

## **APPENDIX F - GLOSSARY**

**ABA**—Architectural Barriers Act  
**ACF**—Apalachicola, Chattahoochee, Flint  
**ADA**—Americans with Disabilities Act  
**ARC**—Atlanta Regional Commission  
**ARPA**—Archaeological Resources Protection Act  
**ATV**—All Terrain Vehicle

**CEIWR**—US Army Engineer Institute for Water Research  
**CFR**—Code of Federal Regulations  
**CG**—Campground  
**CoP**—Community of Practice

**DM**—Design Memoranda  
**DNR**—Department of Natural Resources  
**DOT**—Department of Transportation  
**DU**—Day Use

**EA**—Environmental Assessment  
**EM**—Engineer Manual  
**EP**—Engineer Pamphlet  
**EPA**—Environmental Protection Agency  
**ER**—Engineer Regulation  
**ESA**—Endangered Species Act

**FCA**—Flood Control Act  
**FEPCA**—Federal Environmental Pesticide Control Act  
**FHA**—Federal Highway Administration  
**FLAP**—Federal Lands Access Program  
**FLL**—Friends of Lake Lanier Inc.  
**FLTP**—Federal Lands Transportation Program  
**FWCA**—Fish and Wildlife Coordination Act  
**FWPCA**—Federal Water Pollution Control Act  
**FY**—Fiscal Year

**GA DNR**—Georgia Department of Natural Resources  
**GDOT**—Georgia Department of Transportation

**HPMP**—Historic Properties Management Plan  
**HUC**—Hydrologic Unit Code

**ICRMP**—Integrated Cultural Resources Management Plan

**LDA**—Limited Development Area

**LLI**—Lake Lanier Islands

**LLIDA**—Lake Lanier Islands Development Authority

**LWCF**—Land and Water Conservation Fund

**M&I**—Municipal and Industrial

**MP**—Master Plan

**MSL**—Mean Sea Level

**NAGPRA**—Native American Graves Protection and Repatriation Act

**NEPA**—National Environmental Policy Act

**NGVD**—National Geodetic Vertical Datum

**NHPA**—National Historic Preservation Act

**NRHP**—National Register of Historic Properties

**NRMP**—Natural Resources Management Plan

**NWI**—National Wetlands Inventory

**OMP**—Operational Management Plan

**pH**—Phosphorus

**PL**—Public Law

**PMA**—Proposed Management Action

**RCCS** – Recreational Carrying Capacity Study

**RCRA**—Resource Conservation and Recovery Act

**RHA**—River and Harbor Act

**RHFCA**—River and Harbor and Flood Control Act

**RV**—Recreational Vehicle

**SAMDR**—South Atlantic Mobile District Regulation

**SAP**—Special Activity Permit

**SCORP**—State Comprehensive Outdoor Recreation Plan

**SDWA**—Safe Drinking Water Act

**SDSFIE**—Spatial Data Standards for Facilities, Infrastructure, and Environment

**SHPO**—State Historic Preservation Officer

**SMP**—Shoreline Management Plan

**SR**—State Route

**sUAS**—Small Unmanned Aerial System

**SUP**—Shoreline Use Permit

**SWAP**—State Wildlife Action Plan



**TES**—Threatened and Endangered Species

**TMDL**—Total Maximum Daily Load

**USACE**—US Army Corps of Engineers

**USFWS**—US Fish and Wildlife Service

**WMA**—Wildlife Management Area

**WPA**—Works Progress Administration

**WRDA**—Water Resources Development Act

**WRRDA**—Water Resources Reform and Development Act

## **APPENDIX G—NATURAL RESOURCES MANAGEMENT PLAN (NRMP)—FY21-FY26**

Date: February 5, 2021

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**ACRONYMS AND ABBREVIATIONS**

**BMP**—Best Management Practice

**EP**—Engineer Pamphlet

**ER**—Engineer Regulation

**ESA**—Endangered Species Act

**GIS**—Geographic Information System  
**HPMP**—Historic Properties Management Plan  
**MOU**—Memorandum of Understanding  
**NEPA**—National Environmental Policy Act  
**NPDES**—National Pollution Discharge Elimination System  
**NRM**—Natural Resource Management  
**NRMP**—Natural Resources Management Plan  
**O&M**—Operation and Maintenance  
**PD-EI**—Planning and Environmental Division, Environment and Resources Branch, Inland Environment Team  
**PL**—Public Law  
**SAM**—US Army Corps of Engineers, South Atlantic Division, Mobile District  
**SMP**—Shoreline Management Plan  
**SMZ**—Streamside Management Zone  
**Status Species**—Federal or state-listed threatened or endangered species  
**TES**—Threatened and Endangered Species  
**USACE**—US Army Corps of Engineers  
**USFWS**—US Fish and Wildlife Service

## GLOSSARY

**Artificial regeneration:** Establishment of vegetation through planting, direct seeding, grafting, or other non-natural regeneration methods

**Biological diversity:** Variety of species (plant, animal, or fish) coexisting in a given habitat or physical area

**Carrying capacity:** Population number of a particular species that a habitat, tract, or other management unit is estimated to have the capability to support without detrimental impacts to the natural resources found there; usually expressed in terms of animals per acre or animals per square mile

**Clear-cut:** Timber harvest used to remove most or all of the trees from a particular area

**Consumptive use:** Uses, such as hunting, that consume natural resources, as opposed to “non-consumptive” uses, such as wildlife viewing

**Critical habitat:** Habitat essential to the conservation of a listed species, regardless of species presence

**Drum-chopping:** Use of a spinning drum-shaped tractor implement that has teeth for chopping vegetative matter; a common tool for site preparation in replanting sites or for cutting firebreaks

**Even-aged management:** Use of forest management practices to create a forest stand of nearly same-aged trees; generally reduces biodiversity, but can be used to target specific species management

**Exclusion buffer:** Buffer established around a sensitive area to prevent damage to features within the area; typically used around cultural resources or critical habitat areas

**Exotic species:** Non-native organisms that are introduced into a new habitat

**Firebreak:** Strip of land cleared of debris (such as sticks and leaves) that may catch fire, usually by mowing or plowing; used to stop the spread of forest fires

**Floodplains:** Low areas adjacent to water bodies prone to flooding

**Hard Mast:** Fruit of forest trees, such as acorns or other nuts

**Invasive species:** Any species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

**Level one inventory:** Basic overview of resources, depending on the context; can refer to forest types, soils, plant or animal species, and similar items

**Mosaic:** Typically used to describe forest management practices (burning or thinning) that create a variety of habitat types

**Natural regeneration:** Establishment of vegetation through natural seed fall and germination

**Non-consumptive:** Uses, such as wildlife viewing, that do not consume natural resources, as opposed to “consumptive” uses, such as hunting

**Nuisance species:** Native organisms that may cause a problem in an ecosystem based on their populations, reproduction rates, or other control-limiting characteristics

**Point source pollution:** Pollutants coming from a single identifiable source

**Pollutant:** Any substance introduced into the environment that negatively affects the usefulness of a resource

**Prescribed fire or burning:** Purposeful application of fire in a controlled, knowledgeable manner that is used as a cost-effective forest management tool

**Prescription:** Plan written for activities in a management unit that could include burning, harvesting, planting, and similar items

**Raking:** Site preparation method used prior to replanting that involves raking the ground to remove debris

**Reforestation:** Natural or intentional restocking of existing forests that have been depleted

**Regeneration:** Regrowth of vegetation after a disturbance, such as storm damage, fire, or timber harvest

**Riparian zones:** Vegetated communities along water bodies that are transitional areas between land and water ecosystems

**Rotation length:** Length of time between implementation of management prescriptions

**Salvage harvest:** Timber harvest used to remove dead or injured trees; often required following storm events, severe fires, or insect/disease infestations

**Sanitation harvest:** Timber harvest used to remove diseased trees

**Seed tree harvest:** Timber harvest that removes most of the trees from a stand but leaves desirable trees in sufficient numbers to reseed the area; the number of trees left per acre depends on tree species and diameter; once reproduction is established, seed trees are usually harvested

**Shearing:** Site prep technique used to sever residual stumps and reduce debris prior to planting

**Shelterwood harvest:** Timber harvest that uses gradual removal of an entire stand over two to three cuts; generally used to regenerate heavy-seeded species

**Silviculture:** Practice of controlling the establishment, growth, health, and quality of forested stands to meet diverse needs and values

**Snag:** Common term for a dead, rotten tree

**Soft mast:** General term for soft, edible parts of plants; usually refers to fruits, buds, leaves, and similar items

**Status species:** Common term used to describe threatened or endangered species

**Streamside Management Zone (SMZ):** Area along streams and other water bodies which serves as a vegetative buffer that is maintained or managed to protect water quality; the width varies and depends on slope, but 25' is generally considered a minimum

**Thinning:** Timber harvest used in an immature stand of trees to improve spacing, stand health, and vigor in order to increase the rate of growth of residual timber, to foster higher quality timber, and to promote sanitation

**Timber Stand Improvement (TSI):** Mechanical and/or chemical treatment generally used to control midstory and/or understory vegetation by removing competing vegetation

**Tract:** Defined piece of land; often used to refer to a management unit or a piece of property

**Travel corridor:** Area of habitat used by wildlife to travel between larger tracts of land

**Wetlands:** Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions; generally include swamps, marshes, bogs, and similar areas (*USACE Wetlands Delineation Manual*, 1987).

## REFERENCES AND GUIDING DOCUMENTS

This is not a complete list of laws, regulations, policy and other guiding documents in the field of natural resource management. It should be considered as a general list of the more pertinent and driving guidance that influenced this Natural Resources Management Plan.

### (1) PUBLIC LAWS

- Migratory Bird Treaty Act of 1918, as amended, 16 USC 703-712
- Bald and Golden Eagle Protection Act (1940), PL 86-70, 16 USC 668 *et seq.*
- Fish and Wildlife Coordination Act of 1958, 16 USC 661 *et seq.*
- The Conservation of Reservoir Forest Lands Act (aka Forest Cover Act), PL 86-717, Section 2, September 6, 1960
- Water Project Recreation Act of 1965, as amended, PL 89-72
- National Environmental Policy Act of 1969, as amended, 42 USC 4321 *et seq.*
- Endangered Species Act (1973), PL 93-205
- Archeological Resources Protection Act of 1979
- Water Resources Development Acts (1986, 1990, 1992, 1996, 2000)



- Clean Water Act of 1987, PL 89-753

**(2) EXECUTIVE ORDERS**

- EO 11514, Protection and Enhancement of Environmental Quality, March 5, 1970
- EO 11990, Protection of Wetlands, May 24, 1977
- EO 12088, Federal Compliance with Pollution Control Standards, October 13, 1978
- EO 12962, Recreational Fisheries, June 7, 1995
- EO 13112, Invasive Species, February 3, 1999
- EO 13148, Greening the Government through Leadership in Environmental Management, April 21, 2000

**(3) ENGINEER MANUALS AND REGULATIONS**

- EM 385-1-1, Safety and Health Requirements Manual, November 30, 2014
- EM 1110-2-4000, Sedimentation Investigations of Rivers and Reservoirs, December 15, 1989
- ER 200-2-2, Procedures for Implementing NEPA, March 4, 1988
- ER 200-2-3, Environmental Compliance Policies, October 29, 2010
- ER 1110-2-8154, Water Quality and Environmental Management for Corps Civil Works Projects, May 31, 1995
- ER 1130-2-400, Management of Natural Resources and Outdoor Recreation at Civil Works Water Resource Projects
- ER 1130-2-406, Shoreline Management at Civil Works Projects, revised May 28, 1999
- ER 1130-2-438, Historic Preservation Program, October 26, 1987
- ER 1130-2-540, Environmental Stewardship Operations and Maintenance Policies, November 15, 1996
- ER 1130-2-550, Recreation Operations and Maintenance Guidance and Procedures, revised March 30, 2009

- ER 1165-2-400, Recreational Planning, Development, and Management Policies, August 9, 1985

#### **(4) POLICIES, MEMORANDA, AND OTHER DOCUMENTS**

- Partnership Agreement for Water Resources and Fish and Wildlife, January 22, 2003
- Policy Guidance Letter #24, Restoration of Fish and Wildlife Habitat Resources, March 7, 1991
- Policy Guidance Letter #61, Application of Watershed Perspective to Corps of Engineers Civil Works Programs and Activities, January 27, 1999
- Presidential Memorandum, Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds, April 1994
- SAM SOP 1130-1-2, Special Events Administrative Procedures, February 15, 2007
- Standard Operating Procedure for Declaring Excess Timber for Harvest on Water Resource Development Projects within Mobile District
- Title 36 Code of Federal Regulations, Section 327, Rules and Regulations Governing Public Use of Water Resource Development Projects Administered by the Chief of Engineers, July 1, 2011
- USDA Agriculture Handbook No. 575, Direct Control Methods for the Southern Pine Beetle, March 1981

#### **A. INTRODUCTION**

##### **(1) PURPOSE**

This Natural Resources Management Plan (NRMP) describes the current conditions of natural resources at the project and describes management programs that provide for the conservation of renewable natural resources, preservation of rare and unique resources, and long-term sustainability of ecosystems. It outlines natural resources management (NRM) activities occurring at the project level that support and are consistent with the Congressionally authorized project purposes while protecting and managing natural resources in accordance with accepted stewardship principles.

This document is derived from a template used by all Civil Works projects in the Mobile District, and it outlines ongoing NRM operations and maintenance activities at the project. Adhering to the District template ensures consistency between the projects in NRM planning and reflects consideration for all areas of resource management.

Project work plans may change due to uncontrollable outside influences like weather conditions, budget changes, and personnel changes. For this reason, all plans in this document should be considered flexible, working documents that are modified as necessary.

## **(2) APPLICABILITY**

This document is intended to comply with applicable public laws and US Army Corps of Engineers (USACE) guiding policies, regulations, memoranda, and other documents. It does not supersede, overrule, or otherwise alter guidance from those documents. All management actions described in the following sections will be performed in accordance with the appropriate safety guidelines laid out in EM 385-1-1, Safety and Health Requirements Manual.

This plan is a five-year comprehensive natural resources management plan that is reviewed and updated annually. It is a living document that serves as a guide in natural resource management, but deviations from the plan may sometimes be required by site conditions, weather, budget or personnel limitations, or other factors. Some activities listed in the following pages do not occur on all projects but are part of the District template. In cases where the activity is not practiced, it is denoted by the phrase "Project does not participate in this activity." These activities remain in the document to ensure consistency with the template.

## **(3) SUMMARY**

Natural Resource Management activities are built on a foundation of ecological system diversity. By restoring and maintaining the key characteristics, conditions, and functionality of native ecological systems, NRM should not only improve ecological system diversity but also provide for the needs of diverse plant and animal species on the project. USACE recognizes this in Engineering Regulation (ER) 1130-2-540, where specific stewardship guidance is given to "develop, maintain, protect and/or improve vegetation conditions for timber, fish, wildlife, soils, recreation, water quality, and other beneficial uses."

Forest management operations, in particular, have the capacity to impact and affect a host of resource issues over long time periods. The complexity of issues at stake and the length of time involved (normal harvest rotations of 20 years for pines and 60 years or more for hardwoods) make it critical to make wise forest management decisions.

Conversely, some wildlife species (notably beaver and white-tailed deer) as well as some invasive non-native vegetation and animal species (such as cogon grass, Chinese tallow tree, and feral hogs) can alter and detrimentally impact resource conditions, particularly when their numbers exceed the carrying capacity of the land or when their presence alone endangers resources. In the absence of active management, these species can impact resource composition and native species variety. These potential impacts should be included in all resource management decisions. Thus, fisheries and wildlife management decisions directly

impact and, in turn, are impacted by forestry, invasive species (plant or animal), water and air quality, soil erosion, and recreation decisions.

USACE's role of stewardship responsibility for the protection, restoration, and management of natural resources, including forest and wildlife and fisheries management, on USACE lands and waters in accordance with ecosystem management principles is well documented in Federal law, executive orders, mitigation commitments, and internal regulations. Though USACE manages natural resources with an ecosystem management approach, this NRM Plan breaks down the parts of an ecosystem to improve readability and make the document easier to search.

#### **(4) ENVIRONMENTAL LAW AND POLICY**

##### **(A) FEDERAL LAWS**

The Congress of the United States has established policy regarding natural resource management activities on Federally owned and managed lands through a series of laws. Any USACE resource management must be consistent with Congressional policy. These public laws (PLs) include, but are not limited to the following:

- **The Fish and Wildlife Coordination Act of 1958 (PL 85-624)**—Provides for more effective integration of a fish and wildlife conservation program with Federal water-resource developments. Under this law, wildlife conservation is to receive equal consideration and be coordinated with other features of water-resource development programs.
- **Conservation of Reservoir Forest Lands Act (PL 86-717), popularly known as the "Forest Cover Act"**—Provides for the protection of forest cover surrounding reservoir areas under the jurisdiction of the Secretary of the Army and the Chief of Engineers. It is the policy of the United States "that reservoir areas owned in fee under the jurisdiction of the Secretary of the Army and the Chief of Engineers shall be developed and maintained so as to encourage, promote, and assure fully adequate and dependable future resources of readily available timber, through sustained yield programs, reforestation, and accepted conservation practices, and to increase the value of such areas for conservation, recreation, and other beneficial uses: *Provided*, That such development and management shall be accomplished to the extent practicable and compatible with other uses of the project."
- **Water Projects Recreation Act (PL 89-72)**—Establishes policy that "in investigating and planning any Federal navigation, flood control, reclamation, hydroelectric, or multiple-purpose water resource project, full consideration shall be given to the opportunities, if any, which the project affords for outdoor recreation and for fish and wildlife enhancement and that, wherever any such project can reasonably serve either

or both of these purposes consistently with the provisions of this Act, it shall be constructed, operated, and maintained accordingly.”

- **Endangered Species Act (ESA) (PL 93-205)**—Pledges that the United States will conserve to the extent practicable species of fish or wildlife and plants facing extinction. Section 7 of the ESA declares that “all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities for the purposes of this Act.”
- **National Environmental Policy Act (NEPA) (PL 91-190)**—Requires that all Federal agencies prepare detailed environmental impact statements for “every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment.” Further, it outlines the factors to be considered in the statements, requiring an interdisciplinary approach to decision making and giving value to environmental concerns instead of solely economic and technical considerations.
- **Water Resources Development Act(s) of 1986, 1990, 1992, 1996, and 2000**—Authorizes significant USACE environmental activity:
  - **Water Resources Development Act of 1986, Section 906 (b, d) (PL 99-662)**—Authorizes USACE wildlife mitigation with associated habitat loss or determine finding of no significant impact.
  - **Water Resources Development Act of 1986, Section 1135**—Allows project modifications for improvement of the environment.
  - **Water Resources Development Act of 1990, Section 307(a)**—Stipulates no net loss of wetlands.
  - **Water Resources Development Act of 1992, Section 204**—Identifies beneficial uses of dredged material.
  - **Water Resources Development Act of 1996, Section 306**—Authorizes aquatic ecosystem restoration.
  - **Water Resources Development Act of 2000, Section 301**—Authorizes USACE flexibility to maintain the integrity of mitigation while allowing reasonable project operation and maintenance, regional economic development, and broad-based recreation.

## **(B) USACE REGULATIONS**

In addition to Congressional policy, Engineer Regulations (ERs) have been established, outlining basic NRM program objectives.

The USACE Natural Resources management mission is stated in ER 1130-2-540:

[The] Natural Resources 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, conservation, 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.

Natural resources management plans are developed with this mission as their primary focus. For that reason, it is important that any NRM decision by the project be made only after consideration of the action's impact on the resource and on the action's relationship to authorized project purposes.

## **(C) OTHER GUIDANCE**

Beyond the scope of this document, there exist Engineering Pamphlets (EPs), Executive Orders, Memoranda of Understanding (MOUs), Partnerships, and Cooperative Agreements that further outline the breadth of USACE NRM commitments.

## **B. PROJECT DESCRIPTION—NATURAL ENVIRONMENT**

### **(1) PROJECT COMPARTMENT DESCRIPTIONS**

*Discuss project compartments and strategy used to delineate compartment boundaries.*

For this Natural Resources Management Plan, Lake Sidney Lanier has been divided into 18 blocks and then divided further into smaller management compartments within each block. The blocks were identified based on the watershed boundaries found in the USGS Watershed Boundary Dataset. Some minor adjustments were made to the block boundaries where a

watershed boundary split a management compartment, so that each compartment fit into a single block. Blocks are named using the watershed name. Prior natural resources plans divided the lake into 10 management units. These units roughly followed the same watershed concept but combined several watersheds. In these plans the management units were not named; rather, they were simply numbered 1 through 10. The changes made for this plan help divide the lake into smaller, easier to manage blocks, and provide a location description.

Within each block are identifiable management compartments. These compartments follow the Master Plan Land Classification map, and all have a land classification of Wildlife Management or Recreation. For easier understanding, this plan has not renamed any management compartments. If the management compartment is a recreation area, the compartment name is the recreation area name. Some Wildlife Management areas were identified for recreation and named by prior Master Plans but never developed. In these cases, the management compartment has retained the name from these prior plans. Some management compartments are Wildlife Management Areas that were never named. In these cases, the area has been assigned a WMA number which appears on the NRMP and Master Plan maps.

Within each block there are many areas of land with a Master Plan land classification of Wildlife Management that are small and inaccessible. These are generally areas in the back of coves, on the end of points, or in close proximity to private recreation facilities. These areas are not identified as management compartments and have been labeled WMA-N, followed by a unique number for each area (for example, WMA-N56 and WMA-N633). The majority of these areas will be left as natural areas with little to no active natural resources management.

The table below identifies each natural resources management block and the number of acres of land and water in each. Appendix G9 provides a list of management compartments and the natural resources management activities that already take place or could reasonably take place within each one.

*Table G-1: Natural Resources Management Blocks and Acres.*

<b>Block Name</b>	<b>Acres of Land</b>	<b>Acres of Water</b>	<b>Total Acres</b>
Bald Ridge Creek	1207.5	2147.0	3354.5
Young Deer Creek	807.0	2219.1	3026.1
Six Mile Creek	1144.3	2317.2	3461.5
Two Mile Creek	743.7	3442.7	4186.4
Chestatee Bay	775.9	2204.4	2980.3
Big Junction	671.3	1821.2	2492.5
Taylor Creek	498.0	617.3	1115.3
Latham Creek	441.6	784.5	1226.1
Thompson Creek	1421.7	2250.9	3672.6
Chestatee River	764.7	734.1	1498.8
Sardis Creek	808.6	2030.8	2839.4
Little River	1074.6	2159.1	3233.7

**LAKE SIDNEY LANIER AND BUFORD DAM PROJECT  
MASTER PLAN**

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Block Name	Acres of Land	Acres of Water	Total Acres
Limestone Creek	1128.4	1935.6	3064.0
Chattahoochee River	745.7	459.8	1205.5
Gainesville	1200.0	2544.3	3744.3
Flat Creek	742.5	1652.4	2394.9
Flowery Branch	1463.5	5603.3	7066.8
Shoal Creek	2105.8	4059.7	6165.5

## **(2) GENERAL DESCRIPTION**

*Discuss specific details about the Project (location, river system, etc.). Include reference to at least a basic project map to be included as an appendix. A map showing the NRM blocks is preferred.*

The Buford Dam multipurpose project was authorized by the River and Harbor Act, Public Law 525, 79<sup>th</sup> Congress, 2<sup>nd</sup> Session, approved July 24, 1946. Congressional authorized purposes of the project are flood control, navigation, water regulation, and hydropower production. The Flood Control Act of 1944 authorized recreation at all USACE lake projects, including Lake Lanier. In addition, Public Law 85-624 mandated that fish and wildlife conservation shall receive equal consideration with other project purposes. Project construction began in March 1950 and was completed in 1957. The lake created by Buford Dam was officially designated as Lake Sidney Lanier by Public Law 56-457, approved on March 29, 1956.

Buford Dam is located at river mile 348.5 on the Chattahoochee River in Gwinnett and Forsyth Counties, GA, about 36 miles northeast of Atlanta and 4.5 miles northwest of Buford, GA. Lake Sidney Lanier is located in the upper reaches of the Piedmont Plateau at the base of the Blue Ridge Mountains. It extends up the Chattahoochee and Chestatee Rivers and lies within Gwinnett, Forsyth, Hall, Dawson, and Lumpkin Counties, GA. The Lake Sidney Lanier and Buford Dam Project consists of 56,782 acres of fee land; 17,744 acres of land surround the 39,038 surface acre lake at 1,071' MSL. A project map is included in Appendix H1.

### **(A) CLIMATE**

*Discuss summary of climate.*

The climate of the area is characterized by mild, wet winters and quite warm, humid summers. January is the coldest month with an average minimum temperature of 31° F. July is the warmest month with an average maximum temperature of 89° F.

The project falls within Plant Hardiness Zone 7b. The average growing season is 233 days. The earliest first fall frost date is October 25; however, the average date is November 13. The latest last spring frost date is April 23; however, the average date is March 27.



The average rainfall of the area is 49.71" with an average of 117 days per year with rainfall. January through March marks the period with the highest rainfall amount. June and October have the lowest rainfall amount.

During the dormant season, cold fronts (high pressure) dominate Georgia weather and cross into Georgia every 5 to 7 days. Passage of a cold front results in a clockwise wind direction shift from southwest to northwest. This means that winter wind direction is predominately from the northwest. Winds then slowly shift clockwise to the southeast over the next few days until another cold front passes and starts the cycle over again. From about mid-May through mid-September convective activity dominates Georgia weather. Winds are generally light and variable.

*Table G-2: Monthly Rainfall and Temperature Data for the Project.*

Month	Avg. Rainfall (in.)	Avg. Max Temp (° F)	Avg. Min Temp (° F)	Avg. Snow (in.)
January	6.04	52	31	2.8
February	5.03	57	34	0.8
March	6.14	65	40	0.3
April	4.06	73	47	0.0
May	4.33	79	56	0.0
June	3.82	86	64	0.0
July	4.14	89	68	0.0
August	3.97	88	67	0.0
September	4.40	82	61	0.0
October	3.92	73	50	0.0
November	4.36	64	42	0.1
December	4.54	55	34	0.1

Source: <http://www.intellicast.com>

## **(B) GEOLOGY**

*Discuss specific geological information for Project (type of rock, aquifers, etc.).*

According to the Geologic Map of Georgia the parent material underlying Lake Lanier is made up of granite gneiss, diorite schist, and mica schist.

## **(c) SOIL**

*Discuss specific soil information for Project (major soil orders).*

The soil classification system contains several levels of detail from the most general to the most specific. The most general level of classification in the United States system is the soil order, of which there are 12 (Dave Lindbo, [www.soils.org](http://www.soils.org)). According to the Natural Resources Conservation Service (NRCS) soil order map, Ultisols is the dominant soil order in the Lake Sidney Lanier and Buford Dam Project area. Ultisols are soils in humid areas. They formed from fairly intense weathering and leaching processes that result in a clay-enriched subsoil dominated by minerals, such as quartz, kaolinite, and iron oxides. Ultisols are typically acid soils in which most nutrients are concentrated in the upper few inches. These soils are

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generally of low fertility although they can become productive with additions of fertilizer and lime.

The dominant suborder in the Lake Sidney Lanier and Buford Dam Project area is Udults, which are the more or less freely drained, relatively humus poor Ultisols. They are in the southern and eastern parts of the United States. Most of these soils currently support or formerly supported mixed forest vegetation ([www.nrcs.usda.gov](http://www.nrcs.usda.gov)).

The soil series is the lowest (most specific) category in the soil classification system. It is also the most used unit of soil classification.

The USACE Environmental Stewardship Business Line, however, uses the Land Capability Classification (LCC) system to track and report types of soils on the project. LCC is a system of grouping soils primarily on the basis of their capability to produce common cultivated crops and pasture plants without deteriorating over a long period of time. The LCC includes eight classes (I through VIII) of land. Classes I through IV are considered capable of producing cultivated crops with good management and conservation treatment. Classes V through VII are best suited to perennial vegetative species. Class VIII soils are not suitable for managed vegetation production ([www.nrcs.usda.gov](http://www.nrcs.usda.gov)). The Lake Sidney Lanier and Buford Dam Project has 0 acres of land in Class I and only 2,679 acres in Classes II through IV. The two main land classes at the project are Class VI with 9,526 acres and Class VII with 4,139 acres. Class VI and VII soils are defined as soils that have severe and very severe limitations which make them generally unsuited to cultivation and which limit their use mainly to pasture, rangeland, forestland, or wildlife habitat.

#### **(D) LAND USE**

*Discuss specific ecosystems, forest types, and land uses for the Project area (ie: Coastal Plain, Sand Hills, forestry, agriculture). Discuss some defining species for specific ecosystems.*

The Lake Sidney Lanier and Buford Dam Project is within the Piedmont Physiographic Province in northern Georgia. The predominant land use for the project is developed recreation.

#### **(E) WATERSHED**

*Discuss the overall watershed (size, general location) for the Project and specific wetlands, floodplains, and riparian zones within the Project.*

The 1,045 mi<sup>2</sup> drainage area for Lake Sidney Lanier lies on the southern slope of the Blue Ridge Mountains in the Chattahoochee and Chestatee River basins and within portions of nine GA counties: Gwinnett, Forsyth, Hall, Dawson, Lumpkin, White, Habersham, Towns, and Union. This area is characterized by steep slopes and mountain streams. A watershed map is included in Appendix H2.

**(F) GROUND AND SURFACE WATER RESOURCES**

*Discuss specific information regarding groundwater and surface water resources on the Project (aquifers, groundwater flow direction, surface/groundwater connections, lakes, rivers, streams, etc.).*

The average inflow of Lake Lanier is 2,071 ft<sup>3</sup>/sec. Of this flow, 45% (934 ft<sup>3</sup>/sec) is contributed by the Chattahoochee River and 28% (568 ft<sup>3</sup>/sec) by the Chestatee River. The remaining water comes from direct inflow to the lake (23%) and precipitation (4%) (LTI, 1998).

Lake Lanier is in the Piedmont Province. This area is underlain by bedrock and a crystalline-rock aquifer. The crystalline rocks have few primary pore spaces, and the porosity and permeability of the unweathered and unfractured bedrock are extremely low. However, groundwater is stored in unconsolidated material known as the regolith and in rock fractures. The crystalline rock aquifer is used primarily for domestic water supply wells and agricultural wells for animal watering (USACE 2004 EIS). Few wells remain permitted for use on Government property at Lake Lanier. When abandoned, these wells are to be properly closed per the Georgia Water Wells Standards Act of 1985.

The two primary tributaries that form Lake Lanier are the Chattahoochee River and the Chestatee River. Smaller tributaries identified the following table are listed underneath the primary tributary that they feed into.

*Table G-3: Tributaries*

<b>Tributary Name*</b>	<b>Location (County)</b>	<b>Tributary Name*</b>	<b>Location (County)</b>
<b>Chattahoochee River</b>	Hall	<b>Chestatee River</b>	Lumpkin
Little River	Hall	Yellow Creek	Hall
Wahoo Creek	Hall	Thompson Creek	Dawson
Ada Creek	Hall	Latham Creek	Hall
Sardis Creek	Hall	Johnson Creek	Hall
Short Creek	Forsyth	Taylor Creek	Dawson/Forsyth
Flat Creek	Hall	Toto Creek	Dawson
Mud Creek	Hall		
Orr Creek	Hall		
Flowery Branch Creek	Hall		
Big Creek	Hall		
Two Mile Creek	Forsyth		
Four Mile Creek	Forsyth		
Six Mile Creek	Forsyth		
Young Deer Creek	Forsyth		
Little Ridge Creek	Forsyth		
Bald Ridge Creek	Forsyth		
Shoal Creek	Hall/Gwinnett		
Limestone Creek	Hall		
Squirrel Creek	Hall		

## **(G) WATER QUALITY AND SOURCES OF POLLUTION**

*Discuss specific information on water quality and pollution sources (degradation, runoff, point-source pollution, etc.).*

According to the *Georgia Surface Water and Groundwater Quality Monitoring and Assessment Strategy: 2015 Update* prepared by the Georgia Department of Natural Resources, Environmental Protection Division (GA EPD), “Georgia’s waters are currently categorized as one of the following water use classifications: drinking water, recreation, fishing, coastal fishing, wild river, or scenic river. Specific water quality standards are assigned to support each water use classification. The quality of Georgia’s waters is judged by the extent to which the waters support the uses (comply with standards set for the water use classification or designations) for which they have been designated.” Based on the comparison of data collected to the water quality criteria, the GA EPD places each water into one of three broad groups. Waters are assessed as 1) supporting their designated use, 2) not supporting their designated use, or 3) assessment pending.

Section 305(b) of the Clean Water Act requires states to assess and describe the quality of their waters every two years in a report called the 305(b) report. Section 303(d) of the Clean Water Act requires states to submit a list, every two years, of all the waters that are not meeting their designated uses. Georgia submits a combined 305(b)/303(d) report called an Integrated Report, which is typically titled “Water Quality in Georgia.”

In Georgia’s 2020 integrated 305(b)/303(d) report, Lake Sidney Lanier was divided into six “reaches”: Flowery Branch, Little River, Bolling Bridge, Browns Bridge Road (Georgia State Route 369), Dam Pool, and Lanier Bridge Road (Georgia State Route 53). Each reach has three water use classifications: Drinking Water, Fishing, and Recreation. The Little River reach was the only reach identified as “Supporting its Designated Uses.” All remaining reaches were identified as “Not Supporting Their Designated Uses.”

Non-point sources and urban runoff are listed as the primary contributors to exceeding the Total Maximum Daily Load (TMDL) for each respective reach for Chlorophyll a, which resulted in the “Not Supporting” designations.

The State collects profile data at compliance points in the reservoir for dissolved oxygen, pH, conductivity, and water temperature during the growing season. It also collects grab samples of nitrogen, phosphorus, chlorophyll a, and bacteria. Measured data at compliance points for dissolved oxygen, total nitrogen, and pH are consistent with Georgia’s standards. (Low dissolved oxygen concentrations have been observed in lake water quality data, but overall, dissolved oxygen concentrations meet water quality standards.)

Based on the 2004 Lake Sidney Lanier Environmental Impact Statement watershed model, the primary loading constituents are sediment, total nitrogen, and total phosphorus. The bulk of the overall nitrogen and phosphorus loading into the lake enters through the

Chattahoochee and Chestatee Rivers from the watershed upstream of Lake Lanier. The primary sources for nitrogen loading are groundwater, septic systems, point sources, and storm water runoff from high-density urban areas. The primary sources for phosphorus loading are storm water runoff from pasture land and high-density urban areas. The bulk of the overall sediment loading into the lake enters from non-Governmental lands surrounding the lake. The primary source for the sediment loading is storm water runoff from construction areas.

Water quality at public swim beaches operated by USACE is tested to ensure that the public is not exposed to unhealthy levels of coliform bacteria. The testing follows current Environmental Protection Agency (EPA) recreational water testing guidelines and is conducted during the peak recreation season (March through September). Each sample is analyzed for E. coli and enterococci using EPA Methods 1603 and 1600, respectively. Sampling procedures and thresholds are established by Division Regulation No. 1145-17-01. An example of the swim beach water quality inspection form may be found in Appendix H4.

Illegal discharges from marine toilets can increase the fecal coliform counts in the lake. GA DNR inspects pump out logs at marinas on the lake to control this illegal activity.

A list of the National Pollutant Discharge Elimination System (NPDES)-permitted facilities discharging directly into Lake Lanier is provided in the following table.

*Table G-4: NPDES-Permitted Facilities.*

Facility Name	NPDES Permit #	Major Pollutant	Receiving Waterway
Chattahoochee Country Club	GA0022471	Treated Effluent	Chattahoochee River
Flowery Branch Cinnamon Cove WPCP	GA0049051	Treated Effluent	Chattahoochee River
Flowery Branch WPCP	GA0031933	Treated Effluent	Chattahoochee River
Gainesville (City of)	GA0020168	Treated Effluent	Chattahoochee River
Gwinnett County	GA0038130	Treated Effluent	Chattahoochee River
Habersham on Lanier WPCP	GA0030261	Treated Effluent	Chattahoochee River
Lake Lanier Islands WPCP	GA0049115	Treated Effluent	Chattahoochee River
River Sand, Inc. – Hall County Site	GAG100025	General Sand and Gravel	Chattahoochee River

## **(H) FLORA**

*Provide an overview of major flora on the Project (major tree, shrub, and forbs).*

Some common plant species known to occur at the project are listed in the following tables.

*Table G-5: Common Tree Species.*

Common Name	Scientific Name	Common Name	Scientific Name
<b>Oak Species</b> (White Oak Subgenus)		<b>Oak Species</b> (Red Oak Subgenus)	

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Common Name	Scientific Name	Common Name	Scientific Name
White Oak	<i>Quercus alba</i>	Scarlet Oak	<i>Quercus coccinea</i>
Chestnut Oak	<i>Quercus prinus</i>	Southern Red Oak	<i>Quercus falcate</i>
Post Oak	<i>Quercus stellata</i>	Northern Red Oak	<i>Quercus rubra</i>
		Water Oak	<i>Quercus nigra</i>
<b>Hickory Species</b>		<b>Pine Species</b>	
Pignut Hickory	<i>Carya glabra</i>	Loblolly Pine	<i>Pinus taeda</i>
Shagbark Hickory	<i>Carya ovate</i>	Shortleaf Pine	<i>Pinus echinata</i>
Mockernut Hickory	<i>Carya tomentosa</i>	Virginia Pine	<i>Pinus virginiana</i>
		White Pine	<i>Pinus strobus</i>
<b>Other Species</b>			
Red Maple	<i>Acer rubrum</i>	River Birch	<i>Betula nigra</i>
American Beech	<i>Fagus grandifolia</i>	Black Walnut	<i>Juglans nigra</i>
White Ash	<i>Fraxinus Americana</i>	Green Ash	<i>Fraxinus pennsylvanica</i>
American Holly	<i>Ilex opaca</i>	Eastern Red Cedar	<i>Juniperus virginiana</i>
Sweetgum	<i>Liquidambar styraciflua</i>	Tulip Poplar	<i>Liriodendron tulipifera</i>
Black gum	<i>Nyssa sylvatica</i>	Sycamore	<i>Platanus occidentalis</i>
American Hornbeam	<i>Carpinus caroliniana</i>	Eastern Redbud	<i>Cercis Canadensis</i>
Flowering Dogwood	<i>Cornus florida</i>	Fringetree	<i>Chionanthus virginicus</i>
Washington Hawthorn	<i>Crataegus phaenopyrum</i>	Carolina Buckthorn	<i>Frangula caroliniana</i>
Carolina Silverbell	<i>Halesia tetraptera</i>	Sourwood	<i>Oxydendrum arboretum</i>
Southern Crabapple	<i>Malus angustifolia</i>	Eastern Hophornbeam	<i>Ostrya virginiana</i>
Common Persimmon	<i>Diospyros virginiana</i>	Sassafras	<i>Sassafras albidum</i>

Table G-6: Common Shrubs, Grasses, and Herbaceous Species.

Common Name	Scientific Name	Common Name	Scientific Name
<b>Shrubs</b>		<b>Woody Vines</b>	
Painted Buckeye	<i>Aesculus sylvatica</i>	Trumpetcreeper	<i>Campsis radicans</i>
American Beautyberry	<i>Callicarpa Americana</i>	Virginia Creeper	<i>Parthenocissus quinquefolia</i>
Sweetshrub	<i>Calycanthus floridus</i>	Smilax	<i>Smilax sp.</i>
Button Bush	<i>Cephalanthus occidentalis</i>	Poison Ivy	<i>Toxicodendron radicans</i>
Strawberry Bush	<i>Euonymus americanus</i>	<b>Wildflowers</b>	
Common Witchhazel	<i>Hamamelis virginiana</i>	White Snakeroot	<i>Ageratina Altissima</i>
Winterberry	<i>Ilex verticillata</i>	Jack-in-the-pulpit	<i>Arisaema triphyllum</i>
Virginia Sweetspire	<i>Itea virginica</i>	Butterfly Milkweed	<i>Asclepias tuberosa</i>
Mountain Laurel	<i>Kalmia latifolia</i>	Mayapple	<i>Polophyllum peltatum</i>

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Common Name	Scientific Name	Common Name	Scientific Name
Flame Azalea	<i>Rhododendron calendulaceum</i>	Georgia Aster	<i>Symphyotrichum georgianum</i>
Piedmont Azalea	<i>Rhododendron canescens</i>	Pink Lady's Slipper	<i>Cypripedium acaule</i>
Spice-Bush	<i>Lindera benzoin</i>	<b>Grasses</b>	
Smooth Sumac	<i>Rhus glabra</i>	Big Bluestem	<i>Andropogon gerardii</i>
Winged Sumas	<i>Rhus copallina</i>	Little Bluestem	<i>Schizachyrium scoparium</i>
Mapleleaf Viburnum	<i>Viburnum acerifolium</i>	Blackseed Speargrass	<i>Piptochaetium avenaceum</i>

Table H-7: Common Aquatic Plant Species.

Common Name	Scientific Name	Common Name	Scientific Name
Maidencane	<i>Panicum hemitomon</i>	Waterwillow	<i>Justicia americana</i>

**(I) FISH**

Provide an overview of common fish found at the Project.

One factor that affects the current fish habitat in Lake Lanier is the land-clearing practice during lake construction. The land within the lake was completely cleared of trees between elevation 1,030' and 1,070' MSL, leaving a bare lake bottom in the top 40' feet of the lake. Trees between elevation 980' and 1,030' MSL were topped at or below 1,030' MSL.

Some common fish species known to occur on the Project are listed below.

Table G-8: Common Fish Species.

Common Name	Scientific Name	Common Name	Scientific Name
Largemouth Bass	<i>Micropterus salmoides</i>	Spotted Bass	<i>Micropterus punctulatus</i>
White Bass	<i>Morone chrysops</i>	Striped Bass	<i>Morone saxatilis</i>
Black Crappie	<i>Pomoxis nigromaculatus</i>	White Crappie	<i>Pomoxis annularis</i>
Yellow Perch	<i>Perca flavescens</i>	Bluegill	<i>Lepomis macrochirus</i>
Flathead Catfish	<i>Pylodictis olivaris</i>	Channel Catfish	<i>Ictalurus punctatus</i>
Walleye	<i>Sander vitreus</i>	Longnose Gar	<i>Lepisosteus osseus</i>
Rainbow Trout	<i>Oncorhynchus mykiss</i>	Brown Trout	<i>Salmo trutta</i>

**(J) FAUNA**

Provide an overview of the fauna found at the Project.

Some common animal species known to occur on the Project are listed in the following table.

Table G-9: Common Animal Species

Common Name	Scientific Name	Common Name	Scientific Name
<b>Mammals</b>		<b>Birds</b>	
White-Tailed Deer	<i>Odocoileus virginianus</i>	Eastern Wild Turkey	<i>Meleagris gallopavo silvestris</i>
Bobcat	<i>Lynx rufus</i>	Mourning Dove	<i>Zenaida macroura</i>
Red Fox	<i>Vulpes</i>	Eastern Bluebird	<i>Sialia sialis</i>
Gray Fox	<i>Urocyon cinereoargenteus</i>	Northern Cardinal	<i>Cardinalis</i>
Eastern Cottontail	<i>Sylvilagus floridanus</i>	Brown Thrasher	<i>Toxostoma rufum</i>
Raccoon	<i>Procyon lotor</i>	Canada Goose	<i>Branta Canadensis</i>
Virginia Opossum	<i>Didelphis virginiana</i>	Mallard	<i>Anas platyrhynchos</i>
Striped Skunk	<i>Mephitis</i>	Wood Duck	<i>Aix sponsa</i>
Gray Squirrel	<i>Sciurus carolinensis</i>	Great Blue Heron	<i>Ardea herodias</i>
Beaver	<i>Castor canadensis</i>	Red-tailed Hawk	<i>Buteo jamaicensis</i>
Black Bear	<i>Ursus americanus</i>	Bald Eagle	<i>Haliaeetus leucocephalus</i>
		Osprey	<i>Pandion haliaetus</i>
		Turkey Vulture	<i>Cathartes aura</i>

#### (K) THREATENED AND ENDANGERED SPECIES

Provide an overview of threatened or endangered species found at the Project.

Some threatened and endangered species with potential to occur on the Project are listed in the following table.

Table G-10: Threatened and Endangered Species (TES) with Potential to Occur on the Project

Common Name	Scientific Name	Status*
<b>Mammals</b>		
Gray Myotis	<i>Myotis grisescens</i>	FE, SE
Northern Long-eared Myotis	<i>Myotis septentrionalis</i>	FT, ST
<b>Birds</b>		
Bald Eagle	<i>Haliaeetus leucocephalus</i>	ST
<b>Insects/Arthropods</b>		
Chattahoochee Crayfish	<i>Cambarus howardi</i>	ST
<b>Plants</b>		
Pool Sprite or Little Amphianthus	<i>Amphianthus pusillus</i>	FT, ST
Black Spored Quillwort	<i>Isoetes melanospora</i>	FE
White Fringeless Orchid	<i>Platanthera integrilabia</i>	FT
Georgia Aster	<i>Symphyotrichum georgianum</i>	ST
Sweet Pinesap	<i>Monotropsis odorata</i>	ST

\* F=Federal, S=State  
E=Endangered, T=Threatened



## (L) RARE OR SPECIALLY PROTECTED NON-TES SPECIES

Provide an overview of protected non-TES species found at the Project.

Some rare species with potential to occur on the Project are listed in the following table.

Table G-11: Rare or Specially Protected Species with Potential to Occur on the Project

Common Name	Scientific Name	Status*
<b>Mammals</b>		
Southeastern myotis	<i>Myotis austroriparius</i>	SSoC
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SR
Eastern small-footed myotis	<i>Myotis leibii</i>	SSoC
Little brown myotis	<i>Myotis lucifugus</i>	SSoC
Tri-colored bat	<i>Perimyotis subflavus</i>	SSoC
<b>Birds</b>		
Barn Owl	<i>Tyto alba</i>	SHPS
<b>Fish</b>		
Apalachicola Redhorse	<i>Moxostoma sp. 1</i>	SSoC
Bluestripe Shiner	<i>Cyprinella callitaenia</i>	SR
Shoal Bass	<i>Micropterus cataractae</i>	SHPS
Chattahoochee Bass	<i>Micropterus chattahoochae</i>	SHPS
<b>Reptiles</b>		
Northern Pine Snake	<i>Pituophis melanoleucus</i>	SHPS
<b>Insects/Arthropods</b>		
Mottled Duskywing	<i>Erynnis martialis</i>	SHPS
<b>Plants</b>		
Shining Indigo-bush	<i>Amorpha nitens</i>	SHPS
Pink Ladyslipper	<i>Cypripedium acaule</i>	SU
Yellow Ladyslipper	<i>Cypripedium parviflorum</i>	SR
Indian Olive	<i>Nestronia umbellule</i>	SR
Seneca Snakeroot	<i>Polygala senega</i>	SSoC
Ash-leaf Bush-pea	<i>Thermopsis fraxinifolia</i>	SHPS
Ozark Bunchflower	<i>Veratrum woodii</i>	SR
Broad-toothed Hedge-nettle	<i>Stachys latidens</i>	SSoC
Broadleaf White Spirea	<i>Spiraea latifolia</i>	SHPS

\* F=Federal, S=State

HPS=High-Priority Species, P=Protected, R=Rare, SoC=Species of Concern, U=Unusual

## (M) EXOTIC (NON-NATIVE) SPECIES

Provide an overview of exotic species found at the Project.

Some common exotic species known to occur on the Project are listed in the following table.

Table G-12: Exotic Species Known to Occur on Project Lands or Waters

Common Name	Scientific Name	Common Name	Scientific Name
<b>Trees</b>			
Callery Pear	<i>Pyrus calleryana</i>	Royal Paulonia	<i>Paulownia tomentosa</i>

Common Name	Scientific Name	Common Name	Scientific Name
Mimosa	<i>Albizia julibrissin</i>	Tree-of-Heaven	<i>Ailanthus altissima</i>
<b>Shrubs</b>			
Chinese Privet	<i>Ligustrum sinense</i>	Japanese Knotweed	<i>Polygonum cuspidatum</i>
Leatherleaf Mahonia	<i>Mahonia bealei</i>	Heavenly Bamboo	<i>Nandina domestica</i>
Shrubby Lespedeza	<i>Lespedeza bicolor</i>	Thorny Olive	<i>Elaeagnus pungens</i>
<b>Vines</b>			
Japanese Honeysuckle	<i>Lonicera japonica</i>	Kudzu	<i>Pueraria montana</i>
English Ivy	<i>Hedera helix</i>	Chinese Wisteria	<i>Wisteria sinensis</i>
Bigleaf Periwinkle	<i>Vinca major</i>		
<b>Grasses</b>			
Golden Bamboo	<i>Phyllostachys aurea</i>	Japanese Stiltgrass	<i>Microstegium vimineum</i>
<b>Forbs</b>			
Sericea Lespedeza	<i>Lespedeza sericea</i>	Musk Thistle	<i>Carduus nutans</i>
<b>Animals</b>			
Feral cat	<i>Felis catus</i>		
<b>Aquatic Plants</b>			
Water Lettuce	<i>Pistia stratiotes</i>		
<b>Insects</b>			
Japanese beetle	<i>Popillia japonica</i>		

## **C. HISTORIC AND CULTURAL RESOURCES**

### **(1) OVERVIEW**

USACE Civil Works projects maintain thorough records of cultural resources located within project boundaries. Management practices are adjusted to preserve and protect these sites. An overview of these sites is included in the project's Historic Properties Management Plan (HPMP).

### **(2) GOALS AND OBJECTIVES**

Project goals include, but are not limited, to the following:

- Maintain an up-to-date inventory of cultural resources in the project's HPMP in accordance with the Archaeological Resources Protection Act of 1979, ER 1130-2-438, and the Historic Preservation Program.
- Avoid negative impacts to sites listed in the project's HPMP.
- Protect and preserve cultural sites to the extent possible.

- Provide for the proper curation of artifacts in storage facilities.

### **(3) INVENTORY AND MONITORING**

Inventory and monitoring procedures are discussed in the project's HPMP. A copy of the HPMP is not included with this plan, but it is available as a separate document.

### **(4) MANAGEMENT STRATEGIES**

Before performing NRM activities, the project will consult the HPMP to determine if the management unit contains cultural resource sites. If the unit is found to contain cultural resources, the appropriate steps will be taken to avoid impacts to the site(s). Avoidance is the preferred strategy to minimize impacts. In addition to this strategy, timber availability memos are reviewed by the Mobile District, Planning and Environmental Division, Environment and Resources Branch, Inland Environment Team (CESAM-PD-EI) to ensure compliance with historical property preservation laws and regulations.

Plans may be altered to exclude a management unit that includes such resources, or an exclusion buffer within the unit may be identified to protect the resources from harm. Management strategies that minimize ground-disturbing activities may also be used. As a result of these strategies, normal NRM activities do not cause harm to or adversely impact historical and cultural resources.

The project will implement the following steps to ensure avoidance of negative impacts to historical properties:

- Survey each NRM site for potential negative impacts to nearby historic properties.
- When avoidance is not possible, coordinate with the Mobile District, Planning and Environmental Division, Environment and Resources Branch, Inland Environment Team (CESAM-PD-EI) for guidance.
- Maintain a suitable exclusion buffer around any identified cultural sites.

When avoidance of an identified cultural site is not possible, the project will implement the following steps to minimize impacts:

- The project will draft a memorandum identifying the NRM activity, the cultural site of concern, and the potential impacts or problems.
- The project will route the memorandum to the project coordinator in the Mobile District, Operations Division, Technical Support Branch, Natural Resource Section (CESAM-OP-TR)

- The project coordinator will route the memorandum through the Mobile District, Operations Division, Technical Support Branch, Natural Resource Section (CESAM-OP-TR) to the Mobile District, Planning and Environmental Division, Environment and Resources Branch, Inland Environment Team (CESAM-PD-EI)
- Mobile District, Planning and Environmental Division, Environment and Resources Branch, Inland Environment Team (CESAM-PD-EI) will involve the State Historic Preservation Officer, if necessary, and along with the project develop a plan for avoidance or minimization of impacts

#### **D. THREATENED AND ENDANGERED SPECIES**

##### **(1) OVERVIEW**

Under the Endangered Species Act (ESA), species may be listed as either endangered or threatened. “Endangered” means a species is in danger of extinction throughout all or a significant portion of its range. “Threatened” means a species is likely to become endangered within the foreseeable future. Together, for management purposes, these are known as “special status species” or, informally, as “T&E species” or “TES.” Species afforded these designations have received unique and specific legal protections by Congress and subsequent management restrictions outlined in the ESA. Special status species and/or their designated critical habitats that occur on water resources development projects shall be protected, conserved, or managed in accordance with the ESA, as amended, and with existing state laws and USACE regulations (ER 1130-2-540, Chapter 2).

Section 7 of the ESA dictates that Federal actions should not jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species, but instead requires Federal agencies to use their authorities to carry out conservation and management programs to benefit threatened and endangered species. Furthermore, Section 7(a) of the ESA requires formal consultation with the United States Fish and Wildlife Service (USFWS) whenever a Federal proponent anticipates taking any action that may affect a listed species and/or critical habitat.

##### **(2) GOALS AND OBJECTIVES**

USACE makes every effort to eliminate adverse impacts to threatened and endangered species as required by law and the ethics of good environmental stewardship by accounting for these resources during the environmental planning process, thereby mitigating potential impacts by avoidance where possible. Specific project goals include the following:

- Familiarize NRM personnel with the threatened and endangered species which have historically inhabited the project area so as to recognize them if observed

- Closely coordinate any action involving a threatened or endangered species with the Mobile District Endangered Species Coordinator (usually the Environmental Stewardship Program Manager in CESAM-OP-TR), the US Fish and Wildlife Service, Office of Endangered Species, and the State endangered species coordinator
- Maintain public awareness of endangered species through the posting of informative material when appropriate.
- Develop a special management plan that follows the most current recovery plan for threatened or endangered species when they are found to inhabit the project

### **(3) INVENTORY AND MONITORING**

At a minimum for USACE, a level one inventory documents the potential presence of Federal and State special status species and/or their critical habitat occurring on project lands and waters. A more complete inventory of status species documenting quantity, presence, location, habitat acreage, and type occupied is recommended. This inventory provides baseline data used to determine overall effectiveness of conservation strategies used by the project. Projects shall use scientifically accepted methods to monitor and inventory threatened and endangered species and should update the level one inventory with each Operations Management Plan update. A TES Evaluation Form is included in Appendix H3. This form (or a similar record) should be included as an enclosure with all Timber Harvest Availabilities (discussed in later in “Forest and Fire Management” and Appendix H5).

Every January, Lake Sidney Lanier participates in the annual Midwinter Bald Eagle Survey. The purpose of this survey is to monitor the status of bald eagle wintering populations in the contiguous United States by estimating National and regional count trends, overall and by age class. This survey is conducted by two rangers, visually surveying the sky and tree line for bald eagles from a boat along two continuous routes. The first route follows the Chattahoochee River from Buford Dam to Belton Bridge, a total distance of 38 miles. The second route follows the Chestatee River from Keith’s Bridge Park to where Georgia SR 400 crosses the Chestatee River, a total distance of 17 miles.

There are currently three known bald eagle nest sites on Lake Sidney Lanier; bald eagle numbers remain low but steady. Although bald eagles are no longer Federally protected by the ESA, protections for the bald eagle still exist under the Bald and Golden Eagle Protection Act and under the Migratory Bird Treaty Act. The bald eagle is also listed as “Threatened” in the State of Georgia.

### **(4) MANAGEMENT STRATEGIES**

The project will survey each management unit prior to conducting any natural resource management action to ensure that there are no status species present. Prior to conducting a timber harvest, the project submits a timber availability memo that is reviewed by the Mobile

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District, Planning and Environmental Division, Environment and Resources Branch, Inland Environment Team (CESAM-PD-EI) to ensure compliance with laws and regulations.

When status species are present, the project will coordinate with its regional USFWS ESA representative to ensure that the proposed management action will not negatively impact the species or its habitat. Avoidance is generally the first strategy used to minimize or eliminate harmful impacts where appropriate. However, some status species require regular NRM activities in order to successfully protect, conserve, and maintain the species and/or its designated critical habitat. Section 7 consultation with USFWS may be required prior to conducting a management action. The USFWS and the National Marine Fisheries Service (NMFS) endangered species Recovery Plans shall be followed to protect and conserve status species and/or critical habitat in accordance with the Endangered Species Act, PL 93-205, 1973.

Natural resource management activities and strategies designed to benefit wildlife in general and contribute to healthy ecosystems are far easier to modify for the specific needs and life-cycle requirements of status species than are unmanaged USACE lands and waters. Habitat degradation has been the leading cause of species extinction. Extinction is a natural process that has been exacerbated by human disturbance. Therefore, it is essential that all USACE lands and waters receive the benefits afforded by the USACE environmental operating principles of protection and stewardship. It is the stewardship principle that maintains ecosystem health and promotes availability of these precious natural resources to future generations.

Bound externally by Federal law (the Fish and Wildlife Coordination Act, the Endangered Species Act, and others) and internally by regulations (ER/EP 1130-2-540) to manage for status species as well as for sustainability, the Mobile District must meet its wildlife obligations by ensuring that all USACE lands and waters are being managed through sound NRM policy.

## **E. WATERSHED HEALTH**

### **(1) OVERVIEW**

With the adoption of a watershed approach to the environment (Policy Guidance Letter #61), USACE recognizes the emphasis on an integrated, collaborative approach to problem-solving in riparian, wetland, and aquatic habitats. Using a watershed approach to wetland protection ensures that the entire system—including land, air, and water resources—is protected. Achieving the USACE goal of sustainability for these three requires maintenance, restoration, and monitoring efforts on the part of natural resource management personnel.

Throughout the history of USACE, a watershed approach has been integrated into the process by which water resource systems have been investigated. Watersheds include all land areas that drain into a single point or common outlet, often the lowest topographical

point. Watersheds vary greatly in scale, depending on management objective, commonly crossing ownership boundaries. Watershed health is essential to sustaining the ecological function and productive capacity of USACE lands.

Although perhaps only seasonally wet, wetlands are the interface of water flow, nutrient cycling, and sunlight, which makes them critical aspects of a watershed. They are among the most biologically productive natural ecosystems, providing a nutrient-rich environment that supports abundant and diverse habitat types for fish and wildlife. They also improve water quality, recharge water supplies, reduce flood risk, reduce soil sedimentation and erosion, and provide recreational aesthetics. Wetlands generally include swamps, marshes, bogs, and similar areas differentiated primarily by woody or non-woody vegetation types. At USACE Civil Works Projects, existing wetlands are protected, conserved, and maintained (ER 1130-2-540, Chapter 2) in cooperation with the USACE Regulatory Division, which holds regulatory authority over jurisdictional wetlands.

Floodplains and riparian zones often include wetlands and are an important interface between the lands and waters of the project. These zones should be managed to minimize adverse impacts to this critical habitat component. Soil conservation is of primary concern in these areas because storm water runoff can be a significant source of pollutants and sediment into surface waters, especially in areas where groundcover has been disturbed. Directing and/or slowing the rate of erosion helps to protect valuable land resources, improve water quality, and prolong the life of the reservoir. Floodplains and/or riparian zones also provide the following benefits:

- Storage of excess water during flood events
- Stabilization of stream banks and improvement of water quality through sedimentation reduction
- Quality wildlife habitat and travel corridors
- Physical temperature buffers to protect surface waters

## **(2) GOALS AND OBJECTIVES**

The overall goal of managing watershed health is to protect, conserve, and maintain wetland and riparian habitat within project resources limitations of staff and budget allocations. A secondary goal is to protect areas that are especially sensitive or possess cultural or recreational significance.

The project protects wetlands, floodplains, and riparian zones by doing the following:

- Preventing and/or controlling erosion through use of the appropriate equipment and practices, education of personnel, engineered erosion control methods, and establishment of streamside management zones (SMZs)
- Properly managing SMZs as prescribed by State best management practices (BMPs)

An objective specific to Lake Sidney Lanier is to map, using a Geographical Information System (GIS) and field verification, the wetlands within the project's fee boundary (sub-divided by management block). Knowing the size and locations of the wetlands helps in the development of specific management plans for these wetland areas and the fish and wildlife that use them. This also aids in level one inventory reporting.

### **(3) INVENTORY AND MONITORING**

An inventory of wetland, floodplain, and riparian habitats provides baseline data that can be used to determine losses or gains in habitat quality and quantity in the watershed. The project may develop a plan to inventory and monitor major soil erosion areas. This inventory establishes baseline data which aids in determination of severity of erodible areas during future monitoring. The project should also monitor annually for the presence or absence of non-native species of plants and animals that could overwhelm existing habitats. Using project GIS capabilities, maps of these sites provide a visual representation of valuable habitat areas and critical sites that may require special management.

Water quality monitoring is important to measuring watershed health at the Project. Land-based environmental degradation eventually affects water quality and aquatic ecosystems. Failure to properly monitor water quality on the project may result in negative impacts to project purposes or critical status species. The Georgia Department of Natural Resources (GA DNR) and the Upper Chattahoochee River Keepers both closely monitor water quality on Lake Lanier. Dissolved oxygen and temperature profiles can be found at <https://georgiawildlife.com/fishing-forecasts> while other results can be found at <https://gomaspublic.gaepd.org>.

### **(4) MANAGEMENT STRATEGIES**

The Clean Water Act of 1987 requires efforts to prevent pollution of sources of drinking water and protect water quality. When resource management activities are being conducted, the use of State best management practices (BMPs) can satisfy these requirements. In addition, activities that could result in sedimentation or other changes in water quality and quantity should have project-level design criteria that maintain or improve the hydrologic function of wetland communities.

The project will implement the following strategies to protect, conserve, and maintain these fragile ecosystems:

- Limit disturbance in areas where runoff flows directly into a watercourse.



- Maintain the integrity of all streambeds and banks: Remove debris from streambeds and, when it is necessary to alter a stream's course, return the streambed and banks, as near as possible, to their original condition.
- Refrain from spraying unauthorized chemicals directly into water and from allowing chemicals, herbicides, fertilizers or petroleum products to degrade surface or groundwater.
- Protect native vegetation from non-native, invasive plants and animals.
- Minimize development within floodplains where there is a practical alternative.
- Rehabilitate eroded areas.
- Stabilize exposed soils upon completion of forest management practices, construction activities, or other soil disturbing actions.
- Minimize the use of pesticides and herbicides where practical.
- Minimize the amount of impervious surfaces in newly developed areas.

Best management practices (BMPs) are non-regulatory guidelines for silvicultural practices designed to protect water quality by minimizing or preventing non-point source (NPS) pollution. By applying them to silvicultural activities, the overall integrity of water quality will improve as well as the restoration and protection of all watersheds. Sedimentation from forestry operations may occur after a harvest if exposed soil washes into a stream or other water body. Soil and debris from land management activities should not be allowed to enter wetland or aquatic areas. Without the proper application of BMPs, this sediment can be the main pollutant on sites exposed by harvesting operations, potentially carrying herbicides, pesticides, and other contaminants.

State BMPs establish standards for streamside management zones (SMZs) as areas of limited management along streams and other water bodies. SMZs become permanent fixtures on project land and are the greatest natural protection against siltation of a stream. They vary in size from a few feet to hundreds of feet; determinations must be made on a site-by-site basis based on slope and soil type, but the minimum width should be 25'. Limited harvesting may be permitted within the SMZ based on state BMP guidance at the determination of project natural resource management staff.

Depending on site conditions, limited harvesting may be permitted within a wetland by qualified NRM personnel or the author of the harvest plan. Unless involved in stream improvement work, mechanical equipment should not be allowed to operate in any stream channel except to cross at designated points. All crossings should be at right angles to the stream or riparian zone. Activities that expose more than 10% mineral soil should be avoided

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unless the activity occurs at a designated crossing. Mechanical equipment may operate as long as the soils are dry enough to sustain activity without excessive compaction or rutting. In order to minimize resource damage, access may be restricted during wet seasons or following rainfall events.

#### **(A) EROSION PROTECTION**

Erosion along the shoreline may be caused by seasonal flooding scouring away the shoreline, vessel traffic causing excessive wakes, wave action caused by wind, or commercial navigation using shoreline trees for mooring posts (at applicable projects). Current management strategies for erosion focus primarily on conserving priority sites by implementing or authorizing erosion control practices and enforcement of Title 36 Regulations.

At Lake Sidney Lanier the most common erosion control practice is the installation of riprap along the shoreline. The priority sites targeted with Government funds have been the highly erodible or most exposed portions of developed parks. The shoreline management staff also issues permits through delegated authority for the public to install riprap for erosion control. The majority of these permits are for protection of the shoreline in the immediate vicinity of the applicant's dock permit. However, in 2018 and 2019 the Lake Lanier Association was permitted to install riprap along the shoreline of several undeveloped islands in the lake.

A major problem at Lake Lanier that leads to erosion of the shoreline and sedimentation into the lake is the unauthorized clearing of trees and forest litter from the riparian zone surrounding the lake. Often this is done by the public for a view of the lake from their home or for a "cleaner" appearance of the shoreline. Several factors not relevant to this document make it difficult to enforce the regulations that protect this vegetation. However, the primary focus in all enforcement actions is to revegetate these cleared areas to prevent erosion and restore the habitat.

#### **(B) SEDIMENTATION**

Stream and lake sedimentation has several consequences. It can result in reduced water storage capacity in reservoirs, which then impacts public water supply, flood control capability, and water availability for downstream navigation. Sediment can also cause extensive damage to aquatic life, shorten the useful life of reservoirs, reduce the recreational value of lakes and waterways, increase operational costs to power plants and clog navigation channels. Sediment can fill drainage channels such as ditches and culverts, thus causing localized flooding if it is not removed.

Application of state BMPs in the SMZs reduces the mass load of sediment reaching a water body and improves water quality as well as the use of the water resource. Common sediment reduction strategies include implementing practices on the field that prevent erosion and the transport of sediment from the field. This includes conservation tillage, contour strip-cropping, terraces, and critical area planting. Another strategy is to route runoff from fields through

practices that remove sediment, such as filter strips, field borders, grade stabilization structures, sediment retention ponds, water and sediment control basins, and terraces. Site conditions dictate the appropriate combination of practices for any given situation.

In regard to water storage, Lake Sidney Lanier is divided into three management zones: the “Dead Storage” below elevation 1035' MSL, the “Conservation Pool” between elevations 1035' and 1071' MSL, and the “Flood Pool” between elevations 1071.1' and 1085' MSL. Sedimentation into each of the management zones negatively impacts the project purposes by decreasing the storage volume in that zone.

The historic storage volume within the Conservation Pool measured 1,127,600 acre feet (ac-ft). In 2009 this storage volume was estimated at 1,061,343 ac-ft, a loss of 66,257 ac-ft (6%).

The historic storage volume within the Flood Pool measured 558,800 ac-ft. In 2009 this storage volume was estimated at 598,081 ac-ft, a gain of 39,281 ac-ft (7%).

These numbers appear to indicate that significant erosion has occurred from the USACE-managed property surrounding Lake Lanier. This erosion has created an increase in flood storage capacity, but as this sediment settled within the Conservation Pool, it has created a loss of storage capacity within that zone. However, the gain and loss between zones is not a 1:1 ratio. A significant amount of sediment (26,976 ac-ft) which has settled within the Conservation Pool appears to have come from non-USACE-managed lands further upstream from the USACE boundary.

Dredging sediment from within the Conservation Pool is one management action that occurs on Lake Lanier that helps slow the loss of storage capacity. The majority of sediment removed by dredging occurs by two contract dredge operations that work year-round on the lake. One contract dredges a small area on the northern Chestatee River above Lumpkin County Park. The second contract dredges about 1.5 miles on the northern Chattahoochee River downstream of Belton Bridge Park boat ramp. In the 20 years that these dredge contracts have been in operation, they have removed only 657.9 ac-ft (0.058%) of sediment.

Other minor dredging work occurs through the Programmatic General Permit authority delegated from the Regulatory Division to the Operations Project Manager. These minor actions are typically performed by dock permittees to remove sediment from around their boat dock. The amount of sediment removed via these permits averages only 8.5 ac-ft.

While dredging sediment has some benefits, such as slowing the loss of storage capacity and improving water quality, because of the size of Lake Lanier, the benefits are more localized to the dredging site.

## **F. INVASIVE AND EXOTIC SPECIES**

### **(1) OVERVIEW**

Exotic species can spread rapidly through ecosystems since their natural predators are often not present. These species have the ability to retard natural vegetative succession and reforestation, displace native species, and generally cause a reduction of biological diversity. Exotic species are said to be “invasive” when their introduction causes or is likely to cause economic or environmental harm or harm to human health. They can change whole ecosystems and irreparably damage natural resources.

### **(2) GOALS AND OBJECTIVES**

In accordance with EO 13112, Invasive Species (February 3, 1999), the project will use relevant programs and authorities to do the following:

- Prevent the introduction of invasive species
- Detect and respond rapidly to control populations of such species
- Monitor invasive species populations utilizing current technology, such as a Geographic Information System (GIS) and the Early Detection and Distribution Mapping System (EDDMapS)
- Provide for restoration of native species and habitat

The project will maintain a working knowledge of invasive species known to occur in the surrounding area and will take measures to prevent the spread of these species onto public lands where feasible. Existing populations of invasive species should be inventoried, mapped, and monitored for future management as project budgets allow.

### **(3) INVENTORY AND MONITORING**

Invasive and exotic species inventories provide baseline quantitative and qualitative data for use in determining treatment priorities and strategies. Some invasive and exotic species (such as feral hogs, cogongrass, Chinese tallow tree, Russian olive, Chinese privet, and hydrilla) have significant potential to alter and adversely impact their habitat if their numbers surpass manageable levels. For this reason, baseline monitoring is essential to the success of project NRM goals.

The invasive species known to occur on project lands and waters at Lake Sidney Lanier are identified in Table G-12.

#### **(4) MANAGEMENT STRATEGIES**

Ideally, invasive species would be eradicated; however, when invasive species appear to be well established, eradication may not be financially or logistically feasible. The most effective action may be to prevent their spread or lessen their impacts on new areas through control measures such as Early Detection and Rapid Response (EDRR). The task of controlling invasive and exotic species is expensive and lengthy. However, in accordance with laws and regulations, the project will take steps to prevent the introduction of invasive species and take measures to control invasive and exotic species already established in an economically and environmentally sound manner. The project conducts surveys of identified invasive species locations to assess impacts on operational needs and activities.

Typical management strategies for invasive and exotic species are the following:

- Apply herbicides based on the site and target species
- Physically remove the target species
- Clean equipment prior to moving from one area to another to prevent spread
- Utilize biological control, such as triploid grass carp, alligatorweed flea beetle, and stem boring weevil (not currently in use at Lake Sidney Lanier)
- Establish native species to fill voids in habitat
- Provide education to the public on identification and consequences of transplanting invasive and exotic species

Invasive species control has the potential to be one of the predominant natural resources management activities performed on Lake Sidney Lanier for several reasons. First, the opportunities are plentiful. Exotic species can be found nearly anywhere on the landscape. Second, access limitations are not an issue. While many NRM activities require vehicle access for heavy equipment use, invasive species control does not always require the use of heavy equipment. Many NRM Blocks on Lake Lanier have lands that are classified as Wildlife Management where the lack of vehicle access limits the NRM activities that can take place. Invasive species control can still be performed in these areas where vehicle access is limited. Third, time of year is not a major limiting factor. For invasive plant species, control efforts for some species (like Chinese privet) are best done during the growing season, while others (like climbing vines) are best done during the dormant season. Some type of invasive species control action could be taken at nearly any time of the year.

However, three factors currently limit invasive species control work at Lake Sidney Lanier. The primary limiting factor is manpower. With a small NRM staff and other priorities, most years there is just not enough time to focus on invasive species control. The second limiting

factor is that the NRM staff are not currently trained for use of chainsaws. The third limiting factor is that the NRM staff typically do not purchase or apply herbicides. Because of these last two factors, many invasive species control actions must be performed by the O&M contractor. This adds time and cost to every action and can sometimes be very difficult to schedule due to other O&M priorities. For invasive species control to become as efficient and effective as possible and a predominant part of the NRM program, there needs to be more NRM staff and they should be proficient in the use of chainsaws and the application of herbicides.

## **G. FISH AND WILDLIFE MANAGEMENT**

### **(1) OVERVIEW**

This section discusses fish and wildlife management with respect to terrestrial and aquatic habitats, fish and wildlife populations, nuisance species and wildlife diseases. Special status species management and wetland habitat management are considered independent topics and are discussed in Sections 4 and 5, respectively.

The USACE recognizes the primacy of state ownership in regard to native wildlife species and their management; however, it is mandated by numerous federal laws, congressional mandates, executive orders, mitigation commitments, and internal regulations to manage USACE lands and waters for fish and wildlife habitat as a primary responsibility under environmental stewardship. Management activities are planned using an ecosystem management approach. That is, rather than managing stands individually, actions taken are planned based on their impact(s) on the entire ecosystem. For instance, an oak stand in a river bottom may serve as a management unit, but plans for that stand are developed with respect to that stand's contribution to the entire hardwood river bottom ecosystem.

### **(2) GOALS AND OBJECTIVES**

Fish and wildlife goals include the following:

- Maintain, restore, and enhance natural ecosystems favorable for native fish and wildlife populations, particularly Federal and State-listed protected species (ESA)
- Maintain healthy levels of a diversity of plant and animal life where it does not conflict with the authorized project purposes (Fish and Wildlife Coordination Act, PL 85-624)
- Support of multiple uses, both consumptive and non-consumptive (Water Projects Recreation Act, PL 89-72)
- Minimization of wildlife-related health risks, safety risks, and balance ecosystem health
- Minimization of negative impacts to native ecosystems where practical

- Maintenance of game species populations that provide recreational harvest opportunities on a sustainable basis
- Management of populations of invasive or nuisance wildlife species, attempting to reduce or eliminate their numbers

### **(3) INVENTORY AND MONITORING**

Inventories provide baseline quantitative and qualitative data for use in determining resource management needs. Some wildlife species, notably beaver and white-tailed deer, have significant potential to alter and detrimentally impact their habitat if populations exceed the normal carrying capacity of the habitat. This capacity may dictate forest management practices. For this reason, baseline monitoring and/or control of some wildlife species is essential to the success of project NRM goals. Wildlife population surveys may be performed to establish an inventory of populations of particular species of management concern or priority.

At Lake Sidney Lanier wildlife population surveys are performed for white-tailed deer, Canada geese, and bald eagles. The population survey for bald eagles is addressed in “Threatened and Endangered Species,” above.

Two survey methods are used to monitor white-tailed deer populations. The first method is a spotlight survey along a predetermined route through the parks and USACE property along Buford Dam Road. This survey, which covers approximately 640 acres, is conducted from a vehicle by three rangers, one driver and two spotters, visually surveying the property for deer. This survey is completed every November before the Buford Dam deer hunt takes place. The population data is analyzed over time to monitor changes in deer population and direct management decisions for the Buford Dam deer hunt.

The second method is a harvest report completed by hunters participating in the Islands deer hunt. Hunters report the number of days they hunted, the number of deer they saw, the number of bucks harvested, and the number of does harvested. The survey covers the 1,103 acres that are open for hunting during the hunt. This survey is intended to track trends over the years of this hunt. The assumption is that if the number of deer that hunters see and the number of deer harvested remains steady, the deer population is also remaining steady.

USACE also participates in the Canada goose population survey, which is conducted on Lake Sidney Lanier by the GA DNR. This survey is conducted by four people (two boats with two people in each boat), visually surveying the land, water, and sky for Canada geese. The survey is designed to cover the entire lake in one day, with one boat surveying the area below Browns Bridge and the second boat surveying the area above Browns Bridge. This survey is completed once every two years.

#### **(4) MANAGEMENT STRATEGIES**

A general strategy used is to identify and conserve those species in greatest need for conservation action and their associated habitats while also managing for the full array of wildlife and habitats present within a given ecosystem. Coordination and partnerships with State agencies should be utilized to the fullest extent possible.

Strategies for enhancing wildlife habitat through forest management include the following:

- Maintaining corridors and SMZs to minimize habitat fragmentation
- Allowing some hard and soft mast-producing trees of mast-bearing age to remain as a food source for wildlife
- Maintaining portions of stands with snags and large trees for cavity-nesting species
- Using both cool- and warm-season prescribed burning as appropriate to enhance wildlife food availability, nesting, and brood-rearing cover
- Re-establishing native plant communities, such as longleaf pine and upland hardwoods
- Avoiding conversion of large hardwood stands to pine plantations
- Increasing tree planting spacing, thinning more frequently within rotation lengths or increasing thin intensity within existing stands, thinning overstocked stands, and improving timber stands mechanically and/or chemically
- Selecting the oak timber component for conservation, where appropriate, to preserve hard mast for wildlife
- Interspersing a variety of wildlife-friendly tree/shrub plantings
- Where feasible, planting and managing firebreaks, old logging decks, and roadsides as wildlife openings
- Implementing wildlife projects, such as squirrel and bird boxes, bat houses, food plots, and mineral blocks

Refer to the timber harvest and prescribed burn plans in Appendices H5 and H8 for schedule and location of prescribed burn and thinning activities.



## **(A) WILDLIFE MANAGEMENT**

The capability of any area to support wildlife is largely determined by its inherent soil fertility, climatic conditions, physiography, and past and present land use practices. Many of these factors can be manipulated through wildlife management practices to improve habitat capability and carrying capacity for many species.

The basic needs of all wildlife species are food, water, and cover. Wildlife density and diversity are directly associated with the inherent ability of each habitat type to fulfill the needs of individual species. Basic needs that are not met on a given habitat type become limiting factors for that species. Through management, limiting factors for many species can be reduced to maximize wildlife potential on most cover types within the project area.

Forest management is one of the primary activities that impacts wildlife habitat. Wildlife habitat quality can be determined by available food and cover, which are dependent on forest characteristics (size, shape, age, age class distribution, species composition, and density) and management practices (rotation length, regeneration, and prescribed burning). No single forest stand can provide quality habitat for all wildlife species. Every management activity has wildlife species that benefit from the action and species that do not benefit from the action. Therefore, management actions should be specific to target species. However, in general, wildlife species diversity and abundance are dependent upon habitat diversity.

Plant succession is the change in the type of plants that occurs on a landscape through time. Generally, this succession is divided into six "seral stages," each of which is identified by the dominant plant communities that are present. Succession begins when an area is made devoid of vegetation from some type of disturbance, such as fire, storms, flooding, pests, or logging. The first plants to appear on the landscape in Stage 1 are annual species that require full sun. Annuals are replaced by perennials and grasses, which are in turn replaced by shrubs, which give way to softwood trees, which are ultimately replaced by hardwood trees. Stage 6, or the climax community, in the Lake Lanier area is a mature oak and hickory forest that has a closed canopy with very little sunlight reaching the forest floor.

Different seral stages support different wildlife species. Therefore, the location, shape, size, type, and distribution of timber harvests are analyzed from the standpoint of wildlife habitat management to provide a series of seral stages that are beneficial to both forestry and wildlife. These stages are dependent on the amount of sunlight reaching the forest floor. Timber harvests open the forest canopy to allow sunlight to pass through and are the most practical and efficient means of improving large forested acreages for wildlife, especially when used in conjunction with prescribed burning practices.

Specific management methods include, but are not limited to, the following:

- Create a mosaic of various sized and shaped stands which provides a large amount of habitat variety to benefit wildlife species, but maintain corridors and SMZs to minimize habitat fragmentation.
- Use prescribed fire to enhance wildlife habitat. Regular burning of these areas increases the quality and quantity of food available to wildlife species, reduces wildfire hazard, enhances seed regeneration, provides nesting and brood-rearing cover, increases foraging success, and reduces predation rates.
- Allow public hunting, which is an effective tool for managing wildlife populations. Refer to Natural Resources-Oriented Outdoor Recreation,” below, for hunting program information.

On Lake Sidney Lanier most wildlife management actions will take place on lands that have master plan classifications of Wildlife Management or Recreation. Actions within developed recreation areas can be quite different from actions in undeveloped areas; therefore, this section focuses on actions in undeveloped areas. Wildlife management and forestry actions within developed recreation areas are addressed in “Natural Resource Management in Developed Areas,” below. Lands that have a classification of Vegetative Management are generally thin strips of land between private homes and the lake that are already impacted by shoreline use permits and licenses. In general, USACE does not have access to lands with Vegetative Management classification, and wildlife management actions could be in conflict with the currently permitted use of the land.

Wildlife management actions that are currently implemented at Lake Sidney Lanier focus on improving wildlife habitat. These actions are maintaining food plots, planting soft-mast trees, and installing nest boxes and platforms.

The following are some specific wildlife management goals at Lake Sidney Lanier:

- Expand wildlife inventories and population surveys to include more management compartments and more wildlife species for a more complete assessment, which will help focus management actions for specific areas and specific species
- Improve waterfowl habitat on 34 acres of wetlands within Chattahoochee River Block by constructing waterfowl impoundments
- Improve wood duck habitat by installing and maintaining nesting boxes
- Create wild turkey habitat through forest thinning, prescribed fire, and food plots
- Create mourning dove habitat through forest openings and food plots

- Create new pollinator habitat improvements within management blocks where there are no pollinator habitat improvements
- Diversify existing deer food plots to a mix of cool-season and warm-season plots and expand deer food plots into new management blocks throughout the lake
- Plant and maintain established firebreaks with plants that are beneficial to wildlife and/or pollinators

Nuisance wildlife (such as beavers, feral hogs, feral cats, and coyotes) may be managed either by live trapping and/or lethal removal. Consultation with Federal or State Federal agencies may be required to obtain permits for the control of nuisance animals. Project personnel will consult with appropriate Federal and State wildlife personnel regarding occurrences of wildlife disease or mortality.

On Lake Sidney Lanier the two species of wildlife that commonly become a nuisance are beavers and Canada geese. Beavers can cause damage to trees, but they usually become a nuisance only when they build lodges on and around private boat docks. Because this activity does not interfere with USACE missions or land use, removal is left to the discretion of the dock owner. If the dock owner believes that removal is necessary, her or she is required to use an individual/company that possesses a Nuisance Wildlife Control permit issued by the GA DNR.

Canada geese can become a nuisance within developed parks and marinas around the lake. They graze in the open grass areas and leave behind feathers and feces, which are undesirable to the recreating public. While the hunting season for Canada geese in Georgia helps to control the Canada goose population on the lake, sometimes localized control efforts are still necessary. Rangers occasionally try to repel Canada geese from a park through the use of physical barriers or scare devices. Signs are in place in most parks to discourage the public from feeding geese. When these efforts are not practical or effective and Canada geese have become more than just a nuisance to a particular recreation area, population control efforts are taken by destroying Canada goose nests and/or eggs in the vicinity of the park under permit from the US Fish and Wildlife Service.

USACE lands and waters represent a critical network of habitats for protected and migratory birds, offering sanctuary and migration stopover areas for resting and feeding, including suitable sites for nesting and rearing their young. Projects should attempt to protect, conserve, and create migratory bird habitat. Refer to the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and the related Memorandum of Understanding (MOU).

#### **(B) FISHERIES MANAGEMENT**

USACE recognizes that while the primary responsibility for fisheries management lies with the appropriate State fish and wildlife agencies, USACE operates under numerous Federal laws,

Congressional mandates, executive orders, and internal regulations requiring fisheries management as a primary natural resource management responsibility on USACE waters.

The following are USACE's primary goals in fisheries management at Lake Sidney Lanier:

- Maintain habitat that is capable of supporting a sustainable and diverse sport fishery
- Enhance fishing opportunities

According to the *Final Environmental Impact Statement, Buford Dam and Lake Sidney Lanier, Georgia (Flood Control, Navigation and Power)*, dated 1974, "The land within the lake was completely cleared of trees between elevation 1,030' and 1,070' MSL. Trees between elevation 980' and 1,030' MSL were topped at or below 1,030' MSL, which is 5' below the minimum power pool of 1,035' MSL." This practice has left little to no structure beneficial to fisheries within the top 40' of the lake.

To improve fish spawning and foraging habitat, the GA DNR has proposed to plant native aquatic vegetation in suitable areas, primarily in the northern half of the lake. The aquatic vegetation that would be planted is American Water-Willow (*Justicia Americana*), Common Buttonbush (*Cephalanthus occidentalis*), and Maidencane (*Panicum hemitomon*). The first of these plantings was planned to begin in summer 2020. Another idea to improve fish spawning habitat proposed by the GA DNR was to create gravel spawning beds. Both of these actions are supported by USACE.

To improve fishing opportunities USACE currently maintains 80 fish attractor locations spread throughout the lake. The fish attractors are generally made from used Christmas trees, but occasionally PVC attractors are used. The fish attractors are generally located near parks and in water depths less than 20' to improve bank fishing opportunities.

Permits are also issued to the public who wish to construct and install fish attractors. On the average, 50-100 fish attractors are permitted each year. These attractors are also generally constructed from Christmas trees or tree debris, but occasionally bamboo or PVC is used. These attractors are required to be 20' or more deep so they do not become navigation hazards.

Beginning in the spring each year, some reservoirs in the Mobile District are maintained at a steady-to-slightly rising elevation to help ensure a successful fish spawn. West Point Lake, Lake Seminole, Walter F. George Lake, Allatoona Lake, Okatibbee Lake, and Lake Sidney Lanier are managed under this program through coordination with the District office. Coordination includes team members from the Mobile District, Planning and Environmental Division, Environment and Resources Branch, Inland Environment Team (CESAM-PD-EI); the Mobile District, Operations Division, Technical Support Branch, Natural Resource Section (CESAM-OP-TR); and the Mobile District, Engineering Division, Hydraulics and Hydrology Branch, Water Management Section (CESAM-OP-TR) with input from the USFWS; the states

of Georgia, Alabama, and Florida; and other stakeholders. District Draft SOP 1130-2-9 identifies the window for the Lake Lanier fish spawn as April 1 through June 1. A period of four weeks minimum is targeted within this window.

Nuisance aquatic species (such as zebra mussels, exotic fish, and carp) may be managed by chemical control, netting, electrofishing, and other means. Bowfishing by the public, in accordance with State fishing laws, can be a useful tool for managing nuisance fish populations. Consultation with Federal or State agencies may be required to obtain permits for control of nuisance species. Currently, there are no known nuisance aquatic species in Lake Lanier. However, this area presents an important public education opportunity so that nuisance species are not spread to the lake.

Project personnel will consult with appropriate Federal and State fisheries personnel regarding occurrences of fish disease or mortality. A parasite in the genus *Achtheres*, commonly called Gill Maggots, was found in Lake Lanier in 2017. This parasite infects the mouth and gills of Striped Bass and Largemouth Bass. GA DNR biologists think infestations of this parasite could stress fish as water temperatures rise during the summer months and result in some mortality. This has not affected USACE management actions, but GA DNR fisheries biologists are monitoring this pest along with their normal fish population monitoring efforts.

## **H. FOREST AND FIRE MANAGEMENT**

### **(1) OVERVIEW**

This section describes forest management principles and references recognized State Best Management Practices (BMPs) which should be closely followed. Also contained in this section are specific silvicultural prescriptions for various tracts around the project. At Lake Sidney Lanier, as with wildlife management, most forest and fire management actions take place on lands that have Master Plan classifications of Wildlife Management or Recreation. Most forest management actions would conflict with permitted use of project lands that have a classification of Vegetative Management.

Within the guidelines of the Shoreline Management Program at Lake Sidney Lanier, the public may perform minor forest management actions in Vegetative Management areas if authorized by written permit. These actions are cutting dead or diseased trees which pose a threat to persons or property, planting native vegetation, and removing invasive plant species.

### **(2) GOALS AND OBJECTIVES**

The forest management goals of the project are as follows:

- Conduct timber harvest activities in accordance with the Standard Operating Procedure for Declaring Excess Timber for Harvest on Water Resource Development Projects within Mobile District
- Use uneven-aged forest management techniques to develop, maintain, protect, and/or improve vegetation conditions for timber, fish, wildlife, soils, recreation, water quality, and other beneficial uses (ER 1130-2-540)
- Manage forests as a multi-purpose resource for sustained yield when consistent with recreation and wildlife management objectives and approved land uses (both consumptive and non-consumptive) in accordance with directives contained in the Conservation of Reservoir Forest Lands Act, commonly known as the Forest Cover Act, PL 86-717
- Provide watershed protection (Policy Guidance Letter #61)
- Restore native plant communities (for example, longleaf pine), where appropriate and feasible (Policy Guidance Letter #24)
- Maintain forests in a condition that minimizes threats to safety and human health
- Implement accepted silvicultural practices to maintain healthy, sustainable, uneven-aged, and biologically diverse ecosystems that will sustain native populations of flora and fauna consistent with ecosystem management principles
- Use prescribed fire to control understory vegetation, reduce natural fuel build-up, improve plant vigor and wildlife habitat, and encourage regeneration
  - Establish and maintain firebreaks on management compartments where prescribed fire will be used
- Establish and maintain effective firebreaks
- Minimize outbreaks and infestations of forest pests and invasive species through the use of harvest operations, pesticide applications, or other accepted practices
  - Thin stands to < 80 ft<sup>2</sup>/acre to help prevent southern pine beetle outbreaks
- Implement forest BMPs consistent with soil conservation, erosion control, and protection of water quality standards

### **(3) INVENTORY AND MONITORING**

Monitoring forest stands is an integral part of natural resource management. A project-wide inventory of forest resources should be conducted when feasible. Project personnel should also periodically evaluate forest stand conditions to ensure that project objectives are met.

Prior to any harvest, the existing stand should be inventoried to determine the proper prescription. After a harvest is completed, a residual stand inventory should be conducted for future comparisons used in determining the success of the harvest prescription.

All forest management activities will be mapped using Global Positioning System (GPS) and placed on the project's Geographic Information System (GIS). This mapping information will be used to track and document silvicultural actions. Aerial photography will be incorporated into the GIS and used to evaluate forest cover.

### **(4) MANAGEMENT STRATEGIES**

#### **(A) TIMBER HARVESTS**

Harvesting is an accepted silvicultural practice used to achieve NRM objectives. Basic harvest types include clear-cut, seed tree, shelterwood, thinning, salvage, and sanitation cuts. Site condition and management objectives for a particular stand are considered while determining the appropriate type of harvest to use, if any. Harvesting operations within floodplains, wetlands, or riparian zones are generally restricted in accordance with state BMPs. In some instances, a heavy thin may be prescribed for a forested stand to enhance wildlife value by encouraging early successional growth, which provides increased browse, cover, nesting/bedding habitat, and general improvement of biodiversity in a forest stand.

Most forest stands at Lake Lanier are not generally managed for the production of timber. A lack of large, undeveloped tracts of land; a lack of access to undeveloped tracts; and a small timber market in the metro Atlanta area contribute to this management practice. However, occasionally small timber harvests are performed when associated with other management objectives, such as park development, wildlife management, or salvage cuts after storm or pest damage.

In many cases, these timber harvest hurdles have resulted in decades of little to no forest management on many stands around Lake Lanier. This presents both a challenge and opportunity for natural resources management actions over the next decade or two. To achieve the wildlife management objectives for many tracts, reintroducing a regiment of timber harvests and prescribed fire will be essential. Refer to Appendix G9 for a list of management compartments where timber harvests could be part of the routine management and to the Timber Harvest Plan in Appendix G5 for specific stand prescriptions.

Appendix G6 outlines responsibilities of USACE project and District personnel in the review process for standard timber sale coordination and routing of a Timber Availability, the

document required for District review of any timber harvest prior to sale. It also provides a list of personnel resources to assist with the contracting process. This appendix should be updated as needed to ensure the most up-to-date list of resources available to assist the project. A sample Timber Availability can be found in Appendix G7.

**(B) SITE PREPARATION AND REGENERATION**

Site preparation includes activities designed to enhance site conditions and improve germination rates and/or seedling survival. Site preparation includes, but is not limited to, drum chopping, shearing, raking, burning, and herbicide applications. Of the items in this list, burning is the only site preparation activity anticipated for use at Lake Lanier.

Natural regeneration is used when there is adequate stocking of high-quality seed trees and optimal site characteristics. When there is not an adequate seed source remaining after a harvest action, or if the remaining stand is determined to be of poor genetic quality or poor health, artificial regeneration may be a recommended prescription. Natural regeneration is typically used following seed tree or shelterwood cuts while artificial regeneration is generally used following clear cuts or in instances where natural regeneration is inadequate.

**(C) PRESCRIBED FIRE**

Fire is a natural occurrence of Southern forests; therefore, prescribed fire is a desirable and economically sound management practice. Prescribed fire is generally not used on hardwood sites; however, periodic burns through a hardwood stand can be beneficial. Project staff will coordinate with the appropriate regulatory offices and will secure a burn permit from the State Forestry Agency, if required. Prescribed fire is used to accomplish the following:

- Reduction of hazardous fuels
- Disposal of logging debris
- Preparation of sites for seeding or planting
- Improved wildlife habitat
- Management of competing vegetation
- Control of insects and disease
- Enhanced aesthetics
- Perpetuation of fire-dependent species

The prescribed fire plan contained in Appendix G8 will be executed in accordance with the Project Wildland Fire Management Plan, local and State burning ordinances, and BMPs.



Smoke management is a critical factor in planning prescribed burns. Weather conditions, road proximity, and wildland-urban interface will be evaluated prior to each burn.

General guidelines for smoke management include, but are not limited to, the following:

- Identify smoke sensitive areas (highways, airports, hospitals, farms with livestock or poultry, and populated areas)
- Obtain and use weather and smoke management forecasts
- Do not burn during pollution alerts or stagnant air conditions
- Comply with air pollution control regulations
- Burn on days with a relatively high dispersion index
- Use small, isolated test fires to confirm smoke behavior

Firebreaks are an essential management tool for prescribed fire containment and personnel safety and should be constructed and maintained in compliance with state BMPs. Natural features and existing firebreaks are used where possible to minimize impacts to the environment. Firebreaks may additionally be used to benefit wildlife by providing critical habitat diversity and food in the form of planted wildlife openings. Care should be taken to avoid cultural sites or other sensitive areas. In addition, efforts should be made to establish firebreaks along the topographic contour, where possible, in order to reduce soil erosion.

#### **(D) UNPLANNED ACTIVITIES**

Occasionally, unplanned forest management activities (such as salvage cuts) are required as a result of natural disturbance events (such as insect infestations and/or weather events). For example, the southern pine beetle and other forest pests have the potential to affect very large acreages of pine forests if left unchecked. Severe storms can cause a great deal of damage in a short amount of time.

These occurrences often require a fast response to minimize loss of damaged timber assets through a salvage harvest before time, weather, pests, or other factors decrease their value. Damaged timber lingering on a site may also pose a risk to public safety or act as an attractant for forest pests, allowing them a foothold, which may pose a threat of even greater damage to the remaining forest stand.

In other cases, conditions may prevent treatment of a stand that is scheduled for a management action, causing the project to place another stand before it in the rotation. For example, wet conditions may prevent a timber harvest or burning.

## **I. NATURAL RESOURCE MANAGEMENT IN DEVELOPED AREAS**

### **(1) OVERVIEW**

The USACE Natural Resources Stewardship program mission is to manage and conserve natural resources while providing quality public outdoor recreation experiences. Performing natural resources management activities within developed parks can improve park aesthetics and recreation experiences while benefiting wildlife and forest health. Park infrastructure presents special challenges to natural resource activities not encountered on undeveloped lands.

Some projects have historically avoided management within developed recreation areas due to the challenges associated with avoiding damage to infrastructure, potential cleanup costs, possible effects on visitation, or other reasons. Recreation areas should not be exempt from NRM actions though special care and planning are needed to minimize adverse impacts to other project purposes that are the main focus in these area.

USACE-owned lands that are leased to other entities present additional challenges to NRM actions due to the goal of avoiding negative interference with a lessee's operations. The mandate on USACE to manage its lands following the stated environmental stewardship principles remains the responsibility of USACE personnel and is not delegated to the lessee.

### **(2) GOALS AND OBJECTIVES**

Project goals include the following:

- Manage natural resources within park or leased area boundaries in a manner consistent with project purposes, Federal laws, regulatory guidance, and other guidelines
- Manage understory to provide proper conditions for healthy vegetative succession and to improve park aesthetics, public use, visitor safety, and wildlife habitat
- Manage hazardous trees
- Avoid damage to infrastructure, such as roads, picnic tables, utility lines, or septic systems
- Maintain a healthy, natural setting while managing for forest and wildlife sustainability
- Develop parks responsibly to meet the public need for recreation while not overdeveloping the land or depleting natural resources

- Implement a timber thinning schedule within parks that minimizes outbreaks and infestations of forest pests, reduces the number of hazardous trees, improves aesthetics, and improves forest health.
- Control erosion, including sheet erosion that can occur when overuse destroys vegetative ground cover and bank erosion that can occur from wave action
- Expand hunting opportunities to more recreation areas during closed seasons
- Continue pollinator habitat restoration within underutilized park areas
- Maintain current nesting boxes within parks
- Manage invasive species
- Enhance public fishing opportunities at parks

### **(3) INVENTORY AND MONITORING**

Inventories provide baseline quantitative and qualitative data for use in determining resource management needs. Previous sections of this plan have identified the importance of inventories and monitoring for threatened and endangered species, invasive and exotic species, wildlife management, and forest management. The same techniques and strategies used to inventory these resources in undeveloped areas should be used within developed areas on the project. In some circumstances, such as critical wildlife habitat, it may be necessary to monitor public use within developed areas more closely than in undeveloped areas to prevent habitat degradation.

### **(4) MANAGEMENT STRATEGIES**

All natural resource management strategies can be implemented on some level in developed areas, though some may be more appropriate than others and some adjustments will likely have to be made. Careful planning and coordination of management strategies can reduce park operations and maintenance (O&M) costs or improve visitation. For example, prescribed burning can be used to reduce leaf litter that may ordinarily be blown off of campsites by contractors, increasing O&M contract costs. Timber thinning may reduce the O&M burden of removing hazardous trees and can potentially create attractive vistas. Wildlife food plantings can reduce mowing and provide a wildlife viewing opportunity for park visitors. Fish attractors placed near the shoreline enhance the recreational experience of fishermen.

Management activities in developed areas require careful consideration, planning, and coordination. Other personnel, agencies, or members of the public should be involved in the planning stages as appropriate. For example, if management will take place in a recreation area, NRM staff should consult with recreation staff before finalizing a management plan. The

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same concept applies to work in outgranted areas or near developed shoreline areas. Outside priorities, or those priorities of the other parties, should be considered in the planning phase. For example, timber management in a park may be planned in a way that creates a vista in a highly used location or to maintain shade in campgrounds.

Some basic strategies that apply to this type of management are as follows:

- Utilize only native plant species in landscape plantings in accordance with Presidential Memorandum *Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds* (April 1994)
- Utilize thinning, sanitation, and salvage cuts to maintain an appropriate forest stand stocking
- Enhance public fishing opportunities by constructing and installing fish attractors near fishing piers and the shoreline of developed areas
- Enhance wildlife viewing opportunities and support native species by installing bluebird, bat, wood duck, or squirrel nesting boxes where appropriate
- Use prescribed fire to reduce undesirable understory growth to improve park aesthetics, public use, visitor safety, plant vigor, wildlife habitat, native plant communities and to reduce fuel buildup

## **J. NATURAL RESOURCES-ORIENTED OUTDOOR RECREATION**

### **(1) OVERVIEW**

Natural resources-oriented outdoor recreation includes programs, activities, or opportunities at USACE Civil Works projects that are dependent on the natural environment and are not specifically provided for in developed park areas (such as hunting, fishing, trapping, hiking, and wildlife viewing).

### **(2) GOALS AND OBJECTIVES**

General natural resources-oriented outdoor recreation goals include the following:

- Manage USACE natural resources in a manner that improves outdoor recreation opportunities
- Manage natural resources-based recreation to maintain healthy ecosystems and promote conservation of natural resources

- Improve wildlife habitat by promoting and maintaining diverse forest communities that support native wildlife species in a harmonious environment with recreational activities
- Ensure the availability of natural resources for future generations

Specific natural resources-oriented outdoor recreation goals for Lake Sidney Lanier include the following:

- Maintain both waterfowl and deer hunting opportunities
- Expand hunting opportunities to include other game species
- Expand hunting opportunities into more management compartments
- Reduce and maintain the deer population on the south end of Lake Lanier to State averages of 25-35 deer/mi<sup>2</sup>
- Enhance fishing opportunities
- Develop low impact, sustainable trails that support multiple uses while not negatively impacting the ecosystem or other NRM activities of the area.

### **(3) INVENTORY AND MONITORING**

The need for natural resources-oriented outdoor recreation programs should be evaluated on a regular basis. For instance, annual wildlife population inventories may reveal a need to allow or restrict public hunting due to high or low game populations. A lack of hiking opportunities may drive the need to create new interpretive trails. These programs should be evaluated at each NRM plan annual update with changes being made as project work plans and budget allow.

### **(4) MANAGEMENT STRATEGIES**

As stewards of the lands and waters at USACE water resources projects, the Natural Resources 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 and to provide a safe and healthful environment for project visitors.

Several management strategies (programs) exist at USACE projects to promote outdoor recreation and/or environmental education while controlling certain aspects to conserve the natural resources and promote safety. Examples of these programs include the following:

- Hunting program
  - Disabled hunter program
- Special events program
- Interpretive programs
- Constructing nature viewing area
- Special use ponds and fishing rodeos

Hunting is a popular and important outdoor recreation activity that requires careful management on Lake Lanier. Waterfowl hunting on Lake Lanier follows the State regulations with some minor adjustments to the dates to avoid conflict with park use and recreational boating. There is also a safety buffer that restricts waterfowl hunting within 600' of any dock, house, structure, bridge, road, boat ramp, marina, or open recreation area. For many years this safety buffer was set at 1,000' on Lake Lanier. However, with increased development around the lake, the 1,000' safety buffer nearly eliminated every wetland that was suitable for duck hunting. Through coordination with the GA DNR and a review of safety concerns, the safety buffer was reduced in the 2016-2017 hunting season to 600'. Since that time there have not been any hunting accidents reported to USACE that were related to this safety buffer decrease; nor has there been an increase in complaints from adjacent homeowners. While this action preserved waterfowl hunting opportunities on Lake Lanier, this program will continue to feel the pressure of increased development and recreational use of the lake. It is the desire of USACE to continue to allow waterfowl hunting opportunities, and USACE will work to balance this objective with the use and development of the area. Some specific management actions needed to improve the waterfowl hunting program on Lake Lanier include the following:

- Improved hunting maps that identify areas open for waterfowl hunting
- Improved delineation of the 600' safety buffer in popular hunting areas
- Habitat management actions discussed above in "Wildlife Management"

Deer hunting on USACE property around Lake Lanier is limited to two archery-only quota hunts, known as the Buford Dam Hunt and the Islands Hunt. The Islands Hunt started in 2007 in response to deer overpopulation in many areas. Fifteen islands, totaling 862 acres, were open for hunting for 14 days. The hunt was divided into two back-to-back, seven-day hunts with 60 hunters each. Management of the hunt has changed through the years to spread out the hunters, spread out the hunting pressure, and add additional areas. As of 2019, 18 islands and 3 undeveloped peninsulas, totaling 1,103 acres, were open for 12 days of

hunting. The hunt was divided into three, four-day hunts, spaced two weeks apart, with 38 hunters each.

The Buford Dam Hunt started in January 2010 (the 2009-2010 hunting season) in response to deer overpopulation around the Lake Lanier Project Management Office and other parks on the south end of Lake Lanier. Seven parks and the surrounding land along Buford Dam Road, totaling 611 acres, were open for a two-day hunt. The area was divided into 21 compartments with one hunter in each compartment. Management of this hunt has changed through the years, primarily to increase the harvest success. As of 2019, the original 611 acres has been redivided into 14 compartments, allowing two hunters in each compartment; two parks along Gaines Ferry Road totaling 144 acres have been added to the hunt; and one additional day has been added, making the Buford Dam Hunt a three-day hunt.

Deer hunting permits are currently issued by lottery drawing. This helps control the number of hunters in an area and give all interested members of the public an equal opportunity each year. The demand for public deer hunting land far outweighs the resources available at Lake Lanier. For this reason, it is recommended to continue controlling the number of hunters by a lottery drawing system.

Specific management strategies related to deer hunting that will help achieve the goals stated at the beginning of this section include the following:

- Expand deer hunting opportunities to more parks and management compartments
- Increase the number of days the compartments are open for hunting

Refer to Appendix G9 for a list of management compartments where deer hunting is, or could be, a part of the routine management.

Another opportunity for hunting on Lake Lanier is the Lula Bridge WMA, which is operated by the GA DNR. This 513.5-acre area along the banks of the Chattahoochee River is licensed to the GA DNR for fish and wildlife activities, and is open to the public for waterfowl and small game hunting. Lake Lanier staff are currently working on a Challenge Partnership Agreement with the GA DNR, GDOT, and Ducks Unlimited to improve wetlands and waterfowl habitat on 34 acres in this area. However, USACE is not usually involved with the day-to-day operations of this WMA.

The special events program is a tool through which USACE may exercise its stewardship responsibilities. Special events include, but are not limited to, water carnivals, boat regattas, and fishing tournaments and are managed in accordance with ER/EP 1130-2-550.

## **K. PRIVATE RECREATION FACILITIES**

### **(1) OVERVIEW**

This section applies to projects where private shoreline use is allowed through a Shoreline Management Plan or Policy (SMP). Private recreation facilities and activities are permitted on project lands and waters under the project's Shoreline Management Plan or Policy. A copy of the SMP is not provided within this document, but it is available as a separate document. Water-based facilities and activities impact aquatic ecosystems by altering habitat. Land-based facilities and activities have similar impacts to terrestrial ecosystems. Shoreline use permits create natural resources management challenges similar to those encountered in public recreation areas (for example, infrastructure and personal property). Some projects have historically avoided management within areas with private recreation facilities due to the challenges associated with avoiding damage to permitted facilities, potential conflicts with adjacent landowners, cleanup costs, or other reasons. These areas should not be exempt from NRM actions, though special care and planning are needed to minimize adverse impacts to other project purposes that are the main function of these areas.

At Lake Sidney Lanier, most private recreation facilities are located on lands that have a master plan classification of Vegetative Management. The rangers who work within the Shoreline Management section are responsible for most of the natural resources and recreation facility management that occur within these Vegetative Management areas. However, some natural resources goals and objectives that overlap with the shoreline management goals are listed below.

### **(2) GOALS AND OBJECTIVES**

- Integrate NRM activities with Shoreline Management programs with consideration of potential impacts on permitted land uses
- Maintain appropriate buffers adjacent to private property and permitted facilities
- Control invasive species
- Minimize erosion caused by permitted use of USACE property or bank erosion
- Maintain a healthy forest capable of supporting a diversity of native wildlife and the permitted public use of the shoreline.

### **(3) INVENTORY AND MONITORING**

Inventory and monitoring of permitted private recreation facilities and activities are discussed in the project's SMP. The same techniques and strategies used to inventory natural resources



in undeveloped areas should be used within areas on the project that contain private recreation facilities.

#### **(4) MANAGEMENT STRATEGIES**

- Before USACE performs NRM activities near adjacent subdivisions, evaluate the project's SMP to determine if any permitted facilities or activities are in the management unit in order to avoid damage or conflict where possible
- Monitor permitted facilities and activities in accordance with the project's SMP for natural resource protection
- Provide support to shoreline management rangers when needed for things such as invasive species identification and habitat restoration plans

#### **L. AGRICULTURAL LEASES**

##### **(1) OVERVIEW**

Livestock grazing, haying, crop production, and other agricultural activities are interim tools that may be used in the manipulation of vegetation to protect native grasslands or prairie and/or to improve soil conservation or fish and wildlife habitat (ER 1130-2-540, Chapter 2). Authority for administering agricultural leases lies with the USACE Real Estate Division with direction from the project regarding desirable locations and management objectives. There are no agricultural leases currently in effect at Lake Sidney Lanier. The following goals and management strategies are general information to consider if agricultural leases are considered.

##### **(2) GOALS AND OBJECTIVES**

Agricultural leases can be used to further project natural resource management goals and objectives. They can also do the following:

- Maintain grasslands that would otherwise require mowing with O&M contract
- Use leases for row crop production to supplement wildlife food sources

##### **(3) INVENTORY AND MONITORING**

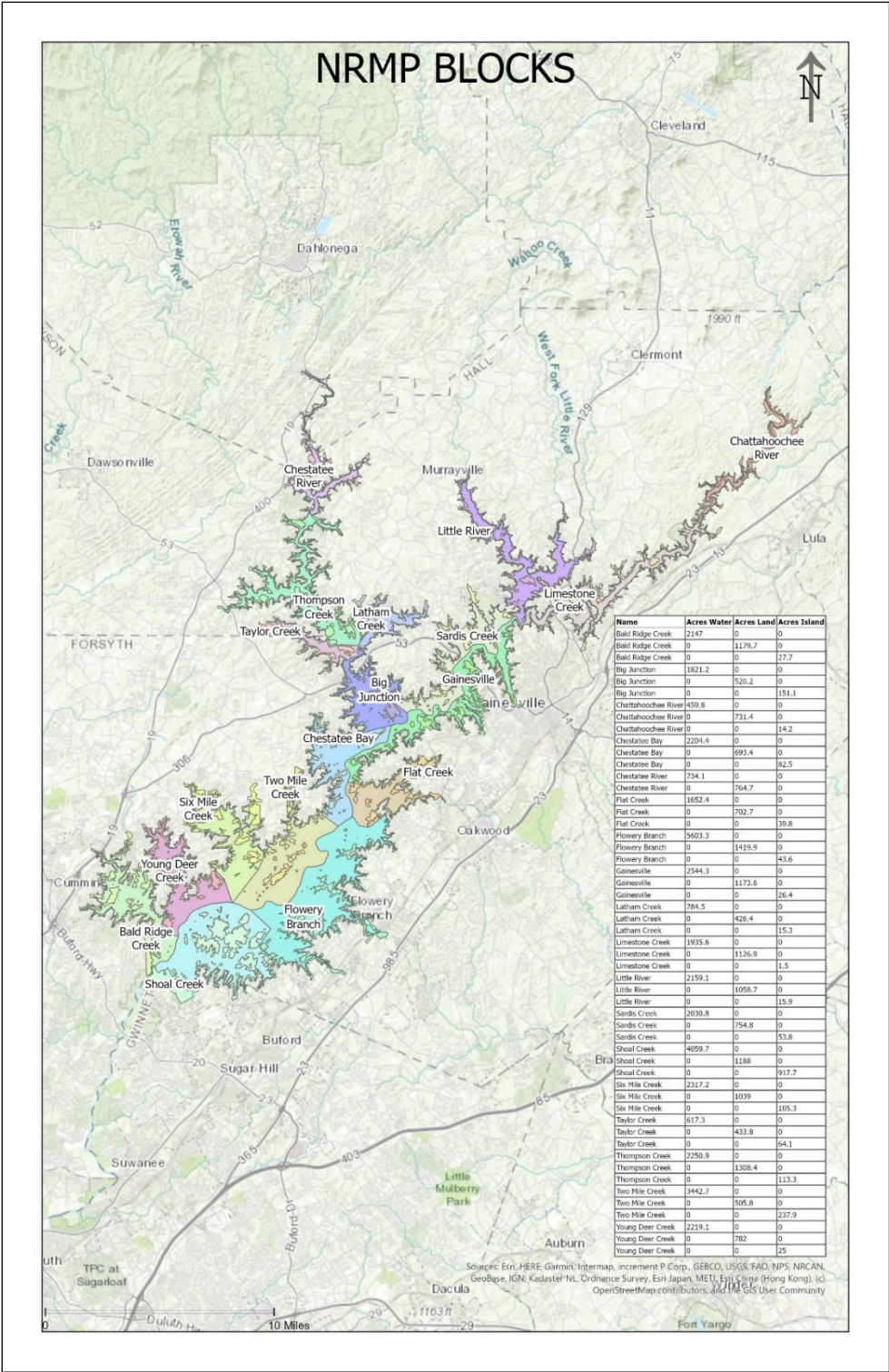
Monitoring agricultural lease areas is important to ensure project objectives are being met. Monitoring wildlife use in these areas may help the project adjust the lease requirement to better support wildlife needs. Monitoring water quality may be necessary if livestock are allowed to enter the project waters.

#### **(4) MANAGEMENT STRATEGIES**

Some examples of strategies implemented using agricultural leases include the following:

- Mow or hay to reduce the mowing burden on the project while adjusting mowing schedules to benefit ground-nesting species
- Leave portions of row crops standing as supplemental winter feeding for wildlife
- Maintain wildlife openings by permitting limited grazing on native grass fields

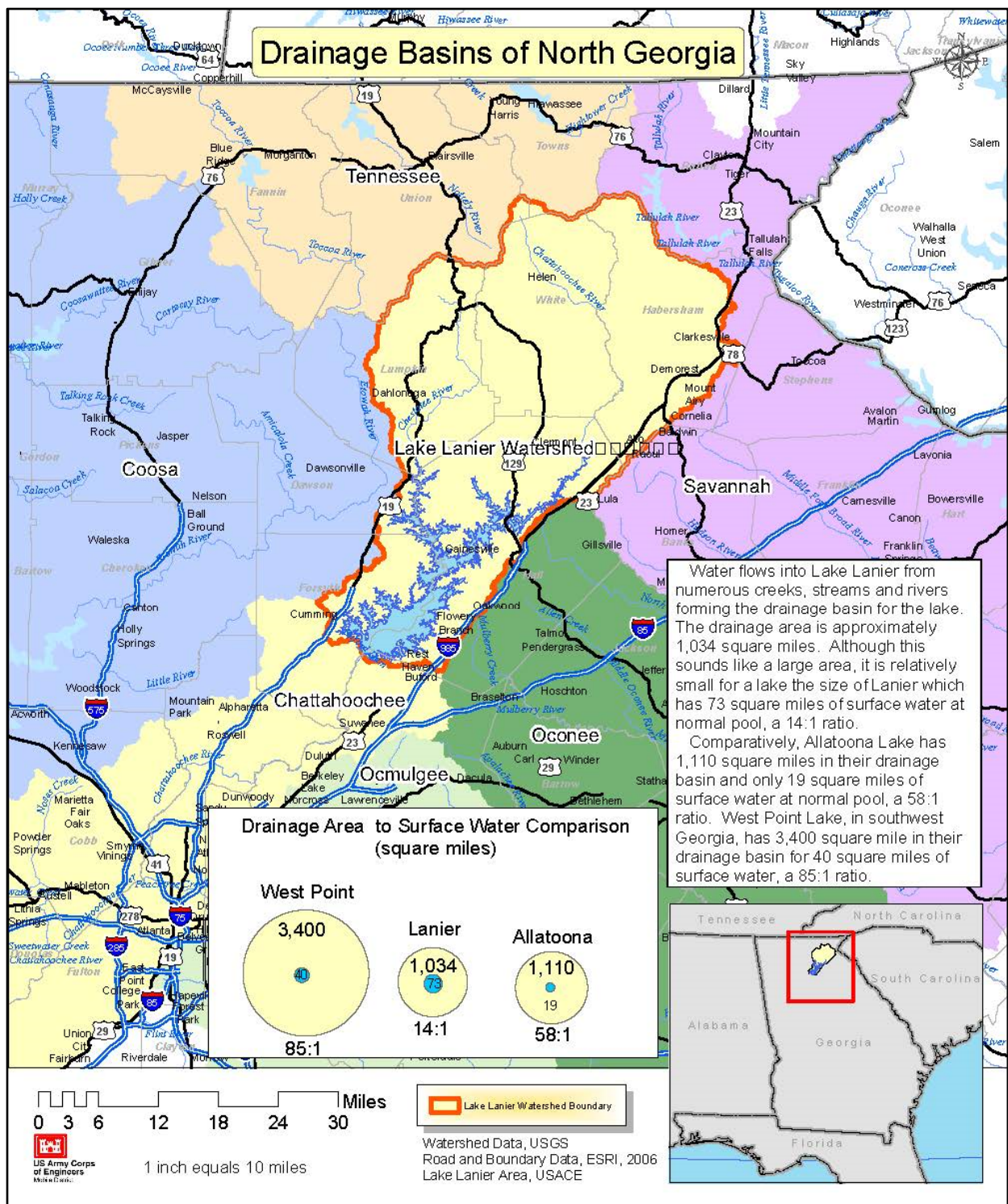
APPENDIX G1—PROJECT MAP WITH NRM BLOCKS





**LAKE SIDNEY LANIER AND BUFORD DAM PROJECT  
MASTER PLAN**

**APPENDIX G2—LAKE SIDNEY LANIER WATERSHED MAP**



**APPENDIX G3—THREATED AND ENDANGERED SPECIES EVALUATION FORM**

**Project TES Evaluation Form**

Name: \_\_\_\_\_ Date: \_\_\_\_\_ County: \_\_\_\_\_ State: \_\_\_\_\_ Avail No: \_\_\_\_\_

Block: \_\_\_\_\_ Compartment: \_\_\_\_\_

**Plants**

Species	Common Name	County	Status	Habitat	Known to Exist on Corps	Habitat Present	Species Present
<i>Amphianthus pusillus</i>	Pool Sprite or Little Amphianthus		FT, ST				
<i>Isoetes melanospora</i>	Black Spored Quillwort		FE				
<i>Platanthera integrilabia</i>	White Fringeless Orchis		FT				
<i>Symphyotrichum georgianum</i>	Georgia Aster		ST				
<i>Monotropsis odorata</i>	Sweet Pinesap		ST				
<i>Amorpha nitens</i>	Shining Indigo-bush		SHPS				
<i>Cypripedium acaule</i>	Pink Ladyslipper		SU				
<i>Cypripedium parviflorum</i>	Yellow Ladyslipper		SR				
<i>Nestronia umbellule</i>	Indian Olive		SR				
<i>Polygala senega</i>	Seneca Snakeroot		SSoC				
<i>Thermopsis fraxinifolia</i>	Ash-leaf Bush-pea		SHPS				
<i>Veratrum woodii</i>	Ozark Bunchflower		SR				
<i>Stachys latidens</i>	Broad-toothed Hedge-nettle		SSoC				
<i>Spiraea latifolia</i>	Broadleaf White Spirea		SHPS				

**Fish**

Species	Common Name	County	Status	Habitat	Known to Exist on Corps	Habitat Present	Species Present
<i>Moxostoma sp. 1</i>	Apalachicola Redhorse		SSoC				
<i>Cyprinella callitaenia</i>	Bluestripe Shiner		SR				
<i>Micropterus catarractae</i>	Shoal Bass		SHPS				
<i>Micropterus chattahoocheae</i>	Chattahoochee Bass		SHPS				

**LAKE SIDNEY LANIER AND BUFORD DAM PROJECT  
MASTER PLAN**

**Mammals**

Species	Common Name	County	Status	Habitat	Known to Exist on Corps	Habitat Present	Species Present
<i>Myotis grisescens</i>	Gray Myotis		FE, SE				
<i>Myotis septentrionalis</i>	Northern Long-eared Myotis		FT, ST				
<i>Myotis austroriparius</i>	Southeastern Myotis		SSoC				
<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-eared Bat		SR				
<i>Myotis leibii</i>	Eastern Small-footed Myotis		SSoC				
<i>Myotis lucifugus</i>	Little Brown Myotis		SSoC				
<i>Perimyotis subflavus</i>	Tri-colored Bat		SSoC				

**Birds**

Species	Common Name	County	Status	Habitat	Known to Exist on Corps	Habitat Present	Species Present
<i>Haliaeetus leucocephalus</i>	Bald Eagle		ST	quiet coastal areas, rivers or lakeshores with large, tall trees	Y		
<i>Tyto alba</i>	Barn Owl		SHPS				

**Reptiles**

Species	Common Name	County	Status	Habitat	Known to Exist on Corps	Habitat Present	Species Present
<i>Pituophis melanoleucus</i>	Northern Pine Snake		SHPS				

**Insects/Arthropods**

Species	Common Name	County	Status	Habitat	Known to Exist on Corps	Habitat Present	Species Present
<i>Cambarus howardi</i>	Chattahoochee Crayfish		ST				
<i>Erynnis martialis</i>	Mottled Duskywing		SHPS				

F--Federal S--State

E--Endangered T--Threatened R--Rare U--Unusual P--Protected

SoC--Species of Concern HPS--High Priority Species

**APPENDIX G4—SWIM BEACH WATER QUALITY INSPECTION FORM**

**LAKE SIDNEY LANIER**

Beach Inspection List

Ranger:

Collection Date:

Water Temp:

Air Temp:

Lake Level:

- |                                |      |
|--------------------------------|------|
| 1. Buford Dam Park             | BD   |
| 2. Lanier Park                 | LP   |
| 3. Burton Mill                 | BM   |
| 4. Van Pugh North E (Sand)     | VPE  |
| 5. Van Pugh North W (Concrete) | VPW  |
| 6. Old Federal C/G             | OFCG |
| 7. Old Federal D/U (South)     | OFDS |
| 8. Old Federal D/U (North)     | OFDN |
| 9. Duckett Mill C/G            | DM   |
| 10. Little Hall                | LH   |
| 11. Bolding Mill C/G           | BMCG |
| 12. Keith's Bridge D/U         | KB   |
| 13. Longhollow D/U             | LHD  |
| 14. Two Mile Creek             | TMP  |
| 15. Bald Ridge C/G             | BR   |
| 16. Sawnee C/G                 | SCG  |
| 17. West Bank S (Sand)         | WBS  |
| 18. West Bank N (Cement)       | WBN  |

COMMENTS:

RECEIVED BY:

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APPENDIX G5—TIMBER HARVEST PLAN

FY 2021								
Block	Compartment	Acreage	Planned Harvest Type	Time Frame	Pine Sawtimber (tons)	Pine Pulpwood (tons)	Hardwood Sawtimber (tons)	Hardwood Pulpwood (tons)
Bald Ridge Creek	WMA #1294	17.26	Clear-cut		157.304	921.222	231.008	820.845
Total Acreage:		17.26	Acres					



## APPENDIX G6—TIMBER HARVEST PROCEDURE ASSISTANCE

### PERSONNEL RESPONSIBILITIES AND ORDER OF OPERATION

- **Project Staff**

Develop the prescription and prepare the timber availability; routes availability through the Mobile District Office (MDO)

- **OP-TR—Operations Division, Technical Support Branch, Natural Resource Section**

Coordinates and tracks the review process for the Operations Division, Management Support Branch (OP-M)

- **OP-TR Operations—Operations Division, Technical Support Branch, Natural Resource Section**

Provides a baseline review of timber availability to ensure compliance with applicable laws and regulations; ensures that the package contains all of the information needed to process the contract

- **PD-EI—Planning and Environmental Division, Environment and Resources Branch, Inland Environment Team**

Coordinates status species issues with the USFWS and cultural resources issues with the State Historic Preservation Officer; provides an overall environmental review

- **OC—Office of Counsel**

Reviews the final documentation of harvest activities for consistency with applicable environmental laws and signs legal sufficiency documentation

- **RE-MT—Real Estate Division**

Files a Report of Availability; receives bids and awards the contract; coordinates the contract and other efforts with RE-PF, RE-PR, and RE-PS

- **RE-PF, RE-PR, RE-PS—Real Estate Division, Fort McClellan, Fort Rucker, and Stennis Space Center**

Prepares the Invitation for Bids and Government estimate appraisal, administers the contract, processes payments, conducts site inspections, provides general assistance

to project staff, and sends monthly harvest reports to the project via the Timber Harvest Information System (THIS)

**CURRENT CONTACTS IN EACH OFFICE**

- **OP-TR**

Shana O'Rear	Shana.D.O'Rear@usace.army.mil	(251) 694-3742
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- **OP-TR**

Rocky Millenbine	Rocky.G.Millenbine@usace.army.mil	(251) 694-3724
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- **PD-EI**

Michael Malsom	Michael.F.Malsom@usace.army.mil	(251) 690-2023
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- **OC**

Joe Givhan	Joseph.P.Givhan.Jr@usace.army.mil	(251) 690-3343
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- **RE**

Dexter Bland	Dexter.L.Bland@usace.army.mil	(256) 239-1713
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- **RE**

Ernie Marlar	Robert.E.Marlar@usace.army.mil	(334) 255-2407
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- **RE**

John Davidson	John.E.Davidson@usace.army.mil	(256) 231-5083
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## APPENDIX G7—TIMBER HARVEST AVAILABILITY

Fill in/edit the items in RED items.

CESAM-OP-PROJECT SYMBOL

Project Routing/Date

MEMORANDUM THRU

OP-TR (O'Rear)

OP-TR (Cobb)

PD-EI (Malsom)

FOR RE (Bland)

SUBJECT: Availability of Timber for Disposal (14-01) Number by FY and harvest number for that FY. i.e. This would be the first harvest of FY14.

1. We request that approximately X acres of pine timber be made available for sale. This sale will be a selective harvest over two stands. Selection will be made based on forest health and wildlife habitat improvement. Both harvest areas will be standard thinning operations.

2. Description of Sale Areas: Sale areas (see the attached map—Enclosure 1) consist of approximately X acres of pine-hardwood forest containing approximately X tons of pine sawtimber, X tons of pine chip-n-saw, and X tons of pine pulpwood. The area also contains approximately X tons of hardwood sawtimber and X tons of hardwood pulpwood. List other products if there are any.

3. Site Characteristics: Areas highlighted are mixed aged stands containing loblolly pines with a wide range of diameter classes and this pine timber has become overstocked. These trees require a selective thin to reduce competition and open the forest canopy.

4. Prescription: Remove approximately two thirds of the pine timber from each stand. Mature pines and diseased or damaged trees will be removed first, then younger trees until a target of 50-60 ft<sup>2</sup> average basal area is reached. Trees marked with blue paint will be cut.

5. Location of Sale Areas: Sale areas are located off Hwy X. Access is off Main St. Heavy roadwork may be required. The sale boundaries will be painted orange, flagged with pink ribbon, or established by roads and natural boundaries.

6. Circumstances Prompting Sale: Overstocked timber is highly susceptible to pests and diseases (i.e. Southern Pine Beetle). Closed canopy conditions have limited ground cover species. Without a change this forest will remain stagnant or decline in health and productivity. By opening the canopy, we will release understory species that have been suppressed by faster growing species.

7. Special Contract Provisions: Any standing dead timber will be left as cavity trees unless marked otherwise. A delimbing gate will be allowed, but must be set on trees to be harvested. Non-harvested trees damaged by delimbing gate use will be considered excessive damage. Due to their limited number in the harvest area, damage to unmarked oaks and fruit producing trees will be considered excessive damage. The contractor will implement Georgia's Best Management Practices for Forestry and meet all USACE requirements in all harvesting operations. The Project or Resident Forester must approve all roads, loading decks, and stream crossings in advance.

8. Required Completion Date: 1 August 2015.

9. Cultural and Environmental Consideration:

a. The files located at the X Operations Project Management Office were reviewed and no significant sites listed on the project Historic Properties Management Plan were found within the sale area(s).

b. There should be no stream crossings in this harvest area. All roads, loading decks, and major skid trails will be planted with a native wildlife beneficial groundcover (i.e. clover, millet, rye, etc.) upon harvest completion. Species will be approved by the Project or Resident Forester prior to planting.

c. This action will be a normal silvicultural practice, which will exceed GA Best Management Practices and will not require state water quality certification.

d. The sale areas are not on formally designated mitigation lands, but are located on a State of X managed WMA. X Department of Natural Resources has been notified and concurs with our recommendation.

e. This sale area has been surveyed by Project personnel for the following protected animal species and none were found: Southern Bald Eagle (*Haliaeetus leucococephalus*), Red-cockaded woodpecker (*Picoides borealis*), Cougar (*Felis concolorcoryi*), Gray Bat (*Myotis grisescens*), Indiana Bat (*Myotis sodalis*), Bachman's Warbler (*Vermivora bachmanii*).

f. Records from the Operations Project Management Office and the Georgia Natural Heritage Program were checked for plant species of concern in this area. Project personnel used the methods described in the *Protected Plants of Georgia* manual, published by the Georgia Department of Natural Resources, to survey for plant species of concern. This method consists of surveying for habitat of species of concern known to occur in the county as well as all neighboring counties. These habitat areas are then surveyed for the species. Attached is a checklist for potential habitat for species of concern in our area (Enclosure 2). No Federally listed or Georgia State species of concern were found.

10. Please contact **Name** at **555-555-5555** if you have questions or need additional information.

**X**  
**Operations Project Manager**

Enc (2)

CF Resident Forester, **List his/her office or name**  
CF District Forester, Mobile District Office

APPENDIX G8—PRESCRIBED BURN PLAN

FY2021 PRESCRIBED BURN PLAN

BLOCK	COMPARTMENT	PRIORITY	OBJECTIVE	ACRES	SCHEDULE	COMPLETED
Shoal Creek	WMA #1	1	Fuel Reduction and Wildlife Habitat	36	Jan-Feb	
		1				
		1				
		1				
		1				
		1				
		1				
		2				
		2				
		2				
		3				
		3				
		3				
TOTAL AREA TO BURN FY 11				36		

\*INDICATES ISLANDS - Can burn most in one day with 2 people and no need for a plow, reducing cost.

PRIORITY 1 - Conditions dictate area needs to be burned this year.

PRIORITY 2 - Conditions dictate area needs to be burned this year, but would not be adversely affected if we are unable to burn until next year.

PRIORITY 3 - Conditions dictate area would benefit from fire if the schedule allows it.

## APPENDIX G9—CURRENT AND POTENTIAL NRM ACTIVITIES BY MANAGEMENT COMPARTMENT

### BALD RIDGE CREEK BLOCK

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Lower Pool West			X			X					X			
WMA #1294	X	X	X		X	X					X			
West Bank			X			X								X
Sawnee Campground	X	X	X	X		X					X	X		X
Little Ridge	X	X	X											
Little Ridge Island		X	X								X			
Mud Ridge			X											X
WMA #1503			X					X						
Bald Ridge Campground	X	X	X	X		X						X		X
Camp Kerusso	X	X												

### YOUNG DEER CREEK BLOCK

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Rocky Point	X	X	X		X			X			X	X	X	
WMA #1347		X	X								X	X		
Shady Grove Campground				X										

**LAKE SIDNEY LANIER AND BUFORD DAM PROJECT  
MASTER PLAN**

**SIX MILE CREEK BLOCK**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Shadburn Ferry			X											
Johnstown Park			X									X		
Charleston														X
Six Mile Creek WMA	X	X	X		X						X	X		X
Little Mill WMA			X									X		
Four Mile Creek WMA		X	X					X			X	X	X	
WMA #1889			X					X		X				
Silver Shoals	X	X	X		X	X		X		X	X	X	X	
Four Mile Island		X	X								X	X	X	

**TWO MILE CREEK BLOCK**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Two Mile Creek Park		X	X		X	X								X
Three Sisters Island		X	X								X	X	X	
Lights Ferry Island		X	X								X	X	X	
WMA #1315		X	X								X	X	X	
Bethel		X	X									X		
Hawthorn			X								X	X		
Buckeye			X								X			
Jot-em Down	X		X					X			X	X	X	X
Jot-em Down North	X		X					X		X	X	X	X	X
WMA #1199			X					X						X



## CHESTATEE BAY BLOCK

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Williams Ferry			X								X	X		X
Brown's Bridge West			X									X		
Pleasant Grove			X								X	X		
Bay Point		X	X											
Long Hollow	X		X		X							X		
Chestatee Bay Point	X	X	X		X						X	X	X	
WMA #1360			X									X		
Keith's Bridge Park		X	X		X							X		X
Keith's Bridge Island		X	X								X	X	X	

## BIG JUNCTION BLOCK

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Mayfield	X	X	X		X						X	X		
Bolding Bridge			X		X		X							
Craggy Point			X											
Little Hall		X	X			X								X
Duckett Mill Campground	X	X	X	X	X	X	X				X	X		X
Big Junction Island		X	X								X	X	X	

**LAKE SIDNEY LANIER AND BUFORD DAM PROJECT  
MASTER PLAN**

**TAYLOR CREEK BLOCK**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Pea Ridge	X	X	X		X			X		X	X	X	X	
Taylor Creek Island		X	X								X	X	X	

**LATHAM CREEK BLOCK**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Latham Creek	X	X	X		X	X					X	X	X	
WMA #960			X					X		X				
Latham Island		X	X								X	X	X	
WMA #520			X					X		X				
WMA #1050			X					X		X				

**THOMPSON CREEK BLOCK**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
War Hill														X
Liberty Point			X								X	X		
WMA #195			X					X		X		X		
Thompson Creek			X		X	X								X
Plateau Ridge			X									X		
WMA #568			X					X	X	X				
Nix Bridge Park			X		X	X								
Nix Island		X	X								X	X	X	

**LAKE SIDNEY LANIER AND BUFORD DAM PROJECT  
MASTER PLAN**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Toto Creek Campground	X	X	X	X	X			X			X			X
Cool Springs			X								X	X		X
WMA #1540			X									X		X
Bolding Mill Campground	X	X	X	X	X	X					X	X		X

**CHESTATEE RIVER BLOCK**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
WMA #650	X	X	X		X			X		X	X	X	X	
Lumpkin County Park								X				X		
WMA #703			X					X	X	X		X		X
WMA #736			X					X		X		X		X

**SARDIS CREEK BLOCK**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Davis Bridge	X		X		X									X
Robinson	X	X	X								X	X		X
Rustic Ridge			X									X		
WMA #583		X	X								X	X	X	
Simpson	X	X	X		X									
Sardis Creek Park			X		X	X	X							X
WMA #790		X	X								X	X		
Thompson Bridge Roadside	X		X								X	X		

**LAKE SIDNEY LANIER AND BUFORD DAM PROJECT  
MASTER PLAN**

**LITTLE RIVER BLOCK**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Thompson Bridge	X		X			X								X
WMA #638			X					X	X	X		X		
WMA #675			X					X		X		X		X
WMA #865			X											X
Wahoo Island		X	X								X	X	X	
WMA #939			X					X						
Bell's Mill			X											X
WMA #599			X		X			X	X	X	X	X		X
Little River	X		X			X								X

**LIMESTONE CREEK BLOCK**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Longstreet Bridge Roadside			X											
WMA #1011			X					X				X		X
WMA #1603			X					X		X				X
Longstreet Bridge Access			X											

**CHATAHOOCHEE RIVER BLOCK**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Lula Bridge WMA		X	X					X	X	X		X	X	
Belton Bridge		X	X		X					X		X		

**LAKE SIDNEY LANIER AND BUFORD DAM PROJECT  
MASTER PLAN**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Mud Creek			X					X		X		X		X

**GAINESVILLE BLOCK**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Hogback Ridge			X								X	X		X
Lanier Point														X
Gainesville Park			X								X	X	X	
Bluff			X								X	X		
River Forks											X			X
Little Junction Island		X	X								X	X	X	
River Bend		X	X								X	X		
Brown's Bridge Roadside			X				X							

**FLAT CREEK BLOCK**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Mountain View	X		X		X						X	X		
Brown's Bridge Island		X	X								X	X	X	
Pleasant Hill			X								X	X		
WMA #306			X											
Hickory Hill			X								X	X		
Balus Creek	X		X											X
Saddle Ridge			X								X	X		
WMA #1586			X											

**LAKE SIDNEY LANIER AND BUFORD DAM PROJECT  
MASTER PLAN**

**FLOWERY BRANCH BLOCK**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Waterfowl Impoundments	Waterfowl Habitat	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Old Federal Day Use		X	X			X								X
Old Federal Campground	X	X	X	X	X	X						X		X
WMA #1479			X					X		X				
Azalea	X		X											
Chestnut Ridge				X							X			
Van Pugh North		X	X			X								X
Gaines Ferry Islands		X	X								X	X		
Van Pugh South	X	X	X		X	X					X	X		X
Sandy Point		X	X									X		
Burton Mill	X	X	X			X					X			X
WMA #37			X					X		X				X

**SHOAL CREEK BLOCK**

Management Compartment	Timber Management	Prescribed Fire	Invasive Species Control	Gypsy Moth Traps	Wildlife / Pollinator Plots	Bluebird Boxes	Osprey Platforms	Duck Boxes	Catfish Pond	Native Plant Trail	Deer Hunting	Waterfowl Hunting	Small Game Hunting	Fish Attractors
Shoal Creek Campground				X										X
County Line			X									X		
Gwinnett County Park	X	X	X		X						X	X		X
WMA #1287	X	X	X		X	X					X			
Lanier Park	X	X	X			X					X	X		X
East Bank	X		X		X						X			
Buford Dam Park	X	X	X			X					X			X
WMA #1	X	X	X		X			X	X		X			
USACE LPMO			X	X	X	X	X			X				
USACE Vehicle Yard			X	X	X	X								
Upper Overlook			X								X			
Lower Pool East			X			X					X			

## **APPENDIX H—BUFORD DAM ROAD PLANNING CHARRETTE**



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## Buford Dam Road – Planning Charrette

Buford Dam, Lake Lanier

CESAM  
4/15/2020

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## **Buford Dam Road – Planning Charrette**

Buford Dam, Lake Lanier

### **1 Project Description**

Buford Dam is a high hazard dam on the Chattahoochee River in Gwinnett and Forsyth Counties, Georgia, about 50 miles northeast of Atlanta, Georgia, and 4.5 miles northwest of the town of Buford, Georgia. Buford Dam was completed in June 1957 and consist of three earth saddle dikes, switch yard, powerhouse, and an earthen dam.

Buford Dam Road is a paved 2-lane, minor arterial/urban collector street that connects Gwinnett and Forsyth Counties. The existing alignment runs through federal property atop of Saddle Dikes number 1 & 2 and across Buford Dam. The roadway is prohibited from use by large truck vehicles and is maintained by the United States Army Corps of Engineers (USACE). The annual Operation and maintenance cost to maintain Buford Dam Road is approximately \$30,000 a year.



*Figure 1: Buford Dam*

Prior to construction of Buford Dam, the Georgia State Highway Department and the two adjacent counties contemplated the need for a shorter route between the communities of Buford in Gwinnett County and Cummings in Forsyth County. To account for this, USACE designed the saddle dikes and main dam to accommodate a roadway on its crest. The detailed discussions between USACE, State Highway Department, and the two adjacent counties is documented in Definite Project Report (DPR) Appendix IV (not Included in this report).



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switchyard. However, other key assets such as the embankment dam and the saddle dikes have no defensive layers to protect them against adversaries. For the executive summary from the CRM-D Risk Assessment dated 27 Sept. 2013 see Appendix A.

In June 2017, a feasibility study of potential improvements to Buford Dam Road was performed by the Federal Highway Administration's Eastern Federal Lands Highway Division. The study resulted in the definition of five reasonable alternatives for possible future implementation. Alternatives 1 and 2 examined improvement options along the existing roadway alignment, while Alternatives 3, 4, and 5 considered a variation of mainline roadway realignments on either side of the main embankment dam. After reviewing the proposed alternative actions, the United States Army Corps of Engineers (USACE) decided to proceed with Alternative 3. Please see Appendix C for the complete feasibility study report. The alignment that is being presented in this report has been modified from the ALT3 alignment after the March 2020 site visit.

## **2 Project Objective**

The ultimate objective of this project is to relocate Buford Dam Road off of the saddle dikes and main dam in order to improve the safety of the travelling public, improve the security of Saddle Dike 1, Saddle Dike 2, Buford Dam, and decrease maintenance costs on Buford Dam Road.

## **3 Existing Buford Dam Road**

Buford Dam Road serves as a paved 2-lane, minor arterial/urban collector street that connects Gwinnett and Forsyth Counties. The existing road does not provide adequate shoulders, guard rails, security, or a suitable foundation to support the current traffic volumes. Due to the increased volume of local traffic over time, the number of accidents have increased and population projections for the area indicate a significant increase in the next 30 years. Based on Atlanta Regional Commission (ARC), Metro Atlanta will add 2.9 million people by the year 2050. For additional information refer to Appendix B for ARC data sheet that provides the population and employment forecasts for each county in the Atlanta metropolitan area between 2015 and 2050.

## **4 Executive Summary**

The new Buford Dam Road will begin at the intersection of Sweetwater Drive and Buford Dam Road and transitions to a roundabout at the intersection of Buford Dam Road and the Sawnee Campground entrance. The new road will include three roundabouts at major road junctions. The roundabouts will be designed to accommodate a MH-B type vehicle (Motorhome with Boat Trailer Combination) with a length of approximately 55 ft. The realignment is west of the current roadway alignment and has a design speed of 40 mph and will tie back to the existing alignment at the intersection of Buford Dam Road and Little Mill Road.

This new, properly constructed road will reduce sharp curvature of the roadway, improve road width, provide a suitable roadway structure to support current and future traffic volumes, and extend existing shoulders to reduce the opportunities/chances for vehicle collisions making the road safer for public travel. Installing roundabouts at either end of Buford Dam Road near the Government property line will enable an easier, safer, and more effective means of closing Buford Dam Road due to security threats.

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## **5 Mobile District Points of Contact**

The Mobile District Project Manager (PM) for this work is Tim Rainey, Phone: (770) 945-9531, E-mail: Timothy.A.Rainey2@usace.army.mil

The Mobile District technical point of contact, Technical Lead (TM) for this work is Matthew Scott Ellzey, Phone: (251) 694-3604, Email: Matthew.S.Ellzey@usace.army.mil

## **6 Site Civil Design Guidance**

### **6.1 Existing Site Conditions**

The realignment of Buford Dam road is located just south of the existing Saddle Dike toe of slope, in Buford Dam Park. The realignment of Buford Dam road begins at the intersection of Sweetwater Drive and Buford Dam Road, Gwinnett Co. Georgia, and terminates near the intersection of Buford Dam Road and Buford Dam Park Road, Forsythe Co. Georgia.

The roadway is situated through Buford Dam Federal Park, which primarily consists of natural forested area. The park is covered with pines and hardwood species dominating the existing landscape outside the toe of slope of the dam. The area located within the saddle dike is cleared and vegetated with native species of grass. Elevations range from 1031 (Sta. 346+17) and 1145 (Sta. 399+64) through the length of the project. Existing Buford dam road consists of rolling grades (grades exceeding 5%), with the flattest grades found across the main dam. The proposed relocation of Buford dam road will need to mimic existing terrain and should be expected to maintain the classification of rolling grades.

The roadway realignment does not impact any known wetlands and based on the site visit conducted in March 2020 there will be approximately 5 stream crossings that will be impacted with the new realignment (See Figure 6). The streams are created by seepage from Saddle Dikes 1 & 2 and did not appear to be created through an aquifer or by a natural spring. The seepage is most likely due to a combination of the high water event and high rainfall (close to 12 inches over the month prior to the site visit). All drainage from Buford Dam Park eventually terminates in the nearby Chattahoochee River through Hawk Creek. A typical intermediate stream caused from seepage and rain runoff can be seen in Figure 2 and typical hardwood stand in the area can be seen in Figure 3



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*Figure 2 Typical intermediate stream*



*Figure 3 Typical hardwood stand*

It is expected that the new roadway realignment will have minimal impact on existing infrastructure. One known impact will be a portion of the USACE storage and equipment yard that is located at the north end of the dam. The impact will affect the existing parking lot that serves as maintenance vehicular parking. The existing section of Buford Dam Road across the top of the main embankment dam will remain in place and will be widened to either side of the road to minimize impact of the existing infrastructure and utilities that includes, power, water, communications, and sewer.

### **6.2 Road Development**

The realignment and development of Buford Dam road is best summarized in the feasibility study as described and completed by Federal Highways Administration (FHWA), June 2017 (See Appendix C). This study was initiated by the increase in traffic from Georgia Route 20 as the main local by-pass road to a congested highway. Buford Dam road currently is serving Gwinnett and Forsyth County as a minor/arterial collector road and serves as the main road to access camp grounds and parks within Buford Dam Park property limits. The substantial increase in vehicular traffic over the current saddle dike road has created additional maintenance each year that is becoming unsustainable. Along with increased maintenance costs, traffic accidents have increased due to the curvilinear nature of the saddle dike road.

The realignment has been planned to alleviate these issues and provide the public with an adequate roadway that is designed to meet current industry standards and to better accommodate the increased traffic load. To meet this objective the roadway is proposed to run parallel to the current saddle dike road at a minimum of 100 feet south off of the toe of the current saddle dike. The location serves to keep any additional loading off of the saddle dike dam slope. The realignment will begin at Sawnee campground park entrance with a 120 ft. inscribed single lane roundabout that will serve as the tie point to existing infrastructure and direct traffic to the re-aligned road. The road then will follow current topography and will include two more roundabouts to serve as continual access points to West Bank Parking and finally Buford Dam Park road which will serve as the terminus point at the USACE boundary and Gwinnett County line. The Forsyth County roadway realignment is primarily over virgin ground until the road is realigned with the current Buford Dam alignment beginning at the north end of the Buford Dam. The road

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has been sited to minimize utility and existing infrastructure impacts. The primary roadway will be widened to 2 – 12ft. lanes and 4ft. bike lanes in either direction. Where bike lanes are not provided, bikers and pedestrians will be able to use the existing Buford dam road as a travel path. Each of the three proposed roundabouts will include a single 20-ft wide, one-way travel lane with a 10-ft concrete truck apron for camper and boat trailer overruns. The roadway is expected to remain closed to truck traffic. The widening of the road is in conjunction with both neighboring counties and their current infrastructure needs. The current saddle dike road will be left in place to serve as maintenance access to the saddle dike and pedestrian shared path use.

The realignment advantages include improved roadway alignment, widening to an existing road to improve safety and driver confidence, and proper road way structure. Additional benefits also include reduced yearly maintenance cost to the Saddle Dike Road, removal of the public off of Saddle Dike Road (which is not structurally capable of handling current traffic loads) between the intersections of Little Mill Road and Buford Dam Road, and providing low maintenance traffic calming features in the form of roundabouts. Realigning the road also separates pedestrian/bike traffic from vehicular traffic for safety and to increase/encourage recreation through the Buford Dam area.

## **6.3 Pavement**

Currently Buford dam road is a 22 ft. wide 2 lane roadway for inbound and outbound traffic. The proposed improvements will widen the road from 11-ft. to 12-ft. lanes and will include 4 ft. bicycle lanes and 2 ft. wide shoulders. The road will be comprised of an asphalt wearing surface, asphalt base course, a crushed aggregate base course and pavement drainage features. The 20 ft. asphalt roundabout lane will be comprised of the same buildup as Buford Dam Road. The 10 foot truck apron will be comprised of reinforced concrete for apron overruns. Safety features for the roadway will include guardrail and side slopes for traverse ability and recovery of wayward traffic.

To develop the pavement structure, a traffic study will be required to evaluate and predict current and future growth. Currently neither County has plans to perform the traffic study. It is possible that the user can pursue Georgia Department of Transportation (GDOT) or FHWA to perform the required traffic study to develop the required pavement structure. The structure will need to be designed to meet GDOT, County and USACE standard. If there is a conflict in criteria the most stringent will control the design.

## **6.4 Storm Drainage/Wetlands**

Storm Drainage will be required to meet UFC 3-201-010 Civil Engineering and Georgia DOT drainage design manual requirements for the development of adequate storm drainage design. Storm drainage features for the project will include but may not be limited to roadside ditches, roadway pipe culverts, and bottomless culverts for stream/tributary crossings. Storm drainage shall meet the max design storm as required in the design document guidelines. All roadway piping should be a minimum class III RCP pipe.

There are no impacts anticipated to wetlands within the boundaries of this project.

## **6.5 Permitting**

The following permits that will be required for this project:

- a) NPDES Stormwater Permit: GAR100002 Infrastructure Construction General Permit
- b) Nationwide Permit
- c) GA Notice of Intent (NOI) and GA Notice of Termination (NOT)

## **6.6 Civil Design Guidelines**

The design criteria for the realignment of Buford Dam road is as follows:

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- a) Road Classification: Minor Arterial, Design Speed 40 MPH, Super Elevation 8% Max
- b) Design Vehicle: AASHTO Designated MH-B
- c) Buford Road Realignment Typical Road Section: 2-12 ft. Travel Lanes, 2x2' shoulder, 10ft. Multiuse Path, MSE Retaining Walls and Guard Rail (as required)
- d) Roundabout Typical: 120ft. diameter inscribed circle, single 20 ft. travel lane, 10 foot truck apron and curbed landscaped median
- e) NCHRP 672 Roundabout Design
- f) GDOT Drainage Manual
- g) GDOT Design Planning Manual
- h) GSWCC Manual for Erosion and Sediment Control
- i) AASHTO Greenbook (A Policy on Geometric Design of Highways and Streets)
- j) Roadside Design Guide
- k) MUTCD (Manual on Uniform Traffic Control Devices)
- l) UFC 3-201-01 Civil Engineering
- m) UFC 3-250-01 Pavement Design For Roads and Parking Areas
- n) UFC 3-250-03 Standard Practice Manual for Flexible Pavements
- o) UFC 3-250-04 Standard Practice for Concrete Pavements
- p) UFC 3-250-08 Standard Practice for Sealing Joints and Cracks in Rigid and Flexible Pavements

## **7 Electrical**

### **7.1 Description**

Lighting will be provided at Sawnee roundabout, West Bank roundabout and Power House Road roundabout by the use of pole mounted light fixtures. Power will be provided at each roundabout from existing power sources, See Appendix F site drawings for location of roundabouts. The new roadway is not required to be lighted along the roadway and the existing roadway lighting will remain as is. Electrical underground power will not be provided along the new roadway and there is no underground communication requirements for this project.

For preliminary cost assume the following:

#### **Sawnee Roundabout:**

- a) Provide 250 ft. of underground primary from overhead primary line (adjacent to roundabout location) to a new pad mounted 45 KVA transformer.
- b) Provide all secondary connections needed to power all round-a-bout lights.
- c) See NCHRP roundabout lighting design guide for illumination levels required at the roundabout. (For cost purposes assume 4 cobra head lights and 12 ornamental type)

#### **West Bank Roundabout:**

- a) Provide 200ft. of underground primary from existing underground junction cabinet (adjacent to roundabout location) to a new pad mounted 45 KVA transformer.
- b) Provide all secondary connections needed to power all roundabout lights.
- c) See NCHRP roundabout lighting design guide for illumination levels required at the roundabout. (For cost purposes assume 4 cobra head lights and 12 ornamental type)

#### **Power House Road Roundabout:**

- a) Provide 200ft. of underground primary from existing underground junction cabinet (adjacent to roundabout location) to a new pad mounted 45 KVA transformer.



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- b) Provide all secondary connections needed to power all roundabout lights.
- c) See NCHRP roundabout lighting design guide for illumination levels required at the roundabout. (For cost purposes assume 4 cobra head lights and 12 ornamental type)

### **7.2 Electrical Design Guidelines**

The Electrical design criteria for the realignment of Buford Dam road is as follows:

- a) NFPA 70 National Electrical Code
- b) IEEE C2 National Electrical Safety Code
- c) NCHRP 672 Roundabout Design
- d) UFC 3-550-01 Exterior Electrical Power Distribution
- e) UFC 3-530-01 Interior and Exterior Lighting Systems and Controls
- f) GDOT

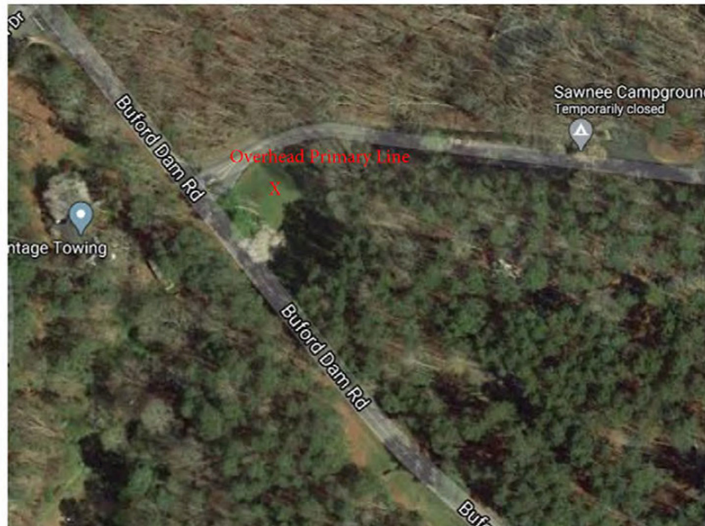


Figure 4: Sawnee Roundabout existing power location



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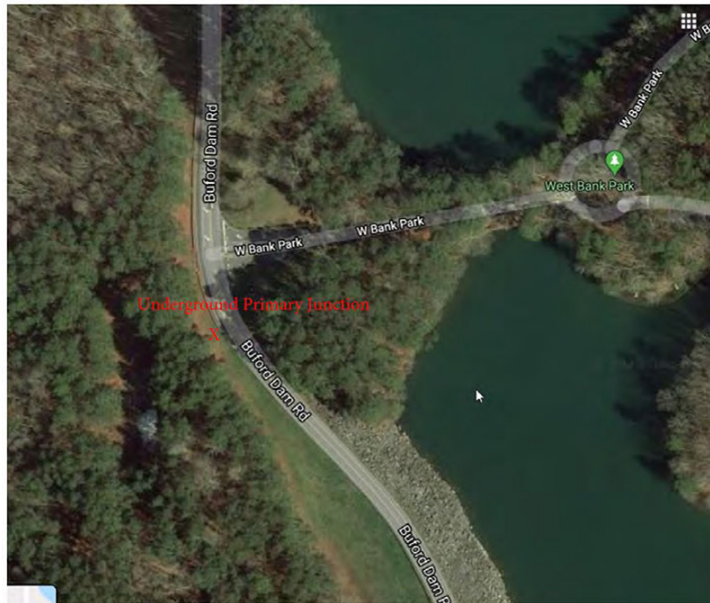


Figure 5 West Bank Roundabout existing power location

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*Figure 6 Power House Road existing power location*

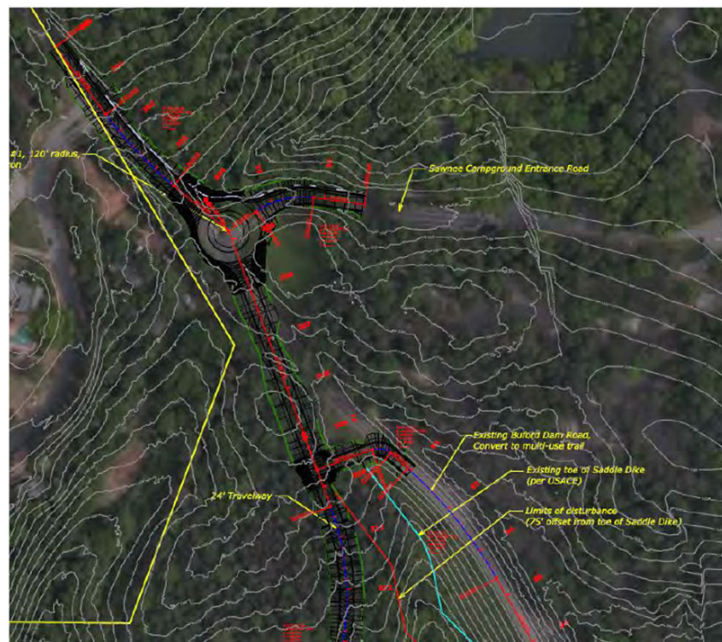
## **8 Geotechnical**

### **8.1 Description**

The new alignment section of Buford Dam Road is approximately two miles in length and is proposed to be located to the west of the existing Buford Dam Road. The new road will maintain a minimum 100 feet clearance from the toe of Saddle Dikes number 1 & 2 in order to provide adequate space to inspect the toe for seepage and to ensure the new alignment does not affect the existing dam structures. An exception to the 100 ft. standoff distance will occur at the start of the new alignment. This is required in order to transition between the existing Buford Dam Road and the new alignment, see Figure 4. A Site visit was performed on 5 March 2020 to confirm the reasonableness of the proposed realignment of this section of the existing roadway. For complete Geotechnical findings please refer to Appendix D, Buford Dam Road Trip Report.

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*Figure 7 Transition between the existing Buford Dam Road and the new Buford Dam Road alignment*

## **8.2 Design References**

The design criteria for the realignment of Buford Dam road is as follows:

- a) UFC 3-220-01 1 Nov 2012, Geotechnical Engineering

## **8.3 Geotechnical Design Concept**

The principal activities associated with the geotechnical design elements of the project would be as follows:

- a) Review existing soils data, planned cut and fill sections, and existing topography.
- b) Collect boring samples, potential borrow samples, and data as necessary.
- c) Submit boring and borrow samples for soils analyses as necessary and conduct required geotechnical analyses to provide recommendations for design.
- d) Provide geotechnical design elements as necessary for aiding the preparation of bids for further design and construction of the project.

Since the current alignment of Buford Dam Road routes traffic over the crest of the main dam, which coincides with the existing roadway alignment, no marine borings are anticipated to be required at this time."

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For preliminary cost assume geotechnical borings on 500 ft. intervals along the center of the new road alignment. Conduct 12 additional borings in seepage and spring areas and drainage channels to characterize the potential seepage and springs for adversely affecting embankments and foundations supporting pavement structures.

## **9 Environmental**

### **9.1 Description**

The proposed Road will be constructed in a currently wooded area. Several intermittent and ephemeral streams run through the project area. These streams drain into Hawk Creek which in turn drains into the Chattahoochee River approximately three-quarters of a mile downstream of the dam. USACE is planning a timber sale involving both the proposed road alignment and a 50 foot buffer at the toe of the saddle dikes.

The proposed road will be built entirely on USACE property and as such will not require either purchase or outgrants of property. The proposed project will occur entirely within the state of Georgia. The current applicable environmental laws for this project are found in Table 1. Additional law may become applicable as the project moves forward.

*Table 1: Applicable environmental laws.*

<b>Law</b>	<b>Applicability</b>
<b>42 U.S.C. §4321-4347</b>	National Environmental Policy Act
<b>54 U.S.C. §300101 et seq.</b>	National Historic Preservation Act (NHPA)
<b>16 U.S.C. § 703–712</b>	The Migratory Bird Treaty Act of 1918
<b>33 U.S.C. § 1251–1387</b>	Clean Water Act
<b>42 U.S.C. § 7401</b>	Clean Air Act
<b>16 U.S.C. § 1531 et seq</b>	Endangered Species Act (ESA)
<b>The Georgia Erosion and Sedimentation Act (12-7-1)</b>	Requires a 25-foot vegetated buffer along all state waters and a 50-foot vegetated buffer on state-designated trout streams
<b>Georgia Water Quality Control Rules (391-3-6-.03)</b>	Establishes the Chattahoochee River as a Secondary Trout Stream until the I-285 West Bridge



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### 9.2 Environmental Requirements

Environmental requirements for this proposed action include but are not limited to:

- National Environmental Policy Act (NEPA) documentation such as an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI)
- Coordination with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act (ESA)
- Stream buffer variance under the Georgia Erosion and Sedimentation Act (12-7-1)
- Water quality certification from the State of Georgia under Section 401 of the Clean Water Act
- Coordination with the State Historic Preservation Office (SHPO) and the applicable federally recognized Native American Tribes under Section 106 of the National Historic Preservation Act (NHPA)

Note: A Phase I cultural resource survey has been completed for the proposed road alignment and timber sale area (SEARCH 2019). A total of 81 shovel tests were plotted and all the excavated test pits were negative for cultural material (Figure 8).

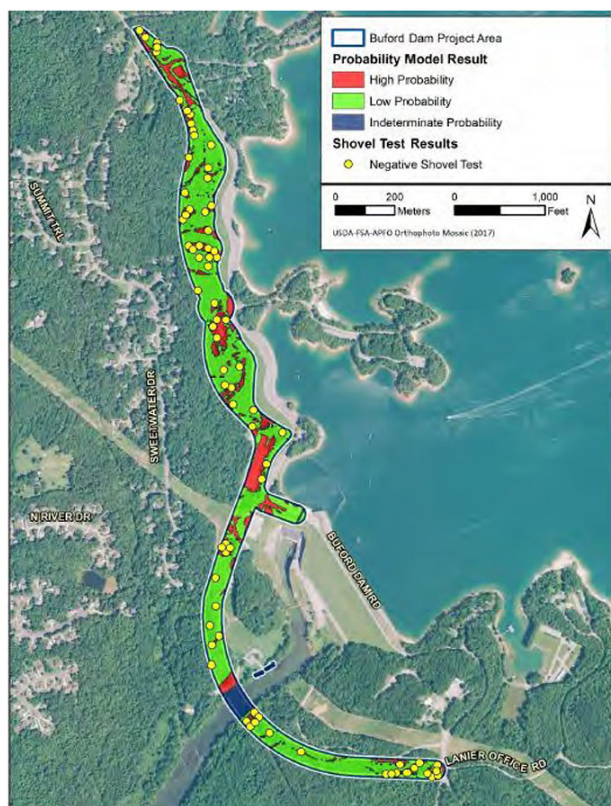


Figure 8 Results of shovel test excavation within the project area. (SEARCH 2019)

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During the design and implementation of this project, care should be taken to minimize impacts to the waters in the area. This including minimizing crossings of perennial, intermittent, and ephemeral streams. When appropriate, use open bottom and double culverts at stream crossings (See Figure 2).



Figure 9 Proposed road alignment and stream crossings

## 10 Cost Estimate

### 10.1 Description

The total project cost for Buford Dam Road is \$8.6 million. For a full price breakdown see Appendix E. The following assumptions were made to determine the cost:

#### 10.1.1 Material Costs

The cost estimate was developed using the Parametric Cost Estimating Software (PACES) per Corps of Engineer Cost Estimating Guidelines. Materials were priced out using the latest PACES Version 1.3

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material libraries. Material prices have been adjusted within the software to account for local material rates in the Atlanta, GA region.

#### **10.1.2 Labor Costs**

Project labor costs were developed using the imbedded labor libraries from PACES Version 1.3. The national average labor costs were then adjusted within PACES to account for labor rates local to Atlanta, GA.

#### **10.1.3 Labor Productivity**

The total construction labor effort has been assumed to last 18 months total. The estimate assumes a standard 40 hour work week with no extended overtime or shift differential.

#### **10.1.4 Equipment Costs**

Equipment costs were incorporated directly from the PACES Version 1.3 software. Price adjustments have been made within PACES to account for localized equipment rates for Atlanta, GA.

#### **10.1.5 Other Indirect Costs**

This cost estimate assumes an open bid large business pool. It is assumed that we will have a minimum of five qualified large business contractors to bid this project. Should competition be limited when this project is ready for bid it is likely that prices will increase. Prime contractor markups include overhead costs, project oversight and general conditions, profit, and bond.

#### **10.1.6 Subcontractor Costs**

This estimate assumes that a large percentage of work will be completed by sub-contractor (95%). Subcontractor markups include overhead costs, project oversight and general conditions, and profit.

#### **10.1.7 Escalation**

This estimate assumes a project duration of 18 months with construction beginning in FY23.

#### **10.1.8 Contingency**

A contingency of 5.00% has been applied to the cost estimate.

#### **10.1.9 SIOH (Supervision, Inspection, Overhead)**

SIOH of 5.70% has been applied to the cost estimate.

#### **10.1.10 Design**

A design fee of 9.00% was chosen for this project in order to capture the project cost for the survey and geotechnical exploration. A rough order of magnitude for the survey and geotechnical exploration came in at \$226,000 and \$216,000 respectively.

## **10.2 Estimate Notes**

This estimate has been prepared as a class 4 estimate per USACE ER-1110-2-1302 Table 1. Civil Works Estimates – Class Level Designation. The estimate has been prepared as a rough order of magnitude parametric estimate in order to validate funding needed to carry the project forward through design.

The estimate reflects the best cost evaluation for the Buford Dam Road project given the limited design and rough project layout. Final project costs will depend on the competitive market standing as well as on material, labor, and equipment pricing at the time of design completion. The current estimate is to serve

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as a programming document until the design process begins at which point the estimate should be updated along with the design to reflect the most accurate pricing at that time.



## Appendix B

**LAKE SIDNEY LANIER AND BUFORD DAM PROJECT  
MASTER PLAN**

County	Households2015	Households2020	Households2030	Households2040	Households2050	Population2015	Population2020	Population2030
Barrow	27,484	30,257	37,724	41,761	45,251	75,370	82,187	101,556
Bartow	37,938	41,469	52,341	58,170	62,822	102,747	111,534	138,690
Carroll	42,283	44,143	52,482	56,162	59,377	114,545	118,755	139,542
Cherokee	86,791	99,250	117,651	131,690	142,291	235,899	266,874	313,128
Clayton	97,498	104,826	120,443	131,877	144,653	273,955	292,263	331,474
Cobb	284,364	310,854	346,394	378,845	408,242	741,333	806,754	892,066
Coweta	50,851	54,460	67,887	75,786	81,265	138,428	147,126	180,957
Dawson	8,875	9,376	11,052	11,670	12,203	23,301	24,470	28,811
DeKalb	283,334	314,897	349,905	372,884	403,667	734,873	809,802	889,371
Douglas	52,526	56,444	61,966	67,633	72,310	140,734	150,575	165,194
Fayette	39,107	42,262	47,601	52,160	53,631	110,712	118,760	132,514
Forsyth	76,231	85,888	115,852	142,614	164,660	212,435	236,425	313,730
Fulton	433,743	484,306	550,745	599,194	661,185	1,010,565	1,116,831	1,250,822
Gwinnett	317,069	359,508	423,017	483,143	541,963	895,823	1,008,503	1,172,752
Hall	67,494	70,447	84,003	92,934	101,490	193,538	200,538	236,057
Henry	78,804	89,807	108,980	125,433	137,900	217,738	246,317	295,688
Newton	38,822	42,459	52,078	56,337	58,524	105,474	114,242	138,049
Paulding	54,965	59,312	74,617	85,303	94,213	152,239	162,677	202,162
Rockdale	31,920	34,120	36,818	39,626	42,073	88,855	93,977	100,001
Spalding	24,197	25,528	30,547	32,900	35,524	64,050	66,926	79,086
Walton	32,096	33,775	40,338	44,046	47,025	88,397	92,323	109,141
<b>Grand Total</b>	<b>2,166,392</b>	<b>2,393,388</b>	<b>2,782,441</b>	<b>3,080,168</b>	<b>3,370,269</b>	<b>5,721,011</b>	<b>6,267,859</b>	<b>7,210,791</b>

**LAKE SIDNEY LANIER AND BUFORD DAM PROJECT  
MASTER PLAN**

Population2040	Population2050	Employment2015	Employment2020	Employment2030	Employment2040	Employment2050
111,855	120,628	20,727	23,215	24,388	26,502	28,311
153,549	164,928	40,873	44,156	47,932	50,811	56,388
148,827	156,392	49,127	54,098	56,545	59,549	63,688
348,813	374,821	67,536	76,147	83,087	90,589	101,105
360,641	393,005	144,352	149,826	153,184	159,157	167,778
966,489	1,035,796	401,734	432,021	451,460	483,987	526,070
201,129	215,037	43,732	48,758	51,800	57,851	63,315
30,599	31,963	10,477	10,600	10,851	11,110	11,361
941,158	1,012,022	366,020	391,015	407,179	436,969	474,144
180,148	192,481	50,719	56,092	59,122	65,562	70,826
144,328	147,415	50,238	55,230	58,100	62,980	68,844
383,673	440,353	81,045	90,517	95,932	103,159	117,216
1,353,425	1,473,300	880,652	933,912	989,865	1,075,690	1,172,921
1,332,037	1,484,742	388,852	424,200	444,226	479,555	522,840
259,730	282,080	92,079	100,297	104,436	111,085	120,222
338,799	370,445	65,781	72,410	77,198	84,472	92,503
148,523	153,590	29,765	32,632	34,660	37,234	41,696
229,977	253,174	29,664	34,089	36,830	39,838	43,564
106,929	112,928	40,640	43,302	45,253	48,633	52,421
84,959	91,478	27,258	29,723	32,314	34,825	38,237
118,598	126,116	25,536	28,162	29,670	31,159	33,948
<b>7,944,186</b>	<b>8,632,694</b>	<b>2,906,807</b>	<b>3,130,402</b>	<b>3,294,032</b>	<b>3,550,717</b>	<b>3,867,398</b>

## Appendix C

# **Buford Dam Road Feasibility Study**

## **Final Study**

Forsyth and Gwinnett County, Georgia



## **Buford Dam Road Feasibility Study**

### **Alternatives Overview**

The primary purpose for the examination of alternative improvement options for the sections of Buford Dam Road which traverse the Lake Sidney Lanier Corps of Engineers Project lands was to provide a safer and more enjoyable route for current and future users of the existing facility. While there are clearly variations in the horizontal and vertical alignments associated with specific elements of the several roadway improvement alternatives that were considered, these alternatives all share several common defining characteristics. The most important of these common characteristics are as follows:

- Buford Dam Road is now, and is planned to remain, a 2-lane, minor arterial/urban collector street. This roadway functional classification type is documented in the most recent versions of both the Gwinnett County (2008) and Forsyth County (2011) Comprehensive Transportation Plans.
- The use of Buford Dam Road is now, and will continue to be, limited to only private vehicles. No commercial vehicles such as large service or delivery trucks can travel through the Corps property. In recognition of the high volume of recreational vehicle travel in the Lake Lanier area, the AASHTO design vehicle used to test the geometry at all intersections was the MH-B (Motorhome with Boat Combination), with a total combined unit length of approximately 55 feet.
- Improvements to support non-motorized travel by bicyclists and pedestrians were incorporated into all alternatives considered. This reflects the designation of Buford Dam Road as an element of the non-motorized transportation system in both the Forsyth County and Gwinnett County transportation plans.
- Minor improvements to the existing roadway, such as increasing the width of the existing vehicle travelway from 2-11 foot lanes to 2-12 foot lanes, were all assumed to employ a 30-mph design speed. At those locations where minor roadway realignments to address specific safety issues were being considered, a design speed of 40 mph was employed. In the case of only one alternative where a major realignment of a large section of the existing Buford Dam Road facility was being considered was a 45-mph design speed used. This range of roadway design speeds is in accordance with the current practices and guidelines of the Georgia Department of Transportation (GDOT), and the Forsyth and Gwinnett County Departments of Transportation for 2-lane suburban roadways. Moreover, these design speeds are consistent with the currently posed speed limits in the range of 35 mph in the two counties and 30 mph through the Corps of Engineers Lake Lanier property. It should also be noted that the horizontal alignment of some sections of existing Buford Dam Road through the Corps property was determined to already be at or below the minimum geometric requirements for a design speed of 30-35 mph.
- A variety of traffic operational and safety improvements were considered for application at each of the at-grade intersections along the study corridor. These included both the addition of dedicated left-turn lanes on some intersection approaches and the use of single lane roundabouts as both traffic calming and safety enhancements at several locations.



## **Buford Dam Road Feasibility Study**

These various roadway characteristics were blended together to define a set of five (5) feasibility study alternative concepts. It should be recognized that, particularly at this initial feasibility study level of detail, the specific horizontal and vertical alignments of each roadway element are still subject to change; thus, these should only be viewed as conceptual improvement alternatives. Each of the five (5) primary alternatives is described in more detail on the following pages. These five basic options are as follows:

- Alternative #1 – Existing Alignment Widening (Option 1)
- Alternative #2 – Existing Alignment Widening (Option 2)
- Alternative #3 – Mainline Realignment Forsyth County Focus
- Alternative #4 – Mainline Realignment Forsyth and Gwinnett Counties
- Alternative #5 – Full Scale Mainline Security Realignment

For each of the five primary alternatives, a separate verbal and graphic description of its principal characteristics was developed. These descriptions included an overview of each alternative; a summary listing of its major proposed improvements; a summary of initially defined advantages and disadvantages of the alternative in comparison to the existing roadway; a tabular summary of the estimated construction costs associated with the alternative; and a series of graphic illustrations of the roadway cross sections and horizontal alignment of each option in comparison to the existing Buford Dam Road. This allows each primary alternative description to essentially stand on its own for the purposes of doing a side by side comparison to the other alternatives.

While the primary focus of Alternatives #1 - #4 is to address currently observed traffic operations and safety concerns along Buford Dam Road, Alternative #5 seeks to address both these concerns as well as a larger regional scale issue associated with security. The Buford Dam / Lake Sidney Lanier Project is the source of a significant percentage of the public water supply for the Atlanta metropolitan area. The dam complex's hydroelectric power generation unit also contributes to the region's supply of electricity. It has been estimated that the failure of the dam would result in massive flooding impacts on the downstream communities.

In discussions between Corps and EFL staff, the potential for the relocation of a portion of Buford Dam Road from the dam itself onto a new downstream alignment bridge over the Chattahoochee River was identified as being worthy of consideration. This concept was viewed as being similar to what was recently implemented at Hoover Dam on the Colorado River along the border of Arizona and Nevada. In that instance, US Route 93, which formerly crossed the Colorado River on top of Hoover Dam, was relocated to a new, 4-lane, high level bridge on the downstream side of the dam. This not only addressed traffic operations and safety concerns associated with an older 2-lane roadway section on the dam being subjected to 4-lane travel demands with a high volume of large trucks along the US Route 93 corridor, but also resolved security and downstream flooding concerns should the dam which created Lake Mead National Recreation Area be severely damaged by natural or man-made actions. In the case of the Buford Dam Road feasibility study, Alternative #5 was thus viewed as an ultimate, long term improvement option.

## Buford Dam Road Feasibility Study

### Alternative #1

Known as the **Existing Alignment Widening (Option 1)**, this alternative begins at the intersection of Sweetwater Drive and Buford Dam Road at the Corps project property line and continues to a proposed single lane roundabout at the intersection of Buford Dam Road and the Sawnee Campground entrance. The general design concept applied to this roundabout, and others which were examined, consists of a single 20-foot, one direction vehicle travel lane and a 120-foot inscribed circle, with a 10-foot paved mountable truck apron. These potential intersection roundabouts were designed to accommodate a MH-B type vehicle (Motorhome with Boat Combination) with a total unit length of approximately 55 feet. Please refer to Figure 1 for the typical roundabout cross section illustrating these vehicle design elements as well as the proposed bicycle lane/pedestrian pathway along the outside of the roundabout. Please refer to Figures 4&7 for the MH-B type vehicle wheel tracking path for the two roundabouts associated with this alternative.

The proposed widening of the current roadway footprint has assumed the use of a 30mph design speed with a 6% maximum super-elevation, while increasing the current vehicle travel lane width from 11ft. to 12ft. (See Figure 2). A 4ft bicycle and pedestrian path will run on both sides of the roadway beginning at the Sawnee Campground Entrance roundabout and ending just south of the relocated Pannell roadway realignment.

These improvements will hold the eastern edge of the existing pavement on the lake side and incorporate all improvements to the western side (downstream) of the existing travel way. By holding the existing edge of pavement on the top of the Dam (See **Cross Section on Dam**/Figure 2), the improvements should reduce the amount of existing utilities that will need to be relocated. A limited amount of excavation will be required to construct the new pavement section that will be built back up to the existing grade (See Figure 2).

### Summary of Proposed Improvements:

- Roundabout added at the intersection of Sawnee Campground Entrance and Buford Dam Road with a 120ft. inscribed circle, 10ft. mountable truck apron, and 20ft. single lane pavement section (see Figures 3 and 4)
- Provide Property Access to two existing privately owned residential lots (Figure 3)
- Improve pavement and shoulder width matching the County's future typical section of 2-12-foot travel lanes and 6 foot paved shoulders.
- Added 4ft. bike path to both sides of the vehicle travel way matching the county's future typical section.
- Provide Safety Improvement by realigning existing travel way beginning near Buford Dam Overlook and continuing to Little Mill Road intersection to eliminate very tight, low speed curves (see Figure 5)



## Buford Dam Road Feasibility Study

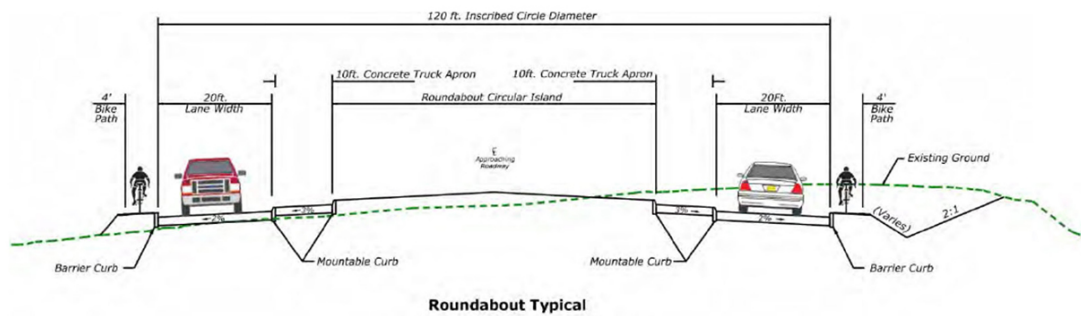
- Added a Pedestrian Bridge over Buford Dam Road to the east of the dam in Forsyth County to better connect pedestrian trails.

### **Disadvantages:**

- Cost and Dam impacts to widen and construct potential walls along Saddle Dike and Dam
- Pedestrian Bridge may be challenging to build given ground elevation differences on either side of Buford Dam Road to be connected.

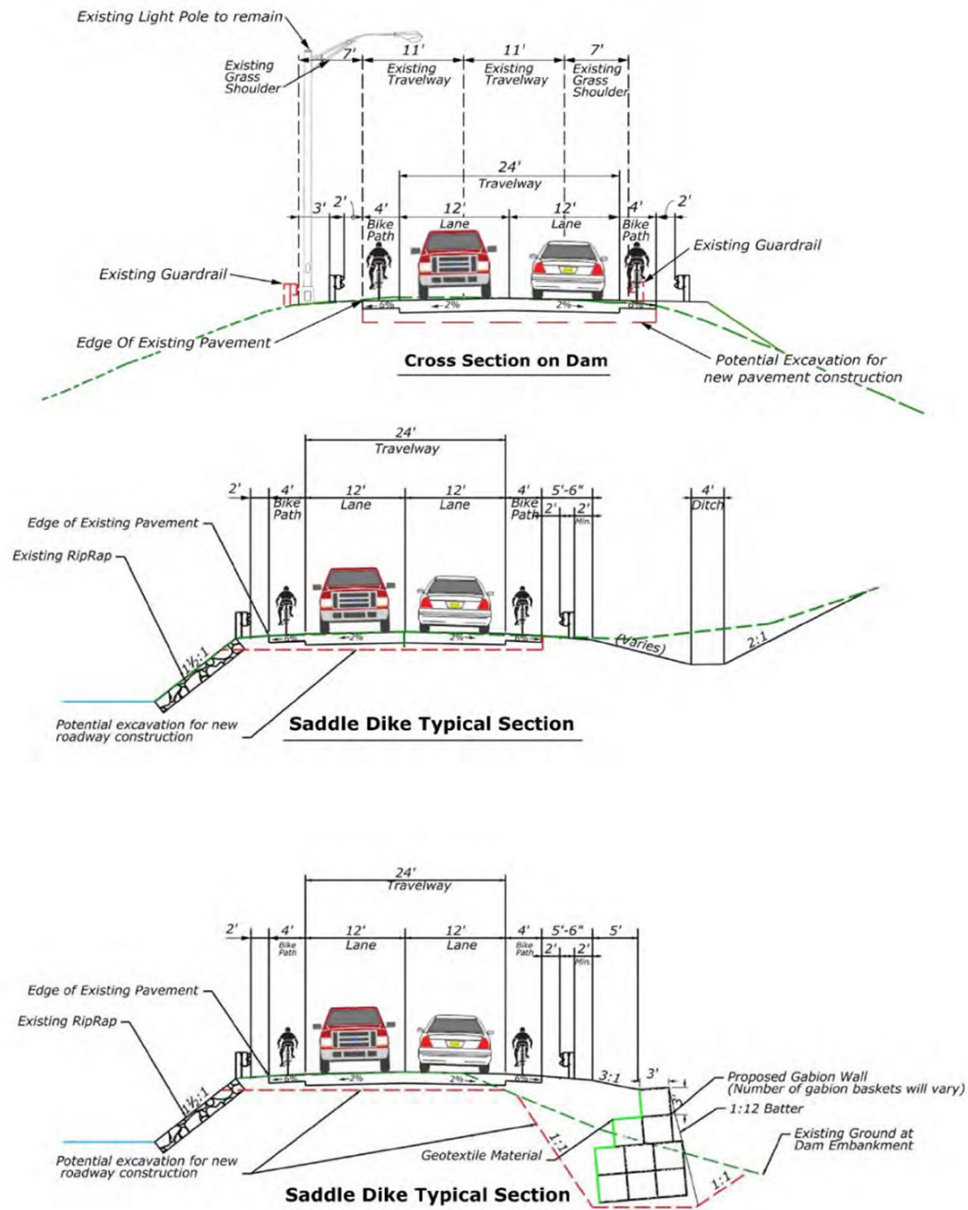
### **Cost:**

	<b><u>Roadway with Walls</u></b>	<b><u>Roadway without Walls</u></b>	<b><u>Pedestrian Bridge</u></b>
<b><u>Subtotal</u></b>	<b>\$5,450,000</b>	<b>\$5,325,000</b>	<b>\$300,000</b>
<b><u>Program Costs (approx. 25%)</u></b>	<b>\$1,375,000</b>	<b>\$1,350,000</b>	<b>\$75,000</b>
<b><u>Rounded Total</u></b>	<b>\$6,825,000</b>	<b>\$6,675,000</b>	<b>\$375,000</b>



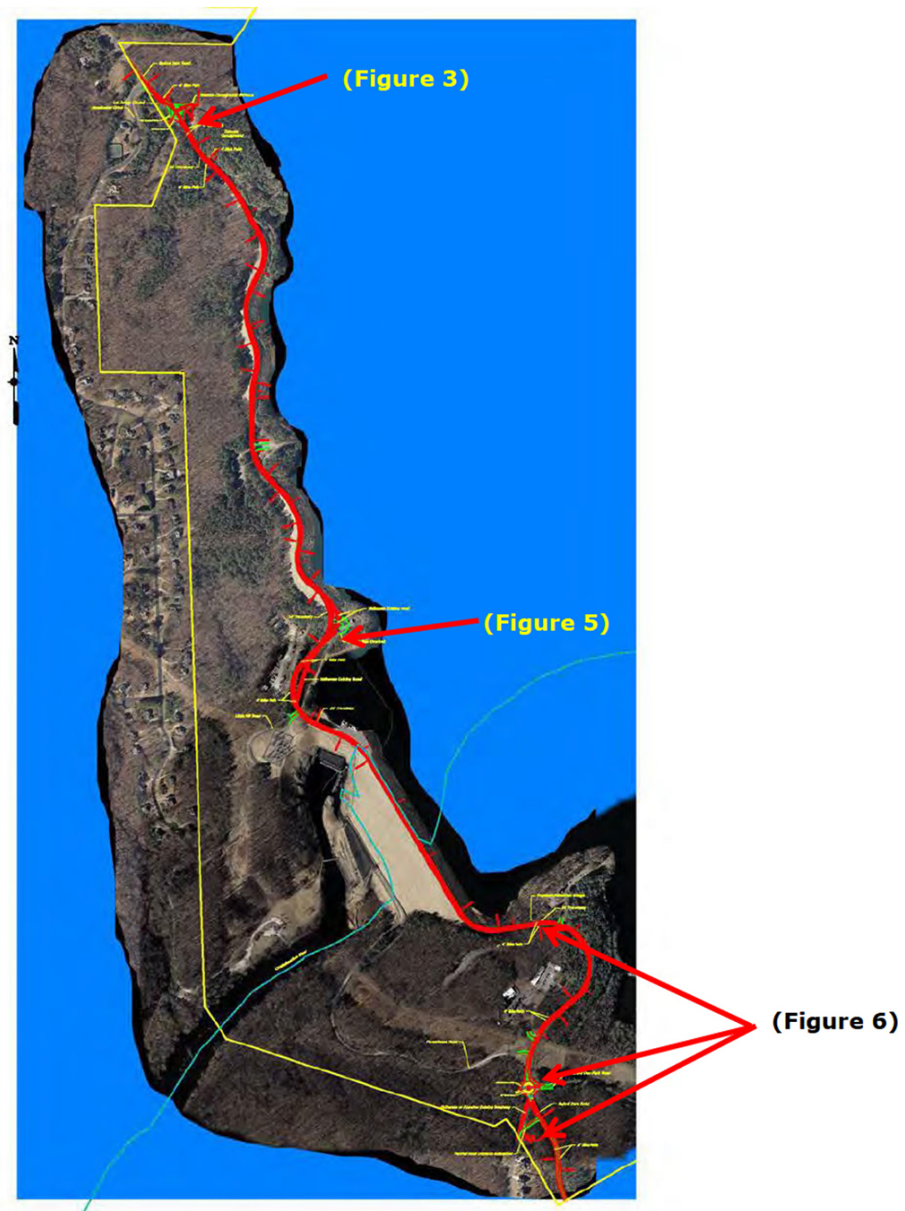
(Figure 1)

## Buford Dam Road Feasibility Study



(Figure 2)

## Buford Dam Road Feasibility Study



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## Buford Dam Road Feasibility Study

### Proposed Roundabout at Buford Dam Road and Sawnee Campground Entrance

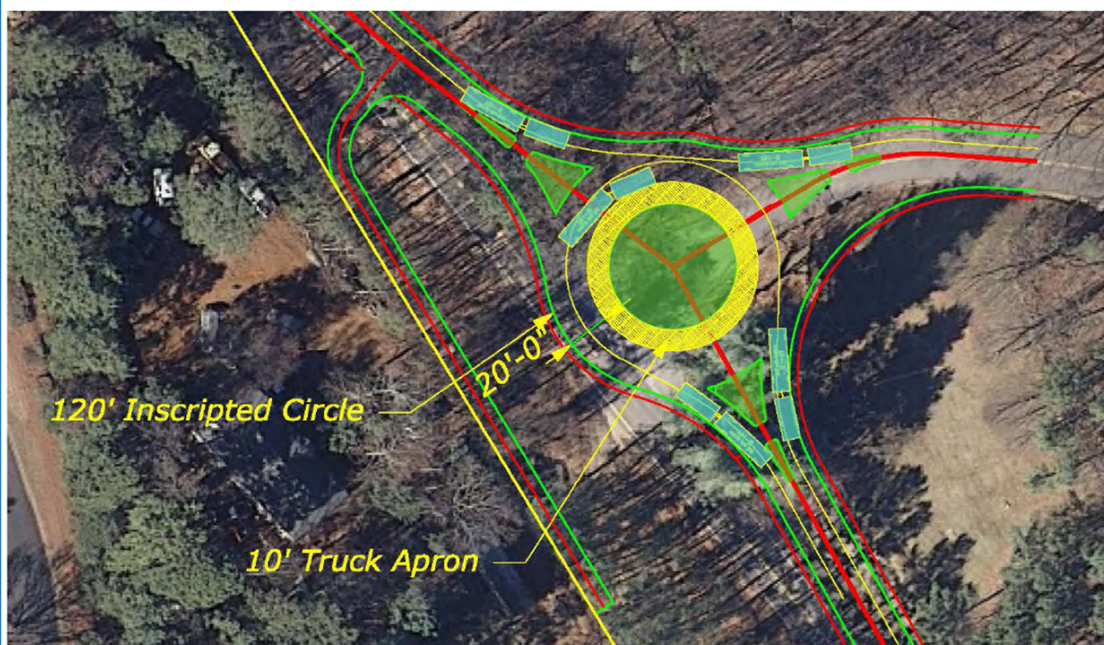


(Figure 3)

## Buford Dam Road Feasibility Study

MH-B Motorhome with Boat Combination

Wheel tracking at Sawnee Campground Roundabout



The illustration above depicts the tire path for a MH-B (Light Blue) which was determined to be the largest vehicle that will travel through this roundabout at this location.

(Figure 4)



## Buford Dam Road Feasibility Study

Safety Realignment between Buford Dam Overlook and Little Mill Road



(Figure 5)

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## Buford Dam Road Feasibility Study

Proposed Pedestrian Bridge, Roundabout at Buford Dam Road and Buford Dam Park,  
and Relocation of the Entrance to Pannell Road



(Figure 6)

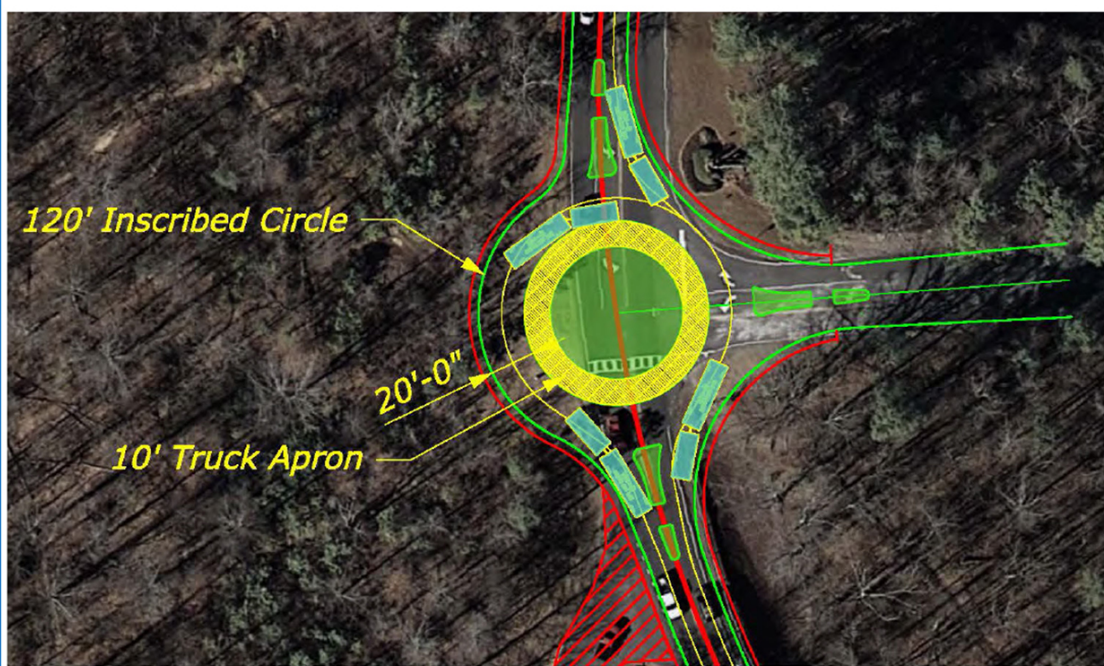
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## Buford Dam Road Feasibility Study

### MH-B Motorhome with Boat Combination

#### Wheel tracking at Buford Dam Road and Bufford Dam Park Road Roundabout



The illustration above depicts the tire path for a MH-B (Light Blue) which was determined to be the largest vehicle that will travel through this roundabout at this location.

(Figure 7)



## Buford Dam Road Feasibility Study

### Alternative #2

Known as **Existing Alignment Widening (Option 2)**, this alternative begins at the intersection of Sweetwater Drive and Buford Dam Road and continues to a roundabout at the intersection of Buford Dam Road and the Sawnee Campground entrance. This roundabout was designed to accommodate a MH-B type vehicle (Motorhome with Boat Combination) with a length of approximately 55ft. (See Figure 1). See Figure 4&7 for the wheel tracking path for the roundabouts for this alternative.

The proposed widening of the current roadway footprint has a 30mph design speed with 6% maximum super-elevation where available, while increasing the current lane width from 11ft. to 12ft. (See Figure 2). A 4ft bike path will run on both sides of the roadway from the Sawnee Campground Entrance roundabout to a point where the proposed realignment at the Northern end of the dam will be realigned to the west and tie to the roundabout at the intersection of Buford Dam Road and Buford Park Entrance. At that point the trail will run along the existing Buford Dam Road to the roundabout at Buford Dam Road and Buford Park Entrance.

These improvements will hold the edge of the existing pavement on the lake side and incorporate all improvements to the west side of the existing travel way. By holding the existing edge of pavement on the Dam (See **Cross Section on Dam/** Figure 2) should reduce the amount of utilities that will need to be relocated. Some excavation will be required to construct the new pavement section that will be built back up to the existing roadway grade (See Figure 2).

### Summary of Proposed Improvements:

- Roundabout added at the intersection of Sawnee Campground Entrance and Buford Dam Road with a 120ft. inscribed circle, 10ft. truck apron, and 20ft. pavement section (Figure 3)
- Provide Property Access to two residential lots (Figure 3)
- Improve pavement and shoulder width matching the County's future typical section
- Added 4ft. bike path to both sides of the travel way matching the county's future typical section.
- Safety Improvement by realigning existing travel way near Buford Dam Overlook to Little Mill Road (Figure 5)
- Realigned existing travel way from the northern end of Dam to the proposed Roundabout at Buford Dam Park Road (Figure 6)
- Roundabout added at the intersection of Buford Dam Road and Buford Dam Park with a 120ft. inscribed circle, 10ft. truck apron, and a 20ft. pavement width (Figure 6)
- Relocated Pannell Road Entrance away from roundabout (Figure 6)

## Buford Dam Road Feasibility Study

### **Advantages:**

- Roadway realignment and typical section are safety improvements
- Roundabouts are considered speed reducing and traffic calming improvements
- Improved pavement width from 11ft. to 12ft. to match the County future typical section
- Added 4ft Bike Path to both sides of travel way to match the County future typical section
- Eliminates the need for Pedestrian Bridge and Speed Humps

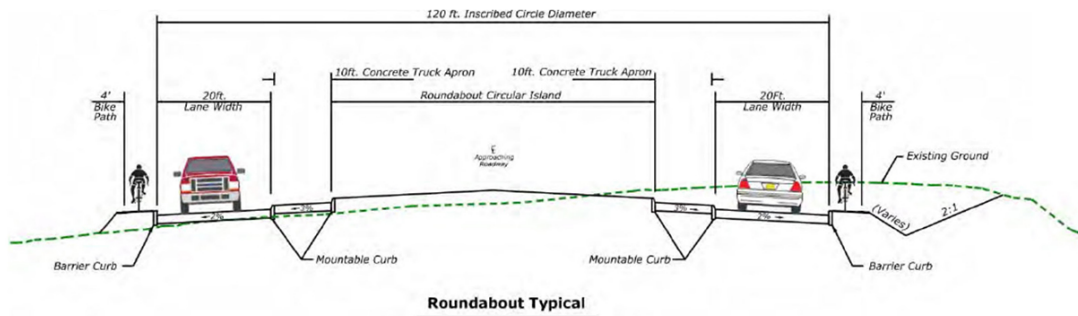
### **Disadvantages:**

- Cost and Dam impacts to widen and construct potential walls along Saddle Dike and Dam
- Requires construction of new access gates to control pedestrian and maintenance traffic movements over saddle dikes.
- Eliminates access to Upper Overlook Day Use Park
- May impact historic bench marks used to check for alignment and settling of the main dam.
- May require some utility relocation over dam

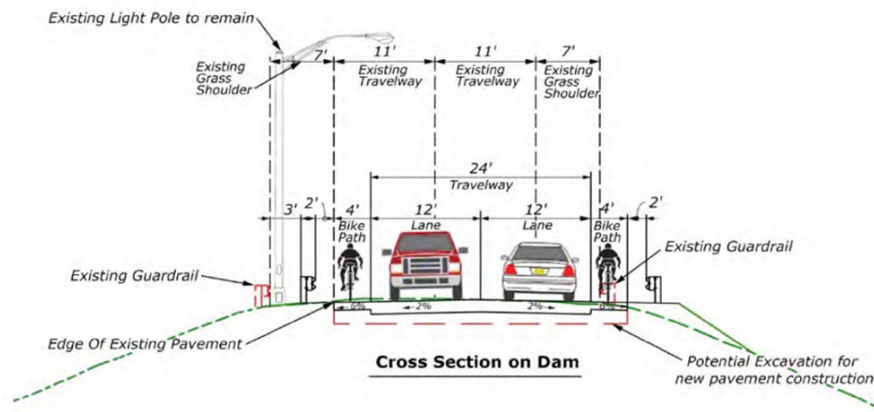
### **Cost:**

	<b><u>Roadway with Walls</u></b>	<b><u>Roadway without Walls</u></b>	<b><u>Pedestrian Bridge</u></b>
<b><u>Subtotal</u></b>	<b>\$5,975,000</b>	<b>\$5,850,000</b>	<b>\$300,000</b>
<b><u>Program Costs (approx. 25%)</u></b>	<b>\$1,500,000</b>	<b>\$1,475,000</b>	<b>\$75,000</b>
<b><u>Rounded Total</u></b>	<b>\$7,475,000</b>	<b>\$7,325,000</b>	<b>\$375,000</b>

## Buford Dam Road Feasibility Study

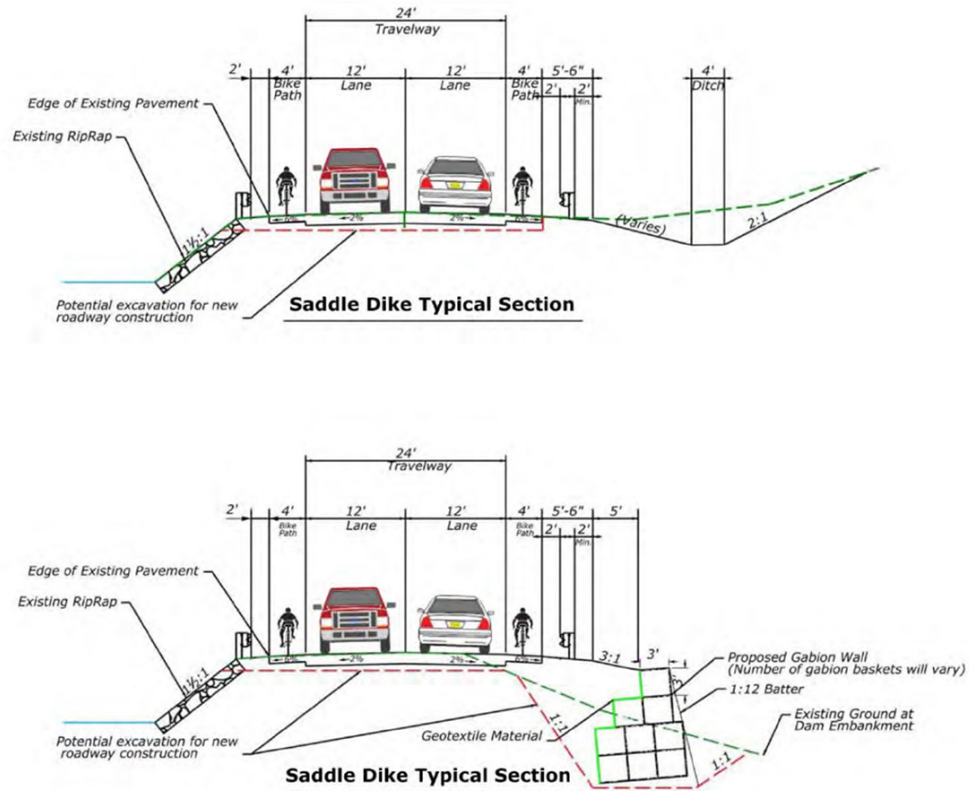


(Figure 1)



(Figure 1)

## Buford Dam Road Feasibility Study



(Figure 2)

### Buford Dam Road Feasibility Study



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## Buford Dam Road Feasibility Study

### Proposed Roundabout at Buford Dam Road and Sawnee Campground Entrance



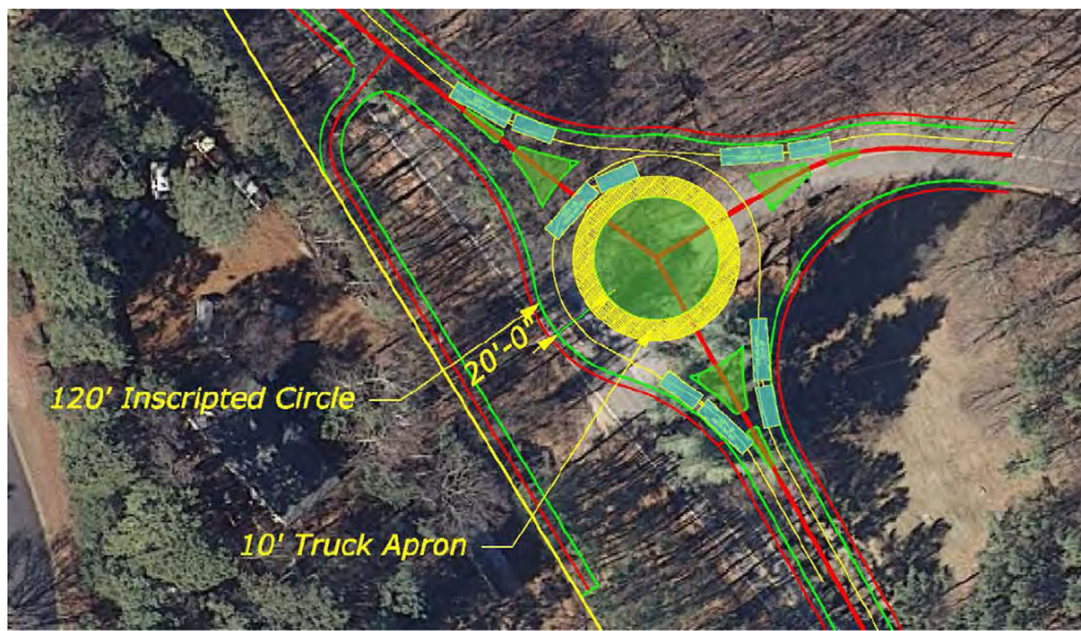
(Figure 3)

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## Buford Dam Road Feasibility Study

MH-B Motorhome with Boat Combination

Wheel tracking at Sawnee Campground Roundabout



The illustration above depicts the tire path for a MH-B (Light Blue) which was determined to be the largest vehicle that will travel through this roundabout at this location.

(Figure 4)



## Buford Dam Road Feasibility Study

### Safety Realignment between Buford Dam Overlook and Little Mill Road



(Figure 5)

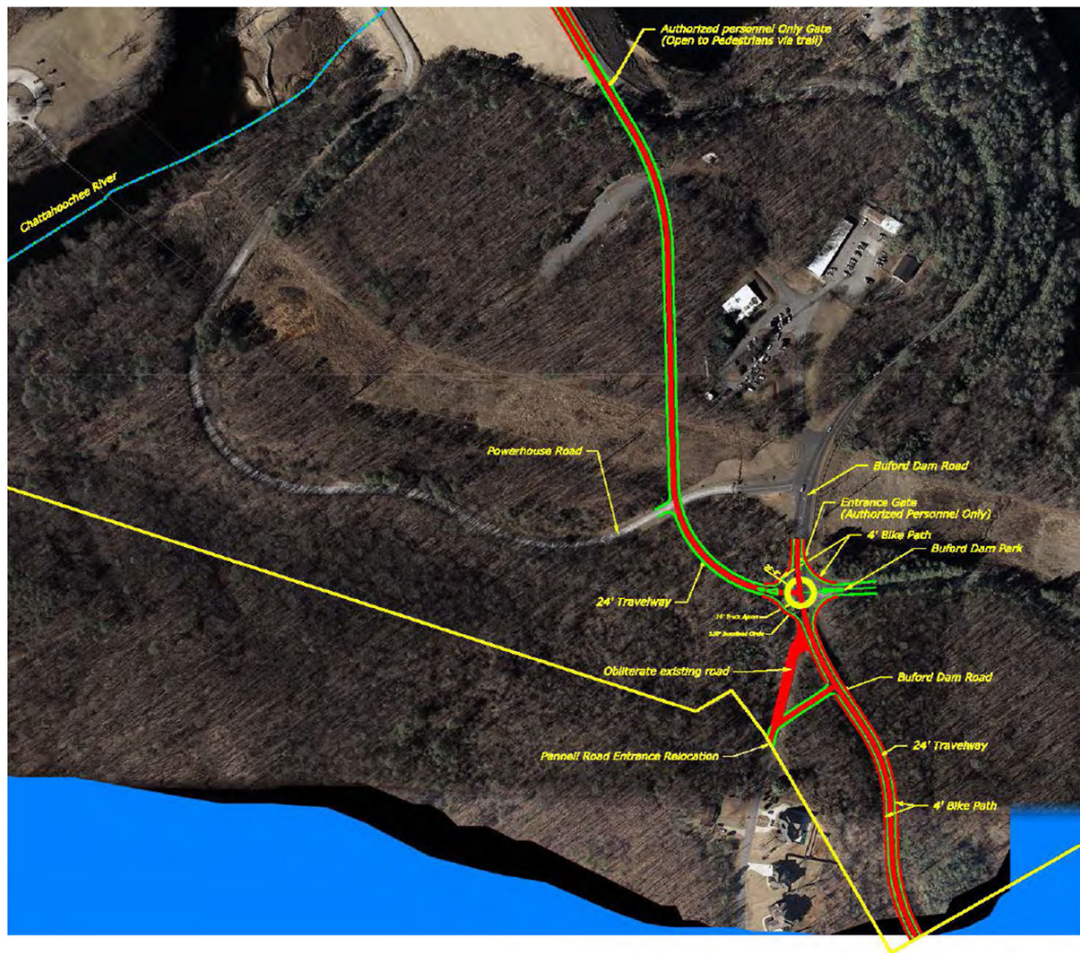


## Buford Dam Road Feasibility Study

Safety Realignment of Travelway from Dam to Buford Dam Park Road,

Roundabout at Buford Dam Road and Buford Dam Park,

and Relocation of Pannell Road



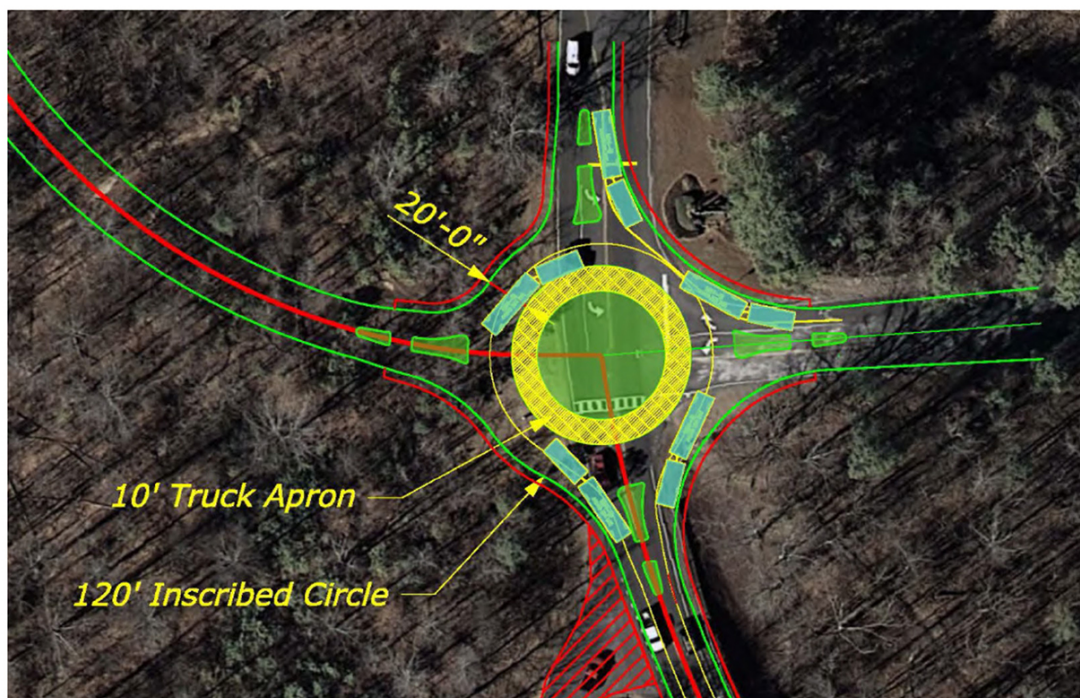
(Figure 6)

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## Buford Dam Road Feasibility Study

MH-B Motorhome with Boat Combination

Wheel tracking at Buford Dam Road and Buford Dam Park Entrance Roundabout



The illustration above depicts the tire path for a MH-B (Light Blue) which was determined to be the largest vehicle that will travel through this roundabout at this location.

(Figure 7)