



MIG 3 Project Operations

September 14, 2010



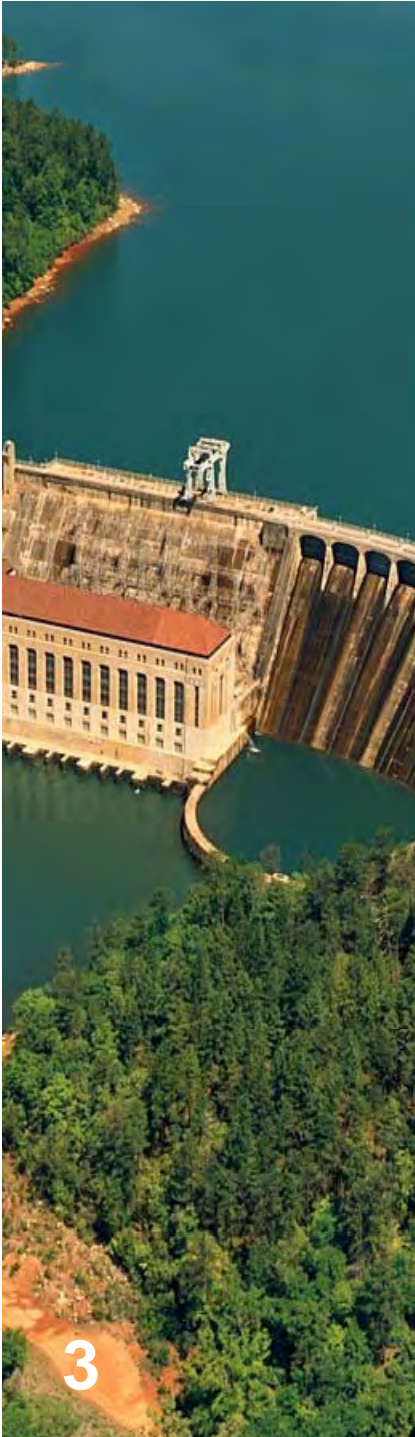


Study Plan 12a:

Rule Curve Change Modeling Analysis

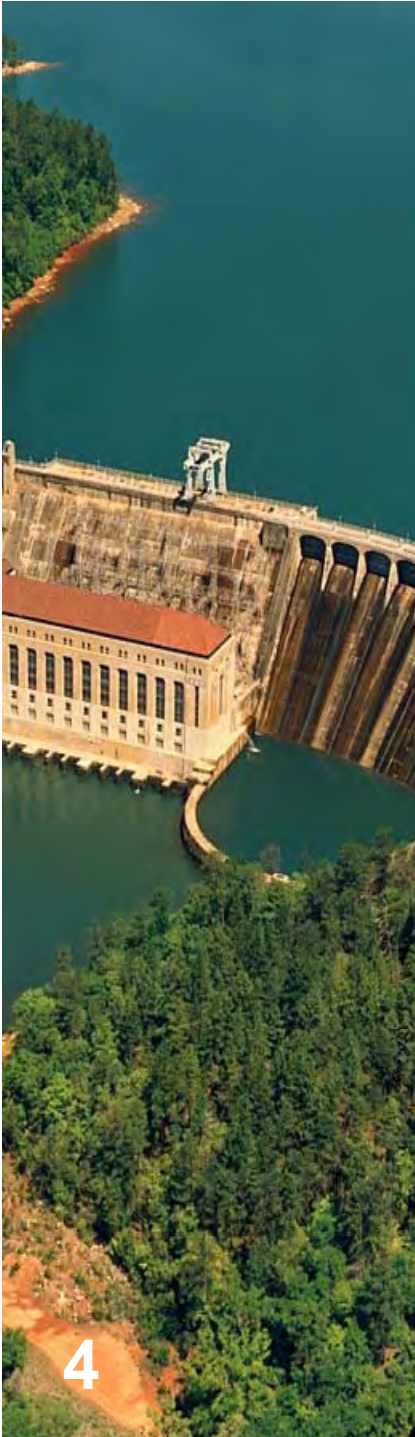
September 14, 2010





Study Goals

- Determine the feasibility of revising the Martin flood control guideline by modeling changes involving an increase in winter pool elevation in increments of 1 foot from el. 481 ft msl to el. 486 ft msl
- Examine the effects of maintaining the summer pool longer in the fall and beginning the refilling of Lake Martin earlier to be at full summer pool a month earlier
- Evaluate impacts to flood control, navigation, minimum flows, and generation



Completed To Date

- Reports:
 - Draft report on March 4, 2010 (with FERC approval for the extension on January 20, 2010)
 - Final report on June 4, 2010
- Alabama Power distributed a CD of the models on April 1, 2010



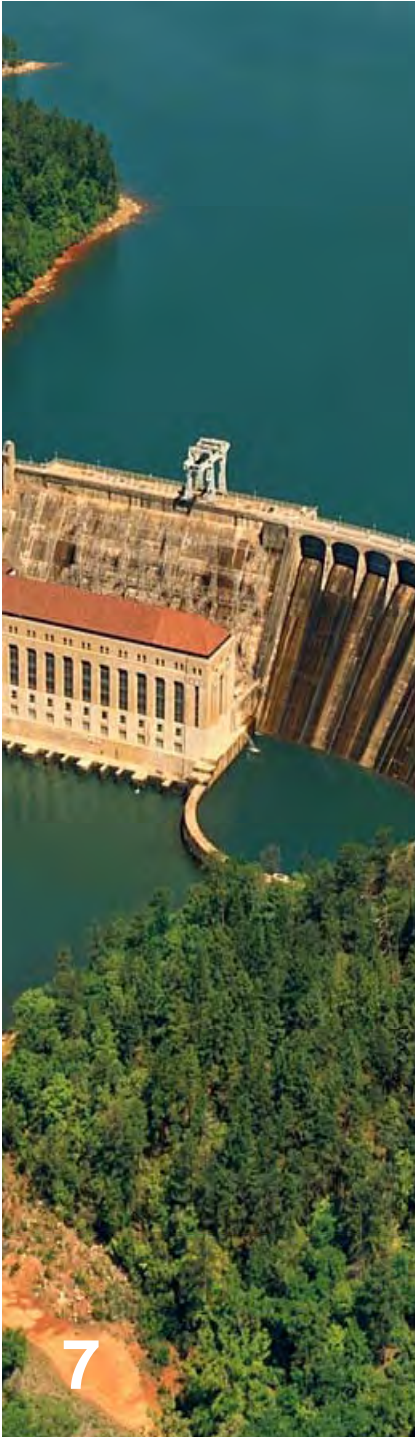
Alternatives Summary

- 23 Alternatives and Baseline Modeled
 - Five alternate winter flood control guidelines in increasing increments of 1 foot up to 486'msl
 - Early filling of the reservoir to begin filling January 15th and be at summer full pool by April 1st
 - Extension of the summer full pool until October 15th
 - Combination of these changes



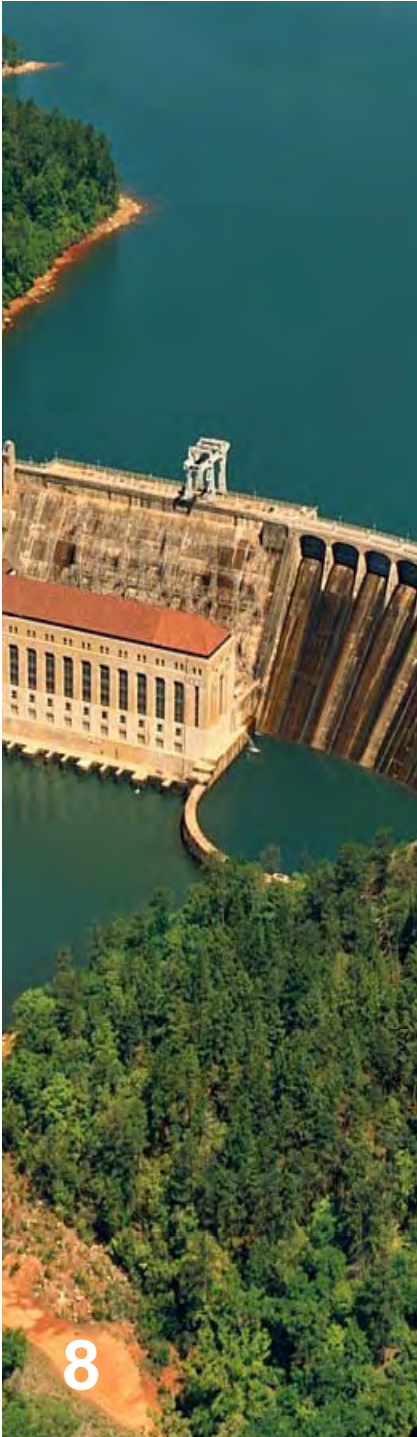
Models Used Summary

- Short and long term impact modeling
 - The short term impact models include the HEC-RAS and Alabama Power's Project Routing Model
 - Hydrologic analyses were performed with the HEC-FFA and HEC-SSP software packages
 - The long term impact models include HEC-ResSim and Alabama Power's HydroBudget model



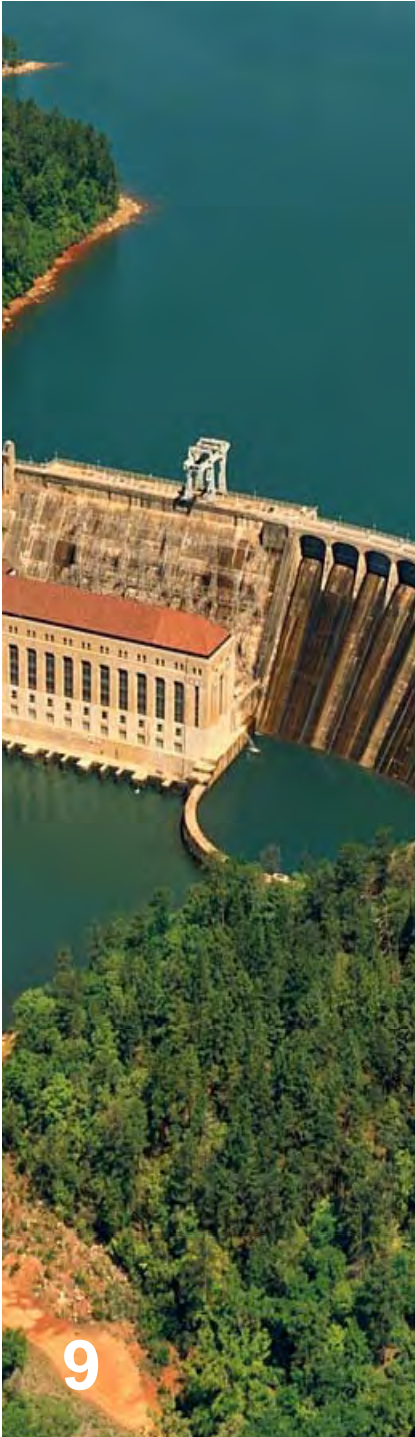
Short Term Impact Summary

- Winter pool alternatives, the 100 year design flood
 - Changes in both the peak discharge and volume
 - Increased peak elevations downstream, ranging from 0.75 ft to 3 ft. higher
- Spring fill alternative, 100 year design flood
 - Changes in the duration of the peak outflow
 - Increased peak elevations downstream of Martin from 0.13 ft to 0.45 ft. higher



Short Term Impact Summary

- April has the highest chance of having a 100 year flood
- Early spring fill coupled with higher winter pool scenario would also be subject to the same downstream flood impacts as the higher winter pool scenarios.



Long Term Impact Summary

- Issues in changing the flood control guideline with respect to long term impacts modeling were:
 - Management of storage
 - Power generation
 - Frequency of spill events
 - Magnitude of spill events
 - Duration of flows
 - Downstream release requirements



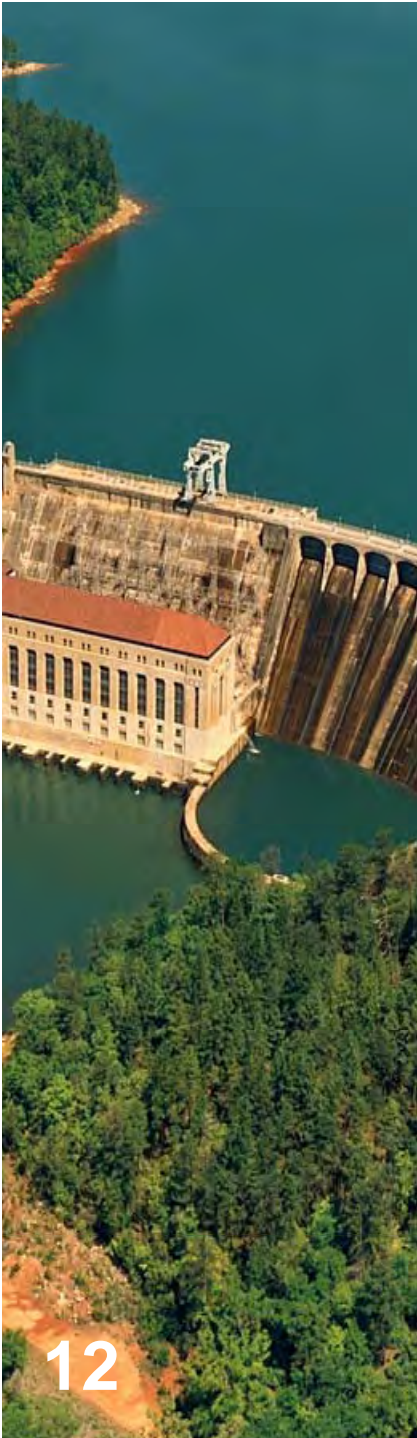
Long Term Impact Summary

- Power generation:
 - With higher winter pools the project value is increased due to higher head on the turbines.
 - Once either the early spring fill or fall extension is applied, there is a more neutral value as the higher head increase is offset by either more spill (flows released through the spillway) in the spring or less generation in the fall.
 - Higher winter pool alternatives combined with both the early spring fill and the fall extension result in an overall economic loss for hydropower to the system.



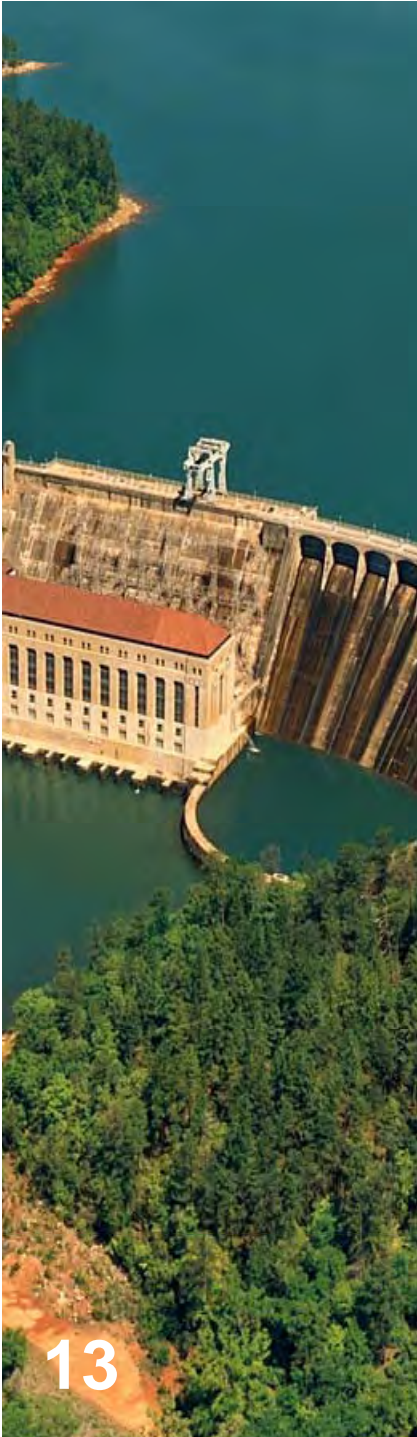
Long Term Impact Summary

- Spilling:
 - The baseline annual spill recurrence is approximately 0.85 %.
 - The frequency of spill for Martin with a **5 foot** higher winter pool is approximately 0.15 % higher.
 - For the early spring fill alternative in combination with the base condition and the higher winter pool, spill occurred at Martin 1.2% to 1.4 % of the time.
 - The result for all alternatives is an increase in the amount of days that spill occurs.



Long Term Impact Summary

- Storage/Downstream Releases:
 - The fall extension of the summer pool elevation resulted in a 1% increase in time the pool was at 490.5 ft. msl, or three additional days per year
 - While meeting the minimum flow requirements at Thurlow for the period of record, the average change in the amount of time flows greater than 1,200 cfs were released for the range of alternatives varied between 8 additional days and 6 fewer days



Next Steps

- Apply the results from this study to analyses proposed in FERC approved Study Plans 12(b) – 12(h)
- The modeling results, combined with the environmental analyses will result in a final recommendation from Alabama Power on the flood control guideline at Martin



Questions



Study Plan 12b:

Effects of Rule Curve Change on Sedimentation Rates and Nuisance Aquatic Vegetation

September 14, 2010





Study Goals

- Identify areas susceptible to increased sedimentation and establishment of nuisance aquatic vegetation
- Develop a ranking system for these areas that describes the probability of increased sedimentation and establishment of nuisance aquatic vegetation at each proposed winter rule curve 1-ft elevation changes



Completed To Date

- Reports:
 - Draft report on April 9, 2010
 - Final report on August 3, 2010



Summary

- Alabama Power selected a total of twenty (20) sites for evaluation
- The sites were given a rank of 1 through 4 with four (4) having the greatest potential for the establishment of aquatic vegetation
- LIDAR and ArcInfo were used to estimate the area that could be impacted at each site by each one foot change in rule curve



Questions



Study Plan 12c:

Effects of Rule Curve Change on Water Quality

September 14, 2010





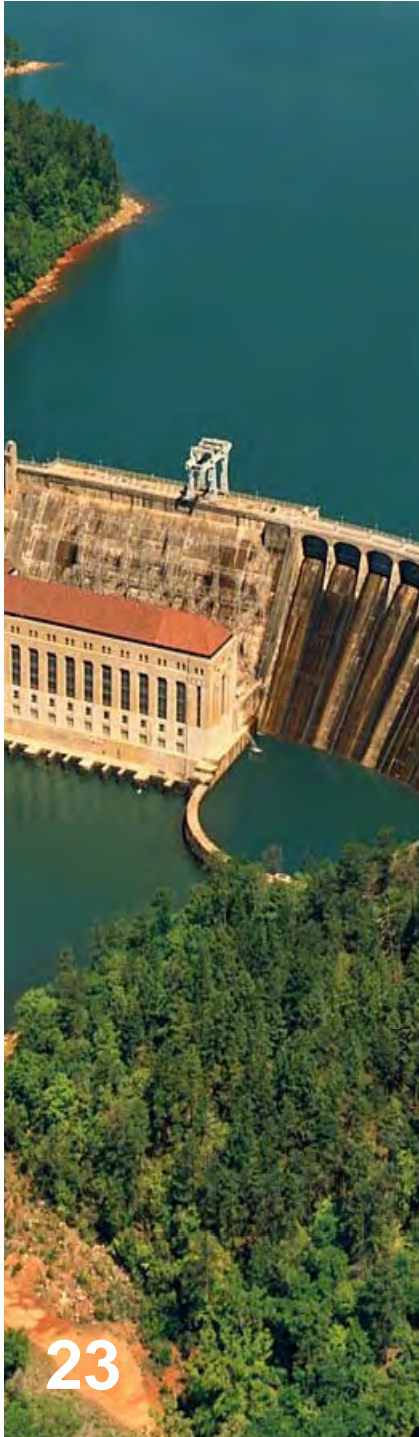
Study Goals

- Provide ADEM with sufficient data, to the extent possible, to examine the potential effects on water quality as a result of changing the winter rule curve elevation and/or extending the duration of the summer pool
- Determine the probability that water quality will change (improve or degrade) with each change to lake level from existing conditions using the above data



Completed To Date

- Reports:
 - Draft report on or before September 30, 2010
 - Final report on or before December 31, 2010
- Five experts selected for Water Quality Panel
- Alabama Power conducted the Water Quality Expert Panel Discussion on July 27, 2010
 - Water Quality Expert Panel Summary Report on July 23, 2010.



Panel Members

- David Bayne- Professor Emeritus
- John Glasier- Lake Watch Lake Martin
- Bill Garrett- Alabama Power
- Bill Deutsch- Alabama Water Watch
- Jim Ruane- REMI



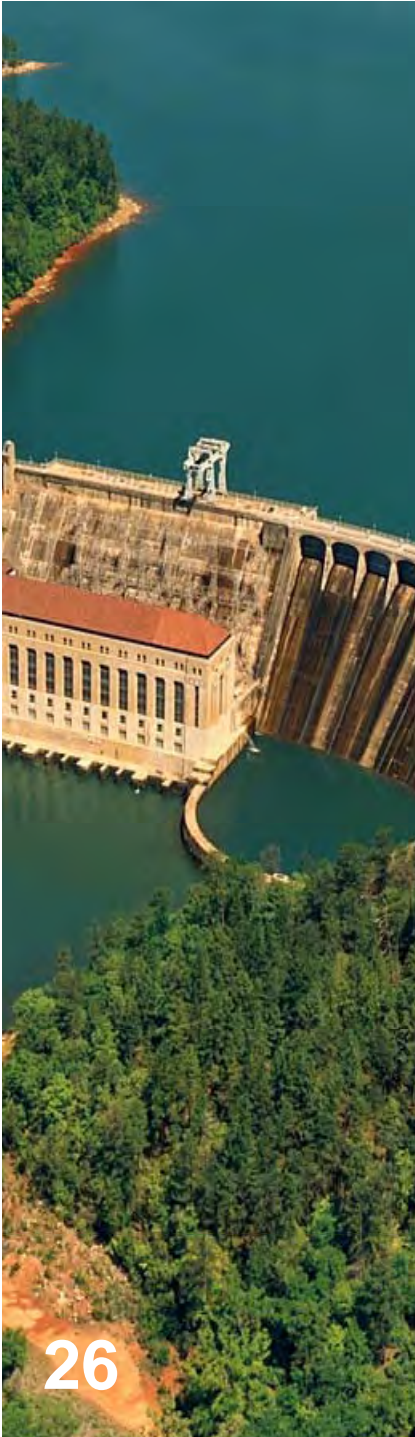
Panel Questions

- How may each of the proposed rule curve changes affect dissolved oxygen content in Lake Martin?
- How may each of the proposed rule curve changes affect Alabama Power's ability to meet the State Water Quality Standards for Hydroelectric Dams (4.0 mg/l dissolved oxygen during generation)?
- How may each of the proposed rule curve changes affect overall temperature in lake (epilimnion and hypolimnion)?



Panel Questions

- How may each of the proposed rule curve changes affect the volume of cold water and timing of stratification of Lake Martin? (potential effect to striped bass fishery)
- How may each of the proposed rule curve changes affect turbidity and chlorophyll *a* in specific areas of the lake (*main channel and side embayments*)
- Will any of the proposed rule curve changes affect eutrophication in Lake Martin? If so, where – main channel or side embayments?
- If you are aware of other rule curve changes that have occurred in similar southeastern storage reservoirs, please describe those situations and the results of the change(s) on water quality in the lake.



Recommendations

- Monitor any changes closely and have the flexibility to return to original operating procedures if necessary
- Review similar situations on other reservoirs such as Lake Murray, South Carolina and several Tennessee Valley Authority Reservoirs
- Ensure compliance with applicable state water quality standards and maintain water quality downstream



Questions

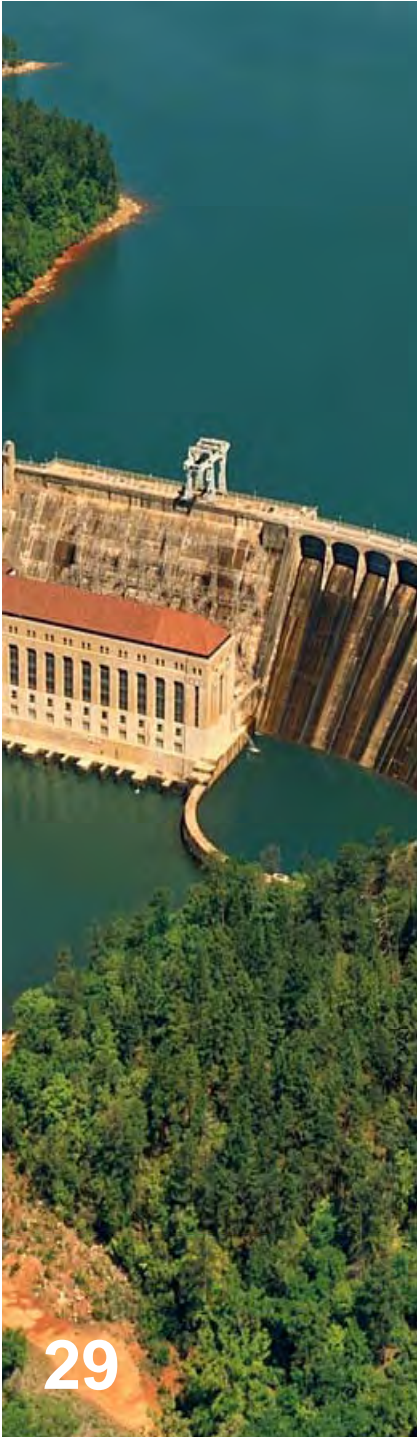


Study Plan 12d:

Effects of Rule Curve Change on Lake and Downstream Erosion

September 14, 2010





Study Goals

- Evaluate the potential for increased or decreased erosion at the current atypical erosion sites identified on shoreline of Lake Martin in Study Plan 10
- Identify the effect that increased flooding may have on the erosion sites in the Martin tailrace and Tallapoosa River downstream of Thurlow Dam



Completed to Date

- Draft report on May 11, 2010
- Final report by December 31, 2010



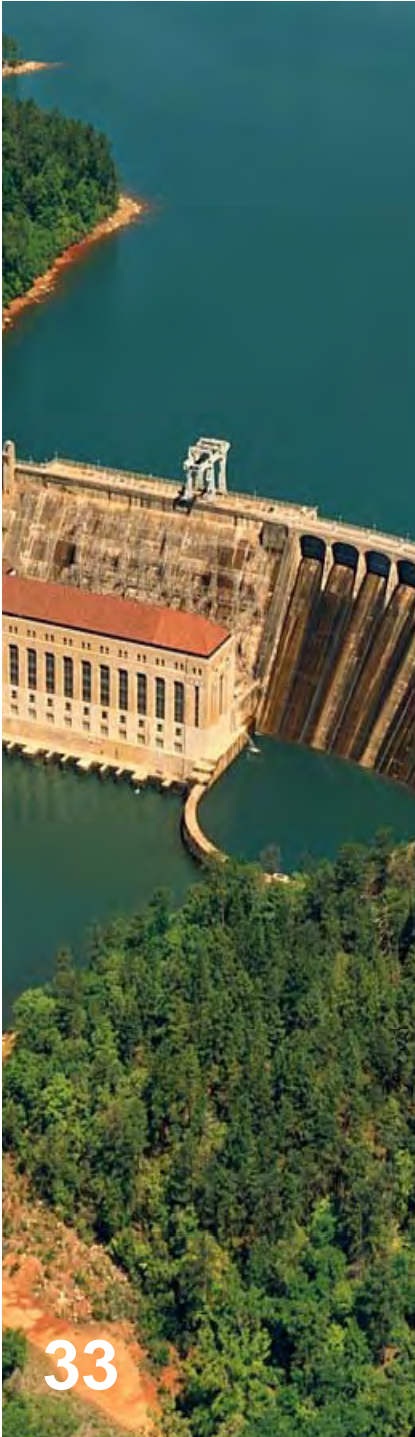
Summary

- Evaluated the potential for increased or decreased erosion at 15 atypical erosion sites on the lake
- Identified the effect that increased flooding may have on shoreline erosion sites in the Martin tailrace and Tallapoosa River downstream of Thurlow Dam
- Evaluated the relative change in sedimentation rates at the 19 sedimentation sites identified on Lake Martin

Summary, continued

- **Lake Erosion:**

- Rule curve changes to elevations 482', 483', 484' and 485' should have a negligible effect on reservoir erosion
- Elevation 486' (5 ft) may increase erosion in approximately 30% of the sites based upon a small variation in bedrock location



Summary, continued

- **Downstream Erosion:**
 - No erosion sites were observed in Martin tailrace
 - Multiple erosion sites were observed in the Tallapoosa River downstream of Thurlow Dam
 - Each flood event results in erosion at existing and potential new sites in the Tallapoosa River downstream of Thurlow Dam



Questions



Study Plan 12e:

Effects of Rule Curve Change on Federally Threatened and Endangered Species at the Martin Project and In the Tallapoosa River Below Thurlow Dam

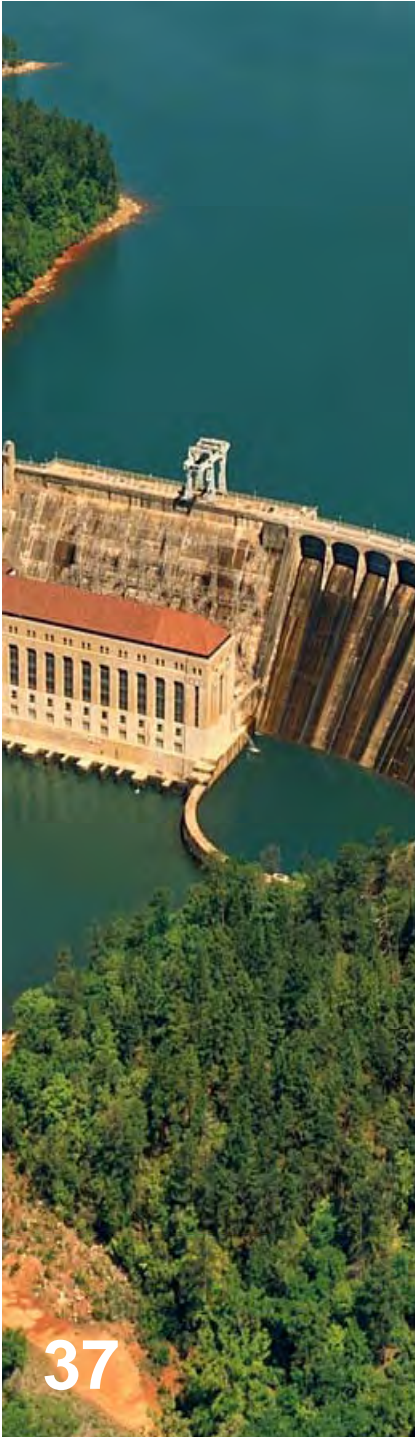
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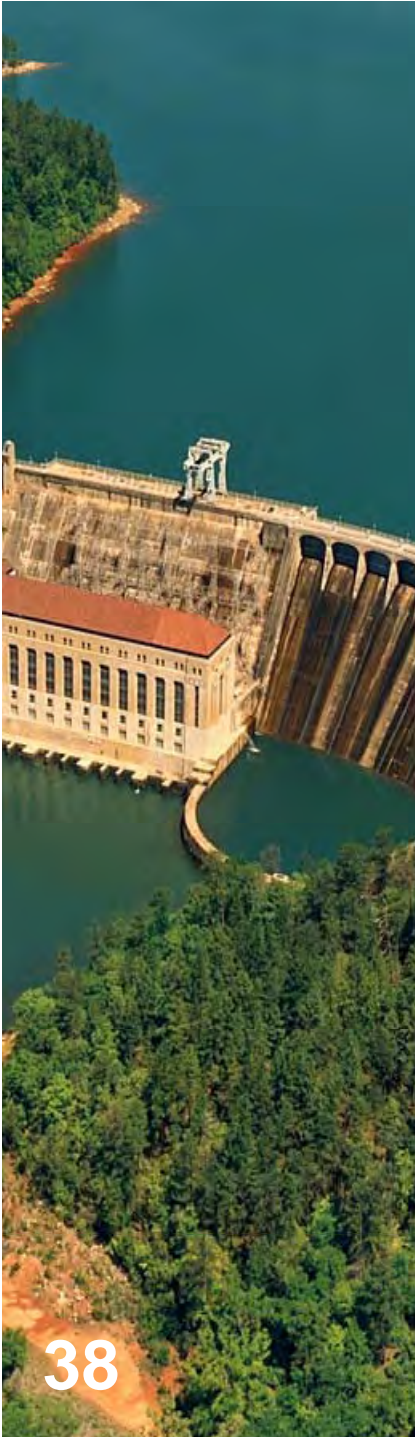
Study Goals

- Determine if increased flooding would affect existing aquatic and terrestrial populations of federally threatened and endangered species in the lower Tallapoosa River
- Determine if a higher Martin lake level during the winter would potentially impact any existing aquatic and terrestrial populations of federally threatened and endangered species in the Martin Project boundary



Completed To Date

- Field surveys completed May 2010
- Reports:
 - Draft report on August 3, 2010
 - Final report on or before September 30, 2010



Summary

- No federally listed or state priority mollusk species were collected within the Project Area during the present study
 - Nor have any been documented to occur in the lower Tallapoosa River below Thurlow Dam
- No federally listed species of fishes were collected at any of the sampling sites
 - One state priority species of interest, *Etheostoma chuckwachatte* (lipstick darter; P2) was collected at two sites (Little Kowaliga and Timbergut creeks) and was also represented in the Auburn University collections from Hillabee Creek
- No individuals of *Amphianthus pusillus* or *Arabis georgiana* were encountered during this survey



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Questions

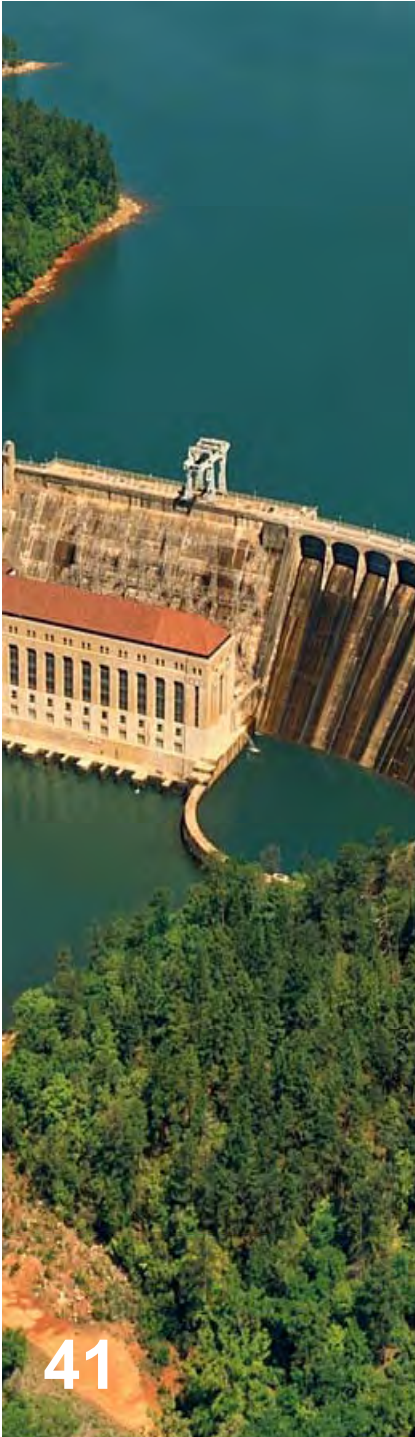


Study Plan 12f:

Effects of Rule Curve Change on Downstream Recreation

September 14, 2010





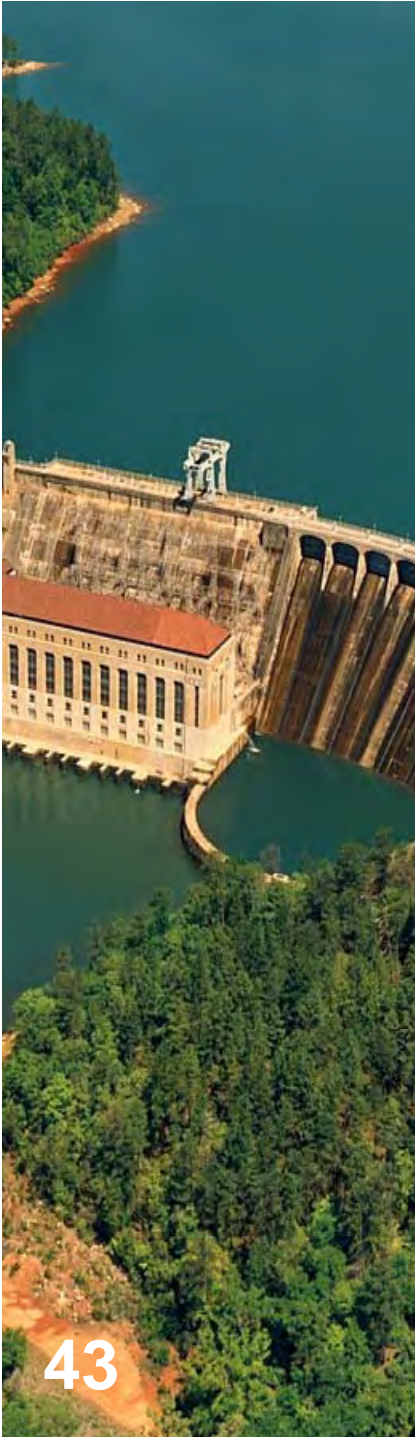
Study Goal

- Determine the effects of the proposed rule curve changes on downstream recreation resources



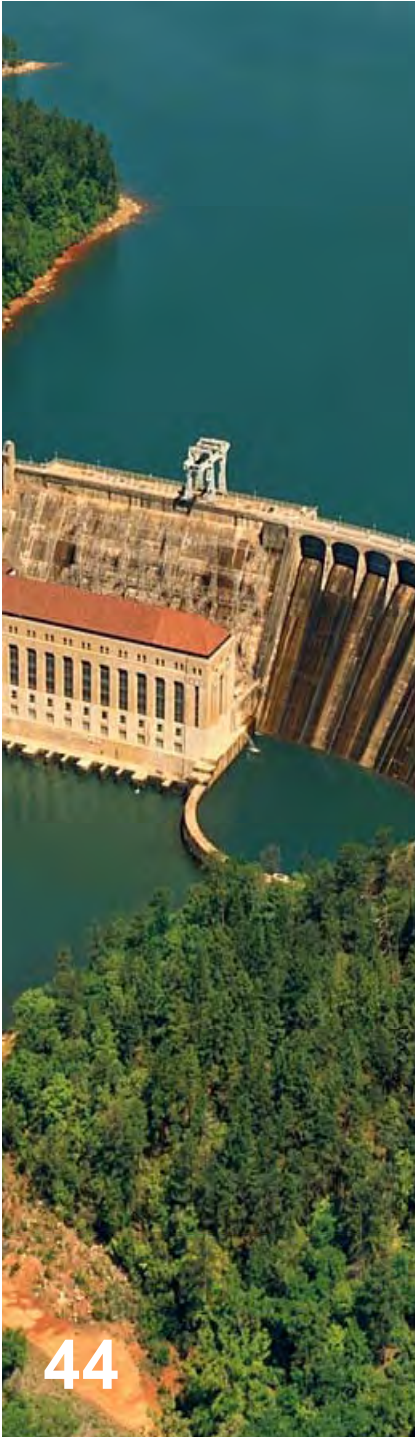
Completed To Date

- Reports:
 - Draft report distributed on May 19, 2010
 - Final report on or before September 30, 2010



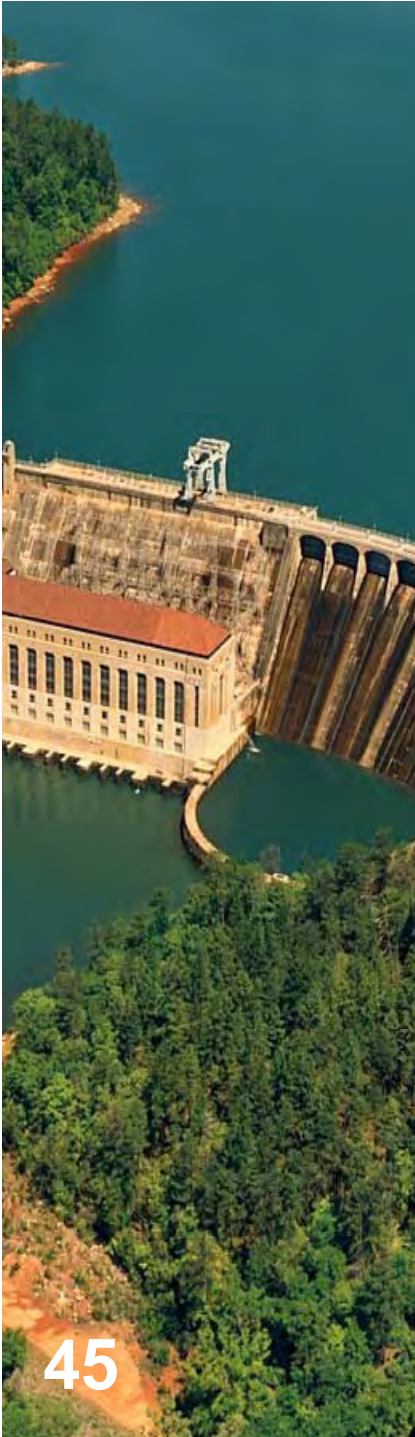
Summary

- Possible effects on recreational resources resulting from proposed changes to the flood control guide curve at Lake Martin were determined using an analysis of secondary data
 - Determined from LIDAR data
 - Establish the frequency these elevations would be reached under the various alternatives



Summary, continued

- **Potential Flooding Effects at Downstream Recreation Sites:**
 - Minimal impacts to the identified recreation sites
 - At 3 sites, there would be no changes to recreation access
 - 3 sites would experience some effects on recreation access



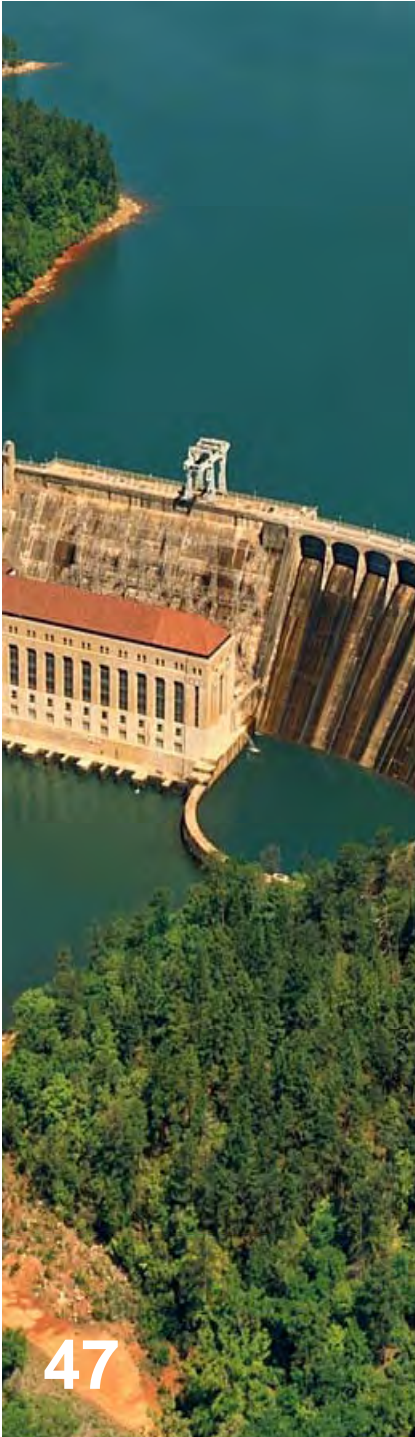
Summary, continued

- **Potential Flow Changes and Their Effects on Downstream Recreation**
 - The early spring fill scenario had minimal effects on the number of days the flows averaged in the preferred range for whitewater boating
 - The various winter pool alternatives generally had negative effects on preferred flows for whitewater boating
 - The fall extension mainly affected flows less than 10,000 cfs



Summary, continued

- **Potential Flow Changes and Their Effects on Downstream Recreation**
 - Mostly negative effects of the early spring fill when combined with the various winter pool alternatives
 - The fall extension when modeled with the various winter pool alternatives resulted in mostly negative impacts to preferred whitewater flows



Summary, continued

- **Potential Flow Changes and Their Effects on Downstream Recreation**
 - Swimming and rock climbing were also popular activities occurring in the Thurlow tailrace, these types of users would probably benefit from lower flows in the river



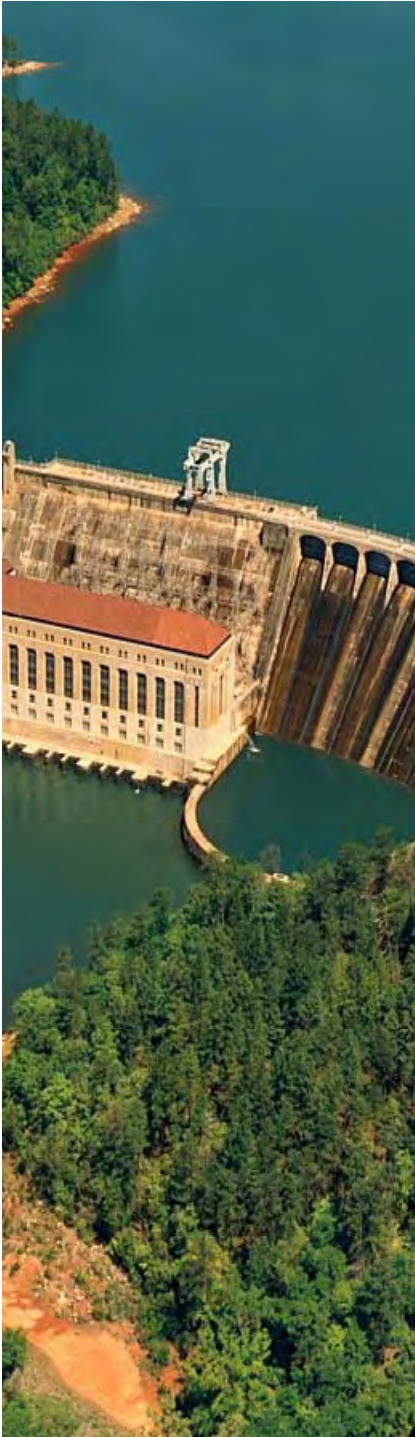
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Questions



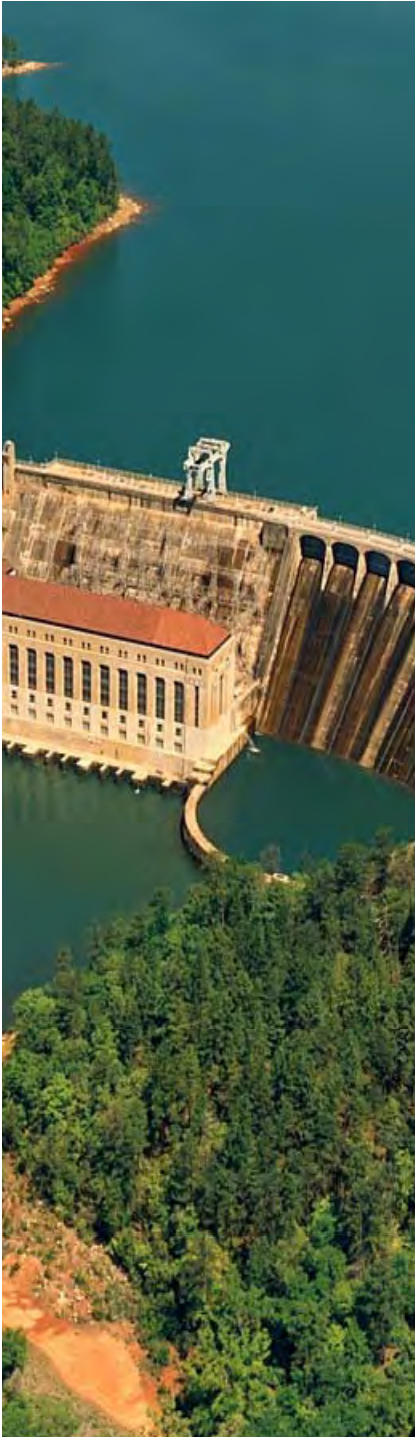
Effects of Changes in Water Level Management on Usage of Lake Martin for Recreation and Related Economic Activity 12(g) and 12(h)





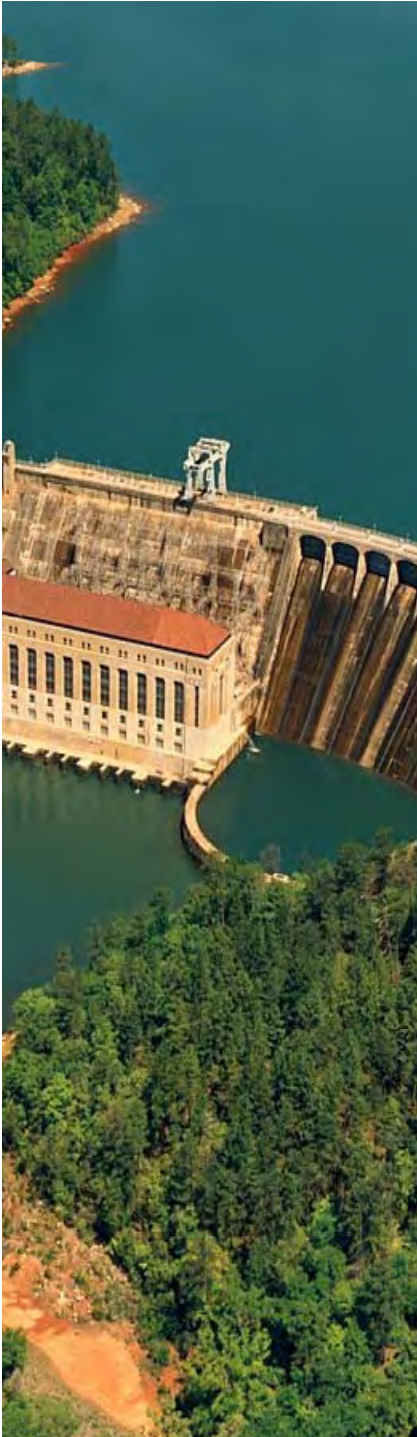
12 (G) – Effects Of Raising Winter Pool Level and Increasing the Duration Of Summer Pool On Recreation Use:

- Estimate total recreational use of the lake, by month and by day type (weekday, weekend, holiday)
- Estimate recreational user characteristics (type of activity, type of residency, demographics)
- Estimate the effects of six different water levels on recreational use



12 (H) – Effects Of Raising Winter Pool Level and Increasing the Duration Of Summer Pool On Lake Martin Economic Indicators:

- Estimate trip and equipment expenditures related to recreational use of Lake Martin
- Estimate expenditures associated with construction and/or maintenance of houses/shoreline structures
- Estimate current market value of shoreline property
- Estimate effects of different water levels on expenditures and shoreline property values
- Estimate the current economic impacts of recreational use on the local and statewide economies and the economic impacts from different water level scenarios



Process

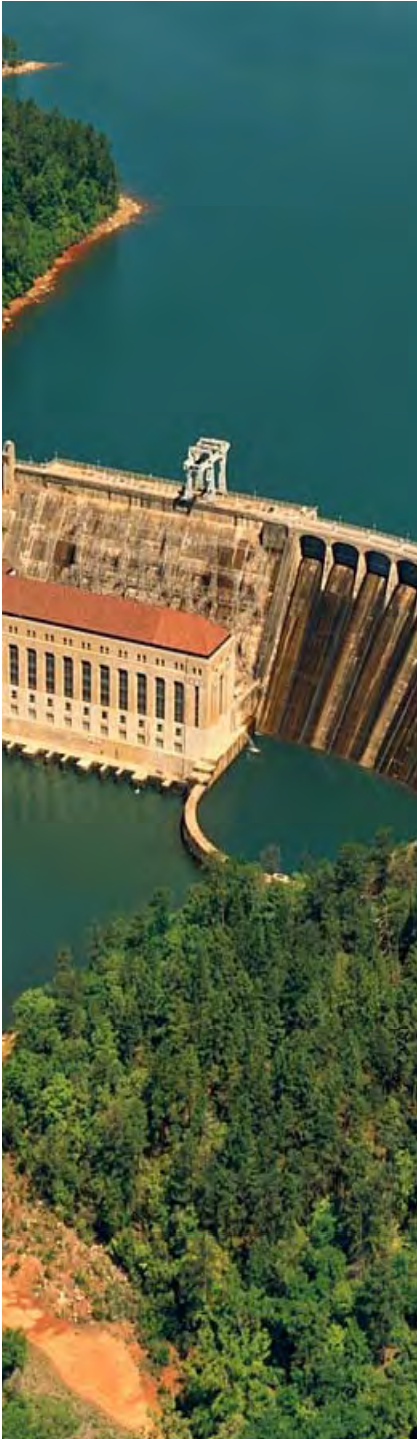
- Public Input:
 - Kick-off meeting to gain feedback and insights from local stakeholders
 - Two business roundtables to ground-truth initial results:
 - Real estate representatives
 - Local business leaders



Task I: Recreational Use and Expenditure Survey

PURPOSE WAS TO ESTIMATE:

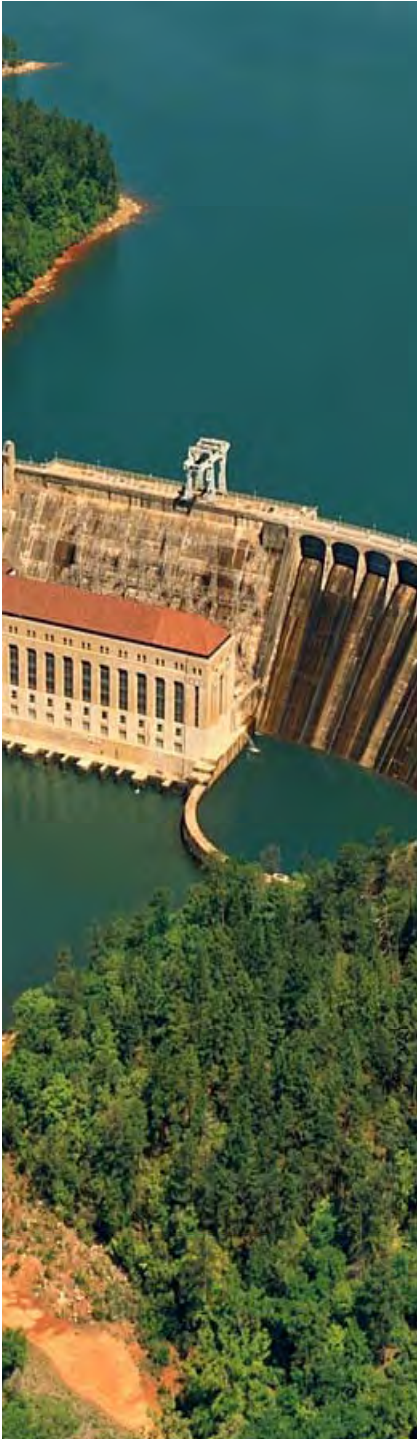
- Recreational use of the lake [12(g)]
- Recreational user characteristics (activity participated in, shoreline property owner, etc.); [12(g)]
- Estimate trip expenditures [12(h)]
- Results used to estimate:
 - Economic impact of current lake use and potential changes per water level scenario [12(h)], and
 - Estimate each scenario's potential impact on recreational use. [12(g)]



Task I: Recreational Use and Expenditure Survey

Method:

- On-site survey (June 2009 to 2010)
- Sampling dates and locations randomly selected
- Lake Martin(168 sampled days) plus 11 public access sites and tailwater sampling (42 sampled days each)



Task II: Shoreline Property Owners Survey

PURPOSE WAS TO ESTIMATE:

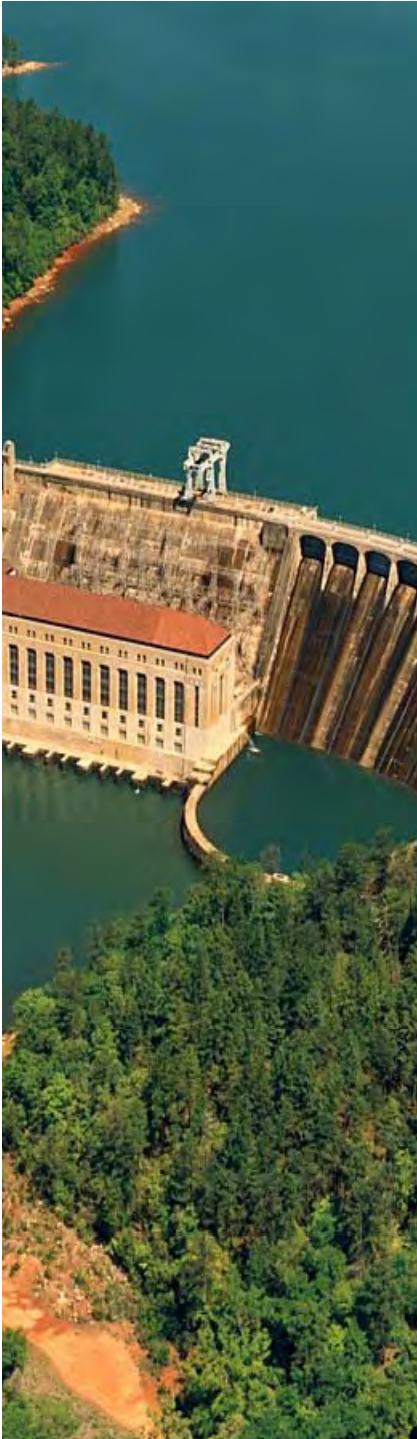
- Shoreline property owners characteristics, recreational use and their property [12(h)]
- Months when docks become unusable [12(h)]
- Current market value of shoreline property [12(h)]
- Construction and maintenance costs [12(h)]
- Results used to estimate:
 - economic impact of construction and maintenance associated with costs; [12(h)]
 - each scenario's potential impact on shoreline property values. [12(h)]



Task II: Shoreline Property Owners Survey

Method:

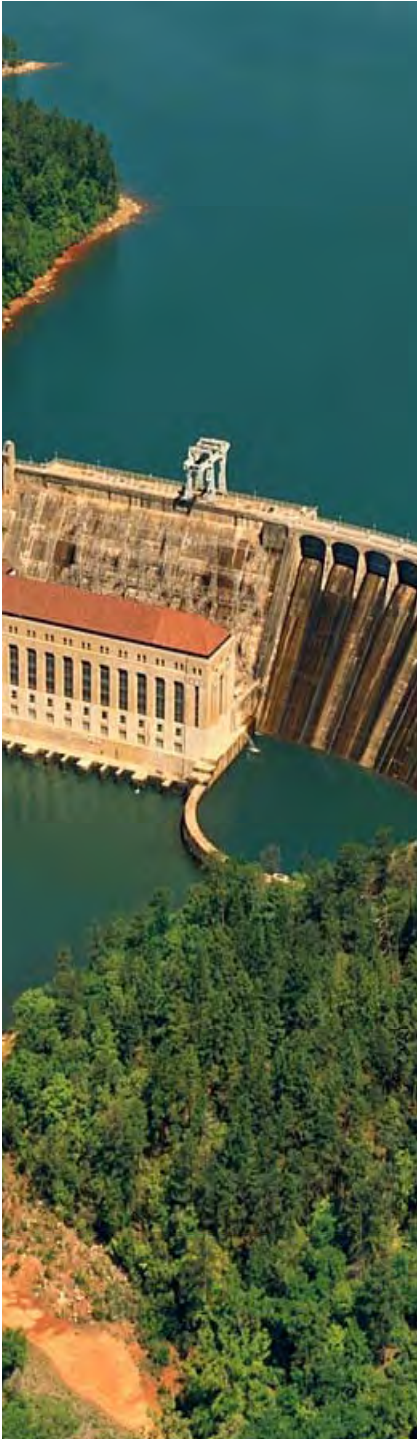
- Mail survey of shoreline property owners
- Six different versions – one per scenario – were distributed
- Post card announcement and two rounds of surveys sent in Nov/Dec 2009
- 10% of privately owned shoreline parcels were randomly selected (N = 690)
- 59% response rate achieved!



Task III: Lake Martin Business Survey

PURPOSE WAS TO ESTIMATE:

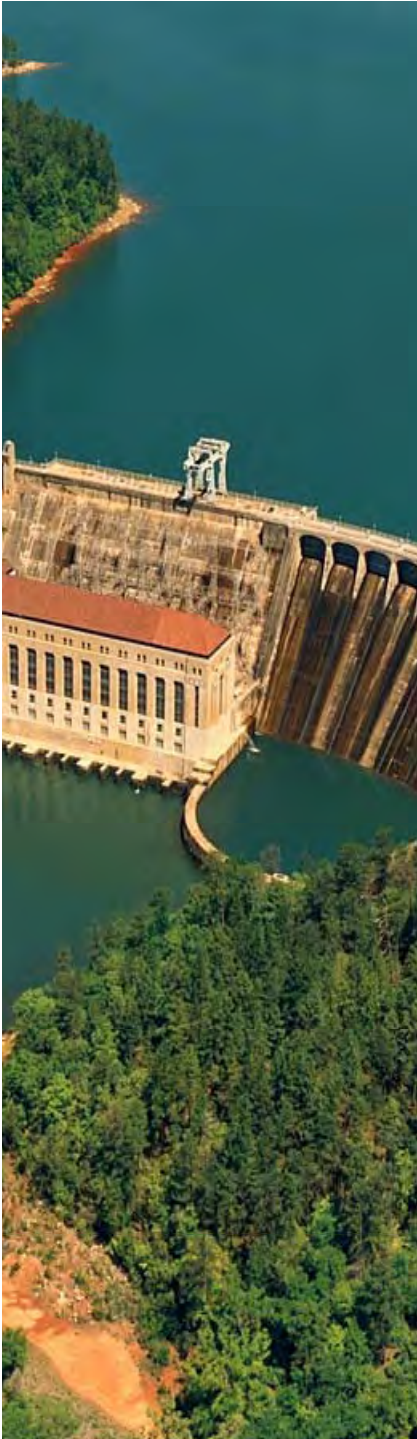
- Characteristics of business and business activity (e.g., on lake or off lake, type of business, gross annual sales, etc.) [12(h)]
- Effects of increasing the duration of the summer pool and increasing the elevation of winter pool on business activity [12(h)]



Task III: Lake Martin Business Survey

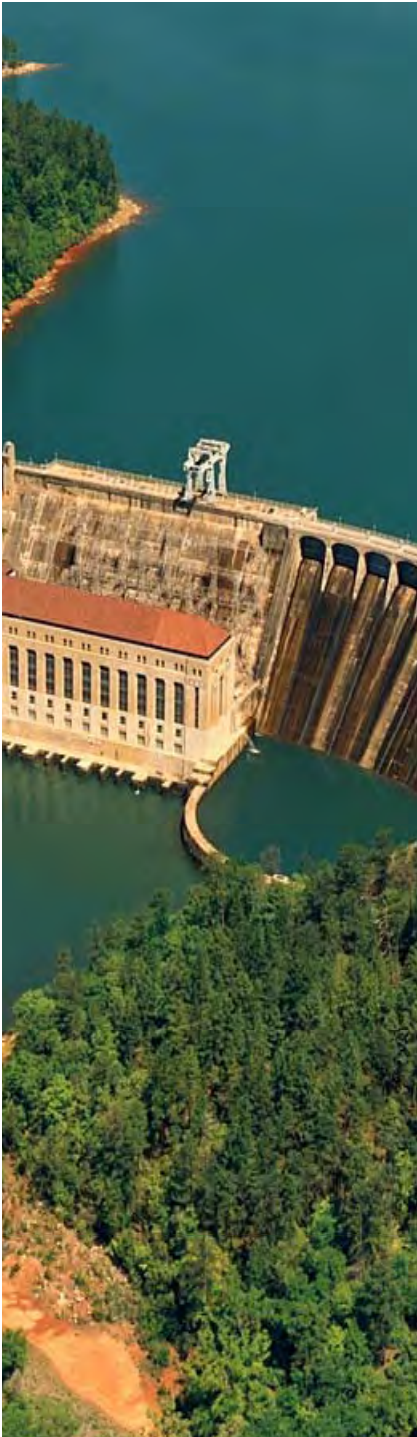
Method:

- Sale tax data were not available to support a regression-based statistical model
- A DELPHI survey was used (Rand Corp/DoD):
 - Two rounds of email-based surveys supported by direct phone calls
 - Draft results were reviewed with other local businesses to ground-truth results
- Existing data sources used to report size & details of the local business community



PRELIMINARY RESULTS

Recreational Use of Lake Martin

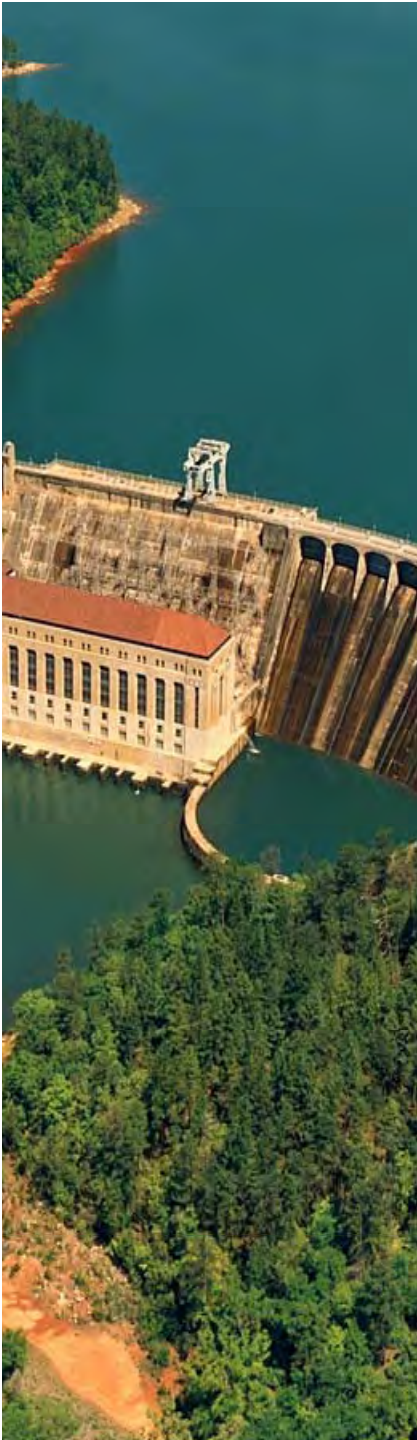


Reservoir Activity	User-Hours
No primary activity	171,696
Pleasure boating	933,255
Sailing	23,630
Water-skiing/tubing/other tow	171,258
Jet skiing	162,203
Canoeing/kayaking	37,452
Fishing (from boat)	148,883
Fishing (from shore)	35,911
Wildlife Observation	2,118
Picnicking	1,582
Tent or vehicle camping	27,760
Sightseeing	13,564
Swimming/beach use	184,819
Windsurfing	1,792
Hunting	1,792
Other	12,305
Sub-total	1,930,021
Tailwater activity	12,392
Total	1,942,413

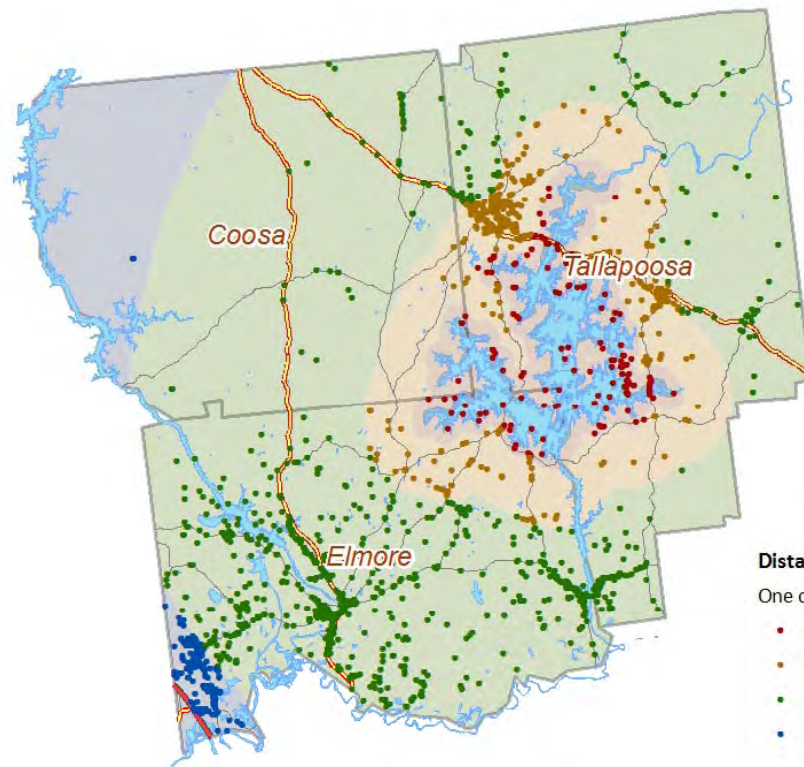
Trip Expenditures (dollars spent per day of recreation)



Expenditure category	Visitors		Permanent Residents	
	N	Mean	N	Mean
Transportation	666	\$8.88	278	\$12.53
Food & beverages	666	\$7.98	277	\$13.42
Trip-related gear and services	666	\$1.78	277	\$1.46
Lodging	666	\$1.14		na
Miscellaneous	666	\$1.01	277	\$3.25
Total	666	\$20.81	277	\$30.60



Businesses in the Lake Martin Region

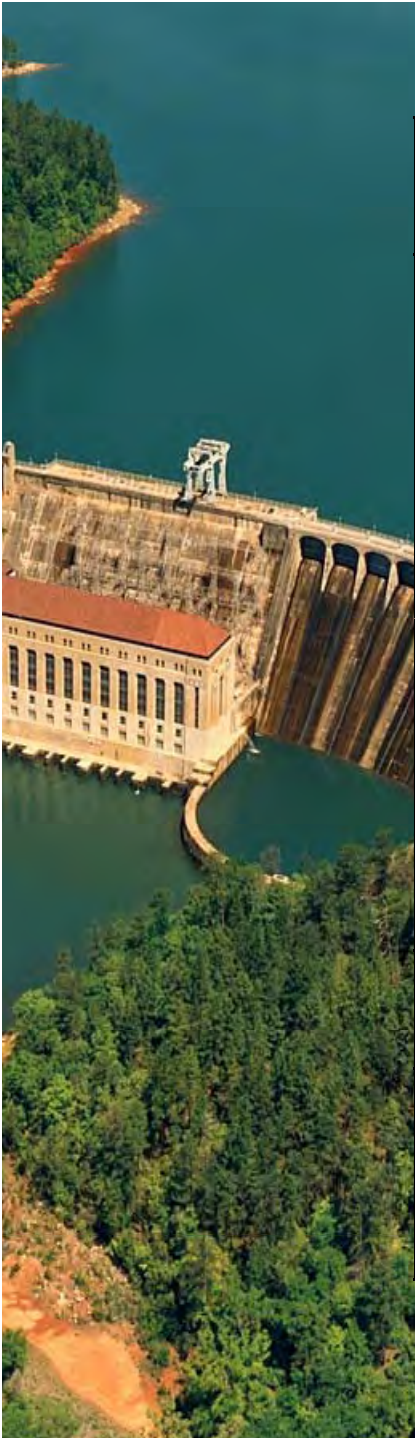


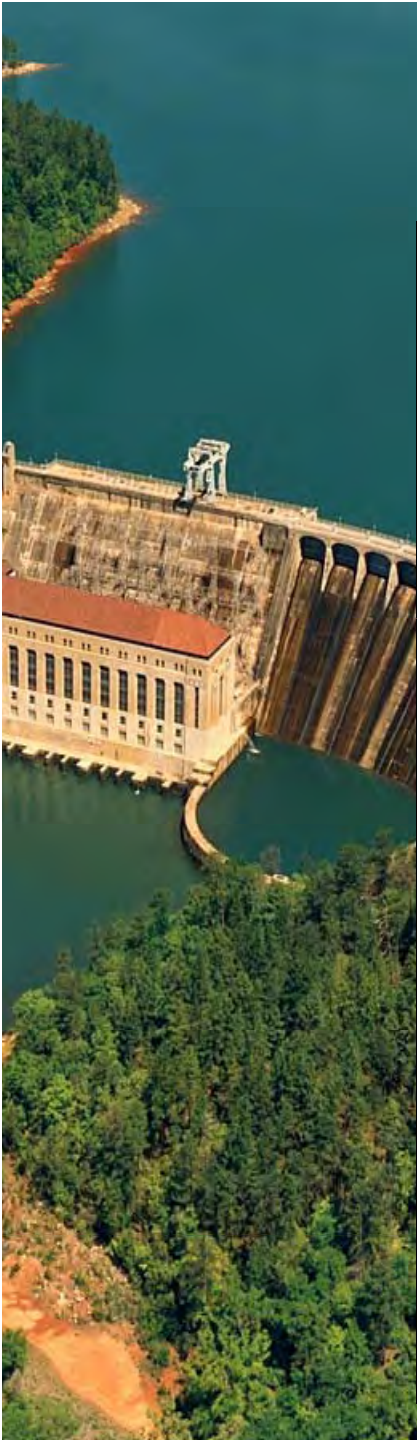
Distance to Lake Martin
One dot = One business

- Less than 1 mile
- 1 to 5 miles
- 5 to 25 miles
- Greater than 25 miles

Number of Businesses, by Size (\$\$)

	Coosa		Elmore		Tallapoosa		Total	
	#	%	#	%	#	%	#	%
Less Than \$500K	38	28.4%	764	40.1%	504	41.0%	1306	40.0%
\$500K-\$1 Million	23	17.2%	358	18.8%	230	18.7%	611	18.7%
\$1 - \$2.5 Million	19	14.2%	276	14.5%	176	14.3%	471	14.4%
\$2.5 - \$5 Million	8	6.0%	93	4.9%	65	5.3%	166	5.1%
\$5 - \$10 Million	4	3.0%	37	1.9%	23	1.9%	64	2.0%
\$10 - \$20 Million	2	1.5%	20	1.1%	16	1.3%	38	1.2%
\$20 - \$100 Million	0	.0%	28	1.5%	11	.9%	39	1.2%
\$100-\$500 Million	0	.0%	3	.2%	2	.2%	5	.2%
Over \$1 Billion	0	.0%	0	.0%	1	.1%	1	.0%
Unknown	40	29.9%	324	17.0%	201	16.4%	565	17.3%
Total	134	100%	1903	100%	1229	100%	3266	100%
Average Annual Sales per Business	\$1,427,053		\$2,048,210		\$3,296,087		\$2,501,534	



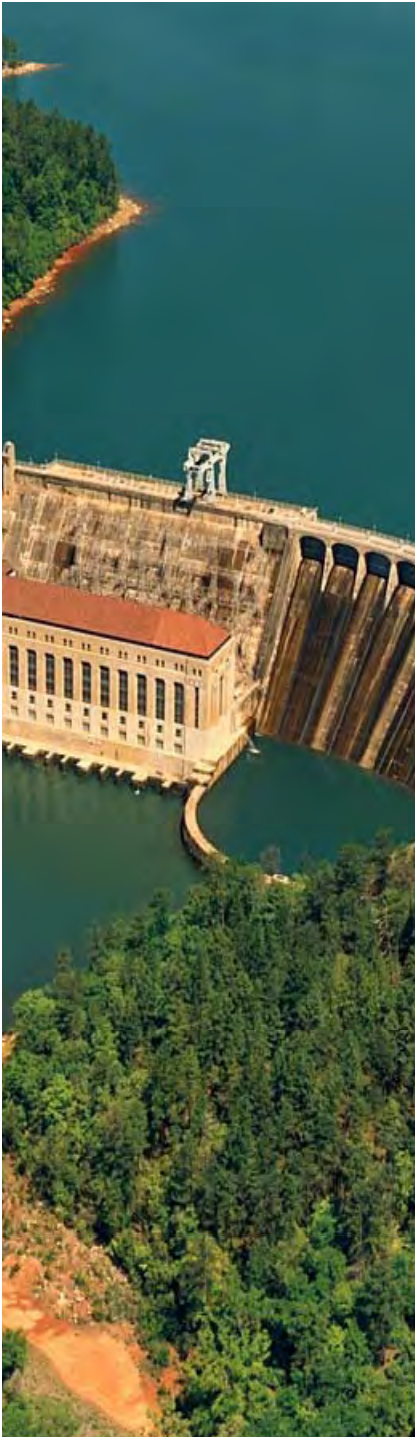


Number of Businesses, by Years in Business

	Coosa	Elmore	Tallapoosa	Total
< 5 yrs	32.1%	39.0%	32.6%	36.3%
5 - 9 years	19.4%	16.4%	14.8%	15.9%
10 - 14 years	15.7%	13.1%	13.8%	13.4%
15 - 19 years	9.0%	9.8%	9.6%	9.7%
20 - 24 years	13.4%	7.1%	10.2%	8.5%
25+ years	10.4%	14.6%	19.0%	16.1%
Total	100%	100%	100%	100%

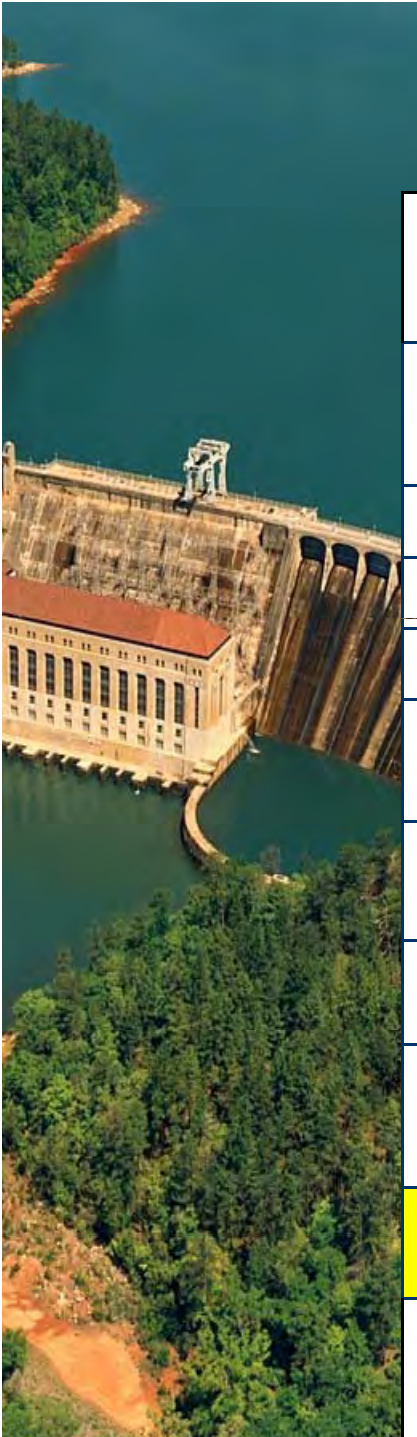
Regional Businesses by Industry

	Coosa		Elmore		Tallapoosa		Total	
	#	%	#	%	#	%	#	%
Agriculture, Forestry, & Fishing	12	9.0%	213	11.2%	112	9.1%	337	10.3%
Mining & Construction	6	4.5%	68	3.6%	46	3.7%	120	3.7%
Manufacturing	11	8.2%	83	4.4%	44	3.6%	138	4.2%
Transportation & Utilities	31	23.1%	443	23.3%	274	22.3%	748	22.9%
Wholesale & Retail Trades	8	6.0%	168	8.8%	114	9.3%	290	8.9%
Restaurants & Lodging	6	4.5%	101	5.3%	82	6.7%	189	5.8%
Services	50	37.3%	441	23.2%	320	26.0%	811	24.8%
Finance, Insur., & Real Estate	9	6.7%	365	19.2%	227	18.5%	601	18.4%
Public Administration	1	.7%	21	1.1%	10	.8%	32	1.0%
Total	134	100%	1903	100%	1229	100%	3266	100%



Regional Industries: Annual Revenues

Industry Sector	In Millions of Dollars			
	Coosa	Elmore	Tallapoosa	Total
Agriculture, Forestry, and Fishing	\$2.5	\$21.5	\$14.9	\$39
Mining	\$4.1	\$3.7	\$8.7	\$17
Construction	\$24.8	\$307.7	\$155.5	\$488
Manufacturing	\$79.6	\$315.3	\$437.7	\$833
Transportation & Utilities	\$23.8	\$170.7	\$55.4	\$250
Wholesale Trade	\$81.5	\$946.9	\$266.7	\$1,295
Retail Trade	\$48.3	\$927.9	\$469.2	\$1,445
Finance, Insurance, and Real Estate	\$6.2	\$295.0	\$350.1	\$651
Services	\$94.0	\$986.9	\$740.8	\$1,822
Total	\$365	\$3,976	\$2,499	\$6,839





**Remaining results
now under review.**

**Complete results to
be released this fall.**



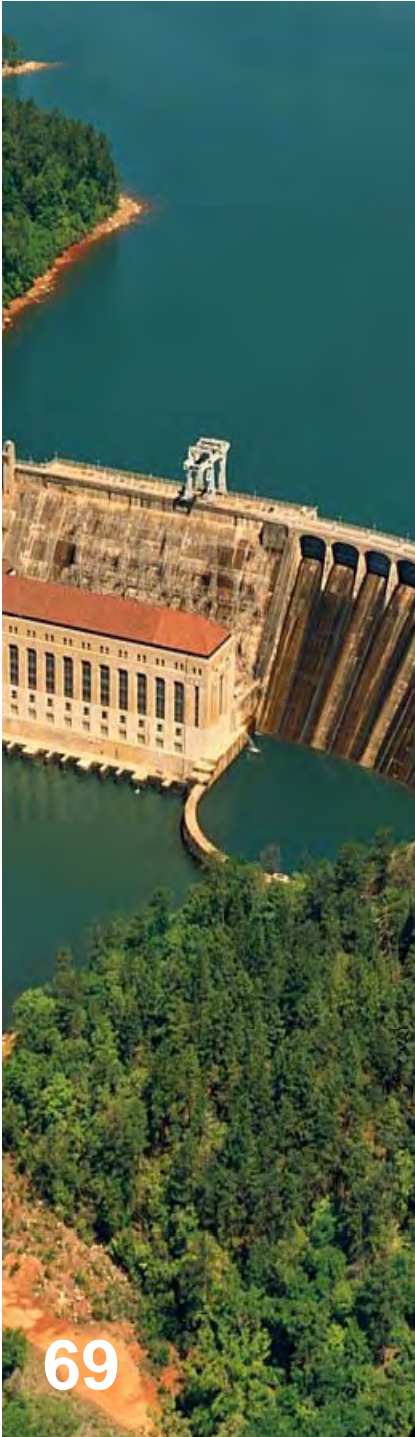


MIG 4 – Shoreline Management

Study Plan 13 – Shoreline Management Program

September 14, 2010





Study Goal

- Develop and implement a Shoreline Management Program (SMP) for the Martin Project
 - identify project land uses and project land use classifications
 - determine Lake Martin shoreline management policies
 - reiterate the permitting program regulations
 - establish and promote best management practices around Lake Martin



Completed to Date

- Reports:
 - Draft SMP on or before September 30, 2010
 - Final SMP on or before January 31, 2011



Summary

- Alabama Power received comments on this draft from several MIG4 members
- Working on addressing comments and evaluating results from other relicensing studies to incorporate into the final draft SMP



Questions

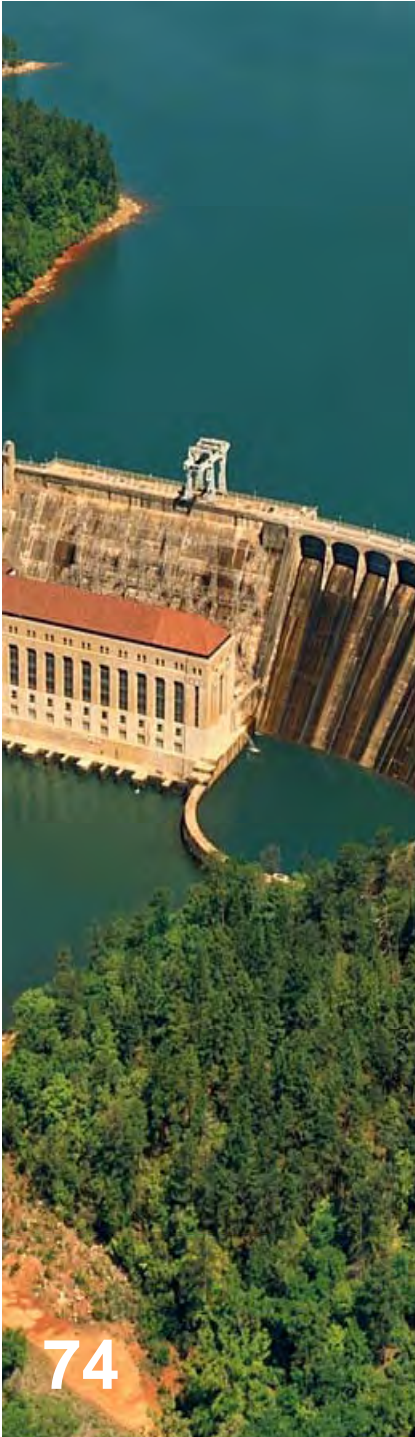


MIG5 - Recreation

Study Plan 14 – Recreation Plan

September 14, 2010

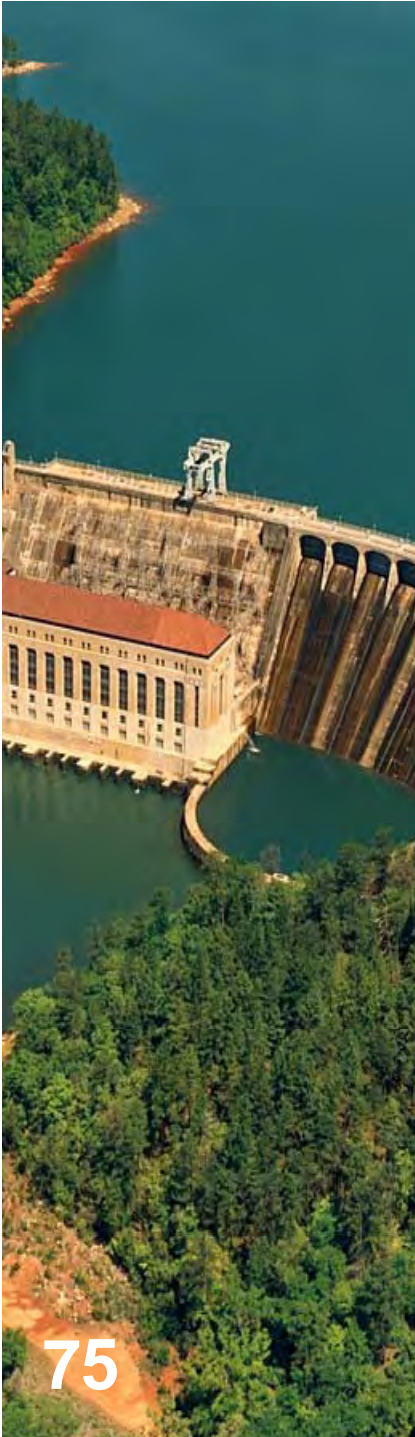




Study Goal

Develop and implement a Recreation Plan for the Martin Project

- describe the Project and existing facilities
- discuss the process of marking hazards in Lake Martin with buoys and the role of the Alabama Marine Police
- discuss current and future use estimates and facility inventories
- propose plans for recreational facilities in the future



Completed to Date

- Alabama Power will distribute the draft plan on or before September 30, 2010 and the final plan on or before December 31, 2010



Questions

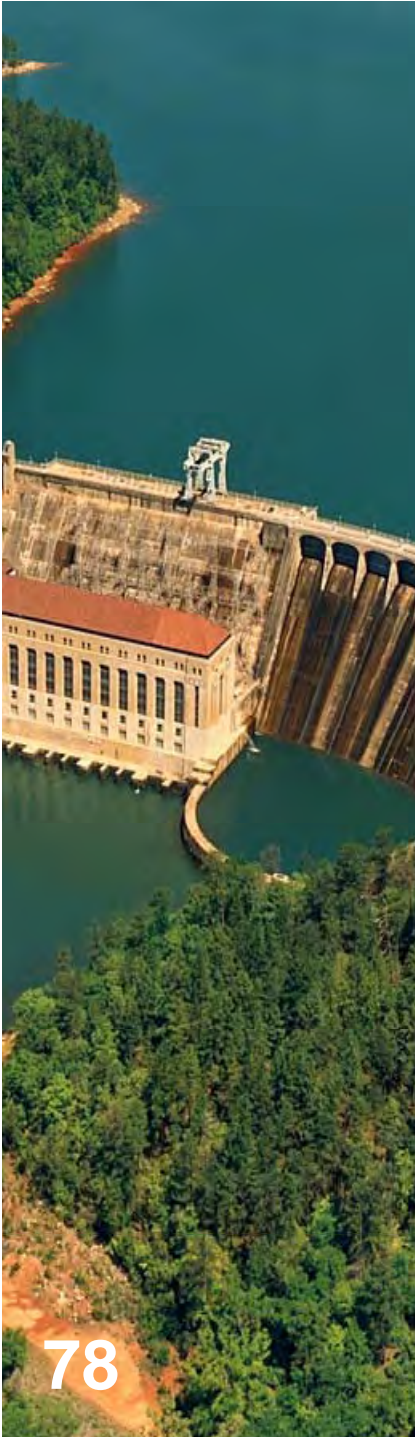


MIG6 – Cultural Resources

Study Plan 15 – Cultural Resources Programmatic Agreement (PA) and Historic Properties Management Plan (HPMP)

September 14, 2010





Study Goals

- Develop a Draft Programmatic Agreement (PA)
- Develop the Historic Properties Management Plan (HPMP) for the Martin Project to be made part of the Draft Programmatic Agreement (PA)



Completed to Date

- Alabama Power plans to distribute Draft Programmatic Agreement to consulting entities on or before September 30, 2010



Questions