DRAFT
ENVIRONMENTAL ASSESSMENT
WESTON LAKE DAM REPAIRS
Fort Jackson, South Carolina

Prepared by Charleston District, USACE
for Fort Jackson
July 2020

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1. Introduction and Background

1.1. Location

The Directorate of Public Works at Fort Jackson, SC has asked the US Army Corps of Engineers, Charleston District (USACE) to develop this Environmental Assessment (EA) to analyze and evaluate the environmental impacts of alternatives to repair the Weston Lake Dam at Fort Jackson and address the on-going seepage condition and potential emergency spillway erosion. The US Army Training Center and Fort Jackson are centrally located within the State of South Carolina in Richland County (Figure 1.1). The military reservation includes approximately 51,316 acres, with more than 100 ranges and field training sites, and over 1,150 buildings. Active military, dependents, civilians, and retirees make up the Fort Jackson community which includes 1,120 permanent military officers, 5,391 civilian personnel, and 27,000 trainees.

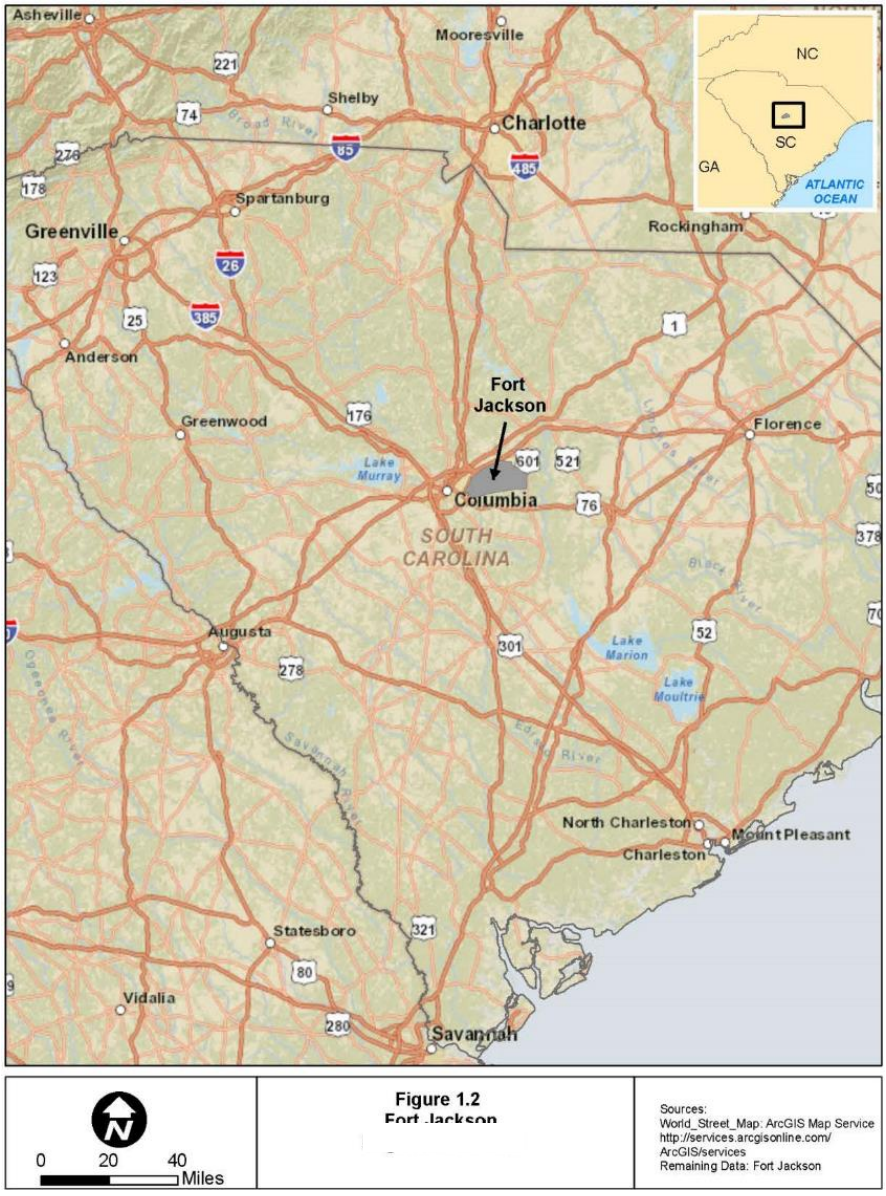

Figure 1.1 - Fort Jackson Regional Location

Weston Lake Dam is a high hazard dam located north of S.C. Highway 262, east of the Fort Jackson cantonment area and west of its intersection with Weston Pond Road, in Richland County, South Carolina (Latitude 34.0076˚, Longitude -80.8313˚). The lake is located completely within the boundaries of Fort Jackson's Military Reservation, and as such, is owned by the Federal Government. Figure 1.2 shows the location of Weston Lake.

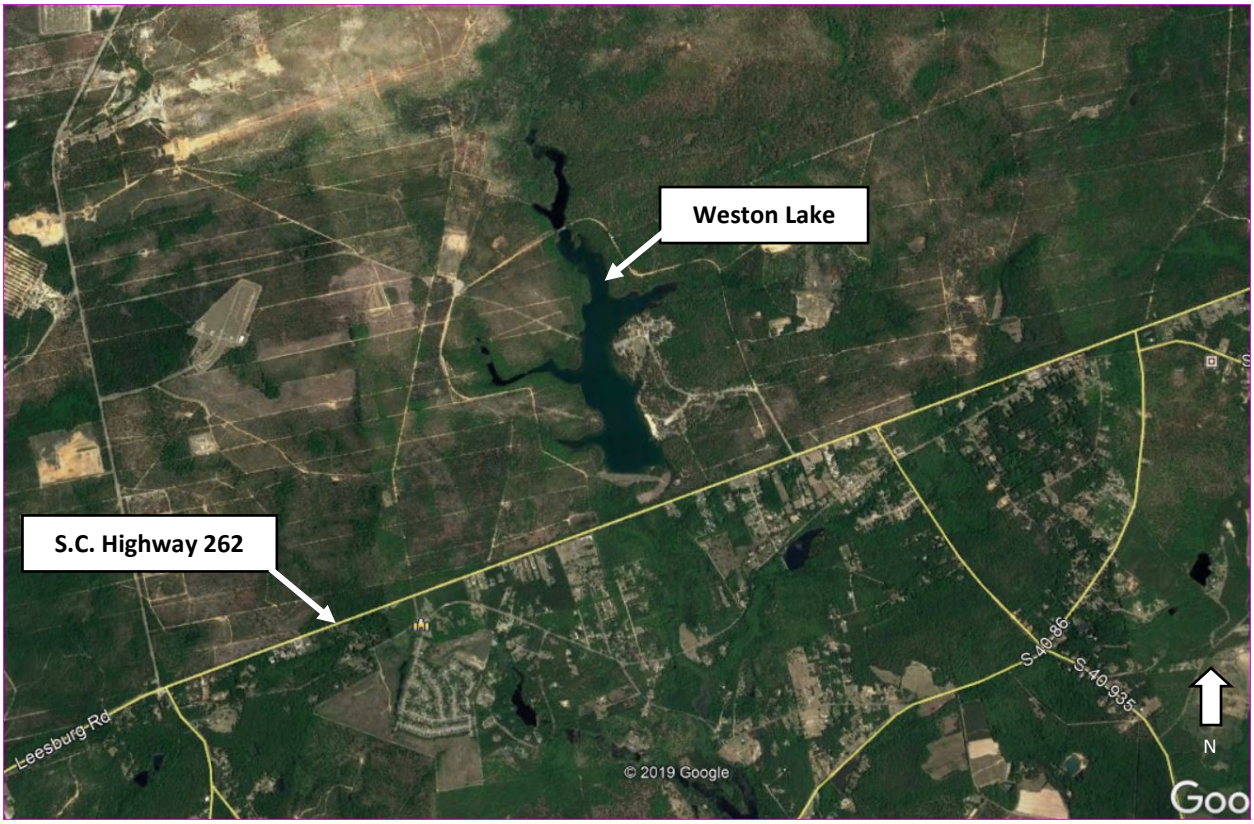

Figure 1.2 - Weston Lake Location Map

1.2. History

1.2.1. Weston Lake Description

Weston Lake Dam

The Weston Lake Dam was designed by the US Department of Agriculture in 1969 and constructed in 1971. The high-hazard, recreational dam is a roller-compacted, zoned earthen-fill impoundment about 1,400 feet long with a design crest width of 16 feet and maximum height of 41 feet. The dam elevation is 284.3 feet NAVD 88 with an average water surface elevation of 274.2 feet NAVD 88 and the normal high pool elevation is 273.7 feet NAVD 88. An unlined emergency spillway is located at the east end of the embankment in the left abutment. The 200 foot wide emergency spillway is approximately 1,000 feet in length with a crest elevation of 279.3 feet NAVD 88. Sandy soils (highly erodible) are found within the emergency spillway footprint.

The water control tower consists of a concrete intake tower with a submerged orifice inlet, a low-level outlet, and a reinforced concrete conduit extending through the embankment. Normal discharge is through the submerged orifice while water levels above 276 feet enter through two 9-foot long, uncontrolled weirs at the top of the tower. The primary discharge conduit is a 36-inch diameter reinforced concrete outlet pipe (RCP) resting on a concrete bedding layer.

Reservoir
Currently, the reservoir has a surface area of approximately 173 acres, with a maximum length of approximately 7,000 feet and a maximum width of about 2,000 feet. Slopes around the shoreline are flat to moderate and are mostly wooded. Table 1 provides additional details regarding the Weston Lake reservoir.

Table 1.1 Weston Lake Dam Physical Data

Structure Type	*Earth Fill*
Structure Length (feet)	*1,400*
Top Elevation (feet)	*284.3*
Top Width (feet)	*16*
Maximum Toe Elevation (feet)	*244.2*
Maximum Height (feet)	*41*
Spillway Crest Elevation (feet)	*279.3*
Spillway Type	*Unlined, uncontrolled*
Spillway Width (feet)	*200*
Number of Spillway Gates	*N/A*
Outlet Structure Description	*Normal discharge is through a submerged orifice with an opening of 2.25-foot wide by 1-foot tall as well as the top of the tower intake at elevation 275.2 feet through a 3 foot circular RCP. The invert of the outlet is 244.2 feet elevation.*
Hydrology	
Maximum High Pool (MH)	*284.9*
Top of Active Storage (TAS)	*279.3*
Normal High Pool (NH)	*273.7*
Drainage Area (square miles)	*9.8*
Maximum Historic Release (cubic feet per second [cfs])	*Unlisted/Unknown*
Maximum Historic Pool Elevation (feet)	*Unlisted/Unknown*

Note: All elevations in this table are expressed in North American Vertical Datum (NAVD) 88.

1.2.2. Background

Weston Lake is located in the headwaters of Cedar Creek. The dam is registered in the National Inventory of Dams (NID) as #SC00233 and is classified as a large and high hazard dam due to potential loss of life and property damage downstream. Seepage locations on the downstream face of the dam embankment have been documented since its construction in 1971. A 1979 Phase 1 Inspection Report for the National Dam Safety Program revealed that the dam would be overtopped by approximately 3.6 feet during the Probable Maximum Flood (PMF) event and the emergency spillway is grossly undersized. During a 2017 periodic inspection, erosion, pin-sized boils, and surficial slope instability were observed. Additional flowing seepage was identified in 2018 and a risk assessment indicated that spillway erosion failure was the highest risk Potential Failure Mode (PFM). Additional risk factors involve Backward Erosion Piping (BEP) through the embankment and foundation soils. Temporary emergency repairs

completed in 2019 include the placement of inverted filters in the embankment seepage areas, and clearing and grubbing of the emergency spillway.

1.3. Purpose, Need, and Scope of Analysis

The National Environmental Policy Act of 1969 (NEPA), 42 USC 4321 et seq., requires federal facilities to evaluate the environmental impacts of a proposed action and any associated alternative actions prior to implementation of the action.

This EA considers the direct, indirect, and cumulative effects of the Proposed Action, the No Action Alternative, and other alternatives over the reasonably foreseeable future. It was prepared in accordance with NEPA and implementing regulations of the Council on Environmental Quality (CEQ) (40 CFR 1500-1508), and the Army (32 CFR Part 651, Environmental Analysis of Army Actions). An EA is "routinely used as a planning document to evaluate environmental impacts, develop alternatives and mitigation measures, and allow for agency and public participation," and "provides the decision maker with sufficient evidence and analysis for determining whether a FONSI [Finding of No Significant Impact] or an EIS should be prepared." 32 CFR 651.20.

The purpose of this EA is to analyze and evaluate the environmental impacts of alternatives to address the seepage and erosional concerns of the Weston Lake Dam. Ongoing embankment seepage and the potential loss of highly erodible soils in the earthen spillway during large flood events have compromised the integrity of the structure.

This EA provides a discussion of the affected environment and the potential impacts to the physical, natural, and socioeconomic resources from the alternative actions to improve the Weston Lake Dam embankment and spillway. Dam improvements are needed to correct the deficiencies identified during a 2017 risk assessment as potential cause for dam failure. The concerns and potential failure modes are due to ongoing seepage at the toe of the dam and highly erodible soils in the earthen spillway as discussed in Section 1.2 of this document. This EA will help inform Army decision makers and the public of the environmental consequences from the alternatives to improve the Weston Lake Dam embankment and emergency spillway. Impacts are evaluated on both a direct and indirect basis and on a short-term, long-term, and cumulative basis. Specifically, the topics that are covered in this EA include:

- Land Use
- Climate
- Physiography, Geology, Topography, and Soils
- Surface Water and Stormwater
- Groundwater
- Floodplains and Wetlands
- Fish and Wildlife
- Vegetation
- Threatened and Endangered Species
- Air Quality
- Noise
- Cultural Resources
- Hazardous Materials & Hazardous Waste Management
- Environmental Justice and Socioeconomic Conditions
- Aesthetics and Recreation

- Cumulative Impacts

1.4. Alternatives Considered but Screened Out

An array of alternatives were considered to address the Weston Lake Dam embankment seepage and emergency spillway erosion issues. Several of these alternatives were screened out early in the alternative formulation process and are described below. The remaining alternatives were carried forward for additional analysis and evaluation and are described in Section 2 of this document.

Permanent Lowering of Weston Lake

This alternative would permanently lower the Weston Lake water level by 10 feet, decreasing the amount of embankment through-seepage and under-seepage currently observed during "normal" lake levels. However, this would not eliminate activation of the emergency spillway during large storm events that cause erosion of the emergency spillway. Seepage through and below the embankment would still occur during large storm events that raise the pool elevation. Additionally, the lower water level would result in a loss of water-based recreation opportunities in and around the lake, and loss of habitat for a variety of wildlife species including mammals, invertebrates, fishes, amphibians, reptiles, and birds. This alternative was rejected because it would provide little in the way of effectively addressing erosion of the emergency spillway during large storm events and the risk to downstream populations would remain above an acceptable level.

Dam Replacement

This alternative would involve removing the existing dam in its entirety, and the design and construction of a new dam that would meet current dam safety standards. This alternative was rejected for a multitude of reasons including constructability, control of water during construction activities, impacts to wetlands and aquatic habitat, and high costs. The constructability issues pertain to the significant amount of materials that would have to be handled to remove the existing embankment and construct a new embankment. Removal of the existing embankment would require sorting of materials, stockpiling acceptable materials for reuse, and disposing of unsuitable materials. It would be necessary to haul in new fill material (i.e. earth fill, sand, aggregate, concrete, etc.). This would generate a tremendous amount of truck traffic on the unimproved road leading to Weston Dam. Also, any precipitation received in the watershed upstream of the dam would pass through an active construction site, leading to issues on how to control the water so that it does not inundate the construction site or impact any downstream interests. During a large storm event such as a hurricane, stormwater could overtop the protected construction site, causing an increase in downstream water levels. This alternative would also require draining of the lake, temporarily eliminating the existing fringe wetlands and aquatic habitat. This impact would last for the duration of the construction project, which could be 2 to 3 years. The estimated cost associated with this alternative is approximately $37.5 million.

2. Alternatives and Proposed Action

2.1. Alternative 1 - No Action

A basic alternative to any proposed action is the No Action alternative (Figure 2.1). The No Action Alternative would leave the Weston Lake Dam in its current condition. In its current state, the emergency spillway does not have sufficient capacity or erosion protection to pass stormwater flows during large storm events which creates a high risk for failure. Additional factors that increase the risk for failure include backward erosion piping through and below the dam embankment. The 2019

temporary emergency repairs have not addressed the spillway deficiencies. The No Action alternative would not repair the emergency spillway or dam embankment and risk to the downstream population would remain above the acceptable levels.

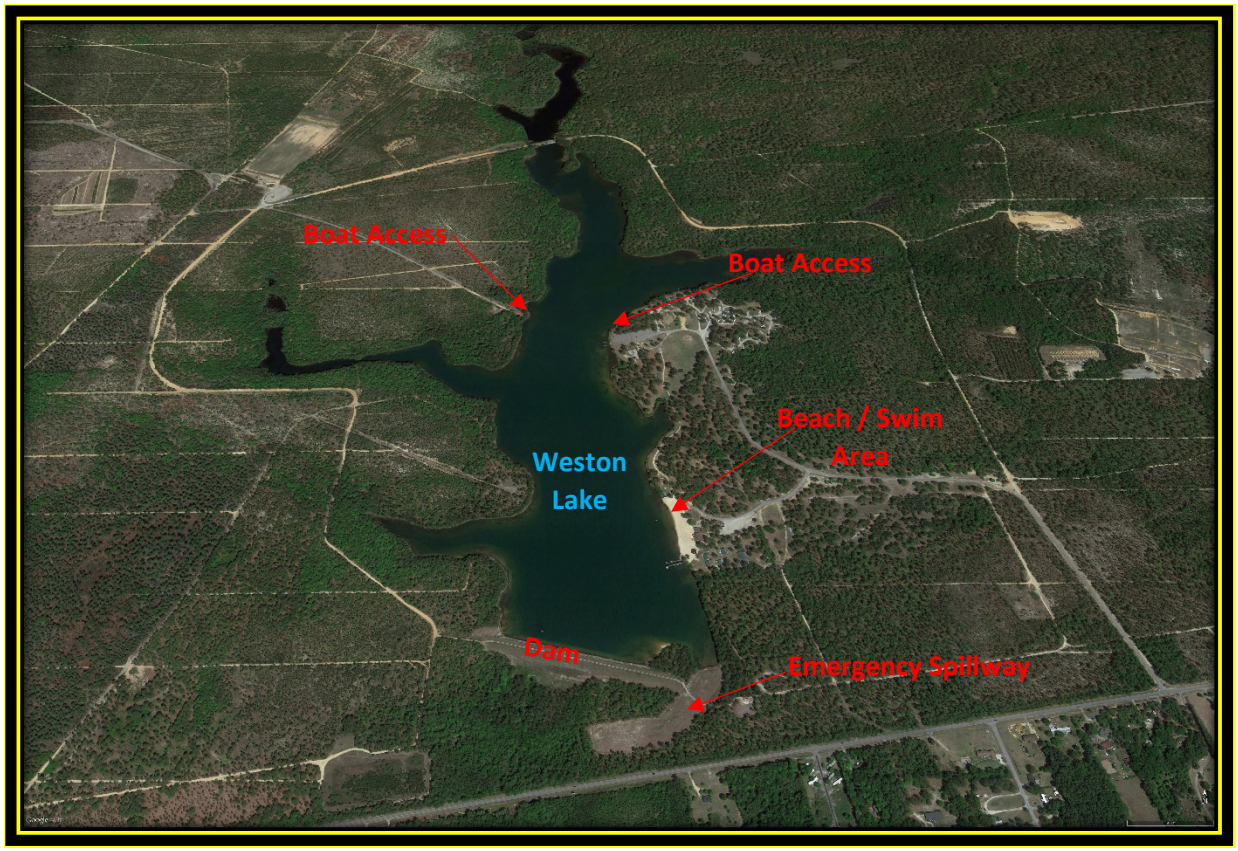

Figure 2.1. Alternative 1 - No Action Alternative

2.2. Alternative 2 - Remove Dam Embankment and Spillway

This alternative would remove the existing earthen embankment and emergency spillway in its entirety and Weston Lake would not exist (Figure 2.2). The removal would likely occur over a period of time in order to prevent a large influx of sediments downstream. Once the embankment and spillway are completely removed and the lake bed drained, a single or in some areas a multi-thread channel with adjacent wetlands would be expected to develop over a period of time within the lake footprint. Current recreational opportunities in and around the lake such as boating, fishing, and access to the beach and swimming area, would be lost. Additionally, there would be a change in wildlife habitat as the existing still water or lentic ecosystem converts to flowing waters. While the original design for Weston Lake was not intended to provide stormwater detention or flood control benefits to downstream areas, in its current configuration the dam does provide some level of attenuation to a range of flood events. The peak inflows entering Weston Lake are reduced before discharging downstream by utilizing the lake's storage capacity and outlet structure. Without the dam, there would be a loss to the attenuation of storm events.

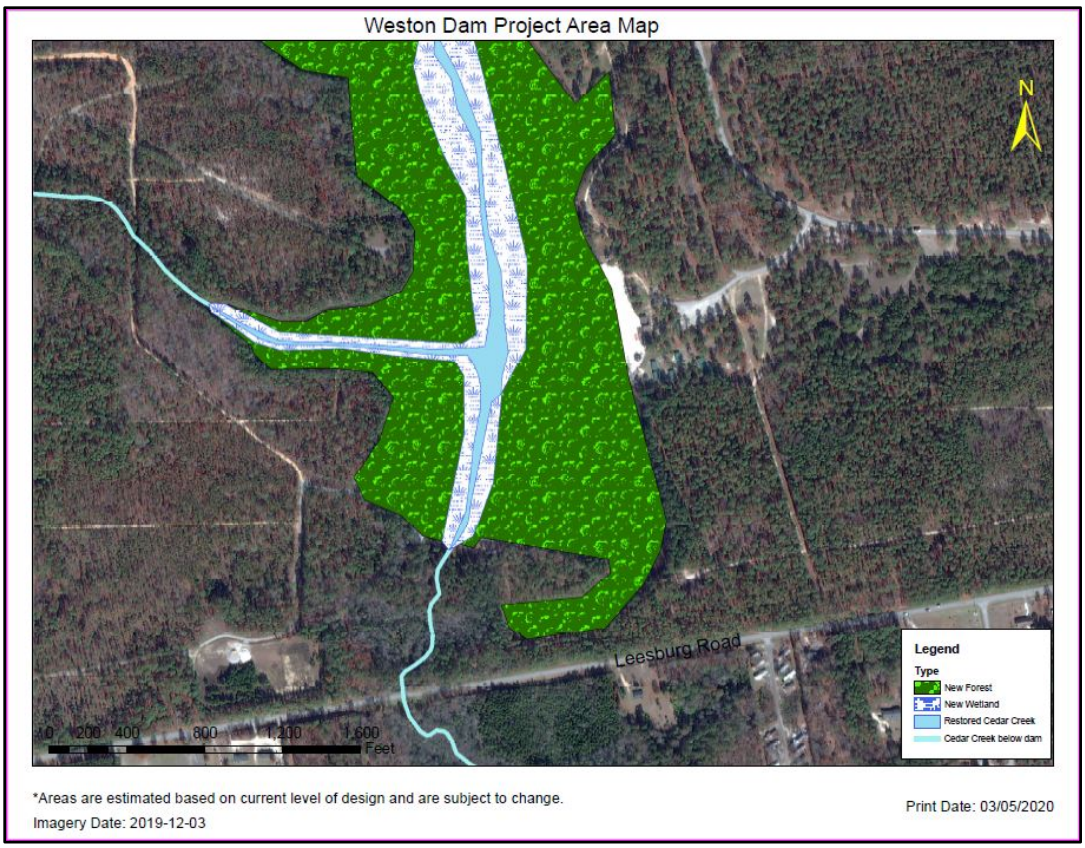

Figure 2.2. Alternative 2 – Remove Dam Embankment and Spillway

2.3. Alternative 3 - Extended Toe Berm with Spillway Armoring

This alternative would include construction of an extended length toe berm with a toe drain collection system and armoring of the emergency spillway (Figure 2.3). The toe berm would extend approximately 250 feet from the dam crest centerline. Modification and extension of the primary spillway conduit and reconstruction of the plunge pool area would extend approximately 130 feet downstream of the existing plunge pool in order to accommodate the toe berm. The emergency spillway improvements consist of the installation of turf reinforcing mat and vegetation for approximately 600-800 feet of the emergency spillway length, construction of a downstream riprap end trench, and construction of a diversion berm on the left bank to direct water towards the natural streambed. The riprap end trench is being constructed as a "self-launching" riprap section that is approximately 30 feet wide and has a maximum thickness of approximately 8 feet. The riprap would meet the gradation requirements of American Society for Testing and Materials (ASTM) D 6092, R-700 riprap. If scour were to form downstream of the emergency spillway, the riprap would self-launch and prevent the progression of head cutting up the emergency spillway. The dam top elevation and emergency spillway crest elevation would not change. The dam would continue to be listed on the NID, undergo periodic inspections, and be maintained as required by dam safety standards. This alternative would preserve the recreational opportunities and aquatic and waterfowl habitat afforded by the lake, and maintain the existing stormwater capacity. Alternative 3 would address the embankment seepage and spillway issues but would result in temporary work within the floodplain and the permanent loss of wetlands (see Section 3.6 below).

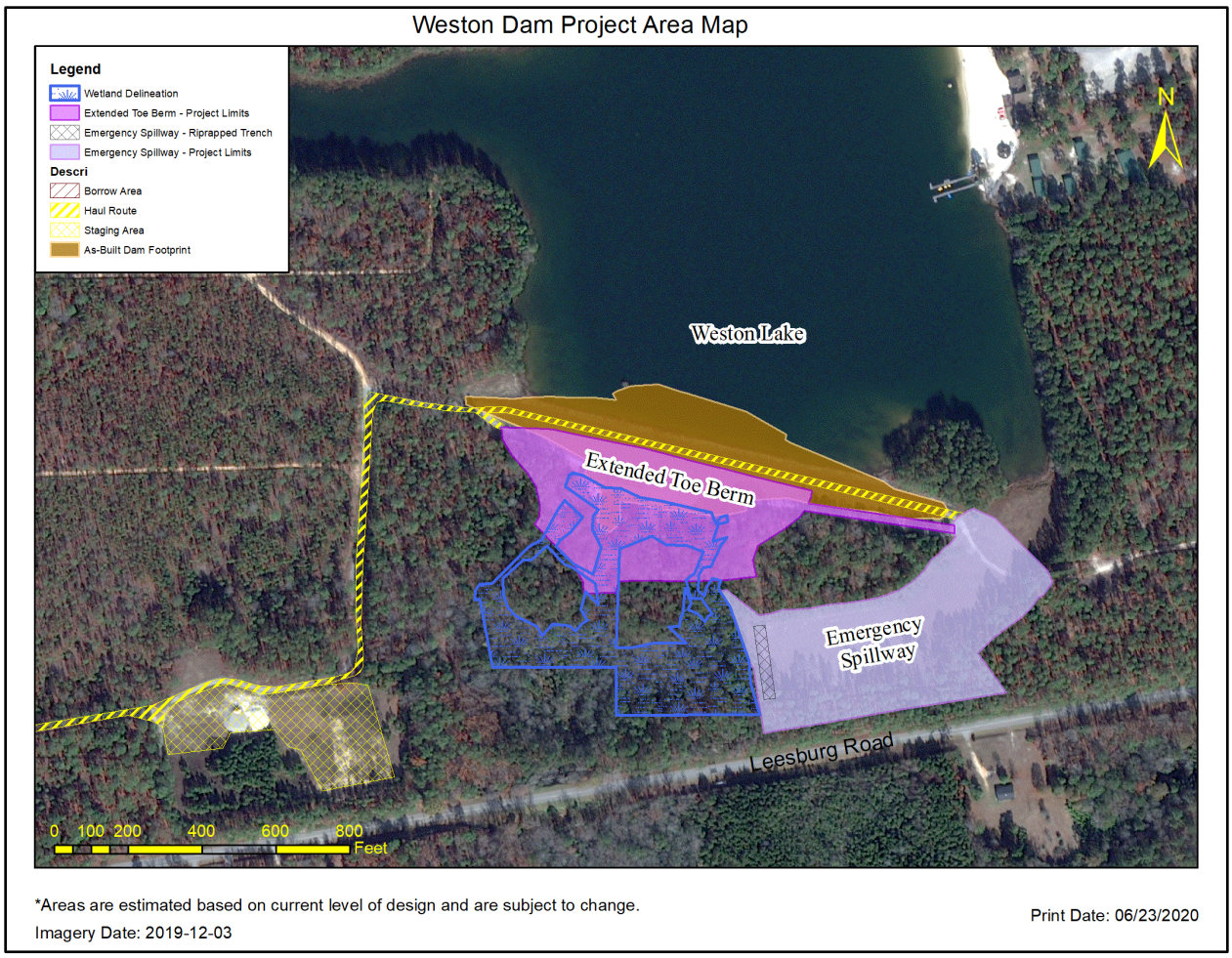

Figure 2.3 - Alternative 3. Extended Toe Berm with Turf Reinforced Spillway (Conceptual Design)

2. 4. Alternative 4 - (Preferred Alternative) Short Toe Berm with Spillway Armoring

This alternative would consist of constructing a short length toe berm over and below the existing embankment with a toe drain collection system, and armoring of the emergency spillway (Figure 2.4). The toe berm would extend approximately 190 feet from the dam crest centerline. Modification and extension of the primary spillway conduit and reconstruction of the plunge pool area would extend to a location approximately 70 feet downstream of the existing plunge pool in order to accommodate the toe berm. Repairs to the emergency spillway would be identical to the Alternative 3 design (see Section 2.3). The dam top elevation and emergency spillway crest elevation would not change. The dam would continue to be listed on the NID, undergo periodic inspections, and be maintained as required by dam safety standards. This alternative would maintain existing stormwater functions along with the current recreational opportunities and the wildlife habitat afforded by the lake. Alternative 4 would correct the embankment seepage and spillway issues and reduce the safety risk to downstream populations with the least amount of impacts to the wetlands and Cedar Creek floodplain (see Section 3.6 below).

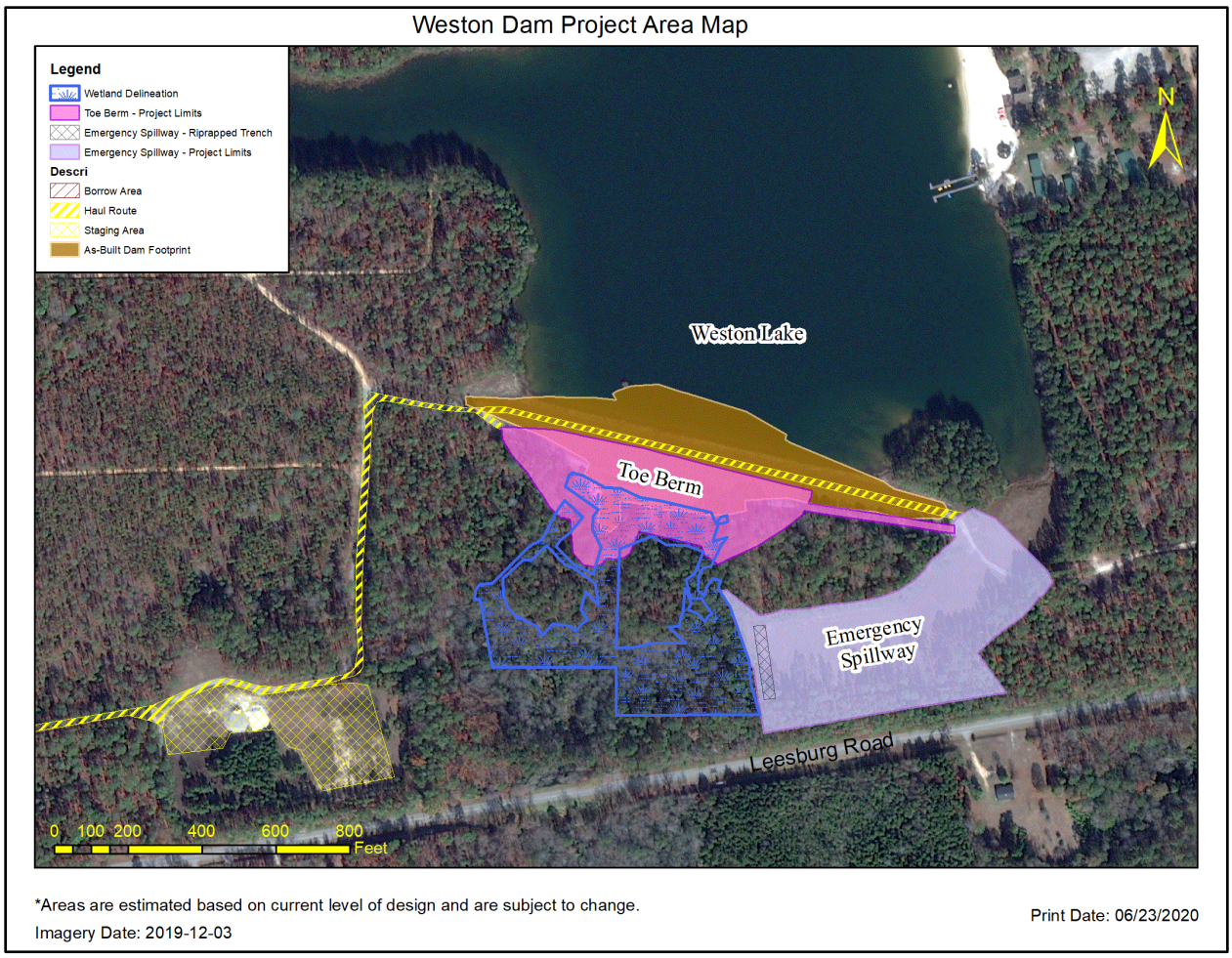

Figure 2.4 - Alternative 4. Short Toe Berm with Turf Reinforced Spillway (Conceptual Design)

3.0 Affected Environment and Environmental Consequences

The focus of this EA is Weston Lake and the immediate vicinity. For additional information about environmental conditions at Fort Jackson, please contact Sarah Smith by email at: sarah.e.smith347.civ@mail.mil.

3.1. Land Use

3.1.1. Affected Environment

This section describes the existing land use of the area surrounding Weston Lake, taking into consideration both natural or human modified activities. Natural land use classifications include wildlife areas, forests, and other open or undeveloped areas. Human-modified land use classifications include residential, community, commercial, industrial, utilities, agricultural, recreational, and other developed uses. Land use is regulated by management plans, policies, and regulations determining the type and extent of land use allowable in particular areas, and protection specifically designated for environmentally sensitive areas.

Weston Lake is located within the boundaries of Fort Jackson, which falls under the military installation land use category. In addition to training camps and other military facilities, this category includes residential, commercial and other supporting uses located within the installation boundaries. The area immediately north of Weston Lake is used for military training and is a dedicated weapons impact area. The lake's eastern and western shores are recreation areas, with recreational facilities located along the eastern shore. Outside the Fort Jackson boundaries, and south of Weston Lake and S.C. Highway 262, land use is primarily residential.

3.1.2. Environmental Consequences

Alternative 1 - No Action

The No Action Alternative would not result in any significant or negative impacts to land use in the areas surrounding the lake. This alternative would result in continued risk of erosion of the emergency spillway and water seepage through and below the embankment. This alternative would not change the risk for failure during large storm events, and it would not have a significant impact on land use in the area. Land use designations would not change if this alternative was implemented.

Alternative 2 - Remove Dam Embankment and Spillway

Construction of Alternative 2 would not result in any significant or negative impacts to land use. Although this alternative would result in the loss of Weston Lake and the existing recreational opportunities the lake provides to civilians, active duty military, and retirees, land use designations would not change if this alternative was implemented.

Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 - (Preferred Alternative)

Construction of Alternative 3 or Alternative 4 would not result in any significant or negative impacts to land use. Construction of these alternatives would ensure long-term stability of the embankment and spillway but would not result in land use changes in the area if implemented.

3.2. Climate

3.2.1 Affected Environment

According to the Köppen climate classification, South Carolina is classified as a humid subtropical climate. Fort Jackson's predominant climatic factors are the Installation's location in the lower latitudes and its proximity to the Appalachian Mountains to the west, which block the approach of unseasonable cold weather in the winter. Columbia, located in central South Carolina, typically experiences its coldest month in January with an average high of 56 °F and warmest month in July with an average high of 93 °F. The average annual temperature is approximately 75 °F. The average annual precipitation is approximately 45 inches per year with the highest rainfall totals occurring during June, July, and August. During these months, the city of Columbia receives between 4.7 and 5.5 inches of rain per month. In general, the state of South Carolina has warmed by one-half to one degree (F) over the last century; however, this increase is less than that of most of the nation (USEPA 2020). It is expected that in the coming decades changing climate in South Carolina will lead to an increase in the number of unpleasantly hot days, an increase in heat-related illness, an increase in inland flooding, a decrease in crop yields, and harm to livestock (USEPA 2020).

3.2.2. Environmental Consequences

Alternative 1 - No Action

The No Action Alternative would not result in significant environmental impacts on climate because the greenhouse gas emission would not change significantly, over time, from the current condition.

Alternative 2 - Remove Dam Embankment and Emergency Spillway

Alternative 2 would not result in any significant or negative environmental impacts on climate. Alternative 2 would not cause changes to the area's climate and minimal amounts of greenhouse gases would be created during construction of this alternative. However, best management practices (discussed in the air quality section) would be followed to reduce greenhouse gas emissions.

Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 - (Preferred Alternative)

Construction of Alternative 3 or Alternative 4 would not result in any significant or negative environmental impacts on climate, and would not cause changes to the area's climate. Both alternatives would increase the climate change resiliency of the area by providing stormwater attenuation during storm events. Adequate stormwater detention provides protection from more frequent and severe storms, and flooding associated with climate change. Minimal amounts of greenhouse gases would be created during construction of these alternatives. Best management practices (discussed in the air quality section) would be followed to reduce greenhouse gas emissions due to construction. Construction of either of these alternatives would lead to no long-term increase in greenhouse gas emissions.

3.3. Physiography, Geology, Topography, and Soils

3.3.1 Affected Environment

Fort Jackson contains two physiographic provinces: the Piedmont Plateau and the Atlantic Coastal Plain. Fort Jackson is located in the northwestern portion of the Atlantic Coastal Plain, referred to as the "Sand Hills", which joins with the Piedmont Province running north and west. The Sand Hills are a region of low to moderate relief and gently rolling plains with numerous streams and springs that are fed by groundwater. Local relief in the high plains of the reservation is largely between 165 and 250 feet. Slopes are predominately between three and eight percent at Fort Jackson. In the areas along narrow stream valleys, slopes commonly exceed 15 percent. The highest elevation on the Installation is 540 feet above sea level in the west-central portion of Fort Jackson; the lowest point is less than 160 feet above sea level occurring in the floodplain of Colonels Creek in the southeastern portion of Fort Jackson. The second physiographic province, known as the Piedmont Plateau also contains numerous streams and water bodies. Ridge tops are broad sloping gentle to moderate toward the streams. The stream floodplains are often narrow. The Fall Line, a zone which marks the boundary between the younger, softer sediments of the Coastal Plain Province and the ancient, crystalline rocks of the Piedmont Province, lies approximately four miles west of the cantonment area.

Rocks in the Piedmont Plateau are shale and schist, rather than true slate. The principal rock type is argillite and fine-grained rock with a high content of silica and alumina. The principal geologic formation in the Sand Hills is the Tuscaloosa, which consists of unconsolidated marine deposits of light-colored sands and kaolin clays. Most of the soils at Fort Jackson are formed from sediments of the Tuscaloosa. A layer of Quaternary sand terrace overlies the Tuscaloosa formation, which lies upon a complex of old

metamorphic and igneous rock. The Tuscaloosa complex generally consists of clay strata overlying unconsolidated sands. Near the northern boundary of the installation, the older crystalline rocks of the Carolina Slate Group outcrop at the surface. In the northwestern portions of Fort Jackson, Pleistocene sands and gravel are present at the ground surface.

Soils serve a critical role in the natural and human environment, affecting vegetation and habitat, water and air quality, and the success of the construction and stability of roads, buildings, and shallow excavations. A soil survey conducted by the United States Department of Agriculture (USDA) concluded that soils in the Fort Jackson coastal plain are predominantly well drained on the higher plains and side slopes and somewhat poorly drained in the valleys. These soils have a sandy surface layer and a predominantly loamy sub-soil.

Weston Lake Soils

The soils surrounding Weston Lake are classified in the Vaucluse-Ailey-Pelion unit. This unit consists of well to moderately well drained soils with a sandy surface layer and loamy subsoil. Minor soils in this unit include Johnston loam, which are very poorly drained soils located within drainage ways. A soil map and descriptions of Soil Classifications found adjacent to Weston Lake are included in Appendix A.

3.3.2. Environmental Consequences

Alternative 1 - No Action

The No Action Alternative would not result in any significant environmental impacts on physiography, topography, geology, or soils. Selection of this alternative would provide a minor positive impact by allowing sediments to settle in the lake, thereby reducing sedimentation downstream of the dam. However, continued risk of erosion to the spillway would result in the transport of sediment downstream which would have negative, short-term and long-term impacts to soils. Excessive sediment deposition can bury fish and wildlife habitat and alter stormwater conveyance during rain events.

Alternative 2 - Remove Dam Embankment and Emergency Spillway.

Alternative 2 would not result in any significant or negative environmental impacts on physiography, topography, geology, or soils. Construction of this alternative would remove the dam and spillway and return the area to its historic, natural grade. Complete removal of the embankment structure would result in a minor change in topographic contours. Alternative 2 would result in a temporary, short-term increase in sedimentation during construction. However, best management practices would be followed to reduce erosion and runoff.

Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 - (Preferred Alternative)

Construction of Alternative 3 or Alternative 4 would not result in significant or negative environmental impacts on physiography, topography, geology, or soils. Construction of either alternative would provide a long-term positive environmental impact by allowing sediments from runoff to settle out of suspension during high flow events, thereby reducing sedimentation downstream of the dam. During construction of either alternative, best management practices would be followed to reduce temporary negative impacts from erosion and runoff due to construction activities.

3.4. Surface Water and Stormwater

3.4.1 Affected Environment

Fort Jackson lies within the boundaries of the Congaree River and the Wateree River basins in the City of Columbia. Streams at Fort Jackson are typical of those found in the Coastal Plain Province. The surface pattern is linear branching and streams occupy relatively broad valleys with gentle regional gradients to the south and southeast. Eventually, all streams leaving Fort Jackson flow into either the Wateree River or the Congaree River. The confluence of these rivers forms the Santee River. The Santee River continues in a southeasterly direction through Lake Moultrie and Lake Marion, eventually emptying into the Atlantic Ocean south of Georgetown, South Carolina.

There are five surface water drainage systems on the installation. The majority of the streams that are present on the eastern half of the reservation flow into Colonels Creek, a major tributary of the Wateree River, which flows southeastward across the installation. The other major surface water drainage system, Gills Creek, flows slightly southwesterly across the northwestern quarter of the installation. Wildcat Creek flows to Gills Creek. The southern part of the installation is drained by the upper reaches of Cedar Creek and Mill Creek. Weston Lake originates in the headwaters of Cedar Creek.

Weston Lake is located on Cedar Creek in the south central quarter of the military reservation with a watershed size of approximately 9.84 square miles (Appendix B). The drainage area above the dam consists primarily of forest areas and open fields. Based on the 2011 National Land Cover Dataset, the percentage of developed (urban) lands within the watershed is 3%. Below the Weston Dam embankment, Cedar Creek flows south under South Carolina Highway 262, through Roberts Road/Harmon Way, and into Harmon's Pond, approximately 2 miles downstream of Weston Lake Dam. Below Harmon's Pond, Cedar Creek flows through Garners Ferry Road, Crossing Creek, and Congaree Road before reaching Congaree Swamp, which drains into the Congaree River and the Santee River.

Fort Jackson does not lie within an area controlled under a Coastal Zone Management Program (CZMP). Therefore, Fort Jackson's on-Post operations and activities are not managed or controlled by the CZMP.

3.4.2. Environmental Consequences

Alternative 1 - No Action

The No Action Alternative would cause no changes from the current conditions of the stormwater and surface water at Weston Lake. However, in its current state, the emergency spillway does not have sufficient capacity or erosion protection to pass stormwater flows during large storm events. This creates a high risk for structure failure as the 2019 temporary emergency repairs did not address the spillway deficiencies.

Alternative 2 - Remove Dam Embankment and Emergency Spillway

Construction of Alternative 2 would cause negative effects to stormwater and surface water during and after construction. These impacts would consist of a short-term increase in turbidity and downstream sedimentation during construction. Without the lake, existing stormwater detention functions would be lost which would increase downstream flows. Additionally, as a stream channel forms through the lake bed, additional sediment loading would occur. Best management practices would be implemented during and after construction to reduce impacts to water quality.

Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 - (Preferred Alternative)

Construction of Alternative 3 or Alternative 4 would cause temporary changes to stormwater and surface water during construction. These impacts would consist of a short-term decrease in the pool elevation and an increase in turbidity and downstream sedimentation during construction that would subside shortly after construction activities cease. After construction, both alternatives would have long-term beneficial impacts to surface and stormwater by maintaining the pool elevation, providing stormwater attenuation, allowing sediment to settle out of stormwater, and preventing erosion of the emergency spillway and seepage of the dam embankment. Best management practices would be implemented during construction to reduce impacts to water quality.

3.5 Groundwater

3.5.1. Affected Environment

Fresh groundwater is generally plentiful at Fort Jackson. The Tuscaloosa Formation, of the Upper Cretaceous age, underlies all of Fort Jackson and is the primary source of groundwater in the area. The formation consists of inter-bedded, generally unconsolidated, and fine to coarse sand and clay, causing groundwater to occur under both unconfined and confined conditions. Groundwater occurs under water table conditions in the upper part of the zone of saturation. At a depth ranging from 100 to 250 feet, the permeable sand zones are frequently overlain by less permeable clay zones, and the groundwater exists under artesian conditions in some locations. Small quantities of groundwater may be available in the alluvial deposits along major streams. Fort Jackson has three drinking water wells in the Weston Lake watershed. Fort Jackson is not located within a recharge area for a sole-source aquifer.

3.5.2. Environmental Consequences

Alternative 1 - No Action Alternative

Selection of the No Action Alternative would not result in any significant or negative environmental impacts to groundwater since the existing lake would remain. Weston Lake is a recreational lake and has been in existence for approximately 50 years.

Alternative 2 - Remove Dam Embankment and Emergency Spillway

Selection of Alternative 2 would result in removal of the lake and the development of a stream channel with adjacent wetlands within the footprint of the existing pool. With removal of the lake, groundwater levels would drop and the developing stream would become the groundwater discharge point. While this would result in a permanent change to the existing groundwater levels, it would not be a significant, negative effect because this alternative is expected to restore groundwater to the natural level that existed prior to creation of Weston Lake.

Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 - (Preferred Alternative)

Selection of Alternative 3 or Alternative 4 may result in temporary impacts to groundwater during construction. Drawdown of the lake water levels would be required in order to implement repairs to the embankment structure which could result in a temporary and minor lowering of the groundwater table. However, once construction is complete, lake surface water levels and groundwater levels should return to normal. Implementation of either of these alternatives should address the current

embankment seepage which would result in a long-term beneficial effect to groundwater by maintaining the normal pool elevation of the lake.

3.6 Floodplains and Wetlands

3.6.1. Affected Environment

One hundred-year floodplains have been designated along all of the major waterways on Fort Jackson. These include lands along Gills Creek, Mill Creek, Cedar Creek, Wildcat Creek and Colonels Creeks. Areas located downstream of Fort Jackson, within the Cedar Creek floodplain, are shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps for Richland County (Richland County 2020) (Appendix C).

Development activities in regulatory floodplain areas are limited in accordance with Executive Orders (EO) 11988 and 11990. An analysis of the preferred alternative for Weston Lake's compliance with these EOs is included in Appendix C. Also included with this EA is a Finding of No Practicable Alternative (FONPA) required by EO 11988 and Army policy.

The term, "wetlands," means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas: 33 CFR 328.3(c)(16). These areas are known to support both aquatic and terrestrial species. Wetlands and other surface water features, which may include intermittent and perennial streams, are generally considered "waters of the United States" by USACE, and under their definition of "jurisdictional waters," are protected under Section 404 of the CWA and EO 11990.

Wetlands on Fort Jackson are non-tidal and are defined as occurring on floodplains along rivers and streams, in isolated depressions surrounded by dry land, along the margins of lakes and ponds, and in other low-lying areas where precipitation sufficiently saturates the soil (USEPA, 2012c).

The focus of Fort Jackson's wetlands management program is protection and maintenance of habitat. Per EO 11990, Fort Jackson's goal is to ensure "no net loss" of wetland acreage. Wetlands are present at the toe of the embankment where seepage has been ongoing since construction of the lake in the 1970s.

Before construction work is conducted in wetland areas which are jurisdictional under Section 404 of the Clean Water Act, required permits/authorizations must be obtained from USACE. A wetlands jurisdictional determination has been conducted for these areas. Areas defined as jurisdictional wetlands (see 33 CFR 328.3(a)(4) and (c)(1)(i)-(iv)) are present at the Weston Lake site.

3.6.2. Environmental Consequences

Alternative 1 - No Action

Selection of the No Action Alternative would result in no short-term changes from the current conditions of the floodplains and wetlands at Weston Lake. However, because of the spillway erosion and continued embankment seepage, Weston Dam may be more susceptible to failure in the future. Temporary emergency repairs completed in 2019 did not address spillway erosion, which is the primary risk factor for failure. A more viable, permanent solution is needed to address safety concerns and issues with the emergency spillway and embankment.

Alternative 2 - Remove Dam Embankment and Emergency Spillway

Alternative 2 would potentially result in a temporary loss of wetlands and long-term adverse effects to stormwater detention. Wetland areas currently exist on the embankment structure due to the continuing seepage through and below the dam since its construction in 1971. Removal of the embankment would likely result in the loss of these wetlands since their existence is due to the water seepage. However, permanent removal of the embankment would result in development of a stream channel and adjacent wetlands within the footprint of the lake and an overall net increase of wetlands within the project area. This alternative would result in a loss of attenuation during a range of storm events which could negatively impact the downstream floodplain of Weston Lake and lead to changes in the flood elevations and flood insurance mapping. Additionally, selection of Alternative 2 could have negative consequences for safety during large storm events due to the loss of stormwater detention functions.

Alternative 3 - Extended Toe Berm with Spillway Armoring

Alternative 3 would result in the permanent loss of 1.25 acres of wetlands due to the placement of fill for construction of the extended toe berm. Alternative 3 would also result in the permanent clearing of 0.20 acre of forested wetlands. While this alternative would require construction activities within the floodplain, the dam and spillway crest elevations would not change so there would be no change in existing flood elevations. Authorization under Section 404 of the Clean Water Act would require a Clean Water Act (CWA) Section 404 permit and mitigation for the permanent loss of 1.25 acres of wetlands. If selected, this alternative would correct the existing embankment seepage and spillway erosion but would result in the permanent loss of 1.25 acres of wetlands on and below the embankment. Wetland effects resulting from construction of this alternative are outlined in Table 3.1.

Table 3.1 – Adverse effects to wetlands from construction of Alternative 3

Type and duration of wetland adverse effects	Location	Approximate wetland acreage
Permanent loss of wetland acreage due to placement of fill	On and below existing embankment	1.25 acres
Permanent loss of partial wetland function due to removal of vegetation (area will be maintained)	On and below existing embankment	0.20 acre

Alternative 4 - (Preferred Alternative) Short Toe Berm with Spillway Armoring

Alternative 4 would result in the permanent loss of 0.46 acre of wetlands associated with the placement of fill to repair the embankment structure. The functions associated with an additional 0.46 acre of forested wetlands would be reduced due to permanent removal of trees. This alternative would require temporary construction activities within the floodplain but the dam and spillway crest elevations would not change so there would be no change in flood elevations. Authorization under Section 404 of the CWA would require a Nationwide Permit (NWP) and may require mitigation for the loss of 0.46 acre of wetlands. If selected, Alternative 4 would correct the existing embankment seepage and spillway erosion while minimizing wetland loss to the maximum extent practicable. Wetland effects resulting from construction of this alternative are outlined in Table 3.2.

Table 3.2 – Adverse effects to wetlands resulting from construction of Alternative 4

Type and duration of wetland adverse effects	Location	Approximate wetland acreage
Permanent loss of wetland acreage due to placement of fill	On and below embankment	0.46 acre
Permanent loss of partial wetland function due to removal of woody vegetation (area will be maintained)	On and below embankment	0.46 acre

3.7 Fish and Wildlife

3.7.1. Affected Environment

There is a wide variety of wildlife, including mammals, birds, fish, reptiles, amphibians, and invertebrates found on Fort Jackson that utilizes the diverse ecosystems present.

The majority of wildlife species found on Fort Jackson are typical of the Sand Hills region of South Carolina. Over the years, baseline and planning level surveys have been performed for various classifications of flora and fauna. Species lists are available from Fort Jackson's Directorate of Public Works' Environmental Division. Wildlife commonly observed around Weston Lake includes white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), coyote (*Canis latrans*), Gray fox (*Urocyon cinereoargenteus*), Beaver (*Castor Canadensis*), Bobcat (*Lynx rufus*), eastern gray squirrel (*Sciruus carolinensis*), and wild turkey (*Melagris gallopavo*). Common fish species in the watershed include largemouth bass (*Micropterus salmoides*), Chain pickerel (*Esox niger*), and Bluegill (*Lepomis macrochirus*. Also common to the Weston Lake area are a variety of birds to include the endangered red-cockaded woodpecker, invertebrates, reptiles, and amphibians typically associated with forested areas, wetlands, and open water environments in the Sandhillls region of South Carolina.

3.7.2. Environmental Consequences

Alternative 1 - No Action

The No Action Alternative would not result in any significant or negative impacts to wildlife when compared to the current condition.

Alternative 2- Remove Dam Embankment and Emergency Spillway

Construction of Alternative 2 would result in temporary construction related impacts to wildlife. During construction, any wildlife in the area likely would leave, but would be expected to return once construction is complete. This alternative could lead to a long term decrease in fish densities due to removal of the lake. The lake area would be allowed to naturally re-vegetate and fish species would be restricted to the stream channel that would develop in the historic lake bed. Implementation of this alternative would not cause any long-term significant or negative impacts to wildlife.

Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 - (Preferred Alternative)

Construction of Alternative 3 or Alternative 4 (Preferred Alternative) would result in temporary construction-related impacts to wildlife, and the permanent loss of 0.2 acres of habitat for the endangered red-cockaded woodpecker (see Section 3.9). During construction, any wildlife in the area

likely would leave, but would be expected to return following completion of construction activities. Either of these alternatives would not result in any long-term significant or negative impacts to wildlife.

3.8 Vegetation

3.8.1. Affected Environment

Fort Jackson contains a wide variety of vegetative communities ranging from Longleaf Pine and upland hardwood forests to wetlands. Twelve vegetation cover types have been recognized for the purpose of cover type mapping, with at least 30 plant community types and 11 subtypes. There are several areas described as "Significant Natural Areas," which are defined in terms of vegetation. These designated natural areas are protected from disturbance to avoid impacts. The Installation's landscape is naturally vegetated except where development has cleared land, creating grassed areas in the cantonment area, along roadways, and on ranges. Over 720 flora species have been identified on Fort Jackson.

Fort Jackson can be classified generally into five primary terrestrial vegetative types: pine, pine/upland hardwood, upland hardwood, bottomland hardwood, and open field. Grassland areas on Fort Jackson include only a small amount in the cantonment area and alongside roads. Forest cover is the primary vegetative type at Fort Jackson.

There are no significant vegetative resources adjacent to Weston Lake.

3.8.2. Environmental Consequences

Alternative 1 - No Action

The No-Action Alternative would not result in any significant or negative impacts to vegetation as the area would remain unchanged.

Alternative 2 - Remove Dam Embankment and Emergency Spillway

Alternative 2 would remove the dam in its entirety. This would involve the removal of vegetation currently located on the embankment, including tree species. Once removal of the dam is complete, vegetation would be allowed to naturally regenerate in the lakebed and footprint of the dam which should provide a buffering effect on stormwater during small rain events. Alternative 2 would not have a negative long-term effect on vegetation.

Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 - (Preferred Alternative)

Construction of Alternative 3 or Alternative 4 (Preferred Alternative) would not result in significant impacts to vegetation. Repair of the dam and spillway would require permanent removal of tree species. However, removal would be limited to the minimal amount necessary to complete construction and no significant vegetative resources are located on the embankment or emergency spillway. Construction of either of these alternatives would result in less than significant effects to vegetation.

3.9 Threatened and Endangered Species

3.9.1. Affected Environment

Under Section 7 of the Endangered Species Act (ESA), the Army must ensure that any Army action authorized, funded, or carried out is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of habitats on Fort Jackson. Appendix D contains a list of at-risk, endangered, and threatened species that have been listed by the

USFWS as occurring or possibly occurring in Richland County, S.C. (list last updated May 21, 2020) (USFWS 2020). No land on Fort Jackson has been identified as critical habitat for any Federally-listed endangered or threatened species.

Surveys for endangered species on Fort Jackson have been conducted since the early 1990's, and continue to be conducted as needed to ensure ESA compliance. Two of the three Federally-listed endangered plant species for Richland County have been found on Fort Jackson. The Rough-leaved Loosestrife *(Lysimachia asperulaefolia)* and the Smooth Coneflower *(Echinacea laevigata)* were first identified during a threatened and endangered plant survey conducted in 1992. Subsequent surveys failed to locate additional populations until June 2020 when a second population of Smooth Coneflower was discovered approximately 6 miles east of Weston Lake dam. These three plant populations are managed in accordance with the March 2015 *Fort Jackson Endangered Species Management Component for Smooth Coneflower and Rough-leaved Loosestrife*. There are no populations of the Rough-leaved Loosestrife or the Smooth Coneflower found in the vicinity of Weston Lake. The third Federally-listed endangered plant species for Richland County, Canby's dropwort, has not been documented on Fort Jackson during multiple floristic surveys performed since the early 1990's. Suitable habitat for this species does not exist within the action area of this project, and no known suitable habitat for this species has been identified elsewhere on Fort Jackson.

Fort Jackson provides habitat for one resident federally-listed endangered bird species, the Red-cockaded Woodpecker (RCW) (*Picoides borealis*). The RCW is a non-migratory, territorial bird that is endemic to the pine forests of the southeastern United States and can be found in mature pine forests, preferably longleaf pine. RCWs live in groups normally consisting of a breeding pair and offspring from the previous years. RCWs excavate roost and nest cavities in living pine trees within their territories. These are referred to as cavity trees. These groupings of cavity trees, occupied by a single group of RCWs, is called a cluster. A single group of RCWs, on average, require about 200 acres of managed pine habitat for foraging and nesting. A major threat to their existence is habitat loss. There are approximately 50 active RCW clusters found on Fort Jackson. Weston Lake Dam lies within the ½ mile foraging partitions associated with two active RCW clusters.

The RCW population and associated habitat on Fort Jackson is managed in accordance with the *RCW Endangered Species Management Component* (ESMC Dec. 2013), the *2017 Fort Jackson Integrated Natural Resources Management Plan*, and the *2007 Management Guidelines for the Red-cockaded Woodpecker on Army Installations* (U.S. Dept. of the Army. 2007). The objective of the ESMC is to conserve this endangered animal species as required by the ESA as amended, while providing for training readiness and other mission requirements.

The American wood stork (*Mycteria americana*), a Federally-listed threatened bird species, has been occasionally documented on Fort Jackson during its migrations, but does not nest on the installation.

The Shortnose sturgeon (*Acipenser brevirostrum)*, an endangered fish species occurring in Richland County, is known to exist in the Congaree River, but is not found in Weston Lake or Cedar Creek. There are 3 to 4 man-made impoundments along Cedar Creek between Fort Jackson and the Congaree River that prevent the migration of shortnose sturgeon into Fort Jackson.

The Bald Eagle, which are protected by the Bald and Golden Eagle Protection Act, occurs on Fort Jackson. The only Bald eagle nest on Fort Jackson is located approximately 6 ½ miles north of the Weston Lake dam.

No other threatened, or endangered species have been documented on Fort Jackson.

3.9.2. Environmental Consequences

Alternative 1 - No Action

The No-Action Alternative would have no effect on any listed Federally-threatened or endangered species.

Alternative 2 - Remove Dam Embankment and Spillway, Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 (Preferred Alternative)

Of the threatened and endangered species known to exist on Fort Jackson, the nearest populations of the Smooth Coneflower and the Rough-leaved Loosestrife are more than 4 miles from Weston Lake Dam and appropriate habitat does not exist near Weston Lake Dam. Therefore, this project would have no effect on these plant species.

The Shortnose sturgeon is not found on Fort Jackson or in Cedar Creek. The temporary, minor impacts to water quality potentially occurring during construction activities will not degrade water quality for this species that is present in the Congaree River. This is due to the fact that at least three man-made impoundments exist on Cedar Creek below Weston Lake. Any sediment leaving the project site during construction will likely settle out before reaching the Congaree River. Therefore, this project would have no effect on the Shortnose sturgeon. In a Biological Assessment and subsequent consultation with the National Marine Fisheries Service (NMFS) in 1997, NMFS concurred with the determination that the shortnose sturgeon is not present on Fort Jackson, and would not be adversely affected by the operations of Fort Jackson.

Bald eagles no longer receive protection of the ESA, as they are no longer listed as threatened or endangered. The closest Bald Eagle nest is located 6.5 miles from Weston Lake Dam. Therefore, this project would have no effect on the Bald eagle.

The American wood stork has been documented as occasionally occurring on Fort Jackson. No nests have been documented on the installation. When documented on Fort Jackson, it has been observed foraging in shallow areas of ponds, and along pond and lake shorelines. These proposed Alternatives may temporarily disrupt foraging near the dam, but are not likely to adversely affect this species.

Weston Lake Dam is located within the ½ mile foraging partitions for two clusters of the Federally-endangered RCW. The RCW would not be impacted by Alternative 2, as no suitable or potentially suitable habitat will be removed. Construction of Alternative 3 or Alternative 4 (Preferred Alternative) will remove 0.2 acres of vegetation which is designated as suitable or potentially suitable habitat associated with one of the two active RCW clusters located within ½ mile of the project site. The permanent loss of this 0.2 acres of RCW habitat was evaluated in a document titled: *Evaluation of the Biological Impacts to Endangered Species, 2020 Weston Lake Dam Repairs, Fort Jackson, Richland County, South Carolina*, dated 30 March 2020. This document evaluated the impacts of these alternatives to all listed species potentially impacted.

In this evaluation:

a. It was determined that there would be "*no effect*" on the following federally listed or protected species: shortnose sturgeon, bald eagle, rough-leaved loosestrife, smooth coneflower, and Canby's dropwort.

b. It was also determined that alternatives 3 and 4 "*may affect, but are not likely to adversely affect*" the American wood stork and the RCW.

The USFWS, in a letter dated 31 March 2020, concurred with these determinations, thus satisfying the requirements of Section 7 of the ESA. However contractors must not operate or store equipment outside the staging area (Figure 2.4) in the adjacent foraging habitat of RCW cluster REC-A.

3.10 Air Quality

3.10.1. Affected Environment

This section describes the existing air quality conditions at and surrounding Fort Jackson. Air quality is determined by the type and concentration of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences. The significance of a pollutant concentration in a region or geographical area is determined by comparing it to federal and/or state ambient air quality standards. Under the authority of the CAA (42 USC7401-7671q), the EPA has been given the responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR part 50) for pollutants considered harmful to public health and the environment, with an adequate margin of safety.

The EPA developed NAAQS for six "criteria pollutants", to represent the maximum allowable atmospheric concentrations. The six "criteria pollutants" include: particulate matter (measured as both particulate matter [PM_{10}] and, fine particulate matter [$PM_{2.5}$]), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen oxides (NOX), ozone (O_3), and lead (Pb). Short-term NAAQS (1-, 8-, and 24-hour periods) have been established for pollutants contributing to acute health effects, while long-term NAAQS (annual averages) have been established for pollutants contributing to chronic health effects. Federal regulations designate Air Quality Control Regions (AQCRs) in violation of the NAAQS as nonattainment areas. Federal regulations designate AQCRs with levels below the NAAQS as attainment areas. According to the severity of the pollution problem, nonattainment areas can be categorized as marginal, moderate, serious, severe, or extreme.

South Carolina represents one of 28 eastern US states under the Clean Air Interstate Rule (CAIR), a program to permanently cap emissions of SO_2 and NO_x. CAIR assists South Carolina in meeting and maintaining NAAQS for ground-level ozone and fine particle pollution (SO_2 and NO_x contribute to the formation of fine particles (PM), and NO_x contributes to the formation of ground-level ozone).

In 2004, Richland County exceeded the ozone standard and joined the "Early Action Compact" (EAC) with the EPA. This was an option provided by the EPA for areas currently meeting the one-hour ozone standard, like those in South Carolina, to attain the eight-hour ozone standard by December 31, 2007, and obtain cleaner air sooner than federally mandated. This option required an expeditious time line for achieving emissions reductions sooner than expected under the eight-hour ozone implementation rulemaking, while providing "fail-safe" provisions for the area to revert to the traditional SIP process if specific milestones are not met. By signing the EAC, EPA agreed to defer the effective date of the nonattainment designation for the participating area. In 2007, Richland County met all milestones

associated with the EAC and was classified as “in attainment” for all six criteria pollutants. Today, the majority of South Carolina is in attainment for air quality.

3.10.2. Environmental Consequences

Alternative 1 - No Action

The No Action Alternative would not result in any significant or negative impacts to air quality.

Alternative 2 - Remove Dam Embankment and Spillway, Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 - (Preferred Alternative)

Construction of any of the Action Alternatives would lead to a short-term and less than significant increase in emissions during construction from the operation of construction equipment. No long-term increases in emissions would occur from construction of any action alternative, as construction equipment would no longer be in use once construction was completed. Best management practices such as reducing fugitive dust emissions, avoiding the unnecessary idling of construction equipment, and maintaining construction equipment in good operating condition would be implemented to reduce impacts to air quality.

3.11 Noise

3.11.1. Affected Environment

Noise is generally defined as undesirable sound. Sound is all around us, becoming noise when it interferes with normal activities such as speech, concentration, or sleep, is intense enough to damage hearing, or is otherwise intrusive. The type and characteristics of the noise, distance between the noise source and the receptor, the receptor sensitivity, and time of day, all cause variations in human response. Noise is often generated by human activities that are fundamental to the quality of life, such as construction or vehicular traffic.

Noise associated with military installations is a factor in land use planning both on-Post and off-Post. Noise emanates from vehicular traffic associated with new facilities and from project sites during construction. Ambient noise (the existing background noise environment) can be generated by a number of noise sources, including mobile sources, such as automobiles and trucks, and stationary sources such as construction sites, machinery, or industrial operations. In addition, there is an existing and variable level of natural ambient noise from sources such as wind, streams and rivers, and wildlife.

Existing sources of noise around Weston Lake include traffic, recreational activities, and noise associated with military training exercises.

3.11.2. Environmental Consequences

Alternative 1 - No Action

The No Action Alternative would not result in any negative impacts to noise levels because construction equipment will not be mobilized/used.

Alternative 2 - Remove Dam Embankment and Spillway, Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 - (Preferred Alternative)

Construction of any of the Action Alternatives would lead to a short-term increase in noise during construction, which is expected to be completed in approximately 24 months. Best management practices such as limiting work to daylight hours and avoiding the unnecessary idling of construction

equipment would be implemented to reduce noise during construction. No long term increases in noise would occur from implementation of any of the Action Alternatives.

3.12 Cultural Resources

3.12.1. Affected Environment

The Army is required to comply with Sections 106 and 110 of the National Historic Preservation Act (NHPA), as amended, and the implementing regulations for Section 106 under 36 CFR 800. Fort Jackson has completed a number of cultural resources surveys inventorying and documenting archaeological and historic properties. These surveys and their findings are recorded in the Integrated Cultural Resources Management Plan (ICRMP). The ICRMP outlines the Army's policies, procedures, and responsibilities for meeting cultural resources compliance and management requirements.

A Programmatic Agreement (PA) between the Army, the SC State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP) was prepared in 2015 and may be renewed every five years. The PA provides terms and conditions by which Fort Jackson can establish a program of operation, maintenance, and development that is in compliance with the Army's Section 106 responsibilities. The PA identifies projects and activities that are exempt from review as well as those which can receive an internal review.

A total of 702 archaeological sites have been identified on Fort Jackson, the majority resulting from timber tract surveys in the late 1980s and early 1990s. There are currently 66 archaeological sites eligible for listing on the National Register of Historic Places (NRHP) with the remaining 636 sites determined ineligible. These sites represent a time period extending back approximately 8000 years to the historic present (1966). There are 27 historic period cemeteries at Fort Jackson. There are no known Traditional Cultural Properties or Sacred Sites on Fort Jackson at this time.

Cultural resource surveys completed for the Weston Lake area in 1991, 1992, and 1993 did not reveal any sites eligible for listing on the NRHP. However, the recent drawdown of the lake during the 2019 temporary emergency repairs, exposed several pre-contact artifact clusters. One of these clusters, the Clawson site, is located approximately ½ mile north of the Weston Lake dam. The Clawson site is part of a 2019-20 effort to evaluate 5 late-discoveries located across the installation. This site appears potentially eligible for listing on the NRHP based on initial evaluation. The draft report is due in August, and will be coordinated with the SHPO. However, the project is expected to have no adverse effects to the Clawson site or to other cultural resources and/or historic properties.

3.12.2. Environmental Consequences

Alternative 1 - No Action

The No Action Alternative would have no effect on historic properties or cultural resources.

Alternative 2 - Remove Dam Embankment and Spillway,

Constrution of Alternative 2 would involve removing the dam in its entirety. This would result in loss of the lake which would permanently expose artifact clusters, including the Clawson Site. Selection of this alternative could result in impacts to cultural resources and may require consultation with SHPO prior to implementation.

Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 - (Preferred Alternative)

Construction of Alternatives 3 or the Preferred Alternative would occur on the downstream slope of the embankment and would not involve work within the lake bed. However, construction would require temporary lowering of the lake levels, which could expose the artifact clusters such as the Clawson site. The site has been surveyed and consultation with SHPO would be initiated prior to beginning construction. However, either alternative is expected to have no adverse effects to cultural resources and/or historic properties.

3.13 Hazardous Materials and Hazardous Waste Management.

3.13.1. Affected Environment

For purposes of this EA, hazardous materials are those regulated under federal, state, Department of Defense, and Army regulations. Hazardous materials are required to be handled, managed, treated, or stored properly by trained personnel under the following regulations: Occupational Safety and Health Administration (OSHA) Hazardous Communication, 29 CFR 1900.1200 and 29 CFR 1926.59; and Department of Transportation Hazardous Materials, 49 CFR 172.101; EPA, 40 CFR 260, *et seq*.

The Installation is required to track annually the amount of hazardous materials used on the Installation and report to the regulatory agencies. Fort Jackson no longer has a permitted on-Post Hazardous Waste storage facility. Fort Jackson is a Resource Conservation and Recovery Act (RCRA) Large Quantity Generator of hazardous waste and operates under permit number SC 3210020449, which was issued February 2010 and expires March 2020. A new permit application is currently under review by the South Carolina Department of Health and Environmental Control (SCDHEC). Facility inspections are conducted each year by SCDHEC and every four to five years by the EPA.

Military operations have been on-going at Fort Jackson for over 90 years. During that time the industrial operations have grown in support of the training programs. Former industrial activities generated wastes, which were stored, treated or disposed of at the Base according to standard practices at that time. As a result, there are multiple contaminated soil and/or groundwater sites on Fort Jackson. There are two known sites located within the land and water portions of the northern half of Weston Lake that are associated with the Military Munitions Response Program (MMRP). The MMRP is a comprehensive program designed to address contamination from past or current activities and restore Army lands to useable conditions. The program was established under the Defense Environmental Restoration Program (DERP) to identify, investigate, and clean up hazardous substances, pollutants, contaminants, unexploded ordnance (UXO), discarded military munitions, and munitions constituents (MC) contaminants that pose environmental health and safety risks at active military installations and formerly used defense sites (FUDS). Fort Jackson currently has 32 known sites, generally referred to as an Area of Concern (AOC) or Solid Waste Management Unit (SWMU).

The two known sites are AOC Site I and Site J, former range fans. AOC site I had lead soil remedial excavations performed. AOC site J required remediation and both land portions of AOC sites I and J are in Long-Term Monitoring (LTM) for Land Use Controls (LUCs). LUCs are remedial actions that include any type of physical, legal, or administrative mechanism that restricts the use of property in accordance with a remedial decision.

The water portions of AOC sites I and J are currently contracted and funded to include a UXO and Munitions Constituent (MC) RCRA Facility Investigation (RFI), and Corrective Measures Study (CMS) under the installation's RCRA permit. AOC sites I and J are not located near the Weston Dam or the spillway.

3.13.2. Environmental Consequences

Alternative 1 - No Action

The No Action alternative would not result in any adverse impacts to known hazardous waste or material sites and would not create hazardous waste since no actions will occur.

Alternative 2- Remove Dam Embankment and Spillway

Alternative 2 would result in removal of the existing embankment and draining of the lake. As is typical with construction projects, on-site hazardous materials will be present to support equipment operations. The majority of those materials will be in the form of petroleum-based fuels, oils, and lubricants. These materials will be handled and stored in accordance with all applicable state and federal laws and no negative environmental impacts resulting from these materials are expected as a result of construction. Best management practices, such as keeping equipment in good operating condition, properly storing and handling fuels, and cleaning leaks and spills immediately, would be implemented to reduce the risk of spills or other means of contamination during construction. However, this alternative would result in the transport of lake sediments downsteam and exposure of the water portions of AOC sites I and J. Prior to implementation of this alternative, sediment testing and analysis may be required. Any proposed subsurface activities would also require coordination with the South Carolina Department of Health and Environmental Control (SCDHEC).

Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 - (Preferred Alternative)

There are two known potential hazardous waste/material sites within the footprint of Weston Lake. However, these sites are not located within the vicinity of the embankment or spillway and would not be disturbed during implementation of either of these alternatives. As is typical with construction projects, on-site hazardous materials will be present to support equipment operations. The majority of those materials will be in the form of petroleum-based fuels, oils, and lubricants. These materials will be handled and stored in accordance with all applicable state and federal laws and no negative environmental impacts resulting from these materials are expected as a result of construction. Best management practices, such as keeping equipment in good operating condition, properly storing and handling fuels, and cleaning leaks and spills immediately, would be implemented to reduce the risk of spills or other means of contamination during construction.

3.14. Environmental Justice and Socioeconomic Condition

3.14.1 Affected Environment

According to Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, each federal agency must conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under, such programs, policies, and activities, because of their

race, color, national origin, or income level. Agencies must assess whether disproportionately high and adverse effects would be imposed on minority or low-income areas by federal actions. In addition, Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks, requires Federal agencies to assess the environmental health and safety risk of their actions on children.

Weston Lake and its tailwaters pass through or are adjacent to 2 census block groups (450790111021, and 450799801001) (Figure 3.1). Key demographic measures for these census block groups are given in Table 3.3. The total population from the US Census Bureau's American Community Survey (ACS) within these census block groups is 3303. The percent minority within the analyzed census block groups ranges from a low of 44% to a high of 46%. The mean percent minority of the two census block groups is 45%. The percent low income within the analyzed census block groups ranges from a low of 36% to a high of 45%. The mean percent below the poverty level within the census block groups of interest is 41%.

Table 3.3. Demographic data for census tracts near Weston Lake

Blockgroup ID:	450790119021	450799801001
State:	SC	SC
Total Population (ACS):	3202	101
Supplementary Demographic Index:	17% (57**)	15% (48**)
% minority:	44% (65**)	46% (66**)
% low income:	36% (59**)	45% (72**)
% linguistic isolation:	0% (45**)	0% (45**)
% less than high school:	6% (29**)	0% (3**)
% under age 5:	5% (42**)	0% (3**)
% over age 64:	13% (59**)	0% (0**)
Demographic Index:	40% (65**)	45 % (70**)

**** State Percentile**

All data is taken from the USEPA's environmental justice mapping and screening EJSCREEN.

Definitions of table metrics are available online at:

https://www.epa.gov/ejscreen/overview-demographic-indicators-ejscreen

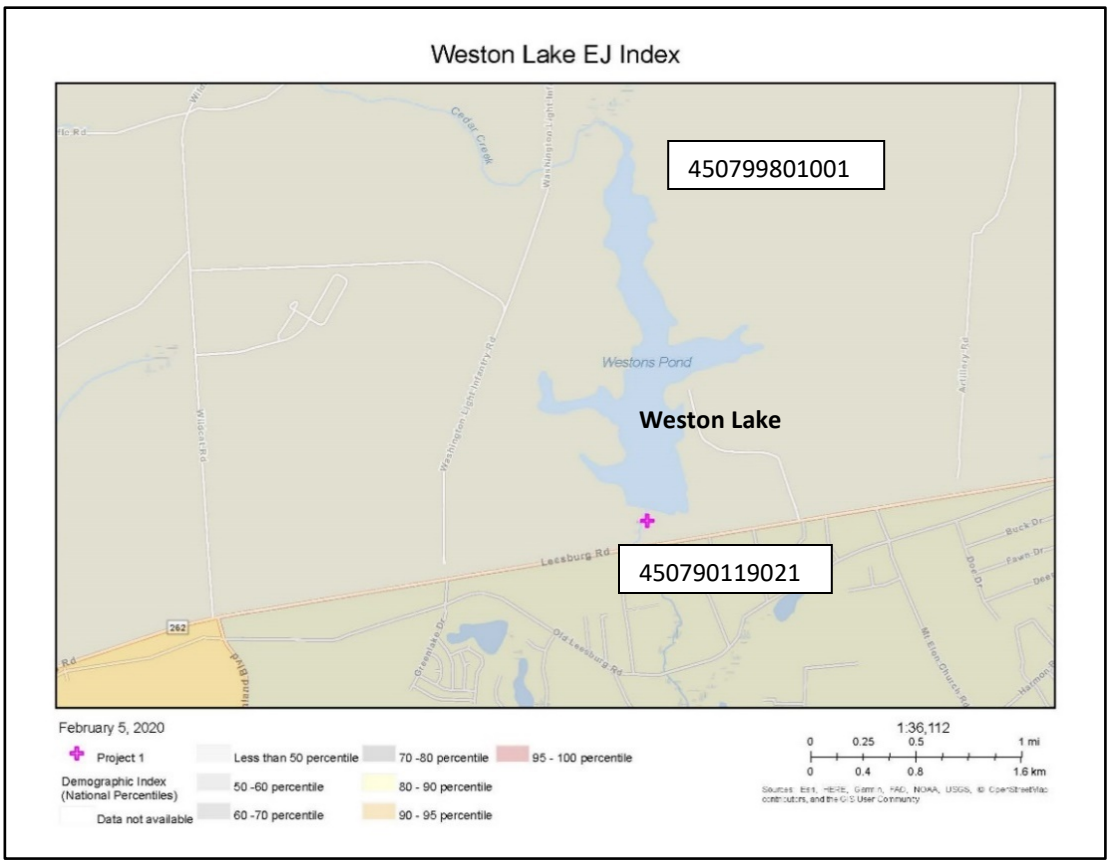

Figure 3.1 – Map of Weston Lake showing EJ Screen Indexes for census block groups.

3.14.2. Environmental Consequences

Alternative 1 - No Action

The No Action Alternative would not result in any disproportionately high or adverse effects on low income or minority populations. Selection of the No Action Alternative would not result in adverse effects to socioeconomic conditions.

Alternative 2 - Remove Dam Embankment and Spillway, Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 - (Preferred Alternative)

The area of impact from all action alternatives does not contain disproportionate populations of minority, juvenile, elderly, or low-income communities when compared to the surrounding area. The construction area is entirely within the boundaries of Fort Jackson.

Alternatives 2, 3, and 4 are not designed to create a benefit for any group or individual. There are no indications that construction of any action alternative would be contrary to the goals of Executive Order 12898, or would create disproportionately high and adverse human health or environmental impacts on minority or low-income populations of the surrounding community. Implementation of the proposed project would cause no significant adverse environmental impacts to any of the residents in the area regardless of race, national origin, or income level of residents. In all, Fort Jackson has determined that in the absence of adverse impacts to human health, environmental health risks, and safety risk, construction of Alternatives 2, 3, or 4 would have no significant or disproportional negative impacts to

any communities, including environmental justice communities or children. Schools, childcare facilities, and hospitals are not disproportionately located near Weston Lake.

3.15. Aesthetics and Recreation

3.15.1. Affected Environment

Weston Lake is the largest lake in existence at Fort Jackson, and also serves as the primary waterside recreation lake with camping facilities, picnic shelters, community house, and beach pavilion. Recreational opportunities, including fishing, waterfowl hunting, swimming, and boating, are available on Weston Lake and the area is frequently used by military personnel, their families, and visitors to the installation.

3.15.2. Environmental Consequences

Alternative 1 - No Action

Selection of the No Action Alternative would leave Weston Lake in its current state. This would maintain the current aesthetics and recreational opportunities in the area for the short-term. However, temporary emergency repairs to the embankment that were completed in 2019 do not address risk associated with activation of the spillway during high storm events that likely causes erosion of the emergency spillway. If measures are not implemented to stop the spillway erosion, there is potential for failure of the spillway and permanent loss of water height within the lake. If this were to occur, recreational opportunities such as boating, fishing, and swimming, would no longer be available.

Alternative 2- Remove Dam Embankment and Spillway

Alternative 2 would result in negative effects to recreation and aesthetics. Without the lake, there would be a permanent loss of the existing water-based recreational opportunities including boating, fishing, and swimming. Removal of the dam would result in formation of a stream channel and wetlands in the lake bed, which would require temporary installation of erosion control measures to prevent the transport of sediments downstream. Natural re-vegetation of the area would occur slowly, however once vegetation is established it would aid in reducing the transport of sediments. This alternative could be considered a negative impact to the aesthetics of the area, as views of water such as lakes are generally highly valued.

Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 - (Preferred Alternative)

Selection of Alternative 3 or Alternative 4 would result in temporary impacts to recreation and aesthetics due to drawdown of the lake and construction activities associated with repair of the embankment and spillway. Once repairs to the embankment and spillway are complete, this alternative would maintain the aesthetics and recreational opportunities that were previously available to soldiers, their families, and the public. There would be no long-term adverse effects to these resources.

3.16. Maintenance

3.16.1. Affected Environment

All alternatives would require some type of maintenance. General maintenance requirements for each alternative are discussed below.

3.16.2. Environmental Consequences

Alternative 1 - No Action

Selection of the No Action Alternative would require continuing maintenance activities at Weston Lake to maintain lake levels and to prevent spillway failure. The 2019 embankment repairs were implemented as a temporary measure to address backward erosion piping and the existing spillway lacks sufficient capacity or erosion protection to pass large storm flows.

Alternative 2- Remove Dam Embankment and Spillway

Selection of this alternative would not require maintenance of the embankment or spillway since these structures would no longer exist once construction is complete. However, measures to control mosquitos could be required until the lakebed has completely drained. The maintenance would include spraying for adult mosquitos and/or treatment of standing water for larval mosquitos. Treatment may also be required to control invasive species during re-establishment of vegetation in the lakebed.

Alternative 3 - Extended Toe Berm with Spillway Armoring, and Alternative 4 - (Preferred Alternative)

Selection of Alternative 3 or Alternative 4 would require periodic inspection and maintenance of the spillway and embankment structures as well as vegetation maintenance on the dam to prevent establishment of woody vegetation that could compromise integrity of the structure.

3.17. Best Management Practices (BMP) and Mitigation Measures

In order to reduce environmental impacts, best management practices and mitigation measures will be used during construction of any Action Alternative. These measures are outlined in Table 3.4.

Table 3.4. Best Management Practices and Mitigation Measures

Resource	Impact	BMPs and Mitigation Measures
Climate	Greenhouse gas emission	To reduce greenhouse gas emissions, the following BMPs will be utilized: reducing fugitive dust emissions, avoiding the unnecessary idling of construction equipment, and maintaining construction equipment in good operating condition.
Physiography, Geology, Topography, and Soils	Soil erosion during construction	To reduce soil erosion, the following BMPs will be utilized as needed: silt fencing and/or other control devices, mulching, removing sediment from pavement, temporary seeding, minimize exposed soil during construction, and other applicable erosion control practices. All erosion control and sedimentation control measures must be in place prior to land disturbance. Thereafter, all controls will be maintained and functioning until the area is permanently stabilized. Materials used for erosion control [hay bales, straw etc.] will be certified as weed free from the supplier. Weekly inspections will be performed to safeguard against failures. Once the project is initiated, it will be carried out expeditiously to minimize the period of disturbance. Upon project completion, all disturbed areas will be permanently stabilized with vegetative cover, riprap, or other erosion control methods. Where vegetation is removed, supplemental plantings will be installed following completion of the project. Such plantings will consist of appropriate native species.

Surface Water and Stormwater	Increased turbidity and sedimentation during construction	To reduce stormwater velocity, the following BMPs will be utilized as needed: limiting of the amount of area disturbed at a time, staging and/or phasing of the construction sequence, sediment basins and sediment traps, diverting off-site flow around the construction site, and controlling the drainage patterns within the construction site. To reduce stormwater velocity, the following BMPs will be utilized as needed: surface roughening along slopes, sediment basins and traps, level spreaders, erosion control blankets, turf reinforcement mats, riprap, and staging and/or phasing of the construction sequence. All stormwater controls will be inspected on a weekly basis.
Threatened and Endangered Species	Impacts to habitat	Contractors must not operate or store equipment outside the staging area in the adjacent foraging habitat of RCW cluster REC-A.
Air Quality	Emissions during construction	To reduce impacts to air quality, the following BMPs will be utilized: reducing fugitive dust emissions by taking the following measures; avoiding the unnecessary idling of construction equipment, imposing a strict slow speed limit for vehicular traffic in the construction site, wetting areas to reduce dust, and maintaining construction equipment in good operating condition.
Noise	Noise during construction	To reduce noise, the following BMPs will be utilized: limiting work to daylight hours and avoiding the unnecessary idling of construction equipment.
Hazardous Materials and Hazardous Waste Management	Waste during construction	To reduce Hazardous Materials and Hazardous Waste, the following BMPs will be utilized: keeping equipment in good operating condition, properly storing and handling fuels, and cleaning leaks and spills immediately. Measures will be taken to prevent POL products, trash, debris etc. from entering adjacent areas, wetlands and surface waters.

4. Cumulative Impacts

Potentially, the most severe environmental degradation does not result from the direct effects of any particular action, but from the combination of effects of multiple, independent actions over time. As defined in the CFR, 40 CFR 1508.7 (CEQ Regulations), a cumulative effect is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions."

As discussed in Section 3.0 above, implementation of the preferred alternative would have no or negligible effects on Land Use, Climate, Physiography, Topography, Geology, Hazardous Waste, Environmental Justice, or Socioeconomics; and only temporary, minor, construction related effects for Soils, Surface and Groundwater, Floodplains, Fish and Wildlife, Air Quality, Noise, Cultural Resources, Aesthetics, and Recreation. As such, these resources were not carried forward into the cumulative effects analysis. The projects or actions evaluated for cumulative effects with the preferred alternative are provided in Section 4.1. The key resource areas examined for cumulative effects are discussed in Section 4.2.

The impacts of the preferred alternative for Weston Lake (Alternative 4), when considered along with past, present, and reasonably foreseeable future actions, are cumulatively less than significant for

construction of the preferred alternative. All impacts associated with the preferred alternative are less than significant construction related activities and are not expected to contribute significantly to cumulative effects. Continuation of positive benefits to fish and wildlife, recreation, aesthetics, erosion prevention, surface water and stormwater detention would occur with construction of the preferred alternative. Any impacts associated with the preferred alternative, when added to other past, present, and reasonable foreseeable future actions, are collectively insignificant as the preferred alternative would provide a viable solution to address on-going embankment seepage and spillway erosion at the Weston Lake Dam.

4.1. Past, Present, and Reasonably Foreseeable Future Actions

Past, present, and reasonably foreseeable future actions include those projects occurring within the boundaries of Fort Jackson as well as those projects occurring within the Cedar Creek watershed outside the boundaries of the military installation.

Weston Lake is located in the Cedar Creek watershed within the boundaries of Fort Jackson. The watershed originates within the boundaries of Fort Jackson above Weston Lake and joins Myers Creek before draining into the Congaree River. The Weston Lake drainage area is largely undeveloped, and is primarily used for military training exercises, wildlife management activities, and recreation. Outside the drainage area of Weston Lake, the Cedar Creek watershed consists primarily of rural areas. Past projects occurring in this watershed include the emergency repairs to the Weston dam, emergency road repairs as a result of flooding in 2015, and an engineered breach to a dam embankment damaged by flooding in 2015. There are no known present or reasonably foreseeable future projects planned within the Cedar Creek watershed at this time.

The cantonment area, located on the western portion of Fort Jackson, is where the majority of past, present, and future projects are located for the military base. The Semmes District encompasses the southern and western portion of the cantonment and includes troop barracks, battalion headquarters, and army training units. The Victory District is located north of the Semmes District and primarily serves as the point of transition for trainees and their families. The Semmes District drains to Wildcat Creek and the Victory District drains to Gills Creek. Wildcat Creek flows to Gills Creek before emptying into the Congaree River.

4.1.1 Past Actions

<u>Weston Lake Embankment Emergency Repairs</u>

Emergency repairs to the Weston Lake embankment structure were completed in 2019. The repairs resulted in the loss of 0.20 acre of wetlands to address embankment seepage. The repairs were an interim measure to control excessive water seepage on and below the embankment and did not address spillway deficiencies.

<u>Legion Lakes Repair Project</u>

The Legion Lakes Repair Project involved repairs to the Upper Legion Lake dam and the Lower Legion Lake dike as a result of damage sustained during a large storm event in October 2015. The repairs included upgrading the Upper Legion Lake dam to meet dam safety standards by removing the trees on the downstream face of the dam and replacing the spillway. The repairs to the Lower Legion Lake dike were required to improve stability of the dike. Adverse effects associated with the Legion Lakes repairs were limited to temporary, minor, construction related impacts.

Emergency Road Repairs

In 2015, flooding from Hurricane Joaquin necessitated four emergency road repairs in the Cedar Creek watershed, south of Weston Lake. Repairs were made to four culvert failures including one on Harmon Road, two on Blue Johnston Road, and one on Wylie Road. Effects were limited to temporary, and minor construction related impacts.

Mandel Park Pond Dam Breach

In 2015, flooding from Hurricane Joaquin resulted in damage to the Mandel Park Pond embankment in the Cedar Creek watershed. The damage undermined the integrity of the structure and required an engineered dam breach in 2016. The project resulted in the transport of sediments downstream but the effects were minimized through erosion control and best management practices.

4.1.2 Present and Reasonably Foreseeable Future Actions

Semmes Lake Repair Project

The Semmes Lake Repair Project, currently under construction, involves repairs to the Semmes Lake dam as a result of breaching of the embankment and loss of pool during a large storm event in October 2015. Adverse effects associated with the Semmes Lake repair consist of minor and temporary construction-related impacts. This project is located on Wildcat Creek. Wildcat Creek joins Gills Creek before draining to the Congaree River. The Cedar Creek watershed drains to the Congaree River but does not intersect Gills Creek or Wildcat Creek.

Privatized Army Lodging Hotel and Associated Parking

A hotel and associated parking facilities are currently under construction at Fort Jackson. Construction of the hotel will likely lead to an increase in the amount of impervious surface within the Wildcat Creek watershed. These effects would be mitigated by providing measures to increase storage capacity for stormwater runoff.

New Trainee Barracks

The construction of three Trainee Barracks are proposed between Hampton Parkway and Jenkins Road. The project is located northeast of Semmes Lake and outside the Cedar Creek watershed. The project would result in a minor increase to impervious surface in the Gills Creek watershed that would be offset by stormwater management measures.

Reception Complex Renovations

Numerous buildings in the Reception Complex on Washington Road are being renovated and a Clothing Initial Issue Point (CIIP) facility will be constructed on the same site. The project is located in the Wildcat Creek watershed. Impacts associated with this project are expected to be limited to temporary, minor, construction-related impacts.

Future Road Improvement Projects

Road improvement projects currently under consideration include the widening of Boyden Arbor Road and Golden Arrow Road from two lanes to four lanes, and the construction of a new two-lane or four-lane road that will connect to Boyden Arbor Road and Golden Arrow Road. These projects are located north of Semmes Lake, in the Gills Creek watershed. Boyden Arbor Road crosses Gills Creek, northwest of its intersection with Dixie Road. Road widening and new road construction projects have the potential to adversely affect wetlands and other waters due to the nature and extent of these infrastructure improvements. While impacts to wetlands or other waters is unknown at this time, the

projects would be expected to comply with all federal, and state regulations and avoid and minimize resource impacts to the maximum extent practicable. If resource impacts could not be avoided, mitigation would be required to offset loss.

Future Equipment Fielding Facility

A new Equipment Fielding Facility (EFF) located on an 8-acre track off Ewell Road is currently in the NEPA process. Construction of the proposed facility would require removal of existing forest stands and increase impervious surface in the Wildcat Creek watershed. Compliance with local stormwater management requirements is expected to offset any increase in stormwater runoff.

4.2. Resource Areas Evaluated For Cumulative Effects

4.2.1 Wetlands

The preferred alternative (Alternative 4), when considered with past, present, and reasonably foreseeable future projects, would not result in significant wetland impacts. The Weston Lake dam emergency repairs resulted in the loss of approximately 0.20 acre of wetlands. However, these wetlands primarily exist because of the embankment seepage that has occurred since the lake was constructed in the 1960s and the project was authorized under a Nationwide Permit (NWP) # 3. NWPs are permits available for projects determined to have minimal adverse environmental impacts. No wetland loss occurred with the Legion Lakes dam and dike repairs. The Semmes Lake repair project is expected to result in the loss of 0.6 acre of wetlands. However, the project limits were reduced to the maximum extent practicable and the project was authorized under a Nationwide Permit (NWP) #3. No other known wetland impacts or loss is anticipated for projects currently under construction and any wetland impacts associated with reasonably foreseeable future projects are unknown at this time. However, these projects would be required to meet federal and state regulatory permitting requirements, including mitigation requirements, thereby limiting their contribution to cumulative effects.

4.2.2 Vegetation

The preferred alternative (Alternative 4), when considered with past, present, and reasonably foreseeable future actions within Fort Jackson and the Cedar Creek watershed, would not result in significant cumulative effects to vegetation. The Weston Lake dam repairs will result in the permanent conversion of 0.46 acre of forested vegetation to herbaceous vegetation. The conversion is necessary to maintain integrity of the embankment structure after repairs and there would be no loss of significant vegetation resources. None of the projects involving dam, dike or spillway repairs, including Legion Lakes, Weston Lake, or Semmes Lake, are located in areas containing rare plant communities. All of the present and future infrastructure projects will occur in the cantonment area where grassed land typically occurs along roadways, on ranges, or in locations where development has occurred. Therefore, these projects are not expected to contribute largely to cumulative effects.

4.2.3 Threatened and Endangered Species

The preferred alternative, when considered with past, present, and reasonably foreseeable future actions within Fort Jackson and the Cedar Creek watershed, would result in less than significant cumulative effects to threatened and endangered species. Weston Lake Dam is located within the ½ mile foraging partitions for two clusters of the Federally-endangered RCW. Repairs to the Weston Lake embankment will require the removal of 0.2 acre of RCW foraging habitat however; construction is

unlikely to result in adverse effects to any species. The USFWS concurred with this determination by letter dated 31 March 2020. Past projects including the Legion Lakes and Weston Lake repairs did not result in adverse effects to species or their habitats. No loss of species or habitat is anticipated for the Semmes Lake repair or for construction of any roads or buildings in the cantonment area. The cantonment area is a highly urbanized area that is located outside of any known locations of threatened or endangered species and no critical habitat exists on Fort Jackson.

5. Public Involvement and Coordination

The CEQ regulations require that agencies "(a) make diligent efforts to involve the public in preparing and implementing their NEPA procedures and (b) provide public notice of NEPA-related hearings, public meetings, and the availability of environmental documents so as to inform those persons and agencies who may be interested or affected". (40 CFR 1506.6(a) and (b)). This document will be coordinated with Federal, State, and local government agencies having jurisdictional responsibilities, or otherwise having an interest in the project; Native American Tribes; media outlets; and the public. All comments received during the comment period will be included in Appendix F and responses to comments will be incorporated into the Final EA or addressed in Appendix F.

6. Conclusion

This EA evaluates the potential effects on the natural and human environment from the proposed repairs to the Weston Lake embankment and spillway. The EA examines the proposed action (Preferred Alternative), other viable alternatives, and a No Action Alternative. This EA evaluates potential long-term and short-term effects on Land Use, Climate, Physiography, Geology, Topography, and Soils, Surface Water and Stormwater, Groundwater, Floodplains and Wetlands, Fish and Wildlife, Vegetation, Threatened and Endangered Species, Air Quality, Noise, Cultural Resources, Hazardous Materials & Hazardous Waste Management, Environmental Justice and Socioeconomic Conditions, Aesthetics and Recreation, and Cumulative Impacts.

Based on the foregoing, the proposed preferred action alternative will not result in a significant effect on the quality of the natural or human environment. Additionally, the implementation of best management practices and related mitigation measures (see section 3.17) will ensure that the minor negative effects to the individual factors discussed above are further minimized to the extent practicable. Therefore, an Environmental Impact Statement will not be required. If this conclusion is confirmed following circulation of this EA and consideration of comments, A Finding of No Significant Impact (FONSI) would be signed. Fort Jackson selected the preferred alternative for Weston Lake Dam by considering the following criteria (Table 6.1):

- Does the alternative meet dam safety standards?
- Does the alternative maintain historic stormwater storage functions?
- Does the alternative have no significant impacts to environmental resources?
- Does the alternative cause no impacts to the floodplain?
- Does the alternative provide recreational opportunity and aesthetic value for soldiers, their families, and visitors?
- Does the alternative minimize maintenance requirements?

Table 6.1 - Summary of Each Alternative's Ability to Meet Selection Criteria

Criterion	No Action	Alternative 2	Alternative 3	Preferred Alternative
Does the alternative meet dam safety standards	Meets Criteria**	Meets Criteria*	Meets Criteria**	Meets Criteria**
Does the alternative maintain historic stormwater storage functions	Meets Criteria	Does Not Meet Criteria	Meets Criteria	Meets Criteria
Does the alternative have no significant impacts to environmental resources	Meets Criteria	Meets Criteria	Meets Criteria	Meets Criteria
Does the alternative cause no or minimize impacts to the floodplain	Meets Criteria	Does Not Meet Criteria	Meets Criteria	Meets Criteria
Does the alternative provide recreational opportunity and aesthetic value for soldiers, their families, and visitors	Meets Criteria	Does Not Meet Criteria	Meets Criteria	Meets Criteria
Does the alternative minimize maintenance requirements	Does Not Meet Criteria	Meets Criteria	Meets Criteria	Meets Criteria

*Does not involve construction or maintenance of a dam so dam safety standards are not applicable.

**Any dam owned or operated by any department or agency of the federal government is exempt from the Dams and Reservoirs Safety Act so the regulations are not applicable.

7. References

Richland County Mapping Services
2020. RC GEO Flood Data Viewer. http://www.richlandmaps.com/apps/flood15/?lat=33.99111&lon=-80.83066. Search conducted February 5, 2020.

South Carolina Department of Health and Environmental Control
2020. South Carolina Dams and Reservoirs Safety Act. https://www.scdhec.gov/environment/bureau-water/dams-reservoirs/laws-regulations-dams-reservoirs. Search conducted February 6, 2020.

U.S. Department of Agriculture.
2020. *Web Soil Survey.* http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm. Search conducted January 28, 2020.

U.S. Environmental Protection Agency
2020. What Climate Change means for South Carolina. https://19january2017snapshot.epa.gov/production/files/documents/climate-change-SC.pdf. Accessed January 29, 2020.

U.S. Environmental Protection Agency
2020. EJ Screen. https://ejscreen.epa.gov/mapper. Search conducted February 5, 2020.

U.S. Environmental Protection Agency
2020. EnviroMapper. https://geopub.epa.gov/myem/efmap/index.html?ve=13,44.704737,-74.713330&pText=Fort%20Jackson,%20Town%20of%20Hopkinton,%20New%20York. Search conducted January 22, 2020.

U.S. Fish Wildlife Service South Carolina Field Office
2020. Endangered, Candidate and At-Risk Species County Listings. Updated September 9, 2019. http://www.fws.gov/charleston/EndangeredSpecies_County.html. Accessed February 3, 2020.

U.S. Geological Survey
2020. StreamStats. https://streamstats.usgs.gov/ss/. Accessed February 6, 2020

Weather Atlas USA
2020. South Carolina Weather and Climate Information. https://www.weather-us.com/en/south-carolina-usa/columbia- climate#rainfall. Accessed January 28, 2020