DRAFT ENVIRONMENTAL ASSESSMENT WITH FINDING OF NO SIGNIFICANT IMPACT

Carlyle Lake - Bond, Clinton, and Fayette, Counties, Illinois

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East Spillway Nature Trail

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Summary

The St. Louis District of the U.S. Army Corps of Engineers (Corps) is proposing to construct a nature trail, namely the East Spillway Nature Trail, at the southeast end of Carlyle Lake. The trail would connect the General Dean Recreation Area to the east side of the Main Dam. Carlyle Lake is located in Fayette, Clinton, and Bond Counties, Illinois. The proposed project is located in Clinton County, Illinois. This action is proposed as part of the 2016 Carlyle Lake Master Plan Update. Carlyle Lake is managed by the St. Louis District Army Corps of Engineers. Many other entities have input into the operation of Carlyle Lake, such as the Illinois Department of Natural Resources, marina concessionaires, upstream and downstream interest groups, farmers, local and civic groups, hunters, fishermen, campers, sailors, businesses, and wildlife observers.

The Corps has prepared this document in compliance with the National Environmental Policy Act and other relevant federal and state laws and regulations. This environmental assessment evaluates the direct, indirect, and cumulative effects for the East Spillway Nature Trail component of the updated 2016 Carlyle Lake Master Plan. The updated Master Plan presents a current inventory and assessment of land and water resources, physical improvements, resource use objectives, and discussion of lake operations and management. In addition to the Tentatively Selected Plan, the Corps also evaluated a No Action alternative. Under the No Action alternative, no nature trail would be constructed connecting the General Dean Recreation Area to the East side of the Main Dam.

This environmental assessment describes and summarizes the anticipated physical, biological, and social impacts of the proposed primitive hiking trail on the environment. Topics of discussion include, among others, (1) federally threatened and endangered species, (2) cultural and socioeconomic components, (3) compliance with relevant laws and regulations, and (4) public and inter-agency coordination.

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1 INTRODUCTION

This document is a Draft Environmental Assessment (EA) with an attached unsigned Finding of No Significant Impact (FONSI) for the construction of the East Spillway Nature Trail, at the southeast end of Carlyle Lake. The purpose of this EA is to evaluate potential environmental impacts of the proposed trail construction, determine if the direct, indirect, and cumulative environmental impacts rise to the level of significant, and to serve as a record of interagency coordination for the proposed action.

1.1 Project Location and Description

Carlyle Lake is located in Bond, Clinton, and Fayette Counties of south-central Illinois. (Figure 1) The dam site is located on the Kaskaskia River about 50 miles east of St. Louis, MO. The Corps of Engineers (Corps) and the State of Illinois Department of Natural Resources (IDNR) operate recreation areas and manage the public lands of the lake. The purpose of the lake includes flood risk reduction on the Kaskaskia and Mississippi Rivers, navigation releases for the Kaskaskia River, domestic and industrial water supply, water quality enhancement, fish and wildlife conservation, and recreation.

1.2 Purpose and Need of the Proposed Project

This EA is being completed to evaluate existing conditions and the potential impacts of a proposed nature trail for the project. The purpose of the proposed East Spillway Nature Trail is part of an overall plan to connect the General Dean Recreation Area with the east side of Carlyle Lake (Figure 2). This proposed trail will shorten the length of travel for nature enthusiasts to gain access to the east side of Carlyle Lake. The trail can also be used as an interpretive and informational trail to teach the public about bottomland forest habitat, prairie habitat and the eastern massasauga rattlesnake that inhabits area around Carlyle Lake.

1.3 Authority

Carlyle Lake was authorized by Congress through the Flood Control Act of 1938 and modified by the Flood Control Act of 1958, House Document No. 232, Eighty-fifth Congress, 1st session. The mission of recreation was authorized by Public Law 78-534, December 2, 1944, Flood Control Act of 1944.

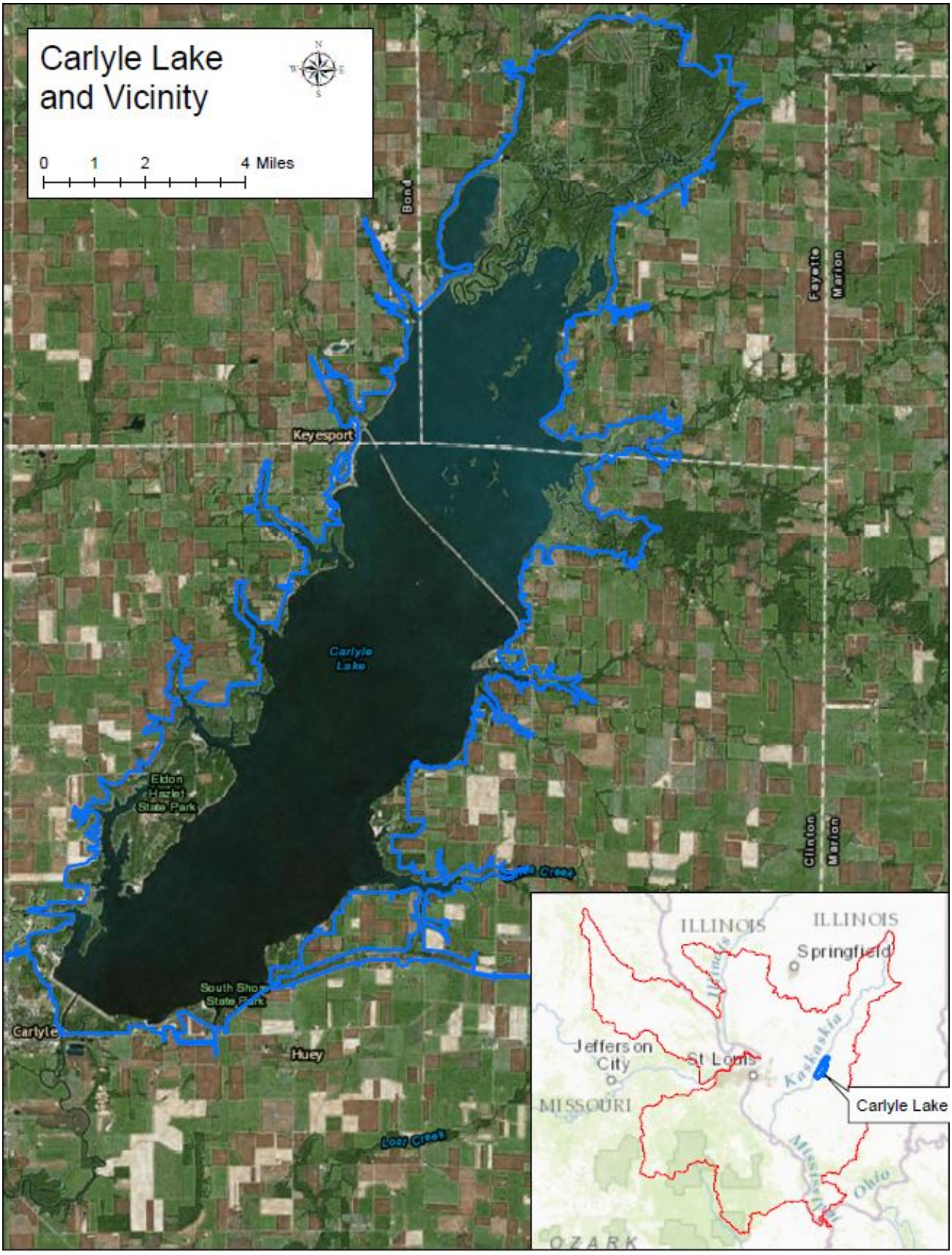

Figure 1. Location of Carlyle Lake, Fayette, Clinton, and Bond Counties, Illinois.

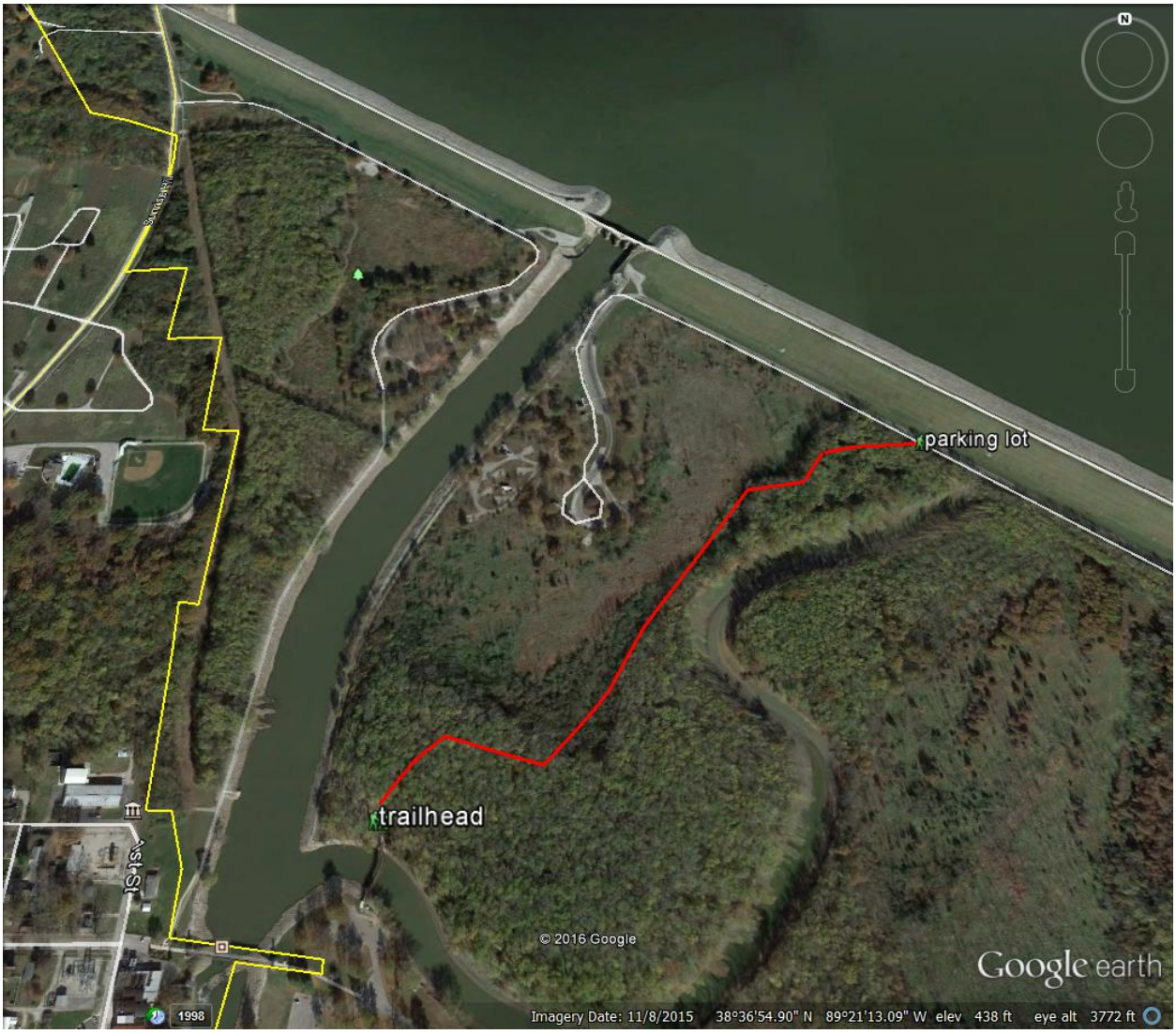

Figure 2. East Spillway Nature Trail location.

2 Alternatives Considered

This section of the EA describes the Alternatives considered, and compares the alternatives in term of their environmental impacts and their achievement of objectives. Two alternatives were considered for this project.

2.1 Alternative 1: No Action Alternative (Future Without Project)

The "No Action" alternative assumes that the proposed project would not be realized. NEPA requires that a No Action Alternative be addressed to provide a baseline or reference against which to describe environmental effects of the action alternatives. Thus, under this No Action Alternative, no nature trail would be constructed in this location.

2.2 Alternative 2 – Construction of the Nature Trail (Tentatively Selected Plan)

The East Spillway Nature Trail would be constructed through a forested area by mowing a path approximately 15 foot wide with a brush hog mower. No earth moving would be associated with this project. The original landscape would not be altered in any way, except to manage the existing vegetation.

3 Affected Environment and Environmental Consequences

This chapter summarizes the biological, physical, and social environments of the affected project area relative to the alternatives under consideration. Relevant resources are addressed in terms of existing conditions, as well as their projected condition under each of the alternatives being considered.

3.1 Federally Threatened and Endangered Species: Biological Assessment

Existing Condition

In compliance with Section 7(c) of the Endangered Species Act of 1973, a list of species and critical habitat was acquired from the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) website: http://ecos.fws.gov/tails/extMod/ipacGetActivity!retrieveDocument.action?pdfFileName=/mnt/secure/webdocs/tails/33431/v4932545.pdf on 4 August 2016 for the proposed project vicinity in Clinton County, Missouri (Table 1). Habitat requirements and impacts of the proposed federal action are discussed for each species.

Table 1. Federally threatened and endangered species from the proposed project area (Clinton County) considered in the effects analysis.

Species	Listing	Habitat
Indiana bat (*Myotis sodalis*)	Endangered	Caves, mines (hibernacula); small stream corridors with well-developed riparian woods; upland forests (foraging)
Northern Long-eared bat (*Myotis septentrionalis*)	Threatened with 4(d) rule	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests and woods
Eastern massasauga (*Sisturus catenatus*)	Threatened	Graminoid dominated plant communities (fens, sedge meadow, peatlands, wet prairies, open woodlands, and shrublands)
Piping plover (*Charadrius melodus*)	Endangered	May be present in Clinton County during migration
Eastern prairie fringed orchid (*Platanthera leucophaea*)	Threatened	Mesic to wet prairies
Lakeside daisy (*Hymenoxys acaulis var. glabra*)	Threatened	Dry rocky prairies

Indiana bat - The endangered Indiana Bat has been noted as occurring in several Illinois and Missouri counties. Indiana Bats are considered to potentially occur in any area with forested habitat. Indiana Bats migrate seasonally between winter hibernacula and summer roosting habitats. Winter hibernacula includes caves and abandoned mines. Females emerge from hibernation in late March or early April to migrate to summer roosts. Females form nursery colonies under the loose bark of trees (dead or alive) and/or in cavities, where each female gives birth to a single young in June or early July. A maternity colony may include from one to 100 individuals. A single colony may utilize a number of roost trees during the summer, typically a primary roost tree and several alternates. Some males remain in the area near the winter hibernacula during the summer months, but others disperse throughout the range of the species and roost individually or in small numbers in the same types of trees as females. The best available data indicate that the species or size of tree does not appear to influence whether Indiana Bats utilize a tree for roosting provided the tree exhibits any of the following characteristics: exfoliating bark, cracks, crevices, cavities. Data also indicate that the use of a particular tree is influenced by conditions, such as solar exposure, temperature and precipitation (USFWS 2007, USFWS 1999).

During the summer, Indiana Bats frequent the corridors of small streams with well-developed

riparian woods, as well as mature bottomland and upland forests. They forage for insects along stream corridors, within the canopy of floodplain and upland forests, over clearings with early successional vegetation (old fields), along the borders of croplands, along wooded fence rows, and over farm ponds and in pastures. It has been shown that the foraging range for the bats varies by season, age and sex and ranges up to 81 acres (33 ha). Although this species are not known to occur within the proposed project area at this time, suitable Indiana Bat summer habitat may be located in the forested areas in and adjacent to the proposed project area.

Alternative 1 – No Action (Future without Project) - Under the No Action Alternative, the area would remain in its current condition with a portion of the trail subject to inundation during water release rates above 5,000 CFS.

Alternative 2 – Construction of East Spillway Nature Trail - As currently planned, this proposed project involves no tree clearing. Further, no hibernacula, nursery, or foraging habitat would be adversely impacted by the construction of the nature trail. There would be no tree removal or other bat disturbance during construction of the trail. Microhabitat changes may occur near the trail/forest interface. Therefore, the St. Louis District has determined that the Tentatively Selected Plan "*may affect, but is not likely to adversely affect*" the Indiana bat.

Northern long-eared bat - The Northern Long-Eared Bat is sparsely found across much of the eastern and north central United States, and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and eastern British Columbia. Northern Long-Eared Bats spend winter hibernating in large caves and mines. During summer, this species roosts singly or in colonies underneath bark, in cavities, in crevices of both live and dead trees, and manmade structures such as barns and culverts. Foraging occurs in interior upland forests. Forest fragmentation, logging and forest conversion are major threats to the species. One of the primary threats to the northern long-eared bat is the fungal disease, white-nose syndrome, which has killed an estimated 5.5 million cave hibernating bats in the Northeast, Southeast, Midwest and Canada. Although this species are not known to occur within the proposed project area at this time, suitable Northern Long-Eared Bat summer habitat may be located in the forested areas in and adjacent to the proposed project area.

Alternative 1 – No Action (Future without Project) - Under the No Action Alternative, the area would remain in its current condition with a portion of the trail subject to inundation during water release rates above 5,000 CFS.

Alternative 2 – Construction of East Spillway Nature Trail - As currently planned, this proposed project involves no tree clearing. Further, no hibernacula, nursery, or foraging habitat would be adversely impacted by the construction of the nature trail. There would be no tree removal or other bat disturbance during construction of the trail. Microhabitat changes may occur near the trail/forest interface. Therefore, the St. Louis District has determined that the Tentatively Selected Plan "*may affect, but is not likely to adversely affect*" the northern long-eared bat.

Eastern massasauga – The eastern massasauga rattlesnake is listed as a federally threatened species and is extant is several Illinois counties. The largest known population in Illinois is found in the vicinity of Carlyle Lake (Clinton, Bond and Fayette Counties) where it hibernates near the lake shoreline. Massasaugas live in wet areas, including wet prairies, marshes and low areas along rivers and lakes. In many areas massasaugas also use adjacent uplands, including forest, during part of the year. They often hibernate in crayfish burrows but they also may be found under logs and tree roots or in small mammal burrows. Unlike other rattlesnakes, massasaugas hibernate alone. Impacts to this species and its associated habitats would be avoided.

Alternative 1 – Under the No Action Alternative, the area would remain in its current condition with a portion of the trail subject to inundation during water release rates above 5,000 CFS.

Alternative 2 – Construction of East Spillway Nature Trail - The eastern massasauga rattlesnake is known to exist in the East Spillway prairie area. The proposed trail will start at the General Dean Bridge Area ad extend through the bottomland timber area extending northward toward the Main Dam. Every effort would be made to keep the trail in the forested area away from suitable habitat. The pathway will be marked prior to cutting the trail to ensure little or no prairie habitat is impacted. No land clearing or construction methods will be used to construct the trail. The proposed trail will be a mowed pathway. Mowing for the path would take place during the hibernating period of the eastern massasauga rattlesnake. The hibernating period is considered to be between October 16th and May 15th. Therefore, the St. Louis District has determined the development of the East Spillway Nature Trail "*may affect, but is not likely to adversely affect"* the eastern massasauga rattlesnake.

Piping plover – Piping plovers use wide, flat, open, sandy beaches with very little grass or other vegetation. Piping plovers are migratory birds and occasionally are seen on Illinois shorelines or wetlands. In the spring and summer they breed in northern United States and Canada. The female lays four eggs in its small, shallow nest lined with pebbles or broken shells. Both parents care for the eggs and chicks. When the chicks hatch, they are able to run about and feed themselves within hours. There are three locations where piping plovers nest in North America: the shorelines of the Great Lakes, the shores of rivers and lakes in the Northern Great Plains and along the Atlantic Coast. In the fall, plovers migrate south and winter along the coast of the Gulf of Mexico or other southern locations. Piping plovers are listed as endangered due to habitat loss or degradation, nest disturbance, and predation.

Alternative 1 – Under the No Action Alternative, the area would remain in its current condition with a portion of the trail subject to inundation during water release rates above 5,000 CFS.

Alternative 2 – Construction of East Spillway Nature Trail - It is possible that the piping plover could occasionally be seen in the project area during its fall southern migration. There is no known nesting habitat in the proposed project area. In general, the bird is a rare migrant along the Middle Mississippi River, and during migration, exposed sand bars provide temporary feeding habitat. The proposed project would not eliminate any habitat preferred by the piping

plover. Therefore, the St. Louis District has determined the development of the East Spillway Nature Trail would have "*no effect*" on the piping plover.

Eastern prairie fringed orchid - The eastern prairie fringed orchid occurs in a wide variety of habitats, from mesic prairie to wetlands such as sedge meadows, marsh edges, and even bogs. It requires full sun for optimum growth and flowering and a grassy habitat with little or no woody encroachment. A symbiotic relationship between the seed and soil fungi, called mycorrhizae, is necessary for seedlings to become established. This fungi helps the seeds assimilate nutrients in the soil.

Blossoms of the orchid often rise just above the height of the surrounding grasses and sedges. The more exposed flower clusters are more likely to be visited by the hawk moth pollinators, though they are also at greater risk of being eaten by white-tailed deer. Seed capsules mature over the growing season and are dispersed by the wind from late August through September. Early decline was due to the loss of habitat, mainly conversion of natural habitats to cropland and pasture. Current decline is mainly due to the loss of habitat from the drainage and development of wetlands. Other reasons for the current decline include succession to woody vegetation, competition from non-native species and over-collection.

Alternative 1 – No Action (Future without Project) - Under the No Action Alternative, the area would remain in its current condition with a portion of the trail subject to inundation during water release rates above 5,000 CFS.

Alternative 2 – Construction of East Spillway Nature Trail - The eastern prairie-fringed orchid is not known to occur in the proposed project area and suitable habitat type is not present in the proposed project area. Therefore, the St. Louis District has determined the development of the East Spillway Nature Trail would have "*no effect*" on the eastern prairie fringed orchid.

Lakeside daisy – This plant is found in dry, rocky prairie grassland underlain by limestone. It requires open sites with full sun. Although it grows in Great Lakes states and along the Canadian shore of Lake Huron, it is named for Lakeside, Ohio, near one of its best known sites. Limestone quarrying destroys the daisy's habitat. Collectors may also pose a threat, since the daisy is now found in just a handful of sites. In the United States it is known only from the Marblehead Peninsula area in northern Ohio, three restored populations in northern Illinois (where it was known historically from two sites), and a single, extremely small colony in Michigan's Upper Peninsula.

The wide area encompassing known lakeside daisy sites suggests that the species was once widespread in prairie habitats throughout the Midwestern United States and along Huron's northern shore. Fire suppression practices have eliminated the wildfires which once regularly cleared prairie grasslands of the encroaching woods. Now the expansion of shrubs and trees threatens the daisy, which needs full sun to survive.

Alternative 1 – No Action (Future without Project) - Under the No Action Alternative, the area would remain in its current condition with a portion of the trail subject to inundation during water release rates above 5,000 CFS.

Alternative 2 – Construction of East Spillway Nature Trail - The lakeside daisy is not known to occur in the proposed project area and suitable habitat type is not present in the proposed project area. Therefore, the St. Louis District has determined the development of the East Spillway Nature Trail would have "*no effect*" on the lakeside daisy.

3.2 **Topography and Geology**

Topography Existing Conditions – The topography of the land around the lake is one of moderately low relief with gently rolling hills and alluvial valleys. The highest elevation in the area is about four miles southwest of Carlyle, Illinois and is approximately 580 feet National Geodetic Vertical Datum (NGVD).

More than seventy percent of the land in the area has a slope of less than 2 percent. Of the remainder, slightly less than 20 percent of the land is gently sloping and only about 10 percent has a slope of 5 percent or more.

The normal summer pool (joint use pool) of the lake is 445.0 (NGVD), which provides a water surface area of approximately 25,000 acres and 87 miles of shoreline. The lake extends upstream from the dam about 13 miles and is 1 to 3 miles wide.

Geology Existing Conditions – Bedrock is seldom exposed to view in the Carlyle Lake area because it is buried by younger glacial age materials. The youngest bedrock is from the Pennsylvanian period, which is 320 to 286 million years ago. This is where major deposits of coal are found in this part of Illinois. Herrin #6 Coal is the major seam of coal found in this area and it is located about 500 feet below Carlyle Lake and the surrounding region. Deeper and older rock formations yield minor amounts of oil and natural gas.

The youngest materials found at the surface consist of glacial derived materials such as till and loess. During the Illinoisan period, about 191,000 to 130,000 years ago, the region was covered in ice, which eroded the upland and covered the area with glacial materials. This activity created the smooth plain and shallow valley topography we see within the region today. This glacial till can be seen along the wave-cut banks of the lake and is called Vandalia till. It is generally composed of silt with some small pebbles.

Alternative 1 – No Action (Future without Project) - Under the No Action Alternative, no adverse impacts to the topography or geology are anticipated to occur.

Alternative 2 – Construction of East Spillway Nature Trail – No changes to the topography or geology are anticipated to occur as a result of the construction of the proposed East Spillway Nature Trail.

3.3 Water Quality

Existing Conditions – The water quality in Carlyle Lake and the downstream river channel is generally good and is of suitable quality for uses, such as:

- Water Supply
- Primary and secondary water contact recreation
- Support for desirable biological communities

A routine water quality monitoring and investigation program is in place and managed by the St. Louis District, U.S. Army Corps of Engineers. Because the lake is very shallow and susceptible to high winds, it often prevents the lake from stratifying permanently during the summer months. During extended periods with little wind and high air temperatures the likelihood of undesirable algae blooms greatly increases. Upon subsequent algae die off, the dissolved oxygen in the lake as well as the downstream discharge can become severely depressed. This condition, combined with minimum downstream discharge, can cause minor fish kills in the lake as well as below the dam. When this occurs, operational modifications such as, changing the release source from the sluice gate to the spillway, are implemented in order to improve downstream water quality. In addition, the minimum release is increased from 50 cubic feet per second (cfs) to 100 cfs. Using these management techniques would help ensure the lake continues to provide a suitable source for drinking water with the exception of potential taste and odor issues sometimes associated with algae blooms.

Generally, the water collected at all sampling sites in the lake, tributaries and tailwater meet or exceed State water quality standards for primary and secondary water contact recreation, which include swimming, boating, fishing and water skiing. Even though phosphorous levels routinely exceed State water quality standards, discharge from the lake generally has lower concentrations of phosphorous than the incoming tributary flows. Also on a few occasions, the tailwater has not met the minimum dissolved oxygen standards established by the State of Illinois.

There are several potential pollution sources, but at present time, no major water quality degradation to the lake or streams is apparent. Continued water quality monitoring will ensure the potential for water quality degradation is kept to a minimum.

Alternative 1 – No Action (Future without Project) – Water quality is anticipated to remain unchanged.

Alternative 2 – Construction of East Spillway Nature Trail – No significant changes in water quality are anticipated with construction of the nature trail.

3.4 Air Quality

Existing Condition – The Clean Air Act of 1963 requires the U.S. Environmental Protection Agency (EPA) to designate National Ambient Air Quality Standards (NAAQS). The EPA has

identified standards for seven pollutants: lead, sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone, particulate matter less than 10 microns in diameter, and particulate matter less than 2.5 microns. Clinton County, Illinois currently meets all EPA air quality standards (USEPA 2009).

Alternative 1 – No Action (Future without Project) – There would be no change in air quality under this alternative.

Alternative 2 – Construction of East Spillway Nature Trail – Short term temporary changes in air quality would occur from brush-hog maintenance of the trail.

3.5 Recreation

Existing Conditions – The use of recreational trails has become one of the most popular outdoor recreation activities at Carlyle Lake. The wide variety of recreation activities that trails support, contributes to their popularity. Over half of the visitors to Carlyle Lake use the trails on public lands. The majority of trails at Carlyle Lake are classified as multi-use trails and can be used for walking, running, jogging, hiking, and bicycling. The Corps of Engineers offers approximately 18 miles of multi-use trails which connect to City routes and South Shore State Park. Currently the area proposed for construction of the East Spillway Nature Trail is not utilized for any recreational purposes. A Carlyle Lake Trail Plan has been developed and can be found as Appendix C of the 2016 Master Plan.

Alternative 1 – No Action (Future without Project) – The area would continue to be unexploited for recreational purposes.

Alternative 2 – Construction of East Spillway Nature Trail – The new nature trail would likely attract new visitors to the area not only for hiking, but for other popular activities such as wildlife watching, birding, and nature photography.

3.6 Historic and Cultural Resources

Since the unimproved interpretive nature trail would have little potential for affecting any historic properties due to previous disturbance in the project area. The District has determined that no further survey is needed for the proposed projects. Pursuant to Section 106 of the National Historic Preservation Act (P.L.89-665, as amended), and the implementing regulation 36CFR800, a letter requesting concurrence with the determination of no significant impact was sent to the Illinois Office of Historic Preservation. Concurrence from the Office is dated 23 August 2016 (see Pertinent Correspondence, Appendix A). In the unlikely event that archaeological cultural deposits or historic sites are discovered during the project, all activity in the immediate area would halt until the newly discovered site is evaluated. The site would be protected from construction impacts until its eligibility for the National Register is determined in consultation with the Illinois State Historic Preservation Officer and any appropriate mitigation is complete.

3.7 Hazardous, Toxic, and Radioactive Water (HTRW)

An Environmental Condition of Property is not required in accordance with ER 200-2-3 for this action.

3.8 Socio-Economic Resources

Existing Conditions – Natural and recreational resources at Carlyle Lake provide ample social, economic and environmental benefits for both visitors and the local economy. Having local recreation options close to the reservoir promote economic investment, environmental awareness and social well-being to local residents and visitors by providing jobs, education, and exercise opportunities. Recreation at Carlyle Lake is also an economic engine for local business, communities and the region. The town of Carlyle caters to local residents and visitors by offering resorts, marinas, grocery stores, and gasoline for cars and recreation vehicles. Visitor use also contributes to sales of recreation equipment, such as boats, campers, tents and fishing gear.

Alternative 1 – No Action (Future without Project) – No Change in the current Socio-economic benefits are anticipated.

Alternative 2 – Construction of East Spillway Nature Trail – The new trail would likely attract new visitors to the area, thus further increasing local economic benefits.

3.9 Relevant Laws and Regulations, Compliance

3.9.1 Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations)

Executive Order 12898 requires "to the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report of the National Performance Review, each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its program, policies and activities on minority population and low-income populations…" Because the impact area of this project will be located in a wooded, unpopulated, uninhabited section of Carlyle Lake is not anticipated that there would be any adverse impacts on minority and low-income populations.

Also included with environmental justice are concerns pursuant to EO 13045, Protection of Children from Environmental Health Risks and Safety Risks. This EO directs federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children under the age of 18. These risks are defined as "risks to health or to safety that are attributable to products or substances that the child is likely to come into contact with or ingest." As above, because this project will be located in a wooded, unpopulated, uninhabited section of Carlyle Lake with no known hazardous, toxic, or radioactive wastes, it has been

determined that the proposed action would not adversely affect or have significant impacts on the health or environment of children under the age of 18.

3.9.2 Bald and Golden Eagle Protection Act of 1940

On August 9, 2007 the bald eagle was removed from the federal list of threatened and endangered species. It remains protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The Bald and Golden Eagle Protection Act prohibits unregulated take of bald eagles. The Fish and Wildlife Service recently finalized a rule defining "take" that includes "disturb." "Disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (USFWS 2007). No known active eagle nests can be found in the Spillway or Old River Channel area below the Main Dam. Eagles do congregate in the winter season in these areas to feed on fish, but they vacate the area in the spring months. No bald eagles are anticipated to be impacted by the East Spillway Nature Trail.

3.9.3 Clean Water Act (Sections 401 and 404)

No jurisdictional wetlands, waterways or other Waters of the United States would be affected by the proposed access, repair, and construction methods associated with this proposed project. As such, the St. Louis District, Regulatory Branch determined that no Section 404 Clean Water Acts permits would be required to complete the project as proposed.

4 CUMULATIVE IMPACTS

A cumulative impact is defined as: The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Cumulative impacts are studied to enable the public, decision-makers, and project proponents to consider the "big picture" effects of a project on the community and the environment. In a broad sense, all impacts on affected resources are probably cumulative; however, the role of the analyst is to narrow the focus of the cumulative effects analysis to important issues of national, regional, or local significance (CEQ, 1997).

The Council on Environmental Quality (CEQ) issued a manual entitled Considering Cumulative Effects Under the National Environmental Policy Act (1997). This manual presents an 11 step procedure for addressing cumulative impact analysis. The cumulative effects analysis for the Proposed Action followed these 11 steps, shown in Table 3. The following subsections address scoping, the affected environment, and environmental consequences for the Proposed Action.

Table 2. CEQ's 11 step approach for assessing cumulative impacts.

CEQ's 11-Step Approach for Assessing Cumulative Impacts	
Component	**Steps**
Scoping	1. Identify resources
	2. Define the study area for each resource
	3. Define time frame for analysis
	4. Identify other actions affecting the
Describing the Affected Environment	5. Characterize resource in terms of its
	6. Characterize stresses in relation to
	7. Define baseline conditions
Determining the Environmental Consequences	8. Identify cause-and-effect relationships
	9. Determine magnitude and significance of
	10. Assess the need for mitigation of
	11. Monitor and adapt management

Scoping

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impacts of activities in and around Carlyle Lake. Past actions include the construction and operation of the reservoir, the recreation sites surrounding the reservoir, as well as residential, commercial, agricultural, and industrial facilities throughout the region. All of these developments have had varying levels of adverse impacts on the physical and natural resources in the region. Many of these developments, however, have had beneficial impacts on the region's socioeconomic resources. In addition, many of the historic impacts have been offset throughout the years by the resource stewardship efforts of the Corps, Illinois DNR, and other management partners.

The most significant past action was the construction and development of Carlyle Lake which, through careful management has created new habitats and other natural resource conditions. The construction of the project also had an impact on cultural resources. Impacts to cultural resources were coordinated with the Illinois SHPO (see section 3.7 of this EA). In addition, the Corps and the other management partners have also brought a wide variety of high-quality recreational opportunities to the reservoir.

Describing the Affected Environment

Existing and future actions also contribute to the adverse and beneficial cumulative impacts in and around the reservoir. Existing and future actions include the operation of project facilities, as well as residential, commercial, agricultural, and industrial development throughout the region that benefit from the lake project. Additionally, continued project operations would result in the sustained maintenance and development of recreational facilities. These facilities would enhance the recreational offerings made by the Corps and other management partners. Such improvements would result in varying levels of impacts to the surrounding resources.

Determining the Environmental Consequences

Within the project boundary, adverse impacts would be offset through resource stewardship efforts. The programmatic approach to project management included in this EA would allow for future development plans and mitigation responses to be adapted to address many adverse actions. This would allow the Corps and other management partners at Carlyle Lake to continue to reduce the contribution of its activities to regional detrimental cumulative impacts to the environment and/or threatened or endangered species, through proactive actions and adaptive resource management strategies.

5 Climate Change

Climate change is a fundamental environmental issue, and is a particularly complex challenge given its global nature and inherent interrelationships among its sources, causation, mechanisms of action, and impacts.

The approach of the Corps is to consider the questions in need of climate change information at the geospatial scale where the driving climate models retain the climate change signal. At present, the Corps judges that the regional, sub-continental climate signals projected by the driving climate models are coherent and useful at the scale of the 2-digit HUC (Water Resources Region) (Figure EA-5). Within Water Resources Region 07, the general consensus in the recent literature points toward moderate increases in temperature and precipitation, and streamflow over the past century. In some studies, and some locations, statistically significant trends have been quantified. In other studies and locales within the Upper Mississippi Region, apparent trends are merely observed graphically but not statistically quantified. There has also been some

There is strong consensus in the literature that air temperatures will increase in the study region, and throughout the country, over the next century. The studies reviewed here generally agree on an increase in mean annual air temperature of approximately 2 to 6 ºC (3.6 to 10.8 ºF) by the latter half of the 21st century in the Upper Mississippi Region. Reasonable consensus is also seen in the literature with respect to projected increases in extreme temperature events, including more frequent, longer, and more intense summer heat waves in the long term future compared to the recent past (USACE, 2015).

Projections of precipitation found in a majority of the studies forecast an increase in annual precipitation and in the frequency of large storm events. However, there is some evidence presented that the northern portion of the Upper Mississippi Region will experience a slight decrease in annual precipitation. Additionally, seasonal deviations from the general projection pattern have been presented, with some studies indicating a potential for drier summers. Lastly, despite projected precipitation increases, droughts are also projected to increase in the basin as a result of increased temperature and evapotranspiration rates (USACE 2015).

A clear consensus is lacking in the hydrologic projection literature. Projections generated by coupling Global Climate Models (GCMs) with macro scale hydrologic models in some cases indicate a reduction in future streamflow but in other cases indicate a potential increase in streamflow. Of the limited number of studies reviewed here, more results point toward the latter than the former, particularly during the critical summer months (USACE 2015). The trends and literary consensus of observed and projected primary variables noted above have been summarized for reference and comparison in Figure EA-6 (USACE 2015).

Figure 3. Water Resources Region 07, Upper Mississippi Region Boundary.

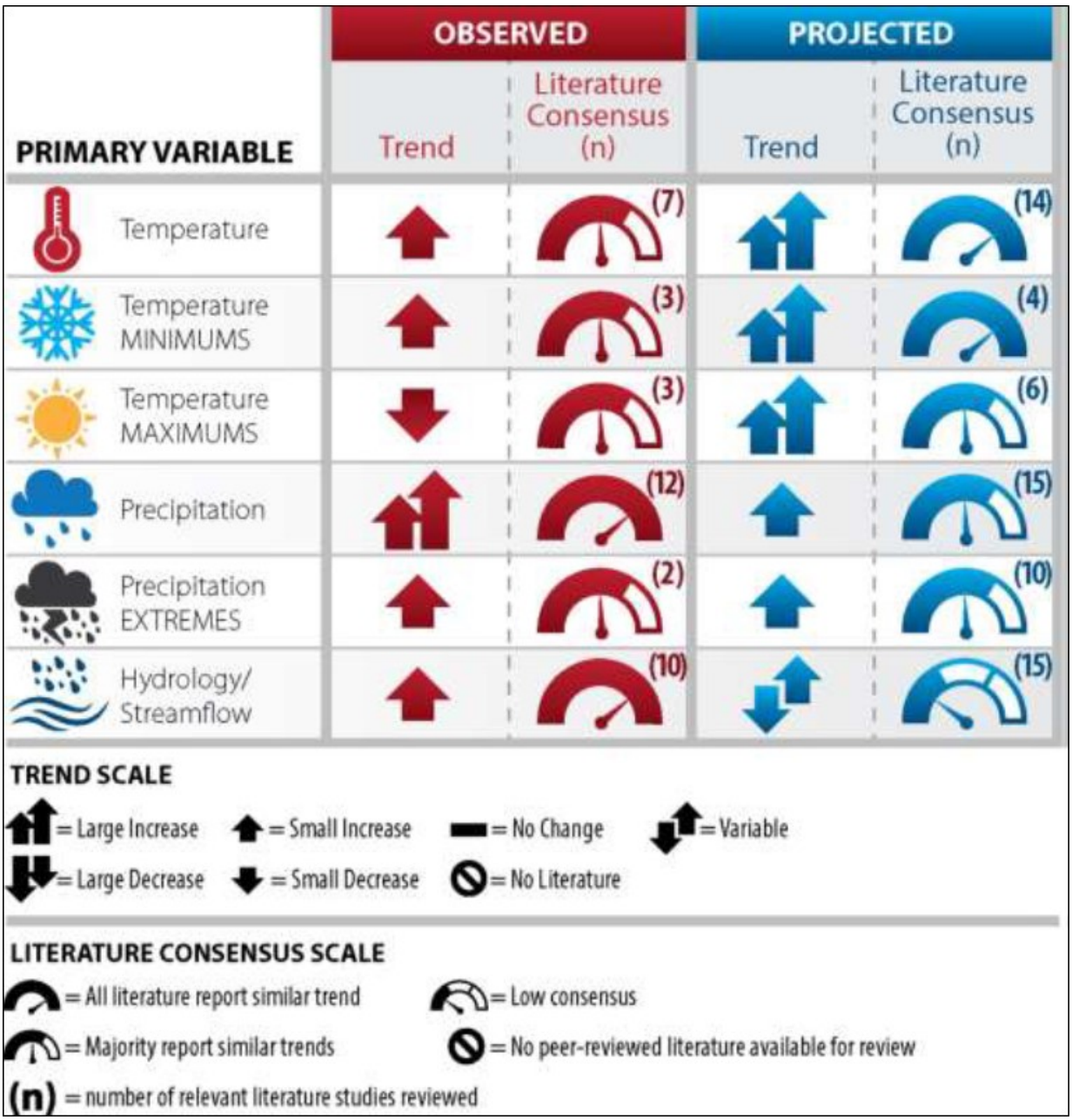

Figure 4. Summary matrix of observed and projected climate trends.

Temperature extremes, increased precipitation, and increased severe weather associated with climate change are likely to impact human well-being and economic growth across the Midwest. In Illinois, 20 to 30 deaths each year are attributed to severe weather including floods, winter storms, tornados, and lightning. Heat and cold waves in Illinois cause even more deaths than severe weather, with an average of 74 deaths per year attributed to heat and 18 deaths each year attributed to cold. Heavy precipitation in Illinois has increased since the 1940s, causing increases in peak river flood levels. Annual flood losses in Illinois have averaged

$257 million annually since 1983, and have increased steadily since the 1950s. Much of the economy in central Illinois relies on agriculture, which is dependent upon climate and timely precipitation. Increased evapotranspiration rates and frequency of severe weather could damage crops. Conversely, a lengthened frost-free season and increased precipitation may increase crop yields.

The CEQ has issued draft guidance on how Federal agencies should consider the effects of greenhouse gas emissions and climate change in their evaluation of all proposed Federal actions. A Federal agency must (1) address the potential effects of a proposed action on climate as indicated by its greenhouse gas emissions; and (2) must discuss the implications of climate change for the environmental effects of a tentatively selected plan. In terms of the project area, existing greenhouse gas emissions would be temporary, short term, and primarily related to the emissions from gas and diesel fuel road construction machinery. Therefore, it is the Corps determination that implementation of the Tentatively Selected Plan would not have a negative effect on global climate change. Further, ongoing research by the Corps Institute for Water Resources on carbon sequestration potential of Corps-owned land and water demonstrates the potential to capture and store greenhouse gases in vegetation and in reservoir sinks.

5.1.1 Relationship of the TSP to Environmental Compliance Requirements

The EA is subject to compliance review with all applicable environmental regulations and guidelines. The National Environmental Policy Act is considered in partial compliance until a NEPA decision document is signed.

Federal Policies	Compliance
Clean Air Act, 42 USC 7401-7542	Full
Clean Water Act, 33 USC 1251-1375	Full
Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC 9601-9675	Full
Endangered Species Act, 16 USC 1531-1543	Partial 1
Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds	Full
Executive Order 11990, as amended (Protection of Wetlands)	Full
Farmland Protection Policy Act, 7 USC 4201-4208	Full
Fish and Wildlife Coordination Act, 16 USC 661-666c	Partial 1
Food Security Act of 1985, 16 USC 3801	Full
Migratory Bird Treaty Act of 1918, 16 USC 703, et seq.	Full
Land and Water Conservation Fund Act of 1965, 16 USC 4604601-4, et seq.	Full
National Environmental Policy Act, 42 USC 4321- 4347	Partial 2
National Historic Preservation Act, 54 USC 300101, et seq.	Full
Noise Control Act of 1972, 42 USC 4901, et seq.	Full
Resource, Conservation, and Rehabilitation Act, 42 USC 6901-6987	Full
Rivers and Harbors Appropriation Act of 1899, 33 USC 401-413	Full
Floodplain Management (EO 11988 as amended)	Full

Prevention, Control, and Abatement of Air and Water Pollution at Federal Facilities (EO 11282 as amended by EO's 11288 and 11507)	Full
Protection and Enhancement of Environmental Quality (EO 11991)	Full
Protection and Enhancement of the Cultural Environment (EO 11593)	Full
Protection of Wetlands (EO 11990 as amended)	Full

Full compliance: having met all requirements of the statute for the current stage of planning
1 Full compliance will be attained upon completion of coordination with the U.S. Fish and Wildlife Service.
2 Full compliance will be attained upon completion and signing of this NEPA document.

6 Coordination

Cooperation with state and federal agencies presently exists in several aspects of forest management, endangered species management, fisheries and wildlife management and invasive species prevention. Portions of project boundary adjoin lands leased or licensed to the State of Illinois. Therefore, continued coordination and cooperation is imperative in such areas and an exchange of information is highly beneficial. Cooperating agencies include: U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, Illinois Environmental Protection Agency, Illinois Department of Natural Resources.

7 Environmental Assessment Preparers

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FINDING OF NO SIGNIFICANT IMPACT
Proposed East Spillway Nature Trail
as part of the 2016 Master Plan Update
Carlyle Lake, Bond, Clinton, and Fayette Counties, Illinois

I. I have reviewed and evaluated this document concerning the proposed construction of the East Spillway Nature Trail at Carlyle Lake. The trail would be constructed at the southeast end of Carlyle Lake, connecting the General Dean Recreation Area to the East side of the Main Dam (Clinton County, Illinois) as part of the 2016 update of the Carlyle Lake Master Plan. The Corps has prepared this document in compliance with the National Environmental Policy Act and other relevant federal and state laws and regulations. This environmental assessment describes and analyzes the direct, indirect, and cumulative effects for the primitive hiking trail.

II. As part of this evaluation, I have considered:

a. Existing Resources and Future without the Authorized Plan - (No Action) Alternative.

b. Impacts to Existing and Future Resources under the Tentatively Selected Plan (Construction of the East Spillway Nature Trail).

III. Issues evaluated as part of my review included the impacts of the construction and maintenance of the East Spillway Nature Trail and the anticipated consequences of the alternatives on the physical, biological, cultural, social and economic aspects of the project. Concluding that:

a. Federally listed endangered and threatened species will not be adversely impacted.
b. There would be no appreciable degradation to the physical environment (e.g., soils, air quality, and water quality).
c. There would be no significant impacts to the biological components of the project (e.g., vegetation, wildlife, aquatic organisms).
d. No significant impacts from invasive/undesirably species management or fuels management are anticipated.
e. No adverse impacts to historic properties are anticipated.
f. The "no action" alternative was evaluated and determined to be unacceptable because it did not address the purpose and need for the proposed action.
g. No significant cumulative impacts are anticipated.

IV. Based on the disclosure of the Tentatively Selected Plan's impacts contained within the Environmental Assessment, no significant impacts to the environment are anticipated. The proposed action has been coordinated with the appropriate resource agencies, and there are no significant unresolved issues. Therefore, an Environmental Impact Statement will not be prepared prior to proceeding with the proposed East Spillway Nature Trail project as identified in this environmental assessment.

Date _____ **_____**

Anthony P. Mitchell
Colonel, U.S. Army
District Commander