provider will help offset such costs and thereby incentivize the provision of return flows. As such, directly credited return flows should be encouraged and facilitated.
- Economic Impacts: The USACE must incorporate into its analysis all potential economic impacts associated with the alternatives that it evaluates, including the host of detrimental economic impacts that would be associated with either not exercising its authority to allocate storage for water withdrawals or not maximizing the provision of water supply through making storage available for lake withdrawals and releases for downstream users.

- Environmental Impacts
    - Environmental impacts in the region. The USACE must incorporate into its analysis all the potential environmental effects of the alternatives it considers, including environmental impacts that would occur without the availability of storage in the Buford Dam/Lake Lanier project for water supply or in any operating scenario that does not maximize storage for water supply from Lake Lanier.
    - The USACE should use an appropriate baseline: The USACE (and the USFWS) should not inappropriately incorporate into the action being reviewed effects that would occur notwithstanding the action under review. The flow of a river depends on the month, season, and multiyear precipitation patterns. A baseline flow regime should not include any of the discretionary federal actions such as rule curves, action zones, peaking hydropower releases, or other aspects of the USACE's water control plan and ongoing operations the effects of which are being studied. The USACE (and USFWS) should use the *run-of-river* flow regime, that is, one that assumes the dams are in place but that the reservoirs simply release the water as it comes in without storing any of it for release later.
    - The USACE should incorporate the most recent information about the endangered species: Recent data provided to the USACE and USFWS in 2012 by experts in the field demonstrate that the species promoted by Florida are in much better shape than assumed, and these data must be incorporated into the EIS/ESA analysis for any revised operating plan for the ACF Basin.

4.4.8 City of Cumming, Georgia

4.4.8.1 Initial Scoping Period—2008

No comments were received.

4.4.8.2 Reopened Scoping Period—2009

Mr. Ford Gravitt, Mayor of Cumming, provided comments in a letter dated December 15, 2009. The comments included the following points:

- City of Cumming has an advanced water intake facility on Lake Lanier and provides raw water to potable water treatment facilities in both the City of Cumming and unincorporated Forsyth County.
- To consider only the Gainesville and Buford combined 10-mgd withdrawal is reckless and will "turn the spigot off" for hundreds of thousands of people.
- The City of Cumming withdrew water from Dobbs Creek, a tributary to Sawnee Creek, just as Gainesville and Buford received their water from Lanier tributaries prior to the construction of Buford Dam.

- Importantly, all notices were given, permits obtained, and laws and regulations complied with in the construction of the city's state-of-the-art intake facility and in conjunction with the expansion and upgrade of the city's wastewater treatment facility. This is true whether the requirements are from the USACE, EPA, federal statutes, state statutes, GAEPD, or any other regulatory entity involved in the process.
- From the description of the city's utility system and its evolution, two things are clear: (1) Nothing about the development of the City of Cumming's utility was a rash or quick decision—everything was well thought out and planned to meet the needs of this growing area; and (2) all told, it is perfectly evident that the federal government, including the USACE, was aware of and approved the City of Cumming's actions, including the investment of millions of dollars into what is now an infrastructure system worth billions. And now the city is told, with the investment complete and the infrastructure in place to provide water to the citizens of the City of Cumming and Forsyth County, the USACE proposes to turn off the water, which would turn the billion-dollar utility into a massive set of empty pipes and thirsty people.
- The City of Cumming is vehemently opposed to the revisions to the Master WCM, especially as disclosed in subsection (b) on the notice received on November 24, 2009. To propose to end all withdrawals by the City of Cumming in July 2012, thus cutting off water to hundreds of thousands of people in Forsyth County alone, is callous, reckless, and a threat to human life and safety. Moreover, given that the USACE and federal government permitted and allowed the City of Cumming's expansions and investments to occur, the USACE should be stopped from now taking that expansion and investment away by turning off the water.
- Finally, considering that the USACE's proposal would take a billion-dollar asset and make it worthless, turning off the water, if carried out, would be the epitome of a taking without just and adequate compensation. To be blunt, when Lake Lanier was built the federal government compensated people so little—$6.00 and $7.00 an acre in some cases—that many people accused the government of stealing the land. Now, it appears that the government will do so again by rendering over 50 years of planning, investment, acquisition, and building worthless.

4.4.8.3 Reopened Scoping Period—2012

No comments were received.

4.4.9 Columbus Consolidated Government

4.4.9.1 Initial Scoping Period—2008

No comments were received.

4.4.9.2 Reopened Scoping Period—2009

No comments were received.

4.4.9.3 Reopened Scoping Period—2012

Comments were received on January 14, 2013, from Teresa Pike Tomlinson, Mayor of Columbus, Georgia. Mayor Tomlinson's comments reiterated previous comments from August 6, 2012, concerning the necessity of maintaining a minimum daily river flow rate of 1,350 cfs, an instantaneous flow of 800 cfs and a weekly flow of 1,850 cfs at Columbus and Fort Benning, Georgia. The rates are necessary for assimilating permitted wastewater discharge, to provide high-quality drinking water and to ensure economic sustainability for the Columbus and Fort Benning community, and Phenix City, Alabama.

4.4.10 Douglasville-Douglas County Water and Sewer Authority

4.4.10.1 Initial Scoping Period—2008

No comments were received.

4.4.10.2 Reopened Scoping Period —2009

No comments were received.

4.4.10.3 Reopened Scoping Period —2012

Mr. Peter Frost signed comments dated November 27, 2012, that made six points of concern. These areas of concern over the WCM update include

- The effect on 7Q10 requirements from their water supply reservoir during low-flow period.
- Future surface water withdrawal permits.
- Effect on Cobb County-Marietta Water Authority's withdrawal capacity.
- Assimilative capacity in the Chattahoochee River and its effect on current and future wastewater discharges.
- Future MNGWPD management plans for water, wastewater, or watershed management.

4.4.11 Forsyth County Board of Commissioners

4.4.11.1 Initial Scoping Period—2008

No comments were received.

4.4.11.2 Reopened Scoping Period —2009

No comments were received.

4.4.11.3 Reopened Scoping Period —2012

Comments were received on January 14, 2013 from Ralph J. Amos, Chairman of the Forsyth County Board of Commissioners. Chairman Amos urged the USACE to diligently work to complete the necessary steps to finalize the update of the Master WCM for the ACF River Basin. The county has been denied access to the lake for an intake for more than 25 years even though 20 square miles of Lake Lanier are in the county. The county supports all efforts to protect and increase water supply for the region while maintaining safe lake levels for recreational use. The county also supports the study of raising the lake level to the benefit of the region. The county strongly believes that water supply should be given top priority and requests that the USACE approve a new Forsyth County withdrawal intake structure and storage allocation contract as quickly as possible.

4.5 Tribal Response

4.5.1 Initial Scoping Period—2008

The tribal response indicated an interest in being informed about the updated Master Manual and Draft EIS as more information becomes available. After the development of the alternatives and proposed action, tribal leaders should be contacted and provided another opportunity for government-to-government consultation.

4.5.2 Reopened Scoping Period—2009

No comments were received.

4.5.3 Reopened Scoping Period—2012

No comments were received.

4.6 Federal Interagency Response

The 2008 pre-meeting planning agenda tool allowed the USACE to focus discussions on topics of interest to the federal agencies represented on the call—drought operations, water quality, biological resources, and water management. Additional issues identified for discussion included minimum base flows, agricultural water use, reservoir flows, buoy tender and use of channel survey data, water quality impacts, alternative analysis, rule curve alternatives, and a timeline for decisions. These areas can be better defined by (1) those related to the Master Manual update and (2) those related to the NEPA process.

- *Master Manual update.* Agencies questioned whether substantial changes would be considered in the Master Manual. The USACE is authorized only to update the Master Manual to current operations; additional authorizations would require congressional authority. The USACE did confirm that the evaluations of alternatives will look at impacts throughout the ACF River Basin. For example, the evaluations will consider how releases at Lake Lanier affect the Apalachicola River and Estuary. Questions were asked regarding changes to minimum flows.

States would have to modify their procedures for these types of changes to occur, as has been considered in the RIOP.

- *NEPA process.* The selection of baseline conditions and alternatives was a concern for the USFWS. The USACE let the agencies know that the scoping process is being used to determine which alternatives will be considered in the EIS, including different levels of water withdrawal.

5.0 Summary of Public Scoping

The USACE has completed the preliminary scoping process for the EIS regarding implementation of an updated Master Manual in Alabama, Florida, and Georgia. The USACE, however, will continue to give due consideration to all relevant input received throughout the development of the EIS because scoping is an ongoing process. Coordination with regulatory agencies and the public will continue. Following finalization and publication of this scoping report, the draft EIS will be completed. The Draft EIS is scheduled to be made available to the public for review and comment in 2014.

The objective of this preliminary scoping phase was to notify regulatory agencies and the public of the proposed action. This phase provided an opportunity for the USACE to learn as much as possible about all concerns, issues, and other significant actions completed, under way, or proposed in the region that could be affected by implementing the proposed action. It also provided an opportunity to gather available information and tools to assist in developing and evaluating the proposed action and alternatives. Such information is essential to ensure that the EIS adequately addresses the effects of the proposed action and alternatives.

Specific requirements of scoping include the following:

- Determining the scope (40 CFR 1508.25) and the significant issues to be analyzed in depth in the EIS.
- Identifying and eliminating from detailed study the issues that are not significant or that have been covered by prior environmental review (40 CFR 1506.3), narrowing the discussion of these issues in the EIS to a brief presentation of why they would not have a significant effect on the human environment or providing a reference to their coverage elsewhere.
- Indicating any public environmental assessments and other EISs that are being or will be prepared and are related to but are not part of the scope of the impact statement under consideration.
- Identifying other environmental review and consultation requirements so the USACE can prepare other required analyses and studies concurrently with, and integrated with, the EIS as provided in 40 CFR 1502.25.
- Considering how the proposed action might affect resource areas cumulatively; that is, whether the resources, ecosystems, and human communities of concern have already been affected by past or present activities and whether other agencies or the public has plans that could affect the resources in the future.

During the initial 2008 scoping period, the reopened 2009 scoping period, and the additional 2012 scoping period, the USACE received 3,621 comments from 958 individuals, organizations, and agencies. The agencies included federal, state, and local governments. Federal agencies that submitted comments were EPA Region 4, SEPA, USFWS, NOAA National Marine Fisheries Service, NPS Southeast Regional Office,

Members of the U.S. Senate from Florida and Alabama submitted comments, as did members of the Georgia Senate. Members of the U.S. House of Representatives from Georgia and Florida submitted comments, as did members of the Georgia House of Representatives. The three states—Alabama, Georgia, and Florida—submitted comments from their associated state agencies. Other local governmental agencies, including the MNGWPD; the ARC; Franklin County, Florida and the Franklin County Board of County Commissioners; Hall County, Georgia; Troup County, Georgia; Gwinnett County, Georgia; the City of LaGrange, Georgia; Columbus, Georgia; Douglasville-Douglas County Water and Sewer Authority, Forsyth County, Georgia's Board of County Commissioners; submitted comments as well.

All the comments were reviewed and organized into 12 categories, as discussed in Section 3. The categories and the percentage of the comments falling into each category follow:

- Water Management Recommendations: 34 percent
- Socioeconomics and Recreation: 19 percent
- Biological Resources: 16 percent
- Drought Operations: 6 percent
- Water Quality: 5 percent
- NEPA: 7 percent
- Water Supply: 4 percent
- Data, Studies, and Analytical Tools: 3 percent
- Other Resources: 2 percent
- Navigation: 1 percent
- Hydropower: 1 percent
- Flood Risk Management: 2 percent

The majority (about 70 percent) of the comments were related to water management recommendations, socioeconomics, and biological resources.

5.1 Recommendations

In January 2008 Secretary of the Army Pete Geren directed the USACE s to update the Master Manual. The current Master Manual was completed in 1958, and consequently it does not include water control plans for West Point Dam, Walter F. George Lock and Dam, and George W. Andrews Lock and Dam. An updated Master Manual that includes water control plans for all the projects in the ACF River Basin is required by ER 1110-2¬240. The Master Manual must prescribe plans of operation for congressionally authorized and general statutory project purposes in the basin, while taking into account private, community, social, and economic needs and sound environmental stewardship. The purpose of the proposed action is to update the water control plans and manuals for

the ACF Basin to conform operations to "requirements resulting from developments in the project area and downstream, improvements in technology, new legislation, and other relevant factors, provided such revisions comply with existing federal regulations and established [USACE] policy." 33 CFR 222.5(f)(3). In the ACF Basin, such factors include changes in basin hydrology and water usage, new or rehabilitated structural features, and environmental issues.

One of the critical issues in the WCM update and associated EIS process, which was directly and indirectly the focus of many of the 2012 scoping comments, is the extent to which present and future water supply needs for metro Atlanta communities can be accommodated by direct withdrawals from Lake Lanier and from the Chattahoochee River downstream of Buford Dam. The June 2011 ruling by the Eleventh Circuit Court of Appeals reversed the 2009 district court decision and directed that the case be remanded to USACE to reconsider and make a final determination as to its legal authority to operate the Buford Dam/Lake Lanier to accommodate Georgia's 2000 water supply request.

USACE responded to the court in July 2012 with a legal opinion and supporting technical analyses to define its legal authority to accommodate Georgia's 2000 water supply request relative to operation of Buford Dam/Lake Lanier. USACE determined that the requested withdrawals could be accommodated within the technical limits of the project. However, the effects of meeting that request would have to be balanced in consideration of effects on other project purposes and subject to public disclosure of environmental impacts and public interest review in accordance with NEPA and other pertinent federal laws, regulations, policies, and executive orders. These issues and considerations will be addressed in the development and coordination of the proposed update of the ACF Master Manual and associated EIS.

On the basis of the stakeholder comments received during scoping, it is clear that the issues of greatest concern are the potential for significant impacts on socioeconomics, water resources, and biological resources. These three topics should be emphasized in the EIS and should be considered in development of the recommended alternative in the Master Manual.

5.2 EIS Schedule

Completing the EIS and updating the Master Manual will take approximately 3 years. The USACE will publish a Notice of Availability in the *Federal Register* when the Draft EIS is available for public review (expected to be summer 2014). Public meetings will also be held following publication of the Notice of Availability to solicit comments on the Draft EIS. Each comment and the corresponding response will be incorporated into the EIS. The USACE expects to publish the Final EIS and Record of Decision in late 2014.

The scoping report is posted at http://www.sam.usace.army.mil/Missions/PlanningEnvironmental/ACFMasterWaterControlManualUpdate.aspx, and it can be downloaded with or without the appendices.

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7.0 Acronyms and Abbreviations

ACCG	Association of County Governments of Georgia
ACF	Apalachicola-Chattahoochee-Flint [River Basin]
ACT	Alabama-Coosa-Tallapoosa [River Basin]
ADCNR	Alabama Department of Conservation and Natural Resources
AOWR	Alabama Office of Water Resources
ARC	Atlanta Regional Commission
CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
cfs	cubic feet per second
CRNRA	Chattahoochee River National Recreation Area
D.C. Court	Federal District Court for the District of Columbia
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ER	Engineer Regulation
ESA	Endangered Species Act
FDEP	Florida Department of Environmental Protection
FERC	Federal Energy Regulatory Commission
GAEPD	Georgia Environmental Protection Division
HEC	Hydrologic Engineering Center
IOP	Interim Operating Plan
Master Manual	*Master Water Control Manual for the Apalachicola-Chattahoochee-Flint River Basin*
mgd	million gallons per day
MNGWPD	Metropolitan North Georgia Water Planning District
MOA	Memorandum of Agreement
msl	mean sea level
MW	Megawatts
NEPA	*National Environmental Policy Act*
NGVD	National Geodetic Vertical Datum
NOI	Notice of Intent
NPS	National Park Service
P.L.	Public Law
RIOP	Revised Interim Operating Plan
SeFPC	Southeast Federal Power Customers, Inc.
SEPA	Southeastern Power Administration
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WCM	Water Control Manual
WRDA	*Water Resources Development Act*

Exhibit B

76th Congress, 1st Session - - - - - House Document No. 342

APALACHICOLA, CHATTAHOOCHEE, AND FLINT RIVERS, GA. AND FLA.

LETTER

FROM

THE SECRETARY OF WAR

TRANSMITTING

A LETTER FROM THE CHIEF OF ENGINEERS, UNITED STATES ARMY, DATED APRIL 20, 1939, SUBMITTING A REPORT, TOGETHER WITH ACCOMPANYING PAPERS AND AN ILLUSTRATION, ON A REEXAMINATION OF APALACHICOLA, CHATTAHOOCHEE, AND FLINT RIVERS, GA. AND FLA., REQUESTED BY RESOLUTION OF THE COMMITTEE ON RIVERS AND HARBORS, HOUSE OF REPRESENTATIVES, ADOPTED APRIL 28, 1936

JUNE 16, 1939.—Referred to the Committee on Rivers and Harbors and ordered to be printed, with an illustration

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1939

LETTER OF TRANSMITTAL

WAR DEPARTMENT,
Washington, June 16, 1939.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEAR MR. SPEAKER: I am transmitting herewith a report dated April 20, 1939, from the Chief of Engineers, United States Army, on reexamination of Apalachicola, Chattahoochee, and Flint Rivers, Ga. and Fla., requested by resolution of the Committee on Rivers and Harbors, House of Representatives, adopted April 28, 1936, together with accompanying papers and illustration.

Sincerely yours,

HARRY H. WOODRING,
Secretary of War.

CONTENTS

	Page
Letter of transmittal	v
Letter of the Chief of Engineers, United States Army	1
Report of the Board of Engineers for Rivers and Harbors	2
Report of the Federal Power Commission	7
Report of the National Resources Committee	8
Report of the district engineer:	
Authority	9
Reports under review	9
Description:	
Apalachicola River	10
Flint River	11
Chattahoochee River	12
Geology	13
History	13
Topography	13
Drainage	14
Stratigraphy	14
Structure	17
Tributary area:	
Population	18
Resources	19
Industries	20
Railroads	21
Highways	22
Bridges	23
Prior reports:	
Apalachicola River	25
Flint River	25
Chattahoochee River	26
Other reports authorized but not yet transmitted to Congress in final form	26
Existing projects:	
Apalachicola River, Fla., the "Cut-off", Lee Slough, and Lower Chipola River	28
Flint River, Ga	28
Chattahoochee River, Ga. and Ala	29
Chattahoochee River, Ga. (flood control in the vicinity of West Point, Ga.)	29
Local cooperation	29
Terminal and transfer facilities	29
Improvement desired	30
Commerce and vessel traffic:	
Existing commerce and vessel traffic	32
Apalachicola Bay, Fla	33
St. Andrews Bay (Panama City), Fla	34
The competitive position of the proposed waterways	35
Rail competition	35
Motor truck competition	35
Barge-rail or rail-barge competition	36
Traffic survey and method of analysis	36
Method of calculating savings and basis for future rates	36
Analysis for each waterway	38
Eliminated commerce	39
Prospective commerce	40
Allowance for increased freight rates	40
Undeveloped traffic	41
Traffic in 1945	41
Chattahoochee River commerce	42

	Page
Commerce and vessel traffic—Continued.	
Principal commodities in order of volume—Chattahoochee River	44
Up-bound tonnage, Chattahoochee River	45
Down-bound tonnage, Chattahoochee River	51
Prospective commerce—Flint River	52
Principal commodities in order of volume, Flint River	55
Up-bound tonnage—Flint River	55
Down-bound tonnage—Flint River	56
Combined commerce—Flint and Chattahoochee Rivers	57
Flint River traffic—5-foot channel	58
Plan of improvement:	
Apalachicola River improvement	58
Chattahoochee River below Columbus, Ga	59
Geological features of dam sites	61
Junction Lock and Dam	61
Paramore Landing Lock and Dam	62
Columbia Lock and Dam	62
Fort Gaines Lock and Dam	62
Florence Lock and Dam	62
Fort Benning Lock and Dam	62
Stratigraphy	62
Geology—Conclusions	63
Locks and dams—General	63
Chattahoochee River improvement above Columbus, Ga	64
Roswell storage-power development	66
Cedar Creek storage-power development	66
Lanier storage-power development	66
Flint River improvement below Albany, Ga	66
Flint River improvement above Albany, Ga	67
Woodbury No. 2 storage-power development	69
Potato Creek storage-power development	69
Auchumpkee Creek storage-power development	69
Estimated power output	70
Bridge alterations	71
Order of development	72
Survey	73
Estimates of cost:	
Navigation improvements:	
Construction cost	73
Operation and maintenance	74
Power development:	
Construction	75
Operation and maintenance of Federal power development	76
Terminal facilities:	
Construction cost	76
Operation and maintenance	77
Bridges:	
Construction cost	77
Operation and maintenance	77
Annual benefits:	
Direct benefits	77
Savings to the public in transportation charges	77
Value of hydroelectric power developed	77
Value as a facility for national defense	79
Increased commercial value of riparian lands	79
Recreational value	79
Value as a source of industrial and municipal water supply	80
Indirect benefits	81
Indirect savings in the tributary area due to railroad rate reductions	81
The improvement of social and economic conditions in the tributary area	82
Economic cost:	
Flint River—9 feet, locks and dams	83
Expenditures, Federal and non-Federal	83
Interest during construction	83
Amortization, depreciation	83

Page
Discussion and conclusions 84
Recommendations 86
Report of the division engineer 87

LIST OF CHARTS MADE IN CONNECTION WITH THIS REPORT

(Only chart 3 printed on page 15)

Chart No.
1 Physiographic provinces of Alabama and Georgia.
2 General areal geology and physiographic divisions.
3 Stratigraphic section of eastern Mississippi, Alabama, and northwestern Florida.
4 Geologic section along lower Chattahoochee River.

LIST OF DRAWINGS MADE IN CONNECTION WITH THIS REPORT

(Only sheet 1 printed at end of document)

Sheet No.
1 General map.
Profile:
2 Apalachicola and Chattahoochee Rivers below Columbus, Ga.
3 Chattahoochee River above Columbus, Ga.
4 Flint River, Ga.
5–18 Hydrographs.
19 Rating and duration curves.
20 Logs of borings Nos. 1–18.
21 Logs of borings Nos. 19–36.
22 Logs of borings Nos. 37–54.
23 Logs of borings Nos. 55–65.
24 Junction Lock and Dam.
25 Paramore Landing Lock and Dam.
26 Columbia Lock and Dam.
27 Fort Gaines Lock and Dam.
28 Florence Lock and Dam.
29 Fort Benning Lock and Dam.

APALACHICOLA, CHATTAHOOCHEE, AND FLINT RIVERS, GA. AND ALA.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, April 20, 1939.

The CHAIRMAN, COMMITTEE ON RIVERS AND HARBORS,
House of Representatives, United States, Washington, D. C.

MY DEAR MR. CHAIRMAN: 1. The Committee on Rivers and Harbors of the House of Representatives, by resolution adopted April 28, 1936, requested the Board of Engineers for Rivers and Harbors to review the reports on Apalachicola-Chattahoochee, and Flint Rivers, Ga. and Fla., with a view to determining if the existing projects should be modified in any way at this time. I enclose the report of the Board in response thereto.

2. After full consideration of the reports secured from the district and division engineers, and after affording local interests full opportunity to be heard, the Board recommends that the general plan presented herein for the full development of the Apalachicola, Chattahoochee, and Flint River system in the combined interest of navigation and power be approved, and that for the initiation and partial accomplishment of said plan, the existing projects for Apalachicola River, Fla., Chattahoochee River, Ga. and Ala., and Flint River, Ga., be modified to provide for the construction of two of the locks and dams for the 9-foot project, one at Fort Benning and one at the junction, supplemented by dredging and contraction works, to provide a navigable depth of 6 feet to Columbus, Ga., and to Bainbridge, Ga., at an estimated cost for new work of $6,500,000, with annual maintenance of $200,000 in addition to that now required, subject to the provisions that local interest furnish assurances satisfactory to the Secretary of War that they will provide free of cost to the United States, when and as required, all necessary rights-of-way, flowage easements, spoil-disposal areas, lock sites, and other necessary lands, exclusive of storage reservoirs; that they will provide the necessary transfer and terminal facilities; and that they will hold and save the United States free from claims for damages which might arise from the construction of the improvements.

3. After due consideration of these reports, I concur in the views and recommendations of the Board.

Very truly yours,

J. L. SCHLEY,
Major General, Chief of Engineers.

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

WAR DEPARTMENT,
THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, D. C., April 10, 1939.

Subject: Apalachicola, Chattahoochee, and Flint Rivers, Ga. and Fla.
To: The Chief of Engineers, United States Army.

1. This report is in response to the following resolution, adopted April 28, 1936:

Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors created under section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the reports on Apalachicola, Chattahoochee, and Flint Rivers, Georgia and Florida, with a view to determining if the existing projects should be modified in any way at this time.

2. The Apalachicola River is formed by the confluence of the Chattahoochee and Flint Rivers at the southwest corner of Georgia and flows southward 112. 8 miles through Florida to Apalachicola Bay on the Gulf of Mexico. Its principal tributary, the Chattahoochee River, has its source in the Blue Ridge Mountains in northeast Georgia and flows southwesterly 235 miles to West Point, Ga., thence southward 201 miles to the junction with the Flint, in the latter reach forming the boundary between Georgia and Alabama, and Georgia and Florida. Flint River has its source near Atlanta and flows generally southward, 350 miles, to the junction with the Chattahoochee. The upper reaches of both tributaries have steep river slopes and contain a number of dams constructed for the development of water power. The dam farthest downstream on the Chattahoochee is at Columbus, Ga., mile 164. Between this point and the mouth the river has a total fall of 145 feet and the depth over shoals during low water is about 2 feet. The dam last downstream on the Flint River is at Albany, Ga., mile 104. Between this dam and the mouth the river has a fall of 112 feet and the controlling depth is 2 feet. The Apalachicola River has a total fall of 45 feet. The mean range of tide at the mouth is 2 feet and its effect extends upstream 25 miles. Chipola River, a tributary of the Apalachicola, rises in the southeastern part of Alabama and flows southward, uniting with the Apalachicola through Lee Slough and the "Cut-off" at mile 42, and also through the lower Chipola River at mile 29. A project, originally authorized by Congress in 1874, provides for improvement of the Apalachicola to secure a channel 6 feet deep at low water and 100 feet wide throughout its length by removal of snags and overhanging trees; for widening and straightening Mocassin Slough, a bypass channel between miles 35 and 37; for snagging and dredging to 6 feet depth the lower 2,500 feet of River Styx, a small tributary entering Mocassin Slough from the east; and for a channel 5 feet deep and 60 feet wide through the "Cut-off," Lee Slough, and the lower Chipola River. This project has been completed. The cost of improvement to June 30, 1938, was $135,798.81 for new work and $263,706.22 for maintenance, and the estimated annual cost of maintenance is $16,000. A project authorized by Congress in 1874 for improvement of the Chattahoochee River provides for securing a channel 4 feet deep at low water and 100 feet wide from the mouth to Columbus, Ga., 164 miles, by snagging, dredging, contraction works, and shore protection.

It is 94 percent complete. The cost of improvement to June 30, 1938, was $1,100,804.07 for new work and $1,033,936.32 for maintenance, and the approved estimate for annual cost of maintenance is $60,000. A project, authorized by Congress in 1874 for improvement of the Flint River provides for a channel 3 feet deep at extreme low water and 100 feet wide from the mouth to Albany, a distance of 103 miles, to be obtained by dredging, rock excavation, contraction works, and snagging. Improvement of the section from Albany to Montezuma, 79 miles, was authorized in 1880 and recommended for elimination from the project in 1917 by the Chief of Engineers. A power dam has since been constructed across the river at Albany without facilities for passing navigation. The improvement work authorized in the section from the mouth to Albany has been completed, except for widening of certain dredged cuts. The cost to June 30, 1938, was $640,819.77 for new work and $182,577.77 for maintenance, and the approved estimate for annual cost of maintenance is $20,000. In recent years the expenditures for maintenance of the channels in the Chattahoochee and Flint Rivers have been considerably less than the project estimates due to the limited requirements of the waterway traffic. Annual maintenance on each of these two waterways has actually averaged $5,000.

3. The area commercially tributary to these channels comprises roughly all counties in Florida, Alabama, and Georgia, lying wholly or in part in the watershed of the Apalachicola River system. It is primarily an agricultural region, producing cotton, peanuts, corn, potatoes, peaches, pecans, tobacco, and vegetables. The population totals 1,740,000, and the principal cities are Atlanta, Ga., with 270,400 inhabitants; Macon, Ga., with 53,800; Columbus, Ga., 43,100; La Grange, Ga., 20,100; Dothan, Ala., 16,000; and Albany, Ga., 14,500. The manufacture of cotton goods is an important industry in the upper part of the area. Large mills or groups of mills, located north of Columbus and operated directly or indirectly by water power, form the nucleus about which many small industrial centers have developed and constitute their chief source of income. Sawmills and planing mills both large and small are operated throughout the area, the greatest concentration being in the southern portion where large quantities of second-growth pine, cypress, poplar, gum, and magnolia are now being cut. Pulpwood obtained in this region is used in the manufacture of paper products at mills located on the Gulf coast. Numerous cotton gins, canning plants, turpentine stills, and fertilizer plants are operated in the tributary area. Granite, fuller's earth, bauxite, clay, sand, gravel, and cement are also obtained and processed in the area. Rail transportation is provided in a general east-west direction by the Louisville & Nashville Railroad, the Atlantic Coast Line, the Seaboard Air Line, the Central of Georgia Railway, the Southern Railway, and the Atlanta, Birmingham & Coast Railroad, and in a north-south direction to a limited extent by several branches of these railroads, the Apalachicola Northern Railroad and the Atlanta and St. Andrews Bay Railroad. Paved highways are available throughout the area. Commerce on the river system consists at the present time of local movements of sand and gravel in barges of 5 feet draft on the lower Chattahoochee, of logs in rafts and in barges of 7 feet draft, from points on the Apalachicola River to sawmills at

Blountstown and Apalachicola, and of pulpwood carried in barges to a paper mill at Panama City via the Intracoastal Waterway. During the past 5 years the commerce of the Chattahoochee River averaged 76,000 tons per year, and that of the Apalachicola averaged 258,000 tons. In 1936 the commerce of the Apalachicola reached a new all-time peak of 316,981 tons, of which 259,838 was vessel traffic and 57,143 was rafted.

4. Local interests request that the United States provide channels 9 feet deep and 100 feet wide in the Apalachicola River above the Intracoastal Waterway, in the Chattahoochee to Columbus, and in the Flint to Albany. They believe that improved waterways will provide transportation at lower cost than that of existing methods; will permit movement of commodities that cannot be handled with existing facilities, and will generally advance industrial development in the region. Cities to be served by the improvement have taken action toward providing necessary transfer and terminal facilities.

5. The district engineer has prepared a comprehensive plan to provide navigation channels as follows:

In the Apalachicola: 112 miles. Open-channel improvement and flow regulation to assure depth of 9 feet and width of 100 feet.

In the Chattahoochee to Columbus: 164 miles. Canalization by 6 dams with locks to assure 9-foot by 100-foot channel.

In the Flint: Open-channel improvement and flow regulation to assure width of 100 feet with depth of 7 feet to Bainbridge, 30 miles; thence 5 feet to Albany, 103 miles above the mouth.

All but one of the dams will be of such height as to permit generation of electrical energy 98 percent of the time. For regulation of river flows, three reservoirs on the upper Chattahoochee and three on the upper Flint are considered. One each of these would provide the minimum required flows; the others are found to be advantageous for inclusion in a plan for ultimate development because of power possibilities.

The estimated cost of the improvement for an initial development to provide for navigation and for an ultimate development to include all economical power is as follows:

INITIAL DEVELOPMENT—2 RESERVOIRS

(Power at 2 reservoirs and 1 navigation dam)

	Navigation	Power	Total
Construction, United States costs	$15,547,000	$20,977,000	$36,524,000
Lands and terminals, local costs	415,000		415,000
Annual carrying charge	990,000	1,018,000	2,008,000
Annual benefits	1,060,800	1,304,400	2,365,200
Ratio of benefits to costs	1.07 to 1	1.28 to 1	1.17 to 1

FULL DEVELOPMENT—6 RESERVOIRS

(Power at 6 reservoirs and at 5 navigation dams)

Construction, United States costs	$15,394,000	$51,235,000	$66,629,000
Lands and terminals, local costs	415,000		415,000
Annual carrying charge	923,000	2,666,000	3,589,000
Annual benefits	1,060,800	6,631,600	7,692,400
Ratio of benefits to costs	1.14 to 1	2.48 to 1	2.14 to 1

The annual benefits are based upon a careful study of potential traffic that would be available to the waterways by completion in 1945; the value of the electrical energy available, assuming there is a market for it by 1945; and nominal allowances for the value to national defense, to recreation, and in increasing the value of riparian lands. Both the navigation features and the power development of the initial step are economically justified and the increased power possibilities of the full development show a substantially increased justification. The district engineer recommends adoption of the plan for full development, with the initial step to be undertaken at once.

6. The division engineer concurs in general in the opinion that the rivers are worthy of progressive development. However, he believes that the present development of the tributary area does not warrant so extensive an improvement at the present time. In his opinion, the authorized project for a 6-foot depth in the Apalachicola River is adequate at the present time and the construction of a dam below Columbus in the Chattahoochee River, and one at River Junction on the Apalachicola River, together with channel improvement on the three streams, will largely remove difficulties encountered by present commerce on the Apalachicola, Chattahoochee, and Flint Rivers. He recommends construction of a lock and dam at Fort Benning on the Chattahoochee River, at River Junction on the Apalachicola River, and dredging and channel improvement on all three rivers as the initial stage of development in these streams in the interest of navigation and power.

7. Local interests were advised of the conclusions of the division engineer and were invited to submit additional information for consideration by the Board. At their request, a public hearing was held. Representatives of local governmental units and of business interests were practically unanimous in urging the eventual adoption of the comprehensive plan and the early initiation of at least the improvement recommended by the division engineer to assure reasonably adequate depth for existing commerce to Columbus. Representatives of communities on Flint River urge the present inclusion of that stream in any plan for improvement to provide usable depths to Bainbridge. The railroads serving the area filed a brief generally discounting the value of any improvement in the interest of navigation.

VIEWS AND RECOMMENDATIONS OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

8. After careful consideration of the reports and of the additional information available, the Board concurs generally in the view that comprehensive development of the Apalachicola and of its major tributaries, the Chattahoochee and the Flint, is justified in the combined interest of low-cost transportation and of hydroelectric power generation. The report of the district engineer indicates that a substantial volume of bulky commodities is potentially available to enter into commerce if low-cost transportation can be provided and that increased energy is needed to supply expanding industry in the region. A considerable volume of commerce is already moving on the waterways, despite the handicaps of inadequate depths and the uncertainties of being able to meet schedules. The comprehensive plan of improvement presented by the district engineer should be adopted

now so that improvement may be undertaken progressively to serve the increasing needs of commerce and industry.

9. The district engineer proposes in the initial development to assure a depth of 9 feet to Columbus by the construction of 5 dams in the Chattahoochee and one dam just below the head of the Apalachicola. Two reservoirs would also be required, one each in headwaters of the Chattahoochee and the Flint, to regulate flows so as to assure a 9-foot depth in the Apalachicola and lesser depths in the Flint. Power would be generated at the storage reservoirs and at one of the navigation dams. The cost of the initial development would be $36,524,000, but savings in transportation costs, sale of power, and nominal amounts credited to the improvement for value to national defense, to recreational use, and to enhancement of land values, would exceed the annual carrying charges. Desirable as it may be to obtain a depth of 9 feet on the waterway, the Board believes that the project may advantageously be developed by providing first for the reasonable needs of existing commerce, undertaking now only those works necessary to extend to Columbus on the Chattahoochee and to Bainbridge on the Flint the depth now authorized for the Apalachicola. This can be accomplished by the construction of two of the navigation dams to maintain depths over critical reaches, supplemented by dredging. A dam in the Apalachicola, just below the junction, will maintain usable depths in the lower Chattahoochee and in the Flint almost to Bainbridge, while a dam in the Chattahoochee at Fort Benning will provide necessary depths over a heretofore limiting reach to Columbus. These dams should be constructed as part of the eventual comprehensive development. The cost of this initial improvement, including necessary dredging, is estimated at $6,500,000.

10. The Board recommends that the general plan presented herein for the full development of the Apalachicola, Chattahoochee, and Flint River system in the combined interest of navigation and power be approved, and that for the initiation and partial accomplishment of said plan, the existing projects for Apalachicola River, Fla., Chattahoochee River, Ga., and Ala., and Flint River, Ga., be modified to provide for the construction of two of the locks and dams, for the 9-foot project, one at Fort Benning and one at the junction, supplemented by dredging and contraction works, to provide a navigable depth of 6 feet to Columbus, Ga., and to Bainbridge, Ga.; at an estimated cost for new work of $6,500,000, with annual maintenance of $200,000 in addition to that now required; subject to the provisions that local interests furnish assurances satisfactory to the Secretary of War that they will provide, free of cost to the United States when and as required, all necessary rights-of-way, flowage easements, spoil-disposal areas, lock sites and other necessary lands, exclusive of storage reservoirs; that they will provide the necessary transfer and terminal facilities; and that they will hold and save the United States free from claims for damages which might arise from the construction of the improvements.

For the Board:

M. C. TYLER,
Brigadier General, Corps of Engineers, Senior Member.

REPORT OF THE FEDERAL POWER COMMISSION

FEDERAL POWER COMMISSION,
Washington, May 23, 1939.

Maj. Gen. JULIAN L. SCHLEY,
Chief of Engineers, United States Army,
War Department, Washington, D. C.

MY DEAR GENERAL SCHLEY: This is in reply to your letter of April 22 transmitting to the Commission a mimeographed copy of a report by your department reviewing previous reports on the Apalachicola, Chattahoochee, and Flint Rivers, Fla., Ga., and Ala, and requesting the Commission's comments thereon.

The report of your department was prepared pursuant to a resolution adopted April 28, 1936, by the Committee on Rivers and Harbors of the House of Representatives requesting the Board of Engineers for Rivers and Harbors to review previous reports on these rivers with a view to determining whether the existing projects should be modified in any way at this time. The report presents and recommends for approval by the Congress a comprehensive plan for the improvement of the Apalachicola, Chattahoochee, and Flint Rivers primarily for navigation and power development, with some incidental recreational and national defense benefits. The ultimate plan as proposed contemplates the construction of six navigation locks and dams, five of which would be on the Chattahoochee River and one on the Apalachicola River just below the junction of the Flint and Chattahoochee; and six storage reservoirs, three on the Flint and three on the Chattahoochee, for the regulation of stream flow for the benefit of navigation, for the production of hydroelectric power, and for other purposes.

The Board of Engineers for Rivers and Harbors and the Chief of Engineers recommend adoption by the Congress of the ultimate plan, including the six navigation locks and dams and the six storage reservoirs, and recommend further that for the initial and partial accomplishment of the ultimate plan the existing projects for navigation be modified to provide for the construction of two of the navigation locks and dams, one of which would be located on the Apalachicola River at the junction of the Flint and Chattahoochee Rivers and the other at Fort Benning on the Chattahoochee River, these works to be supplemented by certain dredging and contraction works.

The immediate construction of the Fort Benning and River Junction locks and dams would not in any way interfere or be inconsistent with the interests of power development in the basins of these rivers, provided suitable and adequate arrangements are made for the development of such water power as may be available at each of the navigation dams after construction of the several proposed headwater reservoirs for stream flow regulation. Such arrangements should be reviewed and approved by the Federal Power Commission before construction is begun.

A plan for constructing storage reservoirs in the basins of these streams similar to the general plan recommended by your department will, it is believed, prove to be suitable for developing the water resources of the region at such time as the demand for power and the requirements of navigation shall warrant the execution of such a plan. As yet, however, the Commission and its staff have not had opportunity to investigate the water-storage possibilities in these river basins in the manner necessary to permit of reaching a definite and

well-considered decision regarding the general plan of development best adapted to serve the several purposes.

It seems desirable that any legislation adopting and authorizing the general or full plan of development recommended by your department provide for very considerable latitude in the final planning of the storage-reservoir system, permitting of possible changes in the locations and capacities of reservoirs and in the degree of stream-flow regulation to be achieved.

No reason is seen why the Fort Benning and River Junction locks and dams, as parts of the general navigation-power project, should not be authorized and constructed in the immediate future.

Sincerely yours,

CLYDE L. SEAVEY,
Acting Chairman.

REPORT OF THE NATIONAL RESOURCES COMMITTEE

NATIONAL RESOURCES COMMITTEE,
Washington, May 27, 1939.

Maj. Gen. JULIAN L. SCHLEY,
Chief of Engineers, Washington, D. C.

MY DEAR GENERAL SCHLEY: On April 22, 1939, you transmitted to me a copy of a report on the Apalachicola, Chattahoochee, and Flint Rivers, Ga. and Fla., with your request for comment thereon.

Our Water Resources Committee, representing the chief Federal agencies concerned with water use and control, has reviewed the report and now submits the following comments; your representative on the Water Resources Committee desired to be recorded as not voting, inasmuch as your own recommendation is embodied as a part of the report under review.

1. These comments apply solely to the initial project for the navigation improvement at an estimated cost for new work of $6,500,000 as recommended in the letter of the Chief of Engineers to the chairman of the Rivers and Harbors Committee of the House of Representatives, April 20, 1939.

2. The committee has previously recommended that new waterway projects should be appraised from the standpoint of their suitability as components of a general land and water transportation system, not as separate entities; and has stated that it should no longer be necessary to improve waterways solely or chiefly as aids in influencing rail rates.

3. Since the simplified project as recommended by the Board of Engineers for Rivers and Harbors and by the Chief of Engineers provides channel improvements substantially less than those upon which estimates of benefits (direct and indirect) were based, it is suggested that the report be supplemented by an estimate of the annual benefits from the simplified navigation project in comparison with the annual carrying and maintenance charges. Such a supplemental estimate seems essential to the evaluation of the simplified project. In such an estimate it would seem desirable in the public interest to maintain the distinction hitherto made between the direct benefits of the project and its indirect benefits through reduction in rail transportation rates which the simplified project would cause to be made.

4. Included in the summary of direct benefits from the initial improvement proposed by the district engineer are its value to national defense, increased commercial value of riparian lands, and recreational value. These values are speculative and should be carefully scrutinized as to the effect which their acceptance may have on the formation of national policy.

The report is returned to you herewith.

Sincerely yours,

HAROLD L. ICKES,
Chairman.

REEXAMINATION OF APALACHICOLA, CHATTAHOOCHEE, AND FLINT RIVERS, GA. AND FLA.

SYLLABUS

The district engineer formulated two plans for improving the Apalachicola, Chattahoochee, and Flint Rivers. Both of these contemplate a 9-foot open river channel on the Apalachicola River, a 9-foot canalized project on the Chattahoochee River to Columbus, Ga., a 7-foot open river channel to Bainbridge, Ga., and a 5-foot open river channel to Albany, Ga. One plan, designated "Plan for Full Development," estimated to cost $66,629,000, contemplates the construction of three storage-power reservoirs on the Chattahoochee above Columbus and three on the Flint above Albany as well as power installations at the upper five of the six navigation locks and dams. The other, designated "Plan for Initial Development," estimated to cost $36,524,000, contemplates the same construction as above except that only one storage-power reservoir would be built on the Chattahoochee and one on the Flint, with a power installation at only one of the six locks and dams. The district engineer recommends the latter plan for immediate construction, with ultimate completion of the full development as the future demand for power may warrant.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE,
Mobile, Ala., December 6, 1938.

Subject: Review of reports on the Apalachicola, Chattahoochee, and Flint Rivers, Ga. and Fla.

To: The Division Engineer, Gulf of Mexico Division, New Orleans, La.

1. *Authority.*—The following report is submitted in accordance with instructions from the division engineer, Gulf of Mexico division, dated May 14, 1936, and in compliance with a resolution adopted by the Committee on Rivers and Harbors, House of Representatives, dated April 28, 1936, which reads as follows:

Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors, created under section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the reports on Apalachicola, Chattahoochee, and Flint Rivers, Georgia and Florida, with a view to determining if the existing projects should be modified in any way at this time.

REPORTS UNDER REVIEW

2. No previous report treating these three rivers as a combined system has yet been transmitted to Congress in final form. Several studies, however, involving extensive surveys and examinations of these waterways, have been made in recent years, but final action on them is being delayed at the request of local interests. They are listed in paragraphs 78 to 84 under "Prior reports." Certain of these reports have been combined into one study made under House Document No. 308, Sixty-ninth Congress, first session, and other authorizations generally called the "308" report, which will be referred to herein from time to time for supporting data.

3. Several other preliminary examinations and surveys have been previously authorized, executed, and reported on each of the three rivers. They are also outlined in general detail under the heading "Prior reports." The broad scope of their combined authorizations is such as would not limit in any way the full consideration at this

time of all phases of navigation, water power, flood control, irrigation, and other related subjects concerned with the improvement of these rivers. The features of improvement to be given particular attention at this time, however, are those pointed out in paragraph 107 under "Improvement desired."

DESCRIPTION

4. The Apalachicola River system drains the western part of Georgia, eastern Alabama, and a portion of west Florida. The Flint River from the northeast, and the Chattahoochee from the north converge at the southwest corner of Georgia to form the Apalachicola River, which continues south through west Florida to the Gulf of Mexico. The Chipola River, a major tributary of the Apalachicola, enters it from the west.

5. The drainage basin has a total area of about 19,500 square miles of which 14,800 square miles are in the western part of Georgia, 2,760 square miles in the southeastern part of Alabama, and 1,880 square miles in the northwestern part of Florida. The southern 55 percent of the total area lies in the Coastal Plain, while the remainder to the north is in the Piedmont upland. The dividing line between these two regions, which extends roughly east and west through Columbus and Macon, Ga., is known as the fall line.

6. *Apalachicola River.*—The Apalachicola River is a mature stream that traverses the broad, flat swamps and hammock land of the southern portion of the basin. From its point of origin at the confluence of the Chattahoochee and Flint Rivers, it winds in a general southerly direction for a distance of 112.8 miles to its mouth in Apalachicola Bay on the Gulf of Mexico, about 300 miles east of New Orleans and 180 miles east of Mobile Bay.

7. The total fall is about 45 feet. The minimum flow of about 5,120 cubic feet per second is sufficient to afford easy navigation for craft drawing up to 5 feet with a small amount of dredging at the bars. The tide at the mouth has a mean range of about 2 feet and its effect is felt some 25 miles upstream. At the head of the river the maximum flood discharge of about 293,000 cubic feet per second raises the water level approximately 36 feet. The stream is muddy with the red clay from the Chattahoochee Valley which settles at the mouth in Apalachicola Bay, forming shoals and mud flats. The town of Apalachicola, Fla., with its shallow harbor at the mouth of the river, would probably have developed into an entrance port for the entire Apalachicola Basin were it not for this excessive shoaling.

8. Low swamplands border the river that support a dense growth of hardwood timber, while back from the river bottoms are vast areas of rolling sand hills covered with second-growth pine and scrub oak. The region as a whole is relatively uninhabited, a large portion of the territory east of the river being contained in the Apalachicola National Forest. The northern portion though, by virtue of its fertile soil, is developing into a thriving agricultural area.

9. The Intracoastal Canal, recently completed to a depth of 9 feet and width of 100 feet, connects with the Apalachicola River 6 miles above its mouth and provides an inland waterway via Panama City, Fla., Pensacola, Fla., and Mobile, Ala., to New Orleans, La., a water distance of 375 miles. A similar channel continues on from New

Orleans to Galveston, and will eventually be completed to Corpus Christi, Tex. From Apalachicola at the mouth of the river the waterway extends eastward 27 miles to the town of Carrabelle, Fla., and has been approved for extension to St. Marks, Fla.

10. The port of Panama City, Fla., located on the Intracoastal Waterway 56 miles west of the river, has a channel from the Gulf of Mexico, 27 feet deep, and is rapidly developing into a gateway for the Apalachicola Basin. The recent location there of a large paper mill, several major oil companies, and other shipping interests assure the port of increasing prominence in the Gulf trade. The harbor at Port St. Joe, Fla., has been improved to serve a large paper mill recently constructed there. A canal was dug by private interests from the port to connect with the Intracoastal Waterway about 18 miles west of the Apalachicola River providing an additional deep-water gateway to this area. A 25-foot channel is under construction at Carrabelle, Fla., which, with projected port facilities, will provide an additional outlet.

11. The Chipola River is the only sizeable tributary of the Apalachicola. It rises in the southeastern part of Alabama and flows in a southerly direction to enter the Apalachicola from the west through Dead Lakes, Lee Slough, and the "cut-off" about 44 miles from the mouth. From this junction the lower Chipola River parallels the Apalachicola to the west and enters it at a second point about 29 miles from the mouth. A fairly uniform flow of clear water, emanating principally from numerous springs, provides a navigable channel 5 feet deep and 60 feet wide through the lower river as far up as Dead Lakes, and in Lee Slough and the "cut-off"; a three-foot channel obtains from there to Look and Tremble Shoals about 35 miles above on the upper Chipola River.

12. *Flint River.*—The Flint River rises just south of Atlanta and flows for about 350 miles in a southerly direction, curving to the west to join the Chattahoochee River at the southwest corner of the State of Georgia. For the first 250 miles of its course extending down to Albany, the slope of the river is rather steep and has been developed for water power at three of the numerous sites. From the last dam near Albany to the mouth, a distance of 104 miles, the total fall is 112 feet. Below Albany, there are a number of rock shoals and rapids extending as far downstream as Bainbridge, a distance of 74.5 miles. Through this stretch the river flows between high steep banks. From there to the mouth, 29.5 miles, the flow velocity diminishes as the stream widens out and passes through broad swamp areas. The lower reach from Bainbridge to the mouth is navigable at 4 feet, while the river above that point to the head of navigation at Albany has a least depth of about 2 feet for a width of 70 feet during periods of low water. The Flint is fed by numerous springs and bears little eroded material, as a result of which the water is generally clear.

13. The maximum range of stage at Albany is about 37 feet. The maximum flow of record is 92,000 cubic feet per second and the minimum flow of record 58 cubic feet per second. The lower flows are affected by upstream power plants so that although the minimum flow for a short time is 58 cubic feet per second the minimum average for 1 day is 327 cubic feet per second.

14. The principal tributaries are listed below:

Tributaries of Flint River	Distance from mouth (miles)	Length (miles)	Drainage area (square miles)
Line Creek	293	29	220
Potato Creek	244	35	240
Muckafoonee Creek	103	67	1,000
Ichawaynotchaway Creek	54	53	1,080
Spring Creek	4	67	710

15. *Chattahoochee River.*—The headwater streams of the Chattahoochee rise in the Blue Ridge Mountains of north Georgia. The river flows in a southwesterly direction for a distance of 235 miles, passing near Gainesville, Atlanta, and LaGrange to West Point, Ga., on the Georgia-Alabama line. Turning south at this point, it continues for about 201 miles to its mouth, constituting the boundary between Georgia on the east and Alabama, and for the lower 26.2 miles, Florida on the west.

16. In traversing the Piedmont upland above Columbus, Ga., the waters become burdened with fine red clay eroded from the unprotected slopes, much of which is transported in suspension for the entire length of the river, giving it a muddy orange color. The 406 feet of fall in the 95 miles above Atlanta, and the 553 feet of fall in the 141-mile reach from there to Columbus, afford numerous sites for water-power plants, nine of which have already been developed. A fixed dam at Columbus marks the head of navigation.

17. Below Columbus the Chattahoochee flows south for a distance of 164 miles, for the most part in unusually straight reaches, to its junction with the Flint River. The total fall in this stretch is 145 feet. From January to August a navigable channel 4 feet deep is usually available, but during the balance of the year when the discharge at West Point is reduced to as low as 224 cubic feet per second, the navigable depth over the shoals is reduced to about 2 feet. The power dams above Columbus seriously affect the low-water discharge by cutting off the flow of the stream at times to store the water. The average variation between low and high water at Columbus is approximately 20 feet, though the extreme fluctuation at that point has reached 53 feet. A maximum flood discharge of about 134,000 cubic feet per second has been recorded at West Point.

18. The more important tributaries of the Chattahoochee River are listed in the following table:

Tributaries of the Chattahoochee River	Distance from mouth (miles)	Length (miles)	Drainage area (square miles)
Soque River	402	32	166
Chestatee River	362	49	295
Upatoi Creek	153	40	560
Uchee Creek	146	34	340
Cowikee Creek	106	38	480
Pataula Creek	84	40	470

19. *Geology—General.*—The geological features of all the areas involved in the river system under investigation were given detailed consideration in the "308" report. A review of the geology of these areas, was made in connection with this report, but detailed study was devoted only to those areas lying in the Coastal Plain, and with special consideration of the section of the Chattahoochee River from Columbus, Ga., to its mouth. The geology of each navigation lock and dam site is discussed under "Plan of improvement."

20. *History.*—The formations that are exposed and underlie the Coastal Plain of this region range from Upper Cretaceous to Recent in age, with the basal Cretaceous sediments deposited unconformably upon a pre-Cambrian crystalline rock erosion surface which had been undergoing degradation for millions of years. The last extensive submergence of this part of North America assumed its greatest proportions just previous to and can be said to mark the beginning of Upper Cretaceous deposition. These deposits are chiefly marine, but include some nonmarine and brackish-water strata. They were laid down in or along shallow epicontinental seas and were derived from the persistent Appalachian land mass to the north. The Upper Cretaceous deposition was culminated in consequence of a general emergence of the continent with an erosional period following. Here again is found an unconformity between the sediments of the Mesozoic and those which issued in the Cenozoic era. The Cenozoic formations flank the arcing Cretaceous belt to form the outer portion of the Coastal Plain. They are a variable assemblage of sands, clays, limestones, and marl, most of them being deposited under conditions not unsimilar to those which now prevail. During the Cenozoic era, the Appalachian region was arched up, the continental shelf was depressed and the formations in this territory progressively tilted to the north and east. In later Cenozoic time during the Pleistocene or Quaternary fluctuations of the sea level brought about by a waxing and waning of continental ice sheets are reflected in the many coastal terraces of the southeastern United States. These terraces are thought to be a shore line development during the various interglacial epochs of Pleistocene glaciation. Today conditions are comparable to those often repeated in the past; namely, the deposition of sand and mud on the Gulf floor in the area immediately contiguous to the present coast line with the finer materials being carried farther seaward, and the formation of limestones in the nonturbid shallower waters of the continental shelf.

21. *Topography.*—That portion of the watershed of the greater Apalachicola River system related to the canalization of the Chattahoochee River below Columbus, Ga., lies wholly within the east Gulf coastal section of the Atlantic Coastal Plain. It is a rolling expanse, young to maturely dissected which slopes from 2 to 3 feet per mile toward the Gulf of Mexico, with the underlying Upper Cretaceous and Cenozoic formations disposed in beltlike array as shown on chart No. 2.[1] Physiographically this territory may be divided into subdivisions as shown on chart No. 1.[1] The lower division is a low, often swampy terrain, called the Southern Limestone Hills in Alabama and Dougherty Plain in Georgia. It is characterized, by solution topography, especially in the area designated as the "lime sink region" on the physiographic chart and is underlain by limestones of

[1] Not printed.

Vicksburg and Jackson age with local cover of sand and gravel. To the northward in Alabama lies a province known as the Southern Red Hills. This is an area of greater relief showing distinct systems of hills or ridges underlain by formations of Eocene age known as the Claiborne, Wilcox, and Midway groups. The next division in Alabama is designated as the Chennunuggee Ridge province. It is also very hilly, forming a conspicuous northward facing escarpment up to 300 feet in elevation. This prominent feature is due principally to resistant sandy phases within the Ripley formation of Upper Cretaceous age. The northernmost division, or so-called Fall Line Hills province, is of even greater relief brought about by resistant beds of sand and of gravel of the Eutaw and Tuscaloosa formations also of Upper Cretaceous age. These assume elevations between 600 and 1,000 feet. Its landward limit is the well known "Fall Line" which is essentially the edge of the pre-Cambrian crystalline area. Good exposures of all formations may be found principally along the river banks.

22. *Drainage.*—The Chattahoochee River throughout the 164-mile reach above its mouth and confluence with the Flint River is gently meandering, with occasional sharp bends. The channel is narrow and the banks often steep-sided. Modification of the banks has in many places been brought about and considerable sand cover superimposed during flood stages. Above the flood plain proper three well-developed river terraces are in evidence, standing at altitudes of 50, 130, and 160 feet above the river, showing that the river once flowed in a broader but shallower valley. The river is today entrenched into its own old flood plain and its tributaries enter through gorges with rapids and falls up to 10 feet high not uncommon, near their mouths. In their upper reaches, the tributary valleys are broader. These conditions are indicative of a youthful stage in the process of adjustment to a new base level necessitated by a general uplift of the region along a hinge line roughly paralleling the present coast line. The water of the Chattahoochee River is turbid from the fine particles of mud which it carries in suspension.

23. *Stratigraphy.*—The stratigraphic relationships, thicknesses and lithologic character of all the formations of the Coastal Plain province, with especial reference to eastern Alabama, western Georgia and northwestern Florida are shown on chart No. 3.

CHART NO. 3.—*Stratigraphic section of eastern Mississippi, Alabama, western Georgia, and northwestern Florida*

Series	Group	Formation	Thickness (feet)	Lithologic character
Recent		Alluvium	0–50	Sands, clays, and silt.
Pleistocene		Terrace deposits	0–100	Gravels, sands, clays, and silt.
Do		Upland gravels	0–100	Gravels, sands, and clays.
Pliocene		Unconformity: Citronelle and Charlton formations.	0–400	Gravels, sands and clays, red and orange color.
Miocene	Alum Bluff	Unconformity: Hawthorn formation	100–300	White or cream colored sandy limestone contains grains of phosphate and readily disintegrates into sand.
		Tampa and Chattahoochee limestones.	15–150	Variable hard, white to creamy yellow argillaceous limestone.
	Grand Gulf	Catahoula sandstone	300–1,000 (?)	White, pink, and purple sands and clays.
Oligocene	Vicksburg	Unconformity: Byram marl	25–35	Light gray and cream colored and yellow soft marl and greenish clays.
		Glendon Limestone	15–40 100 feet in eastern Alabama.	Hard crystalline cavernous limestone ("Horsebone").
		Unconformity(?): Marianna limestone	0–90	White porous limestone ("Chimney Rock").
		Red bluff clay	15–30 Absent in eastern Alabama.	Greenish and yellowish plastic clay, with gypsum and glauconitic marls and marly limestones above.
	Jackson	Ocala limestone	40–100	White and cream colored pure chalky limestone and white, very calcareous marl, best developed in southeastern Alabama and Florida.
		Jackson formation	Western Alabama, 85–170 Eastern Alabama, 20–40.	Massive plastic gray clay with a sandy shell bed at base.
	Claiborne	Local unconformity (?): Gosport sand	0–35 Absent in eastern Alabama.	Green sand and indurated glauconitic sandy marl, weathers red, reddish brown and yellow, very fossiliferous.
		Lisbon formation	50–85 170 feet in eastern Alabama.	Calcareous sands, clays, marls, and oyster beds, glauconitic sands weathering red and very fossiliferous.
		Unconformity (?): Tallahatta formation, buhrstone.	20–300	Claystone, sandstones, and argillaceous sandstone, gray, greenish gray or green, glauconitic, sparingly fossiliferous, highly siliceous.
Eocene	Wilcox	Unconformity: Hatchetigbee formation	150–300(?)	Sandy clays, brownish gray alternating with bands of dark brown or purple, weathering yellow and brown, lignitic in part and also contains beds of marine shells.
		Bashi formation	80–125	Greenish glauconitic fossiliferous marl at top; then laminated sands and clays with thin seams lignite; then cross-bedded yellowish sand with 2-foot bed of lignite at base.
		Tuscahoma formation	140–170 (200?)	Sands, sandy clays and green sands with two fossiliferous marl beds.
		Nanafalia formation	125–200 (250?)	Upper member: 40 feet of indurated gray clay and sandy clay (glauconitic), sometimes referred to as "Pseudo-Buhrstone." Middle member: 80 feet yellow, red and white sands (glauconitic), contains *ostreathirsae*. Lower member: 80 feet sandy clays (glauconitic), lignite bed at base ("Coal bluff beds").

CHART NO. 3.—*Stratigraphic section of eastern Mississippi, Alabama, western Georgia, and northwestern Florida*—Continued

Series	Group	Formation	Thickness (feet)	Lithologic character
Eocene—Continued.	Midway	Unconformity:		
		Naheola formation	125–150 (200?)	Buff and pink cross-bedded sands (sometimes glauconitic), and dark gray to black sandy clays, marine fossils near base.
		Sucarnoochee clay	90–120 (200?) Absent in eastern Alabama.	Dark gray to black tough clay, conchoidal fracture calcareous toward base and grades into Clayton limestone, white limestone and white and yellow micaceous sands.
		Clayton limestone	0–40 200 feet in eastern Alabama.	Type locality Barbour County, absent in parts of southwest Alabama.
Upper Cretaceous		Unconformity:		
		Ripley formation	1,000 feet in eastern Alabama.	Marine sands, clays, marls, and sandy limestones, some glauconitic. This formation gives rise to prominent outcrops and ridges (Chunnenuggee Ridge) merges into Selma chalk to west.
		Selma chalk	900–1,000 In western central Alabama.	Grayish white or bluish gray to dark gray, chalk and chalky limestone, in part clayey, in part sandy, sand phase increases to east, represented by Ripley which is approximate time equivalent, marine.
		Eutaw formation	400–450	Glauconitic, fine to medium-grained, micaceous sands, clays, and lignitic clays, sands are of shallow marine deposition, in part massive, in part cross-bedded.
		Tuscaloosa formation	Average, 1,000	Light to dark gray and green irregularly bedded sands, clays, and gravels locally blotched and banded with red, purple, pink, yellow, and brown. Lignite plant remains and fossil plants nonmarine.

Compiled from: Geological Survey of Alabama, Special Report No. 15, 1929; Geological Survey of Georgia, Bulletin No. 42, 1925; Geological Survey of Florida, Twentieth Annual Report, 1929.

24. *Structure.*—The Coastal Plain formations in the Chattahoochee River region are monoclinal in structure dipping south toward the Gulf of Mexico. The Cretaceous beds dip on an average between 40 to 50 feet per mile, with local variations up to 100 feet not uncommon. Most of the irregularities in dip are in the form of rolls, and explain the reverse attitude of beds in some places. The Cenozoic formations vary in dip from about 40 feet per mile through progressively lower dips to almost horizontal as the Gulf is approached. No faults and only occasional slides have been noted. A generalized geologic section of the Chattahoochee River below Columbus, Ga., is shown on chart No. 4.[1]

TRIBUTARY AREA

25. The accompanying general map includes the area considered tributary to these waterways. It comprises the region bounded roughly by a line extending northward from the Gulf of Mexico approximately parallel to and 30 miles west of the Apalachicola and Chattahoochee Rivers to the latitude of West Point, Ga., thence curving to the northeast to encircle the Atlanta area and return to the mouth of the Apalachicola River via Macon, Tifton, and Thomasville, Ga., and Quincy, Fla. This boundary represents the approximate limits within which commerce might move via the proposed improvement at a probable saving as compared with the cost over other transportation routes.

26. The portion of the area bordering the Apalachicola and the lower reaches of the Chattahoochee and Flint Rivers consists principally of swampland, but continuing northward this gradually diminishes as the slope of the river becomes steeper. The surrounding country becomes one of gently rolling, sandy, clay hills. Farming is more extensive, particularly to the west of the Chattahoochee and east of the Flint. These regions, especially the belt within the eastern limits of the basin extending from Florida to the fall line, are unusually productive and are in a state of rapid development in agriculture and related industries.

27. The region between the two rivers below a line roughly drawn between Columbus and Albany, Ga., is not cultivated to the same extent as the territory to the east. There are sections there, however, particularly in the northern part, that support a thriving agricultural people. The lumber industry is predominant in the southern part.

28. The northern portion of the basin is markedly more populous. Large textile mills and other industries have developed and cities have expanded. Agriculture, too, has become intensified to the point where little arable land remains uncultivated. The extreme north portion on the slopes of the Blue Ridge Mountains is, of course, less thickly settled.

29. The eastern boundary of the tributary area would be determined by the competition to waterway commerce of an overland haul from the south Atlantic ports. On the south would be met similar competition with the Gulf ports. Combination barge-rail traffic over the Savannah River from the port of Savannah, Ga., through Augusta,

[1] Not printed.

Ga., to the Atlanta and Macon territories would also limit the area in that direction. The area to the west and northwest would be limited by the advantages of a water movement over the Warrior River system or an overland haul from the ports of Mobile and Pensacola. The northern boundary is less clearly defined, being influenced by several factors including: Existing barge-rail rates from the southwest via the Warrior River, combination rail-water rates to the North Atlantic States through the South Atlantic ports and Norfolk, and a shortened overland haul to the Central States compared with an increased rail-barge haul over the circuitous route via the Chattahoochee and Apalachicola Rivers, Intracoastal Waterway, and the Mississippi River system.

30. *Population.*—As previously pointed out, the cities and towns in the northern part of the area are more numerous and generally larger than those to the south. Seven of these, namely Atlanta, Macon, Columbus, LaGrange, Decatur, and Griffin, Ga., and Phenix City, Ala., have populations of over 10,000. They support a larger industrial population engaged principally in the manufacture of cotton products. The largest of these also serve as wholesale distribution points for the surrounding territory.

31. The southern territory, more predominantly agricultural, supports fewer large cities. Albany and Thomasville, Ga., and Dothan, Ala., are the only municipalities of over 10,000 population. Albany and Dothan are cities of similar nature, both being distributing and processing centers of lesser importance, while Thomasville is principally a winter resort city for northern tourists.

32. The cities having a population of over 10,000 in 1930 are listed below with 10-year census figures since 1900 also given to indicate their rapid growth in recent years.

City	Population			
	Census year 1900	Census year 1910	Census year 1920	Census year 1930
North of Columbus, Ga.:				
Atlanta, Ga.	89,872	154,839	200,616	270,366
Macon, Ga.	23,272	40,665	52,995	53,829
Columbus, Ga.	17,614	20,554	31,125	43,131
LaGrange, Ga.	4,274	5,587	7,038	20,131
Phenix City, Ala.	4,163	4,555	5,432	13,862
Decatur, Ga.	1,418	2,466	6,150	13,276
Griffin, Ga.	6,857	7,478	8,240	10,321
South of Columbus, Ga.:				
Dothan, Ala.	3,275	7,016	10,034	16,046
Albany, Ga.	4,606	8,190	11,555	14,507
Thomasville, Ga.	5,322	6,727	8,196	11,733

33. Included in the tributary area are 7 counties in Alabama, 6 in Florida, and 60 in Georgia.

The following table sets out certain characteristics of their population:

	Tributary area in—			Total tributary area
	Alabama	Florida	Georgia	
Total population:				
1920	219,482	73,862	1,343,604	1,636,948
1930	230,794	82,689	1,424,469	1,737,952
Increase, 1920-30, percent	5.2	12.0	6.0	6.2
Area and density:				
Area, square miles	4,519	3,932	20,719	29,170
Population per square mile, 1930	51	21	69	60
Negro population:				
1930	104,980	35,865	544,596	685,441
Percent of total	45.5	43.4	38.2	39.4
Urban and rural:				
Percent distribution, 1930:				
Urban	23.2	19.3	38.9	35.9
Rural nonfarm	15.4	37.6	19.3	19.7
Rural farm	61.4	43.1	41.8	44.4
Occupations:				
Number of gainful workers, 1930	90,480	35,459	593,475	719,414
Percentage distribution:				
Agriculture	57.7	52.5	36.3	39.8
Domestic service	7.6	6.7	11.5	10.8
Wholesale and retail trade	5.1	4.6	8.4	7.8
Cotton mills	9.4	0.0	6.0	6.1
Saw and planing mills	3.1	6.5	1.8	2.2
All other	17.1	29.7	36.0	33.3

34. The increase in the total population of the area from 1920 to 1930 is noted as 6.2 percent. This increase is not indicative of conditions throughout the area however, as it is due principally to a large gain in the urban population. It will be seen that the increase in population of the cities of over 10,000 inhabitants is greater than the increase for the territory as a whole, indicating a loss for the balance of the area; in fact, 46 out of the 73 counties showed a decrease for the 10-year period.

35. *Resources.*—In a region so predominantly agricultural the natural resources of first importance are fertile soil and favorable climate. Though some sections of this area are better suited for agriculture than others, there is but a very small part that is unfit for cultivation. Of the total land area of 29,170 square miles, 20,275 or 69.5 percent was in farms in 1935. Climatic conditions studied in detail in the "308" report indicated an ample supply of rainfall and an adequate growing period for a wide variety of crops, including: Cotton, peanuts, corn, potatoes, peaches, pecans, tobacco, watermelons, cantaloups, and sugarcane. Truck farming is of lesser importance and the production of irish potatoes, fruits, and green vegetables is insufficient to meet local demands.

36. Another natural resource of prime importance is the plentiful supply of pine and hardwood timber. The supply of standing saw timber in the area is estimated to be about 10.3 billion board feet. Approximately 74 percent of this is pine and the remainder hardwoods. The majority of the high-grade lumber is produced in the southern part of the area. It is there that longleaf pine, cypress, poplar, gum, magnolia, and other woods are found in abundance. The northern and central sections produce principally hardwoods and short leaf pine, which is inferior to the long leaf variety for construction purposes. Practically all of the original stand of timber has been cut over, but the rapid growth promoted by the mild climate and ample rainfall has produced vast quantities of second-growth trees that are now being worked. Some of the mills in the southern region have

operated continuously at a single site for as long as a hundred years and are now reworking tracts that had been previously cut over. Lumbermen in this section declare that the hardwoods growing in the swamps bordering the rivers will produce a new crop of marketable timber every 20 years. The pines on the higher ground also experience a rapid growth but require slightly longer to produce sizeable timber. The slash pine variety, however, will grow to sufficient size for pulpwood in from 12 to 15 years.

37. Increased activity in the pulpwood industry is just now in evidence in some parts of the area and as yet its full effect has not been experienced. One large paper mill at Panama City, Fla., has been drawing a large part of its raw material from this section for a number of years, and another similar plant recently constructed at Port St. Joe, Fla., on the coast about 21 miles west of Apalachicola River will obtain wood from the vast supply of small pine trees in the area adjacent to these rivers.

38. The wholesale harvesting of these trees, unless regulated in some manner, will prove disastrous to the timber supply and will destroy the productivity of the soil in this area. The small operators and farmers who are unfamiliar with the long time problems of timber production are denuding entire tracts of trees of all sizes, leaving no mature ones for reseeding. In consequence, natural reforestation is checked, and at the same time, the land is left bare and unprotected against erosion. On the hilly slopes of the north and central portions, this problem of soil conservation is of particular importance. It is observed, however, that these shortsighted methods are not practiced on the tracts controlled by the operators of the paper mills, who realize that it is to their best interests that the supply of stock be continuous. Controlled timber cutting is also practiced in the Apalachicola National Forest and in tracts under supervision of the Resettlement Administration.

39. An application of the principles of reforestation and soil conservation aided by the favorable natural elements prevailing would assure this region of an abundant and perpetual supply of timber for both pulpwood and lumber, and an active program for educating the farmers along these lines would lead toward a more comprehensive plan of timber production.

40. The mineral resources of the area are discussed in detail in the "308" report. Those found in the Coastal Plain include: Fullers earth, which is mined in large quantities at Attapulgus, Ga., and Quincy, Fla., bauxite from Macon and Schley Counties in Georgia and Barbour County, Ala., and brick clay, building sand, and gravel from various localities. In the Piedmont section north of LaGrange the most flourishing mineral industry is the quarrying of granite for use principally as road material, concrete aggregate and building stone. Small deposits of gold and iron pyrites occur in the extreme northern part of the area, and quartzite for ceramics is found around the headwaters of the Flint River.

41. *Industries.*—Manufacturing in the area is restricted largely to the initial processing of the farm products produced there. However, there is a definite trend toward the movement of manufacturers from northern cities into this section due to favorable labor conditions, cheap hydroelectric power, the proximity of raw materials, and other factors. The large cities support many industries of various sorts

but the activity there is chiefly concerned with distributing rather than manufacturing.

42. The spinning and weaving of cotton products from fiber, the most of which is locally produced, is perhaps the principal industry. These mills are of comparatively recent inception and are the result of the migration of this industry from its former New England setting. These large mills or groups of mills, located chiefly in the area north of Columbus, are in many instances the nucleus about which some of the towns were originally organized and constitute their chief source of support. The raw cotton is manufactured into finished garments or other goods, or is turned out in a rough or unbleached condition for further processing outside the territory. Knitting mills for the manufacture of cotton, wool, and silk goods are also locating here. In 1927 there were 167 mills in the area engaged in the manufacture of textiles and their products.

43. There are other plants still more closely associated with agriculture. Numerous cotton gins, located throughout practically the entire area, serve to remove the seeds from the cotton and compress the lint into bales. There are 37 other plants that remove the oil from the cottonseed and grind the hulls for stock feed. Many mills in the southern section handle the huge crop of peanuts; some simply remove the nuts from the hulls while others extract the oil and make peanut meal in a manner similar to the cottonseed plants. There are 14 canning plants that preserve fruits, vegetables, cane sirup, and other farm products. Sawmills and planing mills, both large and small, operate continuously throughout the area but principally in the southern part. Over 350 of these were active in 1935 producing a total of about 380,000,000 board feet of lumber. Veneer mills make wooden baskets and crates which are distributed throughout the South and East for packing fresh fruits and vegetables. About 179 small turpentine stills throughout the section south of Eufaula produce turpentine and rosin from the sap of the longleaf and slash pines.

44. There are about 77 fertilizer plants that operate throughout the area. Some of these are only mixing plants for the various dry materials, while other larger ones engage in the manufacture of sulfuric and phosphoric acids. They receive large quantities of fertilizer materials, principally from the ocean ports, and distribute the mixed products to the surrounding area.

45. A fuller's earth plant at Attapulgus, Ga., is the largest of its kind in the world. The material is mined and dried there, then shipped to refineries throughout the country and abroad. Bauxite is similarly handled at Eufaula, Ala.

46. The raising of fine beef cattle and hogs has been stimulated by the recent construction of several large packing plants; one now being developed at Columbus will handle 100,000,000 pounds of meat annually. Other industries of comparative lesser importance in the territory include flour blending mills, feed mills, brick yards, ice plants, gas and electric power plants, bottling works, machine shops; and foundries.

47. *Railroads.*—The railroads that traverse the territory are shown on the accompanying map. It will be seen that all of the principal cities are reasonably well availed of their services.

48. Peculiar to this section is the east and west pattern of the various railroads designed to connect the Apalachicola Basin with the outlet

ports of Savannah, Ga., Brunswick, Ga., and Jacksonville, Fla., on the South Atlantic coast. There is no railroad system serving the interior of this area that has a similar direct line extending south to a Gulf port.

49. Two lines of the Southern Railway extend south from Atlanta into the territory, one to Columbus, Ga., the other to Fort Valley. A third line connects Atlanta and Macon, then extends on to the ports of Brunswick and Jacksonville.

50. The Atlanta, Birmingham & Coast Railroad extends across the northeastern part of the territory connecting Birmingham, Ala., and Atlanta, Ga., with the port of Brunswick.

51. The Seaboard Air Line Railway connects with the Atlantic coast by a line from Montgomery, Ala., through the center of the area to Savannah and another in the southern part from River Junction through Tallahassee, Fla., to Jacksonville. Other lines of the Seaboard running north and south connect Columbus, Ga., with Albany, Ga., and Tallahassee. From the latter point an extension reaches south to Carrabelle, Fla., a small town on the Gulf east of the mouth of the Apalachicola River.

52. The Atlantic Coast Line Railroad extends from Montgomery, Ala., across the southern part of the territory through Dothan, Ala., Bainbridge, Ga., and Thomasville, Ga., to connect with all of the South Atlantic ports. Other lines run from Albany to Brunswick and from Albany south through Thomasville to Florida points.

53. The Central of Georgia, with a network of lines running generally east and west, connects all sections of the territory with the port of Savannah.

54. There are two short-line railroads that connect the extreme southern portion of the territory with Gulf points, the Atlanta and St. Andrews Bay from Dothan, Ala., to the port of Panama City, Fla., and the Apalachicola Northern from River Junction, Fla., to the towns of Apalachicola, Fla., at the mouth of the river and Port St. Joe, Fla., on the coast several miles west. The Louisville & Nashville also has a line from River Junction extending westward through the port of Pensacola, Fla.

55. Also noteworthy is the absence of any rail lines paralleling the Flint or Chattahoochee Rivers to connect directly the various river points.

56. From the foregoing it is evident that any freight destined for movement from interior points within the area to ports on the Gulf of Mexico must be transported over a number of different rail lines and in a roundabout manner. The same is true of movements from one river point to another.

57. Besides these lines to the South Atlantic and Gulf ports there are of course connections with roads to all points in the Northern and Western States.

58. *Highways.*—The principal highways serving the territory are also shown on the accompanying map. Highway construction in this section has undergone an extensive program of expansion in recent years. Where but a few years ago there were only sand and clay roads, which were practically impassable in wet weather, there is now an excellent system of hard-surfaced highways. This system is at present being still farther extended. National highways Nos. 41, 19, 319, 27, 241, 29, and 231 traverse the area in a general north and south direction, while highways 80, 280, 84, and 90 cross from east to

west. In addition, there is an extensive system of paved State highways and a network of improved sand-clay roads to supplement the major routes.

59. The rapid increase in long-distance trucking activities in this section is attributable in part to this construction of hard-surfaced roads. The use of heavy trucks and trailers has made possible an economical system of rapid transportation for practically all types of commodities.

BRIDGES

60. The following three tables list the bridges that cross the Apalachicola, Flint, and Chattahoochee Rivers:

Apalachicola River—from the mouth to junction of Flint and Chattahoochee Rivers

Name of owner	Kind	Clearance			Distance above mouth
		Horizontal	Vertical closed		
			Above low water	Above high water	
		Feet	*Feet*	*Feet*	*Miles*
Florida State Road Department	Swing	130	30.5	25.0	0.0
Apalachicola Northern Railroad Co	do	120	12.0	8.0	4.3
Calhoun County	Fixed	280	63.0	36.5	84.3
Louisville & Nashville Railroad Co	Swing	115	36.8	.8	111.2
Florida State Road Department	Bascule	100	37.7	1.5	112.0

NOTE.—Head of navigation at junction at Flint and Chattahoochee Rivers, mile 112.8

Chattahoochee River—from the mouth to Atlanta, Ga., 305 river-miles

Name of owner	Kind	Clearance			Distance above mouth
		Horizontal	Vertical closed		
			Above low water	Above high water	
		Feet	*Feet*	*Feet*	*Miles*
Georgia-Florida Bridge Co	Fixed	500	80.0	37.2	24.6
States of Alabama and Georgia	Swing	100	49.6	3.7	35.5
Atlantic Coast Line Railroad Co	do	96	50.0	3.5	36.3
City of Columbia, Ala	do	100	54.5	.8	50.4
Central of Georgia Railroad Co.[1]	do	100	52.9	−1.6	50.8
States of Alabama and Georgia	Fixed	300	90.1	29.7	75.6
Central of Georgia Railroad Co.[1]	do	127	77.7	12.1	99.4
States of Alabama and Georgia	do	180	81.2	15.2	100.0
Seaboard Air Line Railroad Co.[1]	Swing	97	63.0	−2.9	123.5
Central of Georgia Railroad Co.[1]	Fixed	135	53.5	.5	164.0
City of Columbus, Ga.[1]	do	140	62.2	8.8	164.1
Do[1]	do	45	53.5		164.0
Central of Georgia Railroad Co	do	70	38.5		164.8
State of Georgia	do	145	29.0		201.2
Atlanta & West Point Railroad Co.[1]	do	113	26.2		201.5
Troup County, Ga.[1]	do	(2)	(2)		211.3
Atlanta, Birmingham & Coast Railroad Co.[1]	do	171	(2)		214.5
Troup County, Ga.[1]	do	(2)	(2)		217.7
Do[1]	do	(2)	(2)		224.8
State of Georgia[1]	do	(2)	(2)		240.0
J. F. Jones & Association	do	138	30.0		258.0
Central of Georgia Railroad Co.[1]	do	141	52.0		264.8
Fulton County, Ga.[1]	do	144	31.0		299.0
Do[1]	do	(2)	(2)		302.6
Southern Railroad Co.[1]	do	91	51.0		304.2
Seaboard Air Line Railroad Co.[1]	do	120	36.0		306.1
Fulton County, Ga.[1]	do	(2)	(2)		306.4

[1] Built without permit.
[2] Not known.

NOTE.—Head of navigation, Columbus, Ga., mile 164.

Flint River—from the mouth to the Fall Line, 228 river-miles

Name of owner	Kind	Clearance			Distance above mouth
		Horizontal	Vertical closed		
			Above low water	Above high water	
		Feet	*Feet*	*Feet*	*Miles*
Seaboard Air Line Railroad Co.	Swing	100	37.5	12	28.5
Decatur County and State of Georgia	Bascule	104	45.0	20	29.5
Atlantic Coast Line Railroad Co.	Swing	100	40.0	15	29.5
State of Georgia	Lift	77	[2] 31.0	[2] 9	73.0
Daugherty County	Fixed	85	44.0	24	101.0
Georgia Northern Railroad Co.[1]	do	145	44.0	24	101.5
Atlantic Coast Line Railroad Co.[1]	do	100	43.0	23	101.5
Georgia Southwestern & Gulf Railroad [1]	do	86	30.0		134.0
Sumter and Dooley Counties	do	203	28.5		140.0
Seaboard Air Line Railroad Co.[1]	Swing	83	28.0		155.0
Atlanta, Birmingham & Coast Railroad Co.[1]	Fixed	129	26.3		182.0
Central of Georgia Railroad Co.[1]	do	109	26.0		182.0
Macon County [1]	do	131	25.0		192.0
Central of Georgia Railroad Co.[1]	do	(4)	(4)		214.0
Crawford County [1]	do	(4)	(4)		226.0

[1] Built without permit.
[2] 60 feet in raised position.
[3] 38 feet in raised position.
[4] Not known.

NOTE.—Head of navigation, Albany, Ga., mile 104.

61. It will be noted that the bridges across the Apalachicola River provide minimum fixed clearances of at least 100 feet horizontal and 63.0 feet vertical above mean low water. Comparable dimensions for the Flint River bridges from the mouth to Albany are 77 feet horizontal and 60 feet vertical, and for the Chattahoochee from the mouth to Columbus, 97 feet horizontal and 77.7 feet vertical.

62. The vertical clearances of the various bridges crossing the Flint and Chattahoochee would be reduced as the level of the water surface was raised by canalization, and horizontal clearances would have to be adequate to safely accommodate the type of traffic that would develop. The matter of bridge alterations is discussed under "Plan of improvement."

63. Recent regulations adopted by the War Department prescribe certain minimum clearances for new structures to be built over these rivers which are generally in excess of those provided by existing bridges. In the future, no bridge may be built across the Apalachicola or Chattahoochee Rivers with a horizontal clearance of less than 150 feet or a fixed vertical clearance of less than 50 feet above the plane of ordinary high water. No clearances are prescribed for the Flint River, but should its navigable capacity be increased to any appreciable extent, regulations similar to those now in effect on the Apalachicola and Chattahoochee Rivers would probably be adopted.

PRIOR REPORTS

64. The previously submitted reports pertaining severally to the Apalachicola, Chattahoochee, and Flint Rivers are listed below in chronological order. At the end of the list are shown those reports which have been authorized but not yet transmitted to Congress in final form.

65. *Apalachicola River.*—The River and Harbor Act approved June 10, 1872, authorized an examination and survey of "Apalachicola River from Chattahoochee, Fla., to Apalachicola." The report on examination and survey (Annual Report, 1873, p. 698) recommended straightening and widening the channel through Moccasin Slough and snagging to insure a depth of 6 feet and sufficient width at an estimated cost of $80,333. This project was adopted by the river and harbor act approved June 23, 1874.

66. The River and Harbor Act approved August 11, 1888, authorized an examination and survey of "Chipola River, Fla., from its mouth to Wewahitchka and the cut-off, and Lee's Slough running from the Apalachicola River to the Chipola River." An examination report (Annual Report, 1889, p. 1416) recommended the improvement of the portion of the Chipola River from its mouth to Wewahitchka and through the cut-off to the Apalachicola River to provide a channel 5 feet deep and 60 feet wide. The River and Harbor Act approved September 19, 1890, appropriated funds for the "Apalachicola including Lee's Slough" and the improvement of the latter was therefore added to the project. The River and Harbor Act approved June 13, 1902, allotted funds to include the improvement of the cut-off and Lower Chipola River as well.

67. *Flint River.*—The River and Harbor Act approved June 10, 1872, authorized a "Survey of Flint River from Albany, Ga., to Chattahoochee, Fla." As a result of the report on this survey (Annual Report, 1873, p. 707) the project for a channel 3 feet deep and 100 feet wide from Albany to the mouth, to be accomplished at an estimated cost of $184,862 was adopted by the river and harbor act approved June 23, 1874.

68. In compliance with the River and Harbor Act approved June 18, 1878, an examination report (Annual Report, 1879, p. 818) was submitted covering the portion of the river between Albany and Montezuma, as a result of which a project for improving that section of the river at an estimated cost of $15,100 was later authorized by the river and harbor act approved June 14, 1880.

69. The River and Harbor Act approved August 5, 1886, authorized an examination of "Flint River, Ga., from Montezuma to Old Agency." A report of the examination (Annual Report, 1887, p. 1490) considered the river worthy of improvement provided certain bridges be altered. No further action was taken.

70. The River and Harbor Act approved August 11, 1888, authorized an examination of "Flint River, Ga., rock reefs at Albany and above." The improvement was designated as worthy (Annual Report, 1889, p. 1420) to be begun after completion of the channel from the mouth to Albany. No work was ever done on these reefs.

71. The River and Harbor Act approved March 4, 1915, authorized a preliminary examination of the "Flint River, Ga., from its mouth to Albany." The report (H. Doc. No. 986, 64th Cong., 1st sess.) recommended that no survey be made.

72. The River and Harbor Act approved July 27, 1916, authorized a preliminary examination and survey of "Flint River, Ga., from Albany to the limit of practicable navigation above said city." The examination report (H. Doc. No. 302, 65th Cong., 1st sess.) recommended no further improvement above Albany.

73. *Chattahoochee River.*—The River and Harbor Act approved June 10, 1872, authorized a "Survey of Chattahoochee River from Columbus, Ga., to Chattahoochee." The report (Annual Report, 1872, p. 585, and Annual Report, 1873, p. 699) recommended the expenditure of $50,000 to obtain a channel 4 feet deep and 100 feet wide by the removal of snags, wrecks, and loose rocks. (See also H. Doc. No. 241, 42d Cong., 2d sess.) The above project was adopted by the river and harbor act approved June 23, 1874.

74. The River and Harbor Act approved June 18, 1878, authorized an examination and survey of "Chattahoochee River above Columbus." The unfavorable survey report (Annual Report, 1880, p. 1705) pointed out the doubtful adequacy of prospective savings to justify the cost of the improvement.

75. The River and Harbor Act approved March 3, 1881, authorized an examination and survey of "the Chattahoochee River, in Georgia, between West Point and Bolton on the Western & Atlantic Railroad so as to complete the survey of that section of the river." The report thereon (Annual Report, 1882, p. 1875) bears out generally the findings of the previous report.

76. The River and Harbor Act approved March 3, 1899, allotted funds for "the survey of that portion of the river between West Point and Franklin." The preliminary report on this survey (H. Doc. No. 111, 56th Cong., 2d sess.) gave an estimate of cost but made no recommendations. A final report was apparently never submitted.

77. The River and Harbor Act approved March 4, 1915, authorized a preliminary examination and survey of "Chattahoochee River, Ga. and Ala." The report on examination and survey conducted under this authorization (H. Doc. No. 1664, 65th Cong., 3d sess.) submitted three plans of improvement contemplating:

(*a*) The improvement of the entire river between Atlanta and the mouth by the construction of locks and dams between Columbus and Atlanta. It contemplates both navigation and power above Columbus and a 6-foot low-water depth at all times below Columbus, to be obtained by increasing the low-water discharge through the use of the Franklin Reservoir above Columbus. The total estimated cost is $32,790,000, and $111,000 per annum for maintenance. The total amount of new power which would be rendered available by this plan is 139,510 horsepower.

(*b*) The construction of a regulating dam, with locks, 19 miles below Columbus, to control the low-water discharge of the river, with a view to providing a 4-foot low-water depth at all times. The only result expected in this case is the maintenance of the natural flow of the river, which, it appears, could also be secured without cost by proper regulation of the power companies above Columbus. The estimated cost of this plan is $1,000,000. Power development is not contemplated.

(*c*) The construction of a system of locks and dams between Columbus and the confluence of the Chattahoochee with the Flint River, supplemented by a prosecution of the present system of improvement below that point, with a view to obtaining a 6-foot depth throughout this system of rivers below Columbus. The estimated cost is $8,400,000, and $84,000 per annum for maintenance. No power development is considered in this plan.

It was recommended that no improvement be undertaken by the United States other than as authorized by the existing project.

78. *Other reports authorized but not yet transmitted to Congress in final form.*—The River and Harbor Act approved March 3, 1925, authorized an examination of "Flint River, Ga." An unfavorable report was submitted by the district engineer October 3, 1925, but it has not been published.

79. The River and Harbor Act approved March 3, 1925, authorized a preliminary examination and survey of an "Inland waterway from New Orleans, La., to Apalachicola River, Fla., and the Apalachicola and Chattahoochee Rivers to Columbus, Ga., with a view to securing a depth suitable to the economical operation of self-propelled barges." The division engineer, to whom this report was assigned, made a preliminary examination report dated October 1, 1925, which was unfavorable. A report on the survey submitted February 5, 1927, was also unfavorable.

80. A group of citizens of Columbus, Ga., interested in the proposed improvement, employed the engineering firm of Black, McKenney & Stewart to make an economic and engineering survey and report on this navigation project. This report was published May 1, 1929. Therein it was concluded that the prospective benefits to be derived from the proposed improvement would more than offset the estimated cost of construction.

81. In response to a request made to the Chief of Engineers by the Board of Engineers, the division engineer on April 30, 1930, submitted a supplemental report wherein the report of Black, McKenney & Stewart was discussed.

82. The River and Harbor Act approved July 3, 1930, authorized preliminary examinations and surveys of "Flint River, Ga., to Albany, Ga., or as much farther up as navigation may be found practicable on said river," "Flint River, Ga., to Montezuma, Ga.," and "the Chattahoochee River, Ga., and connecting waterways, with such land cuts and locks as may be necessary to a point opposite or near Atlanta, Ga., with a view of establishing navigation for barges and small boats thereon and to connect the same with the inland waterway." The two examinations authorized for the Flint River were combined into one report which was submitted by the district engineer on June 23, 1931. The examination report on the Chattahoochee River was submitted by the district engineer under date of June 30, 1931. Each of these reports was unfavorable.

83. In final consideration of the many recent studies of these waterways, the following three related authorizations were treated collectively insofar as concerned the Apalachicola River system and combined into one report, generally referred to as the "308" report:

(*a*) Report on "Apalachicola River and tributaries" in accordance with House Document 308, Sixty-ninth Congress, first session, which was enacted into law, with modifications in section 1 of the River and Harbor Act approved January 21, 1927.

(*b*) Final report on "Inland waterway from New Orleans, La., to Apalachicola River, Fla., and the Apalachicola and Chattahoochee Rivers to Columbus, Ga., with a view to securing a depth suitable to the economical operation of self-propelled barges," authorized by the River and Harbor Act approved March 3, 1925.

(*c*) Report on "Chattahoochee River, Ga., and connecting waterways, with such land cuts and locks as may be necessary to a point opposite or near Atlanta, Ga., with a view to establishing navigation for barges and small boats thereon and to connect the same with the inland waterway," authorized by the River and Harbor Act approved July 3, 1930.

84. This combined report was submitted to the Secretary of War by the Chief of Engineers on April 14, 1934, who reported, "that the

improvement of the Apalachicola River and its tributaries for navigation, except as heretofore authorized by Congress, is not now deemed advisable." It was then transmitted to Congress on the same date but almost immediately recalled for the inclusion of additional data. It has never been resubmitted.

EXISTING PROJECTS

85. *Apalachicola River, Fla., the Cut-off, Lee Slough, and Lower Chipola River—Previous projects.*—The sum of $13,000 was expended between 1828 and 1831, but apparently under no definite project. In the years 1835 and 1836 appropriations amounting to $9,000 were made for the Chipola River. Work under existing project was begun in 1875.

86. *Existing projects.*—The original project adopted in 1874 provided for a channel in the Apalachicola River 6 feet deep at low water and 100 feet wide, to be secured by the removal of snags and overhanging trees. It was revised in 1902 to provide for widening and straightening Moccasin Slough, and for a channel 5 feet deep and 60 feet wide through the Cut-off, Lee Slough, and Lower Chipola River. Snagging and dredging to a depth of 6 feet of the lower 2,500 feet of the River Styx, a tributary of the Apalachicola River, was authorized in 1934. Dredging at the mouth of Florida River, also a tributary, was authorized in 1937 but no work has been done to date.

87. The estimate of cost of new work, revised in 1938, is $127,800, exclusive of amount expended on previous project, but including $1,250 to be contributed by local interests in connection with improvement of Florida River. The latest (1938) approved estimate of annual cost of maintenance is $16,000. The existing project has been completed except for dredging in Florida River. The total cost under the existing project as of June 30, 1938, was $386,505.03, of which $122,798.81 was for new work and $263,706.22 for maintenance.

88. *Flint River, Ga.*—There were no previous projects for the Flint River. The existing project adopted in 1874 provides for a channel 3 feet deep at extreme low water and 100 feet wide, from the mouth to Albany, a distance of 101 miles to be obtained by dredging, rock excavation, building contraction works, and removal of snags; and a channel for light-draft steamers at moderate stages from Albany to Montezuma, a distance of 79 miles, to be obtained by the removal of loose rocks, snags, and overhanging trees.

89. The estimated cost of new work between the mouth and Albany, revised in 1928, is $715,000, and between Albany and Montezuma, made in 1879, $15,100. The latest (1928) approved estimate of annual cost of maintenance is $20,000. The existing project is 98 percent complete; the work remaining consists of widening various dredged cuts from 70 feet to 100 feet. The costs to June 30, 1938, were $640,819.77 for new work and $182,577.77 for maintenance, a total of $823,397.54.

90. Expenditures for maintenance in recent years have been less than the project estimate due to the limited requirements of the small amount of commerce using the river.

91. Under date of July 25, 1917, the Chief of Engineers recommended modification of the project to eliminate improvement of that portion of the river above Albany (H. Doc. 302, 65th Cong., 1st sess.).

92. *Chattahoochee River, Ga. and Ala.—Previous projects.*—The River and Harbor Act approved July 13, 1892, appropriated funds for the improvement of the river bewteen West Point and Franklin, Ga., though no project for this section was ever approved. No funds have been appropriated for this portion of the river since 1899. The total cost was $19,719.22 for new work.

93. *Existing project.*—Adopted in 1874, the existing project provides for securing a channel 4 feet deep at low water and 100 feet wide from the mouth to Columbus, Ga., a distance of 164 miles, by the removal of timber obstructions, dredging, contraction works, and shore protection.

94. The estimated cost of new work from the mouth to Columbus, Ga., revised in 1924, is $1,156,000. The latest (1928) approved estimate of annual cost of maintenance is $60,000. Several items of minor importance remain to finish the project, which is now 94-percent complete. The costs to June 30, 1938, were $1,081,084.85 for new work and $1,033,936.32 for maintenance, a total of $2,115,021.17.

95. The small amount of commerce using the river in recent years has required very little maintenance work to provide an adequate channel.

96. *Chattahoochee River, Ga. (flood control in the vicinity of West Point, Ga.).*—There is no approved project covering this work. The work accomplished consisted of increasing the cross section of the Chattahoochee River at critical points between West Point, Ga., and Langdale Dam, clearing of the floodway on both banks, constructing an earth levee 1,500 feet long, and the construction of an additional span in the highway bridge at West Point, Ga.

97. The work was authorized and funds provided by the Emergency Relief Appropriation Act of April 8, 1935, and was completed in December 1936 at a total cost of $591,068.24, all charged to new work.

LOCAL COOPERATION

98. Existing navigation projects for these rivers have prescribed no conditions requiring that local interests contribute funds, furnish rights-of-way, easements, or disposal areas or perform any work of improvement other than at Florida River, a tributary of the Apalachicola. In this case assurance has been given that local interests will contribute one-fourth of the cost of the improvement and furnish the necessary rights-of-way and spoil areas as required when the work is performed.

99. The flood-control project for the Chattahoochee River at West Point, Ga., required that local interests furnish all easements and rights-of-way to protect the United States from damage resulting from the work, and that local interests take over the maintenance of the project after its completion. All easements and rights-of-way have been furnished and assurances given that local interests will maintain the recently completed project.

TERMINAL AND TRANSFER FACILITIES

100. The limited amount of commerce using these rivers in recent years has required but few and simple facilities for handling vessels and freight. To accommodate any considerable amount of traffic to

be handled by regularly operated boat lines, it would be necessary to construct entirely new wharves and warehouses of proper design and adequate capacity at the various towns along the rivers in order to facilitate the safe and rapid transfer of freight between waterway and overland carriers.

101. The town of Apalachicola, on the bay at the mouth of the river, has a number of marginal wharves to accommodate the shallow-draft coastwise vessels and commercial fishing and oyster boats using the harbor. There are 3 lumber wharves aggregating, in length, about 3,100 feet dockage, with 11 lumber warehouses. Three other wharves of 274-, 150-, and 186-foot frontages, respectively, have warehousing facilities for the handling of general freight and are open to all carriers on equal terms. One oil company has a wharf 79 feet long, a warehouse and 3 storage tanks. All of those wharves are built on piles, capped and floored, and have both rail and highway connections. On the Apalachicola River at Blountstown and River Junction, Fla., there are natural landings convenient to rail and highway that are open to all carriers. None of the above terminals is equipped with mechanical loading devices. A sand and gravel terminal at River Junction, Fla., is equipped to transfer the material from barges to railroad cars or stock piles.

102. All facilities that formerly existed at the various landings along the Chattahoochee River have either been removed or are in such need of repair as to be no longer of any value.

103. The only facilities on the Flint River are at Bainbridge, Ga., where a wharf with a pipe-line connection to storage tanks on shore is used for transferring gasoline from barges to trucks for inland distribution. A warehouse is contemplated for handling general freight.

104. At the port of Panama City, Fla., there is one wharf that can accommodate ocean-going vessels. It is owned by the municipality of Panama City and is leased to the Southern Kraft Corporation, which operates it on a basis of equal terms to all carriers. It is a modern wharf of concrete-steel construction 420 feet long and has a depth of 27 feet alongside. On the wharf is a brick and steel warehouse 340 feet long, 36 feet wide, and 16 feet high provided with rail connection. Due to the congestion at the present pier the Southern Kraft Corporation is now planning the construction of a 500-foot wharf, paralleling the shore line, with warehousing facilities for all commodities. Two oil companies have docking facilities for ocean-going tankers and pipe lines connecting with storage tanks on shore.

105. A new marginal wharf at Port St. Joe, Fla., to be 2,922 feet long and have a depth of 30 feet alongside is nearing completion. A warehouse 100 by 300 feet, with rail and highway connections, will be provided. The city will control 1,000 feet of the frontage which will be open to all on equal terms. The remainder of the wharf will be used by the St. Joe Paper Co.

IMPROVEMENT DESIRED

106. Various civic groups, chambers of commerce, and prominent individuals have on several occasions in the past gone to considerable effort and expense in sponsoring the improvement of these waterways. In connection with this review, the Chattahoochee Valley Chamber of Commerce conducted and financed a traffic survey of the

area and submitted a report wherein was set forth the nature of the improvement desired and the estimated benefits expected to accrue therefrom. The brief accompanies the report of public hearings as "Exhibit J."[1]

107. A public hearing was held at Albany, Ga., September 29, 1936, and another at Columbus, Ga., September 30, 1936, for the purpose of discussing the proposed improvements with interested parties. These meetings were attended by National, State, and municipal political leaders, representatives of major oil companies, steamship lines, railroads, manufacturing interests, lumbermen, former operators of river boats and many other interested and influential citizens. A preliminary brief was submitted at the Columbus hearing by the Chattahoochee Valley Chamber of Commerce which set forth the improvement desired as follows:

> On the Flint River it is desired to have a depth of 9 feet and a width of 100 feet, the improvement to extend from the city of Albany, Ga., to the Apalachicola River connecting with the Intracoastal Inland Waterway into St. Andrews Bay. On the Chattahoochee River it is desired to have a 9-foot depth and a channel 100 feet wide, improvement to extend from Columbus to the Apalachicola River connecting with the Intracoastal Waterway into St. Andrews Bay.

This brief also enumerated the following benefits to be anticipated as a result of the proposed improvement:

1. Provide lower cost of transportation.
2. Provide transportation for commodities that cannot be handled with existing transportation facilities.
3. The establishment of this waterway will give those owning forests and timberlands a year-round market for these products. It has been determined that the establishment of this waterway with its low cost of transportation will double the area from which pulpwood can be shipped.
4. New enterprises and industries will be attracted to this section of the Southern States by reason of the lower cost of transportation and the number of transportation facilities on which the shipments can be made.
5. The finished products of this section will be able to reach a broader market and place the industries of this section in a better competitive position.
6. The establishment of this waterway will assure this section of eternal and perpetual low-cost transportation.
7. The construction of locks and dams on these rivers will provide to a certain extent, flood control of these rivers.
8. Distribution of certain commodities will be handled in this territory for other sections of the Southern States thereby increasing the business of existing transportation facilities such as railroads and trucks.
9. The lower cost of transportation in this section of the Southern States would open unlimited possibilities for the development of the minerals of this section, for example bauxite, fuller's earth, and other clay industries in this State have not reached their highest development because present transportation costs have not permitted the shipment of these commodities to other sections of the United States.

108. Testimony at the hearings indicated the opinion that though a depth of 9 feet would be most desirable, a lesser depth, or about 6 feet would serve to some degree. A letter from the Columbus Chamber of Commerce stated, "It is now deemed proper to ask for a depth 'up to 9 feet' leaving the exact depth to be determined by all the facts and circumstances which might be developed and providing such depth for navigation as was most efficient and economical."

109. The desire for a plan of flood protection was indirectly expressed but only insofar as would be effected by a navigation project. No request was made for flood control.

[1] Not printed.

110. Representatives from Clayton and Fayette Counties, which are located on the headwaters of the Flint River about 30 miles south of Atlanta, Ga., attended the hearing at Albany and requested aid in draining the swamps in that region in order to remedy a malarial condition existing there.

111. To further the interests of navigation and as an earnest of their willingness to cooperate in reestablishing water transportation, the authorities of certain cities and counties situated on the river adopted resolutions agreeing to construct the necessary terminal and transfer facilities without cost to the United States in the event it be decided to improve the channels for navigation. Copies of the resolutions passed by the governing bodies of Columbus, Ga.; Eufaula, Ala.; Fort Gaines, Ga.; Columbia, Ala.; Albany, Ga.; Baker County, Ga.; Bainbridge, Ga.; Decatur County, Ga.; and River Junction, Fla., are attached as exhibits [1] to the minutes [1] of the public hearings.

COMMERCE AND VESSEL TRAFFIC

112. *Existing commerce and vessel traffic.*—Commerce on the Apalachicola River consists principally of the movement of logs by barges and rafts from points along the river to the sawmills at Blountstown and Apalachicola, Fla.; the in-bound movement of sand and gravel from the Chattahoochee River; and the shipment by barge of pulpwood from the banks of the river to the paper mill at Panama City. These tugs and barges draw from 3 to 7 feet.

113. The only use of the Chattahoochee River has been for transporting sand and gravel by barges and tugs from the bars at various points along the river to the town of River Junction, Fla. The craft used in this movement draw from 4 to 5 feet.

114. In recent years there has been no commercial traffic on the Flint River. A barge line started operations in October 1938 between Panama City, Fla. and Bainbridge, Ga., 30 miles up the Flint River. They will handle gasoline in tank barges and general freight. The barges and towboats draw from 4 to 5 feet.

115. Pleasure boats use these waters at various localities but their movements are generally of a local nature and of relative unimportance.

116. The water-borne commerce on these rivers for the past 10 years is shown in the following tables:

Comparative statement of traffic on the Apalachicola River, Fla., the "Cut-off," Lee Slough, and Lower Chipola River, Fla.

Year	Vessel traffic		Rafted		Total		Passengers
	Tons	Value	Tons	Value	Tons	Value	
1928	149,396	$722,630	15,000	$40,000	164,396	$762,630	290
1929	117,068	698,221	48,000	280,000	165,068	978,221	320
1930	95,026	702,826	27,000	216,100	122,026	918,826	----------
1931	111,198	353,429	14,800	103,600	125,998	457,029	146
1932	144,974	316,396	13,710	98,649	158,684	415,045	----------
1933	162,839	478,324	26,000	136,800	188,839	615,124	----------
1934	157,162	395,880	69,300	151,400	226,462	547,280	----------
1935	198,558	413,362	56,609	212,551	255,167	625,913	----------
1936	259,838	665,758	57,143	211,429	316,981	877,187	----------
1937	246,172	859,817	57,300	229,200	303,472	1,080,017	----------

[1] Not printed.

Comparative statement of traffic on the Apalachicola River, Fla., the "Cut-off," Lee Slough, and Lower Chipola River, Fla.—Continued

COMPARATIVE STATEMENT OF TRAFFIC ON THE CHATTAHOOCHEE RIVER, GA. AND ALA.

Year	Tons	Value	Year	Tons	Value
1928	139,699	$308,740	1933	41,870	$37,060
1929	78,371	182,400	1934	137,619	127,219
1930	86,422	327,648	1935	85,668	73,091
1931	12,972	134,680	1936	57,391	47,915
1932	34,528	64,074	1937	59,850	52,254

COMPARATIVE STATEMENT OF TRAFFIC ON THE FLINT RIVER, GA.

1928	11,800	$196,205	1933	1,130	$120,060
1929	9,578	429,720	1934 [1]		
1930	1,057	109,722	1935 [1]		
1931	936	86,882	1936 [1]		
1932	1,190	125,680	1937 [1]		

[1] No traffic reported.

117. The above tables indicate a general increased usage of the Apalachicola River for the past 7 consecutive years with a new all-time high in 1936, an uncertain trend for the Chattahoochee, and a discontinuation of commercial activities on the Flint. It will be noted that the commerce of the barge line to Bainbridge, Ga., started in 1938, is not indicated in the table of Flint River traffic. Commerce over the Apalachicola will in general fluctuate with the demand for timber and pulpwood, while the market for building sand and gravel determines the extent to which the Chattahoochee will be used. The greater demand for raw material for the new paper mill at Port St. Joe should result in an increased shipment of pulpwood from the Apalachicola River as well as some probable movement from the lower reaches of the Flint and Chattahoochee.

118. *Apalachicola Bay, Fla.*—The town of Apalachicola, Fla., located at the mouth of the river on Apalachicola Bay, is supported chiefly by the fishing and oyster business. The entrance channel of 10 feet depth is adequate for the craft engaged in this industry. It would appear that here would be the logical site for a port to serve the contiguous valley region, but the great amount of silt borne by the river makes the improvement and maintenance of a deep-water harbor at this point impractical.

119. Though navigated chiefly by fish and oyster boats, Apalachicola Bay is used in the barge traffic of pulpwood from coastal points east of the river to Panama City and by shallow-draft oil barges and small coastwise freight boats. The water-borne commerce for the past 10 years is shown in the following table:

Comparative statement of traffic on Apalachicola Bay, Fla.

Year	Tons	Value	Passengers (ferry)	Year	Tons	Value	Passengers (ferry)
1928	25,202	$1,651,633	9,518	1933	42,464	$423,019	20,090
1929	19,868	1,279,094	12,783	1934	31,113	673,924	30,818
1930	12,504	826,958	8,785	1935	58,802	706,586	29,530
1931	20,821	453,240	13,700	1936	68,996	574,128	(1)
1932	97,355	485,380	17,842	1937	79,570	725,983	

[1] Ferry replaced by bridge.

120. *St. Andrews Bay (Panama City), Fla.*—It was previously pointed out in this report that the port of Panama City, Fla., is a likely deep-water outlet for the Apalachicola Basin, and it has been found that the development of coastwise and foreign commerce through this port is of vital importance to the full potential utilization of these rivers. The harbor is located on St. Andrews Bay, 56 miles west of the Apalachicola River and is connected to it by the Intracoastal Waterway which has been completed to a project depth of 9 feet and width of 100 feet. In recent years following the development there of the Southern Kraft Corporation paper mill, and the improvement of the channel by the United States to a depth of 27 feet, the water-borne commerce of the harbor has increased rapidly. Its growth is indicated by the figures in the following table:

Comparative statement of traffic on St. Andrews Bay (Panama City), Fla.

Year	Tons	Value	Passengers	Year	Tons	Value	Passengers
1928	49,769	$2,536,232	2,227	1933	364,212	$9,538,423	[1] 1,623
1929	56,646	1,988,440	1,734	1934	377,240	10,430,132	[1] 1,610
1930	41,511	1,419,020	724	1935	444,536	14,287,347	4
1931	149,731	3,373,005	800	1936	669,325	19,181,814	43
1932	365,774	6,735,972	1,200	1937	780,088	24,558,046	42

[1] Estimated.

121. The trend in the movement of the principal commodities is indicated by the following tabulation covering the past 4 years:

	1934	1935	1936	1937
Imports:				
Sulphur				3,333
Fertilizer materials	5,691	1,270	9,002	9,521
Sodium sulphate (to paper mill)	16,571	18,009	28,392	29,951
Exports:				
Peanut cake		5,082	4,202	
Cotton	11,707	10,836	11,261	5,202
Lumber	15,948	16,099	14,157	9,693
Paper and pulpboard	11,579	13,986	9,878	11,138
Iron and steel, scrap				9,059
Coastwise receipts:				
Canned goods	486	1,429	1,851	3,770
Feed, hay and flour	1,588	2,226	6,579	9,061
Petroleum products	29,674	68,496	204,291	295,458
Sulphur	5,063	4,783		
Coastwise shipments:				
Peanuts and peanut meal			399	1,478
Lumber and cross ties	4,644	6,168	1,458	2,018
Paper and pulpboard	93,778	107,610	141,851	202,717
Wood pulp			5,947	810
Iron, pig		1,944	4,857	8,716
Internal and local receipts:				
Lumber and cross ties	680	6,313	3,175	2,984
Pulpwood	159,767	147,969	190,782	127,713

122. The deep-water traffic was transported in vessels drawing up to 27 feet, while that moving internally was handled by tugs and barges of from 5- to 8-foot draft. Of particular note regarding this port is the rapid increase in receipts with little change in shipments, except for paper products, indicating an increased use of the port for receiving consumable goods but little development as an outlet for materials produced in the interior. The drop in pulpwood receipts in 1937 was due to part-time operation of the mill.

123. The commercial statistics available for St. Josephs Bay, Fla., do not indicate the recent traffic development at Port St. Joe and have no significance in connection with this report.

124. *The competitive position of the proposed waterways.*—Traffic from the coast to the area tributary to the proposed waterways now moves through the South Atlantic ports; over the Savannah River via an interchange through Augusta, Ga.; through Gulf ports, or over the Warrior River with an interchange via Birmingport or Tuscaloosa, Ala. The natural reluctance of business concerns to alter the routing of established movements over existing rail, truck, and inland waterway services in the territory would tend in some degree to limit the area which would be served by the rivers under consideration and the amount of commerce that would be handled.

125. *Rail competition.*—Traffic moving from the territory by rail lines destined to Gulf ports and to the southwest must in general move over circuitous routes with several interchanges, due to the fact that most of the rail lines in the territory have been built in a general east-west direction terminating on the South Atlantic with only a few short lines reaching to the Gulf ports. The principal markets for the tributary area at present are to the northwest, north, and east, and the foreign markets which are now reached principally through the South Atlantic ports. The producer in the tributary area is also hampered to some extent in marketing his goods by the interterritorial freight rate situation between the southeast and that section of the country lying north of the Ohio and Potomac Rivers and east of the Mississippi River commonly known as the Official Territory. The existing class rates from the southeast to this territory are said to average about 44 percent higher than similar rates within the territory. A petition is at present before the Interstate Commerce Commission to have this condition rectified. The proposed waterways would have some minor influence upon the interterritorial rate situation, as goods could move from the tributary area into the Official Territory via the Intracoastal Waterway and the Mississippi and Ohio Rivers, but the circuitous route and consequent delay would be less attractive than existing rail facilities. The movement of commerce by rail between the tributary area and the Gulf is relatively small as compared with the movement to the South Atlantic ports by virtue of the more direct route for most movements and established practice of long standing. Some traffic is more economically suited, however, to use the newly developed Gulf ports, as evidenced by the rapid growth of the port of Panama City, Fla. This movement, now established, and other traffic certain to develop would be suited for economical use of the proposed waterways.

126. *Motor truck competition.*—The survey developed that truck competition in the tributary area was a potent factor in handling the principal commodity movements, such as petroleum products, canned goods, peanuts, cotton, lumber, grain products, and sugar. This is particularly true with respect to private carriers. It was found that a number of shippers were moving their goods with their own trucks to and from points as far distant as South Atlantic ports on account of the saving possible under prevailing freight rates. Although the motor truck would furnish serious competition to water carriers on local freight business, it is believed that the truck would act as a feeder for the barge lines in many instances.

127. *Barge-rail or rail-barge competition.*—The survey developed that, in addition to the traffic now being transported over the all-rail routes, there is an extensive movement of tonnage to and from the tributary area via rail-barge or barge-rail routes through the ports of Memphis, Vicksburg, Mobile, Tuscaloosa, and Birmingport. A study of the Federal Barge Line tariffs shows that on a number of established commodity movements, through barge-rail and rail-barge rates are published to and from points in the tributary area as defined by the provisions of I. C. C. formula, *Ex parte 96*. This has resulted in a reduction in the rates on certain commodities between the territory and the Mississippi Valley with a resultant decrease in savings otherwise potential for the proposed waterways.

128. *Traffic survey and method of analysis.*—Prior to the canvass of the tributary area by this office in the fall of 1936, the Chattahoochee Valley Chamber of Commerce, in conjunction with other civic organizations in the valley, prepared and mailed questionnaires to the more important industries and business firms in the area in order to ascertain the amount of commerce that might be expected to move over the proposed waterways. These tonnage figures were compiled and presented by the Chattahoochee Valley Chamber of Commerce in the report accompanying the minutes of the public hearings, marked "Exhibit J," [1] and represent the proponents' estimate of the prospective commerce.

129. No questionnaires were mailed to the shippers and receivers of freight in the territory in connection with the traffic study made by this office, but each firm replying to the questionnaire of the Chattahoochee Valley Chamber of Commerce was visited by a field representative of this district. A number of other shippers not previously contacted were also interviewed. During the course of the traffic survey, 34 cities and towns were visited and 299 shippers were interviewed. The territory was thoroughly covered and the tonnage reported is believed to represent a conservative estimate of the volume of commerce that the shippers and receivers of freight in the area consider immediately prospective for movement over the proposed waterways. The movements of commerce reported by the shippers were carefully analyzed, however, and none were accepted and included in the tabulations unless there appeared to be a reasonable basis for the estimate and unless a saving believed sufficient to attract the traffic to the waterways could be determined. All known duplications were eliminated. No annual movements under 50 tons were considered as prospective commerce. All shippers interviewed were requested to base their estimates of their annual movements over the waterways on their past volume of traffic in what they considered a normal year.

130. *Method of calculating savings and basis for future rates.*—The savings shown in the tables of prospective commerce that follow were derived by comparing computed future rates with the lowest rates now prevailing in the territory via existing rail, water, and truck services. Where the movement was continuous over the proposed waterways and connecting waterways, the entire saving was credited to the proposed improvement. No credit was taken for any savings accruing from coastwise or intercoastal steamer movements, except on gasoline and kerosene tonnages. On these commodities, a saving on

[1] Not printed.

the coastwise movement from Texas ports to Panama City as compared with the longer ocean voyage to the South Atlantic ports was considered creditable, on the quantity that now moves into the area via South Atlantic ports at less cost than through a Gulf port. A saving of $0.05 a barrel was considered proper on this tonnage that would be diverted from the South Atlantic to barge movement from Panama City over the proposed improvement.

131. The rail-and-water rates in effect as of January 1, 1937, were used in all calculations. The lowest rail rates were used in all cases for the determination of the future water and rail-water rates via the proposed waterway. The present rail rates in many instances are what the Interstate Commerce Commission terms "temporary rates," and represent substantial reductions under the original or "standard" basis of rail rates. These reduced rates have been brought about by competition from various other forms of transportation, particularly by water carriers and motortrucks. Many of these temporary rates have been extended over such long periods that they have entirely displaced the standard rates and there is open question as to whether the normal rates will be restored. For this reason, the lowest basis of rail rates was used in determining the savings or differentials, and this action is substantiated by the eighth supplemental report of the Interstate Commerce Commission, wherein it was ruled that, regardless of the level of all-rail rates, the rates via barge-rail and rail-barge-rail routes must be made differentially under the all-rail rates by percentages set forth in *Ex parte 96*, 153 I. C. C. 129.

132. On coastwise traffic that might move by barge and rail to and from the tributary area through the port of Panama City, the future rate via the improvement was figured as the coastwise rate to or from Panama City plus a differential under the existing all-rail rate between Panama City and the interior point. No saving was allowed, however where through published ocean-rail rates or a combination of existing rail and coastwise rates through a South Atlantic port resulted in a lower figure.

133. On import and export traffic for movement by barge-rail or rail-barge, the savings were determined by use of differentials prescribed in I. C. C. formula, *Ex parte 96*, under the existing all-rail rates applying specifically on export and import traffic between Panama City and interior points. Where the existing rates on similar traffic from South Atlantic ports were found to be lower than proposed barge-rail or rail-barge rates via the improvement, no saving was credited.

134. Port-to-port rates are not subject to the Interstate Commerce Act. A check of the common carrier barge tariffs indicates that their port-to-port rates on carload and less-than carload traffic are generally 20 percent under the corresponding all-rail rates between the ports. Numerous exceptions may be noted where port-to-port rates are materially below the so-called 20-percent differential. These exceptions in the majority of instances apply only on minimum quantities of 100 tons or over and are rates made by contract between the barge line and the shipper or receiver. The port-to-port rates involved in this report were determined by application of the 20-percent differential, except on bulk items moving in large quantities, where the barge-line earnings warranted a lower basis.

135. Rail and barge or rail-barge-rail rates are governed by the decision of the Interstate Commerce Commission in Ex parte 96, 153 I. C. C. 129, decided February 14, 1931, and supplemental reports thereto. While this decision is applicable to the construction of rates over the Inland Waterways Corporation, it was used as a criterion or guide in determining the potential rates in this survey.

136. The order in the above report reads, in part, as follows:

(*a*) * * * no such barge-rail route need be established where the shortest all-rail distance via the lines of the rail carriers from point of origin to point of destination through the port of interchange with said Inland Waterways Corporation exceeds by more than 40 percent the shortest all-rail distance between such points of origin and destination, and (*b*) no rail-barge-rail route need be established where the shortest all-rail distance from point of origin to point of destination through the ports of interchange with said Inland Waterways Corporation exceeds by more than 33⅓ percent the shortest all-rail distance between such points of origin and destination, and (*c*) no barge-rail route need be established where the shortest all-rail distance between the inland point of origin or destination, as the case may be, and the port of interchange exceeds three-fourths of the shortest all-rail distance between point of origin and point of destination, and (*d*) no rail-barge-rail route need be established where the sum of the shortest all-rail distance from the point of origin to the port of interchange where the shipment is delivered to said Inland Waterways Corporation, plus the shortest all-rail distance from the port of interchange where the shipment is relinquished by said Inland Waterways Corporation, to the point of destination exceeds two-thirds of the shortest all-rail distance between origin and destination. * * *

(*a*) Where over barge-rail routes the shortest all-rail distance via the lines of the connecting rail carriers from point of origin to point of destination through the port of interchange does not exceed the shortest rail distance between such points of origin and destination by more than 20 percent, where over barge-rail routes the shortest all-rail distance between the inland point of origin or destination and the port of interchange does not exceed two-thirds of the shortest all-rail distance where over rail-barge-rail routes the shortest all-rail distance from point of origin to point of destination through the ports of interchange does not exceed by more than 20 percent the shortest rail distance between such points of origin and destination, and where over rail-barge-rail routes the total rail haul is not more than one-half of the shortest all-rail distance between point of origin and destination, 20 percent of the lowest corresponding all-rail rate between the ports between which the shipment is transported by said Inland Waterways Corporation; and (*b*) in all other cases, 10 percent of the lowest corresponding all-rail rate between the ports between which the shipment is transported by said Inland Waterways Corporation * * *.

137. In the eighth supplemental report of the Interstate Commerce Commission of Ex parte 96, 153 I. C. C. 129, decided March 27, 1933, it is ordered:

* * * that the differentials in terms of percentages of all-rail rates hereinbefore prescribed as reasonable minimum differentials between all-rail rates and joint barge-rail or rail-barge-rail rates be maintained regardless of the level of said all-rail rates until the further order of the Commission * * *.

138. The Commission's rule is known as "the formula" and is found rather complex; but notwithstanding the intricacies of the formula and the complexities of the all-rail tariffs, the potential rail-barge, barge-rail, and rail-barge-rail rates in this survey were determined by a strict application or literal interpretation, without exception, and every effort has been made to apply the mandate of the formula. This statement is made in order to justify any differences. For instance, Ex parte 96 permits the application of group rates, which principle if applied here would result in rates at variance with the point-to-point basis employed in this report.

139. *Analysis for each waterway.*—For a thorough study of the prospective commerce, it was necessary to consider three separate

schemes of improvement, and to analyse the tonnage for each separately. The schemes are as follows:

(*a*) Improvement of the entire Apalachicola River system, including the Chattahoochee River to Columbus, Ga., and the Flint River to Albany, Ga.
(*b*) The improvement of only the Apalachicola and Chattahoochee Rivers to Columbus.
(*c*) The improvement of only the Apalachicola and Flint Rivers to Albany.

140. The commerce considered prospective for the Apalachicola River was not analyzed separately from the Chattahoochee and Flint Rivers, as this river is considered to be only a necessary outlet for these two streams and its improvement to a greater depth than now authorized would be dependent on the improvement of one or both of them. In the discussions that follow, references to the improvement of the Chattahoochee or Flint Rivers alone are considered to include the necessary improvement of the Apalachicola River also.

141. Since the basins of the Chattahoochee and Flint Rivers adjoin, much of the tributary area is common to both rivers and practically the same scale of rates to and from the ocean ports as well as interior points applies in both areas. The commerce and savings allotted to each route, therefore, cannot be added to obtain the total commerce of the two rivers, as approximately 40 percent of the commerce would be common to both rivers.

142. Detailed analyses by commodities were made of the commerce that would likely move over the Flint or Chattahoochee River in the event either were improved; these estimates are set forth in subsequent paragraphs. No separate tabulation was made, however, of the commerce that would probably use these rivers in the event both were improved, but a practical total was obtained by analyzing the detailed estimates for the individual rivers and eliminating the duplicated quantities in the area that would be common to both. In this combined estimate, the tonnage was figured to use the river over which the greater saving would be realized.

143. *Eliminated commerce.*—The total traffic reported by the businessmen who were interviewed in the 1936 canvass of the area was carefully analyzed and many items reported were eliminated from the prospective commerce for various reasons, the chief among which were:

(*a*) No savings could be effected by water, rail-water, or truck-water transportation.
(*b*) Savings too low to attract movement to water.
(*c*) Commodities not adaptable for water transportation.
(*d*) Circuity by water route too great to conform to Interstate Commerce Commission formula set forth in Ex parte 96 and supplemental reports thereto.

The total commerce thus determined as unlikely of movement by either the Flint or Chattahoochee Rivers amounted to 531,468 tons (excluding petroleum) and is shown in detail below by classes of commodities.

Summary of eliminated commerce

Classes of commodities	Tons (2,000 pounds)			
	(a)	(b)	(c)	(d)
Up-bound:				
Animals and animal products		3,686	3,250	800
Vegetable food products	25,828	2,673	30	8,086
Vegetable products, inedible	150			
Textiles	120	65	25	36,874
Wood and paper	2,330		20,137	32,976
Nonmetallic minerals	42,517	3,543		9,621
Ores, metals and manufactures of	4,989			5,108
Machinery and vehicles	3,038			7,225
Chemicals and related products	22,562	4,676		4,781
Unclassified	5,870	100		550
Total	107,404	14,743	23,442	106,021
Down-bound:				
Animals and animal products		200	350	
Vegetable food products	19,346	2,016	3,571	4,990
Vegetable products, inedible	5,000	2,000		1,580
Textiles	82,428	333		1,591
Wood and paper	26,906	20,822	1,450	82,086
Nonmetallic minerals	9,943		1,720	3,240
Ores, metals and manufactures of	6,500			1,052
Machinery and vehicles				16
Chemicals and related products				900
Unclassified	1,309			529
Total down-bound	151,432	25,371	7,091	95,964
Total up-bound	107,404	14,743	23,442	106,021
Total, all traffic	258,836	40,114	30,533	201,985
Grand total, 531,468 tons.				

(a) No savings could be effected by water or rail-water transportation.
(b) Savings too low to attract movement to water.
(c) Commodities not adaptable for water transportation.
(d) Circuity by water route too great to conform to I. C. C. formula set forth in *Ex parte 86*.

144. *Prospective commerce.*—After eliminating a portion of the reported tonnage as outlined above, the remaining traffic was carefully studied to arrive at an estimate of the volume that would be likely to use the waterways. Herein the peculiarities and individual requirements of each commodity movement were studied giving consideration to necessary speed of transportation, need for special handling and transporting equipment, established trade routes, location of principal markets, adaptability of cargo for barge handling, present preferred methods of shipments, relative cost of transportation, and many other factors regarding the relative advantages or disadvantages of water transportation.

145. In the case of several commodities it was found after the field survey had been completed that savings via the proposed waterway would extend to areas outside the territory covered in the canvass. In such cases the normal consumption of the commodity was determined in order to arrive at a total for the area, and of that amount a portion was estimated as probable waterway tonnage.

146. *Allowance for increased freight rates.*—Since the 1936 traffic survey was made, and the savings on prospective commerce were computed a blanket increase in rail rates of 5 or 10 percent has been made on nearly all movements to and from the area. The truck rates have in many cases been increased a like amount. These increases in the cost of overland transportation would, in most cases, produce an increased differential or saving compared to water, water-rail, or water-truck movements. It is believed that a 7-percent increase

in the savings would represent a fair average for all commodities except petroleum, and the tables in this report have been prepared accordingly. In 95 percent of the area the present cheapest method of distributing gasoline does not involve a rail haul, so that an increased rate would not directly affect the saving by the waterway.

147. *Undeveloped traffic.*—The estimates of prospective commerce for the Chattahoochee and Flint Rivers, prepared in accordance with the methods described, are believed to be reasonable and fair appraisals of the portion of the existing traffic to and from the area that may be expected to utilize these waterways if improved as proposed. It is admitted, however, that some traffic not now evident might develop on the waterways, as a result of the proposed improvements, because of the economical means of transportation that would be provided in the territory. Such traffic cannot be anticipated or evaluated at the present time, but it is believed that an arbitrary addition of 25 percent to the total quantity and saving developed by the traffic survey would be a reasonable allowance for unforeseen conditions which might give rise to additional traffic.

148. *Traffic in 1945.*—For the purpose of an estimate, it is assumed that the improvement to these waterways, if approved for construction, would be completed in 1945. It is therefore desirable to estimate the volume of traffic that would be available for water transportation at that time. A traffic survey made in 1936 when properly analyzed should give a reasonable estimate of the portion of the total commerce to and from the area that would use the waterway at that time. The volume that would be available in 1945 would depend on many variable factors.

149. The growth of industry and agriculture in the area and the increase in population will be accompanied by an increase in the volume of traffic moving to and from the area. The recent development of this section of the Southeast and the favorable prospects for continued growth have already been observed.

150. Another favorable influence is the increasing movement of traffic in a direction parallel to these rivers as indicated by the recent development of the port of Panama City, Fla. The table under paragraph 120 shows that the traffic at this port has increased from less than 50,000 to nearly 800,000 tons in the past 8 years. Much of this was new traffic developed as a result of the improvement of the port but a large part of it is the result of a diversion of tonnage from other ports, principally those on the South Atlantic seaboard, by virtue of economies effected by a more direct movement or shorter overland haul. The improvement at Port St. Joe and the harbor at Carrabelle, Fla., will further strengthen the Gulf ports' claim to an even larger portion of the commerce of the Apalachicola River Basin.

151. A reliable indication of the increased activity in the area is the increased consumption of gasoline. It is pointed out in paragraph 158 (a) that the consumption of gasoline in 1936 in the area that would be served by these waterways represents an increase of 12.4 percent over the previous year and 45 percent over 1933. Recent figures on the consumption by States in 1937 show an increase over the previous year of 11.5 percent for Alabama and 8.9 percent for Georgia. Auto registrations increased 52 percent in Alabama from 1933 to 1937 and in Georgia 34 percent.

152. A composite trend determined from economic studies in this office that gave consideration to the separate trends in population, agricultural and mineral production, industrial activity, transportation, financial transactions, and foreign commerce in this general area indicates an increase of 62.2 percent from actual activity in 1933 to probable activity in 1945. The normal trend over the same period indicates an increase of 16.1 percent.

153. All factors considered, it is believed that an increase of 20 percent in the probable tonnage estimated for 1936 will be a reasonable estimate of the tonnage to be expected in 1945 and this figure is used as indicated in the tables of traffic prepared for this report.

154. *Chattahoochee River commerce.*—The commerce that is considered as prospective for the Chattahoochee River, based on the data collected in the traffic survey, analyzed as outlined in preceding paragraphs, is shown in the following tables:

Prospective Commerce—Chattahoochee River

Classes and commodities	Short tons	Average savings per ton	Total savings	Waterway ton-miles
UP-BOUND				
Animals and animal products:				
Canned fish	240	$0.94	$226	38,880
Canned milk	480	3.21	1,541	904,320
Fish scrap and meal	600	.50	300	179,040
Hides	240	2.18	523	21,360
Vegetable food products:				
Canned goods	960	.92	883	1,262,613
Beverages	3,240	1.70	5,508	3,565,050
Flour	6,000	.81	4,860	3,579,594
Glucose	480	2.44	1,171	862,560
Corn	2,400	1.33	3,192	1,096,104
Oats	1,800	1.17	2,106	576,000
Wheat	2,400	1.03	2,472	768,000
Other grain products	4,200	1.54	6,468	4,453,176
Pecans	240	2.44	586	96,720
Rice	4,080	.66	2,693	2,007,434
Sugar	6,720	.54	3,629	3,474,240
All other	120	2.35	282	25,440
Vegetable products, inedible: Starch	3,600	1.86	6,696	7,160,707
Textiles:				
Bags and bagging	600	1.57	942	321,251
Cotton	32,400	1.29	41,796	19,488,065
Wood and paper:				
Shingles	360	.34	122	115,200
Wall board	240	.34	82	76,800
Wrapping paper	600	1.41	846	241,800
Nonmetallic minerals:				
Glass bottles	2,400	1.90	4,560	4,569,486
Petroleum products	239,300	1.52	364,839	78,011,800
Plaster	1,200	.64	768	254,400
Plaster board	360	2.18	785	765,360
Salt	7,200	.68	4,896	4,163,497
Sand and gravel	108,000	.11	11,880	5,400,000
Sulphur	12,000	.39	4,680	2,856,000
Ores, metals and manufactures:				
Iron pipe and fittings	600	3.08	1,848	1,444,145
Iron and steel manufactures	4,800	1.52	7,296	6,675,748
Hardware	1,800	5.67	10,206	3,176,616
Machinery and vehicles:				
Agricultural implements	240	3.34	802	448,280
Machinery	1,200	4.00	4,800	2,247,624
Chemicals:				
Ammonium sluphate	2,400	.40	960	597,965
Dyestuffs	1,200	2.10	2,520	384,000
Fertilizer	240	.41	98	62,640
Nitrate of soda	4,800	.41	1,968	1,191,290
Potash	7,200	.40	2,880	1,264,790
All other	600	2.07	1,242	413,100
Unclassified:				
Roofing	1,200	1.18	1,416	724,244
Miscellaneous	1,440	1.23	1,771	495,925
Total, up-bound	470,180	1.10	517,139	165,461,269

Prospective Commerce—Chattahoochee River—Continued

Classes and commodities	Short tons	Average savings per ton	Total savings	Waterway ton-miles
DOWN-BOUND				
Animals and animal products: Hides	600	$3.49	$2,094	546,480
Vegetable food products:				
Canned goods	3,600	2.55	9,180	3,143,977
Flour	600	1.10	660	237,796
Other grain products	1,680	1.14	1,915	754,980
Pecans	360	1.12	403	74,490
Peanuts	1,200	2.01	2,412	1,978,936
Vegetable products, inedible:				
Tobacco	960	2.31	2,231	144,960
Naval stores	1,200	.77	924	2,370,600
Textiles:				
Cotton	12,000	.73	8,760	3,266,285
Cotton piece goods	1,200	1.84	2,208	779,986
Cotton knit goods	240	1.84	442	62,880
Cotton waste	1,200	1.42	1,704	1,379,386
Cotton yarn	120	2.54	305	239,760
Wood and paper:				
Lumber	6,000	.52	3,120	1,254,230
Logs, poles, piling, etc	120,000	.21	25,200	12,960,000
Pulpwood	120,000	.21	25,200	25,440,000
Nonmetallic minerals: Sand and gravel	108,000	.11	11,880	5,400,000
Ores, metals and manufactures of: Iron and steel manufactures	4,800	1.63	7,824	3,091,200
Unclassified: Miscellaneous	240	1.11	266	36,240
Total, down-bound	384,000	.28	106,728	63,162,186
Total, up-bound	470,180	1.10	517,139	165,461,269
Total, up-bound and down-bound	854,180	.73	623,867	228,623,455
Undeveloped traffic, 25 percent	213,545		155,967	
Prospective traffic, 1936	1,067,725		779,834	
Increase, 20 percent	213,545		155,967	
Prospective traffic, 1945	1,281,270		935,801	

155. Supplementing the tables of prospective commerce shown above, the following tables summarize the commerce by classes of commodities and show the savings per ton and average waterway haul for each class:

Summary of prospective commerce, Chattahoochee River

Classes of commodities	Short tons	Savings per ton	Average waterway haul
UP-BOUND			
Animals and animal products	1,560	$1.66	733
Vegetable food products	32,640	1.04	667
Vegetable products, inedible	3,600	1.86	1,989
Textiles	33,000	1.30	600
Wood and paper	1,200	.88	362
Nonmetallic minerals	370,460	1.06	259
Ores, metals, and manufactures of	7,200	2.69	1,569
Machinery and vehicles	1,440	3.89	1,872
Chemicals and related products	16,440	.59	238
Unclassified	2,640	1.21	462
Total	470,180	1.10	352
DOWN-BOUND			
Animals and animal products	600	3.49	911
Vegetable food products	7,440	1.96	832
Vegetable products, inedible	2,160	1.46	1,165
Textiles	14,760	.91	388
Wood and paper	246,000	.22	161
Nonmetallic minerals	108,000	.11	50
Ores, metals, and manufactures of	4,800	1.63	644
Unclassified	240	1.11	151
Total	384,000	.28	164
Total up-bound and down-bound	854,180	.73	268

156. In compiling the tonnage figures, the port-to-port commerce and the joint rail-water commerce were tabulated separately. Also, the port-to-port traffic was segregated as to common or private and contract carrier freight. Joint haul herein means a movement by rail and water on a through rate. Analyzing these figures, it was found that 84.2 percent of the total commerce reported for the Chattahoochee route was port-to-port tonnage and 15.8 percent joint rail-water. Common carriers would handle all of the joint haul traffic but only 3.3 percent of the port-to-port traffic for an aggregate 18.6 percent of the total traffic. The average water haul for the total commerce was 268 miles, while the port-to-port haul was 200 miles and the waterway movement on joint traffic was 629 miles. The following table shows these figures in detail for both up-bound and down-bound movements, and also, the estimated barge line revenue per ton mile on the port-to-port traffic.

Analysis of traffic—Chattahoochee River

Traffic	Short tons	Percent	Barge line revenue per ton-mile	Average waterway haul
UP-BOUND			*Mills*	
Port-to-port (total)	364,996	77.7	3.7	268
Common carrier	17,696	3.8	5.3	819
Private and contract carrier	347,300	73.9	3.4	240
Joint haul	105,184	22.3	----------	642
Total up-bound	470,180	100.0	----------	352
DOWN-BOUND				
Port-to-port (total)	354,046	92.2	9.6	129
Common carrier	6,046	1.6	15.0	318
Private and contract carrier	348,000	90.6	7.1	126
Joint haul	29,954	7.8	----------	582
Total down-bound	384,000	100.0	----------	164
TOTAL UP-BOUND AND DOWN-BOUND				
Port-to-port (total)	719,042	84.2	4.9	200
Common carrier	23,742	2.8	6.5	691
Private and contract carrier	695,300	81.4	4.7	183
Joint haul	135,138	15.8	----------	629
Total	854,180	100.0	----------	268

The estimated average return to the water carrier of 4.9 mills per ton-mile on port-to-port traffic is believed to be a reasonable figure for the type of commerce anticipated to use these rivers. Though it is somewhat lower than the average for certain other operating waterways, the difference can be accounted for by the type of traffic expected to develop. The up-bound port-to-port movement would consist principally of gasoline which would be handled in barge lots at an estimated 3.5 mills per ton mile, while the large down-bound traffic in pulpwood, logs and gravel would take rates of from 2.0 to 2.5 mills per ton-mile. The generally higher rates that would apply on joint-water-rail traffic would likely result in most cases in a greater revenue per waterway ton mile on that type of commerce.

157. *Principal commodities in order of volume—Chattahoochee River.*—Arranged in order the five leading commodities up-bound and down-bound are as follows:

Principal commodities in order of volume of the Chattahoochee River

Commodity	Estimated tonnage	Rank	Commodity	Estimated tonnage	Rank
UP-BOUND			DOWN-BOUND		
Petroleum products	239,300	1	Pulpwood	120,000	1
Sand and gravel	108,000	2	Logs, poles, piling	120,000	2
Cotton	32,400	3	Sand and gravel	108,000	3
Sulphur	12,000	4	Cotton	12,000	4
Salt	7,200	5	Lumber	6,000	5

The volume of these five commodities amounts to 85 percent of the total up-bound movement and 95 percent of the total down-bound movement developed in the traffic survey. A study of the prospective movement of each of these principal commodities was made and a discussion of each is presented below.

158. *Up-bound tonnage, Chattahoochee River.*—(*a*) *Petroleum products.*—The prospective movement of gasoline and kerosene by barge from a Gulf port via the Apalachicola and Chattahoochee Rivers to an inland river port for ultimate distribution by rail and truck, constitutes by far the largest item of commerce potential for the waterway. Considerable savings could be realized from such a movement as compared with present costs via existing facilities. Gasoline is now being shipped into the territory by a number of different routes. Some is delivered to the eastern and northern portion from the ports of Savannah and Brunswick, Ga., on the South Atlantic, by rail and tank truck. Some is barged from Savannah via the recently improved Savannah River to Augusta, Ga., for truck delivery beyond. The southern portion of the area is served from the deep-water port of Panama City, Fla., and the shallow-draft harbor at Newport, Fla., on the St. Marks River. Gasoline is delivered to the latter point by barge from Panama City, Mobile, or New Orleans for distribution to interior Florida and south Georgia points by tank truck. A rapid development in the gasoline traffic through Panama City is evidenced by an increase in the coastwise receipts of that commodity from 23,742 tons in 1935 to 97,287 tons in 1936, with a further increase to 165,584 tons in 1937. The barge movement of gasoline from Mobile via the 4-foot project channel of the Alabama River serves the immediate vicinity of Montgomery, Ala., to advantage. Extensive traffic in this manner has not developed, however, probably due to the risk and uncertainty involved in handling large quantities of gasoline in small barges over such a shallow channel. Accordingly, in this analysis it was assumed that no considerable quantity would move beyond the territory now served from the river terminals at Montgomery. The deeper channel of the Tombigbee-Warrior River system is more favorable to large-scale barge movement of gasoline. This traffic from Mobile to Tuscaloosa and Birmingport, Ala., has shown a general increase for a number of years in spite of continued reductions in rail rates. In 1936 a total of 96,540 tons was handled, which amounted to about 16 percent of the potential quantity consumed in the territory on which a saving might have been realized by a water movement. Truck or rail distribution from Birmingport limits the Chattahoochee area on the north and northwest. A

study was made of existing rates and costs of handling gasoline in the territory by rail, barge, and truck in order to ascertain what savings might be effected by the proposed improvement. As for rail rates, it was found that throughout practically the entire area a truck competitive scale prevails which results in average rates of from 2.5 cents per ton-mile for short distances of 50 miles or less to 2.0 cents for long hauls of over 250 miles. Transportation costs obtained from oil companies and independent concerns engaged in trucking gasoline in bulk quantities were found to be approximately the same as the rail charges established to meet the competition. For this report, line haul charges for trucking gasoline in bulk were estimated as follows:

Truck haul (miles):	*Cost per ton-mile, cents*
1 to 50	2.5
51 to 100	2.4
101 to 150	2.3
151 to 200	2.2
201 to 250	2.1
Over 250	2.0

Extensive trucking at approximately these rates plays an active part in the distribution of gasoline for distances as great as 300 miles from the ocean ports in Florida and Georgia. Costs in Alabama are somewhat higher due to the lower highway load limit. The savings via the proposed waterway when compared with a long truck haul from a point of origin in Alabama will therefore be conservative. Barge costs for hauling gasoline on the Warrior River based on the testimony of those engaged in the traffic average about 3.5 mills per ton-mile, which cost includes evaporation and insurance. This figure was used for the similar movement proposed for the Chattahoochee River. Terminal costs were found to average 30 cents per ton additional. From the foregoing scale of actual charges by all carriers, the cheapest method of delivering gasoline from the ocean ports was determined for the principal city in each county in the area. This was compared with the calculated barge-truck rate from Panama City through a port at Columbus, Ga., and a unit saving obtained for each county. In this analysis it was assumed from testimony of one of the oil companies that a saving of 5 cents a barrel, or 36 cents a ton, would be effected by delivering gasoline by tank steamer to Panama City instead of hauling it around Florida to the South Atlantic ports. The total quantity of gasoline consumed in the States of Georgia and Alabama in 1936 was prorated to the individual counties on a basis of car registrations. In this it was assumed that trucks and commercial vehicles would use three times the amount of gasoline per unit as passenger cars. Kerosene consumption was found to equal about 10 percent of the figure for gasoline. The detailed analysis of quantity and possible saving by counties based on 1936 consumption is shown in the following table:

Gasoline distribution via Chattahoochee River through a terminal at Columbus, Ga.

County	Principal city	Total consumption 1936 (tons)	Most economical existing method		Proposed water-truck rate per ton	Savings per ton	Total savings
			Route	Rate per ton			
ALABAMA							
Barbour	Eufaula	5,257	Truck, Panama City	$3.25	$2.57	$0.68	$3,575
Bullock	Union Springs	2,285	do	3.75	2.77	.98	2,239
Chambers	Lafayette	6,963	Water-truck, Birmingport	4.32	2.79	1.53	10,653
Lee	Opelika	8,590	Truck, Panama City	4.40	2.22	2.18	18,726
Macon	Tuskegee	4,377	do	4.20	2.90	1.30	5,690
Randolph	Wedowee	5,614	Water-truck, Birmingport	4.81	3.71	1.10	6,175
Russell	Seale	6,688	Truck, Panama City	3.80	1.87	1.93	12,908
Tallapoosa	Dadeville	11,192	Water-truck, Birmingport	3.83	2.94	.89	9,961
FLORIDA							
(No saving.)							
GEORGIA							
Bartow	Cartersville	8,277	do	5.13	4.80	.33	2,731
Bibb	Macon	36,570	Rail, Savannah	4.56	3.80	.76	27,793
Butts	Jackson	2,871	Water-truck, Augusta	4.58	3.99	.59	1,694
Carroll	Carrollton	9,766	Water-truck, Birmingport	4.80	3.70	1.10	10,743
Chattahoochee	Cusseta	4,037	Truck, Panama City	4.11	1.92	2.19	8,841
Cherokee	Canton	6,629	Water-truck, Birmingport	5.15	4.78	.37	2,453
Clayton	Jonesboro	4,803	Water-truck, Augusta	5.12	4.03	1.09	5,235
Cobb	Marietta	15,397	do	5.58	4.38	1.20	18,476
Coweta	Newnan	8,019	Truck, Panama City	5.40	3.35	2.05	16,439
Crawford	Knoxville	1,314	Truck, Brunswick	4.76	3.24	1.52	1,997
Dekalb	Decatur	21,465	Water-truck, Augusta	4.97	4.06	.91	19,533
Dooly	Vienna	3,552	Rail, Savannah	4.26	3.56	.70	2,486
Douglas	Douglasville	3,284	Water-truck, Birmingport	5.33	4.22	1.11	3,645
Fayette	Fayetteville	2,140	Truck, Panama City	5.56	3.74	1.82	3,895
Floyd	Rome	19,229	Water-truck, Birmingport	4.92	4.84	.08	1,538
Forsyth	Cumming	2,424	Water-truck, Augusta	5.85	4.87	.98	2,376
Fulton	Atlanta	208,720	do	5.12	3.90	1.22	254,638
Gordon	Calhoun	5,513	Water-truck, Birmingport	5.31	5.18	.13	717
Gwinnett	Lawrenceville	9,109	Water-truck, Augusta	4.67	4.61	.06	547
Haralson	Buchanan	3,879	Truck, Panama City	5.00	4.04	.96	3,724
Harris	Hamilton	2,542	do	4.32	2.02	2.30	5,847
Heard	Franklin	1,345	Water-truck, Birmingport	5.20	3.17	2.03	2,730
Henry	McDonough	4,958	Water-truck, Augusta	4.84	4.20	.64	3,173
Houston	Perry	2,564	Truck, Brunswick	4.17	3.70	.47	1,205
Jones	Gray	1,689	Water-truck, Augusta	4.26	4.02	.24	405
Lamar	Barnesville	2,877	do	5.06	3.55	1.51	4,344
Macon	Montezuma	3,090	Rail, Savannah	4.76	3.07	1.69	5,222
Marion	Buena Vista	1,489	Truck, Panama City	4.35	2.32	2.03	3,023
Meriwether	Greenville	4,697	do	4.85	2.64	2.21	10,380
Monroe	Forsyth	3,145	Water-truck, Augusta	4.77	3.76	1.01	3,176
Muscogee	Columbus	28,334	Truck, Panama City	4.05	1.14	2.91	82,452
Paulding	Dallas	2,650	Water-truck, Birmingport	5.13	4.32	.81	2,147
Peach	Ft. Valley	3,947	Truck, Brunswick	4.50	3.60	.90	3,552
Pike	Zebulon	2,797	Water-truck, Augusta	5.10	3.62	1.48	4,140
Polk	Cedartown	7,496	Water-truck, Birmingport	4.46	4.43	.03	225
Quitman	Georgetown	972	Truck, Panama City	3.43	2.69	.74	719
Randolph	Cuthbert	3,645	do	3.45	2.85	.60	2,187
Schley	Ellaville	1,208	do	4.53	2.69	1.84	2,223
Spalding	Griffin	9,063	Water-truck, Augusta	4.85	3.60	1.25	11,329
Stewart	Lumpkin	2,327	Truck, Panama City	3.80	2.44	1.36	3,165
Sumter	Americus	6,910	Truck, St. Marks	4.10	2.95	1.15	7,947
Talbot	Talbotton	1,454	Truck, Panama City	4.60	2.42	2.18	3,170
Taylor	Butler	2,806	do	5.02	2.67	2.35	6,594
Terrell	Dawson	3,625	Rail, Panama City	3.90	2.98	.92	3,335
Troup	LaGrange	13,507	Truck, Panama City	4.60	2.65	1.95	26,339
Upson	Thomaston	6,922	do	5.24	3.14	2.10	14,536
Webster	Preston	504	do	4.27	2.59	1.68	847
Total		554,527					673,840
Plus 10 percent for kerosene		55,453					67,384
Total potential (1936)		609,980					741,224

Volume groups according to unit saving

Tons	Savings per ton	Truck haul (miles)	Savings	
			Average	Total
70,235	$2.01 to $2.91	29.4	$2.46	$172,738
38,291	$1.51 to $2.00	51.4	1.79	68,428
276,203	$1.01 to $1.50	103.9	1.21	334,350
109,292	$0.51 to $1.00	94.4	.81	88,494
60,506	$0.03 to $0.50	143.1	.16	9,821
554,527	Average	93.2	1.22	673,840

Volume groups according to length of truck haul

Tons	Truck haul from Columbus (miles)	Savings	
		Average	Total
41,601	0 to 25; average 5.7	$2.65	$110,048
33,681	26 to 50; average 40.7	1.72	58,112
60,798	51 to 75; average 58.3	1.43	87,146
83,357	76 to 100; average 92	1.07	89,615
261,016	101 to 125; average 108.4	1.15	299,856
74,074	126 to 170; average 142.8	.39	29,063
554,527	Average 93.2	1.22	673,840

Of this total potential movement, the portion that would actually benefit by the improvement and the amount of the saving is problematical. In view of the limited use being made of the Warrior River system at the present time and also the fact that the oil companies are not using the present cheapest transportation facility to all parts of the territory, it is certain that all tonnage prospective for the waterway would not so move and the full potential saving made possible by the proposed improvement would not be realized. Rate reductions by other carriers to meet waterway competition has been generally practiced heretofore to retain effectively a large portion of the traffic and would undoubtedly be done in this instance to some extent. There is one point, however, that is peculiar to this situation that would favor retention of the existing railroad mileage rate scale and that is the proximity of the territory to South Atlantic ports as well as Gulf ports. Any reduction in rates from the latter points would likely be met by corresponding charges from the other, and in view of the extensive intervening territory between the Chattahoochee Valley and the Atlantic coast, it is doubtful whether the revenue from the portion of the Chattahoochee tonnage that might be retained would offset the attending loss in the other territory. A likely procedure would be for the rail lines to retain through rates at approximate present levels and establish rates on the same mileage basis for a rail haul from Columbus. This would result in barge-rail rates to all parts of the territory approximately equal to the estimated barge-truck rates. Statements have been received from several of the major oil companies (see Appendix A,[1]) which give assurance of an extensive use of the proposed waterway. It was estimated by several that up to 90 percent of the gasoline consumed within 75 miles of the river would utilize the facility. Considering all of the factors involved, it

[1] Not printed.

is believed that the following estimate represents a reasonable approximation of the savings, either direct or indirect, in the transportation of petroleum products creditable to the proposed improvement of the Apalachicola and Chattahoochee Rivers:

Savings

Savings per ton	Total savings	Estimated portion benefited	Savings creditable to waterway
		Percent	
$2.01 to $2.91	$172,738	80	$138,190
$1.51 to $2.00	68,428	60	41,057
$1.01 to $1.50	334,359	40	133,744
$0.51 to $1.00	88,494	20	17,699
$0.03 to $0.50	9,821	10	982
	673,840	[1] 49.2	331,672
Increase 10 percent for kerosene			33,167
Total			364,839

[1] Average.

Tons

Savings per ton	Total tons	Estimated portion benefited	Tons benefited
		Percent	
$2.01 to $2.91	70,235	80	56,188
$1.51 to $2.00	38,291	60	22,975
$1.01 to $1.50	276,203	40	110,481
$0.51 to $1.00	109,292	20	21,858
$0.03 to $0.50	60,506	10	6,051
	554,527	[1] 39.2	217,553
Increase 10 percent for kerosene			21,755
Total			239,308

[1] Average.

Average saving on total potential tonnage, $1.22 per ton.
Average saving on estimated portion benefited, $1.52 per ton.

These figures, as stated, are based on 1936 consumption, which represents an increase of 12.4 percent over 1935 and about 45 percent over 1933. Consumption by States in 1937 shows an increase over 1936 of 11.5 percent in Alabama and 8.9 percent in Georgia. A continued increase in consumption, though impossible of accurate prediction, is certainly assured for a reasonable period of years. In view of the rapid increase in the consumption of this principal item of prospective commerce, a continued increase of 5 percent per annum, compounded would be a reasonable estimate at least for the near future. The total increase of 20 percent determined in paragraph 148 to arrive at the prospective tonnage in 1945 is, therefore, very conservative for this commodity. Another conservative feature in the estimate of savings on petroleum products is the principle of using the present lowest cost to each distributing center considering all transportation routes without regard to the principal one used in each case. Often the cheapest method is not used because of the small margin of saving, unimproved highways for trucking to certain areas, internal operations peculiar to the various companies or for other reasons. With the greater margin of saving from a water-truck haul

and the continued improvement of highways, much of the area now served at a cost above the cheapest present method would probably be served by the proposed waterway. The actual saving to these areas would, therefore, be the difference between the actual present cost and the future cost via the proposed waterway even though the entire benefit would not be directly attributable to the improvement. All of the saving on gasoline estimated for the Chattahoochee River would be realized through the use of a single port at Columbus, Ga. It was found that the volume prospective for other river points would be insufficient to justify establishing additional terminals.

(*b*) *Sand and gravel.*—These items rank second in the prospective up-bound movement over the proposed waterway. Sand exists in apparently inexhaustible quantities in the Chattahoochee River drainage area. However, the supply of gravel is limited. Frequently the beds of streams are large sources of production and the workable areas are so well distributed that movements of sand and gravel by barge are generally for relatively short distances. Statistics of water-borne commerce over the Chattahoochee River show a total movement of 85,668 tons of sand and gravel in 1935, 57,036 tons in 1936, and 59,850 tons in 1937, which was towed downstream to Chattahoochee, Fla. During the survey, shippers stated that because of the present condition of the waterway the cost of barging sand and gravel for a distance of 40 miles was approximately 21 cents per ton, further, that with the proposed improvement this cost would be reduced 50 percent and the total movement would be materially increased by the access to broader markets. Considering the general scarcity of gravel in sections of the Southeast and the estimated requirements of this area, it is believed that 108,000 tons would represent a reasonable estimate of this tonnage that would develop for upstream shipment at a saving of 11 cents per ton.

(*c*) *Cotton.*—The survey developed 32,400 tons of raw cotton as prospective traffic for up-bound movement via the Chattahoochee River. Approximately 50 percent of this tonnage would consist of long staple cotton which originates in the Mississippi Delta and southwestern territory and would be destined to textile mills located in the tributary area. The growing of long staple cotton in the tributary area has met with little success, making it necessary for the textile mills to secure their requirements from other sources. Cotton, either compressed or uncompressed, is particularly adaptable to water transportation by modern methods and since the advent of the use of motortrucks as feeders in connection with the use of larger barges, cotton has become of increasingly greater importance in the commerce of the inland waterways. The amount reported for movement via the proposed waterway appears to be reasonable in view of the large consumption of long staple cotton in the area.

(*d*) *Sulfur.*—The survey developed a total of 12,000 tons of sulfur as prospective commerce for the proposed waterway. All of this tonnage would originate at the Texas sulfur mines. It is at the present time being transported by steamer in cargo lots from Galveston and Texas City, Tex., to East Gulf and South Atlantic ports, from which latter points it is distributed to consuming industries in the tributary area. Reports of the United States Bureau of Mines show that over 99 percent of the domestic output of sulfur in 1935 originated in Texas and Louisiana mines. The survey showed that sulfur is being moved

to fertilizer and chemical plants in the tributary area to be used in the manufacture of heavy chemicals, fertilizer, and insecticides. It is logical to assume that with the improvement of the waterway, steamers handling sulfur would touch at Panama City, Fla., from which port the tributary area could be more economically served with its requirements of sulfur than from other Gulf or South Atlantic ports, and savings were figured accordingly.

(*e*) *Salt.*—Practically all of the salt offered by shippers as potential tonnage originates at Louisiana mines. Reports of the United States Bureau of Mines show that in 1935 Louisiana ranked third among the salt-producing States, with a total annual output of 578,000 short tons. According to figures compiled by the same source, the annual consumption of salt, within the tributary area in 1935, prorated to the counties on a per capita basis, amounted to 28,776 tons. A total of 7,200 tons was estimated to move over the proposed Chattahoochee route and practically all of it was port-to-port traffic, thus enabling shippers to load barges at the salt mines and unload at the port of destination, where the volume of shipments are sufficient to justify the operation. In view of the prevailing movements of large quantities of this commodity over the inland waterways of the United States, the estimates here included appear to be reasonable.

159. *Down-bound tonnage, Chattahoochee River*—(*a*) *Pulpwood.*—Shippers estimated a potential annual movement of 300,000 tons from points along the banks of the Chattahoochee River destined to Panama City and Port St. Joe, Fla., to be used in the manufacture of paper. Investigation shows that there is a large volume of pulpwood at present being handled by rail to Panama City from points in close proximity to the Chattahoochee River. Shippers stated that the bulk of the proposed movement would be from river points which cannot be reached economically except over the proposed waterway. Statistics show that during 1936, some 78,375 tons of pulpwood were moved over the Apalachicola River for an average haul of 63 miles. It is believed that 120,000 tons annually is a conservative estimate of the prospective continuous movement of pulpwood via the proposed improvement, over and above the quantity that could be moved over the rivers in their present condition. The savings were estimated by comparing the cost of rail transportation from nearby rail points as against water transportation from points on the proposed waterway, resulting in average savings of 21 cents per ton.

(*b*) *Logs, piling, etc.*—In the tonnage estimates here recorded, all rafted logs have been excluded, only those potential estimates scheduled to move by barge having been taken into consideration. The tonnage consists of pine and hardwood logs, poles, piling, and similar forest products having their origin along the waterway. Shippers indicated that the greater part of the log tonnage would be moved to their mills along the river in their own equipment or by contract barge-line carriers and savings were based accordingly.

(*c*) *Gravel.*—The 108,000 tons of gravel estimated to move down-bound over the Chattahoochee route is similar in most respects to the movement heretofore described as up-bound for this waterway. The material would move at a saving over the deeper channel and would be able to reach a broader market along the Gulf coast.

(*d*) *Cotton.*—The estimates of cotton furnished by shippers as down-bound commerce via the Chattahoochee route amounted to 21,800 tons. Approximately all of this cotton would be for export and domestic movement through the port of Panama City Investigation showed that practically all of this cotton is now moving through south Atlantic ports, and on account of steamship service, port facilities, and financial arrangements necessary for its proper handling, it is problematical whether more than one-half of the shippers' estimate would be diverted for shipment through Gulf ports via the proposed waterway. Accordingly, the prospective movement has been estimated as 12,000 tons, with an average saving of $0.73 per ton.

(*e*) *Lumber.*—All of the down-bound lumber shipments, amounting to 6,000 tons, would originate along the Chattahoochee River and would be destined for Panama City for reshipment to foreign and domestic trade areas. All of this tonnage is manufactured by mills on or very close to the waterway and would move port-to-port. River shipments of lumber for export or coastwise movement have for years moved economically by barge, and the amount shown is believed to be a conservative estimate for this type of tonnage. There are few mills located on the river at the present time, which fact accounts for the relatively small lumber movement anticipated.

160. *Prospective commerce—Flint River.*—The commerce listed in the tables below was arrived at by the same careful analysis employed in compiling the prospective commerce for the Chattahoochee River. From the following tables it will be noted that the tonnage movement is fairly well balanced, the down-bound tonnage being only about 20 percent greater than the up-bound tonnage. As pointed out in the discussion of the Chattahoochee River, all commerce not considered adaptable or available for movement by water for reasons shown in paragraph 143 was excluded from the tables. The prospective tonnage developed by the traffic survey amounted to 444,880 tons and the savings $260,242. With the addition of 25 percent for undeveloped traffic, the total for all traffic on the Flint River, based on 1936 traffic, is estimated to be 556,100 tons and the savings $325,303. The prospective tonnage estimated for 1945 is 667,320 tons with a corresponding savings of $390,364. The waterway ton-miles shown in the following tables include the haul over the Flint River and connecting waterways.

Prospective Commerce—Flint River

Classes and commodities	Short tons	Average savings per ton	Total savings	Waterway ton-miles
UP-BOUND				
Animals and animal products:				
Canned milk	360	$3.21	$1,156	655,560
Canned fish	240	.94	226	38,880
Fish scrap and meal	480	.50	240	112,992
Vegetable food products:				
Canned goods	780	.92	718	976,732
Beverages	2,640	1.70	4,488	272,532
Flour	4,800	.81	3,888	2,561,232
Corn	1,920	1.33	2,554	755,923
Oats	1,440	1.17	1,685	370,080
Other grain products	3,360	1.03	3,461	3,350,861
Sugar	1,080	.48	518	490,320
Pecans	240	2.44	586	81,600
Rice	2,280	.66	1,505	978,143
All other	120	2.35	282	17,880

Prospective Commerce—Flint River—Continued

Classes and commodities	Short tons	Average savings per ton	Total savings	Waterway ton-miles
UP-BOUND—continued				
Vegetable products, inedible: Starch	2,400	$1.86	$4,464	4,622,592
Textiles: Bags and bagging	480	1.57	754	226,757
Wood and paper:				
Wrapping paper	480	1.41	677	163,200
Shingles	300	.34	102	77,100
Wallboard	180	.34	61	46,260
Nonmetallic minerals:				
Gravel	30,000	.11	3,300	2,250,000
Salt	6,000	.70	4,200	3,091,560
Petroleum products	107,800	1.07	115,012	28,351,400
Plaster	960	.64	614	203,520
Glass bottles	1,800	1.90	3,420	3,313,710
Sulfur	12,000	.39	4,680	2,856,000
Plasterboard	300	2.18	654	618,900
Ores, metals and manufactures:				
Iron pipe and fittings	480	3.08	1,478	1,125,072
Iron and steel manufactures	3,600	1.52	5,472	4,780,008
Hardware	1,440	5.67	8,165	2,450,563
Machinery and vehicles:				
Agricultural implements	180	3.34	601	324,869
Machinery	960	4.00	3,840	1,737,619
Chemicals:				
Ammonium sulfate	2,400	.40	960	446,760
Potash	2,400	.40	960	422,400
Nitrate of soda	4,200	.41	1,722	1,041,600
Fertilizer	240	.41	98	47,520
All other	480	2.07	994	300,240
Unclassified:				
Roofing	960	1.18	1,133	518,918
Miscellaneous	1,080	1.23	1,328	303,901
Total up-bound	200,860	.93	185,996	69,983,204
DOWN-BOUND				
Vegetable food products:				
Canned goods	3,600	2.55	9,180	2,916,000
Pecans	300	1.12	336	43,200
Peanuts	960	2.01	1,930	1,522,560
Vegetable products, inedible:				
Tobacco	960	2.31	2,218	144,960
Naval stores	1,800	.77	1,386	3,443,400
Textiles: Cotton	12,000	.73	8,760	2,508,000
Wood and paper:				
Lumber	7,200	.52	3,744	1,504,800
Pulpwood	120,000	.21	25,200	12,960,000
Logs, piling, etc	96,000	.21	20,160	20,352,000
Unclassified: Miscellaneous	1,200	1.11	1,332	181,200
Total, down-bound	244,020	.30	74,246	45,576,120
Total, up-bound	200,860	.93	185,996	69,983,204
Total, up-bound and down-bound	444,880	.58	260,242	115,559,324
Undeveloped traffic, 25 percent	111,220		65,061	
Prospective traffic, 1936	556,100		325,303	
Increase 20 percent	111,220		65,061	
Prospective traffic, 1945	667,320		390,364	

161. The following table showing a summary of the commerce by classes of commodities, the savings per ton, and the average waterway haul for each of the classes, supplements the tables of prospective commerce shown above:

Summary of prospective commerce—Flint River

Classes of commodities	Short tons	Savings per ton	Average waterway haul
UP-BOUND			
Animals and animal products	1,080	$1.50	748
Vegetable food products	18,660	1.05	528
Vegetable products, inedible	2,400	1.86	1,926
Textiles	480	1.57	472
Wood and paper	960	.88	299
Nonmetallic minerals	158,860	.83	256
Ores, metals, and manufactures of	5,520	2.74	1,514
Machinery and vehicles	1,140	3.90	1,809
Chemicals and related products	9,720	.49	232
Unclassified	2,040	1.21	403
Total	200,860	.93	348
DOWN-BOUND			
Vegetable food products	4,860	2.35	922
Vegetable products, inedible	2,760	1.31	1,300
Textiles	12,000	.73	209
Wood and paper	223,200	.22	156
Unclassified	1,200	1.11	151
Total	244,020	.30	186
Total up-bound and down-bound	444,880	.58	260

162. Further analyzing the prospective tonnage shown above, the following table shows the amount and the percentage relationship of the port-to-port and joint traffic, the average haul of the water movements, and the barge-line revenue per ton-mile:

Analysis of traffic—Flint River

Traffic	Short tons	Percent	Barge-line revenue per ton-mile	Average waterway haul
UP-BOUND			*Mills*	
Port to port (total)	144,838	72.1	4.0	256
Common carrier	7,038	3.5	7.1	922
Private and contract carrier	137,800	68.6	4.0	222
Joint haul	56,022	27.9	----------	586
Total up-bound	200,860	100.0	----------	348
DOWN-BOUND				
Port to port (total)	217,008	88.9	3.4	154
Common carrier	1,008	.4	11.9	209
Private and contract carrier	216,000	88.5	3.4	154
Joint haul	27,012	11.1	----------	446
Total down-bound	244,020	100.0	----------	186
TOTAL UP-BOUND AND DOWN-BOUND				
Port to port (total)	361,846	81.3	3.7	195
Common carrier	8,046	1.8	7.3	833
Private and contract carrier	353,800	79.5	3.4	181
Joint haul	83,034	18.7	----------	541
Total	444,880	100.0	----------	260

The average barge line revenue on port-to-port traffic on the Flint River, as shown in the above table, is lower than on the Chattahoochee because the preponderance of the traffic consists of commodities moving in bulk on which water-carrier earnings are relatively low.

163. *Principal commodities in order of volume, Flint River.*—The five principal commodities expected to move up-bound constitute 80 percent of that traffic, while 98 percent of the down-bound traffic is made up of the five principal movements in that direction. These principal commodities, arranged in order of volume for up-bound and down-bound movements, are as follows:

Principal commodities in order of volume—Flint River

Commodity	Estimated tonnage	Rank	Commodity	Estimated tonnage	Rank
UP-BOUND			DOWN-BOUND		
Petroleum products	107,800	1	Pulpwood	120,000	1
Gravel	30,000	2	Logs, poles, piling	96,000	2
Sulphur	12,000	3	Cotton	12,000	3
Salt	6,000	4	Lumber	7,200	4
Flour	4,800	5	Canned goods	3,600	5

164. *Up-bound tonnage—Flint River—(a) Petroleum products.*—The total potential movement of gasoline and kerosene via the Flint River for distribution through a terminal at Albany was subjected to the same detailed analysis as outlined in paragraph 158 (*a*) for the Chattahoochee. It was found that, based on 1936 consumption, 493,014 tons of gasoline could have been handled in this manner at a saving of $266,924. Increasing these figures 10 percent to include kerosene would bring the total quantity to 542,315 tons with a corresponding saving of $293,616. It will be noted that this total quantity potential for the Flint River is nearly as great as that for the Chattahoochee but the saving amounts to less than half as much. This is due to the remoteness and consequent low unit saving to the large consuming centers in the northern part of the area. The portion of this total movement that might reasonably be assumed would utilize the waterway is derived on the same basis as the Chattahoochee estimate as indicated in the following tables:

Savings

Savings per ton	Total savings	Estimated portion benefited	Savings creditable to waterway
		Percent	
$2.01 to $2.50	$46,197	80	$36,958
$1.51 to $2	52,368	60	31,421
$1.01 to $1.50	39,924	40	15,970
$0.51 to $1	73,635	20	14,727
$0.02 to $0.50	54,800	10	5,480
Total	266,924	39	104,556
Increase 10 percent for kerosene			10,456
Total			115,012

Tons

Savings per ton	Total tons	Estimated portion benefited	Tons benefited
		Percent	
$2.01 to $2.50	19,964	80	15,971
$1.51 to $2	29,109	60	17,465
$1.01 to $1.50	34,456	40	13,782
$0.51 to $1	98,662	20	19,732
$0.02 to $0.50	310,823	10	31,082
Total	493,014	[1] 20	98,032
Increase 10 percent for kerosene			9,803
Total			107,835

[1] Average.

	Per ton
Average saving on total potential tonnage	$0.54
Average saving on estimated portion benefited	1.07

(*b*) *Gravel.*—All of this tonnage originates on the Chattahoochee River and is now being moved by barge-rail to points in the tributary area. On account of the existing low rail rates prescribed by the Interstate Commerce Commission on the commodity, it is believed that the movement in connection with the Flint River will be confined to points along that waterway. The tonnage estimated is thought to be conservative.

(*c*) *Sulphur.*—The sulphur tonnage, estimated at 12,000 tons up-bound commerce via the Flint River, is the same as that described among the first five leading commodities for up-bound traffic via the Chattahoochee River. (See paragraph 158 (*d*).)

(*d*) *Salt.*—Practically the same transportation problems concern the potential movement of salt via the Flint River as were discussed for the Chattahoochee in paragraph 158 (*e*). By the same method of analysis, the annual consumption in the area tributary to the Flint was estimated at 25,026 tons. Statistics show an average annual movement of salt on the Warrior River for the 6-year period 1931–36, inclusive of 6,504 tons; hence, the tonnage estimate of 6,000 tons here recorded, which represents only approximately 20 percent of the potential salt tonnage, may be regarded as fairly conservative for the prospective movement.

(*e*) *Flour.*—Flour ranked fifth in prospective commerce offered by shippers for up-bound movement via the Flint River. Shippers indicate the origins of this tonnage as Illinois freight, Western Trunk Line, and Pacific coast territories. The greater part of this tonnage would originate on the Pacific coast, and it was figured to move as port-to-port traffic through the port of Panama City, Fla. As all of this tonnage is packed in sacks, it would be comparatively easy to handle as barge traffic. The amount estimated to use the waterway is obviously a small percentage of the total consumption, but, in view of the milling in transit rail rates applicable on this commodity, it is believed to be a fair estimate of the prospective tonnage.

165. *Down-bound tonnage—Flint River*—(*a*) *Pulpwood.*—The supply of pulpwood adjacent to the Flint River and the traffic problems involved in its movement to the paper mills on the coast is comparable in most respects to conditions along the Chattahoochee River, so for the purpose of this analysis, it has been assumed that a like quantity

of 120,000 tons would be attracted to barge shipment. All of this tonnage would move from various points along the banks of the Flint River destined to the paper plants at Port St. Joe and Panama City, and would be a port-to-port movement. In view of the adaptability of this traffic for barge handling as evidenced by the large volume of such commerce now moving over other inland waterways of this district, it is believed the tonnage estimated to move over the Flint River is reasonable and conservative.

(*b*) *Logs, piling, etc.*—The principal factors concerning the movements of timber products have heretofore been evaluated in the down-bound commerce via the Chattahoochee River. These products rank second in tonnage volume as estimated down-bound traffic for the Flint River, amounting to 96,000 tons.

(*c*) *Cotton.*—The survey developed a total of 12,000 tons of cotton as down-bound commerce via the Flint River. The destinations of this tonnage and the problems involved in its movement are the same as discussed in paragraph 159 (*d*) for the down-bound movement via the Chattahoochee River.

(*d*) *Lumber.*—A total of 7,200 tons was developed by the survey as prospective traffic to move down-bound via the Flint River. This tonnage originates at mills located on the banks of the Flint River and is destined for export and coastwise movement through the port of Panama City. In consideration of the fact that all of the potential lumber estimates here recorded are routed as port-to-port movements, together with the fact that the movement of this commodity by private and contract carrier service over inland waterways of the United States is increasing at a progressive rate, it is believed that the estimate is conservative.

(*e*) *Canned goods.*—The survey developed a total of 3,600 tons of canned goods as potential barge commerce for down-bound movement via the Flint River. A large part of this tonnage consists of canned sirup originating at Cairo, Ga., for coastwise movement to the eastern seaboard as well as to New Orleans, La., for distribution to interior points in the Southwest. Cairo, Ga., is stated to be the second largest shipping point for cane sirup in the United States and at present there is an annual movement of over 2,000 tons to western points alone. Canned goods have moved in sizeable quantities over the inland waterways of the United States with definite savings in freight costs, so there appears little question as to the adaptability of the prospective commerce here offered to move over the proposed waterway.

166. *Combined commerce—Flint and Chattahoochee Rivers.*—As stated in paragraph 141, the total commerce prospective for these rivers if both were improved for navigation could not be obtained by combining the totals for the separate rivers due to the overlapping of territory that could be served by either. For example, a shipment of salt from Louisiana to Fort Valley, Ga., could move by barge to either Columbus, Ga. on the Chattahoochee River or Albany, Ga. on the Flint with a rail haul from the river port to final destination at practically the same rate and saving. In this way, the tributary area of either river would be benefited by the improvement of the other.

167. Based on the data collected in the traffic survey analyzed in accordance with the methods outlined for the separate rivers, it is estimated that the total commerce prospective for the Apalachicola

River System in 1945, provided both the Flint and Chattahoochee Rivers are improved to a depth of 9 feet, would amount to approximately 1,400,000 tons, with a resulting saving of about $1,100,000. It was found that the Chattahoochee River alone would accommodate 92 percent of this commerce, of 1,281,270 tons at 85 percent of the total saving, or $935,801, while the Flint River alone would serve only 48 percent of the total volume, or 667,320 tons at 35 percent of the total saving, or $390,364.

168. From the above figures it will be seen that if the Flint River were improved in addition to the Chattahoochee, only about 120,000 tons more would be handled and the total savings would be increased about $164,000, based on the traffic anticipated for a 9-foot channel in 1945.

169. *Flint River traffic—5-foot channel.*—Later under "Plan of Improvement" it is shown that a channel 5 feet deep and 100 feet wide could be provided to Albany by means of stream-flow regulation by reservoirs. The navigable depth to Bainbridge, Ga., with this plan would be 7 feet. Such a channel would carry a lesser volume of traffic than a 9-foot canalized project. The traffic would likely be limited to shipments by contract or private carrier for it is improbable that modern plant such as is used by successful common carriers on other waterways would attempt to use an open river channel of such limited dimensions. A 7-foot channel to Bainbridge, just 30 miles up the Flint River from its intersection with the Chattahoochee, could readily be used as an intermediate port for a common carrier operating on the Apalachicola and Chattahoochee to serve the southwestern part of Georgia to very good advantage.

170. Considering the total additional tonnage for the Flint River indicated in paragraph 168, it appears reasonable to assume that a 7-foot channel to Bainbridge and a 5-foot depth to Albany would handle an additional 50,000 tons with an additional saving of $50,000 for the combined improvement of the Flint and Chattahoochee Rivers.

PLAN OF IMPROVEMENT

171. The plan contemplates the coordinated improvement of navigation and the development of power facilities on the Apalachicola, Chattahoochee, and Flint Rivers. For navigation in the Apalachicola River, it provides for a channel 9 feet deep and 100 feet wide to be obtained by open channel improvement and flow regulation. In the Chattahoochee River below Columbus, Ga., it provides for the same size channel by canalization. In the Flint River it provides for a channel 7 feet deep and 100 feet wide below Bainbridge, Ga., and a channel 5 feet deep and 100 feet wide from Bainbridge to Albany, to be obtained by open channel improvements and flow regulation. Flow regulation for the improvement of navigation and the development of power would be obtained by the construction of six storage-power dams, three on the Chattahoochee River and three on the Flint River. Power facilities would be installed at the six proposed storage-power dams and at five of the six locks and dams proposed for the canalization of the Chattahoochee River.

172. *Apalachicola River improvement.*—The Apalachicola River has a fall of about 45 feet in its length of 112.8 miles. The upper 80 miles has a fairly uniform slope of slightly less than 0.5 foot per mile.

The mean low water flow is about 5,200 cubic feet per second at the upper end. It is proposed to provide a channel 9 feet deep and 100 feet wide by open river methods. Canalization would be more expensive due to the low banks requiring a number of lifts of less than 10 feet each. Although the present low-water flow is theoretically more than sufficient for a channel 9 feet deep by 100 feet wide at the existing slopes, it would require considerable dredging or contraction works to obtain such a channel because of the excess width of the natural river bed. Under present conditions it is estimated that it would take about 3,900,000 cubic yards of dredging to obtain a channel 9 feet deep with 1 foot overdepth and 100 feet wide with proper widening at the bends. The amount of annual dredging that would be required is difficult to predict, but would probably run at least 50 percent of the initial yardage, or about 2,000,000 cubic yards. The annual maintenance may be reduced by the construction of contraction works consisting of revetments and dikes. By the expenditure of about $4,000,000 for the construction of such dikes and revetments, it is estimated that annual maintenance dredging may be reduced to about 600,000 cubic yards. The alternate plan for reducing maintenance dredging, and the one herein proposed for the plan of improvement, is to increase the low water flow by means of storage reservoirs. With the proposed storage-power reservoirs the low-water flow at the head of the Apalachicola River would be increased to about 10,000 cubic feet per second. With this regulated flow it is estimated that annual dredging would be about 600,000 cubic yards.

173. The Apalachicola River is, in general, a relatively straight stream with long easy curves. However, there are about 20 bends around which it would be difficult to navigate with tows more than 300 feet long. To provide navigation for larger tows, it is therefore considered advisable to make a number of channel rectifications and cut-offs. It is estimated that such channel improvements would require about 6,000,000 cubic yards of excavation. In making this estimate it was assumed that cut-off channels would be excavated large enough to carry the entire flow of the river. A saving may, in some cases, be realized by making a pilot cut and causing the river to scour out the new channel by the aid of contracting dikes in the old channel. With the proposed rectifications and cut-offs the minimum radius of curvature of the navigation channel would be 1,000 feet.

174. *Chattahoochee River below Columbus, Ga.*—From Columbus, Ga., to its mouth the Chattahoochee River has a fall of about 141 feet in a distance of 164 miles. The river slope varies from 1.2 feet per mile at Columbus, to about 0.6 foot per mile at the mouth. With the proposed regulation it would be practical to maintain a navigable depth of 6 feet below Columbus, but this depth is not considered adequate for the prospective traffic. The desired depth of 9 feet cannot be practically obtained by open-channel methods even with upstream regulation. For a 9-foot project depth it would, therefore, be necessary to canalize this river. The proposed plan of canalization is summarized in table 1.

TABLE NO. 1.—*Summary of proposed locks and dams on Apalachicola and Chattahoochee Rivers*

[Elevations are referred to mean sea level]

Lock and dam name	River	Distance above mouth (miles)	Lower pool elevation (feet)	Upper pool elevation (feet)	Lift (feet)	Top of lock walls elevation (feet)	Dam		
							Crest elevation (feet)	Effective length (feet)	Spillway
Junction	Apalachicola	112.4	44.0	58.0	14.0	67.0	57.0	1,000	Fixed crest.
Paramore Landing	Chattahoochee	17.0	58.0	77.0	19.0	82.0	67.0	500	5 gates, 10 feet by 100 feet.
Columbia	do	48.0	77.0	105.0	28.0	110.0	93.0	500	5 gates, 12 feet by 100 feet.
Fort Gaines	do	81.3	105.0	135.0	30.0	140.0	121.0	400	4 gates, 14 feet by 100 feet.
Florence	do	117.0	135.0	165.0	30.0	170.0	151.0	300	3 gates, 14 feet by 100 feet.
Fort Benning	do	143.2	165.0	190.0	25.0	195.0	178.0	360	4 gates, 12 feet by 90 feet.

175. The plan with 6 locks and dams would canalize this section of the river with the least number of locks considered practical. To reduce the number of locks to 5 would require either excessive channel excavation or navigation pools at such high levels that excessive flowage damage would result. Consideration was also given to other plans with a greater number of locks and dams and lower lifts. Such plans have the advantage of somewhat lower dams with resulting decreased foundation loads, but there is very little difference in the necessary height of lock walls for plans with various heights of lifts when navigation is to be provided through the locks for 98 percent of the time. Plans providing for navigation over the dam for the higher flows may have lower lock walls, but navigation over the dams would not be practical for lifts greater than 15 feet because of the expensive spillways required. Since geological investigations indicate that the foundation conditions are adequate for the proposed structures, there would be no reason to consider a plan with a greater number of lifts unless it would be more economical. It is believed that any other workable plan of improvement for a 9-foot navigation project would cost as much as or more than the plan proposed. It is also apparent that the interests of navigation would be best served by having the fewest number of locks practical.

176. Although the proposed pool elevations were chosen with the view of avoiding flowage damages, it may be necessary to make some slight adjustments of pool elevations after more detailed surveys have been made. Each spillway has been designed to give a swell-head of one foot or less at floods above bankfull stage. Flowage damages in excess of those now possible should therefore be negligible.

177. *Geological features of dam sites.*—A discussion of the general geology of the area related to the proposed canalization of the Chattahoochee River below Columbus, Ga., was given in paragraphs 19 to 24. The subsurface exploration and geological investigations made in connection with this report were described in paragraph 225 under "Survey." The geological features of the six navigation lock and dam sites involved in the present plan of improvement for the Chattahoochee River are discussed in upstream order in the following paragraphs.

178. *Junction lock and dam.*—The site is located along the south margin of the area designated on chart No. 2 [1] as the "Lime Sink region," and is underlain by the Tampa limestone, a white chalky limestone of alternating hard and soft layers, containing a few cavities. The configuration of the rock surface along the axis of the proposed lock and dam is shown on sheet No. 24 [1] of the drawings accompanying this report. The overburden is made up of sands, clays, and gravel, mixed and interbedded.

179. Unconfined compression tests of four typical samples of the foundation medium were made and indicate an average ultimate crushing strength of 60 tons per square foot.

180. A sufficient quantity of material suitable for dike riprap is believed to be available near the site, the most likely source being the harder phases of limestone which are exposed in highway cuts in the vicinity. Both sand and gravel for concrete could be obtained from the deposits which are to be found at various bars along the river.

[1] Not printed.

181. *Paramore landing lock and dam.*—The area at this site is typical of the "Lime Sink region" in which it is situated, the depressions and sink holes being indicative of the solution phenomena in the limestone that underlies the site, as shown on sheet No. 25 [1] of the drawings accompanying this report. The underlying Ocala limestone is white to cream colored, and has soft and hard layers with cavaties not uncomnon. The overburden is a mixture of sands and clays with silty sands predominating. The subsurface exploration along the axes of the proposed structures did not disclose cavities of any moment and only one filled cavity was in evidence.

182. Several limestone exposures at or near the site indicate that dike riprap is available. Concrete aggregate is available in the form of worked and unworked local deposits of river sands and gravel.

183. *Columbia Lock and Dam.*—The formation underlying the site is part of the Lisbon formation, the middle member of the Claiborne group. The rock line is shown on sheet No. 26.[1] The rock encountered in the exploration varied from semiindurated calcareous sand through variably hard calcareous sandstones to hard white fossiliferous limestones. Thick layers of compact calcareous clay are common throughout. The overburden materials are sands predominantly, with thick beds of sandy clay in some places. Concrete aggregate can be obtained from local deposits of river sands and gravel.

184. Before construction at this site is initiated, a more thorough investigation should be made, especially with a view to decreasing the amount of rock excavation necessary at the lock site.

185. *Fort Gaines Lock and Dam.*—The site is near the contact between the Midway group and the Ripley formation but appears to be underlain by the latter. A profile of the underlying strata is shown on sheet No. 27 [1] of the drawings accompanying this report. The rock encountered in the exploration was a soft limestone changing to hard limestone and grading to a hard sandstone at lower elevations. The overburden materials are fine to coarse sands, with admixed and interbedded clays. Consideriable gravel is found in some of the sand beds.

186. *Florence Lock and Dam.*—The strata underlying the site belong to the Ripley formation. The portion of the Ripley encountered in the exploration of this site was a compact calcareous sand with thin layers of shale. The configuration of this compact strata along the proposed axis of the dam is shown on sheet No. 28 [1] of the drawings accompanying this report. The overburden consists of silt, fine to coarse sand, clay both admixed and interbedded, with considerable gravel in some of the sand beds. Concrete aggregate can be obtained from local deposits of sand and gravel.

187. *Fort Benning Lock and Dam.*—The Fort Benning site is underlain by the Eutaw formation. Only unconsolidated materials were encountered in the exploratory work. These materials are chiefly coarse sands but contain numerous silty and clayey beds as well as some admixed gravel.

188. *Stratigraphy.*—The stratigraphic relationships, thicknesses, and general descriptions of the formations mentioned in above paragraphs are shown on chart No. 3, page 14 of this report.

[1] Not printed.

189. *Geology—Conclusions.*—Based on preliminary field investigations the sites were chosen to take advantage of the best foundation conditions available and at the same time give a suitable lay-out for navigation. The borings now available indicate that in some cases more advantageous foundation conditions may be obtained by shifting the site upstream or downstream from the location selected. Although it appears entirely feasible to build the proposed structures at the sites proposed, it would be advisable to make further underground investigations with a view to economy of construction. From the geological investigations made, it appears that only the Fort Benning Lock and Dam would require a pile foundation.

190. *Locks and dams—General.*—The general lay-out and type of construction proposed for these locks and dams are shown on the accompanying drawings, sheets Nos. 24 to 29,[1] inclusive.

191. At Junction Lock and Dam a fixed crest spillway was found to be the most economical. It is also proposed to use an overflow dike properly protected by riprap for this site. At the five other locks and dams it was found necessary to use some type of movable crest, as fixed-crest dams would need to be excessively long. Any type of vertical lift gates would be expensive because of the high superstructure required to clear high water. Hydraulically operated automatic drum gates are proposed as being the most suitable and economical type of gates for the conditions. It is believed that possible difficulties from silt interfering with the operation of drum gates on these relatively low dams can be overcome by proper design of seals and provision for flushing.

192. Designs and estimates were made for two sizes of locks, namely, 45 by 300 feet and 45 by 450 feet. A depth of 12 feet is provided over the miter sills. The top of lock walls would be 5 feet above normal upper pool, or slightly higher, if necessary, to provide for navigation at least 98 percent of the time. As the locks would be drowned out part of the time, it is proposed to use hydraulically operated lock machinery that would not be damaged by water.

193. Hydroelectric power developments are proposed at all of the locks and dams except Junction Lock and Dam. Because of the low head at the latter, it is estimated that the justification of power installation at this site is very remote. The proposed power developments at the navigation dams would be run-of-river plants and, as they would be drowned out part of the time, their output would be secondary power. Provided, there was a market for the power, it is estimated that the installation of some power facilities would be justified with the present flow conditions. With the proposed regulated flow, slightly larger installations would be justified. By interconnecting these plants with upstream hydroelectric plants having a surplus of available power during high water periods, and by increasing the installations at the upstream plants, it is possible that a portion of the power to be generated at the navigation dams could be changed to primary power and its value increased. A detailed study would be required to determine the exact amount of power that could be economically altered in this way. As the proposed power installations are practically independent of the lock and

[1] Not printed.

dam structures, it would be practical to construct the power facilities either at the time of constructing the locks and dams or later, without a great difference in cost. Table 2 gives the estimated economic power installations and other pertinent data regarding power development at the proposed locks and dams on the Chattahoochee River.

TABLE 2.—*Summary of power development at proposed locks and dams on Chattahoochee River*

Name of development	Normal lower pool (elevation feet mean sea level)	Normal upper pool (elevation feet mean sea level)	Gross maximum head (feet)	Percent of time head is less than 5 feet	Present low water flow (cubic feet per second)
Paramore Landing	58.0	77.0	19.0	5.0	1,200
Columbia	77.0	105.0	28.0	2.5	1,200
Fort Gaines	105.0	135.0	30.0	2.5	1,050
Florence	135.0	165.0	30.0	2.2	700
Fort Benning	165.0	190.0	25.0	2.0	620

Name of development	Minimum flow with regulation (cubic feet per second)	Proposed installation (kilowatts)	Output from proposed installation	
			Available 90 percent of time (kilowatts)	Total annual output (million kilowatt-hours)
Paramore Landing	4,740	7,500	4,300	53.2
Columbia	4,740	11,700	7,800	86.5
Fort Gaines	4,590	10,800	7,300	81.4
Florence	4,300	8,400	6,200	65.8
Fort Benning	4,160	7,800	6,000	57.9

194. *Chattahoochee River improvement above Columbus, Ga.*—The Chattahoochee River falls from elevation 982 near Gainesville, Ga., mile 371.2, to elevation 190 at Columbus, Ga., mile 164.1, a total of 792 feet in a distance of 207.1 miles. Of this total head 341 feet is already developed at existing plants. Above Gainesville, Ga., there is an additional fall of about 300 feet that could be developed for power. Justification of the improvement of the Chattahoochee River for navigation above Columbus, Ga., is remote. This section of the river is naturally adaptable to power development and, it is believed, will be utilized to the greatest public benefit by the plan of improvement that will best develop its power resources. The general plan of proposed development is indicated on the accompanying profile drawing sheet No. 3,[1] and summarized in table 3.

[1] Not printed.

TABLE 3.—*Proposed and existing hydroelectric power development on Chattahoochee River above Columbus, Ga.*

Name of development	Status	Function of development	Drainage area (square miles)	Normal upper pool (elevation feet mean sea level)	Normal lower pool (elevation feet mean sea level)	Gross head (feet)	Gross minimum head (feet)	Drawdown (feet)	Gross average head (feet)	Average flow (cubic feet per second)	Natural minimum monthly mean flow (cubic feet per second)	Usable storage (acre-feet)	Regulated flow (cubic feet per second)	Proposed installation 25 percent load factor (kilowatts)
Roswell [1]	Proposed	Storage power	1,230	982	856	126	76	50	108	2,510	340	1,235,000	2,068	42,500
Morgan Falls [2]	Existing	Power	1,360	856	800	56	56	0	56	2,705	380	----------	2,108	----------
Vinings	Proposed	do	1,450	800	755	45	45	0	45	2,835	400	----------	2,128	----------
Cedar Creek [1]	do	Storage power	2,430	755	685	70	55	15	65	4,290	400	285,000	3,041	45,200
Franklin	do	Power	2,685	685	630	55	55	0	55	4,865	400	----------	3,041	----------
Lanier [1]	do	Storage power	3,455	630	560	70	55	15	65	5,780	400	233,000	3,800	56,400
Riverview [3]	Existing	Power	3,675	560	520	40	40	0	40	6,135	400	----------	3,800	----------
Bartlett's Ferry	do	Storage power	4,260	520	400	120	89	31	109	6,995	[4] 1,450	119,000	3,990	----------
Goat Rock	do	Power	4,535	400	335	65	65	0	65	7,305	[4] 1,470	----------	4,010	----------
Clapp's Factory	Proposed	do	4,645	335	266	69	69	0	69	7,585	[4] 1,480	----------	4,020	----------
North Highlands	Existing	do	4,645	266	226	40	40	0	40	7,570	[4] 1,480	----------	4,020	----------
Columbus [5]	do	do	4,655	226	190	36	36	0	36	7,580	[4] 1,480	----------	4,020	----------

[1] Included in present plan of improvement.
[2] Existing upper pool to be raised 6 feet.
[3] Combines two existing plants, head increased 10 feet.
[4] As augmented by storage from Bartlett's Ferry Reservoir.
[5] Combines two existing plants.

195. Of the various dam sites above Columbus, Ga., that could be developed for maximum utilization of power possibilities, only the storage dams designated Roswell, Cedar Creek, and Lanier, are included in the proposed plan of improvement. These three reservoirs would have a combined usable storage of 1,753,000 acre-feet and would increase the minimum mean monthly flow below West Point by 3,400 cubic feet per second. The other dam sites above Columbus would be entirely for power development without storage.

196. *Roswell storage-power development.*—This dam site is located on the Chattahoochee River 16 miles north of Atlanta, Ga., and about 2.5 miles upstream from the highway bridge at Roswell. The plan proposed is the so-called Roswell project with pool at elevation 982. Estimates submitted are for a concrete gravity section dam and spillway; however, a side channel spillway and rock and earth filled dam may possibly be constructed at some reduction in cost.

197. *Cedar Creek storage-power development.*—This dam site is located on the Chattahoochee River just above the Central of Georgia Railroad bridge and west of the city of Newnan, Ga. A concrete gravity type dam is proposed with an effective spillway length of 720 feet.

198. *Lanier storage-power development.*—This dam site is located on the Chattahoochee River about 4 miles above West Point, Ga., and just below the mouth of Maple Creek. This site is one of several sites which have been considered in this vicinity. The estimate submitted will approximate the cost of any dam built in this reach, but only detailed investigation and studies will determine the relative economy and desirability of the various sites. The proposed dam consists of a concrete gravity section with earth dike abutments. The spillway, which is controlled by gates, has an effective length of 630 feet. Above the proposed power-storage pool elevation of 630, it is proposed to provide 8.5 feet additional storage amounting to 196,000 acre-feet for flood control. This provision would be made in consideration for property and riparian rights already surrendered by local interests centered in West Point, Ga.

199. *Flint River improvement below Albany, Ga.*—From Albany, Ga., to its mouth, the Flint River has a fall of about 103 feet in a distance of 101 miles. The river slope varies considerably, the fall being more than 2 feet per mile in sections. At present the controlling depth below Albany is about 2.5 feet at mean low water. With the proposed upstream regulation it is estimated that the mean low water depth would be increased on the average about 2 feet. With this regulation it is estimated that it would be practical to maintain a 5-foot, and possibly a 6-foot, navigable depth below Albany at a reasonable annual maintenance cost. It is not believed practical to maintain more than 6 feet of depth by open channel methods.

200. To obtain a navigable depth of 9 feet it would, therefore, be necessary to canalize this river. A possible plan consisting of six locks and dams between the mouth and Albany was previously studied and estimated to cost about $6,000,000. This estimate may be low but it will serve as a basis for economic analysis. It is shown later under economic cost that such a project would not be justified at this time.

201. The plan of improvement proposed for the Flint River would provide navigation facilities to the extent considered practical by open channel methods. This would in no way preclude further

improvement by locks and dams at some future time when it might be justified. The proposed plan would provide a channel 7 feet deep and 100 feet wide below Bainbridge and 5 feet deep and 100 feet wide between Bainbridge and Albany. In addition to the proposed upstream regulation, it is estimated that an initial channel excavation of about 600,000 cubic yards would be required. Part of this excavation would be in marl or soft rock requiring a cutter head dredge, and for that reason this excavation has been estimated at $0.15 per cubic yard rather than $0.10 per cubic yard used for estimates of ordinary channel dredging. As the Flint carries a relatively small amount of silt, the maintenance dredging should be low, estimated at 100,000 cubic yards per year.

202. *Flint River improvement above Albany, Ga.*—From near Woodbury, to Albany, Ga., the Flint River has a fall of 550 feet in about 200 miles. Of this fall only 57 feet has been developed for power. As on the upper Chattahoochee River, the upper Flint River is naturally adapted for power development and will probably never be made navigable. It is therefore believed that the plan of improvement of the Flint River above Albany should be that plan which best utilizes its power possibilities.

203. From a comprehensive study of possible power development on the Flint River, a plan of development was worked out which, it is believed, can safely be followed with only such slight modifications as may be found necessary upon detailed investigation of foundations and local conditions. The general plan of future developemnt is indicated on the accompanying profile drawing sheet No. 4,[1] and summarized in table No. 4. Only the storage dams; Woodbury No. 2, Potato Creek, and Auchumpkee Creek, are included in the proposed plan of improvement. These three reservoirs would have a combined usable storage of 746,000 acre-feet and would increase the minimum mean monthly flow below Auchumpkee Creek by about 1,600 cubic feet per second. The other sites above Albany have no storage capacity and if later developed would be entirely for power.

[1] Not printed.

TABLE 4.—*Proposed and existing hydroelectric power development on Flint River*

Name of development	Status	Function of development	Drainage area (square miles)	Normal upper pool elevation (feet, mean sea level)	Normal lower pool elevation (feet, mean sea level)	Gross head (feet)	Gross minimum head (feet)	Drawdown (feet)	Gross average head (feet)	Average flow (cubic feet per second)	Natural minimum monthly mean flow (cubic feet per second)	Usable storage (acre-feet)	Regulated flow (cubic feet per second)	Proposed installation 25 percent load factor (kilowatts)
Woodbury No. 2[1]	Proposed	Storage-power.	1,212	715	590	125	75	50	114	1,730	48	605,000	1,178	23,900
Wynn's Bridge	do	Power	1,267	590	450	140	140	0	140	1,850	51		1,181	
Potato Creek[1]	do	Storage-power.	1,650	450	390	60	45	15	55	2,400	66	44,000	1,394	16,900
Auchumpkee Creek[1]	do	do	1,990	390	330	60	45	15	55	2,900	80	97,000	1,685	20,400
Nokomis	do	Power	2,215	330	301	29	29	0	29	3,200	222		1,827	
Montezuma	do	do	2,709	301	266	35	35	0	35	3,850	406		2,011	
Vienna	do	do	3,225	266	236	30	30	0	30	4,500	1,097		2,702	
Crisp County	Existing	do	3,765	236	206	30	30	0	30	5,200	1,210		2,815	
Upper Albany	Proposed	do	4,033	206	184	22	22	0	22	5,600	1,330		2,935	
Albany	Existing	do	5,152	184	157	27	27	0	27	6,900	1,597		3,202	

[1] Included in present plan of improvement.

204. *Woodbury No. 2 storage-power development.*—Two sites located on the Flint River about 10 miles west of Thomaston, Ga., were investigated. The first has been designated as Woodbury No. 1 and the second as Woodbury No. 2. With the pool elevations proposed, both projects would back water beyond Woodbury, Ga. A comparison of costs indicated that the additional regulated flow attainable with the Woodbury No. 1 project would not justify the increase in cost necessary to develop this site. Therefore the Woodbury No. 2 has been selected and is included in the plan proposed herein.

205. Woodbury No. 2 site is located about 1 mile above Turkey Creek. Its drainage area is 1,212 square miles. The site is underlain by vitreous quartzite, an extremely hard, nonporous, relatively insoluble rock which is susceptible to cracking. This rock appears satisfactory for the foundation of a dam, though cracks if found to be continuous past the site would require grouting to reduce leakage.

206. The construction of this reservoir appears to be justified solely for the purpose of producing power and furnishing a high regulated flow to the Wynn's Bridge possible power development below. Thus, even though a large regulating reservoir were located at downstream points on the Flint River so that Woodbury No. 2 would not greatly increase the regulated flow in the lower river, the project would still enjoy economic justification. Accordingly, of the three storage-power sites on the Flint River, Woodbury No. 2 appears to be the most feasible for development as an individual unit.

207. A headwater elevation of 715 feet, mean sea level, has been tentatively selected for the Woodbury No. 2 development. With this pool elevation the gross reservoir capacity would be 665,000 acre-feet and the reservoir area would be 25,000 acres. A drawdown of 50 feet would furnish a usable storage of 605,000 acre-feet and provide a net regulated prime flow of 1,178 cubic feet per second.

208. The cost estimates are for a concrete gravity dam with controlled spillway.

209. *Potato Creek storage-power development.*—This site is on Flint River about 1 mile below the mouth of Big Potato Creek and about 8 miles south of Thomaston, Ga. The drainage area of the Flint River at this point is 1,650 square miles.

210. No subsurface investigations have been made at the site, but rock is exposed in the gorge where the dam would be located, and it is believed that a good foundation could be secured.

211. The proposed pool elevation of 450 feet, mean sea level, would back water to the Wynn's Bridge power plant site. At this elevation, 3,900 acres of land would be flooded and the total reservoir storage would be 92,700 acre-feet. A drawdown of 15 feet is proposed. This would supply a usable storage of about 44,000 acre-feet which, in conjunction with the Woodbury No. 2 project would furnish a net regulated prime flow of 1,394 cubic feet per second.

212. The cost estimate is for a gravity-type concrete dam with open spillway.

213. *Auchumpkee Creek storage-power development.*—The Auchumpkee Creek site is on Flint River about 12 miles southeast of Thomaston, Ga., and just below the mouth of Auchumpkee Creek. The drainage area is 1,990 square miles.

214. The rock at the two abutments and in the river is hard, reddish gneiss. It appears to be satisfactory to serve as a foundation for a concrete dam. The left bank is low and an earth dike connecting to high ground is proposed for this bank.

215. Two heights of dam at this site were investigated with pool elevations at 390 and 450 feet, mean sea level, respectively. The high dam with pool elevation at 450 feet, mean sea level, is an alternate for the low dam and the Potato Creek project combined. It was found that substitution of the high dam for the lower dams increased the estimated cost more than it increased the prospective benefits. Consequently, the low dam was selected as the more economical for the development of this site.

216. The low dam with a pool elevation of 390 feet, mean sea level, which would back water to the Potato Creek site, would flood 7,400 acres of land and create a pool of 160,600 acre-feet, gross capacity. The most desirable drawdown was found to be 15 feet when the project is operated as a unit in the integrated plan proposed herein. This drawdown would supply about 97,000 acre-feet of usable storage which, together with the storage at the Potato Creek and Woodbury No. 2 projects, would produce a net regulated prime flow of 1,685 cubic feet per second.

217. The cost estimates are for an open gravity-type concrete spillway with bulkhead section to rock on the west end and an earth dike to high ground on the east.

218. *Estimated power output.*—Electrical energy developed has been estimated on the basis of an over-all plant efficiency of 80 percent. Primary power has been computed as the power available at minimum head and for a constant regulated flow. It is probable that the proposed plants could be operated to better advantage than indicated by the above assumption, even approaching operation for constant prime power, and not interfere with the desired regulation for navigation benefits. Secondary power has been taken as the total output from the proposed installations less the primary power. Increased primary power at the proposed and existing plants below the proposed storage-power reservoirs has been computed on the basis of the increase in the minimum flow which would be made available. The power developed at proposed locks and dams has been computed for the flow conditions which will obtain with all proposed storage reservoirs operating. The estimated annual power output is given in table No. 5.

TABLE 5.—*Estimated annual power output—Chattahoochee and Flint Rivers*

Name of development	Primary power (million kilowatt-hours)	Secondary power (million kilowatt-hours)	Increased primary power (million kilowatt-hours)
Woodbury No. 2	52.4	39.1	.....
Wynn's Bridge [1]	.....	.....	92.9
Potato Creek	37.0	24.7	.....
Auchumpkee Creek	44.7	28.4	.....
Nokomis [1]	.....	.....	27.1
Montezuma [1]	.....	.....	32.4
Vienna [1]	.....	.....	28.0
Crisp County [1]	.....	.....	28.0
Upper Albany [1]	.....	.....	20.1
Albany [1]	.....	.....	25.4
Total on Flint River	134.1	92.2	253.9

See footnotes at end of table.

TABLE 5.—*Estimated annual power output—Chattahoochee and Flint Rivers*—Continued

Name of development	Primary power (million kilowatt-hours)	Secondary power (million kilowatt-hours)	Increased primary power (million kilowatt-hours)
Roswell	93.2	52.3	
Morgan Falls [1]			56.1
Vinings [1]			44.7
Cedar Creek	99.0	45.6	
Franklin [2]			85.0
Lanier	123.4	70.2	
Riverview [1]			79.7
Bartlett's Ferry [1]			133.0
Goat Rock [1]			96.4
Clapp's Factory [2]			102.6
North Highlands [1]			59.6
Columbus [1]			53.5
Total, Chattahoochee River above Columbus	315.6	168.1	710.6
Fort Benning		57.9	
Florence		65.8	
Fort Gaines		81.4	
Columbia		86.5	
Paramore Landing		53.2	
Total, Chattahoochee River below Columbus		344.8	
Grand total, kilowatt-hours	449.7	605.1	964.5

[1] Existing plants not included in present proposed plan of improvement.
[2] Proposed plants not included in present proposed plan of improvement.

219. *Bridge alterations.*—Under the proposed plan of improvement of the Apalachicola and Flint Rivers by open-channel methods there will be no change in bridge clearances from present conditions. The minimum horizontal clearance on existing bridges on the Apalachicola River is 100 feet and the minimum vertical clearance, even at maximum high water, is 36.5 feet, while at ordinary low water the vertical clearance is about 63 feet. On the Flint River below Bainbridge, Ga., the existing bridges are either swing or bascule type with a minimum horizontal clearance of 100 feet. Between Bainbridge and Albany, Ga., the minimum horizontal clearance is 77 feet, the minimum vertical clearance at low water 43 feet and at high water 23 feet. The vertical clearances on the Flint River below Albany are as great as on the Apalachicola River. Although the least horizontal clearance is only 77 feet, it is believed adequate for prospective traffic. Under the proposed plan of improving the Chattahoochee River by canalization, the vertical clearance of certain bridges will be affected. (See table No. 6.) The minimum horizontal clearance on the Chattahoochee River below the bridges at Columbus, Ga., is 97 feet, and the minimum vertical clearance after construction of the proposed locks and dams would be 61.5 feet at normal pool elevation and 48.5 feet at ordinary high water, or what is considered the maximum stage for navigation. It is believed that these bridge clearances will be satisfactory for prospective waterway traffic, and no reconstruction of existing bridges or construction of new ones is contemplated.

TABLE 6.—*Chattahoochee River bridges showing revised vertical clearances after canalization*

Name of owner	Kind	Elevation of low steel (feet mean sea level)	Clearances (feet)			Distance above mouth (miles)
			Horizontal	Vertical closed		
				Above normal pool	Above ordinary high water [1]	
Georgia-Florida Bridge Co.	Fixed	139.0	500.0	62.0	53.0	24.6
States of Alabama and Georgia	Swing	114.5	100.0	37.5	23.4	35.5
Atlantic Coast Line R. R. Co.	do	115.0	98.0	38.0	23.2	36.3
City of Columbia, Ala.	do	130.0	100.0	25.0	29.4	50.4
Central of Georgia R. R. Co.[2]	do	128.5	100.0	23.5	27.8	50.8
States of Alabama and Georgia	Fixed	186.7	300.0	81.7	59.7	75.6
Central of Georgia R. R. Co.[2]	do	195.6	127.0	61.5	48.5	99.4
States of Alabama and Georgia	do	199.2	180.0	64.2	51.7	100.0
Seaboard Airline R. R. Co.[2]	Swing	203.2	97.0	38.2	37.7	123.5
Central of Georgia R. R. Co.[2]	Fixed	239.0	135.0	49.0	33.0	164.0
City of Columbus, Ga.[2]	do	247.8	140.0	57.8	41.7	164.1

[1] Ordinary high water above which navigation ceases is taken as the stage equaled or exceeded 2 percent of the time.
[2] Built without permit.

220. *Order of development.*—The entire improvement appears to be amply justified provided there is sufficient demand for the facilities supplied. While the traffic surveys indicate that the demand for the navigational facilities would in a few years create savings sufficient to offset the estimated cost of the purely navigational improvements proposed, there is considerable uncertainty as to how many years it would be before there is a sufficient demand to absorb the entire power output of the proposed power developments.

221. In order to realize any considerable portion of the expected benefits to navigation, it is necessary that the proposed 9-foot navigation project be completed all the way from the mouth of the Apalachicola River to Columbus, Ga., on the Chattahoochee River. The portion of the project consisting of open channel improvement on the Apalachicola River and canalization of the Chattahoochee River should therefore be undertaken as the first step of development.

222. The capitalized value of benefits to navigation from the construction of the proposed storage-power dams is estimated to be only about 13 percent of the estimated cost of the proposed storage-power dams and reservoirs. Except on the Flint River the proposed navigation project can be maintained, though at additional expense, without the proposed storage-power dams. It is therefore apparent that the time of construction of the proposed storage-power dams must depend largely upon the demand for power. The greater part of the flow regulation would be derived from the Roswell Dam on the Chattahoochee River and the Woodbury No. 2 dam on the Flint River. Although the entire power output from the Roswell and Woodbury No. 2 developments may not be absorbed immediately, it is considered desirable that these two storage-power reservoirs be considered for early construction. Of the proposed power installations at locks and dams only the installation proposed at the Fort Benning lock and dam is believed warranted to be included in the initial construction. It is proposed that the Cedar Creek, Lanier, Potato Creek, and Auchumpkee Creek storage-power developments and the power

facilities at the Florence, Fort Gaines, Columbia, and Paramore Landing navigation dams be constructed later as determined by increased power demands.

SURVEY

223. A hydrographic survey was made of the Apalachicola River from the confluence of the Chattahoochee and Flint Rivers to Jackson River, a distance of 106 miles. Cross-sections were taken about 700 feet apart except at a few critical sections where they were spaced at intervals of 350 feet; 22 temporary gages were established, 19 of which were staff gages set at maintenance points and 3 were recording gages. Temporary bench marks were set near each gage in order that the gage might be reestablished on mean sea-level datum at some future date. All bench marks were tied in by double-run levels. Sixty-one concrete monuments were set.

224. Detailed surveys were made of six sites on the Chattahoochee River and one on the Apalachicola River for the proposed locks and dams. Standard plane table methods were used and the surveys plotted to the scale of 1:2,400. All detailed surveys were monumented for future reference.

225. A thorough geologic reconnaissance was made of the Chattahoochee River from Columbus, Ga., to the mouth which was followed by a more detailed surface study to select the most favorable sites for the six locks and dams proposed. Subsurface explorations were made at the selected sites by core drilling and auger boring. The location of these holes, which are numbered 1 to 65, are shown on drawings 24 to 29,[1] inclusive. Logs of these borings are shown on drawings 20 to 23,[1] inclusive. A general geologic reconnaissance only was made of the proposed sites on the Chattahoochee River above Columbus and on the Flint River.

226. The traffic survey for this report has already been described in paragraph 128.

227. A reconnaissance investigation at the headwaters of the Flint River developed the nature of the malarial condition reported to exist in that locality.

ESTIMATES OF COST

228. *Navigation improvements—Construction cost.*—Detailed estimates of costs of the proposed locks and dams are given in "Appendix B".[1]

229. Estimates have been prepared for two sizes of locks, namely, 45 by 450 feet and 45 by 300 feet. These sizes were decided by a recent study to be desirable standard locks for waterways of this class in the Gulf of Mexico division. They would accommodate the increasingly popular barges of 35-foot width with lengths of from 130 to 195 feet and still be sufficiently large to pass dredges and other wider vessels. The summary of costs given below indicates the costs for 45- by 450-foot locks. Using 45- by 300-foot locks, the combined construction cost of the locks would be reduced by $1,306,000. Although power installations are proposed at five of the navigation dams, the entire cost of the dam has been included in the cost to navigation. On the other hand, although the proposed power-storage dams would

[1] Not printed.

reduce open-channel maintenance costs on the Apalachicola River by about $140,000 annually and make open-channel navigation practical for about 2 feet greater depth on the Flint River, no portion of the cost of these developments has been charged to navigation in the estimates below. Estimates of open-channel improvement costs are based on the assumption that the proposed storage-power dams were all constructed. The following estimates of cost of navigation improvements include 20 percent for engineering and contingencies but do not include interest during construction.

Estimated Federal construction cost for navigation

[Locks: 45 by 450 feet]

Chattahoochee River (locks and dams, 9 feet to Columbus):	
Fort Benning Lock and Dam	$2,577,000
Florence Lock and Dam	2,152,000
Fort Gaines Lock and Dam	2,156,000
Columbia Lock and Dam	2,445,000
Paramore Landing Lock and Dam	2,161,000
Junction Lock and Dam	2,799,000
Channel excavation	120,000
Flint River (open river, 7 feet to Bainbridge; 5 feet to Albany):	
Channel improvement	108,000
Apalachicola River (open river, 9 feet throughout): Channel improvement	876,000
Total	15,394,000

230. The above estimates of channel improvement for the Flint and Apalachicola Rivers are based on the assumption that three storage reservoirs are constructed on the Flint and three on the Chattahoochee River. If only one is built on each river, the initial cost of providing the open river channel of the depth indicated is estimated to be $153,000 for the Flint improvement and $984,000 for the Apalachicola.

231. Rights-of-way to include lock sites, cut-offs and spoil-disposal areas for the navigation project are estimated to cost $100,000, which would be included under non-Federal investment.

232. *Flint River—9 feet, locks and dams.*—A previous report estimate that a 9-foot channel on the Flint River to Albany, to be obtained by a series of six locks and dams, would cost approximately $6,000,000. Though it is possible that this estimate is low, it is a reasonable basis for an economic analysis and it was used for such in paragraph 268 of this report.

233. *Operation and maintenance*—(*a*) *Present cost.*—The approved estimated cost of annual maintenance for the existing projects for these rivers is as follows:

Apalachicola River	$16,000
Chattahoochee River	60,000
Flint River	20,000

These amounts are not being expended, however, as the needs of existing navigation do not require it. Periodic dredging and snagging on the Apalachicola River and a limited amount of snagging on the Chattahoochee and Flint Rivers are all the maintenance that is currently justified. The annual expenditures necessary at this time and to be anticipated for the near future are approximately as follows:

Apalachicola River	$15,000
Chattahoochee River	5,000
Flint River	5,000

(*b*) *Estimated cost for proposed navigation project.*—The following table includes estimates for a plan based on the construction of six reservoirs and for a plan based on 2 reservoirs.

Annual operation and maintenance of proposed navigation project

	With two reservoirs	With six reservoirs
Apalachicola River:		
Maintenance dredging and snagging	$110,000	$70,000
Junction Lock and Dam (fixed crest dam)	10,000	10,000
Chattahoochee River:		
Maintenance dredging and snagging	20,000	20,000
Five locks and dams (with crest gates on dam)	75,000	75,000
Flint River: Maintenance dredging and snagging	40,000	20,000
Total	255,000	195,000

(*c*) *Additional cost of operation and maintenance of proposed navigation project.*—Subtracting the current cost of maintenance from the total estimated cost of operation and maintenance of the proposed navigation improvement, the additional cost of operation and maintenance is obtained as follows:

	With 2 reservoirs	With 6 reservoirs
Apalachicola River	$105,000	$65,000
Chattahoochee River	90,000	90,000
Flint River	35,000	15,000
Total	230,000	170,000

234. *Flint River—9 feet, locks and dams.*—The estimate of $90,000 per annum in a previous report for the cost of operating and maintaining a 9-foot canalized project on the Flint River to Albany is believed to be reasonable and is used as a basis for economic analysis in paragraph 268 of this report.

235. *Power development—Construction.*—Detailed estimates of costs of the proposed storage-power developments were made in the previous report. The entire cost of the storage-power dams has been considered as charged against power development, although it is estimated that the capitalized value of navigation benefits resulting from the regulation of flow would be about $4,000,000. The estimated cost of power developments at the proposed locks and dams includes only the cost of the powerhouse and facilities, the entire cost of the dam being included under costs of navigation improvements. Since the basic data upon which the power development estimates are based are not as reliable as the basic data for the navigation improvements, an allowance of 25 percent was included for engineering and contingencies in the table below.

Estimated Federal construction cost for power

River	Name of development	Item	Item cost	Development cost
Flint	Woodbury No. 2	Dam	$2,286,000	
		Reservoir	2,601,000	
		Reservoir land	938,000	
		Power plant	1,528,000	
				$7,353,000
Do	Potato Creek	Dam	1,830,000	
		Reservoir	469,000	
		Reservoir land	278,000	
		Power plant	1,447,000	
				4,024,000
Do	Auchumpkee Creek	Dam	2,567,000	
		Reservoir	491,000	
		Reservoir land	375,000	
		Power plant	1,683,000	
				5,116,000
Total, Flint River				16,493,000
Chattahoochee	Roswell	Dam	4,694,000	
		Reservoir	3,931,000	
		Reservoir land	1,163,000	
		Power plant	2,414,000	
				12,202,000
Do	Cedar Creek	Dam	2,020,000	
		Reservoir	844,000	
		Reservoir land	851,000	
		Power plant	2,623,000	
				6,338,000
Do	Lanier	Dam	4,173,000	
		Reservoir	938,000	
		Reservoir land	911,000	
		Power plant	2,996,000	
				9,018,000
Total, Chattahoochee River above Columbus, Ga.				27,558,000
Chattahoochee	Fort Benning	Power plant	1,422,000	1,422,000
	Florence	do	1,329,000	1,329,000
	Fort Gaines	do	1,445,000	1,445,000
	Columbia	do	1,468,000	1,468,000
	Paramore Landing	do	1,520,000	1,520,000
Total, Chattahoochee River below Columbus, Ga.				7,184,000
Grand total				51,235,000

236. *Operation and maintenance of Federal power development.*—In making the following estimate of annual operation and maintenance there has been included 20 percent for administration and overhead.

River	Name of development	Installation (kilowatts)	Annual operation and maintenance
Flint	Woodbury No. 2	23,900	$35,000
	Potato Creek	16,900	27,000
	Auchumpkee Creek	20,400	32,000
Chattahoochee	Roswell	42,500	50,000
	Cedar Creek	45,200	53,000
	Lanier	56,400	62,000
	Fort Benning	7,800	18,000
	Florence	8,400	20,000
	Fort Gaines	10,800	22,000
	Columbia	11,700	23,000
	Paramore Landing	7,500	18,000
Total		251,500	360,000

237. *Terminal facilities—construction cost.*—The following table indicates what is believed to be a reasonable estimate of the cost of facilities that need be provided at various points along the waterways to satisfactorily provide for the transfer and storage of freight:

River Junction, Fla	$25,000	Columbus, Ga	$150,000
Columbia, Ala	25,000	Bainbridge, Ga	25,000
Fort Gaines, Ga	15,000	Newton, Ga	5,000
Eufaula, Ala	20,000	Albany, Ga	50,000

238. The cost of these terminals would be borne by local interests.

239. *Operation and maintenance.*—No estimate of the probable cost of operating and maintaining these terminals is made since it is contemplated that charges for their use will offset this expense as well as the amount necessary for amortization and interest on the investment to make them self-liquidating projects.

240. *Bridges—construction cost.*—No alteration of existing bridges over the navigable section of these rivers is believed necessary and no new bridges need be built.

241. *Operation and maintenance.*—The additional annual cost of operating and maintaining all existing movable bridges where there is now no regular tender is estimated at $2,000 per bridge, this cost to be borne by non-Federal interests.

ANNUAL BENEFITS

242. Before analyzing the cost of the proposed development of these rivers in relation to the advantages and benefits that would result from their improvement, it is desirable to evaluate the other benefits in addition to those resulting from commercial water transportation already treated under "Commerce." Certain of these would be direct benefits derived from actual or potential use of some part of the river system. Others would be indirect benefits to result from the existence of the improvement without actual use of its facilities.

243. *Direct benefits.*—The principal direct benefits are discussed below and evaluated under the following headings:

(*a*) Savings to the public in transportation charges.
(*b*) Value of hydroelectric power developed.
(*c*) Value as a facility for national defense.
(*d*) Increased commercial value of riparian lands.
(*e*) Recreational value.
(*f*) Value as a source of industrial and municipal water supply.

244. *Savings to the public in transportation charges.*—This benefit was carefully analyzed under "Commerce" so only a summary will be included at this point. The annual savings estimated on traffic anticipated in 1945 are as follows:

Apalachicola, Chattahoochee, and Flint Rivers, 9-foot channel	$1,100,000
Apalachicola and Chattahoochee Rivers, 9-foot channel	935,801
Apalachicola and Flint Rivers, 9-foot channel	390,364
Apalachicola and Chattahoochee, 9-foot channel; Flint River, 7-foot channel to Bainbridge, 5-foot channel to Albany	985,801

245. *Value of hydroelectric power developed.*—The method and basic assumptions used in evaluating hydroelectric power are substantially in accordance with instructions from the Chief of Engineers dated June 30, 1937, relative to flood-control reservoir data. Hydroelectric energy has been evaluated on the basis of the cost of generating the equivalent power at steam plants. It is assumed that the annual capacity value of a steam plant is $12.50 per kilowatt of installation and that the energy charge or cost of fuel is 1.5 mills per kilowatt-hour. It is further assumed that the hydroelectric plants would be operated

on a 25-percent load factor. Hence, primary power would then have a value of $\frac{4 \times \$12.50}{8760} + \$0.0015 = \$0.0072$ per kilowatt-hour. The secondary power of the hydroelectric plants would have a value equal to the cost of fuel or $0.0015 per kilowatt-hour.

246. There has also been included in the power benefits of storage reservoirs the increased value of primed power at existing and proposed plants below. Only such proposed plants have been included as seem reasonably justified for future construction. The increased value credited to the storage reservoir was assumed to be the difference between the value of primary and secondary power less the estimated cost of additional installations. In other words, the increased value per kilowatt of additional installation which the reservoir would make worth while installing below for added primary power would be the difference between the assumed installation value and the estimated installation cost. It is estimated that such installation costs would not be greater than $100 per kilowatt. With interest rate at 3½ percent and allowing 1½ percent for annual amortization charge and $2 per kilowatt for maintenance and operation, the total annual carrying charge would be $7 per kilowatt installed. The increased annual value per kilowatt installed would then be $12.50 less $7, or $5.50. At 25-percent load factor each kilowatt of installation would produce 2,190 kilowatt-hours per year, and the increased value per kilowatt-hour would therefore be $5.50 divided by 2,190, or $0.0025.

247. Computed at the rates determined above, the total annual power output indicated in paragraph 218 would be evaluated as follows:

	Million kilowatt-hours	Value per kilowatt-hour (mills)	Total value
Primary power	449.7	7.2	$3,237,800
Secondary power	605.1	1.5	907,600
Increased primary power	964.5	2.5	2,411,200
Total annual value, all power			6,556,600

248. If storage-power plants were built only at Roswell on the Chattahoochee River and Woodbury No. 2 on the Flint River and a power installation were made at Fort Benning Lock and Dam, the power produced would be evaluated as follows:

	Million kilowatt-hours	Value per kilowatt-hour (mills)	Total value
Primary power	145.6	7.2	$1,048,300
Secondary power	137.4	1.5	206,100
Increased primary power	(1)		
Total annual value, all power			1,254,400

[1] For a conservative estimate, no credit is taken for increased prime flow at existing or other proposed developments downstream from the reservoirs herein considered.

249. *Value as a facility for national defense.*—The canalization of the Chattahoochee River to Columbus, Ga., has a definite value from the standpoint of national defense. The potential advantage to Fort Benning of a navigable channel to its very door is evident. This post is the largest Infantry reservation in the United States and extends along the river for several miles just south of Columbus.

250. During the last war the results of inadequate transportation were everywhere evident. Traffic was hopelessly tied up, important shipments delayed, perishable goods damaged and heavy losses incurred by private business as well as governmental activities by the general congestion. In the event of another national emergency taxing all transportation facilities to their full capacity, the network of inland waterways now in the course of improvement will be of inestimable value. Large movements of heavy goods could be diverted to the waterways, leaving the overland carriers free to transport troops and rush shipments of essential commodities.

251. An exact evaluation of this benefit, even after the improvement had served in such an emergency, would be difficult to determine and in anticipation of such an event almost impossible. The value, particularly in the case of the Chattahoochee River to Fort Benning is so definitely obvious, however, that some account of it should be taken, and it is believed that an average annual benefit of $25,000 would be a reasonable minimum figure to assign.

252. *Increased commercial value of riparian lands.*—Property fronting on a modern operating waterway will obviously increase in value compared to present conditions without the improvement. This increase would be greater in the vicinity of communities located on the rivers by affording potential terminal and industrial sites. Cheap water transportation of raw materials and finished products would be a distinct advantage to plants such as sawmills, brick kilns, cement plants, cotton mills, fertilizer plants, turpentine stills, paper mills and many others. Property values at the outlet ports of Carrabelle, Port St. Joe, and Panama City, Fla., would likewise increase with the greater commercial activity. This property would continue to increase in value with the commercial growth of the waterway and the amount of the increase would be difficult to determine even at any given time. It seems reasonable, however, that during the useful life of the proposed navigation project the average value of riparian property would increase $1,000,000. The benefit from this increase would be realized either through sale or lease. In the former case the interest on the proceeds reinvested would earn an estimated 3½ percent per annum, while a long-term lease might bring a higher return. An average of 5 percent on the total increased value, or $50,000, is believed to be a reasonable estimate of the annual benefit from increased value of riparian land.

253. Land bordering the proposed storage-power reservoirs would probably increase little in value for industrial sites. The recreational value of this property is discussed in subsequent paragraphs under recreational value.

254. *Recreational value.*—The proposed plan of development would create large reservoirs in an area where lakes or other bodies of water are scarce. Furthermore, the ones proposed on the Chattahoochee River would all be in, or accessible to, the semimetropolitan area

surrounding Atlanta. The approximate area and length of shore line of these reservoirs is indicated in the following table:

Storage-power reservoirs

Project	Area (acres)	Length of shore line (miles)	Project	Area (acres)	Length of shore line (miles)
Chattahoochee River:			Flint River:		
Roswell	38,500	360	Woodbury No. 2	25,000	210
Cedar Creek	22,700	150	Potato Creek	3,900	30
Lanier	19,600	140	Auchumpkee Creek	7,400	60

255. Similar but generally smaller reservoirs in north Georgia as much as 125 miles from Atlanta proper are visited on week-ends and during vacations by city residents who have built homes and lodges overlooking the water. Roswell Dam would be only 15 miles from the heart of Atlanta. The Flint River reservoirs would have a similar value, as Woodbury Dam No. 2 would be but 50 miles from Macon, Ga., and about 60 from Atlanta.

256. Besides the private residences that would be built along the shores of these artificial lakes, resort hotels and summer camps for boys and girls that are popular in the Appalachian Mountains and foothills could be developed as a profitable enterprise.

257. Creation of these large bodies of water would afford the opportunity for hunting waterfowl and fishing that is not now enjoyed by the inhabitants of this section.

258. The navigable portions of these waterways would likewise enjoy a recreational benefit from the continuously satisfactory boating conditions afforded.

259. A value of $75,000 for a system with six storage-power reservoirs and $50,000 for one with two reservoirs has been assigned as a reasonable estimate of the annual recreational value of these improvements.

260. *Value as a source of industrial and municipal water supply.*—There is apparently no immediate necessity for increased water supply in this area though the prospect of a future demand is not improbable. The city of Atlanta obtains its supply for domestic and industrial use from the Chattahoochee at the present time. With the continued rapid growth of population and industry in this area the storage capacity of a large reservoir might be of benefit for an assured continuous water supply. This potential asset is given no monetary value in this report.

261. The annual direct benefits are summarized below for the two plans contemplating the construction of either two or six storage-power reservoirs:

Summary of direct benefits

Item of benefit	Annual benefits	
	With 6 reservoirs	With 2 reservoirs
Saving to the public in transportation charges [1]	$985,801	$985,801
Value of hydroelectric power developed	6,556,600	1,254,400
Value as a facility for national defense	25,000	25,000
Increased commercial value of riparian lands	50,000	50,000
Recreational value	75,000	50,000
Value as a source of industrial and municipal water supply		
Total direct benefits	7,692,401	2,365,201

[1] Saving in 1945 by channel 9 feet deep to Columbus, 7 feet to Bainbridge, and 5 feet to Albany, Ga.

262. *Indirect benefits.*—In addition to the direct benefits afforded by the proposed improvement, there would accrue certain indirect benefits which would materially increase the value of the improvement to the public, particularly to those not living directly on the waterway. The two principal indirect benefits, indirect savings in the tributary area due to railroad rate reductions, and the improvement of social and economic conditions in the tributary area, are discussed in the following paragraphs.

263. *Indirect savings in the tributary area due to railroad rate reductions.*—It has been the policy of the railroads in the past to attempt to meet the competition of carriers on improved waterways by rate reductions on practically all commodities adaptable to water transportation moving within the area tributary to the waterway and to more distant points influenced by the waterway. The amount of this rate reduction is indicated by the reduction in savings to the public reported by the Inland Waterways Corporation since 1926. According to reports of this corporation, the Federal Barge Line reduced the transportation charges on the commodities which it handled an average of $1.75 per ton in 1926. Because of the fact that the railroads have reduced their rates to meet water competition on the Mississippi and Warrior Rivers, the savings reported by the Federal Barge Line have been gradually lowered until they amounted to only $1.06 per ton in 1934. There have been more reductions since that time that would probably more than offset the recent blanket increase in rail rates so it is estimated that this saving is now about $1 per ton. These savings are determined by comparing the charges which would have been paid by the public had the commodities been transported by other means of transportation, with the charges actually paid to the Federal Barge Line. It can be seen, therefore, that as a result of water competition transportation charges in the territory have been lowered 75 cents per ton.

264. In House Document No. 56, Seventy-third Congress, first session, an analysis was made of the commerce actually moving over the Tombigbee-Warrior River System and that potentially available for movement over these rivers, and it was determined that only one-third of the adaptable commerce was actually moving during that year, in spite of the fact that a saving could have been made on all adaptable tonnage by the use of water transportation. That analysis indicates that an estimate of twice the tonnage actually moving over the waterway would be a reasonable basis for estimating

the amount of tonnage which would be affected by rail rate reductions in the territory.

265. In the area tributary to the Apalachicola, Chattahoochee, and Flint Rivers it is, therefore, estimated that 2,500,000 tons in the territory would enjoy rate reductions of approximately 75 cents per ton due to water competition, or an indirect savings to shippers of $1,875,000 annually.

266. *The improvement of social and economic conditions in the tributary area.*—The proposed improvement would, no doubt, result in the establishment of new industries in the territory, afford greater recreational facilities resulting in an increase in the tourist trade, and otherwise attract new capital investments in the area. An increase in the general prosperity of the tributary area would result in a greater per capita income, greater taxable values and a greater per capita wealth. These social and economic improvements cannot be evaluated in monetary terms, but with the wealth and income of the territory increased, the State and county agencies would be able to provide better educational facilities, more libraries and hospitals, better health conditions and additional roads. All of these improvements would be of immense benefit to the human welfare of the region.

ECONOMIC COST

267. The tables that follow develop the Federal and non-Federal cost of construction and annual carrying charges for two plans of development. One, with six proposed storage-power reservoirs, is designated "Plan for full development" and the other, with two reservoirs, is the "Plan for initial development." The cost is analyzed in accordance with circular letter R. & H. No. 46, Office, Chief of Engineers, dated August 12, 1938. Following the tables is an explanation of the methods used in computing the annual charges.

PLAN FOR FULL DEVELOPMENT
[6 reservoirs]

Items	Federal		Non-Federal	Total
	Navigation	Power		
Investment:				
Construction by Engineer Department	$15,394,000	$46,719,000	.....	$62,113,000
By other Federal agencies	.....	.....	.....	.....
Right-of-way, damages, etc	.....	4,516,000	$100,000	4,616,000
Reconstruction or alteration of structures	.....	.....	.....	.....
New terminals	.....	.....	315,000	315,000
Total, first cost	15,394,000	51,235,000	415,000	67,044,000
Interest during construction (Federal, 3 percent; non-Federal, 4½ percent)	693,000	2,306,000	28,000	3,027,000
Works scrapped	.....	.....	.....	.....
Total investment	16,087,000	53,541,000	443,000	70,071,000
Annual carrying charges:				
Interest on investment (Federal, 3½ percent; non-Federal, 4½ percent)	563,000	1,874,000	20,000	2,457,000
Amortization	169,000	387,000	2,000	558,000
Operation and maintenance	170,000	360,000	18,000	548,000
Loss of taxes (1 percent right-of-way)	.....	45,000	1,000	46,000
Gross carrying charges	902,000	2,666,000	41,000	3,609,000
Net return from terminals	.....	.....	20,000	20,000
Net annual carrying charges	902,000	2,666,000	21,000	3,589,000

PLAN FOR INITIAL DEVELOPMENT
[2 reservoirs]

Items	Federal		Non-Federal	Total
	Navigation	Power		
Investment:				
Construction by Engineer Department	$15,547,000	$18,876,000		$34,423,000
By other Federal agencies				
Right-of-way, damages, etc.		2,101,000	$100,000	2,201,000
Reconstruction or alteration of structures				
New terminals			315,000	315,000
Total first cost	15,547,000	20,977,000	415,000	36,939,000
Interest during construction (Federal, 3 percent; non-Federal, 4½ percent)	700,000	944,000	28,000	1,672,000
Works scrapped				
Total investment	16,247,000	21,921,000	443,000	38,611,000
Annual carrying charges:				
Interest on investment (Federal, 3½ percent; non-Federal, 4½ percent)	569,000	767,000	20,000	1,356,000
Amortization	170,000	127,000	2,000	299,000
Operation and maintenance	230,000	103,000	18,000	351,000
Loss of taxes (1 percent right-of-way)		21,000	1,000	22,000
Gross carrying charges	969,000	1,018,000	41,000	2,028,000
Net return from terminals			20,000	20,000
Net annual carrying charges	969,000	1,018,000	21,000	2,008,000

268. *Flint River—9 feet, locks and dams.*—A satisfactory estimate of the annual charges against such a project for comparison with the annual benefit may be obtained as follows:

Interest on $6,000,000 at 3½ percent	$210,000
Amortization, 1.2 percent	72,000
Operation and maintenance	90,000
Total annual charges	372,000

269. *Expenditures, Federal and non-Federal.*—The Federal expenditures would cover all costs of works of navigation and of power development with the exception of the cost of rights-of-way for lock sites, cut-offs, and spoil areas in connection with the navigation project. The latter expenditure would be borne by non-Federal agencies, which in addition would provide the necessary terminal facilities along the waterway. The total first cost to be borne by the Engineer Department would be $66,629,000 for the project with six reservoirs, and $36,524,000 with two reservoirs. The non-Federal first cost would be $415,000 and would be the same for either plan.

270. *Interest during construction.*—The construction period proposed for the improvement is 3 years. Interest during construction is computed at 3 percent of the Federal first cost and 4½ percent of the non-Federal first cost for one-half of the construction period.

271. *Amortization, depreciation.*—For some unforeseen cause, such as relocation of markets and trade routes, revolutionized modes of transportation, exhaustion of raw materials, such as lumber or petroleum, and other unpredictable circumstances, an improvement of this sort may become obsolete. The economic life of the proposed navigation improvement has been assumed as 50 years. Fixed parts of navigation structures, therefore, have been amortized on the basis of a 50-year life. Movable parts of navigation structures, however, have been amortized on the basis of a 25-year life, with a

recoverable value at the time of their replacement of 5 percent of the original cost. The cost of all rights-of-way and terminals has been amortized at 50 years, but it is assumed that the cost of the lock sites would be recoverable at the time of obsolescence. Since the storage-power developments and power facilities probably would have a useful life greatly in excess of the navigation project, it has been assumed that at the end of the 50-year period, 75 percent of the original cost of the fixed structures and of the reservoirs would be recoverable. Movable parts of the power facilities, however, have been amortized on the same basis as used for the locks. Interest rates used in determining the annual payments into the amortization funds were 3½ percent on Federal charges and 4½ percent on non-Federal.

DISCUSSION AND CONCLUSIONS

272. Two plans of improving the Apalachicola, Chattahoochee, and Flint Rivers have been developed in this report. Both of these contemplate a 9-foot open river channel on the Apalachicola River, a 9-foot canalized project on the Chattahoochee River to Columbus, Ga., a 7-foot open river channel to Bainbridge, Ga., and a 5-foot open river channel to Albany, Ga. One plan, designated "Plan for full development" contemplates the construction of three storage-power reservoirs on the Chattahoochee above Columbus and three on the Flint above Albany as well as power installations at the upper five of the six navigation locks and dams. The other, to be designated "Plan for initial development," contemplates the construction of only Roswell storage-power reservoir on the Chattahoochee and Woodbury No. 2 on the Flint, with a power installation at only Fort Benning lock and dam.

273. The annual charges determined in the tables under "Economic cost" compare with the annual benefits summarized in paragraph 261 as follows:

PLAN FOR FULL DEVELOPMENT

[6 reservoirs]

Annual charges	$3,589,000
Annual benefits	7,692,401
Ratio of annual charges to annual benefits	1 to 2.14

PLAN FOR INITIAL DEVELOPMENT

[2 reservoirs]

Annual charges	$2,008,000
Annual benefits	2,365,201
Ratio of annual charges to annual benefits	1 to 1.18

274. From the above comparison of costs with benefits, it is seen that the development of these rivers under either plan would be justifiable. The plan for full development shows a more favorable ratio than the partial development, due principally to the greater amount of power produced. The net benefit from the navigation project would be practically the same in each case.

275. It was pointed out in the report that the full amount of power that could be developed is not at present needed in the area, so that complete development of this phase of the project is not warranted at this time. A market for the power that would be developed at Roswell and Woodbury No. 2 Dams should either be available at the present time or develop in the near future. The regulated flow

from these projects would be of immediate benefit to navigation on the Flint and Apalachicola Rivers.

276. The large majority of the benefits to navigation would result only from the complete development of the navigation features proposed, or at least insofar as the Apalachicola and Chattahoochee Rivers are concerned. It was shown that the improvement of the Flint River would produce only a limited saving in addition to that to be derived from the improvement of the Chattahoochee. The plan for open river improvement of the Flint would cost very little, however, provided the flow were regulated by the Woodbury No. 2 storage-power project.

277. The plan for a 9-foot channel on the Flint River to Albany, to be obtained by a system of locks and dams, was studied in sufficient detail to determine that the additional benefits to be derived would not justify the cost involved. The data obtained in the traffic survey and all information submitted by local interests were thoroughly analyzed in the same manner as for the Chattahoochee River, and it was shown in paragraph 168 that the improvement of the Flint in addition to the Chattahoochee would add $164,000 in benefits. The additional annual charges thus incurred, as developed in paragraph 268, would be $372,000.

278. The uneven distribution of potential commerce between the Flint and Chattahoochee Rivers is brought about by a combination of factors. Certain of the area between the two rivers would be common territory that could be served by either the Flint or Chattahoochee, while the western and northern portions would be claimed entirely by the latter and the eastern territory by the former. The greater volume of commerce for the Chattahoochee River is occasioned by its proximity to the populous producing and consuming regions to the north that could not be reached via the Flint. Then too, much of the Flint territory could be served by a water-rail movement through a river port on the Chattahoochee at the same or only slightly less saving under a similar movement through a Flint River port. For instance, the common carrier rate on salt from Louisiana to Albany, Ga., as computed by the Commission's formula would be the same for an all-water haul over the Flint River as for a barge-rail haul via an interchange port on the Chattahoochee River. A further advantage in favor of the Chattahoochee improvement is the higher unit saving, which is due principally to the greater length of the proposed Chattahoochee River improvement enabling water traffic to reach farther inland to territory now served from the coastal ports at higher rates.

279. It has been pointed out that the area tributary to these rivers is in a rapid state of development. New industries are being introduced and the old ones are steadily expanding. More prodcts are being raised and manufactured and consumption too is on the upgrade. Indications point toward a continued increase in the commerce handled to and from this area.

280. This progress is retarded to some extent by prevailing unfavorable freight rates. Marked examples of the seeming discrimination were repeatedly brought out in the field contacts during the traffic survey. The need for a competitive water route was expressed partially on the grounds that rates of existing carriers would be forced

lower. Some revision would probably result, but it is doubtful whether the waterway would ever present serious competition in the principal established movements which are between areas that could not be economically served by these waterways.

281. The plans and estimates have been based upon the assumption that the proposed storage-power developments would be constructed by a Federal agency. Although up to the present time private interests have not considered that it would be to their advantage to expand their present development to include these storage-power projects, it may be that, with Government cooperation to the extent of contributing toward immediate construction an amount commensurate with the proportionate benefits to navigation, private interests may then consider it to their advantage to make such expansions immediately. It is estimated that Federal participation in the construction of a cooperative development of storage-power reservoirs on the Chattahoochee and Flint Rivers would be justified to the extent of contributing up to $4,000,000 toward initial construction costs in consideration for guaranteed minimum flows of 4,000 cubic feet per second in the Chattahoochee River at Columbus, Ga., and of 3,200 cubic feet per second in the Flint River at Albany, Ga. Such an arrangement is believed worthy of serious consideration.

282. Various plans for improving these rivers were carefully studied giving consideration to separate development for navigation, power, and flood control, as well as the combination of these phases into one coordinated plan. It is believed that the plan selected and recommended herein for initial improvement with the opportunity for expansion to include the plan for full development with an increased demand for additional power, is the plan that will best suit the needs of all sections of this area.

RECOMMENDATIONS

283. It is recommended that the existing projects on the Apalachicola, Chattahoochee, and Flint Rivers be modified to provide: (*a*) On the Apalachicola and Chattahoochee Rivers, a channel 9 feet deep and 100 feet wide from the mouth of the Apalachicola River to Columbus, Ga., to be obtained by dredging, cut-off channels, restriction works or other open-river methods, by the construction of a series of locks and dams with power installations, and by flow regulation from 3 storage-power projects on the Chattahoochee River above Columbus substantially as set forth in the Plan for Full Development outlined herein; and (*b*) on the Flint River, a channel 7 feet deep and 100 feet wide from its mouth to Bainbridge, Ga., and 5 feet deep and 100 feet wide from Bainbridge to Albany, Ga., to be obtained by dredging, open-river methods, and flow regulation from 3 storage-power projects substantially as set forth in the Plan for Full Development outlined herein, all at an estimated cost of $66,629,000 for construction and $530,000 annually for maintenance, on condition that local interests furnish assurances satisfactory to the Secretary of War that they will provide free of cost to the United States all necessary rights-of-way, flowage easements, spoil-disposal areas, lock sites and other necessary lands, exclusive of storage reservoirs, provide the necessary transfer and terminal facilities, and hold the United States free from all damages which might arise from the construction of the improvements.

284. It is further recommended that the Plan for Initial Development outlined herein be undertaken at once as the first step at an estimated cost of $36,524,000 for construction and an increase of $333,000 annually for operation and maintenance over actual maintenance expenditures at the present time.

R. PARK,
Colonel, Corps of Engineers,
District Engineer.

[First endorsement]

OFFICE, DIVISION ENGINEER, GULF OF MEXICO,
NEW ORLEANS, LA., *February 8, 1939.*

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. The division engineer concurs in general in the views of the district engineer that the Apalachicola, Chattahoochee, and Flint Rivers, Fla. and Ga., are worthy of progressive development for navigation, hydroelectric power, and flood control. The Apalachicola River and the Chattahoochee River below Columbus, Ga., he believes, are susceptible of improvement for navigation.

2. These channels formerly bore a considerable commerce, but it has practically vanished due to the advent of motortrucks and improved highways, to the construction of power plants on the upper reaches of the Chattahoochee and Flint Rivers, and to the neglect of the Gulf ports adjacent to the mouth of the Apalachicola River. As truck transportation of bulk commodities over long distances is not economical, the division engineer notes that truck transportation might become a feeder to the waterway. The Intracoastal Waterway now connects the Apalachicola River with recently improved ports on either side of the river's mouth and with the inland waterway system. In view of these changed conditions, a benefit to general commerce through improving this waterway, seems reasonably probable of realization. The division engineer also believes that an indirect benefit from lower rail rates may be realized and that the consequent loss to the railroads might be offset by increased business through rail-barge transportation, as no railroad parallels the waterway.

3. However, the division engineer is of the opinion that while a 9-foot navigation project on these rivers is desirable, the present development of the tributary territory does not warrant the immediate completion of such a program. He believes that a 6-foot project, so constructed as to permit of later development into a 9-foot project, would meet the needs of immediately prospective commerce. The existing 6- by 100-foot project on the Apalachicola River is therefore in his opinion adequate at the present time. The Chattahoochee River, with some improvement of the worst reaches, can be made suitable for present commerce. He notes that the reaches of the Chattahoochee River that offer the greatest obstacles to navigation are in that portion immediately below Columbus, Ga. He also notes that a dam at River Junction on the Apalachicola River would benefit navigation conditions at the head of that river and on the

lower Chattahoochee and Flint Rivers, practically providing 6-foot navigation to Bainbridge, Ga.

4. The division engineer recommends modification of the projects on the Apalachicola, Chattahoochee, and Flint Rivers to provide for development of these three rivers in the interest of navigation and power according to the general plan of improvement outlined in the district engineer's report, initial work for the accomplishment of this plan to consist of—

(*a*) Construction of a lock and dam at Fort Benning on the Chattahoochee River;

(*b*) Construction of a lock and dam at River Junction on the Apalachicola River;

(*c*) Initial dredging and channel improvement on the three rivers;

at an estimated cost of $6,500,000 for new work and annual maintenance of $200,000 in addition to the latest approved estimates for maintenance of the three projects, subject to the provisions that local interests furnish assurances satisfactory to the Secretary of War that they will provide free of cost to the United States when and as required, all necessary rights-of-way, flowage easements, spoil-disposal areas, lock sites, and other necessary lands, exclusive of storage reservoirs; that they will provide the necessary transfer and terminal facilities; and that they will hold and save the United States free from claims for damages which might arise from the construction of the improvements.

R. G. POWELL,
Colonel, Corps of Engineers,
Division Engineer.

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WAR DEPARTMENT

CORPS OF ENGINEERS, U. S. ARMY

REVIEW OF REPORTS
APALACHICOLA, CHATTAHOOCHEE & FLINT RIVERS
GEORGIA AND FLORIDA
GENERAL MAP

IN 29 SHEETS

SHEET NO. 1

GRAPHIC SCALE 10 5 0 10 20 MILES

U. S. ENGINEER OFFICE, MOBILE, ALA. DEC. 6, 1938

SUBMITTED: Victor K. Wagner, SENIOR ENGINEER

APPROVAL RECOMMENDED: [signature], MAJOR, CORPS OF ENGINEERS

APPROVED: [signature], LT. COL. CORPS OF ENGINEERS

DRAWN E.C.A.
TRACED E.C.A.
CHECKED J.A.K.

FILE A-1-3-43

REVISIONS

DATE	CHARACTER

VICINITY MAP
SCALE OF MILES 100 0 100 200 300

LEGEND
- Existing Power Dam
- Proposed Navigation Lock & Dam
- Proposed Storage & Power Dam
- Limits Of Drainage Basin
- Apalachicola-Chattahoochee-Flint Waterways
- Improved Inland (Intracoastal) Waterway
- Proposed Inland (Intracoastal) Waterway

MEXICO

GULF OF

HOUSE DOC. NO. 342, 76TH CONG., 1ST SESSION

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