



**US Army Corps
of Engineers**

Little Rock District

DRAFT ENVIRONMENTAL ASSESSMENT

**Master Plan Revision
Norfolk Lake**

September 2021

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FINDING OF NO SIGNIFICANT IMPACT (FONSI)

NAME OF PROPOSED ACTION: Norfolk Lake Master Plan Revision

PURPOSE AND NEED FOR THE PROPOSED ACTION

The revised Master Plan updates Design Memorandum No. 1-E, Updated Master Plan for Development and Management of Norfolk Lake approved in 1988. The Master Plan is the strategic land use document that guides the comprehensive management and development of all recreational, natural, and cultural resources throughout the life of the water resource project. It is a vital tool for the efficient and cost-effective stewardship and sustainability of project resources for the benefit of present and future generations.

With the proposed Master Plan revision, an Environmental Assessment (EA) was completed to evaluate existing conditions and potential impacts of proposed alternatives. The EA is prepared pursuant to the National Environmental Policy Act (NEPA), CEQ regulations (40 CFR, 1500–1517), and the Corps implementing regulation, Policy and Procedures for Implementing NEPA, ER 200-2-2, 1988.

ALTERNATIVES: A No Action Alternative, an Increase Conservation Alternative, and an Increase Preservation Alternative were evaluated in the Environmental Assessment.

No Action (Alternative 3) - The No Action Alternative land classification, which is based on the 1988 master plan, does not accurately reflect the land use activities or resource management of the lake. In addition, this alternative does not address resource management laws, policies, and regulations that were implemented after the 1988 Norfolk Lake Master Plan.

Operation and management of Norfolk Lake would continue as outlined in the current Master Plan Update, which designates 10,367.3 acres as High Density recreation and 11,965.8 acres as Low Density recreation. This alternative has the potential to allow for increased land and water-based impacts within the Low Density land classification due to the fact this constitutes 37% of available shoreline acreage. There are 7,528.9 acres classified as Environmentally Sensitive areas, 76.7 acres as Project Operations, 2,258.2 acres as Wildlife Management, and 336.5 acres that currently have no allocation. High Density recreation refers to lands developed for intensive recreational activities for the visiting public including day use areas and/or campgrounds. These could include areas for concessions (marinas, commercial concessions, etc), and quasi- public development.

Low Density recreation lands have minimal development or infrastructure that supports a passive public recreational use (e.g. primitive camping, fishing, hunting, trails, wildlife viewing, resorts, etc.).

Environmentally Sensitive areas include those lands where scientific, ecological, cultural, or aesthetic features have been identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as the Endangered Species Act, the National Historic

Preservation Act or applicable State statutes. These areas must be considered by management to ensure they are not adversely impacted. Typically, limited or no development of public use is allowed on these lands. No agricultural or grazing uses are permitted on these lands unless necessary for a specific resource management benefit, such as prairie restoration. These restoration areas are typically distinct parcels located within another, and perhaps larger, land classification area.

The Project Operations category includes those lands required for the dam, spillway, switchyard, levees, dikes, offices, maintenance facilities, and other areas that are used solely for the operation of the project.

Wildlife Management lands are designated for stewardship of fish and wildlife resources. Vegetative management lands are designated for stewardship of forest, prairie, and other native vegetative cover.

The Selected Alternative (Alternative 2)—This alternative, which is now the Preferred Alternative, is the Increase Conservation alternative. Under this alternative, the land classifications would be revised to reflect current management practices and responses to agency and public comments received during the scoping phase. Changes included reclassifying undeveloped High Density land classifications (i.e. future/closed Corps parks) to other land classifications; reclassifying undeveloped Low Density land to Wildlife Management, Project Operations, or Environmentally Sensitive Area; and reclassifying lands that contained active shoreline use permits to Low Density.

Alternative 2 proposes 2,683.8 acres in High Density recreation, representing a 7,683.6 acre decrease from the No Action Alternative. Low Density lands total 2,136.7 acres, representing a reduction of 9,829.1 acres from the No Action Alternative. The majority of the decrease in High and Low Density acreage would be due to reclassification to Wildlife Management (increased from 2,258.2 acres to 20,859.7 acres). It should be noted that although the total number of acres of Environmentally Sensitive lands would be less under Alternative 2 than under the No Action Alternative, there would still be the same protected shoreline acreage from the combination of Environmentally Sensitive and Wildlife Management lands.

Increase Preservation (Alternative 1)- This alternative would reclassify most Low Density Recreation lands identified under the No Action Alternative to Environmentally Sensitive Areas. Existing permitted shoreline uses would be grandfathered but there would be no new shoreline use permits issued.

This alternative would create the same amount of protected shoreline as Alternative 2 (85%), with approximately 5,000 acres of Low Density lands shown in Alternative 3 would be reclassified as Environmentally Sensitive lands. Under Alternative 1 there would be a total of 14,552.8 acres in the Environmentally Sensitive classification. High Density is reduced from 10,367.3 acres to 2,451.8 acres, while Wildlife Management lands increase from 2,258.2 acres in the No Action (Alternative 3) to 13,246.2 acres in this alternative.

ANTICIPATED ENVIRONMENTAL IMPACTS: Consideration of the effects disclosed in the EA, and a finding that they are not significant, are necessary to prepare a FONSI. This determination of no significance is required by 40 CFR 1508.13. Additionally, 40 CFR 1508.27 defines significance as it relates to consideration of environmental effects of a direct, indirect or cumulative nature.

Criteria that must be considered in making this finding are addressed below, in terms of both context and intensity. The significance of both short and long term effects must be viewed in several contexts: society as a whole (human, national); the affected region; the affected interests; and the locality. The context for this determination is primarily local. The context for this action is not highly significant geographically, nor is it controversial in any significant way. Consideration of intensity refers to the magnitude and intensity of impact, where impacts may be both beneficial and adverse. Within this context, the magnitude and intensity of impacts resulting from this decision are not significant. The determination for each impact topic is listed below.

1. The degree to which the action results in both beneficial and adverse effects. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial. The EA indicates that there will be beneficial effects from implementation of the Selected Alternative to terrestrial and aquatic resources. The Selected Alternative would also allow for the continued potential development in low density and high density land classifications, yielding a balanced approach.

2. The degree to which the action affects public health or safety. No adverse effects to public health or safety will result from the Selected Alternative. Possible adverse environmental effects may occur from implementation of the No Action Alternative due to potential increased development resulting in more people and watercraft on the lake. Possible adverse economic and socioeconomic effects could potentially occur from implementation of Alternative 1, the Increase Preservation Alternative.

3. The degree to which the action affects unique characteristics of the potentially affected area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas. The Selected Alternative does not threaten any known historic properties. Coordination with Federal, State, and local agencies and Federally Recognized Tribes will be required to avoid, minimize or mitigate potential unforeseen impacts. Park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas will not be impacted by implementation of the Selected Alternative.

4. The degree to which effects on the quality of the human environment are likely to be highly controversial. The project will benefit the public through a balance of terrestrial and aquatic resource preservation with recreation provision. Therefore the Little Rock District; Corps of Engineers does not regard this activity as controversial.

5. The degree to which the possible effects on the human environment is highly uncertain or involves unique or unknown risks. The uncertainty of the impacts of this action is low since

land reclassification around the lake shoreline results in a projection of known and regulated activities as a result of the implementation of the Selected Alternative.

6. The degree to which the action may establish a precedent for future actions with significant impacts. Because the Selected Alternative involves updating the existing Norfolk Lake Master Plan, which provides checks and balances on future lakeshore activities, the action should not establish a precedent for significant future impacts.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. There are no other known individual actions associated with this project, therefore there are no cumulatively significant impacts identified with this action.

8. The degree to which the action may adversely affect items listed or eligible for listing in the National Register of Historic Places, or other significant scientific, cultural or historic resources. The Selected Alternative does not impact any known historic properties or other significant scientific, cultural, or historical resources. Coordination with Federal, State, and local agencies and Federally Recognized Tribes will be required to avoid, minimize or mitigate potential unforeseen impacts.

9. The degree to which the action may adversely affect an endangered or threatened species or its critical habitat. The Selected Alternative should not adversely affect any Threatened & Endangered species, as areas with known T&E species and species habitat are classified as Environmentally Sensitive lands. The listed T & E species in the area include the Gray Bat and Indiana Bat, which are cave-hibernating and roosting species, and the Ozark Hellbender. There are no known hibernaculum caves on the Norfolk Lake project area. Lands adjacent to the Ozark Hellbender habitat, where this T&E species is located are classified as Environmentally Sensitive, allowing for a higher level of protection over other land classifications.

10. Whether the action threatens a violation of Federal, state or local law or requirements imposed for the protection of the environment. No such violations will occur. All applicable Federal, state or local laws and regulations will be complied with during the implementation of the action.

CONCLUSIONS: The impacts identified in the prepared EA have been thoroughly discussed and assessed. No impacts identified in the EA would cause any significant adverse effects to the human environment. Therefore, due to the analysis presented in the EA and comments received from a 45-day public review period that began on September 15, 2021 and will end on October 29, 2021, it is my decision that the preparation of an Environmental Impact Statement (EIS) as required by the National Environmental Policy Act (NEPA) is unwarranted and a “Finding of No Significant Impact” (FONSI) is appropriate. The signing of this document indicates the Corps final decision of the proposed action as it relates to NEPA. The EA and FONSI will be held on file in the Environmental Branch, Planning and Environmental Division of the Little Rock District, Corps of Engineers for future reference. Consultation with regulatory agencies will be ongoing to ensure compliance with all federal, state, regional, and local regulations and guidelines.

Date

ERIC M. NOE, PMP
Colonel, EN
Commanding

**MASTER PLAN REVISION
NORFORK LAKE
ENVIRONMENTAL
ASSESSMENT**

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1. INTRODUCTION

The Master Plan is the strategic land use management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of the water resource project. The Master Plan guides the efficient and cost-effective management, development, and use of project lands. It is a vital tool for the responsible stewardship and sustainability of project resources for the benefit of present and future generations.

The Master Plan guides and articulates Corps' responsibilities pursuant to Federal laws to preserve, conserve, restore, maintain, manage, and develop the project's lands, waters, and associated resources. The Master Plan is a dynamic operational document projecting what could and should happen over the life of the project and is intended to be flexible to respond to changing conditions. The Master Plan deals in concepts, not in details, of design or administration. Detailed management and administration functions are addressed in the Operational Management Plan (OMP), which implements the concepts of the Master Plan into operational actions.

The Master Plan will be developed and kept current for Civil Works projects operated and maintained by the Corps and will include all land (fee, easements, or other interests) originally acquired for the projects and any subsequent land (fee, easements, or other interests) acquired to support the operations and authorized missions of the project.

The Master Plan is not intended to address the specifics of regional water quality, shoreline management, or water level management; these areas are covered in a project's shoreline management plan or water management plan. However, specific issues identified through the Master Plan revision process can still be communicated and coordinated with the appropriate internal Corps resource (i.e., Operations for shoreline management) or external resource agency (i.e., Arkansas Department of Energy and Environment and Missouri Department of Natural Resources for water quality) responsible for that specific area.

The revised Master Plan updates Design Memorandum No. 1-E, Norfolk Lake Master Plan (USACE 1987, later revised in 1988).

With the proposed Master Plan update, an Environmental Assessment (EA) is completed to evaluate existing conditions and potential impacts of proposed alternatives. The EA is prepared pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR, 1500–1517), and the Corps implementing regulation, Policy and Procedures for Implementing NEPA, Engineer Regulation (ER) 200-2-2 (1988).

2. PURPOSE AND NEED FOR ACTION

2.1 Purpose and Need

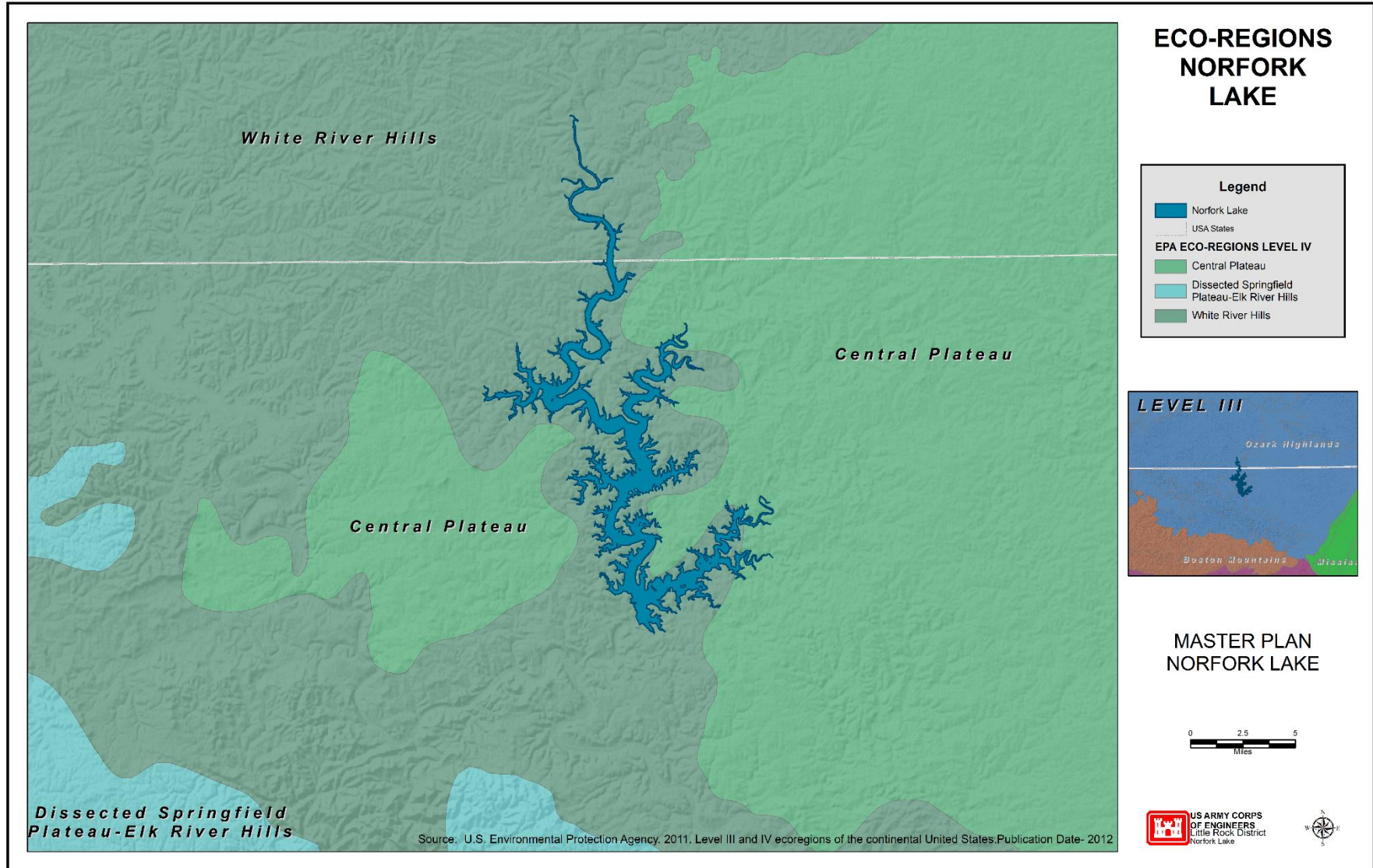
The purpose of the proposed action to revise the Norfolk Lake Master Plan is to set a vision for the next 15 to 25 years and to reflect changing needs for operation of the project's lands, waters, and associated resources.

The need for the proposed action is based on the age of the current plan and the changed conditions around the lake and in lake use. The Master Plan for Norfolk Lake was last approved in 1988; and was followed by 11 supplements over the last 32 years. Since the 1988 master plan revision, forecasted public use and development in the Norfolk Lake region has not occurred as planned on the public lands and resources of the project. Based on this information and to bring in line with current management practices at the project, as well as new guidance and directives within U. S. Army Corps of Engineers (USACE), these actions have dictated the preparation of this Master Plan revision.

2.2 Project History

Norfolk Lake is a multiple purpose water resource development project initially authorized for two purposes: flood control and hydropower generation. Subsequent authorized uses included: water supply, including providing water storage to supply a minimum flow discharge (Section 132 of the FY 2006 Energy and Water Resources Development Act, Public Law 109-103); recreation; and fish and wildlife (Flood Control Act of 1938, as amended in 1944, 1946, 1954, 1962, 1965 and 1968). Norfolk Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Arkansas and Missouri. The project is located in the scenic Ozark Highlands Ecoregion of southern Missouri (Ozark County) and northern Arkansas in Baxter and Fulton counties-Figure 2-1. The total area contained in the Norfolk project, including both land and water surface, consists of 54,410 acres. Of this total, 253 acres are in flowage easement. Project access to the Norfolk Lake area is depicted in Figure 2-2.

Figure 2-1 Eco-Regions at Norfolk Lake Study Area



The lake is very irregular in shape, due to the mountainous terrain. Many large arms and bays extend up the valleys of tributaries, and the topography creates numerous small coves. The well-timbered shoreline varies from steep bluffs to gently sloping points and is indented with many coves. Many of the hills and flat-topped ridges in the vicinity rise to an elevation of 825 feet above mean sea level, and some of the higher peaks in the region reach an elevation of more than 1,100 feet msl. Mile-long limestone bluffs, striking vistas, and heavily wooded shorelines combine to offer a unique natural environment. When the lake is at the top of the conservation pool (elevation 553.75 feet above mean sea level), the water area is 21,662 surface acres with 372 miles of shoreline within the lands owned in fee.

Construction of Norfolk Dam was initiated in spring of 1941. The dam was completed in July of 1944, and the powerhouse and switchyard were completed in 1953. The lake was declared operational for public use in 1953 under the authority of the Flood Control Act approved 28 June 1938 (Public Law No. 761, 75th Congress, 3rd Session) as modified by the Flood Control Act approved 18 August 1941 (Public Law No. 228, 77th Congress, 1st Session) which included the authorization of the project for flood control and generation of hydroelectric power. Table 2-1 provides pertinent construction and operations data for this lake. There are 30 public use areas and 9 marinas around Norfolk Lake. Twenty public use areas on the lake are presently operated by the Corps of Engineers. Detailed descriptions of the Corps parks are located in Chapter 2 of the Master Plan. The Preferred Action, described in this draft EA, would result in no significant park operational changes.

Figure 2-2 Norfolk Lake and Surrounding Area

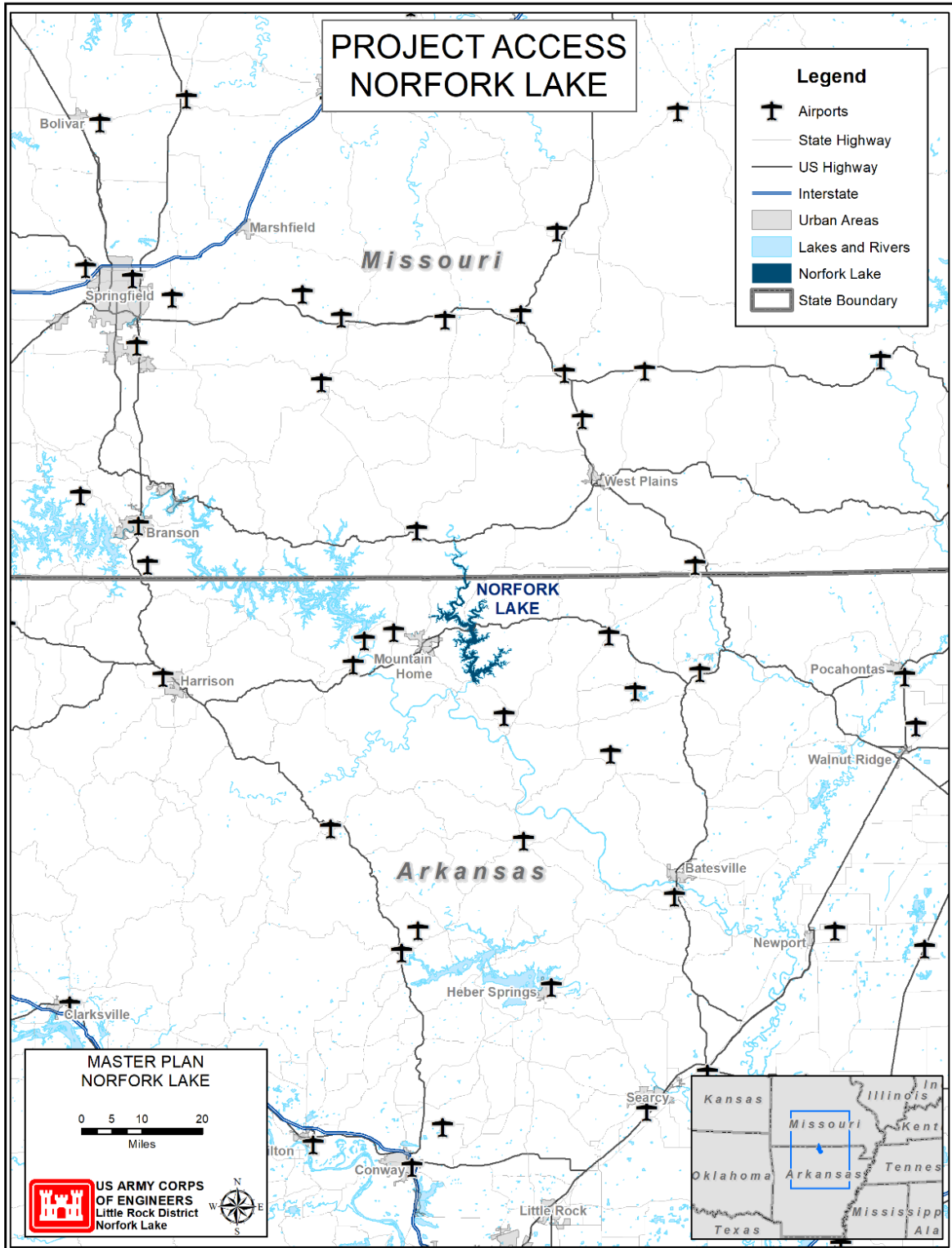


Table 2-1 Pertinent Data of Norfolk Dam and Lake

PERTINENT DATA OF THE DAM AND LAKE	
<u>General Information</u>	
Purpose, Stream, States	FC, P, WS, R, F&W N. Fork R., Missouri
Drainage area, square miles	1,806
Average annual rainfall over the drainage area, inches, approximately	48
<u>Dam</u>	
Length in feet	2,624
Height, feet above streambed	216
Top of dam elevation, feet above mean sea level	590
<u>Generators</u>	
Main units, number	2
Rated capacity each unit, megawatts	40.25
Station service units, number	1
Rated capacity of station service unit, kilowatts	895
<u>Lake</u>	
Nominal bottom of power drawdown Elevation, feet above mean sea level	510
Area, acres	12,300
Nominal top of conservation pool Elevation, feet above mean sea level	553.75
Area, acres	21,662
Length of shoreline, miles	372
Nominal top of flood-control pool Elevation, feet above mean sea level	580
Area, acres	29,513
Length of shoreline, miles	511
<u>Five-Year frequency pool</u>	
Elevation, feet above mean sea level (flood pool)	571.2
Elevation, feet above mean sea level (drawdown)	537.8
<i>(1) FC – flood control, P – power, WS-water supply, MF-minimum flow, R-recreation, F&W-Fish and Wildlife</i>	

3. ALTERNATIVES

Alternatives evaluated in this EA are depicted in Table 3-1, and in Figure 3-1. The alternatives include: Alternative 1 (Increase Preservation); Preferred Alternative 2 (Increase Conservation); and Alternative 3 (No Action). For a more detailed map analysis of the Preferred Alternative, refer to Appendix A of the Norfork Master Plan, which contains topographic maps depicting land classification and flowage easement areas around the shoreline. A complete set of maps for each alternative is located in an appendix to this document.

In this EA development, the different alternatives are compared to the No Action Alternative in order to evaluate potential positive and negative effects on the natural and human environment based on the various shoreline acreage classifications determined by each action alternative. All evaluated alternatives are being provided for public review after completion of the draft EA. Public comments would be collected during the public comment period and considered in the development of the final EA and the final updated Master Plan. Based on public comments received, the final EA would compare all action alternatives to the Preferred Action or to a modified alternative that is developed, based on public preferences. The Final EA would present the selected alternative and provide the basis for the agency decision under NEPA.

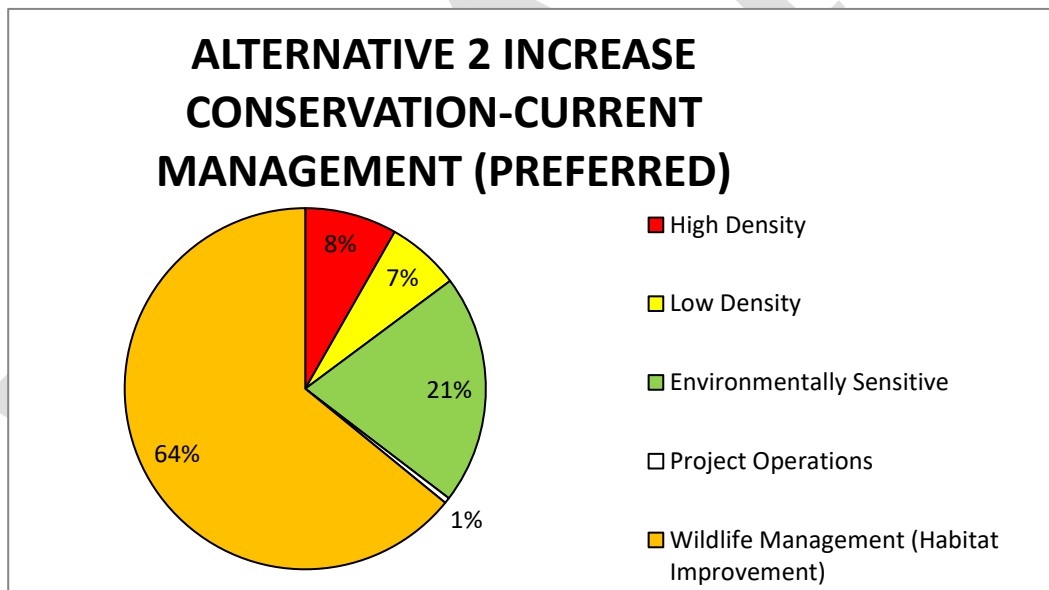
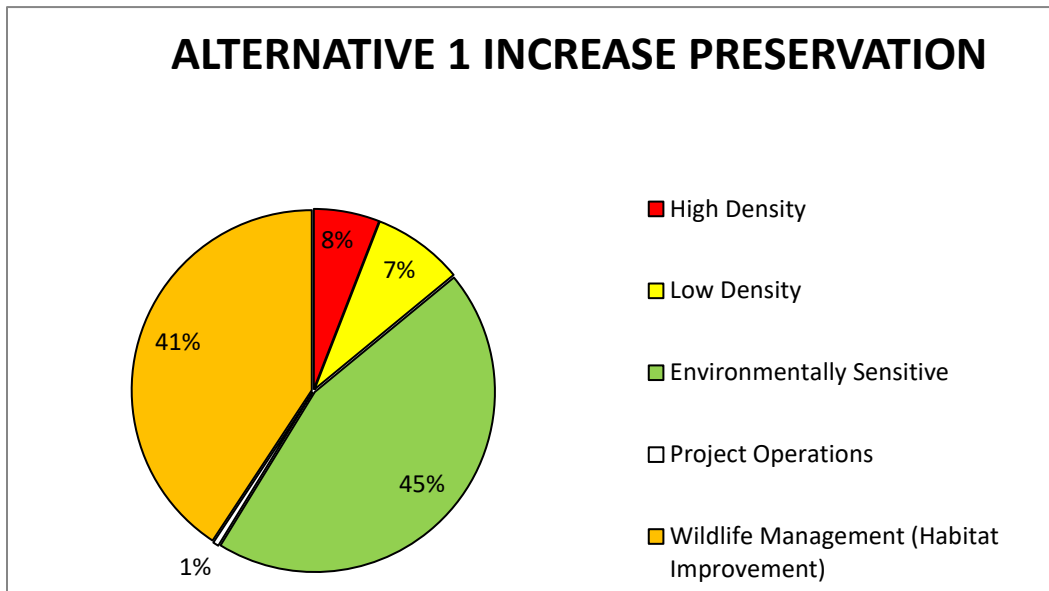
Table 3-1 Change in Land Classification by Alternative

<u>Alternative 1 (Increase Preservation)</u>	<u>Acres</u>	<u>%of Land</u>	<u>+/-Acres</u>	<u>% +/- Change</u>
Total Land and Water	54,412.3			
Total Water	21,878.9			
Restricted Water	61.9			
Open Recreation Water	21,816.9			
Total Land	32,533.5			
High Density Recreation	2,451.8	8%	-7,915.6	-24%
Low Density Recreation	2,116.3	7%	-9,849.5	-30%
Environmentally Sensitive Area	14,552.8	45%	7,023.8	22%
Project Operations	166.4	1%	89.7	0.3%
Wildlife Management (Habitat Improvement)	13,246.2	41%	10,988.0	34%

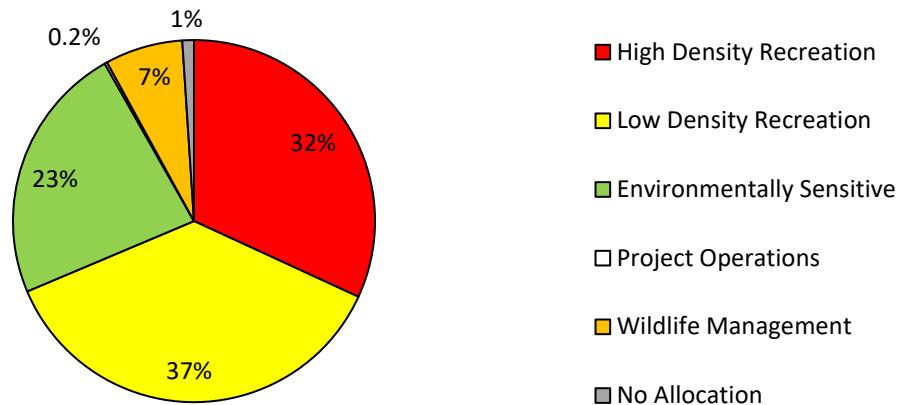
<u>Alternative 2 Preferred (Increase Conservation)</u>	<u>Acres</u>	<u>% of Land</u>	<u>+/-Acres</u>	<u>% +/- Change</u>
Total Land and Water	54,412.3			
Total Water	21,878.9			
Restricted Water	61.9			
Open Recreation Water	21,816.9			
Total Land	32,533.5			
High Density Recreation	2,683.8	8%	-7683.6	-24%
Low Density Recreation	2,136.7	7%	-9,821.1	-30%
Environmentally Sensitive Area	6,686.8	21%	-842.1	-3%
Project Operations	166.4	1%	89.7	0.3%
Wildlife Management (Habitat Improvement)	20,859.7	64%	18,601.5	57%

<u>Alternative 3 (No Action)</u>	<u>Acres</u>	<u>% of Land</u>
Total land and Water	54,410.4	
Total Water	21,877.0	
Restricted Water	56.1	
Open Recreation Water	21,822.7	
Land	32,533.5	
High Density Recreation	10,367.3	32%
Low Density Recreation	11,965.8	37%
Environmentally Sensitive Area	7,528.9	23%
Project Operations	76.7	0.2%
Wildlife Management	2,258.2	7%
No Allocation	336.5	1%

Figure 3-1 Percentage of Land Classifications for Each Alternative



ALTERNATIVE 3 NO ACTION (1988 PLAN)



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3.1 Increase Preservation (Alternative 1)

Alternative 1 would reclassify most Low Density Recreation lands identified under Alternative 3 to Environmentally Sensitive Areas. Existing permitted shoreline uses would be grandfathered but there would be no new shoreline use permits issued.

This alternative would create the same amount of protected shoreline as Alternative 2 (85%), with approximately 5000 acres of Low Density lands shown in Alternative 3 would be reclassified as Environmentally Sensitive lands. Under Alternative 1 there would be a total of 14,552.8 acres in the Environmentally Sensitive classification. High Density is reduced from 10,367.3 acres to 2,451.8 acres, while Wildlife Management lands increase from 2,258.2 acres in the No Action (Alternative 3) to 13,246.2 acres in this alternative.

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Table 3-2 Land Classification Changes form No Action to Alternative 1

No Action	Converted to	Increased Preservation	Acres	% from No Action
No Allocation	Converted to	Low Density Recreation	13.2	3.9%
		Environmentally Sensitive	62.1	18.4%
		High Density Recreation	1.4	0.4%
		Wildlife Management	247.5	73.5%
		Project Operations	12.3	3.7%
Wildlife Management	Converted to	Low Density Recreation	6.0	0.3%
		Environmentally Sensitive	328.6	14.5%
		High Density Recreation	0.0	0.0%
		Wildlife Management	1923.7	85.2%
		Project Operations	0.0	0.0%
Environmentally Sensitive	Converted to	Low Density Recreation	205.1	2.7%
		Environmentally Sensitive	3959.8	52.6%
		High Density Recreation	0.0	0.0%
		Wildlife Management	3364.0	44.7%
		Project Operations	0.0	0.0%
Low Density Recreation	Converted to	Low Density Recreation	1159.9	9.7%
		Environmentally Sensitive	6734.1	56.3%
		High Density Recreation	83.2	0.7%
		Wildlife Management	3988.6	33.3%
		Project Operations	0.0	0.0%
High Density Recreation	Converted to	Low Density Recreation	732.0	7.1%
		Environmentally Sensitive	3468.3	33.5%
		High Density Recreation	2367.2	22.8%
		Wildlife Management	3722.5	35.9%
		Project Operations	77.4	0.7%
Project Operations	Converted to	Low Density Recreation	0.0	0.0%
		Environmentally Sensitive	0.0	0.0%
		High Density Recreation	0.0	0.0%
		Wildlife Management	0.00	0.0%
		Project Operations	76.7	100.0%
Total=			32,533.5 acres	

3.2 Increase Conservation (Alternative 2, Preferred)

Under Alternative 2, the land classifications would be revised to reflect current management practices and responses to agency and public comments received during the scoping phase. Changes include reclassifying undeveloped High Density land classifications (i.e., future/closed Corps parks) to other land classifications; reclassifying undeveloped Low Density Recreation land to Wildlife Management, Project Operations, or Environmentally Sensitive Area; and reclassifying lands that contain active shoreline use permits to Low Density.

Alternative 2 proposes 2,683.8 acres in High Density recreation, representing a 7,683.6 acre decrease from the No Action Alternative. Low Density lands total 2,136.7 acres, representing a reduction of 9,829.1 acres from the No Action Alternative. The majority of the decrease in High and Low Density acreage would be due to reclassification to Wildlife Management (increased from 2,258.2 acres to 20,859.7 acres). It should be noted that although the total number of acres of Environmentally Sensitive lands would be less under Alternative 2 than under the No Action Alternative, there would still be the same protected shoreline acreage from the combination of Environmentally Sensitive and Wildlife Management lands. Table 3-2 provides a comparison of alternatives in relation to Alternative 3.

Table 3-3 Land Classification Changes form No Action to Alternative 2

<u>No Action</u>	<u>Converted to</u>	<u>Preferred</u>	<u>Acres</u>	<u>% from No Action</u>
No Allocation	Converted to	Low Density Recreation	13.5	4.0%
		Environmentally Sensitive	61.6	18.3%
		High Density Recreation	1.4	0.4%
		Wildlife Management	247.7	73.6%
		Project Operations	12.3	3.7%
Wildlife Management	Converted to	Low Density Recreation	6.0	0.3%
		Environmentally Sensitive	0.0	0.0%
		High Density Recreation	0.0	0.0%
		Wildlife Management	2252.2	99.7%
		Project Operations	0.0	0.0%
Environmentally Sensitive	Converted to	Low Density Recreation	208.7	2.8%
		Environmentally Sensitive	1385.1	18.4%
		High Density Recreation	0.0	0.0%
		Wildlife Management	5935.1	78.8%
		Project Operations	0.0	0.0%
Low Density Recreation	Converted to	Low Density Recreation	1166.0	9.7%
		Environmentally Sensitive	3021.7	25.3%
		High Density Recreation	83.2	0.7%
		Wildlife Management	7694.8	64.3%
		Project Operations	0.0	0.0%
High Density Recreation	Converted to	Low Density Recreation	742.5	7.2%
		Environmentally Sensitive	2218.4	21.4%
		High Density Recreation	2599.2	25.1%
		Wildlife Management	4729.9	45.6%
		Project Operations	77.4	0.7%
Project Operations	Converted to	Low Density Recreation	0.0	0.0%
		Environmentally Sensitive	0.0	0.0%
		High Density Recreation	0.0	0.0%
		Wildlife Management	0.00	0.0%
		Project Operations	76.7	100.0%
Total=			32,533.5 acres	

3.3 No-Action (Alternative 3)

The No Action Alternative land classification, which is based on the 1988 master plan, does not accurately reflect the land use activities or resource management of the lake. In addition, this alternative does not address resource management laws, policies, and regulations that were implemented after the 1988 Norfolk Lake Master Plan.

Operation and management of Norfolk Lake would continue as outlined in the 1988 Master Plan Update, which designates 10,367.3 acres as High Density recreation and 11,965.8 acres as Low Density recreation. This alternative has the potential to allow for increased land and water-based impacts within the Low Density land classification due to the fact this constitutes 37% of available shoreline acreage. There are 7,528.9 acres classified as Environmentally Sensitive areas, 76.7 acres as Project Operations, 2,258.2 acres as Wildlife Management, and 336.5 acres that currently have no allocation. High Density recreation refers to lands developed for intensive recreational activities for the visiting public including day use areas and/or campgrounds. These could include areas for concessions (marinas, commercial concessions, etc.), and quasi-public development.

Low Density recreation lands have minimal development or infrastructure that supports a passive public recreational use (e.g., primitive camping, fishing, hunting, trails, wildlife viewing, resorts, etc.).

Environmentally Sensitive areas include those lands where scientific, ecological, cultural or aesthetic features have been identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as the Endangered Species Act, the National Historic Preservation Act or applicable State statutes. These areas must be considered by management to ensure they are not adversely impacted. Typically, limited or no development of public use is allowed on these lands. No agricultural or grazing uses are permitted on these lands unless necessary for a specific resource management benefit, such as prairie restoration. These restoration areas are typically distinct parcels located within another, and perhaps larger, land classification area.

The Project Operations category includes those lands required for the dam, spillway, switchyard, levees, dikes, offices, maintenance facilities, and other areas that are used solely for the operation of the project.

Wildlife Management lands are designated for stewardship of fish and wildlife resources. Vegetative management lands are designated for stewardship of forest, prairie, and other native vegetative cover.

Table 3-4 Comparison of Alternatives and Change Compared to Alternative 3

Land Classification	Alternative 1 – Increased Preservation		Alternative 2 – Increased Conservation		Alternative 3 – No Action	
	Acres	Percent	Acres	Percent	Acres	Percent
High Density	2,451.8	8	2,683.8	8	10,367.3	32
Low Density	2,116.3	7	2,136.7	7	11,965.8	37
Environmentally Sensitive	14,552.8	45	6,686.8	21	7,528.9	23
Project Operations	166.4	1	166.4	1	76.7	0.2
Wildlife Management	13,246.2	41	20,859.7	64	2,258.2	7
Not Allocated	0	0	0.0	0	336.5	1
<i>Change compared to Alternative 3</i>	<i>Decrease</i>		<i>Increase</i>		<i>No Change</i>	

4. AFFECTED ENVIRONMENT

4.1 Project Setting

Norfolk Lake is a reservoir created by the Norfolk Dam on the North Fork of the White River, which is located approximately 4.8 miles upstream of the town of Norfolk, Arkansas. The lake extends from North Central Arkansas in Fulton and Baxter counties into South Central Missouri in Ozark County, as shown in Figure 2-1. A more detailed description of the project location and area is provided in the following sub-sections.

4.2 Climate

Climate within the Norfolk Lake watershed is temperate, with summer extremes lasting for longer periods throughout northern Arkansas, and winter temperatures being more influential in the zone's northern reaches in Missouri. Extremes may vary from lows around 0°F in the winter months to highs above 100°F occurring from southern Arkansas to central Missouri during the summer months. Extreme temperatures may occur for short periods of time at any location within the watershed. Heavy rainfall events are common. Average annual rainfall over the watershed varies from 48 to 50 inches. Monthly rainfall varies from 2.5 inches in the winter months to about 5 inches in the spring. Snowfall each year averages from 8 to 16 inches from south to north across the watershed. Snowpacks are usually short lived and are not commonly a concern for flooding.

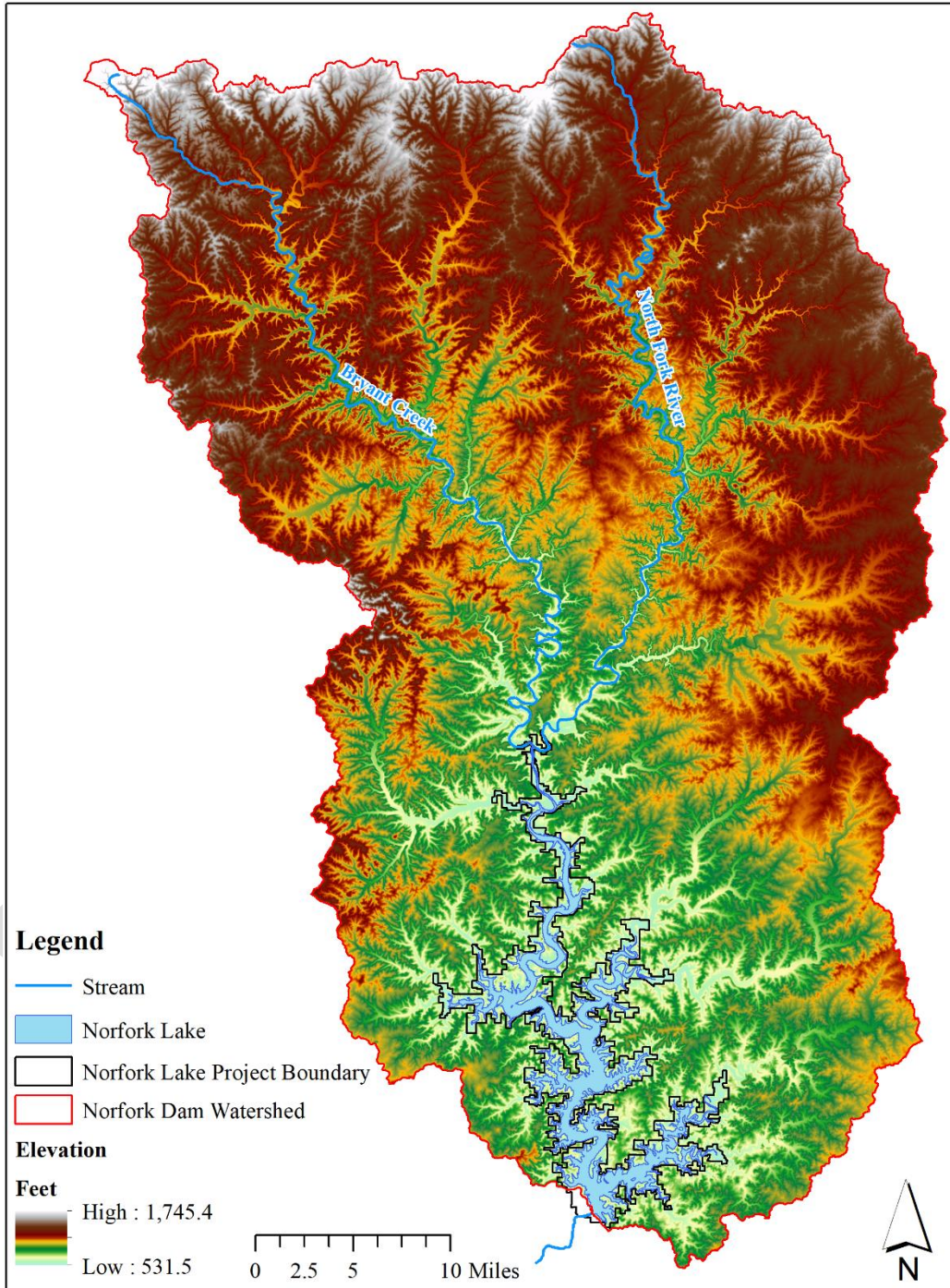
Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (<http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts>). In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Norfolk Lake, the Master Plan and associated documents (i.e., Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

4.3 Topography, Geology, and Soils

Norfolk Lake and its watershed are located in the Springfield-Salem Plateaus section of the Ozark Plateaus physiographic province. The landscape is described as rugged uplands with exposed rock and varying soil depths and includes extensive areas of karst terrain (sink holes, caves, and springs) (Ethridge, 2009). Spring-fed streams are common and typically are perennial with gravelly substrates. Topographic relief in the area is a result of erosional dissection of the plateaus and generally is controlled by lithology, as well as structural features such as faults and fractures. Norfolk Lake's watershed ranges in elevation from 531.5 feet above msl to 1,745.4 feet above msl, with an average elevation of 974 feet above msl (Figure 4-1). The North Fork River drops, on average, approximately 13.7 feet per mile from the headwaters (elevation 1,453.4 feet above msl) to the lake inlet (elevation 554.5 feet above msl). One large tributary

joins the North Fork River from the west, Bryant Creek, and drains a similar area as that of the North Fork River (Figure 4-1).

Figure 4-1 Norfork Lake Watershed and Surrounding Topography



The Norfork Lake area is part of the Ozark uplift. This region is characterized by flat-lying, sedimentary rocks composed predominantly of limestone and dolomitic limestone. The upland area surrounding the lake is part of the Salem Plateau, the surface of which is developed of

limestone and dolomites of the Ordovician age. Remnants of the plateau are represented by the summits of the higher hills in the area. The rock strata underlying the lake and forming its rim are the Everton, Powell, Cotter-Jefferson City, and Roubidoux formations of Ordovician age.

The soil mantle is a residual product of weathering. It is relatively thin on the hills. In some places, it is rocky because of disintegration of the cherty limestone; in others, it is very sandy with sandstone fragments and boulders; and in still other localities, it is composed of red clay, formed by the decomposition of limestone, intermingled with sand and chert fragments. The river has cut a meandering course deep into the bedrock, forming a well-developed narrow floodplain. The alluvial material in the floodplain is composed principally of silt and sand that seldom exceeds 30 feet in thickness. Chert, gravel and sand occur in typically long, narrow and thin bars located on the inside bends of the old riverbed.

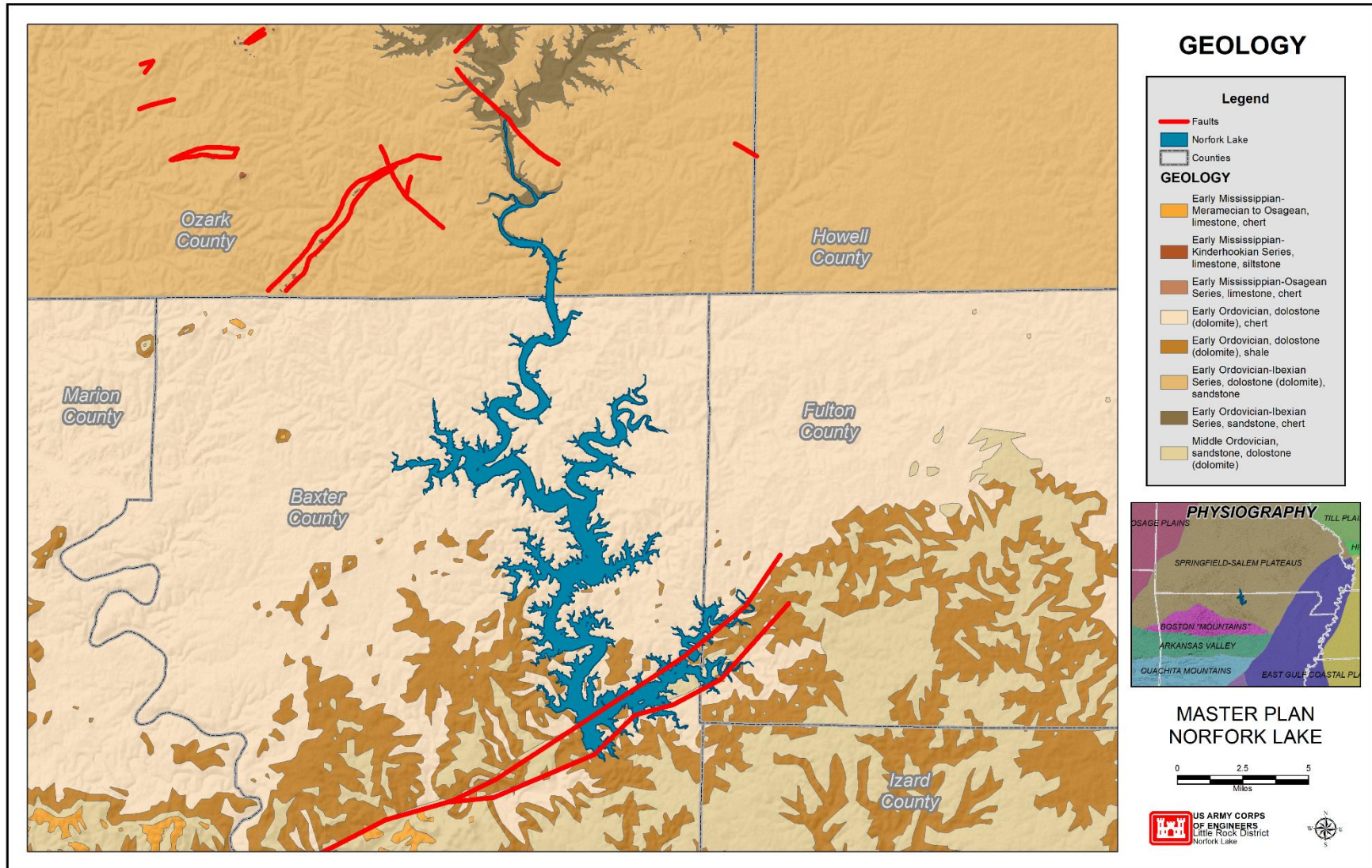
The 1983 Soil Survey of Baxter and Marion Counties, Arkansas (USDA Soil Conservation Service) indicates that the soils around Norfolk Lake fall under two “general” soil map units, including the Arkana-Moko unit and the Doniphan-Gassville unit.

The Arkana-Moko unit consists of soils that formed in the residuum of dolomite and limestone. These soils are scattered throughout the part of Baxter County north of the White River. They are generally located on side slopes and ridgetops throughout the Norfolk Lake project area. Arkana and Moko soils are both well drained. Arkana soils are moderately deep, and Moko soils are shallow. The soils in this unit are used mainly as woodland supporting eastern red cedar and a variety of low to moderate grade hardwoods. In some gently sloping areas, the soils are used for pasture, but they are generally not suitable for cultivated crops. Depth to bedrock, shrink-swell potential, surface stones, erosion hazard and steep slopes represent the main limitations to the use of these soils for farming and most other intensive uses.

The Doniphan-Gassville soils are also scattered throughout the project area. Doniphan soils are deep and well drained on moderately sloping uplands. Gassville soils are moderately deep and well drained, and generally occur on steep side slopes. These soils are not suited for cultivated crops. Primary limitations for intensive use of these soils include slope, erosion hazard, surface chert, depth to bedrock, low strength, and slow permeability. Figure 4-2 depicts the geology of the adjacent watershed of Norfolk Lake.

A high-quality calcareous glade/outcrop has been identified at one location. These areas are typically characterized as dry sites, with thin soil and bedrock at or near the surface. They are frequently on steep slopes and sometimes support stunted or gnarled trees and shrubs and rare plants. This particular calcareous glade/outcrop shows no signs of recent grazing or other disturbance.

Figure 4-2 Geology of Norfolk Lake Watershed



Soil conservation and management are major considerations when planning natural resource and recreation management practices. While soil movement is influenced by climate, soil type, and topography, which are uncontrollable, it can also be negatively affected by compaction, modification of vegetative cover, and very high lake pool elevations which increase wave action and inundation of unprotected shoreline.

4.4 Aquatic Environment

4.4.1 Hydrology and Groundwater

Norfolk Lake is located on the North Fork of the White River and was formed by the construction of Norfolk Dam, which was initiated in the spring of 1941. The dam was completed in July of 1944, and the powerhouse and switchyard were completed in 1953. The lake was declared operational for public use in 1953 under the authority of the Flood Control Act approved 28 June 1938 (Public Law No. 761, 75th Congress, 3rd Session) as modified by the Flood Control Act approved 18 August 1941 (Public Law No. 228, 77th Congress, 1st Session) which included the authorization of the project for flood control and generation of hydroelectric power. The elevation of the top of the conservation pool is approximately 553.75 feet NGVD29 with the flood pool being at 580 feet NGVD29. The conservation pool top area is approximately 21,662 surface acres and the flood pool top area is approximately 29513 surface acres. The shoreline length of the design conservation pool is approximately 372 miles, and the flood pool is approximately 511 miles in length. Norfolk Lake has a drainage area of approximately 1806 square miles in northern Arkansas and southern Missouri. With the implementation of the White River Minimum Flow (WRMF) Project, the total water storage capacity of Norfolk Lake is 5.318 million acre-feet, with 1.983 million acre-feet of flood control storage, 1.290 million acre-feet of conservation storage, and 2.045 million acre-feet of inactive storage. The lake has an average depth of 56 feet.

4.4.2 Water Quality

Overall surface water quality in the Norfolk Lake area is good, and the lake has water quality which is suitable for primary and secondary contact, fisheries, domestic, industrial and agricultural water supply, as designated by the Arkansas Department of Energy and Environment (ADEE). Norfolk Lake is classified by ADEE as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). This is mainly due to temperature stratification, which is natural and occurs in many deep reservoirs such as Norfolk Lake. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen. As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify), and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

In 2004, ADEQ placed the 4.8 miles of the Norfolk tail water on the Water Quality Limited Waterbodies list (303(d) list) due to violation of the 6 mg/L dissolved oxygen (DO) standard. The listed source of the DO violation is hydropower (HP). Section 303(d) of the Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a

significant potential not to meet standards as a result of point source dischargers or non-point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts based on dilution and the assimilative capacity of the water body. A TMDL was established by ADEQ for the 4.8 miles of the North Fork River below Norfolk Dam. With an active TMDL in place, the 4.8 miles below the Norfolk dam is no longer listed on the 303(d) as an impaired water body. In January 2009, USACE completed the WRMF Study, which would increase the minimum flow below the dam to 300 cfs to benefit the aquatic habitat and may result in water quality improvements in the tail water.

For the Missouri portion of Norfolk Lake, the Missouri Department of Natural Resources and the Clean Water Commission are responsible for setting and enforcing water quality standards within the State of Missouri. Classified waters in the state are categorized according to their beneficial water usage. Major reservoirs like Norfolk Lake are usually several thousand acres in size and are classified by the state as L2 (comparable to Type A in Arkansas). Norfolk Lake, in addition to maintaining L2 water quality standards, is also subject to four other water quality standards: (1) livestock and wildlife watering; (2) protection of warm water aquatic life and human health/fish consumption; (3) whole body contact recreation; and (4) boating and canoeing water quality standards (MDNR, 1996b).

4.4.3 Fish Species and Habitat

The impoundment of the North Fork of the White River and other tributary streams which form Norfolk Lake resulted in changes in the composition of the fish populations. Smallmouth bass was the principal game fish found in the White River prior to impoundment. Arkansas Game and Fish Commission (AGFC) and Missouri Department of Conservation (MDC) are the agencies primarily responsible for managing the fishery and through their efforts, a variety of fish species are well-established in the lake. Sport fish species currently found include: largemouth bass, spotted bass, smallmouth bass, white bass, striped bass, hybrid white-striped bass, walleye, flathead catfish, channel catfish, white crappie, black crappie, and various species of sunfish. Due to the quality and diversity of the fishery, Norfolk Lake serves as a national fishing destination, hosting hundreds of bass tournaments annually.

Norfolk Lake was first impounded in 1944 and much of the standing timber was cut prior to the impoundment. Since impoundment, the few remaining native forests that were submerged provided limited structure and forage habitat for fish. This limited habitat has degraded over time. Therefore in 1986, USACE, MDC, and AGFC began a large-scale artificial habitat improvement project with the primary objective to improve fish habitat within Norfolk Lake. Since 1987, numerous fish habitat structures known as “fish attractors” have been placed in Norfolk Lake by AGFC and several attractors by MDC. Approximately 30,000 trees comprise the attractors which cover over 45 acres of lake bottom, totaling 14 miles in length. AGFC and MDC fund the maintenance of the attractors each year, adding fresh cover to keep the attractors productive and increasing the habitat.

In 2013, MDC began a fish habitat enhancement project on Norfolk Lake using standing cut

cedar trees anchored in concrete to provide a vertical habitat structure. When the project is completed, 29 structures would be constructed. Depending upon the structure, up to 300 trees would be constructed parallel to the shore in shallower water and perpendicular to the shore in deeper water to prevent possible boating obstacles. These structures would create approximately 4.3 acres of fish habitat. In 2014, AGFC began a trial program of adding commercially made artificial fish habitat structures to a small number of existing fish attractors. These structures are being studied for visual esthetics, durability, and usage by fish to determine if they can be used to enhance the existing fish habitat structure program.

The public is also encouraged to place natural fish attractors in Norfork Lake. Permits are issued periodically to private individuals to cut cedar trees and place fish attractors at various locations. In 1995, USACE began a program for the public to bring their discarded Christmas trees to be used as fish attractors to enhance fish habitat. Since the program began, thousands of these trees have been placed in the lake by USACE personnel and the public.

The impoundment of Norfork Lake resulted in environmental changes in the tailwater portion of the North Fork River from the dam to 4.8 miles downstream where it empties into the White River. AGFC realized that the cold-water discharges from Norfork Lake would necessitate a change in their fisheries management program for the North Fork River as it transformed from a warm water fishery to a cold water fishery. Rainbow trout, cutthroat trout, brook trout, and brown trout were stocked in the White River to replace the warm-water fishery. These efforts have allowed the production of a viable cold-water fishery. However, because of the unfavorable environmental factors such as: lack of suitable substrate, the fluctuation of water temperatures, dissolved oxygen levels, water levels, trout reproduction is very limited.

In 1955, the Norfork National Fish Hatchery was built by the U.S. Fish and Wildlife Service (USFWS) at Dry Run Creek below Norfork Dam to mitigate the loss of the warm water fishery and provide trout for the cold-water fishery below Norfork and nearby Bull Shoals Dams. Each year, an average of approximately 1,184,000 rainbow trout, 105,000 brown trout, 150,000 cutthroat trout, and 34,500 brook trout from the Norfork Hatchery and from the USFWS Fish Hatcheries at Greers Ferry Lake and Mammoth Springs, AR and the Arkansas State Fish Hatchery at Mammoth Springs, AR are stocked in the North Fork and White Rivers. Since the trout program began, the fishery has flourished and is now known as a world class trout fishery and has become a popular international trout fishing destination.

Previously, during periods when there was little or no power generation, the water flow in the tailwater area is reduced, resulting in shallow depths and exposed river bottom perimeters. Concerns about the degradation of aquatic habitats for the cold-water fishery in the North Fork River and the White River below Bull Shoals Dam due to these exposed areas lead to the implementation of "White River Minimum Flows". Section 132(a) of the FY06 EWDA authorizes and directs the implementation of plan NF-7 at Norfork Lake for minimum flows in order to increase the wetted perimeter of the river and improve the habitat for the cold-water fishery. Plan NF-7 reallocates 3.5 feet of flood control storage at Norfork Lake to be evenly divided (50:50) between the conservation and flood control pools to provide for the minimum flows release of 300 cfs. This target flow of 300 cfs will consist of 185 cfs of minimum flow releases through a siphon system, as well as 20 cfs of existing releases through the house

hydropower Station Service Unit, 40 cfs of existing releases for the downstream trout hatchery, and existing flows of 55 cfs from normal leakage through the closed wicket gates. The conservation pool elevation was raised by 1.75 feet from 552.0 to 553.75 feet. Deviations from normal conservation pool exist for cold water fisheries management and may be found in the White River Basin Water Control Plan for Norfolk Lake. The top of the flood control pool will remain at the existing elevation of 580.0. The construction of the associated bulkhead and siphon was completed in 2012, with the new conservation pool elevation being reached in 2013.

Walleye, striped bass, and hybrid white-striped bass have been introduced into Norfolk Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Norfolk Lake. Since 2004, AGFC each year stocks approximately 108,000 walleye, 67,000 black crappie, 26,000 channel catfish, 17,500 blue catfish, 146,000 striped bass, and 46,000 hybrid white-striped bass, with sporadic stockings of redear sunfish (2004, 2006, 2007), bluegill (2005, 2012), and black crappie (2004, 2007). Since 2017, AGFC has been strictly focusing on annually stocking hybrid striped bass, striped bass, and walleye, and currently have no plans to stock any other species unless a situation arises where there is a need to stock them. MDC stocks approximately 220,000 walleye in Norfolk each year with no current plans to stock other species. While natural reproduction occurs in walleye, white crappie, black crappie, largemouth bass, and spotted bass, AGFC and MDC supplement this reproduction by occasional stockings of these species. Ozark bass, a sub-species of Rock bass, endemic to the North Fork of White River drainage, exists in this water body.

In 1963, AGFC constructed a five-acre fish nursery pond on the west shore of the North Fork River arm of Norfolk Lake on Chapin Point for the purpose of rearing game fish for stocking purposes. This fish nursery pond has been used in the past to introduce walleye, northern pike, striped bass, muskellunge, and blue catfish into the lake fishery. These fish have utilized habitats in the lake which the original stream-type fish avoided. The hatchery pond is typically used to rear walleye (63,000 annually), threadfin shad and bluegill (400,000 in 2017) for stocking directly into the lake.

4.5 Terrestrial Resources

4.5.1 Wildlife

White-tailed deer and eastern wild turkey are common game animals found and hunted in the Norfolk Lake area. Black bear have also become common in the area and are hunted on the Arkansas side of Norfolk Lake. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas and are also popular for sportsmen. Furbearing animals found in the Norfolk Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management activities such as, wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire, provide benefit to these populations.

The bat species diversity at Norfolk Lake is high. Surveys have identified the following bat species around Norfolk Lake, which include the big brown (*Eptesicus fuscus*), eastern red

(*Lasiurus borealis*), hoary (*Lasiurus cinereus*), tri-colored (*Perimyotis subflavus*), little brown (*Myotis lucifugus*), and evening (*Nycticeius humeralis*) bats.

The common migratory waterfowl species around Norfolk Lake include mallard, gadwall, wood duck, and diving species such as common goldeneye, hooded merganser, and bufflehead. Other duck species are also common migrants in this area. However, some of these species are only transient visitors as their characteristic foraging habits involve more shallow waters, rather than the deep, clear waters of Norfolk Lake. Migratory geese common to the area are Canada geese of the Eastern Prairie Population. Giant and Greater Canada geese were introduced to the area by the MDC in 1971 and 1972 and have become established as a resident population. Resident Canada geese are so numerous in many coves and recreation areas that their presence has become a nuisance.

Ring-billed gulls are seen frequently around the Norfolk Lake area. Norfolk has also become a popular place for the public to observe bald eagles. Twenty or more birds commonly winter here, and 4-6 breeding pairs can be found during the nesting period of March to June. Greater and lesser yellow legs and large flocks of horned grebes are also seen during their peak migration in the spring and fall. Norfolk Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. In fact, wintering black vulture numbers have become so large, they also, have become a nuisance to the public.

4.5.2 Vegetation

The area surrounding Norfolk Lake is primarily forested. Figure 4-3 depicts the predominant vegetation classification in the lake area. Vegetation types within this region include oak-hickory forests, oak-hickory-pine forests, and cedar glades. Post oaks, blackjack oaks, and black hickory are the dominant species found in the dry upland forests. Sandstone bedrock areas contain species such as shortleaf pine and various species of oak. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, flowering dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep the strip of government owned lands around the lake in early stages of succession. Ground cover consists of greenbrier, sedge, and native grasses.

Dolomite/limestone glades, which are characterized by barrens-like communities of prairie type native forbs and grasses, occur on the shallow soil over outcroppings of bedrock. USACE conducts a prescribed fire program to help maintain these specialized vegetative ecosystems in the Norfolk Lake project area. Unique terrestrial ecosystems exist within the Norfolk Lake project area, including Ozark Fen, Central Interior Highlands Calcareous Glade and Barrens, Central Interior Highlands and Appalachian Sinkhole and Depression Pond, and Old Growth Forest.

The Ozark Fen system is found in the Ozarks region of the United States. Stands occur on the side slopes of hills in narrow valleys, bases of bluffs, rock ledges, and terraces of streams and rivers, where the soil or substrate is saturated by calcareous groundwater seepage. Soils are moist to wet, mucky peat or mineral, with pH above 6.5, and vary from shallow (0-40 cm) to moderately deep (40-100 cm), depending on natural disturbance and slope. The parent material is a mixture of gravel and dolomite with fragments of deeply weathered bedrock present, or

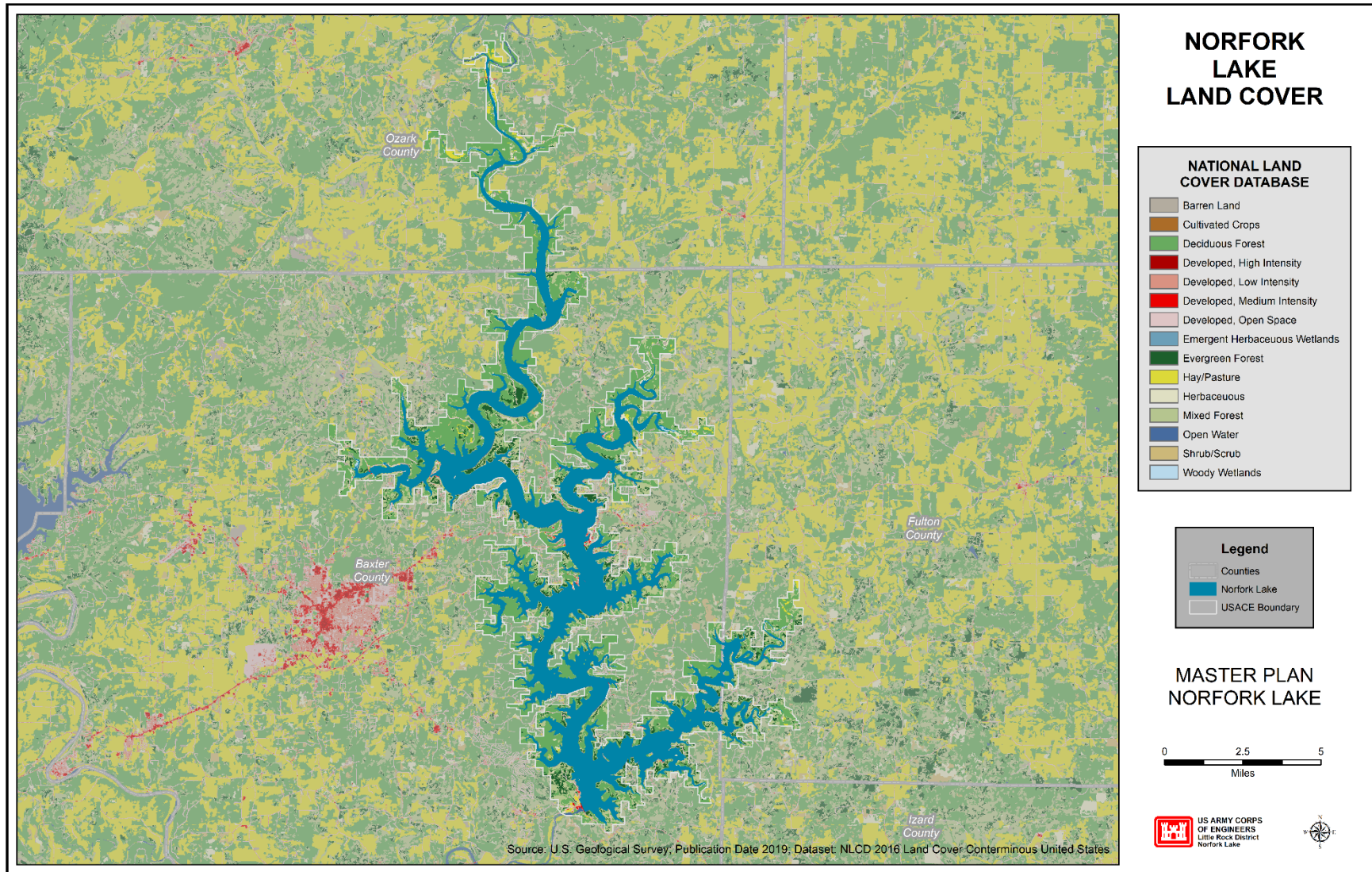
colluvium over bedrock. The bedrock strata are exposed, especially in hanging fens where the slope is greater than 35°. Hydrophytic plants dominate the fen, such as mixed grasses, spike rushes (*Eleocharis sp.*) and sedges (*Carex sp.*).

The Central Interior Highlands Calcareous Glade and Barrens ecosystem occurs along moderate to steep slopes and steep valleys on primarily southerly to westerly facing slopes. Limestone and/or dolomite bedrock typify this system with shallow, moderately to well-drained soils interspersed with rocks. These soils often dry out during the summer and autumn, and then become saturated during the winter and spring. Little bluestem (*Schizachyrium scoparium*) dominates this system and is commonly associated with big bluestem (*Andropogon gerardii*), sideoats grama (*Bouteloua curtipendula*), and other calcium-loving plant species. Stunted woodlands primarily dominated by chinkapin oak (*Quercus muehlenbergii*) interspersed with eastern red cedar (*Juniperus virginiana*) occur on variable-depth-to-bedrock soils. Fire is the primary natural dynamic, and prescribed fires help manage this system by restricting woody growth and maintaining the more open glade structure.

The Central Interior Highlands and Appalachian Sinkhole and Depression Pond system of ponds and wetlands is found in the Interior Highlands of the Ozark region. Stands occur in basins of sinkholes or other isolated depressions on uplands. Soils are very poorly drained, and surface water may be present for extended periods of time, rarely becoming dry. Water depth may vary greatly on a seasonal basis and may be a meter deep or more in the winter. Some examples become dry in the summer. Soils may be deep (100 cm or more), consisting of peat or muck, with parent material of peat, muck or alluvium. Ponds vary from open water to herb-, shrub-, or tree-dominated. Tree-dominated examples typically contain oak species (*Quercus sp.*), American sycamore (*Platanus occidentalis*), green ash (*Fraxinus pennsylvanica*), silver maple (*Acer saccharinum*), or tupelo species (*Nyssa sp.*), or a combination of these. In addition, sweet gum (*Liquidambar styraciflua*) may be present in southern examples. Common buttonbush (*Cephalanthus occidentalis*) is a typical shrub component. The herbaceous layer is widely variable depending on geography.

The Old Growth Forest stands with large, mature or over-mature trees (both healthy and decadent), usually having a multi-layered canopy in trees of various age classes. Stands include dead trees and relatively large amounts of decaying material on the forest floor. Stands also contain trees older than normal rotation age for that timber type and contain numerous trees older than 150 years old. Ozark Highlands old growth forests are typically dominated by oak species (*Quercus sp.*), and mockernut hickory (*Carya tomentosa*).

Figure 4-3 Norfolk Lake Vegetation Classification



4.6 Threatened and Endangered Species

There are many species in the Ozarks that are considered either threatened, endangered, or state species of concern. Species become listed for a variety of reasons including over-hunting, over-fishing, and habitat loss as a result of human development and pollution; of these, habitat loss is the main contributor that imperils most species. A threatened species is one that is likely to become endangered within the foreseeable future. An endangered species is one in danger of extinction throughout all or a significant portion of its range.

The bald eagle (*Haliaeetus leucocephalus*) is common during the winter months around Norfolk Lake. In addition, several bald eagle nests are located around the lake. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. Transient populations of gray and Indiana bats (*Myotis grisescens* and *Myotis sodalis*) -federally endangered species- are documented in caves located on and near the Norfolk Lake area, however, no known caves are present on USACE owned property on Norfolk Lake. The Ozark Hellbender (*Cryptobranchus alleganiensis bishopi*) is a species of strictly aquatic salamander found only in Ozark streams of southern Missouri and northern Arkansas. Critical habitat is located in the riverine portions of the North Fork River near Dawt, MO and the Bryant Creek area arm of Norfolk Lake area in Ozark County, Missouri. USACE works closely with the U.S. Fish and Wildlife Service, protecting USACE owned riparian areas designated as critical habitat, and managing project lands and waters to aid in recovery of stream, water, and habitat quality.

The following species listed in Table 4-1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas and Missouri Natural Heritage data sets which have been reported on project lands. There are other threatened and endangered species that are known to be in the general area

Table 4-1 Threatened, Endangered, and Species of Concern

Common Name	Scientific Name	Federal/State Status	State/Global Rank
Bald Eagle	<i>Haliaeetus leucocephalus</i>	*Protected under Bald and Golden Eagle Protection Act	S3/G5
Gray Bat	<i>Myotis grisescens</i>	E/E	S3/G3
Indiana Bat	<i>Myotis sodalis</i>	E/E	S3/G3
Ozark Hellbender	<i>Cryptobranchus alleganiensis bishopi</i>	E/E	S1/G3 G4 T2Q
Alligator Snapping Turtle	<i>Macrochelys temminckii</i>	Species of Concern (SOC)	S2/G3 G4
Hammack Sedge	<i>Carex fissa var. fissa</i>	SOC	S1/G4 T3 T4
A Moss	<i>Ptychomitrium sinense</i>	SOC	S1/G4 G5
Arkansas Sedge	<i>Carex arkansana</i>	SOC	S3/G4
Umbrella Plant	<i>Eriogonum longifolium var. longifolium</i>	SOC	S2/G4 T4
Checkered Madtom	<i>Noturus flavater</i>	SOC	S3 S4/G3 G4
Red River Mudpuppy	<i>Necturus maculosus louisianensis</i>	SOC	SU/G5 T4
Juniper-leaf	<i>Polypremum procumbens</i>	SOC	S2/G5
Showy Beardtongue	<i>Penstemon cobaea</i>	SOC	S3/G4
Davis' Sedge	<i>carex davisii</i>	SOC	S3/G4
Trelease's Larkspur	<i>Delphinium treleasei</i>	SOC	S3/G3

Horned-Pondweed	<i>Zannichellia palustris</i>	SOC	S2 S3/G5
Gap Ringed Crayfish	<i>Orconectes neglectus chaenodactylus</i>	SOC	S3/G5 T3
Autumn Darter	<i>Etheostoma autumnale</i>	SOC	S3/G4
Giant Prairie Robber Fly	<i>Microstylum morosum</i>	SOC	S1/G3 G4
Eastern Collared Lizard	<i>Croptaphytus collaris</i>	SOC	S2/G5
Large Indian-Breadroot	<i>Pedimelum esculentum</i>	SOC	S2/G5
Heart-leaf Plantain	<i>Plantago cordata</i>	SOC	S2/G4
Prairie Rattlesnake-root	<i>Prenanthes aspera</i>	SOC	S2 S3/G4
Bush's Skullcap	<i>Scutellaria bushii</i>	SOC	S2/G3

E = Endangered; S2: Imperiled: Imperiled in the state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the nation or state (1,000 to 3,000). Typically, 6 to 20 occurrences or few remaining individuals (1,000 to 3,000).

S3: Vulnerable: Vulnerable in the state either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically, 21 to 100 occurrences or between 3,000 and 10,000 individuals; G3: Vulnerable: Vulnerable globally either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction or elimination. Typically, 21 to 100 occurrences or between 3,000 and 10,000 individuals; G5: Secure: Common; widespread and abundant (although it may be rare in parts of its range, particularly on the periphery). Not vulnerable in most of its range. Typically, with considerably more than 100 occurrences and more than 10,000 individuals.

Other possible endangered or threatened species include the threatened northern long-eared bat (*Myotis septentrionalis*) and the endangered Ozark big-eared bat (*Plecotus townsendii ingens*). No known populations or hibernacula of these bats are known to occur on Norfolk Lake at this time. However, until the presence of these bats is determined, tree cutting as a forestry practices will only occur during the winter months.

4.6.1 Invasive Species

In accordance with Executive Order (EO) 13112, an invasive species means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive species can be microbes, plants, or animals that are non-native to an ecosystem.

In contrast, exotic species, as defined by EO 11987, include all plants and animals not naturally occurring, either presently or historically, in any ecosystem of the United States. Invasive species can take over and out-compete native species by consuming their food, taking over their territory, and altering the ecosystem in ways that harm native species. Invasive species can be accidentally transported, or they can be deliberately introduced because they are thought to be helpful in some way. Invasive species cost local, state, and federal agencies billions of dollars every year.

The Norfolk Project is not protected from the spread of invasive species. Locally the project office works with its partners, AGFC, MDC, University of Arkansas Extension Services and United States Department of Agriculture, to help stop the spread of some of the Ozarks most unwanted species. Invasive species include feral hogs (*Sus scrofa*), zebra mussels (*Dreissena polymorpha*), sericea lespedeza (*Lespedeza cuneata*), gypsy moths (*Lymantria dispar*) and the emerald ash borer (*Agrilus planipennis*). Mountain Home Project Office staff post signage in all the recreation areas to communicate the dangers of spreading invasive species on project lands and waters. Project Office staff also place gypsy moth traps on project lands to monitor any infestations of this species in cooperation with the Arkansas State Plant Board. In 2019, an agreement with the U.S. Dept. of Agriculture was signed to allow the trapping of feral hogs on USACE land on Norfolk Lake using USDA crews from the Animal and Plant Health Inspection Service (APHIS) to help control populations.

“Didymo” (*Didymosphenia geminata*) forms dense algal mats at times in the tailwaters of Norfolk Lake and the White River and has been observed in several tributaries of Norfolk Lake. This invasive species attaches to rocks and plants in streambeds and may impact freshwater fish, aquatic plants, and important aquatic insects. Didymo can completely cover rocks and plants and reduce the area of clean substrate on which fish need to spawn and feed. It also tends to out-compete native algal species, many of which are food for aquatic insects, the main diet source of native stream fishes. Didymo mats have become so thick in some areas it became impossible to fish those stream stretches. AGFC and MDC continue to educate anglers about taking precautions to avoid spreading Didymo to other waters by the contamination of recreational equipment, such as boats, life jackets and fishing gear, particularly felt soled waders, being the most common ways for didymo to spread.

4.7 Wetlands

The many rivers and streams flowing through the Norfolk Lake region have created a landscape of level highlands dissected by rugged valleys rich in karst features, such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of three major wetland systems: riverine, lacustrine, and palustrine. In accordance with national USACE policy, wetlands at operational projects are inventoried using the protocol established by the USFWS in their Classification of Wetlands and Deepwater Habitats of the United States. Most wetlands at the project site are in the palustrine system; however, wetlands classified in the lacustrine and riverine systems are also present (USFWS, 2004).

The riverine system is the compilation of rivers and tributaries, flowing either permanently or intermittently, and adjoining the lacustrine, or open water system, they comprise the 21,662-acre permanently flooded reservoir, acre Norfolk Lake. These rivers and tributaries range from low

gradient, slow moving, in well-developed floodplains with low oxygen levels, to mostly high gradient, fast moving, poorly developed floodplain, stone and rock substrate, with high oxygen levels. In between are those rivers with intermittent flows, isolated pools or surface water may be absent.

The palustrine system at Norfork Lake totals approximately 417 acres and constitutes three classes, consisting of freshwater emergent wetlands, forested/shrub-scrub, and ponded wetlands. The palustrine wetlands are impacted by elevated lake levels that have routinely occurred in recent years.

4.8 Archaeological and Historic Resources

4.8.1 Paleontology

North central Arkansas and south central Missouri are located on the Salem Plateau. Geologically the plateau is made up of relatively flat-lying Paleozoic age strata consisting of dolostones, sandstones, and limestones. The Ordovician aged Cotter and Jefferson City Dolomite is the primary outcropping formation in the area. Few fossils are known to exist in the Jefferson City Dolomite. Fossils from the Cotter Dolomite are rare but include gastropods, cephalopods, and reef-building algae. The Ordovician aged Powell Dolomite and Everton Formation also outcrop in the general area although to a lesser extent.

4.8.2 Cultural Resources

Stewardship of cultural resources on USACE Civil Works water resources projects is an important part of the overall Federal responsibility. Numerous laws pertaining to identification, evaluation, and protection of cultural resources, Native American Indian rights, curation and collections management, and the protection of resources from looting and vandalism establish the importance of cultural resources to our Nation's heritage. Guidance is derived from a number of cultural resources laws and regulations, including Sections 106 and 110 of the National Historic Preservation Act (NHPA) of 1966; Archaeological Resources Protection Act (ARPA) of 1979; Native American Graves Protection and Repatriation Act (NAGPRA); and 36 CFR Part 79, Curation of Federally Owned and Administered Archeological Collections. Implementing regulations for Section 106 of the NHPA and NAGPRA are 36 CFR Part 800 and 43 CFR Part 10, respectively. All cultural resources laws and regulations should be addressed under the requirements of the National Environmental Policy Act (NEPA) of 1969, as applicable

There are over 145 identified archeological sites present at Norfork Lake. Many of these sites were submerged by impoundment of the North Fork River. Less than five percent of the known sites within the lake area have been investigated any further than documentation. Table 4-2 summarizes the previously recorded resources at Norfork Lake based on the most up-to-date survey information according the records of the Arkansas Archeological Survey and the Missouri Department of Natural Resources.

Table 4-2 Previously Recorded Resources at Norfolk Lake

Type of Site	Number of Sites
Historic	25
Prehistoric	94
Multicomponent	14
Unknown	12
Total	145
National Register	
Not Evaluated	132
Not Eligible	12
Eligible	1

Norfolk Project has no sites currently listed on the NRHP. Norfolk Dam was completed in 1944 and is old enough to be considered for NRHP inclusion.

Multiple formal archaeological surveys have been completed at Norfolk Lake since the 1960s in response to ongoing activities, such as, lake construction, inadvertent discoveries, and NHPA Section 106 compliance. Small surveys continue to be conducted in and near Norfolk Lake for compliance with Section 106 of the NHPA. When funds are available, surveys and other preservation activities are also conducted in accordance with Section 110 of the NHPA in order to fully inventory the sites present at Norfolk Lake. As significant sites are identified, they may be designated as ESAs in the future.

Table 4-3 provides a list of previous surveys performed at Norfolk Lake. The table below represents the most up-to-date survey information according the records of the Arkansas Archeological Survey and the Missouri Department of Natural Resources.

Table 4-3 Previous Archeological Investigations on Norfolk Lake

Author	Title	Year
Howard, Lynn E.	Archaeological Survey in Norfolk region of Arkansas	1963
Spears, Carol, Nancy Myer, Hester Davis	Watershed Summary of Archaeological and Historic Resources in the White River Basins, Arkansas and Missouri	1975
Padgett, Thomas J.	Norfolk Lake: A Cultural Resources Management Study with Implications for Prehistoric Settlement-Subsistence Patterns in the Ozarks	1977
Novick, Lee and Charles Cantlry	Norfolk Lake: An Archaeological Survey of a Portion of Norfolk Lake Shoreline	1979
Lee, Aubra Lane	Cultural Resources Investigations Norfolk Lake, Arkansas	1986
Austin, David	Phase II Archaeological Testing of Site 23OZ113, US Route 160, Ozark County, Missouri	1987
John Riggs	Survey and Testing at 3FU31, Norfolk Lake, Fulton County Arkansas	1992
Bennett Jr., W. J.	The Archaeological Record at Bull Shoals Lake and Norfolk Lake, Arkansas and Missouri	1993
Ray, Jack H.	An Archaeological and Geomorphological Survey of the Upper North Fork River Valley in Southern Missouri: 1993-1994	1995
John Riggs	Fulton County Resource Management Plan (PIF)	2000
Page, Chris	Tecumseh Park Bridge Replacement (COE) Ozark County, Missouri	2010
Horvath, Elizabeth A.	ACOE Managed Lands, Norfolk Lake	2018
Horvath, Elizabeth A.	Cultural Resource Assessment Survey MH-Norfolk, FY17-MH-N-1, Gamaliel MH-Norfolk, FY17-MH-N-2, Niles 1 MH-Norfolk, FY17-MH-N-3, Niles 2 and MH-Bull Shoals, FY17-MH-B-1, Long Bottom Baxter and Marion Counties, Arkansas	2018
Helton, Deseray	Ozark 160, MoDOT Job No J9P3169; Cultural Resources Survey of Route 160 Improvements from 0.9 Miles East of County Road 530 to 0.3 miles west of North Fork River	2019
Studevart, Craig	Cultural Resource Investigations Phase I Survey David's Trail	2019

Under the NHPA, properties of traditional religious and cultural importance to a living community may be determined to be eligible for inclusion on the NRHP. Commonly known as Traditional Cultural Properties (TCP), these properties are associated with cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community. Therefore, TCPs must be taken into account in order to comply with federal cultural resources regulations. Additionally, Executive Order 13007 states that each federal agency with responsibility for the management of Federal lands shall accommodate access to and ceremonial use of Native American sacred sites

by religious practitioners and avoid adversely affecting the physical integrity of such sacred sites. There have been no TCPs or sacred sites identified at this time at Norfolk Lake. If TCPs or sacred sites are identified at Norfolk Lake in the future, they could be given additional protected status through ESA designation.

Long-term Objectives for Cultural Resources

As funding allows, the Little Rock District will plan and budget for a Cultural Resources Management Plan (CRMP) that shall be developed and incorporated into the Operational Management Plan (OMP) in accordance with EP 1130-2-540. The purpose of the CRMP is to provide a comprehensive program to direct the historic preservation activities and objectives at Norfolk Lake and it will be accomplished if future funding is forthcoming. Completion of a full inventory of cultural resources at Norfolk Lake is a long-term objective that is needed for compliance with Section 110 of the National Historic Preservation Act (NHPA). All currently known sites with unknown eligibility and newly recorded sites must be evaluated to determine their eligibility for the NRHP. Identification and evaluation of sites is an ongoing process at Norfolk Lake. As more significant sites are identified, they could be protected through ESA designation in the future.

The Archaeological Resources Protection Act (ARPA) secures the protection of archaeological resources and sites on lands owned and administered by the United States for the benefit of the American people. According to ARPA, it is illegal to excavate, remove, damage, or deface archaeological resources on public lands without a permit issued by the federal agency managing the land. It is also illegal to sell or transport archaeological resources removed from public lands. Little Rock District requires permits for archaeological investigations at Norfolk Lake in accordance with ARPA, and it is increasing surveillance and coordination with law enforcement agencies in the state to enforce ARPA civil and criminal penalties.

According to the Native American Graves Protection and Repatriation Act (NAGPRA), it is the responsibility of a federal agency to inventory human remains and associated funerary objects, as well as summarize any potential sacred objects, that existed within their archaeological collections prior to the passage of the law and, to the extent possible, identify their cultural affiliation in order to repatriate such objects to affiliated Tribes requesting their return. In addition, there are responsibilities related to the inadvertent discovery of human remains or funerary objects that occurred on federal land after the passage of the law that require a separate process of consultation, affiliation determinations, and notifications prior to repatriation. Although NAGPRA compliance has been an ongoing focus of the Little Rock District and many consultations and repatriations have occurred in the past, there is still more work to be done.

4.9 Air Quality

Norfolk Lake is located in the Ozark Mountains, remote from heavy emission-producing industry or large mining operations. The air is clean with low levels of air emissions below local emission thresholds. There have been no violations of the current National Ambient Air Quality Standards (NAAQS) established by EPA. Air monitoring requirements are established by EPA and are dictated under their guidance and monitoring objectives. Monitoring sites are placed in areas believed to have higher concentration of pollutants, which generally consist of the state's larger metropolitan areas. These areas, called Metropolitan Statistical Areas (MSA's) are

defined by the larger population centers and surrounding counties. Based on these guidelines, the Branson MSA has one air quality monitoring site, with ozone the only constituent being monitored. The ozone concentration is consistently below the 75 parts per billion (ppb) established by EPA for this pollutant.

4.10 Socio-Economic Resources

This section describes the demographic and socioeconomic characteristics for the geographic areas surrounding Norfolk Lake. The lake is located in Baxter County in northern Arkansas, near the border of Arkansas and Missouri. The closest urban area to the lake is the Mountain Home micropolitan statistical area, which is less than 10 miles west of the lake.

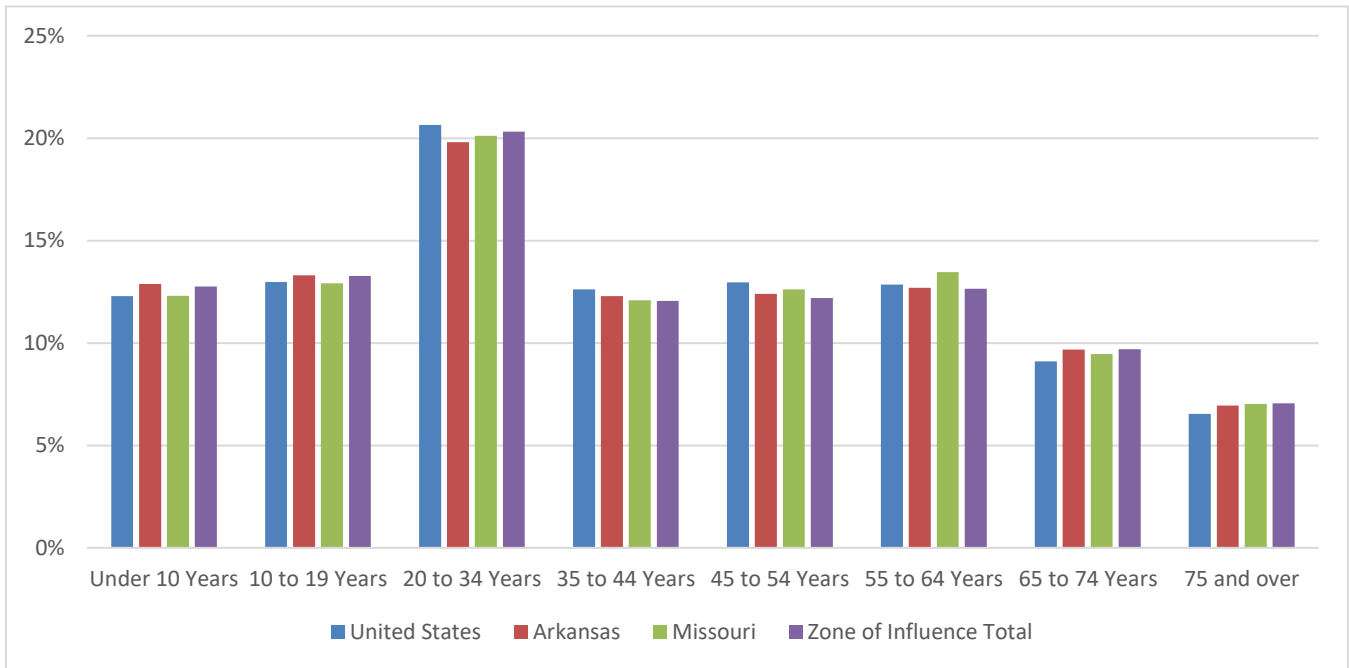
Data from the 2010 Census, the U.S. Bureau of Labor Statistics, and the 2019 American Community Survey were used to summarize socioeconomic conditions in the project area. Table 4-4 shows 2010 and 2019 population estimates, as well as the estimated annual growth rate for each county in the area. The annual growth rate in recent years (2010-2019) has been a mix of positive and negative in the individual counties within the Zone of Influence (ZOI), but overall was positive for the ZOI. The annual growth rate in the ZOI between 2010 and 2019 was 0.5%. During the same timeframe, the annual growth rate was 0.6% in the United States, 0.3% in Arkansas, and 0.2% in Missouri.

Table 4-4 Population Estimates and Trends

Geographical Area	2010 Population Estimate	2019 Population Estimate	Population Percent Change (2010-2019)
United States	308,745,538	324,697,795	0.6%
Arkansas	2,915,918	2,999,370	0.3%
Missouri	5,988,927	6,104,910	0.2%
Zone of Influence	2,775,007	2,906,772	0.5%
Source: U.S. Bureau of the Census, 2010 Census (2010 Estimate); U.S. Bureau of the Census, American Community Survey (2019 Estimate)			

Figure 4-4 displays population by age group for the country, states of Arkansas and Missouri, and the ZOI. In the ZOI, 13% of the population is 0 to 10 years old, another 13% is 10 to 19 years old, 20% is 20 to 34 years old, 12% is 35 to 44 years old, 12% is 45 to 54 years old, 13% is 55 to 64 years old, 10% is 65 to 74 years old, and 7% is 75 years and over. This age distribution is comparable to Arkansas and Missouri.

Figure 4-4 Population Distribution by Age Group (2019)



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

Key income indicators (median household income and per capita income) are presented in Table 4-5. Per capita income for counties in the project area varies but was \$26,128 for the overall ZOI in 2019. By comparison, per capita income was \$34,103 in the United States, \$26,577 in Arkansas, and \$30,810 in Missouri. Median household income is not available for the zone of influence but ranges from \$31,947 in Ozark County (Missouri) to \$66,362 in Benton County (Arkansas) for an average of \$42,758. In terms of occupations, the distribution across the zone of influence is similar to that of the Arkansas and Missouri. The largest majority of the ZOI (34%) is employed in the management, business, science, and arts occupations, followed by 22% in sales and office occupations, 17% in service occupations, 16% in production, transportation, and material moving occupations, and 10% in natural resources, construction, and maintenance occupations. Compared to the country, the ZOI has slightly less individuals employed in management, business, science, and arts occupations and slightly more in production, transportation, and material.

Table 4-5 Income and Employment

Geographical Area	Median Household Income	Per Capita Income	Civilian employed population 16 years and over	Management, business, and arts	Service occupations	Sales and office occupations	Natural resources, construction, and	Production, transportation, and material moving occupations
United States	\$62,843	\$34,103	154,842,185	59,647,283	27,489,501	33,491,626	13,713,796	20,499,979
Arkansas	\$47,597	\$26,577	1,303,490	438,892	220,282	281,025	133,382	229,909
Missouri	\$55,461	\$30,810	2,916,000	1,077,985	503,637	646,716	256,836	430,826
Zone of Influence	NA	\$26,128	1,284,994	441,854	223,195	283,120	125,866	210,959

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

In counties adjacent to Norfolk Lake, tourism and recreation is also an important part of local economies. Recreation at the lake has substantial impact to local economies based on surveys of visitor spending and attendance at Corps projects. Between 2005 and 2019, annual average visitation was approximately 1.4 million. Visitation in 2019 was average, and visitors spent \$44.7 million in local economies within 30 miles of the lake. This spending generated \$12.5 million in business sales revenue and supported about 480 full and part time jobs resulting in \$12.5 million in labor income for local economies.

Executive Order 12898, entitled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” addresses potential disproportionate human health and environmental impacts that a project may have on minority or low-income communities. Thus, the environmental effects of the project on minority and low-income communities or Native American populations must be disclosed, and agencies must evaluate projects to ensure that they do not disproportionately impact any such community. If such impacts are identified, appropriate mitigation measures must be implemented.

To determine whether a project has a disproportionate effect on potential environmental justice communities (i.e., minority or low-income population), the demographics of an affected population within the vicinity of the Project must be considered in the context of the overall region. Guidance from the Council on Environmental Quality (CEQ) states that “minority populations should be identified where either: (1) the minority population of the affected areas exceeds 50 percent, or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997).”

Table 4-6 displays Census data summarizing racial and ethnic characteristics of the ZOI. Table 4-7 displays poverty indicators for the ZOI. The purpose is to analyze whether the demographics of the affected area differ in the context of the broader region; and if so, do differences meet CEQ criteria for an Environmental Justice community. Based on the analysis, it does not appear that minority or low-income populations in the Project area are disproportionately affected.

Table 4-6 Population Distribution by Race and Ethnicity (2019)

Area	White alone	Black or African American alone	Hispanic or Latino (of any race)	American Indian and Alaska Native alone	Asian alone	Native Hawaiian and Other Pacific Islander alone	Some other race alone	Two or more races
United States	61%	12%	18%	1%	5%	0%	0%	2%
Arkansas	72%	15%	7%	1%	1%	0%	0%	2%
Missouri	79%	11%	4%	0%	2%	0%	0%	2%
Zone of Influence	80%	8%	7%	1%	2%	0%	0%	2%

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

Table 4-7 also displays the percentage of children (individuals under the age of 18) by county in the ZOI. The purpose of the data is to assess whether the project disproportionately affects the health or safety risks to children as specified by Executive Order (E.O.) 13045 - Protection of Children from Environmental Health Risks and Safety Risks (1997).

Table 4-7 Poverty Indicators and Number of Children (2019)

Area	Unemployment Rate	Percent of population below poverty line (last 12 months)	Percent of Population Under 18 Years Old
United States	3.7%	13.4%	18.5%
Arkansas	3.5%	17.0%	23.7%
Missouri	3.3%	13.7%	18.7%
Zone of Influence	3.4%	16.4%	22%

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

4.11 Recreation Resources

The recreational opportunities and potential of Norfolk Lake is of great importance to this Ozark Mountain region. The project offers many recreational activities such as swimming, SCUBA diving, boating, water skiing, fishing, picnicking, camping, hunting, hiking, and wildlife viewing. There are 30 public use areas around Norfolk Lake. Eight campgrounds, four primitive campgrounds, one day use area, and seven access points on the lake are operated by the Corps of Engineers. In 2012, a district led Recreation Adjustment Plan evaluated all the parks on Norfolk Lake and for budgetary reasons, leased the camping portion of Jordan Park. In this case,

the boat ramp continues to be operated and maintained by the Mountain Home Project Office. There are nine recreation areas operated by county, resource agencies (i.e., AGFC), or other entities on Norfolk Lake.

At the drafting of this final Master Plan, no significant park operational changes are anticipated. Since 1988, parks have been evaluated using an efficiency review process. Those parks chosen for closure for budgetary reasons were offered for lease through standard leasing procedures. Closed parks may be reopened at such time as adequate funding becomes available. For a detailed description of the recreational resources, as well as visitation data at Norfolk Lake, see Chapter 2 of the Norfolk Revised Master Plan.

4.12 Health and Safety

Safety of project visitors and project staff are the highest priority in daily project operations. Facilities and recreational areas are routinely evaluated to ensure sites are safe for visitor use. Project staff conducts numerous water safety programs and public announcements to educate children and project visitors about ways to be safe on the lake.

In coordination with the Missouri State Highway Patrol (MSHP), no wake zones are marked with buoys. Park Rangers provide visitor assistance and work with county law enforcement agencies to ensure public safety. Park Rangers, MSHP, and Arkansas Game and Fish personnel provide water safety and enforcement patrols on the lake as their budgets allow.

4.13 Aesthetics

Management objectives include maintaining scenic vistas while limiting impacts that would negatively affect aesthetics. Natural landscapes and views of undeveloped lands are an important feature that enhances the recreational experience. The perimeter lands around Norfolk Lake provide a natural setting that is aesthetically pleasing as well as buffering the lake from development and negative impacts such as erosion and storm water runoff. However, there are problems in maintaining these aesthetic qualities. Project resource staff is continually investigating trespasses that include activities such as resource destruction and land degradation. In addition, litter and illegal trash dumping both on project lands and project waters are continual problems. Vandalism within recreation areas is a recurring problem. Other concerns that impact aesthetics are demands put upon project resources for uses such as road and utility line corridors.

5 ENVIRONMENTAL CONSEQUENCES

The following table summarizes the resources that are likely to be affected by each of the alternatives for an update of the Norfolk Master Plan including the No Action alternative. A detailed discussion of the potential impacts of each of the alternatives follows the synopsis provided in the table.

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Table 5.1 Resources Likely Affected with Implementation of Alternatives

Resource Category	Alternative 1 Increase Preservation	Alternative 2 Increase Conservation	Alternative 3 No Action
Climate, Topography, Geology and Soils	The Increase Preservation Alternative would have fewer potential impacts on climate, topography, geology and soils than the No Action Alternative due to a reduction in high and low density lands, and increases in environmentally sensitive and wildlife management lands, thus more vegetated shoreline acres.	The Increase Conservation Alternative would be more protective than the No Action Alternative in terms of potential impacts on climate, topography, geology and soils due to a reduction in low and high density acreage, with a major increase in wildlife management lands. Vegetated shoreline covers 85% of total acreage.	There would be an impact, although not significant, on climate, topography and geology as a result of implementation of the No Action Alternative due to the potential for new development around the lake provided by a larger proportion of high and low density designated lands.
Aquatic Environment	The Increase Preservation Alternative would result in little to no impacts on the hydrology and groundwater components of the aquatic environment. Water quality would likely improve under this alternative due to a primarily vegetated shoreline, which helps reduce erosion.	The Increase Conservation Alternative is similar to the Increase Preservation Alternative in terms of potential impacts to the hydrology and groundwater components of the aquatic environment, with water quality being enhanced due to reduced potential for new development.	The hydrology and groundwater components of Norfolk Lake would not change from the existing condition due to the implementation of the No Action Alternative. Water quality may be minimally impacted due to a greater amount of high and low density designated land which results in a higher risk for new development.

Resource Category	Alternative 1 Increase Preservation	Alternative 2 Increase Conservation	Alternative 3 No Action
Terrestrial Resources	The Increase Preservation Alternative would be similar to the Increase Conservation Alternative, however there is a larger portion of environmentally sensitive lands under this alternative. This may result in minimal positive impacts to wildlife and vegetation due to the potential for additional protection from vegetation modification.	Implementation of the Increase Conservation Alternative would have a positive impact on terrestrial resources in comparison to the No Action Alternative. Due to an increase in wildlife management lands, this would have a positive benefit to wildlife and terrestrial vegetation around the lake.	Under the No Action Alternative there is no modification of existing low density and high density acres. Based on this, the potential exists for continual degradation of shoreline vegetation due to probable increased development and subsequent vegetation removal/mowing activities.
Threatened & Endangered Species	The Increase Preservation Alternative would likely have little to no negative impacts on any species listed Threatened, Endangered, Protected, or Species of State Concern. Positive impacts come from retention of shoreline vegetation, which preserves terrestrial habitat and enhances aquatic habitat quality.	The Increase Conservation Alternative would likely have positive effect on any listed Threatened, Endangered, Protected, or Species of State Concern. Due to the increase in Wildlife Management lands, there may be some positive benefits to both terrestrial and aquatic listed species.	The No Action Alternative could have negative impact on any listed Threatened, Endangered, Protected, or Species of State Concern due to the potential for vegetation removal in the high and low density shoreline acreage.
Wetlands	The Increase Preservation Alternative would likely have little to no negative impacts on wetlands around the lake. Positive impacts come from retention of shoreline vegetation, which helps preserve terrestrial wetlands and enhances aquatic wetland habitat quality.	The Increase Conservation Alternative would likely have positive effect on wetlands. Due to the increase in Wildlife Management lands, there may be some positive benefits to wetlands by retaining shoreline vegetation in the bottom land hardwood wetlands.	The No Action Alternative could have negative impact on wetlands around the lake due to the potential for vegetation removal in the high and low density shoreline acreage.

Resource Category	Alternative 1 Increase Preservation	Alternative 2 Increase Conservation	Alternative 3 No Action
Archaeological & Historic Resources	Under the Increase Preservation Alternative, the amount of Low Density and High Density acreage would decrease. This alternative would slightly reduce the potential for impacts on cultural resource sites or historic properties due to the reduction of lands available for potential development.	Under the Increase Conservation Alternative, due to increases in Wildlife Management acreage, potential impacts on cultural resources and historic properties would be minimal. Eighty five percent of shoreline acreage will be free of development under this alternative.	Under the No Action Alternative, the greatest potential for effects to cultural resources and historic properties would occur in the areas classified as Low Density, High Density, and No Allocation.
Air Quality	Implementation of the Increase Preservation Alternative would result in less potential impact to existing air quality compared to the No Action Alternative due to a decrease in High and Low Density Recreation acreage and thereby a decrease in future development.	Implementation of the Increase Conservation Alternative would result in some reduction in negative air quality impacts as compared to the No Action Alternative due to a decrease in High and Low Density Recreation acreage and thereby a decrease in future development. Eighty five percent of shoreline acreage will retain its oxygen producing shoreline vegetation under this alternative.	Under the No Action Alternative, the air quality around the lake would remain the same as currently exists. There could be an increase in vehicular exhaust emissions due to localized development, and associated construction equipment. No violations of the current National Ambient Air Quality Standards (NAAQS) established by the EPA would be expected under this alternative.

Resource Category	Alternative 1 Increase Preservation	Alternative 2 Increase Conservation	Alternative 3 No Action
Socio-economics	The Increase Preservation Alternative could have some negative effect on the socio-economic situation in the counties surrounding Norfolk Lake due to the loss of potential for future development in the reduced acreage High and Low Density Recreations land classification.	The Increase Conservation Alternative would likely have minimal impact on the socio-economic situation in the counties surrounding Norfolk Lake since this alternative reflects how the lake is currently managed and operated.	The No Action Alternative would likely have the most impact on the socio-economic situation in the counties surrounding Norfolk Lake due to the potential for future development in the Low Density and High Density Recreation land classifications.
Recreation Resources	The Increase Preservation Alternative would have some positive recreation impact in the area of camping, hiking, wildlife viewing and fishing, as these potential opportunities would be enhanced from 85% of the shoreline remaining vegetated and relatively unaltered.	The Increase Conservation Alternative would reclassify shoreline acreage to reflect current uses. Implementation of this alternative would allow continued public use of the lake while sustaining the natural, cultural, and socio-economic resources of the area. Current unclassified lands would have a land classification.	Provision of recreational facilities and services would continue at Norfolk Lake without an update to the Norfolk Lake Master Plan. However, the master plan would not accurately reflect the current status of project facilities. Lands with no classification would remain unclassified.

Resource Category	Alternative 1 Increase Preservation	Alternative 2 Increase Conservation	Alternative 3 No Action
Health & Safety	<p>Under the Increase Preservation Alternative, access to Norfolk Lake shoreline would be enhanced, with a potential for an increase in land-based recreational opportunities, such as hiking, hunting, and wildlife observation. Fishing/boating experiences could also be enhanced by more overhanging vegetation cover for fish, more shoreline shade, and unaltered scenic beauty.</p>	<p>The Increase Conservation Alternative would still allow potential development opportunities, but not to the degree to cause significant boat congestion or increase water related accidents. The increase in Wildlife Management areas could result in an increase in human exposure to insects and wildlife. The availability of recreational opportunities, balanced with conservation of natural environment could lead to better health, both mental and physical, of visiting populations.</p>	<p>The No Action Alternative would retain current land classifications, in which potential development could impact water quality. Continued development may lead to increased water traffic, with the potential for increased accidents and pollution.</p>
Aesthetics	<p>The Increase Preservation Alternative would allow less potential development, which would have a positive effect on the scenic beauty and/or aesthetics of the lake. Under this alternative 85% of the shoreline acreage would retain natural vegetation cover. This will aid in preservation of the unique natural resources that currently exist around the lake.</p>	<p>Under the Increase Conservation Alternative, the wide panorama of Norfolk Lake and the nearby shore would continue to convey a sense of enormity of the lake, and the limited development would continue to promote the sense of a relatively pristine shoreline. The developed areas are, for the most part, shielded from the lake view, which preserves the viewscapes of those recreating on the lake.</p>	<p>Under the No Action Alternative, the visual characteristics surrounding the Norfolk Lake landscape could potentially change due to continued development in High and Low Density land classifications.</p>

5.1 Climate

5.1.1 Increase Preservation (Alternative 1)

There could be some potential positive impact to climate as a result of implementation of the Increase Preservation alternative. Of the 32,533.5 total land acres, only 4,568 acres, representing 15% of the total land acreage, are classified as either High Density or Low Density lands under this alternative. This reduces the potential development opportunities, leaving the majority of the shoreline vegetation intact. Vegetated shorelines result in reduced ground temperatures due to shade, reduced erosion potential, cooler rainfall runoff, and a reduction in lake water temperature.

5.2 Increase Conservation (Alternative 2)

The Increase Conservation Alternative is more protective than the No Action Alternative in terms of potential impacts on air and water temperature modification. A conversion of both High Density and Low Density lands to Environmentally Sensitive and Wildlife Management lands would reduce the potential for development, which reduces the potential impact on climate due to vegetation removal. This reclassification would provide a better buffering effect which would result in storm water velocity reduction and act as a filtering mechanism. This would help reduce erosion and sediment deposition in the lake.

5.2.1 No-Action (Alternative 3)

The No Action Alternative allows for more potential development, due to 69% of the total land being classified as either high or low density lands. This may result in a negative impact on climate around Norfolk Lake due to potential vegetation removal through development. This potential for development could modify the vegetation component near the shoreline, allowing more sunlight penetration. Greater temperature fluctuations generally occur when woody vegetation is removed from an area. Reduced ground cover could cause an increase in sedimentation during rainfall events, which could increase the turbidity of the water, resulting in a potential for a small increase in water temperature.

5.3 Topography, Geology and Soils

5.3.1 Increase Preservation (Alternative 1)

The Increase Preservation Alternative would decrease Low Density lands by 9849.5 acres as compared to the No Action Alternative, and also decrease High Density by 7915.6 acres over the No Action Alternative. This preservation of the natural shoreline vegetation would have a positive impact on the topography, geology and soils. The combination of High Density and Low Density Recreation lands represents only 15% of available acreage around the lake. With Environmentally Sensitive and Wildlife Management lands comprising a vast majority of the shoreline acreage, minimal impacts from erosion and sedimentation would result from the implementation of this alternative.

5.3.2 Increase Conservation (Alternative 2)

The Increase Conservation Alternative is more restrictive than the No Action Alternative in terms of potential impacts to topography, geology and soils. There would be little to no change in impacts on the existing conditions regarding these features due to the fact that this alternative

reflects current lake usage patterns. High Density Recreation acreage would be reduced from the No Action Alternative (8,310.9 acres) to 2,683.8 acres, and the Low Density recreation acreage has been reduced from 31,957.2 to 2,136.7 acres. These lands would be reclassified to Environmentally Sensitive and Wildlife Management lands, which provide a vegetated lake buffer area. This vegetation helps to reduce storm water velocity and acts as a filtering mechanism. This would help reduce erosion and sediment deposition in the lake.

5.3.3 No Action (Alternative 3)

Soil erosion would persist due to development being allowed under this alternative. Approximately 69% of available acreage (22,641.1 acres) around the lake is currently classified as High and Low Density Recreation (32% and 37%, respectively). High Density acreage would allow development of intense recreational activities including campgrounds, parks, marinas, resorts and other public development infrastructure. This development results in soil disturbance, vegetation removal and transforming some pervious surfaces to impervious areas. It also promotes erosion during construction activities and increased runoff velocity after development is completed. The remaining pervious surfaces around these developed areas would become more impervious due to increased foot traffic from recreational activity. Of the activities associated with Low Density land classification primitive camping, fishing, hunting, trails, wildlife viewing, and shoreline use permits the shoreline use permits would typically have the greatest impacts on soil disturbance due to potential vegetation removal and conversion of pervious surfaces to impervious.

5.4 Aquatic Environment

5.4.1 Hydrology and Groundwater

5.4.1.1 Increase Preservation (Alternative 1)

The Increase Preservation Alternative would have a positive impact on the hydrology and groundwater components of the aquatic environment as compared to the No Action Alternative. The High and Low Density Recreation lands comprise 15% of the shoreline in this alternative, with the remainder dominated by Environmentally Sensitive and Wildlife Management lands, which enhance hydrology and groundwater conditions and function.

5.4.1.2 Increase Conservation (Alternative 2)

The Increase Conservation Alternative is different than the No Action Alternative in terms of potential impacts to the hydrology and groundwater components of the aquatic environment. The hydrology and groundwater conditions are generally a function of the watershed drainage and existing geology of the area but having only 15% of the shoreline classified as High and Low Density Recreation lands in this Alternative, as compared to 69% in the No Action Alternative, would enhance rainfall absorption and slow runoff velocity due to retention of Environmentally Sensitive and Wildlife Management land shoreline vegetation.

5.4.1.3 No Action (Alternative 3)

The hydrology and groundwater components of Norfolk Lake would not change from the existing condition due to the implementation of a No Action Alternative. The potential for additional development under this alternative would have some effect on reducing percolation

through the soil layers due to ground cover removal, and potentially increasing storm water velocity.

Wetland areas are relatively limited within Norfork Lake and throughout the adjacent government property surrounding the lake and would not undergo any significant change from existing conditions due to implementation of the No Action Alternative

5.4.2 Water Quality

5.4.2.1 Increase Preservation (Alternative 1)

The Increase Preservation Alternative would reduce Low Density acreage by 9,849.5 (30%) and High Density acreage by 7,915.6 (24%) compared to the No Action Alternative. This alternative represents a 54% reduction in potentially developable shoreline acreage, which would have a positive effect on lake water quality due to the rainwater filtering benefits from shoreline vegetation buffer associated with Environmentally Sensitive and Wildlife Management lands. These land classifications would represent 85% of the shoreline acreage under the Increase Preservation Alternative. Being similar to the Increase Conservation Alternative, these land reclassifications would serve to limit development on these lands, thereby reducing potential impacts from ground disturbance and subsequent increased erosion.

5.4.2.2 Increase Conservation (Alternative 2)

Implementation of the Increase Conservation Alternative may result in positive benefits to water quality due to a reduction in both High Density and Low Density acreage by 7,915.6 and 9,849.5 acres respectively as compared to the No Action Alternative. Though there is a minor decrease in Environmentally Sensitive acreage, from 7,528.9 acres to 6686.8 acres, which represents a reduction of 842.1 acres, Wildlife Management lands increased from 2,258.2 acres to 20,859.7 acres, representing a gain of 18,601.5 acres. These land reclassifications would serve to limit development on these lands, thereby reducing impacts to ground disturbance and subsequent increased erosion. These factors would reduce erosion sedimentation and pollutants scoured from reduced impervious surfaces, with additional benefits of retention of more shoreline vegetation, better fishery habitat, increased water clarity and cooler water temperature conditions due to the decrease of turbidity and sediment deposition.

5.4.2.3 No Action (Alternative 3)

Lake fluctuations, associated with power production and flood control procedures, result in change in the environment along the shoreline of the lake. Turbidity from heavy rainfall has a temporary, adverse effect on Norfork Lake. During these periods of increased runoff, urban areas and other parts of the terrain, especially those that have had the protective vegetation removed, contribute silt and other suspended particles to the tributaries. While implementation of the No Action Alternative is relatively independent of the existing watershed drainage on the lake water quality, potential continued development around the lake shoreline would exacerbate water quality issues due to potential increased erosion, localized increases in turbidity and increased sedimentation in the lake following storm events. Under the No Action Alternative, High Density recreation land classification would be 8,310.9 acres (15% of total available area), Low Density recreation lands would be 31,957.2 acres (57%), Environmentally Sensitive lands include 11,895.7 acres (21%), Wildlife Management lands total 3,953.5 acres (7%), while 169 acres have no current classification. Based on the current classification, the potential exists for continual

degradation of shoreline vegetation due to potential increased development and subsequent vegetation removal and mowing activities. This would result in negative impacts to water quality due to increased storm water velocity, scour and sedimentation.

5.4.3 Fish Species and Habitat

5.4.3.1 Increase Preservation (Alternative 1)

The Increase Preservation Alternative is similar to the Increase Conservation Alternative in terms of potential positive benefits to the lake fishery. A comparison with the No Action Alternative shows a reduction of 9,849.5 acres of Low Density lands. In this alternative, 85% of the available shoreline acreage would be classified as Environmentally Sensitive and Wildlife Management lands, preserving a majority of the natural shoreline vegetation along the shoreline. Similar to the positive effects discussed in the Increase Conservation Alternative, this alternative should have a beneficial effect on the fish and fish habitat of Norfolk Lake.

5.4.3.2 Increase Conservation (Alternative 2)

Implementation of the Increase Conservation Alternative would have a positive effect on the lake fishery resource as compared to the No Action Alternative. There is a 9,849.5-acre reduction in Low Density recreation land classification (-30%), a 7,915.6 acre reduction in High Density lands (-24%), a 57% increase in Wildlife Management lands from 2,258.2 acres to 20,859.7 acres, which results in 64% of available acreage classified as Wildlife Management lands. The increase in lands classified in this area would serve as additional protection for lakeside vegetation and preservation of overhanging vegetation, which provides cover for fish, reduces storm flow velocity, reduces erosion scour, and reduces sedimentation. These factors improve spawning habitat, thereby potentially enhancing fish population dynamics in the lake.

5.4.3.3 No Action (Alternative 3)

The fishery of Norfolk Lake may have potential minor impacts from the implementation of the No Action alternative, which has 69% of available shoreline acreage classified as High and Low Density lands. Implementation of the No Action alternative would allow potential development around much of the shoreline. Development often results in vegetation removal down to water's edge, which impacts shoreline stability, removes fish cover provided by overhanging vegetation, tree trunks and roots, and exacerbates storm water erosion and sedimentation. During the spring spawning season this sedimentation has the potential to disrupt spawning activity and productivity in the coves and lake arms where spawning commonly occurs.

5.5 Terrestrial Resources

5.5.1 Wildlife

5.5.1.1 Increase Preservation (Alternative 1)

The Increase Preservation alternative is more similar to the Increase Conservation Alternative than the No Action Alternative in terms of potential effects to the terrestrial resources and land use patterns. A proposed decrease in Low Density lands of 9,849.5 acres, would result in 7% of available acreage classified as Low Density, which would potentially be available for development. This amount of Low Density land would likely have some negative, but still insignificant effect, on wildlife species and activity. With approximately 20 acres difference in

Low Density lands between this and the Increase Conservation Alternative, the majority of natural shoreline vegetation would likely remain in this alternative. High Density lands are reduced by 7,915.6 acres from the original 10,367.3 acres in the No Action Alternative. With 85% of the shoreline in Environmentally Sensitive and Wildlife Management lands, good habitat for wildlife would still be abundant under this alternative.

5.5.1.2 Increase Conservation (Alternative 2)

Implementation of the Increase Conservation Alternative would have a positive effect on terrestrial resources, when compared to the No Action alternative. There would be a 9,829.1-acre reduction in Low Density Recreation land classification (to 2,136.7 acres), a 7,683.6-acre reduction in High Density Recreation lands (to 2,683.8), only a .3% decrease in Environmentally Sensitive Area lands classification (6,683.6 total acres) and an increase in Wildlife Management lands from 2,258.2 acres to 20,859.7 acres. This would result in 64% of available acreage classified as Wildlife Management lands. The increase in lands classified as Wildlife Management land would provide additional protection for lakeside vegetation, and preservation of habitat for wildlife and migratory bird species. The buffer of natural vegetation that remains along the shoreline from this designated acreage would potentially enhance migration and feeding activities for many species of wildlife.

5.5.1.3 No Action (Alternative 3)

Under the No Action Alternative, shoreline lands would be classified into High Density Recreation lands (10,337.6 acres, representing 32% of total available area), Low Density Recreation lands (11,965.8 acres-37%), Environmentally Sensitive Area lands (7,528.9 acres-23%), and Wildlife Management lands (2,258.2 acres-7%), while 336.5 acres have no current classification. Based on the current shoreline classification, the potential exists for continual degradation of shoreline vegetation due to increased development and potential vegetation removal and mowing activities. Unclassified lands are potentially developable, resulting in 70% of the shoreline acreage subject to possible increased or new development. This would result in negative effects to wildlife due to potential removal of trees and understory vegetation (with the highest potential in the Low Density Recreation lands), thus altering food sources and migratory patterns of insects, birds and mammal species.

5.5.2 Vegetation

5.5.2.1 Increase Preservation (Alternative 1)

The Increase Preservation Alternative is more similar to the Increase Conservation Alternative in terms of potential effects to the lakeshore vegetation than that of the No Action Alternative. A proposed decrease in Low Density lands of 9,849.5 acres, would result in 7% of available acreage for potential development, would likely have some, but still insignificant effect, on shoreline vegetation. High Density lands are reduced by 7,915.6 acres from the original 10,367.3 acres in the No Action Alternative. With 85% of the shoreline in Environmentally Sensitive and Wildlife Management lands, natural shoreline vegetation would still be abundant under this alternative.

5.5.2.2 Increase Conservation (Alternative 2)

Implementation of the Increase Conservation Alternative would have a positive effect on shoreline vegetation, when compared to the No Action alternative. There would be a 9,829.1

acre reduction in Low Density recreation land classification (to 2,136.7 acres), a 7,683.8 acre reduction in High Density lands (to 2,683.8), only a .3% decrease in Environmentally Sensitive lands classification (6,683.6 total acres) and an increase in Wildlife Management lands from 2,258.2 acres to 20,859.7 acres. This would result in 64% of available acreage classified as Wildlife Management lands. The increase in lands classified as Wildlife Management land would provide additional protection for lakeside vegetation and subsequent preservation of habitat for wildlife and migratory bird species. The buffer of natural vegetation that remains along the shoreline from this designated acreage would enhance migration and feeding activities for many species of wildlife, as well as mediate storm water velocity and scour.

5.5.2.3 No Action (Alternative 3)

Under the No Action Alternative, shoreline lands would be classified into High Density recreation lands (10,337.6 acres, representing 32% of total available area), Low Density recreation lands (11,965.8 acres-37%), Environmentally Sensitive lands (7,528.9 acres-23%), and Wildlife Management lands (2,258.2 acres-7%), while 336.5 acres have no current classification. Based on this, the potential exists for continued degradation of shoreline vegetation due to increased development and subsequent vegetation removal and mowing activities. Unclassified lands are potentially developable, resulting in 7% of the shoreline acreage subject to possible increased or new development. This would result in potential negative effects to the natural shoreline vegetation composition due to potential removal of trees and understory vegetation, thus possibly altering food sources and migratory patterns of insects, birds and mammal species, as well as increasing a potential for increased storm water erosion effects.

5.6 Threatened and Endangered Species

5.6.1 Increase Preservation (Alternative 1)

The Increase Preservation Alternative would likely have little to no effects on any listed Threatened, Endangered, Protected, or Species of State Concern based on the proposed reduction of potentially developable acreage from the amount listed in the No Action Alternative. A proposed decrease in Low Density lands of 9,849.5 acres, would result in 7% of available acreage for potential development. This may result in some potential minor negative effects to listed species based on possible development activity in Low Density lands. High Density lands are reduced by 7,915.6 acres from the original 10,367.3 acres in the No Action Alternative. With 85% of the shoreline in Environmentally Sensitive and Wildlife Management lands, natural shoreline vegetation would still be abundant and provide protection for T&E species and Species of State Concern.

5.6.2 Increase Conservation (Alternative 2)

The Increase Conservation Alternative would likely have little to no negative effects on any listed threatened, endangered, protected, or species of state concern based on the documentation and justification noted in the No Action Alternative. Due to the reclassification of 17,512.7 acres from High and Low Density Recreation lands to Environmentally Sensitive and Wildlife Management lands classifications, there may be potential positive benefits to any or all the listed species, and possibly other yet undiscovered species that may exist in the area. This is due to the higher level of protection offered by the Environmentally Sensitive and Wildlife Management land classifications, which constitute 85% of total shoreline acreage.

5.6.3 No Action (Alternative 3)

Of the species listed in Table 4-1 of Section 4.0, affected environment, two species would be most affected by implementation of the No Action Alternative. The Gray Bat, *Myotis grisescens*, and the Indiana Bat, *Myotis sodalis*, roost in various species of hardwood trees located in areas currently classified as High and Low Density lands. Potential development could occur in these land classifications that might have a significant impact on the ecology of area that these species utilize. The Bald Eagle, *Haliaeetus leucocephalus*, was removed from the threatened listing in 2007 by the USFWS, but it still remains as a protected species. While there have been reports of nesting in some locations around the lake perimeter, this species is not confined to a particular area around the lake, so implementation of this alternative may result in potential removal of large trees used as nesting sites.

5.7 Wetlands

Norfolk Lake has a variety of wetland habitats representative of three major wetland systems: riverine, lacustrine, and palustrine, with the majority of wetlands at the project site being in the palustrine system. While the following sections discuss potential impacts from implementation of various alternatives, the greatest impact to wetlands at this lake is due to an extended high water conditions, which have occurred in recent years.

5.7.1 Increase Preservation (Alternative 1)

The Increase Preservation Alternative is similar to the Increase Conservation Alternative in terms of potential effects to the lakeshore wetland vegetation, as compared to the No Action Alternative. A proposed decrease in Low Density lands of 9,849.5 acres, would result in 7% of available acreage for potential development, would likely have some, but still insignificant effect, on shoreline wetland areas. High Density lands are reduced by 7,915.6 acres from the original 10,367.3 acres in the No Action Alternative. With 85% of the shoreline in Environmentally Sensitive and Wildlife Management lands, natural shoreline wetland vegetation would still be protected under this alternative.

5.7.2 Increase Conservation (Alternative 2)

Implementation of the Increase Conservation Alternative would have a positive effect on shoreline wetland vegetation, when compared to the No Action alternative. There would be a 9,829.1-acre reduction in Low Density recreation land classification (to 2,136.7 acres), a 7,683.6-acre reduction in High Density lands (to 2,683.8), only a .3% decrease in Environmentally Sensitive lands classification (6,686.8 total acres) and an increase in Wildlife Management lands from 2,258.2 acres to 20,859.7 acres. This would result in 64% of available acreage classified as Wildlife Management lands. The increase in lands classified as Wildlife Management land would provide additional protection for lakeside wetland vegetation by preventing destruction of wetland plant and animal species due to potential development activity.

5.7.3 No Action (Alternative 3)

Under the No Action Alternative, shoreline lands would be classified into High Density recreation lands (10,337.6 acres, representing 32% of total available area), Low Density recreation lands (11,965.8 acres-37%), Environmentally Sensitive lands (7,528.9 acres-23%), and Wildlife Management lands (2,258.2 acres-7%), while 336.5 acres have no current classification. Based on this, the potential exists for continued degradation of shoreline wetland vegetation due

to increased development and subsequent vegetation removal and mowing activities. Unclassified lands are potentially developable, resulting in 7% of the shoreline acreage subject to possible increased or new development. This would result in potential negative effects to the existing natural wetland habitat due to potential removal of trees, as well as understory and emergent vegetation, thus possibly altering food sources of wetland inhabitants, including insects, amphibians, reptiles, birds and mammal species that utilize these areas.

5.8 Archaeological and Historic Resources

5.8.1 Increase Preservation (Alternative 1)

Under the Increase Preservation Alternative, High Density Recreation classifications would be decreased around Norfolk Lake; Low Density would also be decreased to a slightly greater amount than under the Preferred Action, while Environmentally Sensitive and Wildlife Management Areas would be increased, thus reducing the potential for development. This alternative, while having a larger potential for development as compared to the Preferred Action, would still result in a benefit to cultural resources based on the large decrease in the increase in Wildlife Management lands and large decreases in High and Low Density Recreation land classifications, as compared to the No Action Alternative.

5.8.2 Increase Conservation (Alternative 2)

Under the Increase Conservation Alternative, the area classified as Environmentally Sensitive would have a reduction of 842.1 acres, however, Wildlife Management lands would increase by over 18,600 acres. With these proposed modifications, there would be minimal potential for ground disturbing activities along the shoreline, thus decreasing the potential for effects on cultural resources. In areas that were classified as Low Density under the No Action Alternative and that have no permits or houses, and undeveloped lots, would be changed to Environmentally Sensitive in effort to preserve the scenic, historical, archaeological, scientific, water quality, or ecological value of the overall project. In areas where the land has been previously classified as High Density, but it has not yet been identified for development, these lands would be converted to Environmentally Sensitive or Wildlife Management.

5.8.3 No Action (Alternative 3)

Under the No-Action Alternative there would be no change in the current Master Plan land classifications as designated under the 1988 MP. Under this alternative, the greatest potential for effects on cultural resources and historic properties would occur in the areas classified as Low and High Density Recreation and those lands with no classification. Cultural Resources under the No Action Alternative would be at risk of disturbance in areas where the land classification would allow for intensive development. Any new ground disturbing activities on USACE lands would require a permit to be issued prior to commencement of the activity. Through the site review process prior to issuance of a permit or any federal action, unknown sites would be identified, and known sites would be evaluated for their significance and eligibility for the National Register of Historic Places pursuant to 36 CFR Part 800 of the National Historic Preservation Act. Cultural Resource sites within Low Density or High Density classification areas could potentially undergo the most severe impact due to the fact that activities such as boat dock construction and shoreline use permits result in a degree of ground disturbance which could pose a threat to intact cultural deposits. Potential mitigation for impact to cultural or historic sites would be the requirement for a cultural or historic

resource site evaluation. If evaluation of site identifies a cultural or historic resource, avoidance of the action would be recommended.

5.9 Socio-Economic Resources

5.9.1 Increase Preservation (Alternative 1)

The Increase Preservation Alternative would result in a similar socio-economic situation as Alternative 2, but possibly would have less of a positive effect as compared to the No Action Alternative. Low Density acreage in this alternative would be 2,116.3 acres, representing 7% of available shoreline acreage. The economy in the area could possibly decrease slightly due to a potential decreased opportunity for development and boating recreation.

5.9.2 Increase Conservation (Alternative 2)

The Increase Conservation Alternative would likely have less of a positive effect on the socio-economic situation in the counties surrounding Norfolk Lake than the No Action Alternative. Population would be expected to stay the same or decline slightly due to the decreased High Density acreage and the conversion of 9,829.1 acres of Low Density lands to Wildlife Management lands. Although under the Preferred Action, the demographic makeup of the population would likely be unaffected. Total housing units would stay the same or decrease due to the decreased availability of recreation at the lake, but it is unlikely that housing values would change as a result of the alternative. The economy of the area would likely stay the same or have a slight decline if this alternative is implemented.

5.9.3 No Action (Alternative 3)

The No Action Alternative may have the most effect on the socio-economic situation in the counties surrounding Norfolk Lake due to the fact that 70% of the available shoreline acreage is classified as either High or Low Density Recreation lands. While the potential for some development exists around the lake, current population growth and the demographic makeup of the population are expected to remain similar to the current rates and percentages the area experiences now. Housing units and their values would not be affected if the No Action alternative is implemented. It is likely that changes in the socio-economic conditions of the Norfolk area would be the result of outside influences, and not those created by the No Action alternative.

5.10 Recreation Resources

5.10.1 Increase Preservation (Alternative 1)

The Increase Preservation Alternative would not deviate significantly from the Increase Conservation Alternative in terms of provision of recreational opportunities on the lake. The 9,849.5 acres of shoreline that would be reclassified from Low Density recreation and 7,915.6 acres from High Density to Environmentally Sensitive and Wildlife Management lands would create a reduced potential to have additional private boat docks for fishing and lake access but would increase the potential to develop nature trails and wildlife viewing areas, thus potentially increasing recreational traffic around Norfolk Lake and its adjacent lands.

5.10.2 Increase Conservation (Alternative 2)

Under the Increase Conservation Alternative, all lands would be classified and some of the

existing classifications would be changed. This proposed update in classification would be structured to achieve a balance based on the present public use of the lake while sustaining the natural, cultural, and socio-economic resources of the area and reflecting the current management and operation of lands at Norfolk Lake. Under Alternative 2, the current High and Low Density lands, comprising 69% of available shoreline acreage, would be reduced to 15%, while Environmentally Sensitive and Wildlife Management lands, at 23% and 7%, respectively, would change to 21% and 64% of shoreline acreage. These classifications reflect current lake usage, with fishing, boating, hunting and wildlife viewing dominating the recreational activity on the lake. The proposed increase in Wildlife Management and Environmentally Sensitive classified lands action would assist in forging partnerships between public and private entities for recreational and wildlife conservation opportunities. The retention of a major percentage of the natural shoreline vegetation would lead to improved water quality, due to the buffering and filtering capability of this vegetation.

5.10.3 No Action (Alternative 3)

Provision of recreational facilities and services would continue at Norfolk Lake without an update to the Norfolk Lake Master Plan. However, the plan by which the Resource Manager and staff operate would not accurately reflect the current status of project facilities. Nor would there be additional measures in place, such as trail corridors and additional land use designations, to better accommodate recreational needs while protecting the natural resources. Currently, there are several boat docks outside of areas currently zoned for them and under the No Action Alternative these uses would remain inconsistent with the Master Plan. A total of 336.5 acres of shoreline would remain unclassified generating confusion about which uses are allowed in these areas.

5.11 Air Quality

5.11.1 Increase Preservation (Alternative 1)

Being similar to the Increase Conservation Alternative, the Increase Preservation Alternative would result in fewer air quality effects as compared to the No Action Alternative. This alternative would reclassify more High and Low Density to Environmentally Sensitive, as compared to the Preferred Action, which converted more to Wildlife Management lands. This additional Environmentally Sensitive and Wildlife Management lands acreage would result in a reduced potential for additional development, which could lead to decreased local vehicular exhaust emissions. The increased vegetation cover would result in increased oxygen production through photosynthesis, and lower air temperatures from additional shade. No violations of the current NAAQS established by EPA would be expected as a result of the implementation of this alternative.

5.11.2 Increase Conservation (Alternative 2)

Implementation of the Increase Conservation Alternative would also result improved air quality impacts, as compared to the No Action Alternative. Since this alternative would incorporate more shoreline acreage into the Wildlife Management land classification, there would likely be a reduction in potential development, local vehicular exhaust emissions, and construction equipment activity. This would avoid or reduce potential impacts on localized air quality. No violations of the current NAAQS established by EPA would be expected as a result of the implementation of this alternative.

5.11.3 No Action (Alternative 3)

Under the No Action alternative, the air quality around the lake would remain the same as currently exists. There would likely be increases in vehicular exhaust emissions due to localized development, and the associated construction equipment and traffic in the area. However, no violations of the current National Ambient Air Quality Standards (NAAQS) established by EPA would be expected as a result of the implementation of this alternative.

5.12 Health & Safety

5.12.1 Increase Preservation (Alternative 1)

Similar to the impacts in Alternative 2, the Increase Preservation Alternative could also reduce the potential for additional boat docks being built due to a reduction in High and Low Density Recreation lands. This alternative would potentially result in a small decrease of traffic congestion on the water, thus water related incidents could potentially become reduced under this alternative, as compared to the No Action Alternative.

5.12.2 Increase Conservation (Alternative 2)

The recreational opportunities, balanced with conservation of natural environment could lead to better health, both mental and physical, of the visiting population. Implementation of the Increase Conservation Alternative would likely result in reduced traffic congestion on the water, and a lower potential for water related incidents. The increase in Wildlife Management Areas could potentially increase exposure to insects and animals, which is generally understood by the public who utilize these lands.

5.12.3 No Action (Alternative 3)

Safety of project visitors and project staff are highest priority in daily project operations. The No Action Alternative would have 69% of available shoreline acreage classified for High and Low Density development, would allow for the highest potential for a reduction in lake water quality, as described in Section 5.3.2. There could potentially be an increase in boat traffic on the lake and a possible increase in congestion, creating additional safety issues. The lake could experience increased user conflict, for example, boats vs. personal watercrafts. Under the No Action Alternative, populations who recreate at the lake could be exposed to health risks associated with impaired water quality, such as *E. coli*, and potential hazardous run off due to the overall potential for increased recreation at the lake.

5.13 Aesthetics

Aesthetics are an important feature that enhances the recreational experience. Lands around Norfolk Lake provide a natural setting that is aesthetically pleasing as well as buffering the lake from views of development and existing cleared areas.

5.13.1 Increase Preservation (Alternative 1)

Implementation of the Increase Preservation Alternative would be similar in regard to aesthetics as the Increase Conservation Alternative. Under this alternative, a combined 17,513.5 acres of High and Low Density would be converted to Environmentally Sensitive and Wildlife Management lands. This reduces potential for additional boat dock construction and vegetation modification permits, thus preserving the natural scenic beauty of the lake shoreline.

5.13.2 Increase Conservation (Alternative 2)

The wide panorama of Norfolk Lake and the nearby shore conveys a sense of enormity to the lake, and the conversion of 9,829.1 acres of Low Density lands and 7,683.6 acres of High Density lands to Wildlife Management acreage under the Increase Conservation Alternative would continue to preserve the sense of relatively pristine shoreline. The natural vegetation along the shoreline would enhance the views of the people recreating on the lake, while potentially impeding the view of the lake from the shore. Under this proposed alternative, property owners could work with Corps staff to determine the appropriate vegetation management measures for their specific property location adjacent to the shoreline of the lake.

5.13.3 Action (Alternative 3)

Under the No-Action Alternative the visual character of the landscape would slowly change due to potential continued development increasing the amount of land with views of development and human structures. This would increase the amount of visual contrast between the natural and developed landscapes around the lake. Visual contrast is a measure of impact on visual quality and aesthetics. Dock development would eliminate the unspoiled and untamed aesthetic of this landscape. Road and utility line corridors also impact aesthetics and visual resources at Norfolk. Since the lake is partially surrounded by pockets of residential and commercial development, these demands would continue to increase. In many instances, requests for new shoreline use permits are in areas where the natural vegetation and landscape would be disturbed.

5.14 Cumulative Impacts

Cumulative impacts are those that may result from the incremental impact of the evaluated alternatives added to those of other past, present, or reasonably foreseeable future actions in the local area. The Master Plan for Norfolk Lake was last approved in 1988; this was followed by multiple supplements over the last 32 years. During that time, public use patterns have remained similar, but trends, facility and service demands have shifted in the past 32 years due to the need for alternative experiences in recreation and tourism. The demand for high quality recreational experiences remain. Norfolk Lake receives pressure for both private shoreline and public recreation use, resulting in management concerns regarding the overall sustainability of the lake. With public use at project facilities changing, reallocations of services at these facilities need to be addressed. Changes involving recreation area closures and improvements have occurred during the last four decades to meet the evolving public use. In addition, cooperative agreements are being considered in order to operate and maintain facilities, which would reduce the financial burden on the taxpayers.

Two main themes came out of the scoping process, which was a cumulative exercise involving private and public entities, and local, state and federal agencies improved water quality and maintenance of the environmental setting around the lake. Preservation of the natural shoreline and lack of extensive development has enhanced and maintained good water quality since the lake was constructed. The Arkansas Department of Energy and Environment has classified Norfolk Lake as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). The Missouri Department of Natural

Resources has designated it as a Class L2 waterbody, which is similar to the ADEE classification. Existing conditions at the lake allow for some degree of development on 69% of available acreage, with an additional 336.5 acres having no specific land classification. However, it should be noted that reclassification of lands under the proposed alternative would enhance water quality by restricting Low Density recreation development and increasing the amount of Wildlife Management acreage, thereby retaining more of the natural shoreline vegetation. Approximately 85% of the linear shoreline would have a natural vegetated shoreline due to these land reclassifications identified in the Proposed Alternative. There would be some positive impacts to climate, topography, geology and soils under this alternative. The aquatic environment of the lake should benefit from a potential reduction in storm water runoff velocity, reduced sedimentation, improved water quality, and a cleaner substrate for macroinvertebrate production and fish spawning activity. This alternative would also enhance wildlife foraging and movement patterns, offer more protection for threatened and endangered species that inhabit the area, and result in minimal impacts to cultural resources. A provision for additional potential development opportunities coupled with an abundance of lands remaining in their natural condition would balance and enhance recreational experiences, which would potentially stimulate the socioeconomics of the area. This balanced approach should provide a safe and aesthetically pleasing recreational experience for the public that visits and/or lives at Norfolk Lake.

Continued collaboration and coordination with state and federal resource agencies, as well as local agencies and watershed groups, is necessary to monitor, evaluate and remediate aging infrastructure, failing septic systems around the shoreline, and potential water quality impacts. Coordination with these entities could also evaluate and promote watershed enhancement programs that would serve to institute stream bank stabilization, land improvement and conservation programs, and implementation of best management practices to reduce watershed runoff and erosion.

As management of Norfolk Lake ensues, the Corps would continue to coordinate with Federal, State, and local agencies to avoid, minimize or mitigate potential impacts.

6. ENVIRONMENTAL COMPLIANCE

Compliance with Federal Acts and Executive Orders are summarized in the following table.

Table 6-1 Federal Act/Executive Order Compliance

Act/Executive Order	Status	Compliance
Wetlands (EO 11990)	No effect	C
Prime/Unique Farmlands	N/A	N/A
Floodplain Management (EO 11988)	N/A	N/A
Clean Water Act		
Section 404	No effect	N/A
Section 401	No effect	N/A
NPDES	No effect	N/A
Fish and Wildlife Coordination Act	No effect	C
Endangered Species Act	No effect	C
National Historic Preservation Act	No effect	C
Environmental Justice (EO 12898)	No effect	C
Clean Air Act	No effect	C
Comprehensive Environmental Response Compensation and Liability Act (CERCLA)	N/A	N/A
Resource Conservation and Recovery Act (RCRA)	N/A	N/A
Wild and Scenic Rivers Act	N/A	N/A
Rivers and Harbors Act	N/A	N/A
N/A—not applicable C--Compliant		

6.1 Fish and Wildlife Coordination Act

The Corps is required to coordinate with the USFWS and MDNR under the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 USC 661 et. seq.). Coordination was initiated with a scoping notice; no concerns were raised by these agencies. Review of the Environmental Assessment is pending; no concerns are anticipated.

6.2 Endangered Species Act

The Endangered Species Act (ESA) requires the determination of possible effects on species or degradation of habitat critical to Federally listed endangered or threatened species. Implementation of an updated Master Plan is not likely to affect threatened or endangered species. Individual requests for use of project lands would be evaluated to ensure compliance with this Act.

6.3 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations* requires Federal agencies to promote

“nondiscrimination in Federal programs substantially affecting human health and environment”. In response to this directive, Federal Agencies must identify and address a disproportionately high and adverse human health and environmental effects of their programs, policies, and activities on minority and low-income populations. The final step in the environmental justice evaluation process is to evaluate the impact of the project on the population and to ascertain whether target populations are affected more adversely than other residents.

Implementing the proposed Master Plan Update would not disproportionately affect minority or low-income populations.

6.4 Cultural Resource Requirement

Section 106 of the National Historic Preservation Act of 1966 requires the Corps to identify historic properties affected by the proposed action and to evaluate the eligibility of those properties for the National Register of Historic Places. Section 110 of the Act requires the Corps to assume responsibility for the preservation of historic properties in its ownership. The Act also requires Federal agencies to provide the Advisory Council on Historic Preservation an opportunity to comment on undertakings through the process outlined in the Council’s regulations (36 CFR 800).

There would be no potential adverse effects on cultural resources with implementation of an updated Master Plan. Individual requests for use of project lands would be evaluated on a case-by-case basis to ensure compliance with this act.

7. Scoping and Public Concern

7.1 Introduction

No single agency has complete oversight of stewardship activities on the public lands and waters surrounding Norfolk Lake. Responsibility for natural resource and recreation management falls to several agencies that own or have jurisdiction over these public lands and waters.

Increasingly, competition for the use of these lands and waters and their natural resources can create conflicts and concerns among stakeholders. The need to coordinate a cooperative approach to protect and sustain these resources is compelling. Many opportunities exist to increase the effectiveness of Federal programs through collaboration among agencies and to facilitate the process of partnering between government and non-government agencies.

To sustain healthy and productive public lands and water with the most efficient approach requires individuals and organizations to recognize their unique ability to contribute to commonly held goals. The key to progress is building on the strengths of each sector, achieving goals collectively that could not be reasonably achieved individually. Given the inter-jurisdictional nature of Norfolk Lake, partnering opportunities exist and can promote the leveraging of limited financial and human resources. Partnering and identification of innovative approaches to deliver justified levels of service defuse polarization among interest groups, and lead to a common understanding and appreciation of individual roles, priorities, and

responsibilities.

To the extent practical, this Master Plan and a proactive approach to partnering would position Norfolk Lake to aggressively leverage project financial capability and human resources in order to identify and satisfy customer expectations, protect and sustain natural and cultural resources and recreational infrastructure, and programmatically bring Corps management efforts and outputs up to a justified level of service. Public involvement and extensive coordination within the Corps of Engineers and with other affected agencies and organizations is a critical feature required in developing or revising a Project Master Plan.

Agency and public involvement and coordination have been a key element in every phase of the Norfolk Lake Master Plan revision.

7.2 Scoping

In March of 2020, a global coronavirus pandemic (COVID-19) was declared. This prompted a lot of changes in the workforce, including USACE implementing telework schedules across the board to keep employees safe and social distanced. In addition, and due to the evolving Federal, State, and Local policies designed to address the spread of COVID-19, the project delivery team (PDT) determined that no in person agency or public scoping workshops would occur until the threat of the virus subsided. As an alternative, the Norfolk Master Plan Revision website was created to be the primary source of information during this time. Website information was provided through various sources, such notification postcards, news releases, agency scoping letters, and media outreach, for individuals to visit the project website to find out more information about the process to update the master plan for Norfolk Lake; to solicit comments for Scoping; and to communicate to the public of the reason behind changing the traditional USACE scoping process in response to the global pandemic. As part of the initial phase of the environmental process, an extended public scoping comment period was held between November 16, 2020 and December 31, 2020 to gather agency public comments on the MP revision process and issues that should be examined as part of the environmental analysis. The extension on the comment period was one response to the change in the traditional USACE scoping process due to the pandemic.

Agencies were invited to participate in the scoping process and to provide input on the vision for the Norfolk Lake MP and on issues that should be addressed through the environmental assessment. A letter was sent on November 10, 2020 to 30 agencies providing notification of the upcoming agency scoping comment period and links to the project website where more information could be found.

In total, approximately 165 comment submittals (letters, emails, comment cards, or oral comments) from members of the public and 8 comment submittals from agencies were received by the end of the comment period.

7.3 Draft Master Plan/Draft Environmental Assessment.

The Draft Master Plan/Draft Environmental Assessment is currently scheduled for release at the end of September 2021 with public workshops scheduled for September 2021.

7.4 Final Master Plan/Final EA.

The Final Master Plan is currently scheduled for completion in November 2021, with public workshops scheduled in early December 2021.

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8. Conclusions

The Master Plan for Norfolk Lake was last approved in 1988; this was followed by multiple supplements over the last 32 years. During that time, public use patterns have remained similar, but trends, facility and service demands have shifted in the past 32 years due to the need for alternative experiences in recreation and tourism. Norfolk Lake receives pressure for both private shoreline and public recreation use, resulting in management concerns regarding the overall sustainability of the lake. With public use at project facilities changing, reallocations of services at these facilities need to be addressed. Changes involving recreation area closures and improvements have occurred during the last four decades to meet the evolving public use. In addition, cooperative agreements are being considered in order to operate and maintain facilities, which would reduce the financial burden on the taxpayers.

The Master Plan is not intended to address the specifics of regional water quality, shoreline management, or water level management; these areas are covered in a project's shoreline management plan or water management plan. However, specific issues identified through the Master Plan revision process can still be communicated and coordinated with the appropriate internal Corps resource (i.e., Operations for shoreline management) or external resource agency (i.e., Missouri Department of Natural Resources and Arkansas Dept. of Energy and Environment for water quality) responsible for that specific area. To facilitate this action, the current Master Plan development evaluated three alternatives relative to their potential impacts on the land and water resources of Norfolk Lake.

These alternatives spanned the gamut of increased shoreline protection to increased shoreline development and the potential effects on the human, terrestrial, and aquatic environment from their implementation. A no action alternative looked at leaving the lake as it currently exists in terms of developable areas and protected areas. Of the 32,533.5 acres of available land around the lake, 69% of this is classified as High and Low density recreation, with potential future development occurring. While 23% of available acreage is classified as Environmentally Sensitive lands, 336.5 acres of land currently has no classification. Under each of the action alternatives, the lands with no classification are allocated to one of the land classifications.

The action alternatives included an Increase Preservation and an Increase Conservation Alternative. The Increase Preservation Alternative (Alternative 1) shifted the majority of the available shoreline acreage toward future preservation, with 8% classified as High Density recreation, 45% classified as Environmentally Sensitive, and 41% classified as Wildlife Management lands. Potential effects from this would be decreased vegetation removal and a reduction in soil erosion due to the reclassification of lands previously included as high and low density lands, having the potential for construction and conversion of pervious surfaces to impervious. This construction activity is generally detrimental to water quality and terrestrial and aquatic wildlife species. Development has the potential to increase the number of boats on the lake, increased health and safety issues, aesthetic impacts, and impaired recreational experiences for many visitors. The Increase Conservation Alternative (Alternative 2 Preferred) includes 8% High Density lands, while reducing the 37% of Low Density lands to 7%, with the 30% difference going to the Wildlife Management classification. This action would preserve

shoreline vegetation, reduce stormwater runoff quantity and velocity, resulting in less in-lake sedimentation and turbidity, and improve water quality. This action also has the potential to improve health and safety issues, aesthetics, terrestrial and aquatic wildlife habitat. The Increase Conservation Alternative seeks to balance all components of lake usage, including the provision for growth and recreation potential, while protecting and preserving terrestrial and aquatic resources. A detailed description of the modifications is located in Chapter 5 of the Master Plan.

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Appendix A: Norfolk Lake Scoping Report

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Appendix B: Draft Release Comments Report

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Reserved for Draft Release Comment Report

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Appendix C: Alternative Map