
Recreational Usage Estimates and Forecast for the Coosa River Projects

1.0 INTRODUCTION

Alabama Power Company (APC) formed Issue Action Groups (IAGs) to assist with addressing relicensing-related recreation issues. The IAGs developed a list of Standard Process Questions to help characterize existing recreation resources and aid in the development of appropriate recreation plans for the projects. Step 2 of this process involves establishing baseline conditions, including Question 8: describe notable recreation activities on the reservoir and Question 10: identify expected future demand for recreation at the reservoir. The Federal Energy Regulatory Commission (FERC) also requires an assessment and characterization of current and future recreation use as part of the relicensing application. In addition, the FERC requires hydroelectric project owners to complete a Form 80 every six years, which provides overall recreational use and capacity information for individual facilities within project boundary.

This document presents information intended to help answer Questions 8 and 10 of the Standard Process, including identification of appropriate methodologies for determining current and projecting future recreational usage at the reservoirs. This information will be used to characterize recreational activity and use at the hydro developments currently being relicensed on the Coosa River and at the Smith Project on the Warrior River. The information will also be used to determine overall use figures for FERC Form 80 compliance.

2.0 EXISTING DATA ON RECREATIONAL USAGE

Five existing sources of data are available to address recreational usage at the reservoirs.

- The Alabama-Coosa-Tallapoosa (ACT)/Apalachicola-Chattahoochee-Flint (ACF) Comprehensive Study produced significant, detailed recreational data for the six Coosa River projects.
- USDA Projections of Outdoor Recreation Participation to 2050, provides growth coefficients based on a model of current recreational behavior.
- The Fishery Information Management Systems Studies (FIMS) covers portions of the Coosa River and provides crucial data for the Lewis Smith Project on the Warrior River
- Alabama Power Company FERC Compliance Studies which include the Jordan Tailrace Survey, provides detailed recreational use information specifically for the Jordan Tailrace area and will be used to focus on issues downstream of the Jordan Project.
- Existing FERC Form 80, provides a snapshot of the recreation facilities available in 1996 and at what percent capacity of use those facilities were, at the time of the study.

2.1 ACT STUDY

In September 1998, a draft environmental impact statement (EIS) was published to address potential changes in the allocation of water resources within the ACT river basin. The EIS is based on a federally funded comprehensive study addressing multiple water-related resource areas, including recreation. The U.S. Army Corps of Engineers (USACOE) Mobile District in cooperation with ten other Federal agencies prepared the EIS. These other agencies are:

- Environmental Protection Agency,
- U.S. Fish and Wildlife Service,
- U.S. Forest Service (USFS),
- Maritime Administration,
- National Marine Fisheries Service,
- National Ocean Service,
- National Park Service,
- Natural Resources Conservation Service,
- Southeastern Power Administration, and
- US Geological Survey.

The States of Alabama and Georgia also provided review and comments during the preparation of this EIS. (*Draft Environmental Impact Statement: Water Allocation for the Alabama-Coosa-Tallapoosa (ACT) River Basin Main Report*, pages ES-1 and ES-2).¹

Increasing water demands and reallocations of water supplies caused the State of Alabama to file litigation challenging proposed water reallocations in north Georgia. The States of Alabama, Georgia, and Florida and the USACOE developed a memorandum of agreement to undertake the Comprehensive Study to address water resources in the region. The ACT/ACF Comprehensive Study includes several reports developed to assess present and future capabilities of the water resources of the river basins. Two of these reports specifically address recreational usage within the basins.

In 1995, Market Facts, Inc. undertook a study of recreational use on ACT/ACF lakes. This study, as summarized in *Section II: ACT/ACF 1995 Recreational Boating Survey*, of the Market Facts study, estimates use patterns and expenditures by recreation visitors to the ACT/ACF river basin. The results of the survey are also summarized in the document *Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint Comprehensive Study Recreational Demand Element*, published 1998. The evaluation of recreation in the subsequent *Draft EIS: Water Allocation for the ACT River Basin*, published by the USACOE in September 1998, was based on information developed in the Comprehensive Study and the evaluation of impacts completed by the USACOE economics and planning staff.

2.2 U.S. DEPARTMENT OF AGRICULTURE (USFS) PROJECTIONS OF OUTDOOR RECREATION PARTICIPATION TO 2050

¹ Please refer to Chapter 1 of the *Draft Environmental Impact Statement: Water Allocation for the Alabama-Coosa-Tallapoosa (ACT) River Basin Main Report* (September 1998) for a complete discussion of the background of the EIS.

This document was published by the USDA, USFS in 1999, and was developed by USFS researchers to provide regional recreational growth coefficients that project recreation days by activity. The document provides indexed projections of future recreation days across four assessment regions (North, South², Rocky Mountain, and Pacific) in 10-year increments from 2000 through 2050. To develop the growth projections presented in the USDA document, a model of current recreational behavior was developed, using age, age-squared, real income, race, gender, and regional population growth.

2.3 FISHERY INFORMATION MANAGEMENT SYSTEMS STUDIES (FIMS) – COMMISSIONED BY THE STATE/APC

Several studies were conducted by FIMS on portions of the Coosa River, including the Jordan, Bouldin, Lay, Logan Martin and Weiss developments. The Jordan Bouldin Tailwater Complex was also included in the studies. The data was collected from recreational users, landowners abutting the impoundment, and business owners. The study was conducted from July 28, 1994 to July 31, 1995 on both reservoir and tailraces of the listed developments. The methodology used for this report was an on site interview. The objectives for the study were:

- To obtain counts of recreation users to estimate total recreational use;
- To characterize recreation users and economic values associated with their recreation activity;
- To determine user willingness to pay to prevent changes in current water levels; and
- To determine potential effects of changing water conditions on recreational visitation and user based economic values.

Data from the FIMS studies are also available for Lewis Smith Reservoir and are presented in *Volume 4 of The Potential Impacts of Water Diversion on Recreation Use and Economic Values Associated with Six Alabama Reservoir Systems*.

2.4 JORDAN TAILRACE SURVEYS

Surveys of Recreational Boaters in the Jordan Dam Tailwater have been conducted in accordance with a FERC Order requiring APC to monitor certain characteristics of the recreational boater population during scheduled releases of water from Jordan Dam for recreational purposes. The objectives of the study were to estimate the number of boaters in the tailwater during scheduled recreational flows; determine the recreational boater types using the resource during scheduled recreational flows; estimate average trip time for each boater type, assess safety concerns and facility needs; and determine the economic value of recreational boating during the survey period. Two surveys have been conducted, August through October of 1999 and April through October 2000.

The November 1999 report focused on weekends during the three-month period. Scheduled releases during that period were 2,000 cfs, 4,000 cfs, 6,000 cfs, 8,000 cfs, and 10,000 cfs. The December 2000 report was more diverse with regard to sampling days and releases. The actual survey period was longer and was divided into two phases. Phase One from April 1 to June 15 studied a continuous flow of 8,000 cfs from 6 am to 12 pm, and then 4,000 cfs from 12 pm to 6 pm. The sampling was conducted on both weekdays and weekends. Phase Two planned to study recreational releases planned from the middle of June until October on weekends and holidays. Due to severe drought

² The South, as defined for the projections, is comprised of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

conditions recreational flows were cancelled and the water remained at 2,000 cfs throughout Phase Two.

2.5 FERC FORM 80

FERC defines the Form 80 as “used to gather information necessary for the Commission and other agencies to know what recreational facilities are located at licensed projects, whether public recreational needs are being accommodated by the facilities, and where additional efforts could be made to meet future needs.” FERC Licensees file this form with FERC, once every six years. APC is required to submit a Form 80 in 2003 that reports 2002 recreational use.

Current FERC Form 80 documents for the Coosa and Warrior developments rely on the FIMS database for annual recreational projections. For the 2003 Form 80 submittal, APC is planning to utilize the ACT database for the Coosa developments. The Smith Project will continue to utilize the FIMS database for recreation use projections.

One of the tools used to assess historical recreation information and to gather new information is the FERC Form 80. This information will be reviewed for each of the Coosa developments by E/PRO. Each IAG will be polled for concerns about capacity utilization at individual public access sites. It can then be determined, within the individual IAGs, if there are concerns or questions about capacity levels and what form of investigations may be required to answer those concerns or questions. Capacity levels for the Form 80s will be defined from information received from the IAGs and from specific investigations considered necessary to gather additional information if needed.

3.0 EXISTING RECREATION USE

In 1995, Market Facts, Inc. undertook a study of recreational use on ACT/ACF lakes. This study was summarized in *Section II: ACT/ACF 1995 Recreational Boating Survey*. The results of the survey were included in the document *Draft EIS: Water Allocation for the ACT River Basin Main Report*, published 1998. The study developed estimates of total trips, seasonal trips, and visitor days for 1995. Table 1 summarizes this data for the six projects on the Coosa River.

Table 1 Annual Usage, 1995 – Coosa River Projects

	Total Trips	Total Visitor-days	Winter (%)	Spring (%)	Summer (%)	Fall (%)
Weiss Lake	293,625	1,276,630	7	41	43	9
H. Neely Henry Lake	170,431	501,268	12	29	53	6
Logan Martin Lake	309,041	1,343,657	7	32	50	11
Lay Lake	149,977	453,185	17	43	31	9
Mitchell Lake	63,658	164,816	16	39	34	12
Jordan Lake	160,906	498,663	13	39	36	11

Source: Table 4-62, *Draft EIS: Water Allocation for the Alabama-Coosa-Tallapoosa (ACT) River Basin Main Report*, page 4-216.

Table 2 below presents the percentage and number of visitors participating in various activities at each of the Coosa River projects generated from the ACT study. The percentages total to greater than 100 percent and the visitor-days total to greater than the annual number of visitor-days spent at that reservoir because recreationists frequently engage in multiple activities during a trip or day.

Table 2 Current and Projected Usage, by activity type (a) – Coosa River Projects

	Percentage (b)	1995 Visitor-days
Weiss Lake		
Fishing: shore	24	306,391
Fishing: boat	95	1,212,799
Pleasure boating	41	523,418
Water skiing	20	255,326
Jet skiing	9	114,897
Swimming	35	446,821
Camping	18	229,793
Picnicking	34	434,054
Hunting (c)	4	51,065
H. Neely Henry Lake		
Fishing: shore	12	60,152
Fishing: boat	82	411,040
Pleasure boating	36	180,456
Water skiing	22	110,279
Jet skiing	7	35,089
Swimming	27	135,342
Camping	9	45,114
Picnicking	22	110,279
Hunting (c)	2	10,025
Logan Martin Lake		
Fishing: shore	17	228,422
Fishing: boat	82	1,101,799
Pleasure boating	42	564,336
Water skiing	24	322,478
Jet skiing	12	161,239
Swimming	37	497,153
Camping	11	147,802
Picnicking	30	403,097
Hunting (c)	1	13,437
Lay Lake		
Fishing: shore	6	27,191
Fishing: boat	92	416,930
Pleasure boating	26	117,828
Water skiing	10	45,319
Jet skiing	3	13,596
Swimming	21	95,169
Camping	8	36,255
Picnicking	13	58,914
Hunting (c)	2	9,064
Mitchell Lake		
Fishing: shore	7	11,537
Fishing: boat	86	141,742

Table 2 Current and Projected Usage, by activity type (a) – Coosa River Projects

	Percentage (b)	1995 Visitor-days
Pleasure boating	36	59,334
Water skiing	14	23,074
Jet skiing	6	9,889
Swimming	23	37,908
Camping	10	16,482
Picnicking	17	28,019
Hunting (c)	1	1,648
Jordan Lake		
Fishing: shore	13	65,382
Fishing: boat	82	412,408
Pleasure boating	42	211,233
Water skiing	17	85,499
Jet skiing	11	55,323
Swimming	31	155,910
Camping	6	30,176
Picnicking	22	110,646
Hunting (c)	0	0

(a) Source (excluding Hunting): USACOE. September 1998. Table 4-63, *Draft EIS: Water Allocation for the Alabama-Coosa-Tallapoosa (ACT) River Basin Main Report*. Page 4-216 and 4-217.

(b) Because recreational activities are not mutually exclusive, the data sum too more than the total number of recreation days.

(c) Source: Perr, Andrea L. March 1997. *Section II ACT/ACF 1995 Recreational Boating Survey*.

4.0 EXPECTED FUTURE USE

There are two primary approaches that can be used to project recreational demand at the APC reservoirs. The first simply applies the projected population growth rate for a certain area to the recreation activity usage estimates. This is the approach that was used as part of the ACT/ACF Comprehensive Study. The second approach uses a combination of population, income, age, gender, and ethnicity to develop projected regional growth rates that are then applied to various recreational activities.

The FERC document *Preparing Environmental Assessments: Guidelines for Applicants, Contractors, and Staff* does not outline an approach for projecting recreational usage at the projects it licenses (FERC, 2001). The USACOE, however, does cite several different approaches in Chapter 17 of its Policy Digest EP 1165-2-1 *Water Resources Policies and Authorities* (USACOE, 1999). This document specifically mentions the use of regional models as a suitable approach to developing recreation projections (paragraph 17-4a).

The approach used as part of the ACT/ACF Comprehensive Study relies solely on population growth to project changes in recreation demand. While such an approach may have been appropriate for modeling future water needs, it does not adequately consider factors beyond population that affect recreation demand. The authors of the *Recreation Demand Element* recognize the limits of their approach and state:

“This study recognizes that recreation demand is a function of more factors than just population growth. Other factors that influence change in recreation demand include, and are not limited to, changes in underlying demographics, recreation technology, and recreation consumer behavior. However, a more elaborate method for forecasting change would require development of a recreation demand model which is outside the scope of this study.” (page 33)

The USDA published *Projections of Outdoor Recreation Participation to 2050*, in 1999. The authors cite several studies showing that demographic factors such as age, race, gender, education, previous experience, and income influence recreational behavior. These studies include Hof and Kaiser, 1983; Walsh, Jon, McKean and Hof, 1992; Cordell, Bergstrom, Hartman, and English, 1990 (see the bibliography at the end of this Technical Memorandum for specific citations).

For the purposes of the projections presented here, growth factors, as presented in the USDA report, were expanded to five-year increments based on the percentage change over the ten-year period. The recreation factors used to develop the projections presented here are from the Southern Region. The USDA’s methodology develops usage coefficients for individual activities. Because of the variety of factors that can impact recreational participation, such as health trends and the economy, it is difficult to develop reliable projections beyond a 20-year period. Therefore, it is reasonable to present projections through 2015, 20 years beyond the 1995 estimates. Table 3 presents the projection index figures by activity, as identified in the USDA Forest Service report.

Table 3 Recreation Projection Index – Southern Region, 2000 through 2015

USDA-defined Activity	2000	2005 (b)	2010	2015 (b)	ACT-defined Recreation Activities (c)
Fishing	1.02	1.06	1.11	1.15	Boat Fishing, Shore Fishing
Motorboating	0.99	0.99	1.00	1.01	Pleasure Boating, Skiing, Jet Skiing
Nonpool Swimming	0.96	0.99	1.02	1.05	Swimming
Picnicking	1.10	1.23	1.37	1.52	Picnicking
Developed Camping	1.07	1.13	1.19	1.25	Camping
Hunting	0.92	0.90	0.89	0.87	Hunting

(a) Source: Bowker, J. M., Donald B. K. English, H. Ken Cordell. *Projections of Outdoor Recreation Participation to 2050*, published by the USDA Forest Service, Athens, GA.

(b) Interpolated.

(c) The USDA document does not use the same set of activities as the ACT-ACF Comprehensive Study. For example, the USDA document only identifies “Fishing” as an activity, while the Comprehensive Study distinguishes between boat fishing and shore fishing. It is assumed, for the purposes of this study, that participation in boat fishing and shore fishing will grow at the same rate (identified as “Fishing” in the USDA document). Likewise, pleasure boating, skiing, and jet skiing are expected to grow at the “Motorboating” rate.

Table 4 below presents the projected recreation days associated with various reservoir activities using the USDA’s behavior model approach. As recreationists frequently enjoy multiple activities during a day at a reservoir, the activity totals sum to greater than the total number of recreation days. By using a weighted average of the growth rates, coefficients can be developed to calculate total future recreation days. The coefficients vary slightly among the reservoirs based on the mix of activity there. For example, reservoirs with a greater proportion of “growth” activities, such as picnicking and camping, will have a higher overall expected growth in recreation days compared with a reservoir with a relatively greater proportion of hunting and motorboating. Growth coefficients are projected to be the highest at Weiss Lake, where total recreation days are expected to increase by 13.4 percent

by 2015. Weiss Lake has a relatively high proportion of the strong-growth activities camping (18 percent) and picnicking (34 percent). The increase in recreation days is projected to be the lowest at Jordan Lake, where recreation days are anticipated to increase by 11.2 percent by 2015, which has less camping (6 percent) and picnicking (22 percent).

Table 4 – Current and Projected Usage, by activity type – Coosa River Projects

	1995 (a)	2000 (b)	2005 (b)	2010 (b)	2015 (b)
Weiss Lake					
Fishing: shore	306,391	312,519	326,015	340,094	352,137
Fishing: boat	1,212,799	1,237,054	1,290,477	1,346,206	1,393,874
Pleasure boating	523,418	518,184	520,795	523,418	528,627
Water skiing	255,326	252,773	254,046	255,326	257,867
Jet skiing	114,897	113,748	114,321	114,897	116,040
Swimming	446,821	428,948	442,149	455,757	468,970
Camping	229,793	252,773	282,094	314,817	348,620
Picnicking	434,054	464,438	489,789	516,524	544,007
Hunting	51,065	46,980	46,208	45,448	44,675
<i>Avg. Growth Coefficient</i>		<i>1.01</i>	<i>1.05</i>	<i>1.09</i>	<i>1.13</i>
Total Recreation Days (c)	1,276,630	1,295,010	1,344,383	1,396,642	1,447,381
H. Neely Henry Lake					
Fishing: shore	60,152	61,355	64,005	66,769	69,133
Fishing: boat	411,040	419,261	437,366	456,254	472,410
Pleasure boating	180,456	178,652	179,552	180,456	182,252
Water skiing	110,279	109,176	109,726	110,279	111,376
Jet skiing	35,089	34,738	34,913	35,089	35,438
Swimming	135,342	129,929	133,927	138,049	142,051
Camping	45,114	49,626	55,382	61,806	68,443
Picnicking	110,279	117,998	124,439	131,232	138,214
Hunting	10,025	9,223	9,072	8,923	8,771
<i>Avg. Growth Coefficient</i>		<i>1.01</i>	<i>1.05</i>	<i>1.08</i>	<i>1.12</i>
Total Recreation Days (c)	501,268	506,714	524,247	542,714	560,614
Logan Martin Lake					
Fishing: shore	228,422	232,990	243,052	253,548	262,526
Fishing: boat	1,101,799	1,123,835	1,172,368	1,222,997	1,266,302
Pleasure boating	564,336	558,693	561,507	564,336	569,951
Water skiing	322,478	319,253	320,861	322,478	325,686
Jet skiing	161,239	159,626	160,431	161,239	162,843
Swimming	497,153	477,267	491,956	507,096	521,798
Camping	147,802	162,582	181,442	202,489	224,231
Picnicking	403,097	431,314	454,857	479,686	505,208
Hunting	13,437	12,362	12,158	11,959	11,755
<i>Avg. Growth Coefficient</i>		<i>1.01</i>	<i>1.05</i>	<i>1.08</i>	<i>1.12</i>
Total Recreation Days (c)	1,343,657	1,358,296	1,405,419	1,455,071	1,503,659

Table 4 – Current and Projected Usage, by activity type – Coosa River Projects

	1995 (a)	2000 (b)	2005 (b)	2010 (b)	2015 (b)
Lay Lake					
Fishing: shore	27,191	27,735	28,933	30,182	31,251
Fishing: boat	416,930	425,269	443,634	462,793	479,180
Pleasure boating	117,828	116,650	117,237	117,828	119,001
Water skiing	45,319	44,865	45,091	45,319	45,769
Jet skiing	13,596	13,460	13,527	13,596	13,731
Swimming	95,169	91,362	94,174	97,072	99,886
Camping	36,255	39,880	44,506	49,669	55,002
Picnicking	58,914	63,038	66,479	70,108	73,838
Hunting	9,064	8,339	8,202	8,067	7,930
<i>Avg. Growth Coefficient</i>		1.01	1.05	1.09	1.13
Total Recreation Days (c)	453,185	458,894	476,124	494,272	511,374
Mitchell Lake					
Fishing: shore	11,537	11,768	12,276	12,806	13,260
Fishing: boat	141,742	144,577	150,820	157,333	162,904
Pleasure boating	59,334	58,740	59,036	59,334	59,924
Water skiing	23,074	22,843	22,959	23,074	23,304
Jet skiing	9,889	9,790	9,839	9,889	9,987
Swimming	37,908	36,391	37,511	38,666	39,787
Camping	16,482	18,130	20,233	22,580	25,004
Picnicking	28,019	29,980	31,616	33,342	35,116
Hunting	1,648	1,516	1,491	1,467	1,442
<i>Avg. Growth Coefficient</i>		1.01	1.05	1.09	1.12
Total Recreation Days (c)	164,816	166,782	172,794	179,135	185,242
Jordan Lake					
Fishing: shore	65,382	66,689	69,569	72,574	75,143
Fishing: boat	412,408	420,656	438,822	457,772	473,982
Pleasure boating	211,233	209,121	210,174	211,233	213,335
Water skiing	85,499	84,644	85,071	85,499	86,350
Jet skiing	55,323	54,770	55,046	55,323	55,873
Swimming	155,910	149,674	154,280	159,028	163,639
Camping	30,176	33,194	37,044	41,341	45,780
Picnicking	110,646	118,391	124,854	131,669	138,674
Hunting	0	0	0	0	0
<i>Avg. Growth Coefficient</i>		1.01	1.04	1.08	1.11
Total Recreation Days (c)	502,936	507,541	524,372	542,031	559,136

(a) 1995 estimates are calculated from Table 4-63, *Draft EIS: Water Allocation for the Alabama-Coosa-Tallapoosa (ACT) River Basin Main Report*. September 1998. Page 4-216 and 4-217.

(b) Because recreational activities are not mutually exclusive, the data sum too more than the total number of recreation days.

(c) Projections were developed using the growth coefficients presented in Table 3 above.

5.0 RECOMMENDATIONS

The E/PRO Team recommends the following approaches to establishing the baseline conditions (Step 2 of the Standard Questions) related to existing and projected recreation use at the APC projects:

- Use existing data developed as part of the ACT/ACF Comprehensive Study to characterize recreation usage at Weiss Lake, H. Neely Henry Lake, Logan Martin Lake, Lay Lake, Mitchell Lake, and Jordan Lake.
- Use existing data developed as part of the FIMS study for Lewis Smith Reservoir and Tailrace.
- Use the USDA growth coefficients presented in *Projections of Outdoor Recreation Participation to 2050* to project usage by activity at each of the reservoirs through the year 2015, at which time future use can be updated as part of the Form 80 requirements.
- Use APC surveys for characterizing use in the Jordan Tailrace
- Focus any additional data collection on refining issues relative to capacity utilization at select sites, to be dovetailed with this year's Form 80 requirements.

The ACT Study represents the most appropriate data for characterizing recreational use on the Coosa River since the data are more complete and the combined studies and EIS documents received extensive review by numerous participating agencies and stakeholders. For the Smith Project on the Warrior River, the FIMS data is the primary source of data for that area and should be considered for use in the characterization of recreational use and activity for that development, with the appropriate use of the USDA study on behavioral/activity based projections.

With regard to the Jordan tailrace area, use data are available from the ACT study. However, the more recent Jordan Tailrace surveys allow for a more accurate and very specific characterization of the Jordan tailrace area. This survey information is more detailed than the overall ACT Study. The figures were collected during different time frames, therefore the data is not directly comparable with the ACT data, but it presents precise information on recent recreational use of the Jordan tailrace.

In conclusion, the data available in the ACT/ACF Comprehensive Study, the FIMS report, the USDA Recreation Use Projections, existing FERC Form 80s and the Jordan Tailrace Surveys provide relatively recent information on recreational use for the Coosa River and Lewis Smith Reservoir. The use of this current recreational use data should preclude the need to do extensive recreational use monitoring at the developments in order to characterize recreational activity and use. Also, this current information enables participants to make common sense determinations with regard to recreational needs and will allow the completion of FERC requirements for the characterization of recreational use and activity for the Coosa and Warrior relicensing applications.

6.0 BIBLIOGRAPHY

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