



US Army Corps
of Engineers®

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J. STROM THURMOND LAKE MASTER PLAN

US ARMY CORPS OF ENGINEERS

SAVANNAH DISTRICT

McCormick and Abbeville Counties in South Carolina; and Columbia, McDuffie, Warren,
Wilkes, Lincoln and Elbert Counties in Georgia

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Introduction

The Master Plan (MP) provides a programmatic approach to the management of all the lands included within the J. Strom Thurmond Project (Thurmond Project). The MP is the basic document guiding the United States Army Corps of Engineers (USACE) responsibilities pursuant to Federal laws to preserve, conserve, restore, maintain, manage, and develop the project's lands, waters, and associated resources. The MP is a planning document anticipating what could and should happen and is flexible based upon changing conditions. MPs are required for civil works projects and other fee-owned lands for which USACE has administrative responsibility for management of natural and manmade resources.

The primary goals of the MP are to prescribe an overall land and water management plan, resource objectives, and associated design and management concepts, which: (1) Provide the best possible combination of responses to regional needs, resource capabilities and suitability, and expressed public interests and desires consistent with authorized project purposes; (2) Contribute towards providing a high degree of recreation diversity within the region; (3) Emphasize the particular qualities, characteristics, and potentials of the project; and (4) Exhibit consistency and compatibility with national objectives and other state and regional goals and programs.

Current guidance for MP development includes revised categories of Land Classifications used to define project lands. All lands are acquired for authorized project purposes and allocated for these uses. The classification process is a further distribution of project lands by management categories which, based upon resources available and public needs, will provide for utilization while protecting project resources. The guidance also includes requirements for an interdisciplinary team approach for MP supplements or revisions. Coordination with other agencies and the public is an integral part of the master planning process.

The MP includes a Geographic Information Systems (GIS) database. Management can continually update the database throughout the life of the plan to allow USACE to take proactive management actions and adapt existing strategies. Acreages were calculated using best available GIS technology and may vary from acreages in prior MP or official land acquisition records. As a land use tool, this MP provides USACE and the public with the current classification and preferred future uses of project lands. The land classification of project lands allows USACE and the public to visually evaluate the distribution of uses of project lands. Maintaining an up-to-date MP allows USACE to respond effectively to development plans made internally or by outside parties as well as identify laws and policies that govern management of the Thurmond Project.

This policy-based MP, along with the accompanying Environmental Assessment (EA), provides USACE with a document that sets goals and objectives, but does not establish concrete development plans. This allows USACE flexibility in the management and development of Thurmond Project, within a clear policy framework. This MP does not

address the specifics of regional water quality, shoreline management, or water level management.

**J. STROM THURMOND DAM AND LAKE PROJECT MASTER PLAN
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1.0 INTRODUCTION

As stated in Engineer Regulation 1130-2-550, Chapter 2, Paragraph 2-2.a.(1), dated November 15, 1996, the Natural Resource Management Mission of the U.S. Army Corps of Engineers (USACE) is as follows:

Mission Statement

The Army Corps of Engineers is the steward of the lands and waters at Corps' water resources projects. Its Natural Resource Management Mission is to manage and conserve those natural resources, consistent with ecosystem management principles, while providing quality public outdoor recreation experiences to serve the needs of present and future generations.

In all aspects of natural and cultural resources management, the Corps promotes awareness of environmental values and adheres to sound environmental stewardship, protection, compliance, and restoration practices.

The Corps manages for long-term public access to, and use of, the natural resources in cooperation with other Federal, State, and local agencies as well as the private sector.

The Corps integrates the management of diverse natural resource components such as fish, wildlife, forests, wetlands, grasslands, soil, air, and water with the provision of public recreation opportunities. The Corps conserves natural resources and provides public recreation opportunities that contribute to the quality of American life.

1.1 Project Authorization

The initial construction of the J. Strom Thurmond Project (Thurmond Project) was authorized as part of the Rivers and Harbors Act of 1927. This act authorized the USACE to investigate existing and prospective development on various streams throughout the nation for purposes of navigation, power development, flood control, and irrigation. This authorization was embodied in House Document 308, 69th Congress, first session. Savannah District completed a report on the entire Savannah River Basin in May 1933. This document recommended against any U.S. Government flood control project for the river. Two locations, however, were proposed as likely sites for future power dams in the upper Savannah River Basin: Clark Hill (Thurmond) and Hartwell. The Thurmond Project was authorized as a multipurpose dam and reservoir as part of Public Law 534, 78th Congress, passed on December 22, 1944.

Section 864 of the Water Resources Development Act of 1986 (P.L. 99-662) was modified to include recreation and fish and wildlife management as Thurmond Project purposes. Project lands which are managed or reserved as of the date of the enactment of that law for the conservation, enhancement, or preservation of fish and wildlife and for recreation shall be considered as lands necessary for such purposes.

On December 22, 1987, President Ronald Reagan signed into law legislation (P.L. 100-209) which changed the name of Clarks Hill Dam, Lake and Highway to J. Strom Thurmond Dam, Reservoir, and Highway in honor of the senior Senator from South Carolina.

1.2 Project Purposes

The Flood Control Act of 1944 (P.L. 78-534) authorized construction of Thurmond Project for flood control, generation of hydropower, and to increase minimum regulated flows for navigation of the Savannah River below Augusta, GA.

The Water Resources Development Act of 1986 (P.L. 99-662) authorized recreation and fish and wildlife management as Thurmond Project purposes. In addition, this act included authorization to designate certain Thurmond Project lands for the mitigation of wildlife habitat loss due to the construction of Richard B. Russell Project.

The Water Supply Act of 1958, as amended (P.L. 85-500) allows the USACE to reallocate water storage from hydropower to water supply if there is no significant impact on authorized project purposes.

The Federal Water Pollution Control Act of 1972 (P.L. 92-500) established a national goal of eliminating all pollutant discharges into the waters of the U.S. and added water quality as a consideration in general terms.

1.3 Purpose and Scope of the Master Plan

The last Thurmond Project MP update was finalized in June 1995. Over the past 25 years, changes have occurred that warrant an update to the MP. These include changes in policy, changes in regulations, increases in economic growth, increase in surrounding community growth, changes in recreational use patterns, and changes in natural resources management practices. Pursuant to ER 1130-2-550, the objective of the updated MP is to provide a strategic land use management document to guide the comprehensive management and development of all recreational, natural, and cultural resources for the next 10 to 20 years.

The proposed MP update meets the following goals:

- Incorporates updates to policies and regulations pertaining to the management and future development of Thurmond Project.
- Provides the best possible combination of responses to regional needs, resource capabilities and suitability, and expressed public interests and desires consistent with authorized project purposes.
- Addresses changes in land uses, recreational uses, and natural resources management activities.
- Provides for the orderly and timely development of recreation facilities by lessees and the USACE.

- Ensures that program management actions are based on current information and regulations through collaboration with the public, stakeholders, and subject matter experts.

The MP guidance includes revised categories of Land Classifications used to define project lands. All lands were acquired for authorized project purposes and allocated for these uses. The classification process is a further distribution of project lands by management categories which, based upon resources available and public needs, will provide for utilization while protecting project resources. The guidance also includes requirements for an interdisciplinary team approach for the development, re-evaluation, and supplementation, or updating of the MP. Coordination with other agencies and the public is an integral part of the MP process.

The MP serves three primary purposes that are equal in importance. First, it is the primary management document for the project and provides direction for many of the other plans that also guide the management of the Thurmond Project. Second, it is a land use management tool. This MP will be utilized to update many of the resource management plans as needed such as the Operational Management Plan (OMP). Third, the MP provides for the environmental assessment and public review necessary for facilities and activities proposed in the MP.

As a land use tool, this MP provides the USACE and the public with the current classification and preferred future uses of project lands. The land classification of project lands allows USACE and the public to visually evaluate the distribution of uses of project lands. For example, the identification of project lands that are suitable for the development of a new recreation facility by USACE, a lease holder, or a future development is beneficial. Maintaining an up-to-date MP allows USACE to respond effectively to development plans made internally or by outside parties.

The MP includes a Geographic Information Systems (GIS) database. Management can continually update the database throughout the life of the plan to allow USACE to take proactive management actions and adapt existing strategies.

The policy-based MP along with the associated Environmental Assessment (EA) provides the USACE with a document that sets goals and objectives but does not establish concrete development plans. This allows the USACE flexibility in the management and development of Thurmond Project, within a clear policy framework. A separate EA will not be required for proposed activities or facilities described in this MP.

1.4 Description of Project and Watershed

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 70,714-acre reservoir has a shoreline of approximately 1,166 miles and an additional 79 miles of island shoreline, with the entire

project compromising approximately 150,301 acres of public land and water. This data is based on 2017 LIDAR data and differs from shoreline data reported in previous master plans and shoreline management plans.

There are 93 public recreation areas located around Thurmond Lake ranging from boat ramp only areas to a destination resort state park. The States of Georgia and South Carolina lease approximately 30,342 acres of land for wildlife management. The USACE manages 22,749.7 acres of land for wildlife.

Within the vicinity of the Thurmond Project, land use is primarily forest and agriculture. Residential development is primarily low-density and scattered. There are 91 subdivisions around Thurmond Lake. There are also 42 private club sites around the lake. Broken out by county, there are 63 subdivisions/clubs in Lincoln County, 34 in McCormick County, 27 in Columbia County, six (6) in Elbert County, and three (3) in McDuffie County. These developments impact the economy of the surrounding counties.

The Savannah River Basin consists of 34 watersheds. The Thurmond Project is in three (3) hydrologic units (HUC) (Figure 3); they are HUC 03060103 (Upper Savannah, 1,830 sq. mi), HUC 03060104 (Broad, 1,500 sq. mi.), and HUC 03060105 (Little, 766 sq. mi.). Detailed information regarding hydrologic units and subunits is available from the South Carolina Department of Health and Environmental Control <http://www.scdhec.gov/HomeAndEnvironment/Docs/60103-07.pdf> and the Georgia Watershed Boundary Dataset <https://databasin.org>.

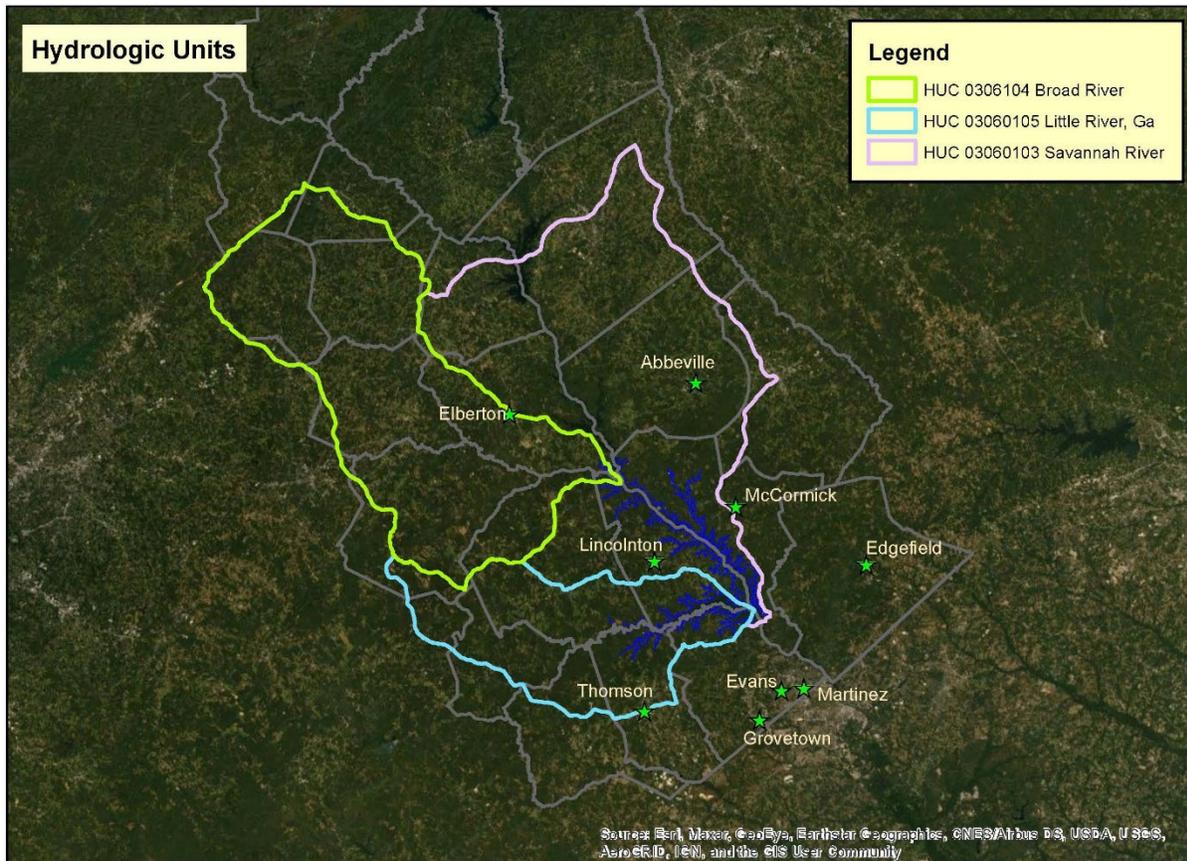


Figure 1: Hydrologic Units Upper Savannah, Broad, and Little River at J. Strom Thurmond

1.5 Prior Documentation

The original MP for Thurmond Project (formerly known as Clarks Hill Lake) was published in September 1950. Updates were published in 1966, 1980, and 1995. These updates reflected changes made in response to public demands for recreational opportunities and natural resources needs. Copies of the updates are available at the Thurmond Project Manager’s office and may be reviewed upon request.

1.6 Pertinent Project Information

Table 1: Pertinent Project Information and Water Storage Capacities

Feature	Elevation (feet above mean sea level)	Area (acres)	Capacity (acre-feet)
Top of Dam (Roadway)	351	n/a	n/a
Maximum Surcharge Elevation	346	96,587*	
Flood Surcharge Storage	335-346		950,000
Top of Flood Pool (Flood Gates)	335	77,756*	
Flood Storage	330-335		390,000
Top of Conservation Pool	330	70,520*	
Usable Conservation Storage	312-330		1,045,000
Minimum Design Pool	312	45,000	
Spillway Crest	300		1,000,000

* Acreage based on LIDAR topography collected in FY 2017.

2.0 PROJECT SETTING AND FACTORS INFLUENCING MANAGEMENT AND DEVELOPMENT

2.1 Description of Reservoir

Thurmond Dam is located on the Savannah River, 22 miles upstream of the Fifth Street Bridge in Augusta, GA. It impounds a 70,714-acre reservoir that has a shoreline of approximately 1,166 miles and 79 miles of island shoreline. The reservoir stretches nearly 37.8 miles up the Savannah River to Richard B. Russell (RBR) Dam, 44.5 miles up Little River, Georgia and 19.7 miles up Little River in South Carolina. Other main tributaries include Long Cane Creek (6.9 miles), Benningsfield Creek (3.7 miles), and Hawe Creek (3.5 miles) in South Carolina and Broad River (6.1 miles), Soap Creek (8.6 miles), Fishing Creek (9.5 miles), Keg Creek (6.4 miles), Pistol Creek (4.0 miles), Germany Creek (4.1 miles), Lloyd Creek (4.7 miles), Grays Creek (4.6 miles), and Murray Creek (3.2 miles) in Georgia. At full pool, there are over 300 islands in the reservoir ranging in size from 0.10-acre to 43 acres. There are numerous islands less than 0.10-acre in size.

2.2 Hydrology and Groundwater

The sub-basin drainage area for Thurmond Lake totals 4,096 square miles which represents 39 percent of the 10,579 square miles of the Savannah River Basin. Reservoir pool elevations fluctuate considerably and are influenced to a great degree by stream flow, power production demand, and regulated releases and pumped storage operations from the RBR Dam. Normally, the reservoir reaches a summer pool elevation of 330' above mean sea level (amsl) in April and remains within a few feet of this height until September. From September to mid-December, the pool is gradually

lowered to 326' amsl in preparation for winter and spring rains. A rising pool elevation occurs from January through April. At 330' amsl, the conservation pool which is usable storage totals 1,045,000 acre-feet. The flood storage pool which is between 330'-335' amsl totals 390,000 acre-feet. Additional information regarding storage and water releases can be found in the Savannah District Water Control Manual: <http://155.82.195.51/manual/index.cfm>.

2.3 Sedimentation and Shoreline Erosion

Like many river basins, sedimentation in the Savannah River basin has been greatly reduced since the early 1900's by the conversion of much former cropland to forest and pasture. Cotton farming, considered a highly erosive land use, has greatly declined during the last century in east central Georgia and western South Carolina. The combination of agricultural decline, transition of cropland to timber and pasture, and widespread implementation of soil conservation practices have resulted in lessened stream sediment loads. Deposits of silt in the reservoirs and channel retrogression below the dams are not major problems. Silt and retrogression ranges were established when the projects were initially constructed. At Thurmond Lake, ranges 16, 20, 30, 35, 40, 49, and 59 were resurveyed in 1959. Only range 35, which had an average depth of 4 feet of sediment, showed any appreciable change from the initial conditions. All 71 ranges were resurveyed in 1973, with no significant accumulation of sediment noted. Because the 1973 survey reflected relatively minor change in the cross-sections, there was little interest in resurveying the lines until 1999. In June of 1999, 61 sediment ranges were surveyed. Sedimentation has occurred in Broad River, Soap Creek, and Long Cane Creek. An estimate of conservation storage lost was 3,000 acre-feet which is less than 0.3% of the total conservation storage. Most of this lost conservation storage was in the lower part of the Conservation Pool, below elevation 320 feet, and is seldom used. The majority of the sedimentation was found below the usable conservation storage, in the inactive storage pool below elevation 312 feet. At the time of the 1999 survey, the sedimentation was more of a nuisance and/or aesthetic loss to lakeside residents and recreationists in the shoal areas. The actual volume of storage lost did not significantly impact any project purposes, other than minor impacts to recreation in a few locations. A summary of the 1999 sediment survey can be found at the following link: http://155.82.195.51/ThurmondSediment/sed_surv.pdf

Shoreline erosion is a major problem for many areas on Thurmond Lake, especially on the South Carolina side of the lake due to prevailing westerly winds. In several instances, private property has been eroded. The USACE, outgrantees, and many adjoining property owners have undertaken considerable erosion control efforts to protect facilities and property. The USACE is only responsible for erosion control measures to protect USACE facilities. Outgrantees and adjoining property owners must obtain the necessary permits prior to implementing erosion control measures.

2.4 Water Quality and Supply

The headwaters of Thurmond Lake back up to the RBR Dam. As a result, water released from RBR Dam affects water quality in Thurmond Lake. Russell project conducts continuous monitoring of RBR reservoir discharges to evaluate the impacts of USACE project operations on water quality in the reservoirs and immediate tailrace areas.

Water quality in Thurmond Lake is measured by Georgia and South Carolina natural resource state agencies. There are nine monitoring stations along Thurmond Lake (CL-040, RL-05405, RL-05407, RL-03357, RL-05463, SV-291, RL-06423, RL-04385, CL-041). Aquatic life and recreational uses are fully supported at all sites. Currently, both states have identified fish consumption advisories for largemouth bass caught in Thurmond Lake due to potential mercury levels resulting from outside sources. Additionally, the state of South Carolina has designated Thurmond Lake as a No Discharge Lake.

Thurmond Lake experiences thermal stratification from April through September. Thermal stratification in the downstream region of the reservoir usually begins in late-April with the establishment of a thermocline (20-26 feet) in mid-May. Temperatures range from 57.2 to 86°F, and the thermocline remains near an average depth of 26 to 33 feet throughout the stratification period. The thermocline begins to weaken in late-September when seasonal cooling begins until the reservoir conditions are almost completely isothermal by mid-October. Temporal regimes in the Savannah River portion (mainstem) of Thurmond Lake can be influenced by flow releases from RBR Lake.

In a water quality summary report (Ashby et al., 1994), temporal and spatial gradients of dissolved oxygen (DO) were observed in the mainstem of the reservoir during stratification (1984–1988 monitoring period). The DO concentrations remained near 8 to 10 milligrams per liter (mg/L), gradually decreasing towards the downstream area of the reservoir. Anoxic conditions were established in the downstream hypolimnion area from mid-to-late August continuing until late October. Anoxic conditions remained within 33 feet of the surface. Concentrations of DO did not fall below 4 mg/L in the mid-region of the reservoir. The oxygenated waters during stratification can be attributed to the well-oxygenated flow releases from RBR Dam. Anoxic conditions may also be the result of the proximity of major and secondary tributaries entering Thurmond Lake. Temperature and DO concentrations in the water releases showed similar trends to those of the forebay. During fall mixing, DO levels were near 10 mg/L in the tailrace.

Thurmond Project conducts monthly sampling of DO and temperature at established locations in the reservoir. The routine monthly sampling is conducted only at the forebay station from December through March when reservoir conditions are isothermal and DO concentrations are near saturation. From April through November, stratification resulting from temperature changes leads to reduced DO conditions, and the reservoir is sampled at 12 established locations throughout the mainstem and major tributaries.

Sampling locations are shown in Figure 2. Additional sampling may occasionally be required for special studies (i.e. operation of oxygen system and blueback herring entrainment).

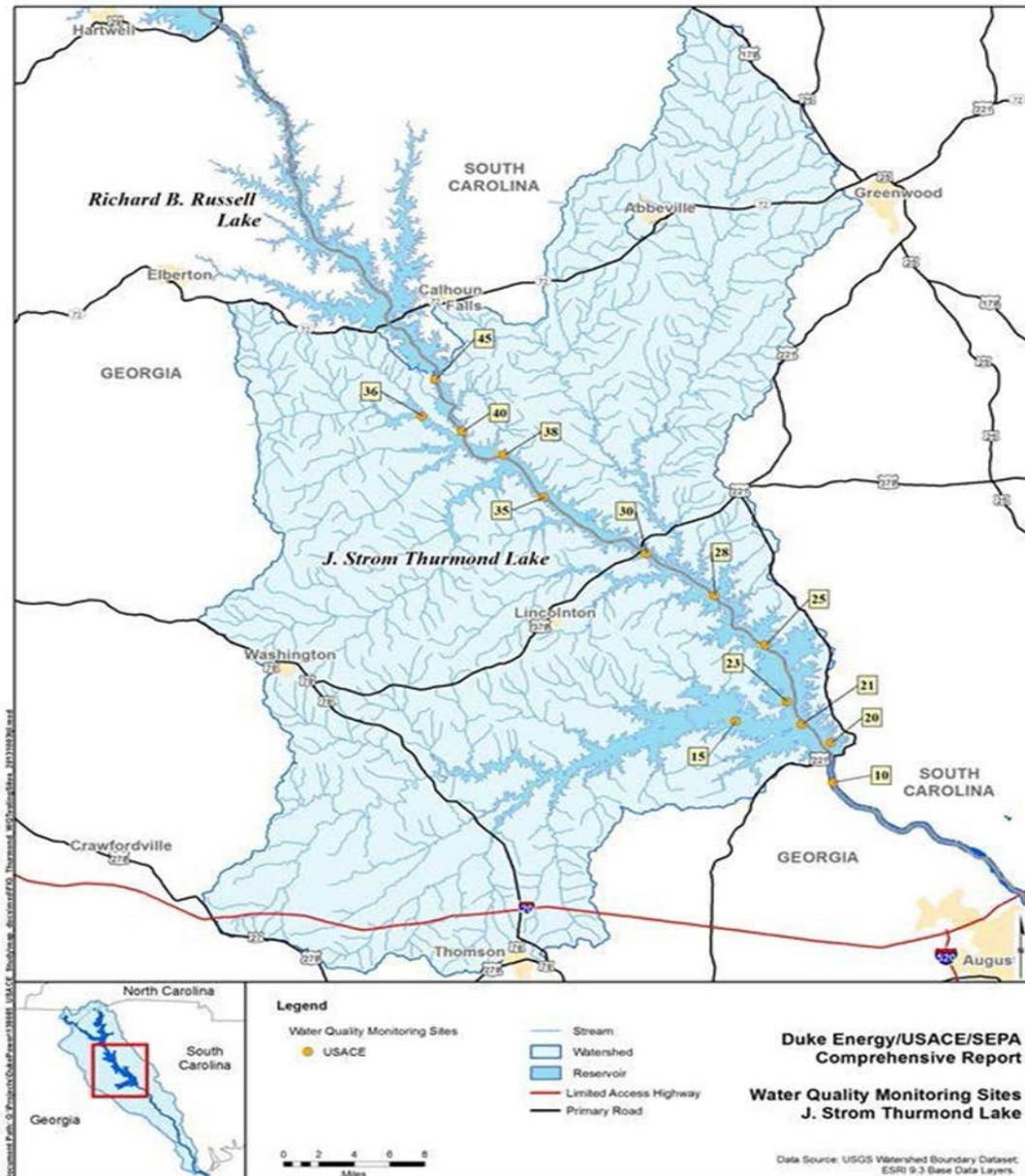


Figure 2: Water Quality Monitoring Sites

The turbines at Thurmond Dam were replaced during a major rehabilitation effort that was completed in 2007. The new turbines included a self-aspirating design that is an advanced form of turbine venting. This venting adds 2 to 3 mg/l of DO to the water as it passes through the dam. In addition to turbine venting, the USACE, Savannah District installed an oxygen injection system in the lake that began operating in 2011. This system is located adjacent to the Modoc Boat Ramp near Modoc, SC approximately 5.5-miles upstream of the dam. The primary objective of this system is to improve cool

water fishery habitat in the lower 1/3 of the reservoir, but the system also improves the DO of water immediately upstream of Thurmond Dam. Thus, the operation of this DO system in combination with the turbine venting at the dam results in the DO concentration below Thurmond Dam remaining near or above 5 mg/l throughout the year.

There is a low potential for pollution from industrial discharges and other forms of chemical discharge into Thurmond Lake. Such discharges are monitored by the states and the U.S. Environmental Protection Agency (EPA). In addition, both the States of SC and GA are developing their nonpoint source pollution programs. Project personnel look for evidence of harmful discharges during their daily activities. Emergency procedures for handling oil spills and hazardous substances are contained in the project Spill Prevention, Control and Countermeasures Plan.

To maintain and enhance the water quality of Thurmond Lake, USACE personnel will diligently pursue enforcement of State and Federal pollution control laws. Sources of pollution not covered under Federal regulations will be reported to the Georgia Environmental Protection Division and/or South Carolina Department of Health and Environmental Control for appropriate action.

Average daily water withdrawals from Thurmond Lake (2017 - 2019) are 6.7 million gallons per day (mgd) including withdrawals from eleven raw water intakes. There are six users with a total of eight permanent water storage contracts withdrawing from the lake: McCormick, South Carolina (two contracts); Lincolnton, Georgia (two contracts); Thomson, Georgia; Columbia County, Georgia; Savannah Lakes Village, South Carolina; and Washington, Georgia. Additionally, Hickory Knob State Park Golf Course withdraws water in accordance with riparian rights. The contracted amount of storage accounts for 3,741-acre feet of conservation storage.

2.5 Project Access

Thurmond Project is served by an extensive network of state and county roads. Access roads to all major recreation areas are paved and well maintained. Thurmond Project maintains all or portions of paved roads on retained road easements leading into Winfield and Hesters Ferry Campgrounds.

Access to wildlife management areas may be by either paved or gravel roads. In several instances, access is at the discretion of the adjoining property owner. Efforts are underway to obtain permanent access or reclaim abandoned easements to larger management areas.

2.6 Climate

Hot, humid summers and mild, pleasant winters characterize the Piedmont Region. Over the course of a year, the temperature typically varies from 37°F to 91°F and is rarely below 24°F or above 98°F. The warm season lasts from May 25 to September 15

with an average daily high temperature above 84°F. The hottest day of the year is around July 20, with an average high of 91°F and low of 72°F. The cold season lasts from November 27 to February 27 with an average daily high temperature below 55°F. The coldest day of the year is around January 17, with an average low of 37°F and high of 55°F. Over the entire year, the most common forms of precipitation are thunderstorms, light rain, and moderate rain. Snowfall is rare in the region.

Severe thunderstorms with damaging winds and ice storms occur periodically causing moderate damage to affected timber stands and facilities. Tornadoes occur infrequently in the region; however, microbursts are more common. Remnants from hurricanes and tropical storms periodically impact the region.

2.7 Topography, Geology, and Soils

Thurmond Project is in the lower Piedmont region and has a rolling, highly eroded topography with numerous creeks and small streams. Elevations range from 200' amsl below the dam to 550' amsl on the northern end of the Project.

Much of the southeastern Piedmont is covered by deeply weathered bedrock called saprolite. Average saprolite thickness in the Piedmont rarely exceeds 20 meters, but the thickness can vary widely within a short distance. A considerable amount of ground water flows through the saprolite and recharges streams in the Piedmont. Saprolite is easily eroded when covering vegetation and soil are removed. Extensive erosion of soil and saprolite caused by agricultural practices during the 1800s and early 1900s contributed a vast quantity of sediment into stream valleys, choking the streams and raising the streams base level. As conservation practices stabilized erosion, streams began to reestablish grade and cut into the thick accumulations of sediments, remobilizing them into the major rivers and eventually into reservoirs.

Soils consist primarily of sandy clays and sandy silt with an overlying porphyritic granite composed primarily of quartz and feldspar. Soils are quite erodible and create serious erosion problems when exposed to wind and wave action. Approximately 25 percent of the soils have moderate limitations for building recreation facilities. Approximately 75 percent of the soils have severe to very severe limitations for development.

2.8 Resources Analysis

A list of common terrestrial and aquatic plants, animals and fish found on the Thurmond Project is found in Appendix A.

2.8.1 Fisheries and Wildlife Resources

Due to the large land base, reservoir size, and diverse habitats, the Thurmond Project is able to maintain stable populations of most fish and wildlife species common to the region. The Thurmond Project is working with the South Carolina and Georgia Departments of Natural Resources as well as other partners to improve habitat for these

species. Resource managers utilize an ecosystem-based approach in the daily management of Thurmond's natural resources. Prescribed fire is an ever-growing part of this management strategy. Many species of concern, like the bobwhite quail, have evolved in fire dependent systems like those found in the region.

Natural Resources staff have also increased efforts to promote native pollinators as part of national and international initiatives sparked by declining pollinator populations worldwide. As part of this effort, native plantings have been incorporated into landscape improvements around the project. Interpretive materials and programs are being developed to promote/emphasize this effort.

2.8.2 Vegetative Resources

Thurmond Project is situated near the southeastern margin of the Piedmont Plateau Region. Lands acquired for Thurmond Project 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 acquisition, most forested areas were supporting second growth pine with a mixture of regional hardwoods. Most river bottom hardwoods were inundated when Thurmond reservoir was constructed.

Five basic forest types may be identified on project lands: shortleaf pine, shortleaf pine-hardwood, loblolly pine-shortleaf pine, loblolly pine, and loblolly pine-hardwood. For practical silviculture, these five types are consolidated into three types: pine, pine-hardwood, and hardwood. The pine forest type is made up of shortleaf pine, loblolly pine, and scattered small stands of longleaf pine that occur naturally or have been planted. The pine-hardwood forest type includes the pine species given above associated with hardwood species such as sweetgum, yellow-poplar, white oak, post oak, southern red oak, other red oaks, white ash, winged elm, and other regional hardwoods. Minor constituents of this type include sourwood, American holly, sycamore, and red maple.

Understory species vary widely and include viburnum, poison ivy and oak, sassafras, several species of blackberry, greenbriar, dogwood, and redbud. Japanese honeysuckle is abundant throughout the area but is kept in check by whitetail deer. Kudzu and wisteria are problematic in some areas. Other exotics found on project lands include chinaberry, princess tree, privet, climbing fern, tallow tree, bamboo, giant reed, and periwinkle.

Only a small percentage of the total land area is open or not forested. A few of the open areas are maintained for operational use and utility right-of-ways, but most exist under the wildlife management program.

Thurmond Project has always implemented an active forest management plan designed to provide increased user benefits by creating and maintaining a healthy, mixed forest.

Silvicultural treatments are prescribed for forest management activities each year. Selective tree thinnings and regeneration harvest are made to improve wildlife habitat, diversify habitat, and enhance low-density recreational use. Special consideration is given to high-density recreation areas and other areas with unique or cultural values.

The vegetative resources of the Thurmond Project were classified using information derived from FY2020 Project Site Vegetative Resource Records reported in the Operations and Maintenance Business Information Link (OMBIL). These data are displayed in Table 2.

Table 2: Vegetative Resources

Division	Order	Class	Sub-Class	Acreage
Vegetated	Herb Dominated	Herb Dominated	Annual Gramimoid or Forb Vegetation	942
Vegetated	Tree Dominated	Closed Canopy	Deciduous Closed Tree Canopy	5,996
Vegetated	Tree Dominated	Closed Canopy	Evergreen Forest	22,521
Vegetated	Tree Dominated	Closed Canopy	Mixed Evergreen-Deciduous Closed Tree Canopy	42,441
Vegetated	Tree Dominated	Open Canopy	Evergreen Open Tree Canopy	4,282
Vegetated	Herb Dominated	Herb Dominated	Perennial Gramimoid Vegetation (Grasslands)	864
Vegetative	Nonvascular Dominate	Nonvascular Vegetation	Algae Vegetation	71,022
Non-Vegetative	Non-Vegetative	Non-Vegetative	Non-Vegetative	1,642
Total Vegetated				149,710

2.8.3 Protected Species

Using the list published by the U.S. Fish and Wildlife Service (USFWS), Department of Interior, the following species of concern have been identified on Thurmond Project lands:

- Michaux's sumac (*Rhus michauxii*), a Federal endangered species, has been located in Elbert County on the Broad River Wildlife Management Area (WMA). The area is managed by Georgia Department of Natural Resources (GADNR).

- Shoals Spider-lily (*Hymenocallis coronaria*) a Federal species of concern is found in the Anthony shoals portion of Broad River.

Section 7(a)(2) of the Endangered Species Act requires federal agencies to ensure that any action authorized, funded, or carried out by such agency is not likely to:

- Jeopardize the continued existence of any endangered or threatened species, or
- Result in the destruction or adverse modification of critical habitat.

The term, "jeopardize the continued existence of" means to reduce appreciably the likelihood of both the survival and recovery of listed species in the wild by reducing the species' reproduction, numbers, or distribution (50 CFR, Section 402.02). Jeopardy opinions must present reasonable evidence that the project will jeopardize the continued existence of the listed species or result in destruction or adverse modification of critical habitat.

If a survey for a project site is positive for any federally-listed protected species, the following best management practices would be implemented:

- Project footprint will be minimized to the greatest extent practicable.
- Equipment will utilize existing roads and all equipment will use the same path to minimize disturbance.
- Vegetation will be established in areas not permanently impacted that were disturbed during project construction as soon as possible following construction. This will be accomplished with an appropriate mix of plant species native to the project site. Plants listed as invasive by the U.S. Department of Agriculture or the State of Georgia and/or South Carolina should not be used.
- At least an area equal to the suitable habitat impacted by the project actions (impacts of existing flood pools excluded) will be replaced through improved management or restoration of habitat suitable for federally-listed protected species. USACE will prepare a habitat plan outlining proposed habitat improvements and the improved or restored habitat must be in a location approved by the USFWS.
- Management and monitoring of these habitat areas must be incorporated to maintain these areas and such actions will be included in an annual report to the USFWS.

In accordance with the Memorandum of Agreement between the USACE, Savannah District, and the U.S. Fish and Wildlife Service, dated July 2010, endangered species surveys are conducted by qualified personnel prior to any ground disturbing activity in

unmaintained areas. Plant species of concern listed by the states of SC and GA are also considered in these surveys and avoided when possible. Results of these surveys are on file at the Project Manager's Office. Other threatened and endangered species having potential habitat at Thurmond Project fee lands, as identified by the USFWS, can be found in Table 3.

Table 3: Federally Protected Species Potentially Found on Thurmond Project Lands

Common Name	Scientific Name	Federal Status
Birds		
Bald eagle *	<i>Haliaeetus leucocephalus</i>	BGEPA
Wood stork +	<i>Mycteria americana</i>	T
Red-cockaded woodpecker	<i>Picoides borealis</i>	E
Mammals		
Northern Long-eared bat	<i>Myotis septentrionalis</i>	T
Reptiles		
Gopher Tortoise	<i>Gopherus polyphemus</i>	C
Mollusks		
Carolina Heelsplitter	<i>Lasmigona decorate</i>	E
Plants		
Harperella	<i>Ptilimnium nodosum</i>	E
Pool Sprite	<i>Amphianthus pusillus</i>	T
Miccosukee Gooseberry	<i>Ribes echinellum</i>	T
Michaux's Sumac*	<i>Rhus michauxii</i>	E
Relict Trillium	<i>Trillium reliquum</i>	E
Smooth Coneflower	<i>Echinacea laevigata</i>	E
Source: FWS ECOS IPaC 2020 Notes: E = Endangered, T = Threatened, C = Candidate, BGEPA = Bald & Golden Eagle Protection Act		
* Present on Thurmond Project		
+ Occasionally seen on Thurmond Project		

2.8.4 Invasive Species

Georgia and South Carolina have 207 state-listed invasive species. Table 4 lists invasive species that occur on Thurmond Project lands and waters. Data was retrieved from the FY2020 Project Site Invasive Species records reported in OMBIL and updated annually.

Table 4: Invasive Species

Species Group	Species Common Name	Type of Occurrence	Acreage Impacted	Percent Acreage Impacted
Aquatic and Wetlands Plants	Water Primrose	Minor	10	0.01%
Aquatic and Wetlands Plants	Hydrilla*	Significant to Major	2,363	3.35%
Aquatic and Wetlands Plants	Alligator Weed	Moderate	90	0.12%
Aquatic and Wetlands Plants	Curlyleaf Pondweed	Moderate	150	0.21%
Aquatic and Wetlands Plants	Giant-reed	Minor	3	0.004%
Terrestrial Animals	Red imported fire ant	Significant to Major	1,000	1.26%
Terrestrial Animals	Wild Boar	Significant to Major	1,800	2.26%
Terrestrial Plants	Autumn Olive	Significant to Major	90	0.11%
Terrestrial Plants	Chinaberry	Significant to Major	150	0.19%
Terrestrial Plants	Chinese Privet	Moderate	55	0.07%
Terrestrial Plants	Chinese Tallow Tree	Moderate	25	0.03%
Terrestrial Plants	Japanese Climbing Fern	Moderate	50	0.06%
Terrestrial Plants	Chinese Privet	Moderate	55	0.07%
Terrestrial Plants	Johnson Grass	Significant to Major	225	0.28%
Terrestrial Plants	Royal Paulownia	Minor	20	0.03%
Terrestrial Plants	Kudzu	Significant to Major	150	0.19%
Terrestrial Plants	Wisteria	Significant to Major	2,000	2.5%
Total Impacted			8,236	5.48%

*a cursory survey conducted in the fall of 2019 did not identify any hydrilla at the time of survey

Hydrilla is the most problematic invasive species due to its widespread impacts on recreation uses and it is proven to be the dominate host at Thurmond Lake for a cyanobacteria linked to Avian Vacuolar Myelinopathy (AVM), a neurological disorder that impacts American Bald Eagle and various waterfowl and shorebird populations. The Aquatic Plant Management Plan for USACE, Savannah District Water Resources Projects addresses actions taken to reduce the negative impacts of nuisance aquatic vegetation. The Avian Vacuolar Myelinopathy Plan for USACE, Savannah District, J. Strom Thurmond Project, addresses actions taken to reduce the effects of AVM on bald eagle and waterfowl populations.

Other invasive species that are problematic include feral hogs, imported fire ants, Johnson grass, and wisteria. Feral hogs negatively impact bottom land habitat and food plots in certain areas. Permits are issued to hunters to allow them to hunt feral hogs outside of the regular hunting seasons. Imported fire ant mounds are treated when they cause significant impacts within recreation areas. Johnson grass is treated as part of wildlife food plot maintenance when funds are available. Wisteria is treated in conjunction with forest management activities.

2.8.5 Ecological Setting

The Thurmond Project is located on the Savannah River near the southeastern margin of the Piedmont Plateau Region. Thurmond Dam is located on the Savannah River, 22 miles upstream of the Fifth Street Bridge in Augusta, GA. The reservoir stretches nearly 37.8 miles up the Savannah River to Russell Dam, 44.5 miles up to Little River, Georgia and 19.7 miles up Little River in South Carolina.

Within the vicinity of the Thurmond Project, land use is primarily forest and agriculture. While residential development is primarily low-density and scattered. There are 91 subdivisions around Thurmond Lake. There are also 42 private club sites around the lake.

2.8.6 Wetlands

Table 5 lists the acreages of various types of wetlands present in and around Thurmond Lake. Data was obtained from the National Wetlands Inventory.

Table 5: Wetland Summary

Wetland Class	Subtotals	Total Acres
Palustrine		2,762.0
Emergent Wetland	505.7	
Forested Wetland	1,914.4	
Scrub-Shrub Wetland	288.9	
Unconsolidated Bottom	48.8	
Unconsolidated Shore	4.2	
Riverine		1,125.1
Lacustrine		70,286.5
Unconsolidated Bottom	70,164.4	
Unconsolidated Shore	122.1	
		Total 74,173.6

2.9 Borrow Pits and Utilities

There are seven (7) active borrow/burn pits on Thurmond Project lands totaling 10.5 acres. The pits are used to burn woody debris removed from recreation areas and obtain soil for minor construction and maintenance. Two (2) borrow pits are inactive and are being allowed to naturally regenerate.

Utility rights-of-way encumber approximately 295 acres of project lands. Many of these rights-of-way provide open areas for wildlife. Approximately 1,000 acres of project lands are encumbered by roads and parking lots.

2.10 Mineral and Timber Resources

The potential exists to dredge sand deposits from certain tributaries that flow into Thurmond Lake, most notably, the Broad River portion of the reservoir. To date, no private companies have been willing to pursue this possibility. Additional environmental assessments will be necessary to pursue this activity.

Thurmond Project has always implemented an active forest management plan designed to provide increased user benefits by creating and maintaining a healthy, mixed forest. Silvicultural treatments are prescribed for forest management activities each year. Selective tree thinnings and regeneration harvest are made to improve wildlife habitat, diversify habitat, and enhance values for low-density recreational use. Salvage operations are conducted when feasible to slow insect infestations and salvage and/or remove damaged timber and remove timber prior to construction of new facilities. Prescribed burning is an integral part of the program. Special consideration is given to high-density recreation areas and other areas with unique or cultural values. On average, 12,500 tons of sawtimber and 7,000 to 9,500 tons of pulpwood are harvested annually. Timber is made available for sale by the Thurmond Project Natural Resources Manager. The timber sales are conducted by the Savannah District Real Estate Division.

2.11 Cultural Resources

The Savannah River Basin has a long history of human occupation with the 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 Lake, cultural resources investigations of varying degrees of comprehensiveness were conducted. Recent archaeological investigations at Thurmond Project have focused primarily on the upland areas (i.e., above 330' amsl), although smaller shoreline surveys have been conducted. 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 citizens, 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 Thurmond Lake (i.e., at or below 330' amsl) and almost the same number was situated outside of the flood pool.

Since 1990, shoreline cultural surveys of the Thurmond Project documented 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 shoreline 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 at Thurmond Project by cultural resources firms contracted by Savannah District have focused exclusively on upland areas. 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 rock piles 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.

There are no identified Traditional Cultural Properties (TCP) which is a property or a place that is eligible for inclusion on the National Register of Historic Places (NRHP) because of its association with cultural practices and beliefs that are rooted in the history of a community.

Eight (8) archaeological sites have been formally determined eligible for listing in the NRHP. There are 327 sites that are potentially eligible for NRHP status and two of unknown status that require additional investigation before eligibility can be determined. These sites are afforded the same protections as NRHP-eligible sites until fully

evaluated. Project lands include a total of 78 cemeteries. There are 12 additional cemeteries that were not acquired during Project acquisition that are surrounded by Project lands. Cemeteries are protected by various state laws.

Management of cultural resources would continue in accordance with the J. Strom Thurmond Project Historic Properties Management Plan, updated April 2001 and the Programmatic Agreement Among the U.S. Army Engineer District, Savannah, the Georgia State Historic Preservation Officer, the South Carolina Historic Preservation Office, and the Advisory Council on Historic Preservation for the Operation and Maintenance of the J. Strom Thurmond Lake Project, Georgia and South Carolina, dated 2003. This plan and agreement define policies and procedures implemented at Thurmond Project to assure compliance with federal cultural resources laws and regulations.

2.12 Socioeconomic Resources

Socioeconomic resources describe the existing setting in relation to population demographics, employment, income, and ethnicity.

2.12.1 Affected Environment

The affected environment includes 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 is Abbeville, Aiken, Edgefield, and McCormick Counties in South Carolina and Columbia, Elbert, Lincoln, McDuffie, Richmond, Warren, and Wilkes Counties in Georgia.

2.12.2 Population Demographics

The total population for the zone of interest is approximately 654,812, as shown in Table 6. More than 80 percent of the population is in the greater Augusta area which consist of Richmond, Columbia, and Aiken counties. Each of the remaining counties make up less than 5 percent each of the total population. The population in the zone of interest makes up approximately 3.9 percent of the total population of Georgia and 4.5 percent of South Carolina. The zone of interest includes those adjacent counties that would be directly impacted by the management of Thurmond Project.

In Georgia, Columbia County experienced the highest annual growth in 2020 and the highest projected growth from 2010 through 2021. In South Carolina, Aiken County experienced the highest growth in population annually and projected from 2010 through 2021.

Table 6: 2019 Population Estimates and 2021 Projections

	2019 Population Estimate ¹	2019 Percent of Zone of Interest ¹	2020 Annual Growth Rate ²	Estimated Growth 2010-2021 ²
States:				
Georgia	10,711,908			
South Carolina	5,118,714			
Counties:				
Abbeville, SC	24,527	3.75%	-0.24%	-3.64%
Aiken, SC	170,872	26.09%	0.84%	8.20%
Edgefield, SC	27,260	4.16%	0.47%	2.05%
McCormick	9,463	1.45%	0.58%	-6.23%
Columbia, GA	156,714	23.93%	1.68%	29.64%
Elbert, GA	19,194	2.93%	0.52%	-3.52%
Lincoln, GA	7,921	1.21%	-0.05%	-0.72%
McDuffie, GA	21,312	3.25%	-1.02%	-4.27%
Richmond, GA	202,518	30.93%	0.42%	1.54%
Warren, GA	5,254	0.80%	0.13%	-8.89%
Wilkes, GA	9,777	1.49%	-0.88%	-7.56%
Zone of Interest Total	654,812			

¹U.S. Bureau of the Census, 2019 Estimate

²Annual Growth and Estimated Growth, World Population Review Projections from the 2019 Census Estimate

The distribution of the population among gender is approximately 49.2 percent male and 50.8 percent female as shown in Table 7. Table 7 also shows the population composition by age group. It should be noted that many of the rural counties have a higher population of those over age 65.

Table 7: 2019 Age and Gender Distribution

Geographical Area	Under 18	18 to 64	65 and Over	Female	Male
States:					
Georgia	23.6%	62.1%	14.3%	51.3%	48.7%
South Carolina	21.6%	60.2%	18.2%	51.7%	48.3%
Counties:					
Abbeville, SC	20.8%	58.1%	21.1%	48.3%	51.7%
Aiken, SC	20.9%	60.4%	18.7%	51.7%	48.3%
Edgefield, SC	18.6%	63.0%	18.4%	46.7%	53.3%
McCormick	12.2%	54.4%	33.4%	44.6%	55.4%
Columbia, GA	25.5%	61.3%	13.2%	51.1%	48.9%
Elbert, GA	21.9%	57.8%	20.3%	52.0%	48.0%
Lincoln, GA	19.2%	57.6%	23.2%	53.2%	46.8%
McDuffie, GA	25.3%	57.4%	17.3%	54.2%	45.8%
Richmond, GA	23.1%	63.3%	13.6%	51.6%	48.4%
Warren, GA	20.8%	57.6%	21.6%	53.4%	46.6%
Wilkes, GA	21.4%	55.7%	22.9%	51.5%	48.5%
Zone of Interest Total	20.9%	58.8%	20.3%	50.8%	49.2%

Source: U.S. Bureau of the Census, 2019 American Community Survey

Population by Race and Hispanic Origin is displayed in Table 8. For the zone of interest, 58.5 percent of the population is White, 37.3 percent is Black or African American, 3.8 percent are Hispanic or Latina, 0.9 percent are Asian, and 1.9 percent are two or more races. The remainder of the races makes up less than 1 percent each.

By comparison, for the state of South Carolina, 66.7 percent of the population is White, 26.5 percent is Black or African American, and the remaining races constitute a slightly greater percentage of the total population than in the zone of interest. For Georgia, 57.8 percent of the population is White, 31.9 percent is Black or African American, and the remaining races constitute a slightly greater percentage of the total population than in the zone of interest.

Table 8: 2019 Population Estimate by Race/Hispanic Origin

Geographical Area	White Alone	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian or Other Pacific Islander Alone	Two or more races	Hispanic or Latino
States:							
Georgia	57.8%	31.9%	0.4%	4.1%	0.1%	2.7%	9.8%
South Carolina	66.7%	26.5%	0.4%	1.7%	0.1%	2.4%	5.8%
Counties:							
Abbeville, SC	69.9%	27.6%	0.1%	0.3%	0.0%	1.9%	1.5%
Aiken, SC	70.7%	25.0%	0.3%	0.9%	0.0%	2.4%	5.7%
Edgefield, SC	60.0%	35.3%	0.4%	0.3%	0.0%	1.8%	6.0%
McCormick	51.5%	44.8%	0.2%	0.2%	0.0%	2.7%	0.8%
Columbia, GA	73.9%	16.7%	0.3%	3.9%	0.0%	4.2%	6.7%
Elbert, GA	68.1%	29.9%	0.0%	0.6%	0.0%	0.9%	5.7%
Lincoln, GA	67.4%	31.0%	0.1%	0.0%	0.0%	1.0%	1.8%
McDuffie, GA	54.0%	39.9%	0.0%	0.4%	1.2%	1.9%	3.1%
Richmond, GA	37.1%	56.5%	0.3%	1.9%	0.2%	2.6%	4.9%
Warren, GA	37.5%	61.1%	0.0%	0.6%	0.0%	0.7%	0.5%
Wilkes, GA	52.6%	42.6%	0.0%	0.4%	0.0%	0.9%	5.1%
Zone of Interest Total	58.5%	37.3%	0.2%	0.9%	0.1%	1.9%	3.8%

Source: U.S. Bureau of the Census, 2019 American Community Survey

2.12.3 Education and Employment

Table 9 shows the population over 25 years of age by highest level of educational attainment for each of the geographical areas. In the zone of interest, for 5.4 percent of the population 25 years old and older, the highest level of education attained is below the ninth-grade level. Another 11.6 percent attended high school but did not graduate. For 36.2 percent of the population, the largest in the zone of interest, a high school degree is the highest level of educational attainment. Another 19.4 percent attended some college but did not graduate. Bachelor's degrees were the highest educational attainment of 11.9 percent, while associate degrees were 8.8 percent. The smallest group, those that have graduate or professional degrees, is 6.7 percent.

By comparison, in Georgia 4.5 percent have less than ninth grade education, 7.6 percent attended some high school, 27.4 percent graduated high school, 20.0 percent attended some college, 9.9 percent obtained an associate degree, 19.9 percent obtained a bachelor’s degree, and 12.6 percent have a graduate or professional degree. For South Carolina, 3.7 percent have less than ninth grade education, 7.9 percent attended some high school, 28.5 percent graduated high school, 20.4 percent attended some college, 9.9 percent obtained an associate degree, 18.4 percent obtained a bachelor’s degree, and 11.2 percent have a graduate or professional degree.

Table 9: Population Highest Level of Education Attainment (Age 25 or greater)

Geographic Area	Less than 9th grade	9th to 12th grade, no diploma	High school graduate (includes equivalency)	Some college, no degree	Associate degree	Bachelor degree	Graduate or professional degree
States:							
Georgia	4.5%	7.6%	27.4%	20.0%	9.9%	19.9%	12.6%
South Carolina	3.7%	7.9%	28.5%	20.4%	9.9%	18.4%	11.2%
Counties:							
Abbeville, SC	6.0%	12.4%	34.0%	18.9%	13.1%	11.0%	4.5%
Aiken, SC	4.3%	7.7%	32.8%	20.3%	8.5%	17.1%	9.3%
Edgefield, SC	6.7%	10.4%	36.7%	20.8%	8.8%	10.2%	6.5%
McCormick	4.1%	12.5%	33.9%	18.4%	10.6%	13.9%	6.6%
Columbia, GA	2.4%	4.9%	23.8%	22.0%	10.6%	22.5%	13.9%
Elbert, GA	6.2%	15.4%	40.9%	18.9%	7.0%	6.9%	4.7%
Lincoln, GA	5.4%	12.5%	39.7%	18.8%	7.8%	11.0%	4.9%
McDuffie, GA	4.2%	12.5%	41.6%	19.6%	8.1%	8.7%	5.3%
Richmond, GA	4.1%	11.8%	31.4%	22.7%	8.6%	13.1%	8.3%
Warren, GA	9.8%	17.0%	39.8%	14.2%	6.9%	8.1%	4.2%
Wilkes, GA	6.0%	10.3%	44.0%	18.6%	7.3%	8.0%	5.8%
Zone of Interest Total	5.4%	11.6%	36.2%	19.4%	8.8%	11.9%	6.7%

Source: U.S. Bureau of the Census, 2019 American Community Survey

Employment by sector is presented in Table 10 (U.S. Bureau of the Census, 2019 American Community Survey). Each figure represents the percentage of the employed civilian population in each area. In the zone of interest, the largest sectors are educational services, health care, and social assistance, employing 22.6 percent of the population. The second largest sector is manufacturing, employing 17.1 percent. This is followed by retail trade with 11.5 percent.

Table 10: Employment by Sector (percentage of employed civilian population)

Sector	GA	SC	Abbe-ville, SC	Aiken SC	Edge field, SC	McCor mick, SC	Colum -bia, GA	Elbert GA	Lincoln GA	McDuffie GA	Richmond GA	Warren GA	Wilkes GA	Zone of Interest Total
Public Administration	4.4%	4.3%	3.2%	4.6%	4.3%	8.2%	7.9%	5.7%	6.3%	4.4%	5.6%	5.9%	7.3%	5.7%
Other Service except Public Administration	4.7%	5.0%	4.6%	5.5%	6.7%	4.8%	4.0%	5.5%	3.7%	3.1%	4.4%	3.6%	5.4%	4.8%
Arts, entertainment, recreation, food	9.4%	10.8%	7.0%	8.5%	5.1%	7.1%	7.4%	4.4%	5.6%	10.0%	11.8%	2.4%	4.5%	7.2%
Educational services, health care, social	20.8%	21.9%	24.3%	21.1 %	19.6 %	28.5%	26.4%	20.1%	30.5%	16.8%	24.9%	17.8%	27.2%	22.6%
Professional, scientific, admin	13.1%	10.2%	7.9%	10.7 %	8.9%	4.9%	11.5%	5.2%	7.1%	8.9%	11.9%	7.0%	6.7%	8.9%
Finance, insurance, real estate, rentals	6.3%	5.6%	3.3%	4.4%	3.7%	3.3%	4.2%	3.3%	5.3%	2.9%	3.5%	1.8%	5.2%	3.4%
Information	2.3%	1.3%	1.1%	1.4%	1.6%	3.0%	1.8%	0.6%	1.5%	2.4%	1.6%	0.4%	1.1%	1.2%
Transportation, warehouse, utilities	7.2%	5.3%	4.6%	6.1%	5.2%	3.4%	5.2%	4.4%	5.8%	4.7%	5.4%	8.1%	6.5%	5.2%
Retail trade	10.7%	11.5%	9.2%	12.6 %	11.5 %	7.5%	13.0%	11.4%	10.8%	16.8%	13.4%	14.3%	8.2%	11.5%
Wholesale trade	2.9%	2.3%	1.7%	1.5%	2.2%	0.8%	1.9%	4.4%	1.7%	3.1%	1.9%	2.1%	2.2%	2.1%
Manufacturing	10.6%	13.7%	24.0%	14.1 %	17.7 %	21.7%	9.8%	27.3%	14.0%	15.3%	9.7%	25.2%	16.3%	17.1%
Construction	6.7%	7.2%	6.3%	8.0%	7.4%	6.0%	6.7%	3.4%	15.1%	8.9%	5.2%	4.4%	3.8%	7.4%
Agriculture, forestry, fishing and hunting	1.0%	0.9%	1.5%	1.5%	6.2%	0.9%	0.3%	4.4%	2.5%	2.6%	0.6%	6.6%	5.4%	2.9%

Source: U.S. Bureau of Census, 2019

Similarly, the largest employment sectors for Georgia and South Carolina are also educational services, health care, and social assistance, with 20.8 percent and 21.9 percent, respectively, of the total employment. While manufacturing has importance in both the zone of interest and state, it is evident that the economies are driven by service sector employment.

As shown in Table 11, the 2019 unemployment rate for the zone of interest at 6.8 percent is higher than that of Georgia and South Carolina average unemployment rate of 4.75 percent. Columbia, Lincoln, and Wilkes Counties are the only counties with unemployment rates below the state averages.

Table 11: Labor Force, Employment and Unemployment Rates for Civilian Labor Force Over Age 16

Geographical Area	Labor Force	Employed	Unemployed	Unemployment Rate	Armed Forces
States:					
Georgia	5,308,730	5,002,153	251,981	4.7%	54,596
South Carolina	2,513,088	2,359,714	116,037	4.6%	37,337
Counties:					
Abbeville, SC	10,719	10,104	586	5.5%	29
Aiken, SC	77,441	71,279	5,813	7.5%	349
Edgefield, SC	11,389	10,602	753	6.6%	34
McCormick	3,066	2,803	263	8.6%	0
Columbia, GA	75,480	68,738	3,271	4.3%	3,471
Elbert, GA	8,401	7,769	623	7.4%	9
Lincoln, GA	3,418	3,289	116	3.4%	13
McDuffie, GA	9,229	8,481	641	6.9%	107
Richmond, GA	96,101	82,032	8,095	8.4%	5,974
Warren, GA	2,224	2,115	107	4.8%	2
Wilkes, GA	4,234	4,092	128	3.0%	14
Zone of Interest Total	301,702	271,304	20,396	6.8%	10,002

Source: U.S. Bureau of the Census, 2019 American Community Survey

2.12.4 Households and Income

There are approximately 233,416 households in the zone of interest with an average household size of 2.51 persons. For Georgia, there are 3.85 million households and in South Carolina, 1.98 million, with an average size of households at 2.69 for Georgia and 2.54 for South Carolina, as shown in Table 12. Also as shown in Table 12, the zone of

interest is poorer than Georgia and South Carolina overall. In the counties in zone of interest, the median household income is \$45,896 compared to the state median household incomes of \$56,227 in South Carolina and \$61,890 in Georgia. Similarly, the zone of interest has a lower per capita income (\$23,423) compared to Georgia (\$32,657) and South Carolina (\$31,295). Within the zone of interest, Columbia County has the highest per capita income (\$34,579).

Table 12: Households, Household Size, Median Income, and Per Capita Income

Geographical Area	Households	Persons/ household	Median household income 2019 Dollars	Per capita income 2019 Dollars
States:				
Georgia	3,852,714	2.69	\$61,890	\$32,657
South Carolina	1,975,915	2.54	\$56,227	\$31,295
Counties:				
Abbeville, SC	9,660	2.46	\$38,714	\$22,646
Aiken, SC	67,598	2.45	\$51,399	\$28,396
Edgefield, SC	9,176	2.64	\$49,127	\$26,228
McCormick, SC	3,957	2.11	\$43,633	\$25,617
Columbia, GA	47,215	3.18	\$82,330	\$34,579
Elbert, GA	7,559	2.50	\$38,678	\$22,355
Lincoln, GA	3,475	2.23	\$39,742	\$26,918
McDuffie, GA	8,153	2.59	\$43,468	\$21,625
Richmond, GA	71,400	2.69	\$42,728	\$22,787
Warren, GA	2,244	2.32	\$37,203	\$23,448
Wilkes, GA	3,979	2.45	\$37,838	\$24,674
Zone of Interest Total	233,416	2.51	\$45,896	\$23,423

Source: U.S. Bureau of the Census, 2019 American Community Survey

2.13 Recreation Facilities, Activities and Needs

2.13.1 Zones of Influence

The primary area of economic influence encompasses portions of Abbeville, Aiken, Edgefield, and McCormick Counties in South Carolina and Columbia, Elbert, Lincoln, McDuffie, Richmond, Warren, and Wilkes Counties in Georgia with additional economic influence from within a 100-mile radius of the lake. This eleven-county region has been utilized as the basis in summarizing the population characteristics of Thurmond Lake.

2.13.2 Visitation Profile

The majority of visitors to Thurmond Lake come from within a 100-mile radius of the lake area. Visitors primary activities involve water-based recreation such as swimming, fishing, boating, water skiing (including wakeboarding), kayaking, and sailing. Picnicking and camping are often an important part of their visit. Another large segment of visitors relies on Thurmond Project's large land base for activities such as hunting, hiking, horseback riding, and mountain biking. The majority of visitors are repeat customers who have been "going to the lake" for years.

2.13.3 Recreation Analysis

Thurmond Lake receives approximately 3.5 million visitors per year. Recreational visitation has remained relatively consistent for the last 15 years due to reoccurring droughts, lack of major recreation area development, and changes in the public's leisure pursuits. With the exception of summer holiday weekends, the demand for picnic sites, group shelters and campsites are met. The six existing marinas meet the current demand for boat moorage. While there are an ample number of boat ramps around the lake, parking is insufficient at many boat ramps especially on the lower end of the lake. This is, in part, due to larger boat trailers and tow vehicles. The demand for 50 amp or greater electrical service at campsites has increased due to the larger RVs preferred by many campers. The demand for quality rental cabins and/or motel rooms exceeds what is available in state parks and marinas.

2.13.4 Recreational Carrying Capacity

The recreational carrying capacity of a lake is the amount of development, use, and activity any lake and associated recreational lands can sustain without being permanently adversely impacted. Overuse occasionally occurs at choice campsites and picnic sites. The lake staff in conjunction with lessees will continue to identify possible causes and effects of overcrowding and overuse and apply appropriate best management practices including site management and modifying visitor behavior.

2.14 Real Estate

Thurmond Project was authorized as a multipurpose dam and reservoir as part of Public Law 534, 78th Congress, passed on 22 December 1944. Thurmond Project was surveyed to encompass elevation 346' amsl. The acquisition of land began in 1945 and ended in 1952. Initially, 171,320 acres of land (including 3,900 acres of riverbed already in public domain) was acquired for the construction of Thurmond Project. In 1979, approximately 1,836 acres were transferred to the Russell Project for construction and operations. Approximately 19,258 acres have been disposed to the private sector through various disposal actions. A net disposal of 2,053 acres of land above 346' amsl occurred as a result of a land exchange with the US Forest Service in October 1973.

Government property is monitored by lake personnel to identify and correct instances of unauthorized use. When permanent encroachments are discovered, the project will notify and work with Real Estate Division to resolve them.

Forest products generated through clearing and salvage operations or incidental to implementation of the approved Operational Management Plan (OMP) and not required for USACE use are sold. Disposal procedure for standing timber is a Real Estate Division function and all proposed sales will incorporate a disposal plan. Generally, the plan will indicate extent, volume, and justification for such sales, and will be accomplished through the Real Estate Division, Savannah District. Funds derived from the sale of forest products are returned to the project and utilized for the implementation of natural resource management programs in accordance with the Collection of Civil Works Appropriation Refunds USACE Policy (2016-05).

Lake personnel oversee and manage 253 real estate instruments at Thurmond Lake, also a function of the Real Estate Division, Savannah District. These instruments include 42 leases for marinas, state and county parks, quasi-public sites and private clubs, as well as 20 federal, state and county permits, licenses and consents, and 188 highway and utility easements. Easements are renewed on a regular basis and new easements are issued for utilities to serve recreation areas and adjoining private customers. All easements are reviewed for compliance with NEPA in accordance with ER 200-2-2, the USACE Non-Recreational Outgrant Policy and all applicable environmental laws and regulations. Issuance of easements is addressed in accordance with a categorical exclusion for real estate grants for rights-of-way.

2.15 Applicable Public Laws

In addition to the MP, SMP, and USACE policies, a number of public laws are applicable to Thurmond Project. Compliance with these laws further guides management of USACE lands and waters. A complete listing of applicable public laws can be found in Appendix B.

3.0 RESOURCE OBJECTIVES

Resource objectives describe measurable and attainable current and future management and development activities that support the goals of the MP, Environmental Operating Principles, and applicable national performance measures. They are guidelines for obtaining maximum public benefits while minimizing adverse impacts to the environment and are developed in accordance with: 1) authorized project purposes; 2) applicable laws and regulations; 3) resource capabilities and suitability; 4) regional needs; 5) other governmental plans and programs; and; 6) expressed public desires.

Conflicts regularly arise between multiple user groups, various government agencies, and private business that have interests in the management of Project lands, recreation facilities, and waters. The Project is also obligated to balance and manage these resources for the best long-term interest of the public and the natural resources.

3.1 Aids to Navigation (ATON)

The ATON objectives are:

- to manage an effective aids to navigation program that assures critical buoys are properly maintained; and
- there is consistency in the placement of “No Wake” and hazard buoys, and inspections are conducted on a frequent basis

3.2 Safety Objectives

The safety objectives are:

- to assure a safe working environment for Project staff and contractor personnel through adherence to safety standards, regular safety training, and regular inspection of facilities and equipment;
- to implement and maintain a proactive safety management system in accordance with the USACE Safety and Occupational Health Management System (CESOHMS);
- to provide a robust public water safety program including organized programs and events, personal contacts, volunteer outreach, media involvement, coordination with other agencies, and personal floatation device (PFD) loaner boards; and
- to provide safe, well maintained facilities through regular inspection and prompt action to correct safety deficiencies.

3.3 Recreation Objectives

The recreation objectives are:

- to maintain existing USACE facilities to assure current and future visitor demands are met. This includes rehabilitation or replacement of existing facilities and repaving roads and parking lots;
- to increase the use of renewable energy sources, reduce energy consumption, and increase recycling efforts within recreation areas;
- to maintain partnerships with lessees to assure current and future visitor demands are met. This is especially applicable to facilities not provided by the USACE such as cabins and marina facilities;
- to explore and implement opportunities to partner with other government agencies and/or private entities to form public/private partnership to operate and maintain recreation areas;
- to maintain a strong cadre of volunteers to assist in all phases of recreation and natural resources management;
- to improve management of forest resources within recreation areas to provide for the conversion of over mature pine stands into areas dominated by desirable hardwoods;
- Develop and manage the area for maximum enjoyment of the recreating public to the extent compatible with other authorized purposes. It is a goal of the USACE to make its facilities accessible to persons with disabilities. The USACE will comply with standards of the Architectural Barriers Act (ABA) of 1968 to the maximum extent practicable and feasible without compromising the facility's function.

3.4 Natural Resources Objectives

3.4.1 General Objectives

The general objectives are:

- to work closely with state agencies, other federal agencies, universities, and other stakeholders to address management issues including habitat improvement on leased lands, fisheries management, water quality, invasive species management, AVM, and species of concern;
- to detect, monitor, and treat invasive species to minimize impacts to authorized project purposes in a cost-effective and environmentally sound manner;
- to improve access to larger tracts of Project lands through the reclaiming of existing easements and obtaining new easements as needed to assure public access and the continued ability to manage the natural resources;
- to identify and protect rare, threatened, and endangered species and critical habitats. This includes state listed species of concern; and

- to develop a program to better delineate Project wetlands. The existing National Wetlands Inventory does not adequately identify wetlands that have expanded or developed due to continued siltation of numerous tributaries.

3.4.2 Wildlife Management

The wildlife management objectives are:

- to maintain habitat diversity consistent with ecosystem management principles. Forest management techniques (i.e., timber thinning, regeneration, site preparation, and prescribed burning) are utilized to diversify wildlife habitat on USACE wildlife management units and South Carolina Department of Natural Resources (SCDNR) and GADNR wildlife management areas;
- to improve habitat for a variety of game and non-game species, including the maintenance of existing wildlife openings and development of additional wildlife openings and permanent fire breaks; and
- to encourage and accommodate the public use and appreciation of the project's wildlife resources. This includes improving and maintaining key access roads within wildlife management units to meet management objectives and for use by hunters, hikers, cycles, and horseback riders.

3.4.3 Fisheries Management

The fisheries management objectives are:

- to monitor, conserve, restore and improve aquatic ecosystems including the establishment of native aquatic vegetation;
- to monitor fisheries populations to ensure the populations are healthy and stable and provide a quality fishery for recreation;
- to assist partners in improving the quality and quantity of fishing opportunities to meet visitor demand; and
- to encourage and accommodate public use, public access, and appreciation of the project fisheries resources.

3.5 Cultural Resource Objectives

The cultural resources objectives are:

- to protect cultural resources sites that are eligible and potentially eligible for nomination to the National Register of Historic Places and cemeteries from further disturbance;
- to further evaluate potentially eligible archeological sites to determine eligibility status;
- to nominate eligible sites to the NRHP; and
- to ensure cultural collections are properly curated.

3.6 Other Resource Objectives

The remaining resource objectives are:

- to conserve aesthetic values of the Project's natural features;
- to delineate and periodically inspect flowage easements to ensure private development has not encroached into the easements; and
- to maintain the integrity to the Project's boundary line by periodic inspection and maintenance, minimizing encroachment on public property.

3.7 State Comprehensive Outdoor Recreation Plan (SCORP)

Both GA and SC have State Comprehensive Outdoor Recreation Plans (SCORP), which make the states eligible to receive federal grant dollars through the Land and Water Conservation Fund. These plans are typically updated every five years.

The GA 2017-2021 SCORP stresses the positive impacts provided by outdoor recreation by highlighting the value that parks and recreation bring to protecting natural resources, maintaining healthy populations, and adding to local economic vitality. Their priority is to attend to the urgent needs of current outdoor recreation facilities.

The SC 2014 SCORP focuses on providing recreational opportunities to all populations and creating economic benefits for the surrounding communities.

One of the unique challenges identified in the SCORP is the increase in resource user groups that have historically represented ethnic and racial minorities. The SCORP demonstrated that low-income and rural constituents often face unique challenges in accessing outdoor recreation resources. Any reduction in the availability of outdoor recreation would increase the negative impacts on these population groups. USACE will continue to maintain public access to these areas to facilitate outdoor recreation use and help address these needs.

4.0 LAND ALLOCATION, LAND CLASSIFICATION, WATER SURFACE, AND PROJECT EASEMENT LANDS

4.1 Land Allocation

Land allocation categories (Operations, Recreation, Fish and Wildlife Management, Mitigation) identify the congressionally authorized purpose for which project lands were acquired, whether by fee simple purchase or through other means as described below. All Project lands were acquired for the purpose of Operations (flood control, hydropower, to increased minimum regulated flows for navigation), recreation, and fish and wildlife management.

4.2 Land Classification

Land Classification refers to the primary use for which project lands are managed. Project lands have been classified for development and resource management consistent with authorized Project purposes and provisions of the NEPA and other Federal laws. Maps of land classifications are available on ArcGIS Online at (web address link) and Appendix C. Mapping capabilities have greatly improved with the implementation of Global Information Systems (GIS) and easily accessible digital aerial photography. Therefore, Land Classifications have been mapped in greater detail than was previously possible.

4.2.1 Project Operations

Approximately 647.4 acres of Thurmond Project lands are classified as Project Operations. This classification identifies Project lands required for the dam, the switch yard, maintenance facilities, Volunteer Village, and the Project Manager's Office and Visitor Center. It also includes lands that are encumbered by uses that are not consistent with other classifications such as major highways, roads, bridge crossings, water intake structures, and utilities. While all lands acquired below the maximum surcharge elevation (346' amsl) are required to fulfill the flood control mission of the project, these lands are classified based on their primary use other than flood control.

4.2.2 High-Density Recreation

Approximately 13,890.8 acres of Project lands are classified as high-density recreation. These lands have been developed for intensive recreation uses including day use areas, campgrounds, boat ramps, resorts, and public marinas. This classification is further subdivided:

- a. Public Recreation Areas are defined as lands identified and managed for the benefit of the public in general (11,627.8 acres).
- b. Quasi-Public Development. This category includes lands leased to churches, Boy Scouts, and the Family Y for group recreational usage (935.3 acres).
- c. Private Club Leases. This designation will allow the Project to honor past lease commitments in accordance with existing USACE policy on private exclusive use. There are no additional lands for lease to private clubs (26.3 acres).
- d. Special Use Area. This category includes areas leased for Points West Army Resort, the Veterans Administration Recreation Area, and the South Carolina Army National Guard Clarks Hill Training Site. Use of these areas is limited to active duty and retired military personnel (1,301.4 acres).

4.2.3 Mitigation

While Project lands were not specifically acquired to offset losses associated with the construction of Thurmond Project, the Water Resources Development Act of 1986 (P.L. 99-662) included authorization to designate 6,858 acres of Thurmond Project lands for the mitigation of wildlife habitat loss due to the construction of RBR Project. The current leases state that 2,773 acres are leased to GADNR and 4,085 acres are leased to SCDNR.

4.2.4 Environmentally Sensitive Areas

These are areas where scientific, ecological, cultural, and aesthetic features have been identified. These areas include wetlands, most islands, cultural resources sites, and cemeteries, and areas containing rare and endangered plants, unusual plant communities, and bald eagle nesting territories. This designation limits and can prohibit any further development within the area. There are currently 2,419.8 acres of land above 330' amsl classified as environmentally sensitive areas. There are two key elements of this designation: 1) The sensitive area classification will be extended to other project lands as additional sensitive areas are identified including eagle nesting territories that can frequently change; and 2) To protect the integrity of known cultural resources sites, cemeteries, and plants of concern, their locations are not shown on Land Classification maps. This information is on file at the Project Operations Manager's Office and is available for reference as needed.

4.2.5 Multiple Resource Management Lands

- a. **Low-density Recreation:** These are lands with minimal publicly funded development that support passive public recreational use. The majority of Project lands in this classification (9,538.2 acres) are those areas utilized by adjoining property owners as authorized by the Thurmond Lake Shoreline Management Plan. Other areas include designated bank fishing areas, primitive camping areas, trails, and trailheads.
- b. **Wildlife Management:** Approximately 44,369.7 acres of Project lands are classified as Wildlife Management. In addition to lands leased to the states for Mitigation (6,858.0 acres), 21,190.3 acres of land and water are leased to GADNR and 6,201.0 acres of land and water are leased to SCDNR for wildlife management. The remaining lands in this classification are managed by the USACE.
- c. **Vegetative Management:** There are no areas designated specifically for or authorized for vegetative management.
- d. **Future or Inactive Recreation Areas:** Currently there are no inactive recreation areas. This classification is also subject to change if recreation areas are closed.

4.2.6 Water Surface

The Project’s surface water zoning program is intended to facilitate project operations and public safety. The navigation channel and hazard buoys are managed by the USACE. Restricted water areas are restricted for project operations, safety, and security purposes. The following table summarizes these restricted areas.

Table 13: Surface Water Restrictions

Restriction	Acres	Effected Facilities
Prohibited Access	32.9	The water intake and flood gate portions of the dam, dam tailrace, and county water intake structures
Boats Keep Out	92.6	Designated beaches, USACE boat ramp, and maintenance dock
No Divers	9.6	The water intake and flood gate portions of the dam adjacent to the Prohibited Access area
Total	135.0	

- a. **Designated No-Wake.** Approximately 852.4 acres of the lake adjoining designated beach areas, boat ramps, at bridge crossings, within marina basins, and other high boat traffic areas have been designated as No Wake. In addition, boating regulations enforced by the states impose no wake restrictions in the vicinity of docks, anchored vessels, and/or persons in the water.

- b. **Fish and Wildlife Sanctuary.** These areas are managed with annual or seasonal restrictions to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning. Thurmond Lake does not have surface water designated for this purpose. However, there are spring water level restrictions for the purpose of maintaining largemouth bass spawning habitat (Division Regulation PDS-O-1). The spawning period is defined as beginning when the water temperature reaches 65 degrees Fahrenheit and lasts until three weeks after the water temperature reaches 70 degrees. The spawning period usually starts around the first of April and lasts 4 to 6 weeks. Past studies indicate that the four-week period of April 1 - 28 is the peak spawning period. Stable lake levels should be provided during this peak spawning period to prevent the stranding of eggs and abandonment of nests. Throughout the spawning season, water levels should not be lowered more than six inches below the highest lake elevation recorded during the operational spawning window. If inflows during the spawning season cause lake levels to rise to flood levels, managers have the authority to lower lake levels more than 6 inches, since flood control takes precedence over fish spawn. Additionally, maintaining stable lake levels may not always be possible during drought.

- c. **Open Recreation.** The remainder of the lake is open to recreational use, approximately 68,969.0 acres.

- d. **Sensitive Areas.** Approximately 574.1 acres of project lands below 330' amsl are designated as Environmentally Sensitive Areas due to the presences of wetlands or buffer areas for eagle nests. While this designation may limit facility development, it does not impact most recreational uses.
- e. **River.** Portions of rivers on Project lands that are not impounded at elevation 330' amsl, approximately 183.2 acres.

Table 14 provides a summary of land classifications at Thurmond Project. A map representing these areas is available on ArcGIS Online at ([web address link](#)) and in Appendix C.

Table 14: Land and Water Classifications

Land Classification		Acres	
Project Operations		647.4	
High-density Recreation		13,890.8	
Public Recreation Areas	11,627.8		
Quasi-public Recreation Areas	935.3		
Private Clubs	26.3		
Special Use Areas	1,301.4		
Mitigation Lands		6,882.8	
Environmental Sensitive Areas Above 330' amsl (includes islands)		2,419.8	
Cultural Resource Sites, Cemeteries, Buffer*	1,654.5		
Plants of Concern*	137.2		
Multiple Resources Management Lands		55,746.7	
Low-density Recreation	9,538.2		
Wildlife Management	46,208.5		
Closed/Future Recreation Areas	0		
Vegetative Management	0		
TOTAL LAND		79,587.5	
Surface Water Classification			
Restricted		135.0	
Designated No-Wake		852.4	
Fish and Wildlife Sanctuary		0.0	
Sensitive Areas		574.1	
Open Recreation		68,969.0	
River		183.2	
TOTAL WATER		70,713.7	

*Cultural resources and plants of concern acreages are included within other classifications.

4.3 Project Easement Lands

4.3.1 Operations Easements

These are easements the USACE purchased or retained for the purpose of project operations.

Three easements were acquired to construct saddle dikes and outfall ditches to prevent lake water from entering the Stevens Creek drainage basin during flood risk management operations. These easements located within or near the town of Parksville, SC total 2.65 acres.

Seventy-six (76) road easements totaling 274.09 acres were retained during various disposal actions dating back to the early 1960s or have been acquired since 2002. The status of these easements is summarized in Table 15:

Table 15: Road Easement Summary

Number of Easements	Acres	Status	Action Required for Project Operations
18	80.13	Public roads	None
4	19.66	Rarely used public roads	Monitor for continued access
25	78.59	Easements encumbered by private property owners	Re-establish easement
2	1.62	Easements encumbered by private property owners	No longer needed for project operations
6	23.44	No access to public roads.	Re-establish easement if public access becomes available
12	26.45	No access to public roads.	No longer needed for project operations
9	44.20	Roads maintained by USACE	Continue maintenance

4.3.2 Flowage Easements

These are easements purchased or retained by the USACE giving the right to temporarily flood private land during flood control operations. There are approximately 4,940 acres of flowage easement lands located at Thurmond Lake. The majority of these easements are on lands managed by the US Forest Service (4,118 acres).

4.3.3 Conservation Easements

These are easements purchased by the USACE for the purpose of protecting wildlife, fisheries, recreation, vegetation, archeological, threatened and endangered species, or other environmental benefits. There are no conservation easements at Thurmond Lake.

4.4 Land Classification Objectives

4.4.1 Project Operations

The Thurmond Project will continue to operate and maintain lands designated for Project Operations to assure the safety and security of Project assets. Project personnel will continue to work with outgrantees to assure they are able to sustain the operational requirements of their approved facilities (e. g. water intake structures and highways).

4.4.2 High-density Recreation

Because high-density recreation includes marina concessions, campgrounds, boat ramps, and day use areas, often in close proximity to each other, the Thurmond Project will coordinate planning with state, local, and private partners while ensuring that use of project lands is compatible with sound stewardship of the natural resource. In cooperation with our partners, Thurmond Project will develop and manage project resources to support various types and levels of recreational activities indicated by visitor demand and consistent with carrying capacities, mitigation requirements, and natural resources capabilities.

4.4.3 Mitigation

Thurmond Project will work with the RBR Project, SCDNR, and GADNR to ensure the RBR Project mitigation goals established in HD 97-244 and the Mitigation Implementation Plan of 1995 are met. Existing leases will be modified to include the approximately 89 acres needed to meet the intent of the mitigation plan.

4.4.4 Environmentally Sensitive Areas

Identification, documentation, and protection of environmentally sensitive areas has been engrained into the Natural Resources Management Programs at Thurmond Project. Thurmond Project will continue to work with our partners to ensure these areas are not adversely impacted. Shoreline Management permits will not be issued in Sensitive Areas regardless of Shoreline Management Allocation.

4.4.5 Multiple Resource Management

a. Low-density Recreation: Thurmond Project will manage areas designated for low-density recreation to accommodate and support a variety of uses such as hiking, wildlife observation, hunting, and fishing. Provisions of the J. Strom Thurmond Project Shoreline Management plan will be enforced. Forest techniques such as thinning and regeneration harvest may be used when practical to improve the health of the forest and to diversify wildlife habitats.

b. Wildlife Management: Thurmond Project will utilize both forest management and agricultural techniques to provide a diversity of habitats to support game and nongame wildlife. Management techniques will include but are not limited to invasive species suppression, insect and disease suppression, timber thinnings, regeneration timber harvest, site preparation and replanting, and prescribed burning. In addition, public access will be improved to promote a variety of uses including hiking, wildlife observation, hunting, and fishing.

c. Inactive Recreation Areas: Thurmond Project will work with local agencies, non-profit organizations and private interests to reopen inactive or closed recreation areas if possible.

4.4.6 Surface Water

The Thurmond Project will continue to maintain existing aids to navigation to ensure consistency of buoy placement especially for No Wake and hazard buoys. Another objective will be to reduce maintenance costs.

4.4.7 Easements

The Thurmond Project will develop a program to delineate all flowage easements and provide for the periodic easement inspection to minimize encroachments. Road easements will be clearly identified by survey and ground monumentation and reopened as warranted to meet operation needs and ensure public access.

5.0 RESOURCE PLAN

5.1 Purpose

The overall objective of the resource plan is to maximize recreational benefits while maintaining the projects unique natural resources and scenic qualities. The resource plan recognizes that budgets are variable from year to year and visitor use patterns and preferences change over time.

5.2 Common Recreation Facilities

In general, the following types of common recreational facilities listed in Table 16 may be considered for development within existing high-density recreation areas without an additional formal Environmental Assessment (EA) or modification to the MP:

Table 16: Potential Recreational Facilities Development

Public Parks:	
Facilities approved on the lease development plan	Replacement, relocation, and/or modernization of existing facilities not to exceed 10 percent of the original facility's footprint
Campsites not to exceed 25 percent of the existing number of campsites	Picnic Sites not to exceed 50 percent of the existing number of picnic sites
Yurts not to exceed 25 percent of the existing number of campsites/yurts sites combined	Portable or fixed mini cabins not to exceed 25 percent of the existing number of campsites/yurts sites combined
Sanitary facilities necessary to meet existing or expected demand including restrooms, shower houses, septic systems, RV dump station, etc.	Conversion of picnic areas to campgrounds or campgrounds to picnic areas.
Picnic shelter not to exceed 200-person capacity	Amphitheater not to exceed 250-person capacity
Designated parking lot(s) not to exceed 100 spaces	Disc golf course not to exceed 25 acres in size
Archery or skeet range not to exceed 25 acres in size	Additional lanes to existing boat ramps. Realignment of roads to improve safety and traffic flow at boat ramps
Playground(s)	Park office or gate house
Restaurant	Hiking, biking, interpretive, fitness, endurance, or equestrian trails or zip lines/high ropes courses
Courtesy dock, fishing pier	Park attendant/camp host sites
Fish cleaning station	Swim beach(s)
Shoreline erosion control	Game court, ball field
Camp store not to exceed 1,000 sq. ft.	Designated pet friendly areas
Interpretive center	Splash pad/mini water park not to exceed one acre

Public Marinas:	
Facilities approved on the lease development plan	Replacement, relocation, and/or modernization of existing facilities not to exceed 10 percent of the original facility's footprint
Additional wet slip, dry stack, or open boat storage not to exceed 25 percent of the approved total of boat storage opportunities	Marina office, ships store or gate house
Sanitary facilities necessary to meet existing or expected demand including restrooms, shower houses, septic systems, marine pump out station	Picnic shelters not to exceed 200-person capacity
Amphitheater not to exceed 250-person capacity	Marine service and sales facility not to exceed 1 acre
Playground(s)	Fish cleaning station
Courtesy dock, fishing pier	Restaurant

Lessee must submit detailed plans prior to approval of such facilities. Engineer approved plans may be required. An economic analysis including market and feasibility studies may be required for larger, revenue producing facilities. All state and local ordinances and laws apply. Prior to construction, an endangered species survey will be conducted in accordance with the Memorandum of Agreement between the USACE, Savannah District, and the U.S. Fish and Wildlife Service, dated July 2010. Cultural resources information will be reviewed to assure these resources are protected. Section 404 permits may be required for certain water-based construction. Generally, habitable structures will not be authorized below 346' amsl elevation, the maximum flood surcharge.

5.3 Area Resource Plans

Appendix D provides resource plans and maps for individual recreation areas (including lease areas) and wildlife management areas. These maps are also available on ArcGIS Online at (web address link). These descriptions provide the following information:

- **Management Agency** – The agency responsible for the day-to-day operations and maintenance of an area (Table 17).
- **Land Classification** – The designated land use as defined in Section 4.2.
- **Location** – A brief description of the area's location.
- **Description** – A brief description of the area, focusing on recreation features currently on site.
- **Resource Objective and Future Development** – Lists the potential for future development based on the features originally in the design, but due to various constraints were not constructed. Also, includes those features being proposed for development, but not in the original design.

Table 17: Recreation Area Managing Agency

PARK	MAP #	TOTAL ACRES	AGENCY
Project Manager's Office/Visitor Center (PMO)	1	22.1	USACE
Below Dam, South Carolina Day Use Area	2	26.1	USACE
Clarks Hill Park	3	78.4	USACE
Scotts Ferry Boat Ramp	4	7.7	USACE
Modoc Campground	5	224.2	USACE
JST Volunteer Village	6	43.9	USACE
Modoc Boat Ramp	7	96.6	USACE
Parksville Recreation Area	8	42.3	USACE
Dordon Creek Boat Ramp	9	24.2	USACE
Hawe Creek Campground	10	156.8	USACE
Leroys Ferry Campground	11	74.7	USACE
Mt. Pleasant Boat Ramp	12	6.1	USACE
Calhoun Falls Ramp	13	11.5	USACE
Morrahs Boat Ramp	14	24.7	USACE
Gill Point Recreation Area	15	17.2	USACE
Bussey Point Campground	16	209.1	USACE
Amity Recreation Area	17	100.1	USACE
Winfield Campground	18	189.5	USACE
Ridge Road Campground	19	129.8	USACE
Keg Creek Boat Ramp	20	17.4	USACE
Petersburg Campground	21	263.9	USACE
Lake Springs Recreation Area	22	252.3	USACE
West Dam Recreation Area	23	28.9	USACE
Below Dam, Georgia Boat Ramp	24	19.5	USACE
Hamilton Branch State Park	25	727.2	SCPRT
Baker Creek State Park	26	1324.8	SCPRT
Hickory Knob State Resort Park	27	963.4	SCPRT
Bobby Brown Park	28	661.8	GADNR/Elbert County, GA Sublease
Elijah Clark State Park	29	450.9	GADNR
Mistletoe State Park	30	1915.0	GADNR
Parksville Wayside	31	7.6	McCormick County, SC
Dorn Fishing and Boating Facility	32	28.0	McCormick County, SC
Broad River Campground	33	29.3	Lincoln County, GA
Hester's Ferry Campground	34	187.5	Lincoln County, GA
Parkway Boat Ramp	35	33.5	Lincoln County, GA

PARK	MAP #	TOTAL ACRES	AGENCY
Eddie Fletcher Park	36	64.1	Lincoln County, GA
Cherokee Recreation Area	37	219.8	Lincoln County, GA
Clay Hill Campground	38	68.7	Lincoln County, GA
Holiday Park	39	316.9	Wilkes County, GA
Raysville Campground	40	105.7	McDuffie County, GA
Big Hart Recreation Area	41	425.7	McDuffie County, GA
Wildwood Park	42	948.9	Columbia County, GA
Plum Branch Yacht Club	43	66.8	Private Concessionaire
Savannah Lakes Marina	44	3.5	Private Concessionaire
Soap Creek Marina	45	107.3	Private Concessionaire
Raysville Marina	46	22.8	Private Concessionaire
Clarks Hill (Thurmond) Marina	47	100.0	Private Concessionaire
Tradewinds Marina	48	201.8	Private Concessionaire
Future Marina Sites (4 sites)	49	505.2	Private Concessionaire
Hester's Bottom Campground	50	161.6	Private Concessionaire
Clarks Hill Training Site	51	867.7	SC National Guard
Fort Gordon Recreation Area (Points West Army Resort)	52	908.5	Department of Army

6.0 SPECIAL TOPICS/ISSUES/CONSIDERATIONS

6.1 Non-Residential Use Designation for J. Strom Thurmond Lake Airstrip #1

From 1950s until 1970s, Thurmond Project conducted active mosquito control programs that included the use of pesticides including DDT. A chemical mixing area located at the lower airstrip near Lake Springs Road required clean up and remediation.

Approximately 389 tons of contaminated material were removed in 2010 (Figure 3). In the Revised Compliance Status Report dated June 08, 2016, Georgia Environmental Protection Division has required the following in order to remove the site from the State of Georgia Hazardous Site Index:

- a. The Site shall not be used for recreational purposes, agricultural or grazing purposes, residential purposes, childcare centers, schools, parks, athletic fields, sporting activities of any kind, kennels, private animal pens or riding clubs without the written approval of the Georgia EPD.
- b. Groundwater beneath the Site shall not be used as a source of potable or irrigation water without the written approval of the Georgia EPD.
- c. The USACE shall take no action to modify the Site provisions of the J. Strom Thurmond Lake Master Plan listed in subsections a & b above, without the written approval of the Georgia EPD.

d. If the Department of Defense determines the property to be excess, USACE will advise the General Services Administration (GSA) of contamination that remains on the Site. During the disposal process, GSA will evaluate the need to impose any land use restrictions upon transfer of the Site property or conduct additional investigation into potential corrective action to bring the Site into compliance with Georgia EPD Risk Reduction Standards (RRS) for residential use.



Figure 3: Non-Residential Use Designation Location Map

6.2 Thurmond Marina (Clarks Hill Marina) Underground Storage Tank Site

Thurmond Marina (Clarks Hill Marina) was originally established in 1953 as Little River Sportsmen's Camp. At that time, two 2,000-gallon underground fuel storage tanks (UST) and one 1,000-gallon UST were installed. These tanks were abandoned in place and replaced with two 4,000-gallon tanks and one 2,000-gallon tank in 1988. Upon expiration of the previous lease in 2010, all USTs were abandoned and replaced with above-ground storage tanks under the current lease. During removal of the USTs in 2014, soil and groundwater contamination was discovered. A corrective action plan was developed in accordance with State of Georgia regulations for removal of 1,482 cubic yards of benzene, toluene, and ethylbenzene (BTE) contaminated soil and installation of injection wells and monitoring wells to treat and monitor groundwater contamination. Oxygen Release Compound (ORC-A) in pellet form was placed in the excavated area prior to backfilling and ORC-A in liquid form was subsequently injected via the wells for a second treatment. Periodic groundwater monitoring will be conducted in accordance with state requirements and the corrective action plan.



Figure 4: Clarks Hill Marina Underground Storage Tanks and Fuel Line

6.3 Longleaf Pine Restoration

A significant portion of Thurmond Project is located on the northern edge of the historic range of longleaf pine (*Pinus palustris*) as noted in Figure 5. Substantial remnant populations of longleaf pine have been found near Modoc, Shriver Creek, Bussey Point, and Clarks Hill WMA. Since 2004, efforts have been undertaken to restore longleaf habitat in locations that have suitable soils and where prescribed burns can be conducted easily on a regular rotation. Restoration of this type of habitat benefits numerous wildlife species that prefer open woodlands, especially bobwhite quail. In addition to the areas previously listed, longleaf pines have been planted in the Below Dam, GA Quail Habitat Demonstration Area. As of 2020, over 535 acres have been replanted to longleaf pine. In 2018, the Longleaf Alliance began to partner with the Project in this effort.

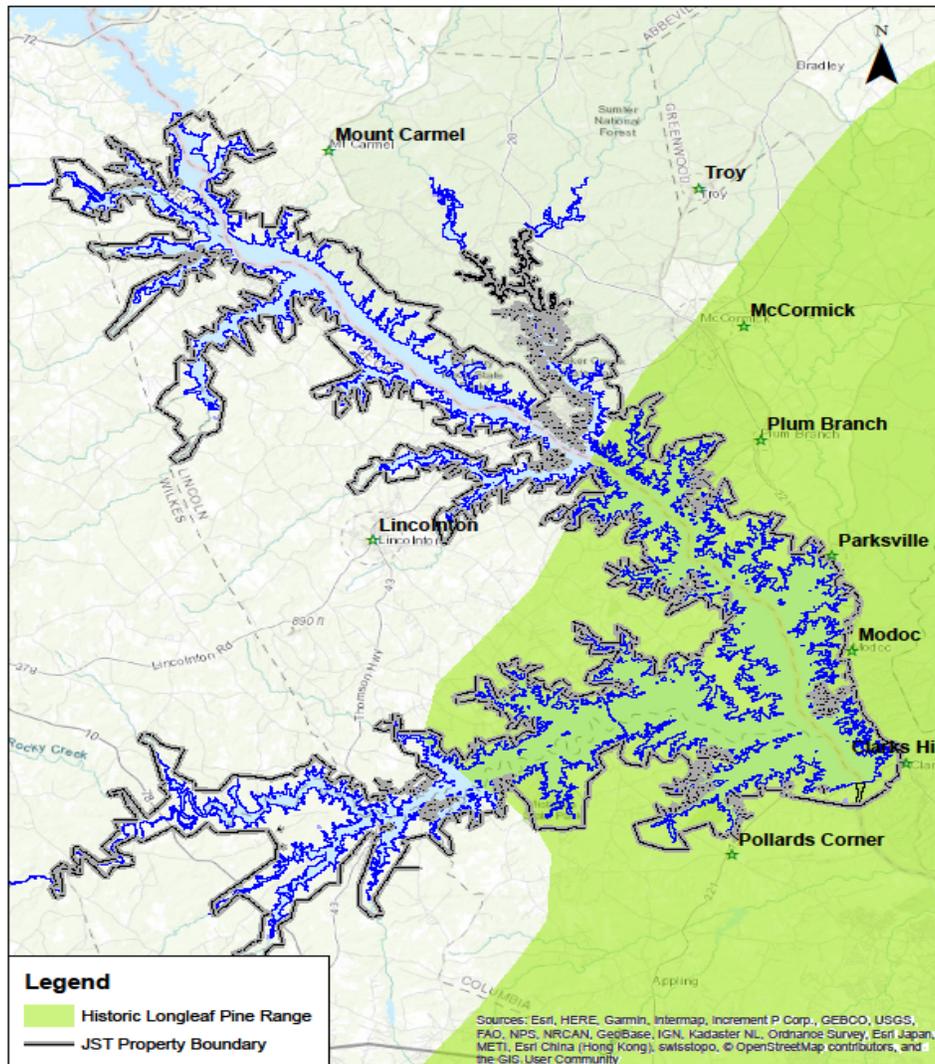


Figure 5: Historic Range of Longleaf Pine

6.4 Pollinator Habitat Improvements

On May 19, 2015, the [National Strategy to Promote the Health of Honey Bees and Other Pollinators](#) was released by the White House. The Strategy includes the [USACE Pollinator Protection Plan](#) which establishes guidance to promote the health of pollinator species on lands and waters administered by the USACE. At Thurmond Project, the use of plants beneficial to pollinators in landscaping and the maintenance of wildlife openings was increased. In 2019, the 40-acre Pollinator and Longleaf Pine Habitat Demonstration Area located between the Project Managers Office and Clarks Hill Park was opened to the public. In April 2021, this area was dedicated in memory of Chris Spiller, Natural Resources Manager at Thurmond Lake. This area provides visitors with the opportunity to learn more about the importance of pollinators and to view firsthand the uniqueness of a longleaf pine habitat.

7.0 AGENCY AND PUBLIC COORDINATION

The USACE began planning to revise the Thurmond Project MP in the fall of 2018. The objectives for a MP revision were:

- Update land classifications to reflect changes in USACE land management policies since 1980 and new agency requirements for MP documents in accordance with ER 1130-2-550, Change 7, January 30, 2013 and EP 1130-2-550, Change 5, January 30, 2013.
- Identify and approve proposed recreation area development in concept.
- Identify and approve proposed natural resource management activities.

The Public Comment period was from XXXXXX to XXXXXX. Comments are listed in Appendix E.

8.0 SUMMARY OF RECOMMENDATIONS

The recommended course of action necessary to manage Thurmond Project considered a broad spectrum of public use, environmental, socioeconomic, and workload constraints. The final Master Plan for Thurmond Lake will continue to provide for and enhance recreational opportunities for the public, improve environmental quality, and create a management philosophy that recognizes the unique qualities, characteristics, and potentials of the project.

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