



US Army Corps
of Engineers®

**DRAFT
ENVIRONMENTAL ASSESSMENT
SHORELINE MANAGEMENT PLAN
J. STROM THURMOND LAKE**

**US ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT**

July 2016

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1.0 INTRODUCTION

The J. Strom Thurmond Project (Thurmond) is operated by the U.S. Army Corps of Engineers (USACE) and includes approximately 71,341 acres of water surface area and 78,885 acres of land. Flowage easements are maintained across the following lands: 4,118 acres on US Forest Service property, 241 acres of Boy Scouts of America property, and a total of 324 acres on other smaller properties. USACE is the federal agency responsible for maintaining and operating the dam, as well as the lands and water that comprises and surrounds the lake.

Engineering Regulation (ER) 1130-2-406 Project Operation – Shoreline Management at Civil Works Projects, requires that a Shoreline Management Plan (SMP) be prepared for each USACE project where private shoreline use is allowed. The current Thurmond SMP was approved in 2001. The ER also requires the SMP be reviewed at least every 5 years and revised as necessary. SMP updates must comply with the National Environmental Policy Act of 1969 (NEPA), as amended and include public participation to the maximum extent practicable.

This document evaluates the impacts associated with implementation of the proposed updated SMP for the Thurmond Project. This EA addresses the environmental effects of the changes to the existing conditions as a result of the proposed 2016 Draft Shoreline Management Plan (Draft SMP).

1.1 Background

Pursuant to ER 1130-2-406 Shoreline Management at Civil Works Projects, it is the policy of the USACE to protect and manage shorelines of all Civil Works water resources development projects in a manner that promotes the safe and healthful use of the shorelines by the public while maintaining environmental safeguards to ensure a quality resource for use by the public. The objectives include maintenance of the aesthetic and environmental characteristics of the Reservoir for the full benefit of the general public.

1.2 Description of the Project Area

The Thurmond Project is located on the Savannah River near the southeastern margin of the Piedmont Plateau Region, and comprises parts of McCormick and Abbeville counties in South Carolina; and parts of Columbia, McDuffie, Warren, Wilkes, Lincoln and Elbert Counties in Georgia. The Reservoir has a shoreline of approximately 1200 miles including 115 miles of island shoreline, with the entire project comprising 150,000 acres of public land and water. Thurmond Dam impounds a lake that stretches nearly 40 miles up the Savannah River and 26 miles up to Little River, Georgia. Other main tributaries include Little River, Benningsfield Creek and Hawe Creek in South Carolina and Broad River, Soap Creek, Fishing Creek, Keg Creek, Pistol Creek and Murray Creek in Georgia.

1.3 Shoreline Allocation

Land use allocations provide the basic framework for the development, management, and operation of all Thurmond resources and facilities. The SMP for the Thurmond Project divides land uses into five categories, as follows:

A. Limited Development Shoreline. Limited Development Shoreline refers to areas where certain specific private uses may be authorized if a permit is obtained. Applications are reviewed "first come/first serve" and are based on individual merit. Several resource management considerations must be satisfied prior to approving or denying a permit including density of development, navigation, environment, safety, and site conditions.

B. Protected Shoreline. Protected Shorelines are designated to maintain or restore aesthetic values; to protect fish and wildlife habitat and other environmental values; to protect cultural, historical and archaeological resources; to protect channels for navigation; to restrict structures from water too shallow for navigation; and to protect areas that are subject to excessive siltation, erosion, rapid dewatering, or exposure to high wind, wave or currents. No permits for new private structures or utilities will be authorized in these areas. However, permits may be granted for minor modifications to vegetation, such as creating a path to the shoreline if it is determined that the activity will not adversely impact the environmental values or physical characteristics that resulted in that area being protected. Improved pathways or walkways will not be authorized in areas classified as protected. Islands within the lake are designated as Protected Shoreline unless they are part of a recreation area or outgrant.

C. Public Recreation Shoreline. Public Recreation Shoreline consists of lands designated in the Project's Master Plan for present, or future, intensive recreational development. No permits for private uses are issued in areas with this designation.

D. Special Use Shoreline. Special Use Shorelines are areas outgranted to quasi-public organizations, local and state agencies, and other Federal agencies for specialized uses. Permits for floating facilities and certain land based activities may be permitted only to the leasee in this area designation.

E. Prohibited Access Shoreline. Prohibited Access Shoreline areas are reserved for project operation and include lands located in proximity to the hydropower structure, operational areas, and water intake structures.

2.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The Thurmond SMP was last updated in January 2001 (Appendix B). Over the past 14 years, changes have occurred that warrant an update to the SMP. These include: changes in policy, changes in regulations, increases in economic growth, increase in surrounding community growth and increases in recreational use. Pursuant to ER 1130-2-406, the objective of the updated SMP is to maintain a balance between permitted private uses, long-term natural resource protection, and public recreation opportunities. Specifically, ER 1130-2-406 states the intended purpose of an SMP is to protect desirable environmental characteristics of Civil Works lake projects and restore shorelines where degradation has occurred through private exclusive use. The ER states that the plan must protect public lands and private investments and honor any past commitment. Public participation is also encouraged to the fullest extent.

The proposed SMP update meets the following goals:

- Incorporates updates to policies and regulations pertaining to the shoreline of Thurmond Lake.
- Maintains aesthetic and environmental characteristics of the lake for the full benefit of the general public.
- Addresses shoreline allocations (zoning), rules, regulations, and other information relative to the Shoreline Management Program.
- Ensures that program management actions are based on current information and regulations through collaboration with the public, stakeholders, and subject matter experts.

3.0 ALTERNATIVES

Alternatives that meet the objectives and goals described above were considered during development of the proposed SMP. These alternatives are described below.

3.1 Proposed Shoreline Management Plan (Preferred Alternative)

The Proposed SMP was developed in accordance with the criteria outlined within the USACE shoreline management regulation (ER 1130-2-406). The preferred alternative will meet Thurmond shoreline management goals and responsibilities while protecting the natural environment. Some of the 2001 SMP will remain unchanged with the proposed SMP. The most significant proposed changes to the SMP are shown below in Table 1:

Table 1: Comparison of Changes Between 2001 SMP and Proposed SMP

Topic	2001 SMP	Proposed SMP
<i>Access Requirements</i>	Fee simple ownership of adjacent private land. Public roads do not serve as legitimate access. However, public roads between adjacent private property and public land do constitute legitimate access.	Fee simple ownership of adjacent private land. Public roads that terminate at public land do not serve as legitimate access. However, public roads between adjacent private property and public land do constitute legitimate access. <i>(Added clarification of terminus roads). If one structure (house, other dwelling, garage, etc.) or other supporting feature (driveway, swimming pool, porches, etc.) occupies more than one identified piece of property, the properties together will be considered one lot and will meet the criteria for consideration of one permit and license. In the event a structure/feature is built across separate properties for which permits were issued prior to construction of the structure/feature, previous permits, as necessary, will be cancelled and associated facilities removed so only one permit remains for the subject property.</i>
<i>Site Requirements</i>	Based on shoreline allocation map. Permits will not be issued in wetlands, environmentally sensitive areas or cultural resource areas.	<i>Minimum of 20' common frontage with public land. The adjacent private property must be of a practical design or plat (extremely shallow or narrow lots, know and finger or flag lots, will not qualify). Applicants for a permit or license for adjacent undeveloped property must submit a survey identifying that public land located with a 90 degree trajectory from the common boundary.</i>
<i>Designs for Persons with Disabilities</i>	Special deviations from design requirements for structures may be permitted to accommodate disabled members of adjacent landowner's household. Must have justifiable documentation or eligible for federal or state assistance.	Special deviations from design requirements for structures may be permitted to accommodate disabled members of adjacent landowner's household. Must have <i>justifying documentation and need for accommodation from a medical provider or Federal or state agency.</i>
<i>Dock Facility Location</i>	Common boundary line considered access area for purpose of floating facility location. Dock placed in front of this common boundary line frontage. Dock facilities will not interfere with navigation or create safety hazard.	<i>Clarification of "in front of" - Located in front of the common boundary line frontage based on a 90° survey plat. Dock placement within this area determined by Park Ranger. No cross-over of adjacent facilities allowed.</i>

Table 1: Comparison of Changes Between 2001 SMP and Proposed SMP

Topic	2001 SMP	Proposed SMP
<i>Private Floating Dock Size</i>	Boat Dock w/Slip: 720 sq. ft., Footprint includes surface water occupied by structure (including slip and “dead space”). Roof overhangs up to 24”. Staircases overhanging edge will be considered as additional square footage.	Boat Dock w/Slip: 720 sq. ft., Footprint includes surface water occupied by structure (including slip and “dead space”). Roof overhangs up to 24”. <i>Staircases, sundecks, jet ski lifts and other structural additions included in total footprint of facility. Open water surface encumbered by structures are also included in overall footprint and may not exceed 720 sq. ft.</i>
<i>Community Docks</i>	A structure with one or more boat mooring slips shared by more than one individual. Combined area of first two slips cannot exceed 1160 square feet. Each additional authorized slip may be up to 454 square feet. Community dock agreement must be signed by designated agent and all members. Community dock members must permit other individuals to add on to the dock until the maximum size is reached. In established developments, one slip will be provided for each dockable lot in the designated area identified for inclusion on the dock. One slip will be planned for every 70 feet of dockable boundary line in the designated area. The number of slips may not exceed the number of private individual docks that would be allowed for a given area.	Added - Only community docks will be authorized in all new county certified, platted subdivisions approved after implementation of this plan. These developments must establish a homeowners association or other governing entity that will work directly with the Thurmond Lake Office on all permit and license actions. All community dock placements will be pre-determined within specific limited development allocation shoreline locations adjacent to the proposed development. The number of moorages/slips allowed on the community docks will be determined upon review of the submitted subdivision plat. Typically a maximum of 2 moorages/slips for every 82 feet of limited development zoned shoreline will be authorized. Moorage/slip availability within the community docks will be determined by the homeowners association. The homeowners association will notify the Thurmond Lake Office of which subdivision lots they deem feasible for moorage.
<i>Docks in Private Club Sites</i>	Not addressed.	<i>Adjacent private club site must be in common ownership. Individual and community docks allowed. Permits issued to club president as “Club Permitted Facilities”. Maximum number of moorages, including private docks and community dock slips, determined by amount of dockable boundary divided by 70 feet.</i>

Table 1: Comparison of Changes Between 2001 SMP and Proposed SMP

Topic	2001 SMP	Proposed SMP
<i>Courtesy Dock</i>	Permits for courtesy docks to be used for temporary moorage adjacent to community access points may be approved. Courtesy docks will be located within 150 feet of the community access corridor. Courtesy docks may be constructed to a minimum of six feet and a maximum of 10 feet wide, and a minimum of 20 feet and a maximum of 60 feet in length. Normally, one courtesy dock will be allowed per subdivision or development. Additional courtesy docks must be justified by need and will be approved on a case by case basis. Minimum spacing criteria is 150 feet from existing floating facilities due to increased boating activity. Courtesy docks can be utilized for temporary moorage only.	<i>No new courtesy dock permits will be issued. Existing courtesy dock permits authorized under previous plans will be reissued provided docks are maintained in safe condition and are not modified in size or location. Upon modification or becoming dilapidated beyond repair, the permit will not be reissued and the dock must be removed upon permit expiration. Any dilapidated dock must be repaired or removed immediately.</i>
<i>Structural Support System</i>	Must submit plans approved by a state licensed engineer to assure structural safety. If using local dock builder, plans must reference dock builder's master plan on file at Thurmond Project Office.	Must submit plans approved by a state licensed engineer to assure structural safety. If using local dock builder, plans must reference dock builder's master plan on file at Thurmond Project Office. <i>All installed docks with a second level must display a plate identifying the maximum rated weight capacity of the second level.</i> All dock installations and approved modifications must be completed within one year of approval.
<i>Structural Materials</i>	Structural materials must be designed for outdoor use. Creosote, arsenic or penta treated wood is not acceptable.	Structural materials must be designed for outdoor use. <i>Non-rigid structures and floating lift structures are not approved and will not be permitted. Creosote or penta treated wood is not acceptable.</i>

Table 1: Comparison of Changes Between 2001 SMP and Proposed SMP

Topic	2001 SMP	Proposed SMP
<i>Dock Anchorage</i>	Dock must be physically attached to shore with catwalk and cables. Cables must be stainless steel or galvanized. Cables may not be attached to trees. During low water, temporary anchor pins are allowed be 330' msl and must remove upon return to 330' msl.	Dock must be physically attached to shore with catwalk and cables. Cables must be stainless steel or galvanized. Cables may not be attached to trees. During low water, temporary anchor pins are allowed be 330' msl and must be removed upon return to 330' msl. <i>Deleted – Swim Floats and mooring buoys must be anchored securely to prevent unnecessary drift. Moved to section on mooring buoys. Permits for swim floats will be grandfathered to the current owner and may be reissued. Permits will not be issued to subsequent owners upon sale or transfer of ownership (See Slides, Diving Platforms, Swim Floats and Diving Boards)</i>
<i>Boat Dock Roof and Sundecks</i>	Roofs may be gabled or flat and may overhang the dock up to 24 inches.	Roofs may be gabled or flat and may overhang the dock up to 24 inches. <i>No third level decks will be approved or permitted. All new roofs must be a neutral earth tone.</i>
<i>Dock Furniture, Household Items, etc.</i>	Although dock facilities are permitted for the purpose of providing moorage for vessels, it is recognized that docks may be used for other leisure activities where furniture is desired. Permanently mounted chairs and/or benches are permitted on boat docks; however, such items may not impede safe access on the structure. Indoor furniture or household type items that denote habitation (<i>such as, but not limited to, couches, stoves, sinks and refrigerators</i>) are prohibited.	Although dock facilities are permitted for the purpose of providing moorage for vessels, it is recognized that docks may be used for other leisure activities where furniture is desired. Permanently mounted chairs and/or benches are permitted on boat docks; however, such items may not impede safe access on the structure. Indoor furniture or household type items that denote habitation (<i>such as, but not limited to, couches, stoves, sinks and refrigerators</i>) are prohibited. <i>Carpet and other materials covering decking and obscuring visual inspection of deck integrity are not approved.</i>
<i>Bank Stabilization/Dredging</i>	Bank stabilization/minor shoreline protection by vegetative planting techniques, installation of rip-rap or retaining walls will be authorized by the OPM under the Nationwide Permit No. 13. Plans must be submitted and approved prior to beginning work.	<i>Bank stabilization/minor shoreline protection by vegetative planting techniques or installation of rip-rap will be authorized by the OPM approved under the current PGP/RGP. Plans must be submitted and approved prior to beginning work. Construction of retaining walls will no longer be approved.</i> Permits to remove accumulated silt and sediment may also be authorized under the RGP/PGP during periods of low water. Wavebreaks, breakwaters and wave attenuators may be permitted under Section 404 of the Clean Water Act for large, marine-type docks in private clubs only.

Table 1: Comparison of Changes Between 2001 SMP and Proposed SMP

Topic	2001 SMP	Proposed SMP
<i>Electrical Service</i>	<p>All electrical wiring must meet the requirements of the current National Electrical Code, county ordinances and the Corps. For new installation, replacement or modification of existing installations, upon issuance of a new permit to a new owner or reissuance of an existing permit, wiring plans and electrical service must be certified by a state-license electrician.</p>	<p><i>Thurmond Project will implement a pilot program requiring all new electrical service to be a low voltage solar power source located solely on the dock. No new licenses will be issued for power lines. Licenses for existing electrical service will continue to be issued to current and future owners, provided the facility is in compliance with all license conditions. Exceptions to solar power may be granted on a case-by-case basis in situations where solar power is not feasible (i.e., excessively shady sites). All existing electrical wiring must meet the requirements of the current National Electrical Code, county ordinances and the Corps. For new installation, replacement or modification of existing installations, upon issuance of a new permit to a new owner or reissuance of an existing permit, wiring plans and electrical service must be certified by an electrician licensed in the state in which dock is permitted. Any required local or state permits must be obtained prior to installation of electrical service, including temporary wiring installations. A ground rod must be installed at the base of each light or power pole. To reduce the risk of inundation, all electrical outlets mounted to poles or pedestals must be located at or above 335' msl elevation.</i></p>
<i>Potable Waterlines</i>	<p>No new permit/license will be issued for withdrawal of water from the lake by private individuals for drinking (potable) purposes. Any permit/license authorizing withdrawal of lake water for drinking purposes will be terminated upon issuance of a new permit if potable water is available from other sources (e.g. countywide water service). Potable waterlines from private property may be permitted. Only one above ground spigot may be authorized on public land. No restroom, shower or irrigation fixtures will be permitted on public property or floating facilities.</p>	<p>No new permit/license will be issued for withdrawal of water from the lake by private individuals for drinking (potable) purposes. Any permit/license authorizing withdrawal of lake water for drinking purposes will be terminated upon issuance of a new permit if potable water is available from other sources (e.g. countywide water service). Potable water lines from private property may be permitted. Only one above ground spigot may be authorized on public land. No restroom, shower, sink or irrigation fixtures will be permitted on public property or floating facilities.</p>

Table 1: Comparison of Changes Between 2001 SMP and Proposed SMP

Topic	2001 SMP	Proposed SMP
<i>Non-Potable Waterlines</i>	Only the intake pipe and associated piping will be located on public property. All pumps and related power service will be located on private property or floating facility. Maximum size of pipe will be 1.5 inches in diameter. Submersible pumps will not be permitted.	Only the intake pipe and associated piping will be located on public property. All pumps and related power service will be located on private property or floating facility. Maximum size of pipe will be 1.5 inches in diameter. Submersible pumps will not be permitted. <i>The intake structure head on non-potable pumps may not be located lower than the 324 feet msl elevation so as not to impede navigation. When the pipe becomes exposed due to winter drawdown or drought conditions, it will be buried to that depth. Pumps for non-consumptive use of lake water around the immediate dock area are authorized and will not require a license, provided water is not pumped upland away from the dock. Cleaning vessels and docks with soaps and solvents is not permitted.</i>
<i>Major Repairs</i>	Major repair normally requires removal of the facility from the project. The facility usually has severe structural damage and using the facility without maintenance is life threatening.	Major repair normally requires removal of the facility from the project. The facility usually has severe structural damage and using the facility without maintenance is life threatening <i>or poses an immediate hazard to life or property.</i>
<i>Vegetative Modification</i>		<i>Change section name to Underbrushing</i>
<i>Underbrushing Authorization</i>	Not included	<i>As with any activity on public property, vegetative modification, whether it be underbrushing or planting must be authorized and an approved permit received by the applicant prior to commencement of work on-site. Initiation of the permit process begins with an on-site meeting with a Park Ranger to identify where underbrushing can be authorized and to develop an underbrushing plan.</i>
<i>Underbrushing</i>	The purpose of underbrushing is to provide safe access to the shoreline with minimal alteration to the existing vegetation. Permits are not issued to create vistas, for speculative purposes, beautification, etc. Underbrushing is defined as selective removal of woodland understory vegetation (shrubs, brush, vines, briars, etc.) or small trees 6" or less in diameter at the ground level, and periodic maintenance removal of re-growth.	The purpose of underbrushing is to provide safe access to the shoreline with minimal alteration to the existing vegetation. Permits are not issued to create vistas, for speculative purposes, beautification, etc. Underbrushing is defined as selective removal of woodland understory vegetation (shrubs, brush, vines, briars, etc.) or small trees 6" or less in diameter, <i>measured in all directions</i> at the ground level, and periodic maintenance removal of re-growth.

Table 1: Comparison of Changes Between 2001 SMP and Proposed SMP

Topic	2001 SMP	Proposed SMP
<i>Size of Area</i>	The underbrush area is limited to 50% of the applicant's adjacent property frontage, not to exceed a 150-foot width. In all cases, the distance to the shoreline must be less than 600 feet.	The shoreline is defined at the 330' full pool elevation. Lands eligible for underbrushing are limited to only those portions of adjacent property frontage that are less than 600 feet from the shoreline. The underbrush area is limited to a maximum of 50% of the applicant's adjacent property frontage, not to exceed a 150-foot width. In all cases, the distance to the shoreline must be less than 600 feet. Any of an applicant's adjacent property frontage that is equal to or greater than the maximum 600 feet distance will not be eligible for underbrushing. All areas outside of the approved underbrush area must remain in a natural condition. <i>Applicants for new underbrushing permits must submit a professional survey prepared by a licensed surveyor showing that adjacent private property meets the 600' distance requirement and is eligible for an underbrush permit. No new or additional underbrush areas will be authorized for private clubs. Permits for underbrushing authorized in accordance with the previous shoreline management plan will be honored and may be reissued.</i>
<i>Encroachment Resolution</i>		<i>Language added regarding county setbacks.</i>
<i>Natural Resources Management</i>		<i>Sections added addressing cultural resources and aquatic plant management. Specified Acts Permits for hydrilla treatment are addressed in Section 39.</i>
<i>Diagrams</i>		<i>Shoreline allocation maps will be updated, as needed, to reflect any allocation changes. A diagram has also been added showing the interpretation of "in front of" based on a 90 degree projection.</i>
<i>Items in Italics are to accentuate the changes from the 2001 SMP to the new version.</i>		

3.2 No Action

The No Action alternative involves the continued use of the 2001 Thurmond SMP. This would not allow the Thurmond Project to operate under an up-to-date Shoreline Master Plan, in accordance with ER 1130-2-406.

4.0 AFFECTED ENVIRONMENT AND IMPACTS

The following sections describe the environment of Thurmond and will contrast and compare the impacts of the Proposed Plan to the No Action alternative.

4.1 Physical Environment

4.1.1 Geology, Topography and Soils

Thurmond Reservoir is located near the "fall line" on the Piedmont Plateau which is essentially an upland of fairly strong relief, developed through repeated and continued wearing away of the region of disordered crystalline rocks which have been deeply weathered and disintegrated. This section includes hilly areas and deep valleys, but no lowlands or general highlands. Consistent with other areas on the Piedmont Plateau near the "fall line," there is little variation in elevations in the immediate area. For the most part, the Reservoir shoreline slopes from 3 to 20 percent, with an average between 4 and 12 percent. Area soils consist primarily of sandy clays and sandy silt with an overlying porphyritic granite composed predominantly of quartz and feldspar.

No significant adverse environmental effects are expected on the Reservoir's geology, topography or soils with the Proposed Plan or the No Action alternative.

4.1.2 Floodplains

Thurmond Lake's normal full pool elevation is 330 feet msl. The guide curve for Thurmond Lake targets the 330 feet msl elevation from April to mid-October each year. In accordance with the guide curve, the Thurmond Lake pool recedes gradually to approximately 326 feet msl in mid-December in preparation for winter rains. The pool remains at 326 feet msl until January, when it begins rising to 330 feet msl by April. The lake covers approximately 71,100 acres of water surface area at the normal summer pool elevation of 330 feet msl. Thurmond Lake's flood storage pool is from 330 to 335 feet msl.

In accordance with Executive Order 11988, federal agencies must avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains, and avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

The Proposed Plan and the No Action alternative would result in no adverse impacts to the floodplain or management of the floodplain.

4.1.3 Surface Hydrology

Thurmond Lake includes approximately 71,100 acres of water surface area. The Reservoir is located on the Savannah River near the southeastern margin of the Piedmont Plateau Region, and comprises parts of McCormick and Abbeville counties in South Carolina; and parts of Columbia, McDuffie, Warren, Wilkes, Lincoln and Elbert Counties in Georgia. Thurmond Dam impounds a lake that stretches nearly 40 miles up the Savannah River and 26 miles up to Little River, Georgia. The lake covers approximately 71,100 acres of water surface area at the normal summer pool elevation of 330 feet msl and has nearly 1200 miles of shoreline including 115 miles of island shoreline. At minimum design pool, an elevation of 312 feet the lake covers 45,000 acres; at the top of the flood control gates, (335 feet msl) the lake expands further to 78,500 acres; at maximum design surcharge, 346 feet the lake has 97,500 acres of water surface area. The Reservoir presently meets both Georgia and South Carolina water quality standards.

The Proposed Plan and the No Action alternative should have no impacts to surface hydrology as all applicable sedimentation and erosion control requirements would be met during construction, operation and maintenance of footpaths, docks and marinas.

4.1.4 Water Quality

The Savannah District, along with the USACE Engineer Research Development Center (ERDC - formerly the Waterways Experiment Station) has conducted an extensive water quality monitoring program since 1983. The monitoring includes an assessment of the quality of water in Thurmond Lake and the water discharged through the Thurmond Dam.

The quality of the water is measured by Georgia and South Carolina state agencies and published as part of their Section 305(d)/303(d) listings. Thurmond Lake is listed by Georgia as meeting Category 1 of their water quality standards. That category is defined as “data indicate that waters are supporting their designated use(s)”. South Carolina states that water quality “standards are fully supported” in the lake. As a result, Thurmond Lake upholds a wide diversity of aquatic life.

The water temperatures released from the dam vary with season ranging from a low of 46⁰ F during the winter to a high of 84⁰ F during the summer. Water temperatures within the lake also vary seasonally, with the lake mixed from top to bottom during winter. Spring brings a warming of surface waters, and the onset of thermal stratification begins in late spring. During the summer the lake is thermally stratified, with warmer surface waters and cooler, deep hypolimnetic waters. Thermal stratification creates a density gradient and prevents mixing between the water layers. This condition results in depressed dissolved oxygen levels in the lower water layer. The hypolimnion can become nearly anoxic during the summer.

In the fall, surface temperatures cool allowing the water column to completely mix. Thurmond Lake has not experienced problems with excessive nutrient loading caused by agricultural runoff or municipal sewage. The lake is currently categorized as near-oligotrophic having relatively low nutrient levels and low productivity.

Impacts to water quality would be negligible for either the Proposed Plan or the No Action alternative.

4.1.5 Air Quality

The Thurmond Project extends into McCormick and Abbeville counties in South Carolina; and parts of Columbia, McDuffie, Warren, Wilkes, Lincoln and Elbert Counties in Georgia. The air quality is regulated under Section 176(c) of the Clean Air Act and is managed by the EPA, SC DHEC and GA DNR-EPD. The air quality standards are defined in the National Ambient Air Quality Standards. Actions which result in increased emissions may require a permit issued by SC DHEC or GA DNR-EPD.

All of these counties are considered to be in “Attainment” for all federal air quality standards (EPA 2014). Despite being in compliance for these standards, portions of the area that contains the Reservoir are at times subjected to temporary impacts to air quality as a result of activities like large-scale construction projects.

Air quality within the project boundary is influenced by exhaust from motor vehicles and boats, the use of grills and fire pits, and other regional activities (such as large-scale construction projects as well as timber industry logging operations). The large open area that is created by the Reservoir allows for strong air currents to reduce and/or eliminate any localized air quality concerns caused by these pollutants. Air quality is strongly influenced by external factors, such as urban areas and factories located as far away as Augusta and Atlanta, GA.

The Proposed Plan and the No Action alternative would result in no adverse impacts to air quality.

4.1.6 Noise

Noise levels vary around Thurmond Lake and high levels are usually limited to heavily trafficked roads or in close proximity to agricultural or industrial activities. Most of the areas around Thurmond Lake are rural areas with few prominent noise sources. Within the immediate vicinity of the lake, the primary noise sources are vehicles traveling on local or project roads and boat engines at various boat ramps, marinas, on the water, and from adjoining lakeside properties. Periodic logging operations are also typical around the lake. Occasionally, public events occur that may include use of loud speakers or music, as well as annual fireworks events.

Sensitive noise receptors adjacent to and within the proposed project area include camping areas, park visitors, and wildlife communities. Some private

residences are located just beyond the project boundary, as well. Noise ordinances and regulations have been developed and are enforced by individual municipalities. These ordinances restrict the level of noise that can occur in certain areas and/or times of day.

The Proposed Plan and the No Action alternative would have no adverse impacts to noise.

4.1.7 Cultural Resources

The Savannah River Basin has a long history of human occupation with earliest evidence of settlement dating as far back as the Paleoindian Period, ca. 9,500 B.P. The basin has long been an area of archaeological interest for researchers. Prior to the impoundment and subsequent inundation of Thurmond (aka Clark Hill), cultural resources investigations of varying degrees of comprehensiveness were conducted. Recent archaeological investigations on project lands have focused primarily on the upland areas (i.e., above 330 ft msl), although smaller shoreline surveys have been conducted on project lands.

Archaeological fieldwork conducted in the late 1940s and early 1950s through the Smithsonian Institution's River Basin Survey identified more than 200 sites at Thurmond project, with limited excavation conducted at a minimum of 21 of the sites by former Smithsonian Institution and University of Georgia personnel (Elliott 1995). The survey focused on site visits to locales reported by local collectors, previously recorded sites and visits to likely village sites as determined through archival research and previous experience of working in similar environmental settings. Some of the recorded sites were discovered during excavation of the reservoir. Nearly 100 of the sites were determined to be flooded by the inundation of the lake (i.e., at or below 335 msl) and almost the same number was situated outside of the flood pool.

More recently shoreline surveys of project lands have been conducted that resulted in the recordation of numerous previously unrecorded archaeological sites. In 1983-84 the US Forest Service identified 54 sites, 38 of which had been previously unrecorded. Sites ranged from the Early Archaic period (8,000 B.C. – 6,000 B.C) to the early 20th century (Elliott 1995). Anderson et al. (1994) conducted a terrestrial and underwater survey of a two mile section of lake shore and a 440 acre upland tract that identified 14 upland sites, 32 sites along the shoreline as well as one underwater site. Only the underwater site had been previously located by the River Basin Survey in the 1940s-1950s.

Archaeological surveys conducted in the mid-late 1990s by cultural resources firms contracted by Savannah District focused exclusively on upland areas (above 330 ft. msl). These large-scale surveys were conducted to comply with Section 110 of the National Historic Preservation Act, as amended (NHPA) in areas that were managed for timber. As a result of the surveys over 1600 archaeological sites, isolated finds and rockpiles have been recorded. A wide array of site types are represented at Thurmond project, ranging from prehistoric camp sites to 19th-20th century mills and cemeteries. Ten sites have been determined eligible for the National Register of Historic Places.

The Proposed Plan and the No Action alternative would have no adverse impacts to cultural resources as all activities will be conducted in accordance with the Programmatic Agreement, Treatment of Historic Resources, Thurmond Project, Georgia and South Carolina, which was signed in 2003 and the project's Historic Properties Management Plan and in accordance with established procedures for issuing permits. A district archaeologist and/or Project personnel monitors the project when the work is conducted near a recorded historic property that extends near the proposed permit area. Additionally, permits include a clause regarding inadvertent discoveries that requires work stoppage.

4.1.8 Hazardous and Toxic Wastes Sites

Hazardous materials and wastes are regulated by the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Oil Pollution Act, Toxic Substances Control Act (TSCA), and related USACE guidelines. Any change in the storage or use of hazardous materials must comply with these regulations. The Thurmond Project is responsible for ensuring compliance with EPA, SC DHEC and GA DNR-EPD regulations on public lands at the Thurmond Project. The EPA EnviroMapper website was researched and identified no known hazardous waste sites at the Thurmond Project.

The Proposed Plan and the No Action alternative would have no impacts to hazardous wastes within the project area.

4.1.9 Aesthetics

Thurmond is one of the few civil works projects possessing a large land base consisting mainly of woodlands. Boaters can view miles of undisturbed shoreline free of docks, marinas, cabins and other signs of human habitation. These extensive woodlands provide a pleasant visual experience and serve to minimize conflicting activities.

The natural beauty of Thurmond Project is a recreational asset which offers almost unlimited opportunities for outdoor oriented activities such as sightseeing and hiking, as well as providing a pleasant environment for campers, mountain bikers, horseback riders, hunters and fishermen.

The Proposed Plan and the No Action alternative would not result in permanent adverse impacts to aesthetics or any view of the watershed. One of the changes proposed with the SMP is intended to increase the aesthetic quality of the view shed by requiring neutral colored roofs on the docks, where the 2001 plan did not have a color restriction. The Proposed Plan states that no third level decks will be approved or permitted.

4.2 Natural Resources

4.2.1 Vegetation

Lands acquired for the Thurmond Reservoir were generally owned by small landowners, forest industries, and power companies. In many cases, the land had been used for agricultural purposes prior to the Depression Era but has been allowed to revert to forest growth. At the time of their acquisition, most forested areas supported second growth pine with a mixture of regional hardwoods. Most river bottom hardwoods were inundated when the Thurmond Reservoir was filled.

The seven basic forest types identified on project lands are loblolly pine, loblolly pine-hardwood, shortleaf pine, shortleaf-hardwood, loblolly pine-shortleaf pine, upland hardwood, and bottomland hardwood forests. For silvicultural applications, these forest types are consolidated into four categories: pine, pine-hardwood, hardwood-pine, and hardwood. Other forest types, such as longleaf pine, do exist in small areas and receive special management considerations.

The pine-hardwood forest type includes the pine species shortleaf pine (*Pinus echinata*) and loblolly pine (*Pinus taeda*) with associated hardwood species such as sweetgum (*Liquidambar styraciflua*), yellow-poplar (*Liriodendron tulipifera*), white oak (*Quercus alba*), post oak (*Q. stellata*), southern red oak (*Q. falcata*), other red oaks, white ash (*Fraxinus americana*), winged elm (*Ulmus alata*), and other regional hardwoods. Minor constituents of this type include sourwood (*Oxydendrum arboreum*), American holly (*Ilex opaca*), sycamore (*Platanus occidentalis*), and red maple (*Acer rubrum*).

Understory species vary widely and include *Viburnum spp.*, *Rhus spp.*, *Sassafras spp.*, several species of blackberry (*Rubus spp.*), greenbriar (*Smilax spp.*), dogwood (*Cornus florida*) and redbud (*Cercis canadensis*). Japanese honeysuckle (*Lonicera japonica*) is abundant throughout the area. Other exotics found on project lands include kudzu, chinaberry, wisteria, privet, Chinese tallow tree, Johnson grass, Chinese climbing fern, and princess tree. The SMP does not authorize or carry out any actions that are likely to promote invasive species proliferation. Any subsequent occurrence of any invasive species in the project vicinity should not solely be the result of the implementation of this project. This project is in full compliance with E.O. 13112. A small percentage of the total land area is open or unforested. A number of the open areas are maintained for operational use and recreational uses. Most open areas are included in the wildlife management program or in conjunction with utility rights of way and roads.

Early project managers realized the importance of forest management, therefore staffed positions for this purpose. Initial work included pine stand improvement and pulpwood thinning to remove diseased and suppressed trees. Currently, most accepted forest management practices including insect and disease suppression, timber harvesting, prescribed burning, chemical and mechanical site preparation, and regeneration are employed to assure the continuation of the forest and wildlife

resources. Detailed information on management of vegetation and land cover can be found in the Operational Management Plan.

The Proposed SMP and the No Action alternative would not result in permanent adverse impacts to vegetation surrounding the Reservoir. Under both the current and updated SMP, minor vegetation modifications require an approved permit prior to commencement of work and an on-site meeting with the Park Ranger. The meeting is intended to identify where underbrushing can be authorized and develop an underbrushing plan. The proposed SMP clarifies underbrushing standards that requires applicants to submit a professional land survey prepared by a licensed surveyor showing the site meets the 600 foot distance requirement to be eligible for an underbrush permit.

4.2.2 Fish and Wildlife

The Reservoir is populated by a variety of native species of freshwater fish, crustaceans and fresh water mussels, many endemic to the Savannah River system. Popular game fish within the Reservoir are largemouth bass (*Micropterus salmoides*), striped bass (*Morone saxatilis*), black crappie (*Pomoxis nigromaculatus*), hybrid bass, bluegill, red-eared sunfish, channel catfish, and flathead catfish (*Pylodictis olivaris*) (DGIF 2014). Some of the game fish are stocked within the Reservoir to support recreational fishing while others naturally enter the system from the reservoir's tributaries.

Wildlife species known to occur at Thurmond Lake includes 40 mammal species, 61 species of amphibians/reptiles, and 127 species of birds. Mammals most commonly seen around the project include: Eastern grey squirrel (*Sciurus carolinensis*), white-tailed deer (*Odocoileus virginianus*), North American river otter (*Lontra canadensis*), fox squirrel, red fox, grey fox and North American beaver (*Castor canadensis*). Bird species that frequent the project include: American goldfinch (*Carduelis tristis*), Canada goose (*Branta canadensis*), great blue heron (*Ardea herodias*), wild turkey (*Meleagris gallopavo*), osprey (*Pandion haliaetus*) cardinal (*Cardinalis cardinalis*) and many other songbirds common to the eastern US. A few examples of amphibians and reptiles common to the project are: Green frog (*Rana clamitans*), American toad (*Bufo americanus*), Copperhead (*Agkistrodon contortrix*), Black Racer (*Coluber constrictor*), Eastern box turtle (*Terrapene carolina*) and yellow-bellied slider (*Trachemys scripta scripta*) (Van Alstine, Fleming, & LeGrand Jr., 1999). Please see Appendix A for a complete listing.

The Thurmond Lake Operational Management Plan prescribes active management for maintenance of diverse habitats for game and non-game wildlife species. A total of 54,086 acres of project lands are managed as wildlife management areas, including 7,984 acres leased to SC DNR, 18,362 acres leased to GA DNR, and the remaining 27,740 acres are managed by USACE.

Docks and pathways would continue to be constructed under both the Proposed Alternative and No Action Alternative, resulting in temporary noise increases which may

disturb wildlife in the immediate vicinity of the construction area. During construction of docks and pathways, construction-related noise would be temporary and minimal.

Existing sound conditions would resume following the construction activities. New docks and pathways would increase the frequency of use by adjacent landowners in some areas. The presence of humans can influence the number and variety of wildlife in these areas. However, given existing levels of land use in these areas, the overall impacts on wildlife are expected to be localized and minor.

Any material used in the construction of the dock facility must be noted on the plans and approved by USACE before construction begins. Construction materials commonly used for joist, rafters, studding and decking are wood and/or metal. All wood construction shall be either pressure treated or decay resistant. Creosote or penta treated wood is not acceptable, as these chemicals degrade, the by-products bio-accumulate and are known to have toxic qualities, thus, possibly having an adverse effect on the fish and wildlife.

The Proposed SMP will implement a pilot program requiring all new electrical service to be a low voltage solar power source located solely on the dock. No new licenses will be issued for power lines. Licenses for existing electrical service will continue to be issued to current and future owners, provided the facility is in compliance with all license conditions. Exceptions to solar power may be granted in situations where solar power is not feasible (i.e., excessively shady sites). These instances will be reviewed on a case-by-case basis and where appropriate, a license for low voltage pathway lights may be authorized. It is encouraged to utilize a solar power option on community docks larger than two (2) slips but is not required. Installation of solar power on a dock does not require a license, but must be included in the approved permit plans. Solar powered lights installed along a pathway or on a service pole must be placed under license.

No impacts are expected to fish and wildlife resources from either the Proposed SMP or the No Action alternative.

4.2.3 Threatened and Endangered Species

A copy of the Memorandum of Agreement between the U.S. Army Corps of Engineers, Savannah District, and the U.S. Fish and Wildlife Service Concerning Protected Species Surveys at J. Strom Thurmond, Richard B. Russell, and Hartwell Lakes is on file at the Thurmond Project Manager's Office. In accordance with this agreement, endangered species surveys are performed by qualified USACE team members prior to the initiation of any "action"* to determine if endangered species or habitat is present in the affected area. This includes prescribed burns, thinning, regeneration cuts, and developing food plots and openings. Furthermore, special efforts will be made to avoid critical habitats adjoining affected areas. Though not specifically protected by law, rare and infrequently occurring plants are also protected from disturbance. Locations for known rare, threatened and endangered plant species as well as critical habitats are noted in the individual compartment descriptions.

The U.S. Fish and Wildlife Service (USFWS) Information, Planning and Conservation System (<http://ecos.fws.gov/ipac/>) website provided a current inventory of federally listed species within the Thurmond Reservoir area. Table 2 identifies the state and federally listed species using this USFWS information. The list also includes the bald eagle (*Haliaeetus leucocephalus*) which is protected under the Federal Bald and Gold Eagle Protection Act, and species listed under the Migratory Bird Treaty Act.

The bald eagle (*Haliaeetus leucocephalus*) is a large raptor with a wingspan of approximately seven feet (2 meters). Adult individuals of this species have a mainly dark brown plumage with a solid white head and tail. Primary habitat for this species is undisturbed riparian zones including coastal, river, and lakeshore areas. Bald eagle nest sites within the southeast are usually located in living pine or cypress trees. Nest sites are often located in the largest living trees within the area commanding an open view of the surrounding terrain. Nest sites are generally located within one-half mile of open water with a clear flight path leading to the water. There are known bald eagle nesting locations adjacent to Thurmond Reservoir. SAS announced the availability to the public of a plan to reduce the occurrences of Avian Vacuolar Myelinopathy (AVM) in bald eagles. The Draft AVM Reduction Management Plan, Draft EA, and Draft FONSI can be downloaded from the District website at <http://1.usa.gov/1VIDgsw>.

Thurmond considers state-listed species in all of the Threatened and Endangered Species surveys conducted at the lake. The state-listed species that may potentially occur around the lake that are not on the list below include Atlantic pigtoe mussel, bluebarred pygmy sunfish, gopher frog, robust redhorse, southern hognose snake, sandbar shiner, pool sprite, Dixie mountain breadroot, whitlow grass, yellow nailwort, Carolina birdfoot-trefoil, Georgia plume, granite stonecrop, Ocmulgee skullcap, sweet pitcherplant, silky camellia, pineland Barbara buttons, Oglethorpe oak, Webster's salamander, Indian olive, pink ladyslipper, Broad River burrowing crayfish, lean crayfish, Bachman's sparrow, sweet pinesap, delicate spike, smooth coneflower, Georgia aster, mat-forming quillwort, gopher tortoise, Savannah Lilliput, spotted turtle, and Rafinesque's big-eared bat. This list is based on the GA and SC state lists and heritage program, identifying species for each county at the lake as well as the immediately adjacent counties.

*"Action" is defined by the USFWS as an activity or program of any kind authorized, funded, or carried out, in whole or in part, by a federal agency in the United States or upon the high seas, such as: (a) an action intended to conserve listed species or their habitat; (b) the promulgation of a regulation; (c) the granting of a license, contract, lease, easement, right-of-way, permit, or grant-in-aid; and (d) an action directly or indirectly causing modification to the land, water, or air.

Table 2: Federal and State Listed Species

Common Name	Federal Status	GA Status	SC Status
Atlantic Pigtoe		E	
Bachman's Sparrow		R	
Bald Eagle		T	T
Broad River Burrowing Crayfish		T	
Carolina Bogmint		R	
Carolina Heelsplitter	E		E
Carolina Trefoil		E	
Delicate Spike		E	
Dixie Mountain Breadroot		E	
Georgia Aster	C	T	
Georgia Plume		T	
Gopher Tortoise	C	T	E
Granite Stonecrop		T	
Indian Olive		R	
Lean Crayfish		T	
Little Amphianthus	T	T	T
Mat-forming Quillwort	E		E
Miccosukee Gooseberry	T		T
Michaux's Sumac	E	E	E
Northern Long-eared Bat	T		
Ocmulgee Skullcap		T	
Oglethorpe Oak		T	
Pineland Barbara's Buttons		R	
Pink Ladyslipper		U	
Red-cockaded Woodpecker	E	E	E
Relict Trillium	E	E	E
Robust Redhorse		E	
Sandbar Shiner		R	
Savannah Lilliput		T	
Shoals Spider Lily		T	T
Silky Camellia		R	
Southern Hognose Snake		T	
Spotted Turtle		U	
Sun-loving Draba		E	
Sweet Pinesap		T	
Sweet Pitcherplant		T	
Webster's Salamander			E
Wood Stork	T	T	T
Yellow Nailwort		E	

*C-Candidate, E-Endangered, T-Threatened, R- Rare, U - Unusual

The Proposed Plan and the No Action alternative would have no adverse impacts to threatened and endangered species within the project area.

4.2.4 Wetlands

Wetlands are defined by the USACE (33 CFR 328.3) and USEPA (40 CFR 230.3) as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.”

Executive Order 11990 requires federal agencies to “minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands”.

The National Wetland Inventory layer in the Thurmond Project’s GIS, Thurmond Lake includes 526 acres of freshwater emergent wetlands, 1,625 acres of freshwater forested/shrub wetlands, and 40.95 acres of freshwater pond.

Table 3: Wetland Classification for FY14 from OMBIL

SYSTEM	SUB-SYSTEM	CLASS	CLASS ACRES
Lacustrine	Littoral	Unconsolidated Shore	122.05
Paulustrine	No Sub-system	Emergent Wetland	505.71
Paulustrine	No Sub-system	Forested Wetland	1914.39
Paulustrine	No Sub-system	Scrub-Shrub Wetland	288.89
Paulustrine	No Sub-system	Unconsolidated Bottom	48.76
Paulustrine	No Sub-system	Unconsolidated Shore	4.22
Riverine	Lower perennial	Unconsolidated Bottom	1125.08
Lacustrine	Limnetic	Unconsolidated Bottom	70164.35
		Upland (Non-Wetland) Acres	75,536.55
		Project Fee-Owned Area	149,710.00

The Proposed Plan and the No Action alternative would have no adverse impacts to wetland features around the Reservoir. Any proposed pathway or dock constructed would avoid any impacts to wetland resources. Permits will not be issued in areas determined to be wetlands.

4.3 Socioeconomic Resources

4.3.1 Land Use

Approximately 78,885 acres of project land surrounding Thurmond Reservoir is above the normal full pool of 330 feet msl and is classified for the following land uses based on the current project Master Plan updated in 1995:

- Environmental Sensitive Areas – 5,671 acres
- Flowage Easements – 4,683 acres
- Multiple Resource Management – 54,039 acres
- Mitigation – 6,877 acres
- Project Operations – 193 acres
- Recreation Facilities – 12,725 acres
- Recreation (Quasi-Public and Private Clubs) – 2,830 acres

Within the vicinity of the Reservoir, land use is primarily forest and agriculture. Within areas adjacent to the Thurmond Project, residential development is primarily low density and scattered.

Under the current plan, 18% of the lake shoreline is allocated a Limited Development. The allocation by county follows: Columbia County shoreline is 23.8% Limited Development (approx. 35% of which is saturated with docks), Lincoln County shoreline is 30.86% Limited Development (23% saturated), Elbert County shoreline is 25.28% Limited Development (23% saturated), McDuffie County shoreline is 5.8% Limited Development (39% saturated), McCormick County shoreline is 10.5 % Limited Development (56% saturated), and Abbeville, Warren and Wilkes County have no Limited Development shoreline.

There are 82 subdivisions around Thurmond Lake with lots eligible for permits, nine (9) of which are in Savannah Lakes and are not subject to the SMP. There are also 41 private club sites around the lake. Broken out by county, there are 64 subdivisions/clubs in Lincoln County, 32 in McCormick County, 23 in Columbia County, four (4) in Elbert County and two (2) in McDuffie County. Thurmond Project also issues permits to adjacent property owners not in planned developments. These developments impact the economy of the surrounding counties. Since the 2001 Shoreline Management Plan, nine (9) new subdivisions have begun development. While the Thurmond Project is not planning to increase the Limited Development allocation, there is still considerable shoreline zoned as Limited Development that is not saturated and allows opportunities for further development around Thurmond Lake and benefit to the local economy.

The Proposed Plan and the No Action alternative would have no significant adverse impacts to land uses around the Reservoir.

4.3.2 Demographics

This section presents regional and local demographic and economic information as it relates to the Thurmond Project and the surrounding area. For the purposes of this section, the socioeconomic study area includes all of McCormick and Abbeville counties in South Carolina, and Columbia, McDuffie, Warren, Wilkes, Lincoln and Elbert Counties in Georgia.

Population

The area surrounding the Thurmond Project had a combined population of 237,958 in 2014. This represents a net increase of 23.6 percent since 2000. Though Abbeville, McCormick, McDuffie, Warren, Wilkes, Lincoln, and Elbert counties experienced population declines ranging from 1.1 to 12.9 percent during that time, Columbia County's massive increase of 56 percent more than offset those impacts. Study area population estimates are summarized in Table 4.3-2.

Table 4: Study Area Population Estimates

County	Population 2000	Population 2014 Estimate	Percent Change 2000 - 2014
Abbeville	26,167	24,965	-4.6
McCormick	9,958	9,846	-1.1
Columbia	89,288	139,257	+56.0
McDuffie	21,231	21,370	+0.7
Warren	6,336	5,520	-12.9
Wilkes	10,687	9,940	-7.0
Lincoln	8,348	7,622	-8.7
Elbert	20,511	19,438	-5.2
<i>Total</i>	<i>192,526</i>	<i>237,958</i>	<i>+23.6</i>

Source:

- U.S. Census Bureau (U.S. Census). 2000. State and County Quick Facts. <<http://quickfacts.census.gov>>. Accessed August 21, 2015.
- U.S. Census Bureau (U.S. Census). 2010. State and County Quick Facts. <<http://quickfacts.census.gov>>. Accessed August 21, 2015.

Income and Unemployment

The area surrounding the Thurmond Project had an average per capita income of \$20,454 and an average median household income of \$38,874 in 2013. Abbeville and McCormick counties both fell below South Carolina's average per capita and median household incomes of \$23,943 and \$44,779 respectively. Additionally, the

unemployment rates in these counties were well above South Carolina’s 2013 average of 7.6 percent. In Georgia, all affected counties except Columbia fell below the state average per capita and median household incomes of \$25,182 and \$49,179 respectively. Beside Columbia County, the unemployment rates of these counties were all above Georgia’s 2013 average of 8.2 percent. Study area income and unemployment characteristics are summarized in Table 5.

Table 5: Income and Unemployment (2013)

County	Per Capita Income (\$)	Median Household Income (\$)	Unemployed (% of Civilian Labor Force)
Abbeville	18,134	35,947	14.6
McCormick	22,150	40,028	14.2
Columbia	30,949	69,306	7.9
McDuffie	17,922	37,487	11.2
Warren	17,884	27,796	15.9
Wilkes	17,120	28,983	13.4
Lincoln	20,641	35,625	12.2
Elbert	18,835	35,817	12.9
<i>Average</i>	<i>20,454</i>	<i>38,874</i>	<i>12.8</i>

Source:

- U.S. Census Bureau (U.S. Census). 2013. American Factfinder: Selected Economic Characteristics, 2009-2013 American Community Survey 5-Year Estimates. <<http://factfinder.census.gov>>. Accessed August 21, 2015.

4.3.3 Environmental Justice.

The concept of environmental justice is based on the premise that no segment of the population should bear a disproportionate share of adverse human health or environmental effects. Executive Order (E.O.) 12898, *Federal Actions to Address Environmental Justice in Minority and Low Income Populations* requires each Federal agency to make achieving environmental justice part of its mission. Specifically, the agency must identify and address, as appropriate, the disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. In addition, E.O. 12898 requires each federal agency to conduct its programs, policies, and activities so that they do not exclude, deny benefits to, or discriminate against persons (including populations) because of race, color, or national origin.

Minority groups include African American, Hispanic, Asian, American Indian and Alaska Native, and Native Hawaiian or Other Pacific Islander. A “low-income” person is defined as a person whose household income is at or below the income level stated in

the U.S. Department of Health and Human Services' poverty guidelines, which in the 2013 guidelines was \$23,550 for a family of four.

In order to identify if any potential disproportionate adverse environmental justice effects would be associated with the implementation of the Proposed Action, existing environmental justice characteristics (i.e., minority and low-income population) in the community directly affected (i.e., McCormick, Abbeville, Columbia, McDuffie, Warren, Wilkes, Lincoln and Elbert Counties) were identified for the purpose of this EA. These communities were determined to have a combined minority population of 30.3 percent, and a combined percentage of individuals below the poverty level of 14.3. Study area environmental justice characteristics are summarized in Table 6.

Table 6: Environmental Justice Population Characteristics (2013)

County	Population	Percent Minority	Percent Below Poverty Line
Abbeville	25,008	30.1	21.6
McCormick	9,932	50.8	17.2
Columbia	136,287	24.1	8.3
McDuffie	21,421	42.7	22.2
Warren	5,554	61.9	31.6
Wilkes	9,944	45	27.3
Lincoln	7,719	33.4	26.5
Elbert	19,514	31.9	20.4
<i>Average</i>	-	30.3	14.3

Source: U.S. Census Bureau (U.S. Census). 2010. State and County Quick Facts. <<http://quickfacts.census.gov>>. Accessed August 21, 2015.

As identified above, the communities surrounding the Thurmond Project do not have a disproportionately high minority or low-income population. In addition, there are no specific impacts on general health or quality of life that would adversely or disproportionately impact the surrounding population. Therefore, Savannah District concluded that no disproportionate adverse environmental justice effects would be associated with the implementation of the Proposed SMP. The “No Action Alternative” would not have any effect on environmental justice because no action would be taken.

4.3.4 Protection of Children

The concept of protecting children arises out of a growing body of scientific knowledge that demonstrates that children may suffer disproportionately from environmental health and safety risks. Executive Order (E.O.) 13045, *Protection of Children from Environmental Health Risks and Safety Risks* sets requirements for federal agencies in order to address this issue. Under E.O. 13045, each federal agency must identify and assess environmental health and safety risks that may

disproportionately affect children to ensure that policies, programs, activities, and standards address disproportionate risk to children that results from environmental health or safety risks.

As there are no specific impacts on general health or quality of life that would adversely or disproportionately impact the surrounding population, Savannah District concluded that no disproportionate adverse health effects would be associated with the implementation of the Proposed SMP. The “No Action Alternative” would not have any effect on children’s safety and health because no action would be taken.

4.3.5 Recreation

The Thurmond Project offers many opportunities for recreation, including fishing, boating, camping, hiking, and hunting, to more than four million visitors every year. Currently, Thurmond provides 24 recreation areas, including six state parks, nine county parks, seven (7) USACE-operated campgrounds and five (5) major USACE-operated day use areas. Thurmond Lake also provide 32 boat ramps, six (6) marinas, and 16 quasi-public recreation areas that are currently leased to universities, churches, civic groups, and scout organizations. Two additional areas are leased to the Army and the South Carolina National Guard for recreation and training purposes.

The No Action alternative and the Proposed SMP allow for 15 percent of the shoreline to be allotted for public recreation, resulting in no impacts to current recreation opportunities available at the Reservoir.

4.3.6 Water Supply

USACE is allowed to reallocate water storage from hydropower to water supply if there is no significant impact on authorized project purposes. This allows up to 50,000-acre feet to be reallocated without additional Congressional authority. No reallocation is proposed as part of this update to the Shoreline Management Plan. The project has already reallocated 3,803 acre-feet to water supply, as Table 7 demonstrates:

Table 7: Reallocation of Water Supply

User	Date of Agreement	Storage Space (acre-feet)	Cost of Reallocation (\$)	Method Used to Determine Cost of Storage	Reallocation Source
City of Lincolnton (2 agreements)	1964	92	15,000	Updated Cost of Storage	Hydropower
	1990	83	24,608		
City of Washington	1975	632	72,800	Benefits Foregone	Hydropower
Savannah Valley Auth.	1989	92	27,395	Updated Cost of Storage	Hydropower
Columbia County	1989	1,056	313,048	Updated Cost of Storage	Hydropower
Town of McCormick (2 agreements)	1999	506	17,357	Benefits Foregone	Hydropower
	2001	316	66,499		
City of Thompson	1990	1,056	334,714	Updated Cost of Storage	Hydropower

There are currently 11 raw water intakes on Thurmond Lake under contracts with local municipalities and Savannah Lakes Village. The contracts are for a total of 3,833 acre feet of storage in the lake. There are five users with permanent water storage contracts in Thurmond Lake: McCormick, South Carolina; Lincolnton, Georgia; Thomson, Georgia; Columbia County, Georgia; and Washington, Georgia. This leaves approximately 92%, or 46,167 acre-feet of storage in Thurmond available for reallocation in the future without additional specific Congressional approval.

Some counties are nearing capacity and may request an increase to their current contracted allocation. This would require conducting a new allocation study. The current Shoreline Management Plan allows non-potable waterlines, which increase the water withdrawals from the lake. Under the proposed plan, licenses for new and existing not potable water lines will be issued to current and future owners, provided the facility is in compliance with all license conditions. Pumps for non-consumptive use of lake water around the immediate dock area are authorized and will not require a license. Submersible pumps are prohibited at Thurmond Lake and will not be authorized. Additionally, cleaning vessels and docks with soaps and solvents is not authorized. The Thurmond Project currently has 219 private licenses for non-potable waterlines.

Neither the No Action alternative or the Proposed Plan is expected to adversely affect water supply.

4.3.7 Safety

The objective of the safety program is to provide a safe environment for project personnel and the visiting public and to prevent damage from accidents or fires. It is the policy of USACE, as stated in ER 1130-2-406, to protect and manage shorelines of all civil works water resource development projects under USACE jurisdiction in a manner which would promote the safe and healthful use of these shorelines by the public while maintaining environmental safeguards to ensure a quality resource for use by the public. The objectives of all management actions would be to achieve a balance between permitted private uses and resource protection for general public use.

The proposed updates to the SMP would require all new electrical service to facilities to be solar powered, with exceptions granted on a case-to-case basis. Also, electrical work would be required to be performed by an electrician licensed in the state in which the dock is permitted. Any required local or state permits must be obtained prior to installation of electrical service. A ground rod must be installed at the base of each light or power pole. To reduce the risk of inundation, all electrical outlets mounted to poles or pedestals must be located at or above 335 feet msl elevation.

All installed docks with a second level must display a weight rating plate identifying the maximum rated weight capacity of the structure to ensure dock owners are aware of the load bearing capacity.

No new courtesy dock permits will be issued. Existing courtesy dock permits authorized under previous plans will be reissued if the docks are maintained in a safe condition and are not modified in size or location. Upon modification or becoming dilapidated, the permit will not be reissued and the dock must be removed when the permit expires. Any dilapidated dock must be repaired or removed immediately.

Each of these changes would increase public safety; therefore, the Proposed Action will have a beneficial impact on public safety within the Reservoir, while the No Action alternative will not create a change in the current public safety.

4.4 Environmental Impact Comparison of Alternatives

Table 8 provides a brief summary and comparison of impacts to the physical and natural environment for the alternatives considered.

Table 8: Environmental Impact Comparison of Alternatives

Resource	Alternatives	
	<i>Proposed New SMP</i>	<i>No Action</i>
Geology/Topography/Soil	No Impact	No Impact
Floodplains	No Impact	No Impact
Surface Hydrology	No Impact	No Impact
Water Quality	No Impact	No Impact
Air Quality	No Impact	No Impact
Noise	No Impact	No Impact
Cultural Resources	No Impact	No Impact
Hazardous & Toxic Waste	No Impact	No Impact
Aesthetics	No Impact	No Impact
Vegetation	Underbrushing permit changes	No Impact
Fish & Wildlife	No Impact	No Impact
Threatened & Endangered Species	Updated list from USFWS	No Impact
Wetlands	No Impact	No Impact
Land Use	No Impact	No Impact
Recreation	No Impact	No Impact
Water Supply	No Impact	No Impact
Safety	Increased safety measures with power on docks replaced or modified by an electrician licensed in the state in which the dock is permitted.	No Impact

4.5 Unavoidable Adverse Impacts of the Proposed Action

Construction of docks and their associated pathways in areas of Limited Development would result in unavoidable minor direct and secondary adverse impacts to vegetation immediately within and adjacent to the footpaths. Wildlife in the vicinity of the pathways would experience an increase in frequency and level of human disturbance. Soils would be continually disturbed and/or compacted within the foot print of the paths. These impacts are considered minor and localized and would not have significant long term adverse impacts to soil, topography, water or air quality, cultural resources, nor vegetation and wildlife populations. Additionally, creation of pathways and installation of buried power lines and water lines increases soil erosion on project lands. Underbrush clearing under the No Action alternative and the Proposed Alternative would both result in minor direct impacts to vegetation through the removal of understory vegetation. Underbrush clearing may also result in an increase of soil erosion on steep slopes.

5.0 CUMULATIVE EFFECTS

The Council on Environmental Quality (CEQ) regulations that implement NEPA (40 CFR 1508.7) require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.”

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impacts of activities in and around the Reservoir. Past actions include the construction and operation of the Reservoir, the recreation sites surrounding the Reservoir, as well as residential, commercial, and industrial facilities throughout the region. All of these developments have had varying levels of impacts on the physical and natural resources in the region. Implementing management plans like the SMP help to ensure a balance between public uses and stewardship of the natural environment. The proposed updates to the SMP will require underbrushing authorization and permit approval, require earth tone colors be used on roofs to increase the natural aesthetics of the shoreline, require an electrician to be licensed in the state which the dock is permitted, and no longer approve retaining walls for bank stabilization.

While the Thurmond Project is not planning to increase the amount of land allocated to Limited Development, considerable shoreline zoned as Limited Development is still available for development. Future development of those lands around Thurmond Lake would benefit the local economy.

6.0 PUBLIC INVOLVEMENT

6.1 Public Information Sessions

Public scoping meetings were held March 2, 2015 in Lincolnton; March 3, 2015 in McCormick; and March 5, 2015 in Evans. Information provided during these scoping meetings was used to develop the Thurmond SMP.

6.2 Recipients of the Environmental Assessment

This EA is being circulated for a 30-day review and comment period to the following concerned agencies, groups, and individuals.

Federal Agencies

- National Marine Fisheries Service - Southeast Regional Office
- US Department of the Interior - Office of Environmental Policy & Compliance
- US Fish and Wildlife Service

State Agencies

South Carolina

- SC State Historic Preservation Office
- SC Department of Health and Environmental Control
- SC Department of Natural Resources

Georgia

- GA Department of Natural Resources, Environmental Protection Division
- GA State Historic Preservation Office
- GA Department of Natural Resources, Wildlife Resources Division

Conservation Groups

- The Nature Conservancy
- The Georgia Conservancy

7.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

Environmental compliance for the proposed action would be achieved upon: coordination of this EA and draft Finding of No Significant Impact (FONSI) with appropriate agencies, organizations, and individuals for their review and comments; U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) confirmation that the proposed action would not likely adversely affect any endangered or threatened species; receipt of a Water Quality Certificate from the State of Georgia and South Carolina; public review of the Section 404(b)(1) Public Notice; and concurrence from the State Historic Preservation Officer in the Corps' Determination of No Effect on cultural resources. The draft FONSI will not be signed until the proposed action achieves environmental compliance with applicable laws and regulations, as described above.

Table 9: Compliance of the Proposed Action with Executive Orders		
Executive Orders	Number	Compliance Status
Invasive Species	13112	In Compliance
Equal Opportunity	11246	In Compliance
Protection and Enhancement of Environmental Quality	11514/11991	In Compliance
Protection and Enhancement of the Cultural Environment	11593	In Compliance
Convict Labor	11755	In Compliance
Floodplain Management	11988	In Compliance
Protection of Wetlands	11990	In Compliance
Federal Compliance with Pollution Control Standards	12088	In Compliance
Environmental Effects Abroad of Major Federal Actions	12114	In Compliance
Federal Compliance with Right-To-Know Laws and Pollution Prevention	12856	In Compliance

Table 9: Compliance of the Proposed Action with Executive Orders		
Executive Orders	Number	Compliance Status
Federal Actions to Address Environmental Justice and Minority and Low-Income Populations	12898	In Compliance
Implementation of the North American Free Trade Agreement	12889	In Compliance
Energy Efficiency and Water Conservation at Federal Facilities	12902	In Compliance
Federal Acquisition and Community Right-To-Know	12969	In Compliance
Protection Of Children from Environmental Health Risks and Safety Risks	13045	In Compliance
Environmental Justice	12898	In Compliance
National Invasive Species Council	13112	In Compliance
Responsibilities of Federal Agencies to Protect Migratory Birds	13186	In Compliance

8.0 PREPARERS

This EA and the associated draft FONSI were prepared by Cynthia Gose, Environmental Engineer; Nathan Dayan, Biologist; Marty Harm, Economist; with relevant sections prepared by: Susan Boyd – HTRW; Julie Morgan - Cultural Resources; Chris Spiller - Recreational Resources; and Wendell Hardwick – Natural Resources.

The address of the preparers is: U.S. Army Corps of Engineers, Savannah District - Planning Division, 100 West Oglethorpe Avenue, Savannah, GA 31401.

Written comments regarding this Environmental Assessment should be sent to the address above.

9.0 CONCLUSION

Savannah District has assessed the environmental impacts of the proposed action and concludes that the proposed action would have no significant adverse or beneficial impact upon environmental resources. There are no cumulative adverse impacts associated with the proposed action.

The Proposed Plan is not expected to significantly adversely affect the quality of the environment, therefore an Environmental Impact Statement would not be required. If this opinion is upheld following circulation of this EA, a Finding of No Significant Impact (FONSI) would be signed.

10.0 REFERENCES

- U.S. Army Corps of Engineers (USACE). (1999). *Engineer Regulation 1130-2-406: Shoreline Management at Civil Works Projects*. Retrieved from http://planning.usace.army.mil/toolbox/library/ERs/ER1130-2-406_31Oct1990.pdf
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Appendix A

Commonly Occurring Terrestrial and Aquatic Plants, Mammals, Reptiles, Amphibians, Birds, and Fish of J. Strom Thurmond Project

Commonly Occurring Plant Species

Overstory

Common Name	Scientific Name
Southern Sugar Maple	<i>Acer baratum</i>
Red Maple	<i>Acer rubrum</i>
Silver Maple	<i>Acer saccharium</i>
River Birch	<i>Betula nigra</i>
Bitternut Hickory	<i>Carya cordiformis</i>
Pignut Hickory	<i>Carya glabra</i>
Shagbark Hickory	<i>Carya ovata</i>
Mockernut Hickory	<i>Carya tomentosa</i>
White Ash	<i>Faxinus americana</i>
Sweetgum	<i>Liquidamber styraciflua</i>
Yellow Poplar	<i>Liriodendron tulipifera</i>
Southern Magnolia	<i>Magnolia grandiflora</i>
Blackgum	<i>Nyssa sylvatica</i>
Shortleaf Pine	<i>Pinus echinata</i>
Slash Pine	<i>Pinus elliottii</i>
Longleaf Pine	<i>Pinus pulustris</i>
Loblolly Pine	<i>Pinus taeda</i>
Sycamore	<i>Plantanus occidentallis</i>
Eastern Cottonwood	<i>Populus deltoides</i>
White Oak	<i>Quercus alba</i>
Scarlet Oak	<i>Quercus coccinea</i>
Southern Red Oak	<i>Quercus falcata</i>
Turkey Oak	<i>Quercus laevis</i>
Laurel Oak	<i>Quercus laurifolia</i>
Blackjack Oak	<i>Quercus marilandica</i>
Water Oak	<i>Quercus nigra</i>
Pin Oak	<i>Quercus palustris</i>
Willow Oak	<i>Quercus phellos</i>
Swamp Chestnut Oak	<i>Quercus prinus</i>
Northern Red Oak	<i>Quercus rubra</i>
Post Oak	<i>Quercus stellata</i>
Black Oak	<i>Quercus velutina</i>
Winged elm	<i>Ulmus alata</i>
American elm	<i>Ulmus americana</i>

Midstory

Common Name	Scientific Name
Boxelder	<i>Acer negundo</i>
Beauty-berry	<i>Callicarpa americana</i>
American Hornbeam, Musclewood	<i>Carpinus caroliniana</i>
Hackberry	<i>Celtis occidentalis</i>
Redbud	<i>Cercis canadensis</i>
Fringetree	<i>Chionanthus virginicus</i>
Dogwood	<i>Cornus florida</i>
Hawthorn	<i>Crataegus sp.</i>
Persimmon	<i>Diospyros virginiana</i>
Honeylocust	<i>Gleditsia triacanthos</i>
American Holly	<i>Ilex opaca</i>
Black Walnut	<i>Juglans nigra</i>
Eastern Red Cedar	<i>Juniperus virginiana</i>
Red Mulberry	<i>Morus rubra</i>
Waxmyrtle	<i>Myrica cerifera</i>
Eastern Hop Hornbeam, Ironwood	<i>Ostrya virginiana</i>
Sourwood	<i>Osydendron arboreum</i>
Black Cherry	<i>Prunus serotina</i>
Wild Plum	<i>Prunus sp.</i>
Winged Sumac	<i>Rhus copallia</i>
Blacklocust	<i>Robinia pseudoacacia</i>
Palmetto	<i>Sabal minor</i>
Black Willow	<i>Salix nigra</i>
Sassafras	<i>Sassafras albidum</i>
Sparkleberry	<i>Vaccinium sp.</i>
Blueberry	<i>Vacinium corymbosum</i>

Ground Covers

Common Name	Scientific Name
Trumpet Creeper	<i>Campis radicans</i>
Yellow jessamine	<i>Gelseminum sempervirens</i>
Virginia Creeper	<i>Parthenocissus quinquefolia</i>
Ferns	<i>Polystichum sp.</i>
Poison Oak	<i>Rhus quercifolia</i>
Poison Ivy	<i>Rhus radicans</i>
Poison Sumac	<i>Rhus vernix</i>
Black Berry	<i>Rubus sp.</i>
Greenbrier, Smilax	<i>Smilax sp.</i>
Wood grass	<i>Uniola sessiliflora</i>
Periwinkle	<i>Vinca minor</i>
Muscadine	<i>Vitis rotundifloia</i>

Aquatic Plants

Common Name	Scientific Name
Brazilian elodea, egeria	<i>Egeria densa</i>
Waterhyacinth	<i>Eichhornia crassipes</i>
Hydrilla	<i>Hydrilla verticillata</i>
Water primrose	<i>Ludwigia hexapetala</i>
Parrotfeather	<i>Myriophyllum aquaticum</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
American lotus, lotus lily	<i>Nelumbo lutea</i>
Alligatorweed	<i>Alternanthera philoxeroides</i>
Fanwort	<i>Cabomba caroliniana</i>
Coontail, hornwort	<i>Ceratophyllum demersum</i>
Chara, musk grass	<i>Chara sp.</i>
Elodea	<i>Elodea canadensis</i>
Marsh Hibiscus	<i>Hibiscus moscheutos</i>
Southern watergrass	<i>Hydrochloa caroliniensis</i>
Water pennywort	<i>Hyrocotyle umbellata</i>
Waterwillow	<i>Justicis americana</i>
Southern naiad	<i>Najas guadalupensis</i>
Slender naiad, spiny-leaf naiad	<i>Najas minor</i>
Fragrant waterlily	<i>Nymphaea odorata</i>
Water paspalum	<i>Paspalum fluitans</i>
Pickerelweed	<i>Pontederia cordata</i>
Pondweed	<i>Potamogeton sp.</i>
Arrowheads	<i>Sagittaria sp.</i>
Cattail	<i>Typha sp.</i>
Bladderwort	<i>Utricularia sp.</i>

Exotics

Common Name	Scientific Name
Japanese honeysuckle	<i>Lonicera japonica</i>
China-berry	<i>Melia azedarach</i>
Kudzu	<i>Pueraria lobata</i>
Wisteria	<i>Wisteria frutesus</i>
Chinese Tallow	<i>Sapium sebiferum</i>
Giant Reed	<i>Arundo donax</i>
Chinese Privet	<i>Ligustrum sinense</i>
Old World Climbing Fern	<i>Lygodium microphyllum</i>
Johnson Grass	<i>Sorghum halepense</i>
Autumn Olive or Eleagnus	<i>Eleagnus umbellata</i>
Bamboo	<i>Phyllosachys sp</i>
Hydrilla	<i>Hydrilla verticillata</i>
Alligator Weed	<i>Alternanthera philoxeroides</i>
Parrot Feather	<i>Myriophyllum aquaticum</i>

Commonly Occurring Bird Species

Common Name	Scientific Name	
Wood Duck	<i>Aix sponsa</i>	Summer
Mallard	<i>Anas platyrhynchos</i>	Summer
Canada Goose	<i>Branta canadensis</i>	Summer
Hooded Merganser	<i>Lophodytes cucullatus</i>	Summer
Blue-winged Teal	<i>Anas discors</i>	Winter
Green-winged Teal	<i>Podilymbus podiceps</i>	Winter
Northern Shovelers	<i>Anas clypeata</i>	Winter
Canvasback	<i>Aythya valisineria</i>	Winter
Redhead	<i>Aythya americana</i>	Winter
Ring-necked Duck	<i>Aythya collaris</i>	Winter
Greater Scaup	<i>Aythya marila</i>	Winter
Lesser Scaup	<i>Aythya affinis</i>	Winter
Long-tailed Duck	<i>Clangula hyemalis</i>	Winter
Bufflehead	<i>Bucephala albeola</i>	Winter
Common Golden eye	<i>Bucephala clangula</i>	Winter
Common Merganser	<i>Mergus merganser</i>	Winter
Red Breasted Merganser	<i>Mergus serrator</i>	Winter
Ruddy Duck	<i>Oxyura jamaicensis</i>	Summer
Pacific Loon	<i>Gavia Pacifica</i>	Winter
Common Loon	<i>Gavia immer</i>	Winter
Red Throated Loon	<i>Gavia stellata</i>	Winter
Pied Billed Grebe	<i>Podilymbus podiceps</i>	Summer/Winter
Horned Grebe	<i>Podiceps auritus</i>	Winter
Eared Grebe	<i>Podiceps nigricollis</i>	Winter
American Coot	<i>Fulica americana</i>	Winter
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Summer/Winter
Anhinga	<i>Anhinga anhinga</i>	Summer
Belted Kingfisher	<i>Megaceryle alcyon</i>	Summer
Great Egret	<i>Ardea alba</i>	Summer
Great Blue Heron	<i>Ardea herodias</i>	Summer
Green Heron	<i>Butorides virescens</i>	Summer
White Ibis	<i>Eudocimus albus</i>	Summer
Least Bittern	<i>Ixobryhus exilis</i>	Summer
Wood Stork	<i>Mycteria americana</i>	Late summer
Brown Pelican	<i>Pelecanus occidentalis</i>	Winter
White Pelican	<i>Pelecanus erythrorhynchos</i>	Winter
Chimney Swift	<i>Chaetura pelagica</i>	Summer
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	Summer
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>	Summer
Whip-poor-will	<i>Caprimulgus vociferus</i>	Summer
Common Nighthawk	<i>Chordeiles minor</i>	Summer

Continued		
Killdeer	<i>Charadrius vociferus</i>	Summer
Cooper's Hawk	<i>Accipiter cooperii</i>	Summer
Sharp-shinned Hawk	<i>Accipiter striatus</i>	Summer
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Summer
Broad-winged Hawk	<i>Buteo playtypterus</i>	Summer
Red-shouldered Hawk	<i>Buteo lineatus</i>	Summer
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Summer/Winter
Osprey	<i>Pandion haliaetus</i>	Summer/Winter
Turkey Vulture	<i>Cathartes aura</i>	Summer/Winter
Black Vulture	<i>Coragyps atratus</i>	Summer/Winter
Peregrine Falcon	<i>Falco peregrinus</i>	Winter
American Kestrel	<i>Falco sparverius</i>	Winter
Mourning Dove	<i>Zenaida macroura</i>	Summer/Winter
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Summer
Northern Bobwhite	<i>Colinus virginianus</i>	Summer/Winter
Wild Turkey	<i>Meleagris gallopavo</i>	Summer/Winter
Cedar Waxwing	<i>Bombycilla cedrorum</i>	Winter
Northern Cardinal	<i>Cardinalis cardinalis</i>	Summer/Winter
American Crow	<i>Corvus brachyrhynchos</i>	Summer/Winter
Fish Crow	<i>Corvus ossifragus</i>	Summer/Winter
Blue Jay	<i>Cyanocitta cristata</i>	Summer/Winter
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	Summer/Winter
American Goldfinch	<i>Carduelis tristis</i>	Summer/Winter
House Finch	<i>Carpodacus mexicanus</i>	Summer/Winter
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Summer
Orchard Oriole	<i>Icterus spurius</i>	Summer
Brown-headed Cowbird	<i>Molothrus ater</i>	Summer
Common Grackle	<i>Quiscalus quiscula</i>	Summer
Eastern Meadowlark	<i>Sturnella magna</i>	Summer
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Summer
Northern Mockingbird	<i>Mimus polyglottos</i>	Summer/Winter
Brown Thrasher	<i>Toxostoma rufum</i>	Summer/Winter
Tufted Titmouse	<i>Baeolophus bicolor</i>	Summer/Winter
Carolina Chickadee	<i>Poecile carolinensis</i>	Summer/Winter
Pine Warbler	<i>Dendroica pinus</i>	Summer/Winter
Yellow-breasted Chat	<i>Icteria virens</i>	Summer
Prothonotary Warbler	<i>Protonotaria citrea</i>	Summer
American Redstart	<i>Setophaga ruticilla</i>	Summer
Hooded Warbler	<i>Wilsonia citrina</i>	Summer
Ovenbird	<i>Seiurus aurocapilla</i>	Summer
Louisiana Waterthrush	<i>Seiurus motacilla</i>	Summer
Black-and-White Warbler	<i>Mniotilta varia</i>	Summer
Kentucky Warbler	<i>Oporornis formosus</i>	Summer
Common Yellowthroat	<i>Geothlypis trichas</i>	Summer

Continued		
Hooded Warbler	<i>Wilsonia citrina</i>	Summer
Northern Parula	<i>Parula Americana</i>	Summer
Pine Warbler	<i>Dendroica pinus</i>	Summer
Yellow-throated Warbler	<i>Dendroica dominica</i>	Summer
Prairie Warbler	<i>Dendroica discolor</i>	Summer
Yellow-Breasted Chat	<i>Icteria virens</i>	Summer
Bachman's Sparrow	<i>Aimophila aestivalis</i>	Summer/Winter
Chipping Sparrow	<i>Spizella passerine</i>	Summer/Winter
Field Sparrow	<i>Spizella pusilla</i>	Summer/Winter
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	Summer/Winter
Song Sparrow	<i>Melospiza melodia</i>	Summer/Winter
White-throated Sparrow	<i>Zonotrichia albicollis</i>	Winter
Summer Tanager	<i>Piranga rubra</i>	Summer
Northern Cardinal	<i>Cardinalis cardinalis</i>	Summer/Winter
Blue Grosbeak	<i>Passerina caerulea</i>	Summer/Winter
Indigo Bunting	<i>Passerina cyanea</i>	Summer
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Summer/Winter
Eastern Meadowlark	<i>Sturnella magna</i>	Summer
House Finch	<i>Carpodacus mexicanus</i>	Summer/Winter
American Goldfinch	<i>Carduelis tristis</i>	Summer/Winter
Ruby-crowned Kinglet	<i>Regulus calendula</i>	Winter
Brown-headed Nuthatch	<i>Sitta pusilla</i>	Summer/Winter
European Starling	<i>Sturnus vulgaris</i>	Summer/Winter
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	Summer
Summer Tanager	<i>Piranga rubra</i>	Summer
Carolina Wren	<i>Thryothorus ludovicianus</i>	Summer/Winter
Wood Thrush	<i>Hylocichla mustelina</i>	Summer
Eastern Bluebird	<i>Sialia sialis</i>	Summer/Winter
American Robin	<i>Turdus migratorius</i>	Summer/Winter
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	Summer
Eastern Phoebe	<i>Sayornis phoebe</i>	Summer
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Summer
Red-eyed Vireo	<i>Vireo olivaceus</i>	Summer
White-eyed Vireo	<i>Vireo Grieus</i>	Summer
Pileated Woodpecker	<i>Dryocopus pileatus</i>	Summer/Winter
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	Summer/Winter
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Summer/Winter
Downy Woodpecker	<i>Picoides pubescens</i>	Summer/Winter
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	Winter
Great Horned Owl	<i>Bubo virginianus</i>	Summer/Winter
Eastern Screech-Owl	<i>Megascops asio</i>	Summer/Winter
Barred Owl	<i>Strix varia</i>	Summer/Winter

**compiled from "Georgia Breeding Bird Atlas", Georgia Ornithological Society Records, UGA Museum of Natural History Records, and field observations.

Mammals	
Common Name	Scientific Name
Hispid Cotton Rat	<i>Sigmodon hispidus</i>
Golden Mouse	<i>Ochrotomys nuttalli</i>
Eastern Harvest Mouse	<i>Reithrodontomys humulis</i>
White-footed Mouse	<i>Peromyscus leucopus</i>
Cotton Mouse	<i>Peromyscus gossypinus</i>
Common Muskrat	<i>Ondatra zibethicus</i>
Oldfield Mouse	<i>Peromyscus polionotus</i>
Southern Flying Squirrel	<i>Glaucomys volans</i>
Eastern Gray Squirrel	<i>Sciurus carolinensis</i>
Eastern Fox Squirrel	<i>Sciurus niger</i>
Eastern Chipmunk	<i>Tamias striatus</i>
Southern Short-tailed Shrew	<i>Blarina carolinensis</i>
Least Shrew	<i>Cryptotis parva</i>
Eastern Mole	<i>Scalopus aquaticus</i>
Eastern Cottontail	<i>Sylvilagus aquaticus</i>
Swamp Rabbit	<i>Sylvilagus floridanus</i>
Eastern Pipistrille	<i>Pipistrellus subflavus</i>
Rafineques Big Eared bat	<i>Corynorhinus rafinesquii</i>
Southeastern Myotis	<i>Myotis austroriparius</i>
Big Brown Bat	<i>Eptesicus fuscus</i>
Little Brown Bat	<i>Myotis lucifugus</i>
Silver-haired Bat	<i>Lasionycteris noctivagans</i>
Eastern Red Bat	<i>Lasiurus borealis</i>
Hoary Bat	<i>Lasiurus cinereus</i>
Seminole Bat	<i>Lasiurus seminolus</i>
Evening Bat	<i>Pipistrellus subflavus</i>
Coyote	<i>Canis latrans</i>
Gray Fox	<i>Urocyon cinereoargenteus</i>
Red Fox	<i>Vulpes vulpes</i>
Bobcat	<i>Lynx rufus</i>
Striped Skunk	<i>Mephitis mephitis</i>
Spotted Skunk	<i>Spilogale putorius</i>
Long-tailed Weasel	<i>Mustela frenata</i>
Mink	<i>Mustela vison</i>
Northern Raccoon	<i>Procyon lotor</i>
Northern River Otter	<i>Lontra canadensis</i>
Virginia Opossum	<i>Didelphis virginiana</i>
American Beaver	<i>Castor canadensis</i>
Nine-banded Armadillo	<i>Dasypus novemcinctus</i>
White-tailed Deer	<i>Odocoileus virginianus</i>

Reptiles	
Common Name	Scientific Name
Snakes	
Eastern Black Racer	<i>Coluber constrictor</i>
Corn Snake	<i>Elaphe guttata</i>
Rat Snake	<i>Elaphe obsoleta</i>
Eastern Hognose Snake	<i>Heterodon platirhinos</i>
Southern Hognose	<i>Heterodon simus</i>
Mole Snake	<i>Lampropeltis calligaster</i>
Eastern King Snake	<i>Lampropeltis getula</i>
Scarlet King	<i>Lampropeltis triangulum elapsoides</i>
Coachwhip	<i>Masticophis flagellum</i>
Plain-bellied Watersnake	<i>Nerodia erythrogaster</i>
Northern Watersnake	<i>Nerodia sipedon</i>
Brown Watersnake	<i>Nerodia taxispilota</i>
Rough Green Snake	<i>Opeodrys aestivalis</i>
Queen Snake	<i>Regina septemvittata</i>
Brown Snake	<i>Storeria dekayi</i>
Red-bellied Snake	<i>Storeria occipitomaculata</i>
Southeastern Crowned Snake	<i>Tantila coronata</i>
Eastern Ribbon Snake	<i>Thamnophis suaritus</i>
Common Garter Snake	<i>Thamnophis sirtalis</i>
Rough Earth Snake	<i>Virginia striatula</i>
Smooth Earth Snake	<i>Virginia valeriae</i>
Copperhead	<i>Agkistrodon contortrix</i>
Cottonmouth	<i>Agkistrodon piscivorus</i>
Timber Rattlesnake	<i>Crotalus horridus</i>
Pygmy Rattlesnake	<i>Sistrurus miliarius</i>
Lizards	
Common Name	Scientific Name
Eastern Fence Lizard	<i>Sceloporus undulatus</i>
Green Anole	<i>Anolis carolinensis</i>
Five-lined Skink	<i>Eumeces fasciatus</i>
Southeastern Five-lined Skink	<i>Eumeces inexpectatus</i>
Six-lined Racerunner	<i>Cnemidophorus sexlineatus</i>
Slender Glass Lizard	<i>Ophisaurus attenuatus</i>
Eastern Glass Lizard	<i>Ophisaurus ventralis</i>
Broadhead Skink	<i>Eumeces laticeps</i>
Ground Skink	<i>Scincella lateralis</i>
American Alligator	<i>Alligator mississippiensis</i>
Turtles	
Common Name	Scientific Name
Common Snapping Turtle	<i>Chelydra serpentina</i>

Eastern Box Turtle	<i>Terrapene carolina</i>
Pond Slider	<i>Trachemys scripta</i>
Painted Turtle	<i>Chrysemys picta</i>
River Cooter	<i>Pseudemys coninna</i>
Eastern Musk Turtle	<i>Kinosternon subrubrum</i>
Common Musk Turtle	<i>Sternotherus odoratus</i>
Spiny Softshell	<i>Apalone spinifera</i>

Amphibians	
Common Name	Scientific Name
Frogs and Toads	
American Toad	<i>Bufo americanus</i>
Fowler's Toad	<i>Bufo fowleri</i>
Northern Cricket Frog	<i>Acris crepitans</i>
Bird-voiced Treefrog	<i>Hyla avivoca</i>
Cope's Gray Treefrog	<i>Hyla chrysoscelis</i>
Green Treefrog	<i>Hyla cinerea</i>
Barking Treefrog	<i>Hyla gratiosa</i>
Squirrel Treefrog	<i>Hyla squirella</i>
Spring Peeper	<i>Pseudacris crucifer</i>
Upland Chorus Frog	<i>Pseudacris feriarum</i>
Southern Chorus Frog	<i>Pseudacris nigrita</i>
Eastern Narrowmouth Toad	<i>Gastrophryne carolinensis</i>
Eastern Spadefoot Toad	<i>Scaphiopus holbrookii</i>
Bullfrog	<i>Rana catesbeiana</i>
Green Frog / Bronze Frog	<i>Rana clamitans</i>
Pickerel Frog	<i>Rana palustris</i>
Southern Leopard Frog	<i>Rana sphenoccephala</i>
Salamanders	
Spotted Salamander	<i>Ambystoma maculatum</i>
Marbled Salamander	<i>Ambystoma opacum</i>
Mole Salamander	<i>Ambystoma talpoideum</i>
Two-toed Amphiuma	<i>Amphiuma means</i>
Spotted Dusky Salamander	<i>Desmognathus conanti</i>
Two-lined Salamander	<i>Eueycea bislineata complex</i>
Three-lined Salamander	<i>Eueycea guttolineatta</i>
Atlantic Coast Slimy Salamander	<i>Plethodon chlorobryonis</i>
Savannah Slimy Salamander	<i>Plethodon savannah</i>
Mud Salamander	<i>Pseudotriton montanus</i>
Red Salamander	<i>Pseudotriton ruber</i>

**Compiled utilizing "Amphibians and Reptiles of Georgia" and the UGA Museum of Natural History Records website

Commonly Occurring Fish Species

Common Name	Scientific Name
Game Fish	
Bass	<i>Serranidae</i>
Striped bass*	<i>Morone saxatilis</i>
White bass	<i>Morone chrysops</i>
Hybrid bass*	<i>Morone saxatilis x Morone chrysops</i>
White perch	<i>Morone americana</i>
Sunfish	<i>Centrarchidae</i>
Largemouth bass	<i>Micropterus salmoides</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
White crappie	<i>Pomoxis annularis</i>
Bluegill	<i>Lepomis macrochirus</i>
Redbreast	<i>Lepomis auritus</i>
Green sunfish	<i>Lepomis cyanellus</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Flier	<i>Centrarchus macropterus</i>
Warmouth	<i>Chaenobryttus coronaris</i>
Redear	<i>Lepomis microlophus</i>
Perch	<i>Percidae</i>
Yellow perch	<i>Perca flavescens</i>
Rough Fish	
Catfish	<i>Lepisosteidae</i>
Channel catfish	<i>Ictalurus punctatus</i>
White catfish	<i>Ictalurus catus</i>
Flat bullhead	<i>Ictalurus platycephalus</i>
Brown bullhead	<i>Ictalurus nebulosus</i>
Flathead catfish	<i>Pylodictis olivaris</i>
Other	
Longnose gar	<i>Lepospsteus osseus</i>
Chain pickerel (jack)	<i>Esox niger</i>
Redhorse sucker	<i>Maxostoma spp.</i>
Northern hogsucker	<i>Hypentelium nigricans</i>
Spotted sucker	<i>Minytrema melanops</i>
Carp	<i>Cyprinus carpio</i>

* Stocked Species

Commonly Occurring Fish Species
(Con't)

Forage Species	
Shad and herring	<i>Clupeidae</i>
Gizzard shad	<i>Dorosoma cepedianum</i>
Threadfin shad	<i>Dorosoma petenense</i>
Blueback herring	<i>Alosa aestivalis</i>
Minnows	<i>Cyprinidae</i>
Spottail shiner	<i>Notropis hudsonius</i>
Golden shiner	<i>Notemigonus chrysoleucas</i>
Livebearers	<i>Poeciliidae</i>
Mosquito fish	<i>Gambusia affinis</i>

APPENDIX B

2001 Shoreline Management Plan

For

J. Strom Thurmond

APPENDIX C

8-Step Process for EO11988: Floodplain Management

8-Step Process for EO 11988: Floodplain Management

J. Strom Thurmond Lake Shoreline Management Plan

- ER 1130-2-406

--Decision Process for E.O. 11988 as Provided by 24 CFR §55.20

Step 1: Determine whether the action is located in a 100-year flood plain (or a 500-year flood plain for critical actions).

Part of this action is located in a 100-year flood plain. Based on FEMA Flood maps the elevation of the 100 year flood plains is 339 msl. J. Strom Thurmond Lake will be above and below this flood plain. The Preferred alternative is the update of the Shoreline Management Plan. Therefore, E.O. 11988 applies and an evaluation of direct and indirect impacts associated with construction, occupancy, and modification of the flood plain is required.

Step 2: Notify the public for early review of the proposal and involve the affected and interested public in the decision making process.

The Thurmond SMP was last updated in January 2001 (Appendix B). Over the past 14 years, changes have occurred that warrant an update to the SMP. These include: changes in policy, changes in regulations, increases in economic growth, increase in surrounding community growth and increases in recreational use. Pursuant to ER 1130-2-406, the objective of the updated SMP is to maintain a balance between permitted private uses, long-term natural resource protection, and public recreation opportunities. Specifically, ER 1130-2-406 states the intended purpose of an SMP is to provide protection of desirable environmental characteristics of Civil Works lake projects and restoration of shorelines where degradation has occurred through private exclusive use. The ER states that the plan must provide for protection of public lands and private investments and honor any past commitment. Public participation is also encouraged to the fullest extent.

The proposed SMP update meets the following goals:

- Updates policies and regulations pertaining to the shoreline of Thurmond Lake.
- Maintains aesthetic and environmental characteristics of the lake for the full benefit of the general public.
- Addresses shoreline allocations (zoning), rules, regulations, and other information relative to the Shoreline Management Program.
- Ensures that program management actions are based on current information and regulations through collaboration with the public, stakeholders, and subject matter experts.

Step 3: *Identify and evaluate practicable alternatives.*

A. Locate the Project Within the Flood plain

The Proposed SMP was developed in accordance with the criteria outlined within the USACE shoreline management regulation (ER 1130-2-406). The preferred alternative will meet J. Strom Thurmond Lake shoreline management goals and responsibilities while protecting the natural environment. Some of the 2001 SMP will remain unchanged with the proposed SMP.

A. No Action or Alternative Actions that Serve the Same Purpose

The J. Strom Thurmond Lake Environmental Assessment also considered a No Action Alternative which involves the continued use of the 2001 Thurmond SMP. This would not allow the Thurmond Project to operate under an up-to-date Shoreline Master Plan, in accordance with ER 1130-2-406.

Step 4: *Identify Potential Direct and Indirect Impacts of Associated with Flood plain Development.*

Section 4.1.2 of the Environmental Assessment for this project describes the impacts to the flood plain that would be expected under each alternative. With implementation of the either Alternative, the existing flood plain would not have adverse impacts.

Step 5: *Where practicable, design or modify the proposed action to minimize the potential adverse impacts to lives, property, and natural values within the flood plain and to restore, and preserve the values of the flood plain.*

Thurmond Lake's normal full pool elevation is 330 feet msl. The guide curve for Thurmond Lake targets the 330 feet msl elevation from April to mid-October each year. In accordance with the guide curve, the Thurmond Lake pool recedes gradually to approximately 326 feet msl in mid-December in preparation for winter rains. The pool remains at 326 feet msl until January, when it begins rising to 330 feet msl by April. The lake covers approximately 71,100 acres of water surface area at the normal summer pool elevation of 330 feet msl. Thurmond Lake's flood storage pool is from 330 to 346 feet msl. The Proposed Plan and the No Action alternative would result in no adverse impacts to the floodplain or management of the floodplain.

Step 6: *Reevaluate the Alternatives.*

Although the SMP is in a flood plain, the project has been designed in order to minimize effects on flood plain values.

Step 7: *Determination of No Practicable Alternative*

It is our determination that there is no practicable alternative for locating the project out of the flood zone. This is due to the need to mitigate and minimize impacts on human health, public

property, and flood plain values.

A final notice will be published during the public review of these documents.

Step 8: *Implement the Proposed Action*

USACE will assure that this plan, as modified and described above, is executed and necessary language will be included in all agreements with participating parties. USACE will also take an active role in monitoring the process to ensure no unnecessary impacts occur nor unnecessary risks are taken.