US Army Corps
of Engineers
Little Rock District

Final
Environmental Assessment

Master Plan for the Development and Management of Nimrod Lake

Arkansas River Watershed
Nimrod Lake, Arkansas

September 2024

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FINDING OF NO SIGNIFICANT IMPACT

ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED MASTER PLAN FOR THE DEVELOPMENT AND MANAGEMENT OF NIMROD LAKE, ARKANSAS RIVER WATERSHED PERRY AND YELL COUNTIES, ARKANSAS

The U.S. Army Corps of Engineers (USACE) Engineering Regulation (ER) 1130-2-550 Change 07, dated 30 January 2013, and Engineering Pamphlet (EP) 1130-2-550 Change 05, dated 30 January 2013, require Master Plans for USACE water resources development projects having a federally owned land base. The revision of the 1975 Nimrod Lake Master Plan is being conducted pursuant to this ER and EP and is necessary to bring it up to date to reflect current ecological, socioeconomic, and outdoor recreation trends affecting the lake, as well as those anticipated to occur in the future.

In accordance with the National Environmental Policy Act of 1969, as amended, including guidelines in 33 Code of Federal Regulations (CFR), Part 230 and 40 CFR Parts 1500-1508, the USACE Little Rock District has conducted an environmental analysis on the draft 2024 Nimrod Lake Master Plan. The draft master plan addresses the need for an updated comprehensive land management document for the Nimrod Project in Perry and Yell Counties, Arkansas. The final recommendation will be contained in the 2024 Nimrod Lake Master Plan.

The revision of the 1975 Nimrod Lake Master Plan is a framework built collaboratively to serve as a guide toward appropriate stewardship of USACE administered resources at Nimrod Lake over the next 25 years.

The Environmental Assessment (EA) for the 2024 Final Nimrod Lake Master Plan evaluated a “no action” plan and two action alternatives that would revise the 1975 Nimrod Lake Master Plan to meet current policy.

In addition to the “no action” plan, two alternatives that meet the project purposes were evaluated, including Alternative 2, the Selected Alternative, and Alternative 3, the Limited Development Alternative. Chapter 2 of the draft Nimrod Lake Master Plan EA discusses the alternative formulation and selection as well as a summary of the new goals and objectives. Chapter 2, Table 2-1 of the EA summarizes the changes to the land classifications. The proposed plan is Alternative 2, the Selected Alternative, and includes:

- Reclassifying lands to reflect current management practices including recreation, hunting, fishing, timber management, habitat management, and responses to agency and public comments during the scoping phase;
- Reclassifying undeveloped High Density and Low Density Recreation land classifications (i.e., future or closed USACE parks) to Wildlife Management; and,
- Reclassifying more remote areas that contain islands, shoreline bluffs, narrow bands of isolated areas, and otherwise unique habitats to Environmentally Sensitive Areas.

The proposed plan includes coordination with the public, revisions to comply with USACE regulations and guidance, and reflects changes in land management and land uses that have occurred since 1975. Land classifications were refined to meet authorized project purposes and current resource objectives that address a mix of natural resources and recreation management objectives that are compatible with regional goals, recognize outdoor recreation trends, and are responsive to public comments.

Table 1: Summary of Potential Effects of the Recommended Plan

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Aesthetics	☒	☐	☐
Air quality	☒	☐	☐
Aquatic resources/wetlands	☒	☐	☐
Invasive species	☒	☐	☐
Fish and wildlife habitat	☒	☐	☐
Threatened/Endangered species/critical habitat	☒	☐	☐
Historic properties	☒	☐	☐
Other cultural resources	☒	☐	☐
Floodplains	☐	☐	☒
Hazardous, toxic & radioactive waste	☐	☐	☒
Hydrology	☒	☐	☐
Land use	☒	☐	☐
Noise levels	☐	☐	☒
Public infrastructure	☒	☐	☐
Socio-economics	☒	☐	☐
Environmental justice	☒	☐	☐
Soils	☒	☐	☐
Water quality	☒	☐	☐
Climate change	☒	☐	☐
Health and safety	☒	☐	☐
Recreation	☒	☐	☐

All practicable and appropriate means to avoid or minimize adverse environmental effects have been analyzed and incorporated into the proposed plan. The proposed plan will not entail any ground-disturbing activities. Any future ground-disturbing activities on USACE property will be subject to all necessary environmental evaluations and compliance.

No compensatory mitigation is required as part of the proposed plan.

Public review of the draft Master Plan, EA, and Finding of No Significant Impact (FONSI) were completed on June 8, 2024. All comments submitted during the public review period were responded to in the Final Master Plan and EA.

Pursuant to Section 7 of the Endangered Species Act of 1973, as amended, the U.S. Army Corps of Engineers has determined that the proposed plan will have No Effect on federally listed species nor their designated critical habitat.

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the U.S. Army Corps of Engineers has determined that the proposed plan will have No Effect on historic properties.

All applicable environmental laws were considered and coordination with appropriate agencies and officials has been completed.

All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on the draft report, the reviews by other Federal, State and local agencies, Tribal Nations, input of the public, and the review by my staff, it is my determination that the proposed plan would not cause significant adverse impacts on the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

06-Sep-24

Date

KNARR.DAMON.MITCHELL.1042337222

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Date: 2024.09.06 11:30:51 -05'00'

Damon Knarr
Colonel, Corps of Engineers
District Commander

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MASTER PLAN REVISION
NIMROD LAKE
ENVIRONMENTAL ASSESSMENT

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Acronyms

%	Percent
A&G	Agriculture and Grazing
ABB	American Burying Beetle
ADEE	Arkansas Department of Energy and Environment
AGFC	Arkansas Game and Fish Commission
ANHC	Arkansas Natural Heritage Commission
AOI	Area of Interest
AR	Arkansas
ARPA	Archaeological Resources Protection Act
CAA	Clean Air Act
CCC	Civilian Conservation Corps
CEJST	Climate and Economic Justice Screening Tool
CEQ	Council on Environmental Quality
CO	Carbon monoxide
CWA	Clean Water Act
CWD	Chronic Wasting Disease
DO	Dissolved oxygen
EA	Environmental Assessment
EJ	Environmental Justice
EO	Executive Order
EPA	Environmental Protection Agency
ER	Engineer Regulation
ESA	Endangered Species Act
FWCA	Fish and Wildlife Coordination Act
GTR	Green Tree Reservoir
HPMP	Historic Preservation Management Plan
IBAT	Indiana Bat
IPaC	Information for Planning and Consultation Tool
msl	mean sea level
NAGPRA	Native American Graves Protection and Repatriation Act
NAAQS	National Ambient Air Quality Standards
NAVD88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NLEB	Northern Long Eared Bat
NO_2	Nitrogen Dioxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	Oxygen
OK	Oklahoma
OMP	Operational Management Plan
Pb	Lead
PBO	Programmatic Biological Opinion
P.L.	Public Law
PM	Particulate Matter
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SWL	Little Rock District, USACE
TCB	Tricolored Bat
TCP	Traditional Cultural Properties
TSI	Timber Stand Improvement
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WMA	Wildlife Management Area
WPA	Works Progress Administration
WSI	Wildlife Stand Improvement
ZOI	Zone of Influence

1 INTRODUCTION

This Environmental Assessment (EA) has been prepared by the U.S. Army Corps of Engineers (USACE) to evaluate the proposed 2024 Nimrod Lake Master Plan. The Master Plan is a programmatic document that is subject to evaluation under the National Environmental Policy Act (NEPA) of 1969 (Public Law [PL] 91-190). This EA is an assessment of potential impacts that could result from the implementation of Alternative 1 (the No Action Alternative), Alternative 2 (the Selected Alternative), and Alternative 3 (the Limited Development Alternative), and has been prepared in accordance with NEPA as amended in 2020, the Council on Environmental Quality (CEQ) regulations (40 CFR 1500-1508), and USACE regulations, including Engineer Regulation (ER) 200-2-2: Procedures for Implementing NEPA (1988).

The Master Plan is the strategic land use management document that guides the comprehensive management and potential 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 USACE responsibilities pursuant to federal laws to preserve, conserve, restore, maintain, manage, and develop project lands, surface 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 flexible based upon changing conditions. The Master Plan deals in concepts, not in details, of design and 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 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 control manual. There is no Shoreline Management Plan for Nimrod Lake. The Water Control Manual addresses how the reservoir is managed for flood risk management, and water supply purposes. The 2024 Master Plan revises Nimrod Dam and Lake Design Memorandum No. 1-D (1975 Nimrod Lake Master Plan).

1.1 Project Description

The Nimrod Dam and Lake project was authorized for construction by the Flood Control Act approved 28 June 1938, (Public Law No.761, 75th Congress, 3rd Session) as a modification of Nimrod Reservoir authorized by the Flood Control Act approved 18 August 1941 (Public Law No. 228, 77th Congress, 1st Session). Nimrod Lake is a multiple-purpose flood risk management project and is a major unit in a comprehensive plan for development of the water resources of the Arkansas River Basin in west central Arkansas. Additional purposes include Recreation, Water Supply, and Hydroelectric Power. However, Nimrod Dam is not currently equipped for hydroelectric power. While Fish and Wildlife is not an authorized purpose, environmental stewardship of project lands and waters is an inherent responsibility for USACE and must be taken into consideration with all project management activities. The project encompasses roughly 25,278 acres with approximately 78 miles of shoreline and 3,236 surface acres of water at normal pool elevation (Figure 1-1).

Figure 1-1. Nimrod Lake and Surrounding Area

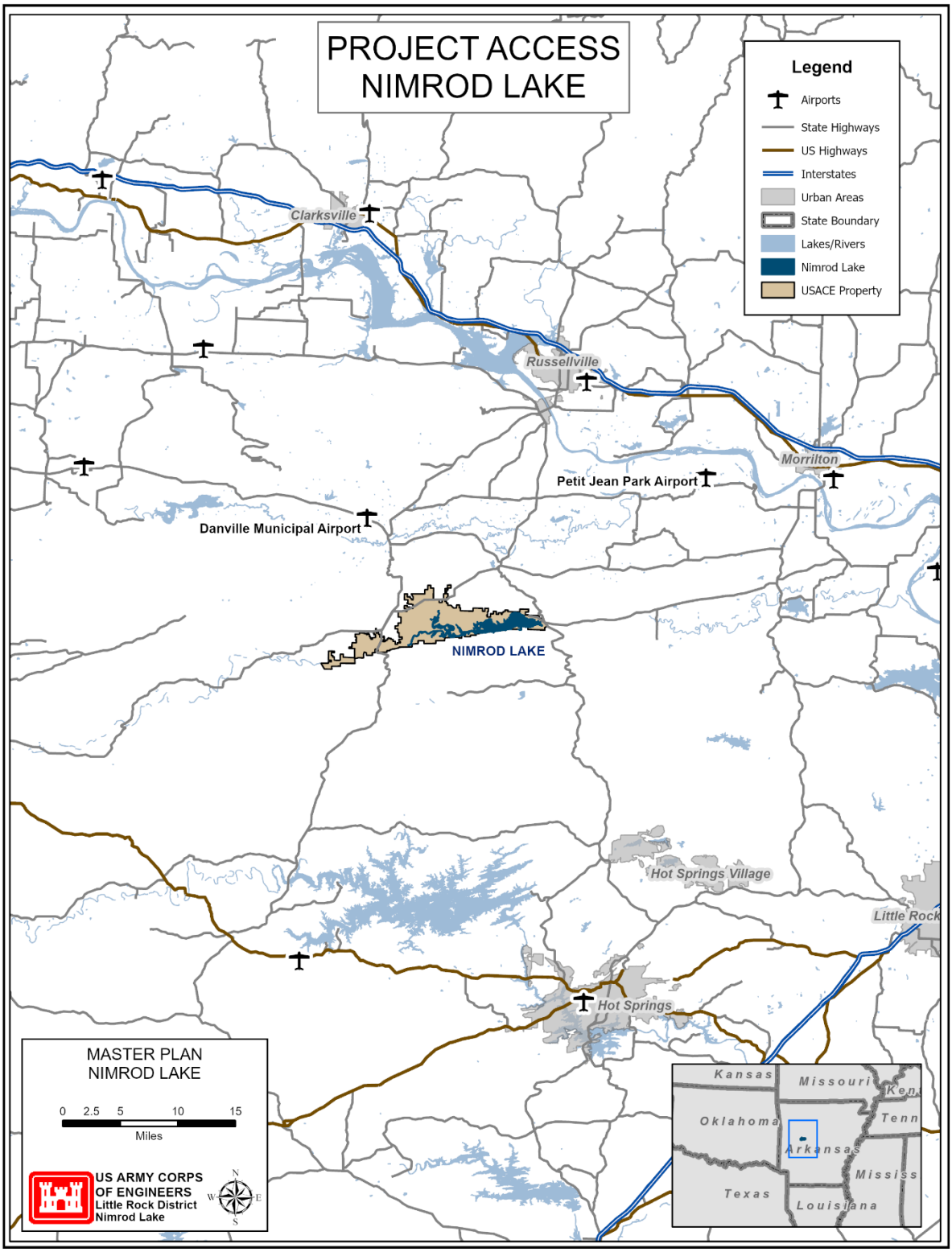


Table 1-1. Pertinent Data of Nimrod Dam and Lake

PERTINENT DATA OF THE NIMROD DAM AND LAKE	
General Information	
Authorized Purpose	Flood Control, Recreation, Water Supply, Hydroelectric Power
Stream, State	Fourche LaFave River, Arkansas
Drainage area, square miles	680
Average annual rainfall over the drainage area, inches (1978-2018)	52
Dam	
Crest Length in feet	1,012
Top of dam elevation, feet above mean sea level	400
Lake	
Nominal top of conservation pool Elevation, feet above mean sea level (msl)	
January 1 – March 1	342
March 1 – March 15	342-345
March 15 – May 15	345
May 15 – July 1	344.5-345
July 1 – October 1	342-344.5
October 1 – December 31	342
Surface Area at conservation pool, acres	3,236
Length of shoreline at conservation pool, miles	78.0
Nominal top of flood-control pool Elevation, feet above mean sea level	373.0
Surface Area at flood pool, acres	18,149
Length of shoreline at flood pool, miles	186

1.2 Purpose and Need

The purpose of the Master Plan revision is to ensure that the conservation and sustainability of the land, water, and recreation resources at Nimrod Lake are in compliance with applicable environmental and management laws and regulations and to maintain quality lands for future public use. The 2024 Master Plan is intended to serve as a comprehensive land and recreation management plan with an effective life of approximately 25 years.

The need for the Master Plan revision is to bring the 1975 Master Plan up to date and to reflect ecological, socio-political, and socio-demographic changes that are currently impacting Nimrod Lake, as well as those changes anticipated to occur in the next 25 years. In particular, changes in outdoor recreation trends, regional land use, population, current legislative requirements, and

USACE management policy have indicated the need to revise the plan. Additionally, increasing fragmentation of wildlife habitat, national policies related to climate change, growing demand for recreational access, and protection of natural resources are all factors affecting Nimrod Lake. In response to these continually evolving trends, USACE determined that a full revision of the 1975 Master Plan would be required.

As part of the master planning process, the project delivery team evaluated public comments and current land uses, determined any necessary changes to land classifications, and formulated proposed alternatives. As a result of public coordination and a public comment period, alternatives were developed, and this EA was initiated.

1.3 Scope of the Action

This EA was prepared to evaluate existing conditions and potential impacts of proposed alternatives associated with the implementation of the 2024 Nimrod Lake Master Plan. The alternative considerations were formulated with special attention given to revised land classifications, new resource management objectives, and a conceptual resource plan for each land classification category. The Final Master Plan is currently available and is incorporated into this EA by reference. This EA was prepared pursuant to NEPA, as amended in 2020. The application of NEPA to more strategic decisions not only meets the CEQ implementing regulations (CEQ 2005) and USACE regulations for implementing NEPA (USACE 1988), but also allows USACE to consider the environmental consequences of its actions long before any physical activity is implemented. Multiple benefits can be derived from such early consideration. Effective and early NEPA integration with the master planning process can significantly increase the usefulness of the Final Master Plan to the decision maker.

2 PROPOSED ACTION AND ALTERNATIVES

The project need is to revise the 1975 Master Plan so that is compliant with current USACE regulations and guidance, incorporates public needs, and recognizes surrounding land use and recreational trends. As part of this process, which includes public outreach and comment, three alternatives were developed for evaluation, including a No Action Alternative. The alternatives were developed using land classifications that indicate the primary use for which project lands would be managed. USACE regulations outline specific land classifications to be used in Master Plan development, and these are described in Section 2.1 below.

2.1 Land Allocations

The principal purpose of the Master Plan for Nimrod Lake is to balance public use and benefits with protection and conservation of natural and cultural resources. The Resource Plan in Chapter 5 of the Master Plan considers these standards in land use classification and in planning for the recreational activities and stewardship of the lands and waters associated with the project. "Land Allocation" is a term used by USACE to describe the purpose for which lands at a project were acquired. The four possible allocations include: Operations, Recreation, Fish and Wildlife and Mitigation. At Nimrod Lake, all lands are allocated as Operations lands. No lands were specifically acquired for Recreation, Fish and Wildlife, or Mitigation.

USACE further divides land allocations through a system of land classification which designates the primary use for which project lands are managed. Project lands are classified for development and resource management consistent with authorized project purposes and the provisions of the NEPA and other Federal laws. Land classifications also consider recreational trends, regionally important natural resources, and cultural resources. The proposed land classifications at Nimrod Lake are defined as follows:

1. **Project Operations.** This 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.
2. **High Density Recreation.** Lands developed for intensive recreational activities for the visiting public, including day use areas and/or campgrounds. These also include areas for commercial marina concessions, quasi-public development, and comprehensive resorts.
3. **Mitigation.** This classification will only be used for lands with an allocation of Mitigation and that were acquired specifically for the purposes of offsetting losses associated with development of the project.
4. **Environmentally Sensitive Areas.** Areas 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 areas are typically distinct parcels located within another, and perhaps, larger, land classification, area.

5. **Multiple Resource Management Lands.** This classification allows for the designation of a predominate use as described below, with the understanding that other compatible uses described below may also occur on these lands (e.g., a trail through an area designated as Wildlife Management). Land classification maps must reflect the predominant sub-classification, rather than just Multiple Resource Management.
    a. **Low Density Recreation.** Lands with minimal development or infrastructure that support passive public recreational use (e.g., primitive camping, fishing, hunting, trails, wildlife viewing, etc.).
    b. **Wildlife Management.** Lands designated for stewardship of fish and wildlife resources.
    c. **Vegetative Management.** Lands designated for stewardship of forest, prairie, and other native vegetative cover.
    d. **Future/Inactive Recreation Areas.** Areas with site characteristics compatible with potential future recreational development or recreation areas that are closed. Until there is an opportunity to develop or reopen these areas, they will be managed for multiple resources.
6. **Water Surface Classifications.** If the project administers a surface water zoning program, then it should be included in the Master Plan.
    a. **Restricted.** Water areas restricted for project operations, safety, and security purposes.
    b. **Designated No-Wake.** To protect environmentally sensitive shoreline areas, recreational water access areas from disturbance, and for public safety.
    c. **Fish and Wildlife Sanctuary.** Annual or seasonal restrictions on areas to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning.
    d. **Open Recreation.** Those waters available for year-round or seasonal water-based recreational use.

2.2 Alternatives Development

The diverse range of habitats occurring throughout the 25,278-acre, USACE-operated Nimrod Lake Project require a diversity of management actions to achieve habitat improvement for the benefit of wildlife and environmental sustainability. Additionally, the management and development of existing and potential future recreation areas should reflect historical and evolving recreation trends and demands. The following excerpt from EP 1130-2-550 express the goals for the Nimrod Lake Master Plan:

- Goal A: Provide the best management practices to respond to regional needs, resource capabilities and suitability's, and expressed public interests consistent with authorized project purposes.
- Goal B: Protect and manage project natural and cultural resources through sustainable environmental stewardship programs.

- Goal C: Provide public outdoor recreation opportunities that support project purposes and public demands created by the project itself while sustaining project natural resources.
- Goal D: Recognize the particular qualities, characteristics, and potentials of the project.
- Goal E: Provide consistency and compatibility with national objectives and other State and regional goals and programs.

In addition to the above goals, USACE management activities are also guided by USACE-wide Environmental Operating Principles as follows:

- Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse and sustainable condition is necessary to support life.
- Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of USACE programs and act accordingly in all appropriate circumstances.
- Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.
- Continue to accept corporate responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems.
- Seek ways and means to assess and mitigate cumulative impacts on the environment; bring systems approaches to the full life cycle of our processes and work.
- Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.
- Respect the views of individuals and groups interested in USACE activities; listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the nation's problems that also protect and enhance the environment.

Specific resource objectives to accomplish these goals can be found in Chapter 3 of the 2024 Master Plan.

To meet these management needs, two action alternatives, as well as the No Action Alternative, were developed throughout the Master Plan revision and are evaluated in this EA. Alternatives evaluated include Alternative 1 – No Action (1975 Plan), Alternative 2 – Selected, and Alternative 3 – Limited Development. Table 2-1 below depicts the land classification acreages and percentages of total fee land by alternative. Action alternatives are compared to the No Action, and the change in acreage and percentage for each land classification from the No Action is also relayed in Table 2-1. For a more detailed map analysis of the three alternatives evaluated, refer to the complete set of maps located in Appendix C. The land classifications established under each action alternative were developed to reflect historical, current, and future resource management objectives, with emphasis given to recreation and fish and wildlife management objectives. Public comments received and further analyzed in Appendix A were thoroughly considered and integrated as appropriate into the development of the action alternatives.

In this EA development, the action 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 fee land acreage classifications determined by each action alternative. All evaluated alternatives were provided for public review during the public comment period for the draft Master Plan.

Table 2-1. Change in Land Classification by Alternative, Including No Action Converted to Selected Alternative

Alternative 1 (No Action)	Acres	% of Land	+/-Acres	% +/- Change
Total Land and Water	25,278.4		N/A	
Total Water	3,586.6			
Restricted Water	11.8			
Open Recreation Water	3,574.8			
Land	21,691.8			
High Density Recreation	3,185.2	15%		
Low Density Recreation	14,257.9	66%		
Environmentally Sensitive	429.4	2%		
Project Operations	123.0	1%		
Wildlife Management	3,684.1	17%		
No Allocation	12.2	0.1%		
Alternative 2 (Selected)	**Acres**	**%of Land**	**+/-Acres**	**% +/- Change**
Total Land and Water	25,278.4			
Total Water	3,586.6			
Restricted Water	11.8			
Open Recreation Water	3,574.8			
Land	21,691.8			
High Density	637.2	3%	-2,548.0	-12%
Low Density	3,667.8	17%	-10,590.1	-49%
Environmentally Sensitive	925.2	4%	495.8	2%
Project Operations	159.9	1%	36.9	0.2%
Wildlife Management	16,301.7	75%	12,617.7	58%
Alternative 3 (Limited Development)	**Acres**	**%of Land**	**+/-Acres**	**% +/- Change**
Total Land and Water	25,278.4			
Total Water	3,586.6			
Restricted Water	11.8			
Open Recreation Water	3,574.8			
Land	21,691.8			
High Density	217.3	1%	-2,967.9	-14%
Low Density	184.7	1%	-14,073.2	-65%
Environmentally Sensitive	928.7	4%	499.3	2%
Project Operations	159.9	1%	36.9	0.2%
Wildlife Management	20,201.2	93%	16,517.1	76%
Note: Acreages are approximate and are based on GIS data. Totals vary depending on changes in lake levels, sedimentation, and shoreline erosion.				

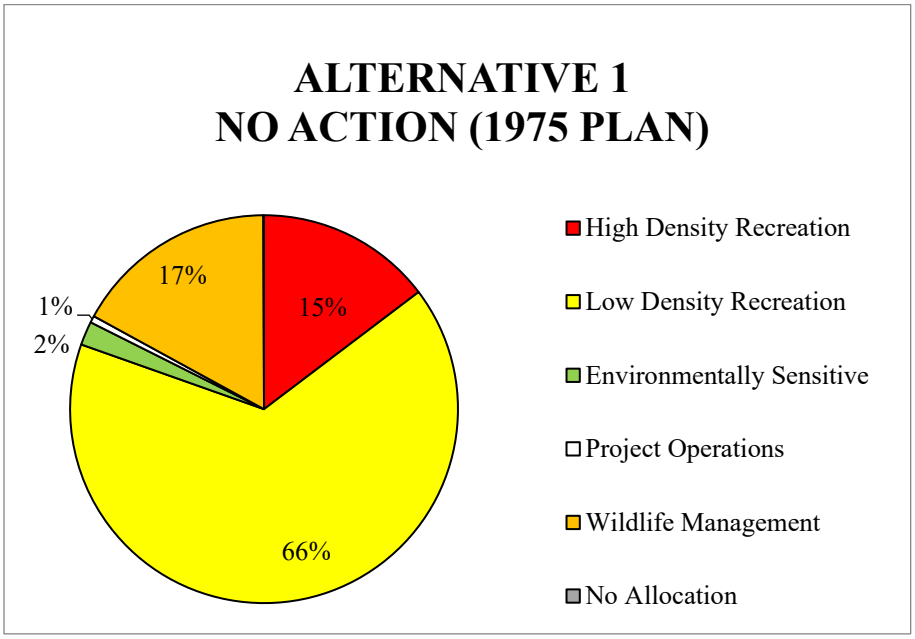
2.2.1 Alternative 1 – No Action (1975 Plan)

The No Action Alternative serves as a basis for comparison to the anticipated effects of the other action alternatives, and its inclusion in this EA is required by NEPA and CEQ regulations (40 CFR 1502.14[c]). Under the No Action Alternative, the USACE would not approve the adoption

or implementation of the 2024 Master Plan revision. Instead, the USACE would continue to manage Nimrod Lake's natural resources as set forth in the 1975 Master Plan. The No Action Alternative does not meet the goals outlined in EP 1130-2-550, the USACE Environmental Operating Principles, or the Master Plan-specific objectives identified for this revision. This alternative does not accurately reflect the current nor anticipated land use activities or resource management practices at the lake, thereby failing to meet Goal A and multiple objectives specified in the revised Master Plan. This alternative does not address resource management laws, policies, and regulations that were implemented after the 1975 Nimrod Lake Master Plan. While it does not meet the purpose of, or need for, the Master Plan revision, the No Action Alternative serves as a benchmark of existing conditions against which federal actions can be evaluated.

Operation and management of Nimrod Lake would continue as outlined in the current Master Plan, which designates 3,185.2 acres as High Density Recreation and 14,257.9 acres as Low Density recreation. There are 429.4 acres classified as Environmentally Sensitive areas, 123.0 acres as Project Operations, 3,684.1 acres as Wildlife Management, and 12.2 acres that currently have no allocation (Figure 2-1).

Figure 2-1. Percentage of Land Classifications for Alternative 1



2.2.2 Alternative 2 – Selected

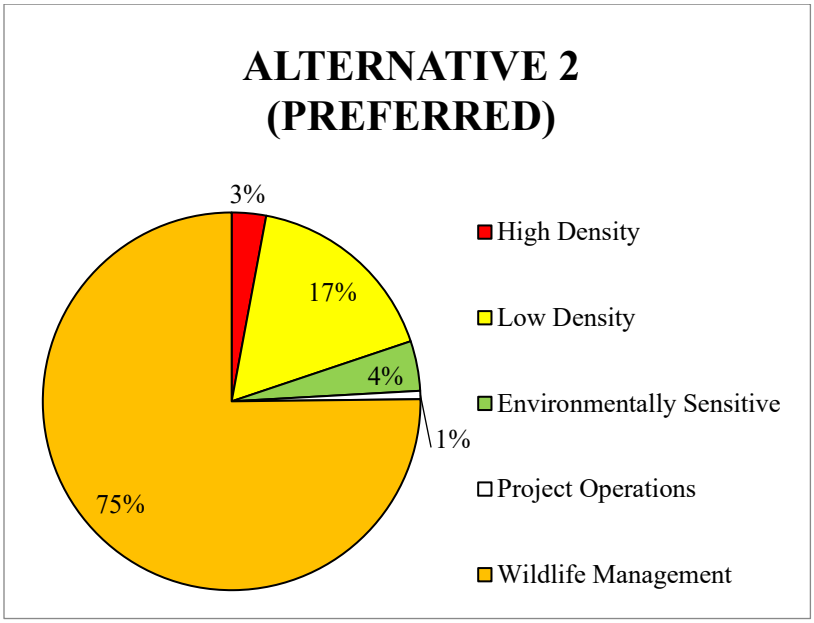
Under Alternative 2, Nimrod Lake land classifications were revised to reflect current management practices including hunting, fishing, timber management, habitat management, and responses to agency and public comments received (Figure 2-2). Changes included reclassifying some undeveloped High Density and Low Density land classifications (i.e. future/closed USACE parks) to Wildlife Management. Lands that contain shoreline bluffs and narrow bands of isolated areas were reclassified as Environmentally Sensitive Areas to protect unique habitats from outside disturbance. The Lloyd Millwood Green Tree Reservoir area, encompassing 15

percent (%) of overall project area, was reclassified from Wildlife Management to Low Density Recreation to accurately account for the extensive recreational use occurring in the area.

Alternative 2 proposes 637.2 acres in High Density Recreation, representing a 2,548 acre decrease from the No Action Alternative. Low Density lands total 3,667.8 acres, representing a decrease of 10,590.1 acres from the No Action Alternative. The majority of the areas removed from the High and Low Density classifications are reclassified as Wildlife Management lands under Alternative 2. Wildlife Management is increased by 12,617.7 acres, for a total of 16,301.7 acres, and Environmentally Sensitive lands are increased by 495.8 acres, for a total of 925.2 acres. Table 2-2 provides a comparison of alternatives in relation to Alternative 2.

The land reclassifications proposed under the Selected Alternative would bring the 1975 Master Plan into compliance with resource management laws, policies, and regulations that were implemented after the 1975 Nimrod Lake Master Plan as well as local, regional, and national objectives (Goal E). Furthermore, this alternative would reflect the current and anticipated land use activities and natural resource management practices at the lake. The Selected Alternative would fulfil the goals outlined in EP 1130-2-550, the USACE Environmental Operating Principles, and the Master Plan-specific objectives identified for this revision. Specifically, this alternative would fulfil Goal A by facilitating best management practices, Goal B by enabling more effective natural and cultural resource management, and Goal C by maintaining existing and allowing for future recreation opportunities. All of these benefits also serve to support revision-specific objectives set forth in Section 3.3.2 of the 2024 Master Plan.

Figure 2-2. Percentage of Land Classifications for Alternative 2



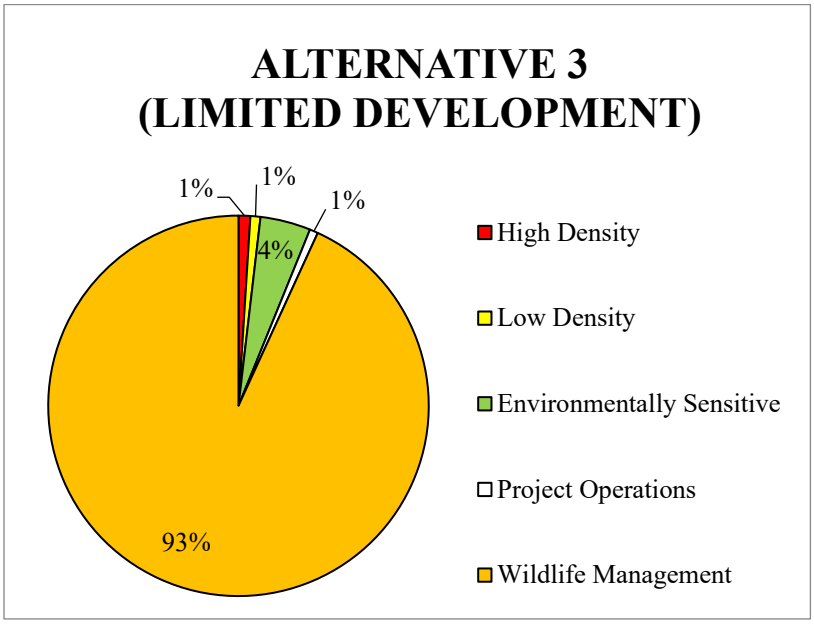
2.2.3 Alternative 3 – Limited Development

Alternative 3 seeks to limit future development of recreation areas to the greatest extent possible, maximizing Wildlife Management and Environmentally Sensitive land allocations (Figure 2-3).

Alternative 3, compared to the No Action, would reduce High Density lands from 3,185.2 acres to 217.3 acres (15% of total land area to 1%). Project Operations acreage would increase from 123.0 acres to 159.9 acres. Environmentally Sensitive Areas would increase to 928.7 acres, or 4% of total area. Wildlife Management lands would increase from 3,684.1 acres to 20,201.2 acres. The Lloyd Millwood Green Tree Reservoir area, encompassing 15% of overall project area, would be classified as Wildlife Management land, although this would not accurately reflect the scale and type of recreation and activity occurring in the area. Additionally, the majority of existing primitive camping areas and accesses designated as Low Density recreation would be reclassified as Wildlife Management, under which camping is not permitted. This alternative could protect land area from future development more than the other alternatives, as evidenced by the 928.7 acres (4% of total area) reclassified as Environmentally Sensitive lands.

The land reclassifications proposed under the Limited Development Alternative would bring the 1975 Master Plan into compliance with resource management laws, policies, and regulations that were implemented after the 1975 Nimrod Lake Master Plan as well as local, regional, and national objectives (Goal E). While this alternative is being considered, it prioritizes fish and wildlife management objectives over recreation objectives. Alternative 3 also overlooks the public desire for improvement of existing recreation areas and increase in recreation opportunities as expressed during the scoping comment period. This alternative does not accurately reflect the current and anticipated land use activities and natural resource management practices at the lake, as some of the reclassifications to Environmentally Sensitive Areas would prohibit a majority of the primitive camping areas and would not allow for the desired multi-use trail nor potential recreation facility improvements. While the Limited Development Alternative would fulfil the goals outlined in the USACE Environmental Operating Principles, it fails to meet many of the Master Plan-specific objectives identified for this revision and set forth in Section 3.3.2 of the 2024 Master Plan.

Figure 2-3. Percentage of Land Classifications for Alternative 3



2.3 Alternatives Comparison

Table 2-2 below compares the acreage and percent of available fee land each alternative entails. Additionally, the action alternatives are color coded to depict if the percent of each land classification increased, decreased, or remained the same compared to the 1975 Master Plan.

Alternative 2 was chosen as the Selected Alternative because it seeks to balance all components of lake usage, including the provision for growth and recreation improvements, while protecting and preserving terrestrial and aquatic resources. This action would protect and/or preserve vegetation and unique habitat in areas classified as Environmentally Sensitive and reduce stormwater runoff quantity and velocity, resulting in reduced in-lake sedimentation and turbidity thereby improving water quality and fisheries. The increase in Wildlife Management Area reflects the importance of natural resource management objectives as well as public hunting recreational opportunities. In High and Low Density areas, the opportunity would still exist to reopen, modify, or expand existing or potential future recreation areas. Alternative 3, the Limited Development Alternative, does not allow for potential recreation improvements and expansion, as desired by lake staff and the public. Additionally, the increase in Low Density acreage represents a more accurate classification for the Lloyd Millwood Green Tree Reservoir as it entails infrastructure and recreation activities that fall outside of the existing Wildlife Management classification. The Selected Alternative best meets both the recreation and fish and wildlife objectives desired by the public and resource agencies as verbalized in the scoping period, and exemplifies the objectives set by Nimrod Lake Project staff.

Table 2-2. Comparison of Alternatives and Change Compared to the No Action

Land Classification	Alternative 1 – No Action		Alternative 2 – Selected		Alternative 3 – Limited Development	
	Acres	Percent	Acres	Percent	Acres	Percent
High Density	3,185.2	15	637.2	3	217.3	1
Low Density	14,257.9	66	3,667.8	17	184.7	1
Environmentally Sensitive	429.4	2	925.2	4	928.7	4
Project Operations	123.0	1	159.9	1	159.9	1
Wildlife Management	3,684.1	17	16,301.7	75	20,201.2	93
Not Allocated	12.2	0.1	0	0	0	0
Change compared to Alternative 1			*Decrease*	*Increase*	*No Change*	

2.4 Selected Alternative

The Draft Master Plan and EA were made available to the public for review and feedback from May 8 to June 8, 2024. In general, the public supported Alternative 2, the Preferred Alternative, as the path forward. Comments received indicated the desire to change the name of Earl Branch Park to Crap Shooters Point, its historical name. No feedback on land classification changes was received. Based on these comments, Alternative 2 was chosen as the Selected Alternative with

the only revision being the renaming of Crap Shooters Point, and this land reclassification will be adopted in the Final Master Plan. The "Proposed Alternative" and "Selected Alternative" are herein referred to synonymously. Selected Alternative maps can be found in Appendix C.

3 AFFECTED ENVIRONMENT

This chapter presents a description of the environmental resources and baseline conditions that could be affected from implementing the alternatives. All potentially relevant environmental resource areas were considered for analysis in this EA.

3.1 Project Setting

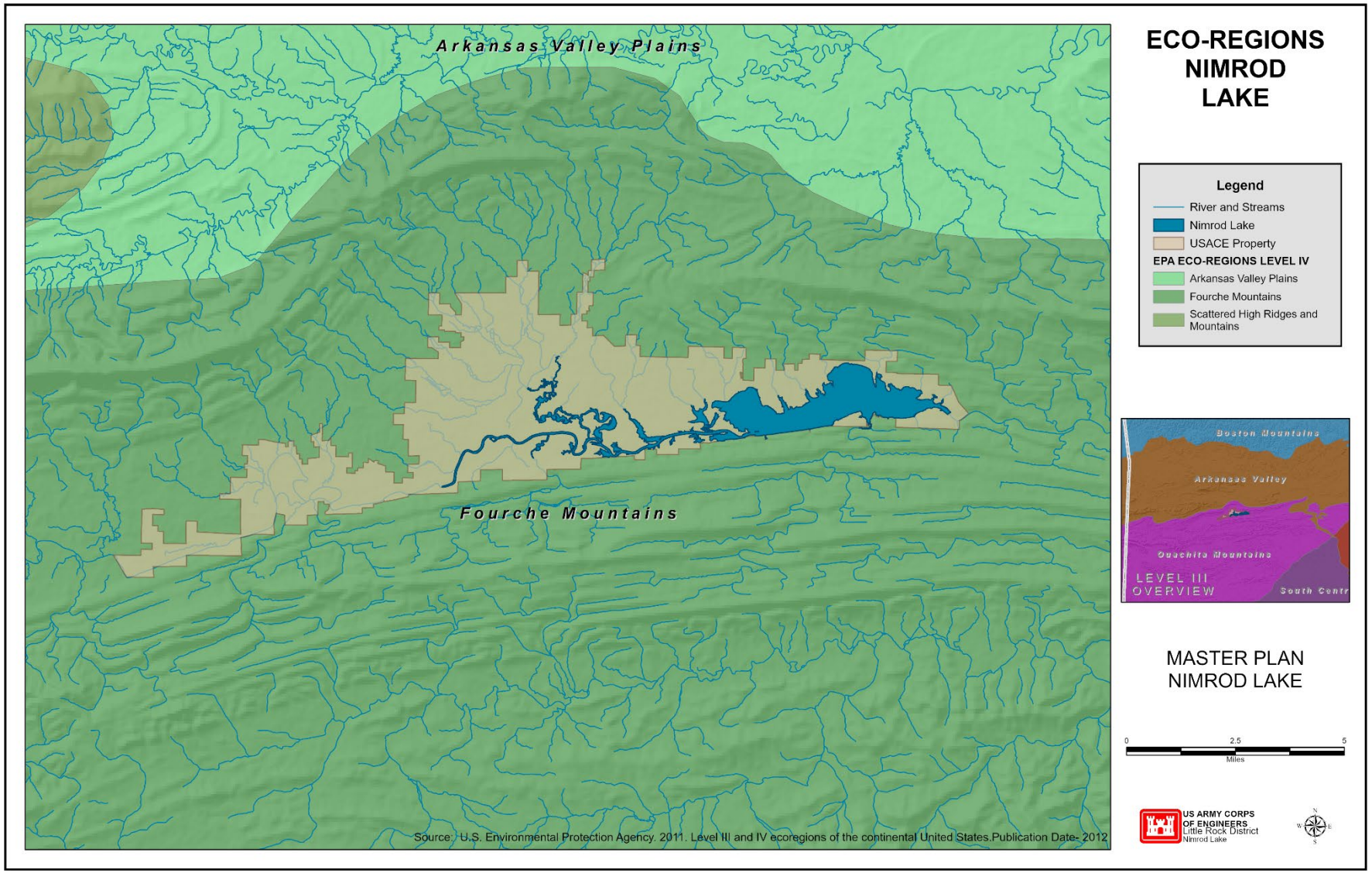
Nimrod Dam is located on the Fourche La Fave River in the western part of Perry County, Arkansas, about 29 miles south of Russellville Arkansas and eight miles southeast of Plainview, Arkansas, and four miles west of the community of Nimrod, from which it derives its name. Nimrod Lake is located in Perry and Yell Counties, Arkansas. The dam is approximately two miles downstream of the boundary between the two counties. It is about 62 river miles upstream from the confluence of the Fourche La Fave and Arkansas Rivers.

The conservation pool of Nimrod Lake is at elevation 342.0 mean sea level (msl), and seasonally adjusted to 345.0 msl for fisheries management. The total water surface is about 3,236 acres at conservation pool. Nimrod Lake lies in the sharply defined valley of the Fourche La Fave River, a tributary of the Arkansas River. Some tributary streams that flow into the lake include School House Branch, Earl Branch, Anderson Branch, Prairie Creek, Porter Creek, Gilkey Creek, Hogan Creek, and Brush Creek. These are generally short and less than five miles in length. The total drainage area is approximately 680 square miles. The total fee owned area contained on the Nimrod Project, including both land and water surface, consists of 25,278 acres.

Nimrod Lake lies within the Environmental Protection Agency (EPA) Ouachita Mountains Level III Ecoregion, located in western central Arkansas and extending into eastern Oklahoma (Figure 3-1). The Ouachitas are made up of ridges, hills, and valleys formed by the erosion of folded and faulted Paleozoic sandstone, shale, and chert. They are a continuation of the Appalachians. More specifically, the Fourche Mountains Level IV Ecoregion encompasses Nimrod Lake. This sub-ecoregion encompasses 2,452 square miles and is composed of long, east to west trending, forested ridges composed of sandstone. Intervening valleys are cut into shale. Ridges are longer, habitat continuity is greater, the lithologic mosaic is different, and the topographic orientation is more consistent compared to other parts of the Ouachita Mountains. Elevation ranges from 290 to 2,700 feet, with uplands the lowest in the east at 100 to 1,600 feet. Differences in moisture and temperature between north- and south-facing slopes significantly influences native plant communities. Forests on steep, north-facing slopes are more mesic compared to southern aspects, the latter of which is characterized by grassy woodlands. Here, natural vegetation may include oak-hickory-pine forest; mixed shortleaf pine-upland deciduous forest in the uplands; and southern red oak, willow, elm, birch, maples, sweetgum, and American sycamore on the floodplains and low terraces. Presently, loblolly-shortleaf pine and upland oak-hickory-pine forest vegetation types are codominant. Pastureland and hayland are restricted to a few broad valleys.

Logging is not nearly as intensive as in the commercial pine plantations of the less rugged Athens Plateau, another Level IV Ecoregion within the Ouachita Mountains. Nutrient, mineral, and biochemical water quality parameter concentrations are low in the surface waters of this region, but turbidity can be higher than in other mountainous parts of the Ouachitas (Woods et al., 2004).

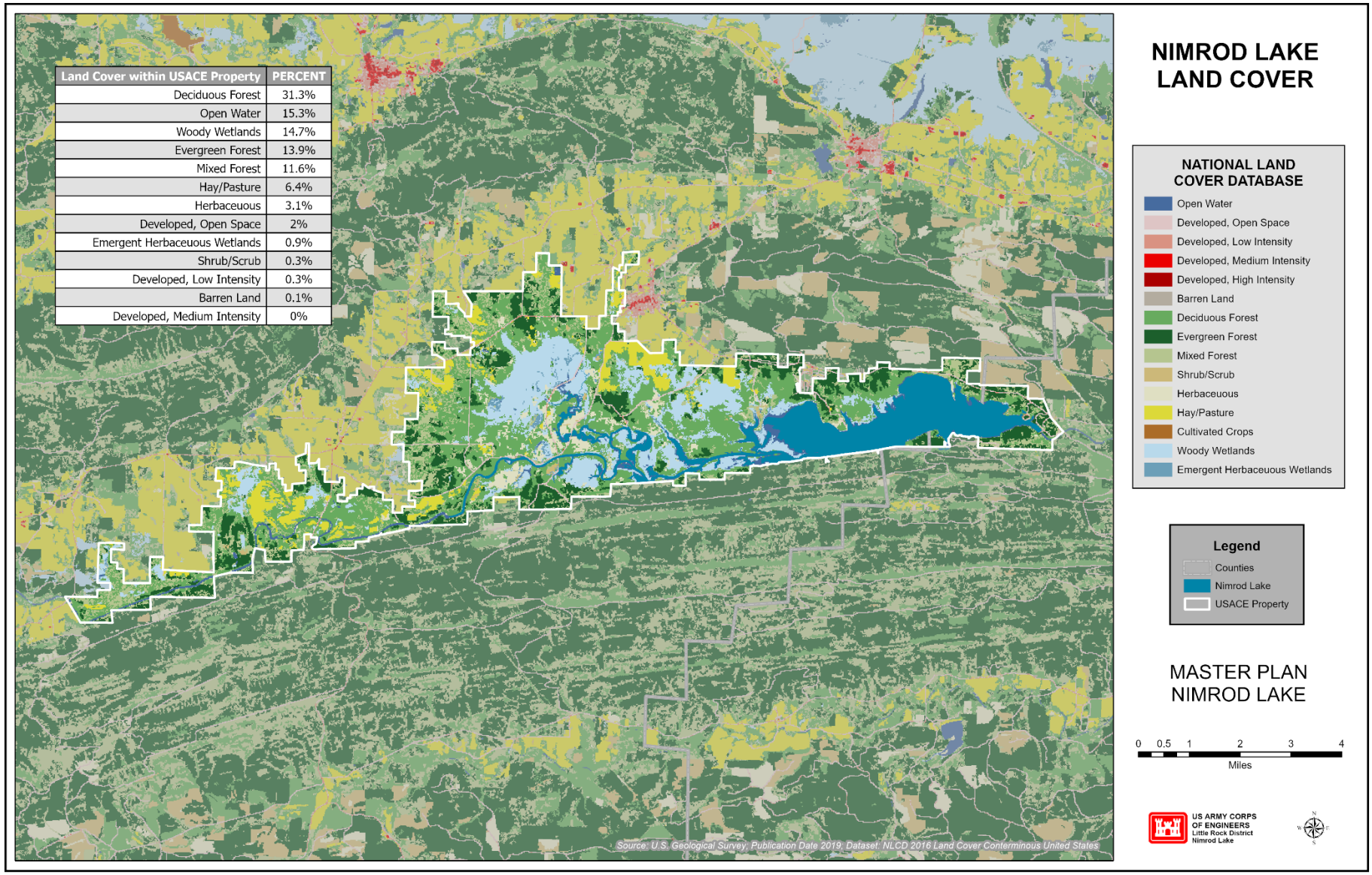
Figure 3-1. Ecoregions Bordering Nimrod Lake



3.2 Land Use

Federally owned property at Nimrod Lake serves the project's authorized purposes of flood control, recreation, water supply, and hydroelectric power. While Fish and Wildlife is not an authorized purpose, environmental stewardship of project lands and waters is an inherent responsibility for USACE and must be taken into consideration with all project management activities. As such, land uses to execute these purposes primarily include dam operations for flood risk management, lake- and land-based recreation opportunities, timber management practices, and other fish and wildlife stewardship activities. Land surrounding Nimrod Lake is primarily utilized for logging operations and agricultural practices. Southwest of the project is the Ouachita National Forest, and north of the project is the Ozark-St. Francis National Forest (USDA, 2024). Figure 3-2 below depicts land cover classifications on the Nimrod fee-owned property and surrounding areas.

Figure 3-2. Nimrod Lake Land Cover



3.3 Climate, Climate Change, and Greenhouse Gases

The climate in the Nimrod Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by a warm, temperate climate with fully humid precipitation and temperatures that are hot during the summer months. Winters are typically mild to cool (Kottek et al., 2006). Warm, humid, subtropical air that is generated by the Gulf of Mexico can lead to heavy precipitation under certain large-scale pressure patterns. The warm, moist air meets with cold, dry air from the west, creating an environment of high instability and wind shear. These fronts tend to have a north-south alignment but can also shift east-west, can occur any time of year, and can generate heavy precipitation for daily or longer durations (Perica et al., 2013).

Precipitation

Proximity to the Gulf of Mexico makes Nimrod Lake susceptible to tropical storm systems, which account for the majority of extreme rainfall events (Perica et al., 2013). The region sees an average of 55.75 inches of rainfall and 2.53 inches of snow annually. At Nimrod Lake, the reservoir averages 4.5 inches of rainfall monthly, receiving the majority in the spring and averaging 54.43 inches annually. The reservoir's average precipitation is distributed over 92 days per year in the form of rain, snow, sleet, or hail (approximately 2.8 inches annually of frozen precipitation).

Temperature

With Nimrod Dam and Aplin being the only stations with temperature monitoring capabilities near Nimrod Lake, average annual temperatures for the area are approximately 61 degrees Fahrenheit (°F). Annual temperatures range from a maximum of 72.8°F to minimum annual temperatures of 49.9°F. August is typically the hottest month, with mean daily highs of approximately 93°F, and January being the coldest month, with a mean daily low of approximately 29°F (NOAA, 2023). Based on USACE data, evaporation from Nimrod Lake over the past 50 years (1971 to 2021) averages approximately 1,065 acre-feet annually, with the majority of evaporation occurring in late July and least occurring between December and January.

Climate Change and Greenhouse Gases

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. While temperature and precipitation variations determine habitat types and wildlife diversity under normal conditions, extremes weather events such as flooding, drought, and tornados will introduce stress that has the potential to negatively impact the health and productivity of ecosystems (USDA, 1999). The U.S. Global Change Research Program summarized information regarding climate change and its potential effects in regional assessments. It states that in the South, extreme events such as heat waves, droughts, and heavy rainfall events are projected to occur more frequently. If the current rate of greenhouse gas (GHG) emissions continues, the potential severity and frequency of these extreme weather events is likely to increase over time.

The USACE mission for the Responses to Climate Change Program is "to develop, implement, and assess adjustments or changes in operations and decision environments to enhance resilience or reduce vulnerability of USACE projects, systems, and programs to observed or expected changes in climate." Furthermore, the USACE has prepared an Adaptation Plan in response to previously existing related EOs and Climate Action Plan. The Adaptation Plan includes the following USACE policy statement: "It is the policy of USACE to integrate climate change

preparedness and resilience planning and actions in all activities for the purpose of enhancing the resilience of our built and natural water-resource infrastructure and the effectiveness of our military support mission, and to reduce the potential vulnerabilities of that infrastructure and those missions to the effects of climate change and variability." The effects of climate change and mitigation efforts are evolving, and it is a USACE responsibility as a steward for some of the Nation's most important natural resources to act accordingly. As such, Nimrod Lake and all federally owned property is managed to comply with laws and executive orders to respond to the growing threat of climate change.

3.4 Topography, Geology, Soils, Prime Farmland, and Mineral Resources

3.4.1 General Topography

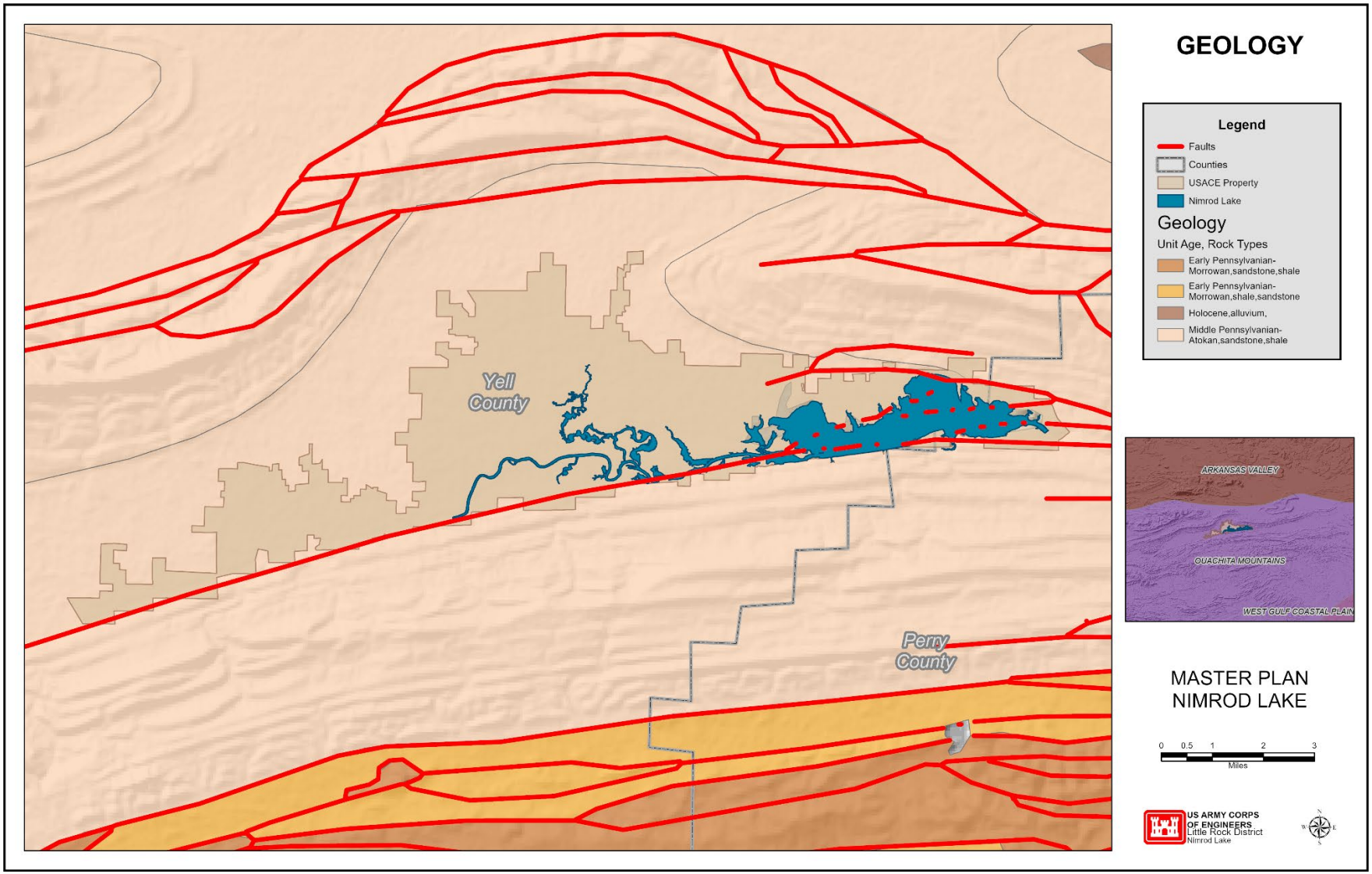
The topography in the southern portion and extreme western portion of the Fourche La Fave watershed includes steep inclines typical of the Ouachita Mountains (Figure 3-4), with the area along the Fourche La Fave River, below Nimrod Lake, consisting of Quaternary alluvial deposits. The south-western portion of the watershed has a rugged topography, with average relief of several hundred feet and some areas that exceed 2,000 feet in elevation. This area also forms the topographic boundary between the Fourche La Fave River watershed and the headwaters of the Ouachita River watershed to the south.

3.4.2 Site Geology

The geology within the watershed is comprised of the Ouachita Mountains, which are complexly folded and faulted rocks originally deposited in mostly deep marine environments (Office of the State Geologist, 2024). The Ouachita Mountains consist of a series of east-west trending ridges and valleys composed of Early Ordovician through Middle Pennsylvanian age rocks (Figure 3-3). The valleys primarily consist of shales while the ridges primarily consist of competent sandstone, chert, and novaculite. The prominent structures within the Ouachita Mountains are folds, thrust faults, and reverse faults (U.S. Forest Service, 2024). Folding is intricate at all scale levels and consist of both complete and partial overturning (Office of the State Geologist, 2024). The Fourche La Fave watershed is a perfect example of the east-west trending ridges and valleys of the Ouachita Mountains (Figure 3-4).

The Ouachita Mountain physiographic province underlying the Fourche La Fave watershed is composed mainly of Paleozoic sedimentary rocks and represents the extreme frontal element of the orogenic belt and is a mildly compressed fold belt. The predominant formation underlying the Fourche La Fave watershed is the Pennsylvanian-aged Atoka Formation and is characterized as being mostly dark shales with sandstones and sandy limestones. The area known as the Arkansas River Valley has been above sea level and eroding since the beginning of the Permian Period and, therefore, no rocks were preserved until the Quaternary Period when the Arkansas River deposited sediment in the form of terraces (Chandler, 2007).

Figure 3-3. Geology of Nimrod Lake and Surrounding Area



3.4.3 Soils

The Fourche La Fave headwaters rises in Scott County about 45 miles south of Fort Smith, Arkansas, and flows toward Nimrod Dam approximately 65 miles to the east through Scott, Yell, and Perry counties and draining the periphery of Garland, Saline, Polk, Montgomery, and Pulaski counties. Throughout this reach, the basin is relatively steep, long, and narrow with only one main stem fed by numerous short tributaries and drains a total area of 1,100 square miles. Soil Orders in the Fourche Mountains includes Ultisols and Inceptisols. On floodplains and stream terraces, Ultisols, Alfisols, and Entisols are dominant (Woods et al., 2004).

The Fourche La Fave headwaters are in the south-central portion of Scott County and the north-central periphery of Polk County, which is characterized by large east to west linear mountains intermingled with large cone-shaped hills, smaller dissected mountains, and narrow valleys. Soils in the mountainous and hilly areas of the uplands consist primarily of the Carnasaw-Sherless-Clebit complex, which is characterized as being deep to shallow, gently sloping to very steep, well drained, gravelly, or stony, and consists of clayed and loamy residuum of sandstone and shale. Other soil complexes with the same or similar characteristics includes the Kenn-Avilla-Ceda, Spadra-Neff-Cupco, and the Leadvale-Endsaw-Taft complexes. The natural vegetation includes oak, hickory, dogwood, and pine with adapted species that include shortleaf and loblolly pine. Soils in the stream terraces and flood plains consist primarily of the Kenn-Avilla-Ceda series, which are characterized as being deep, level to gently sloping, well drained, with loamy alluvium. Major land uses are pasture and woodland (Soil Survey Staff, 2023).

Upon leaving Scott County, the Fourche La Fave drains into the south-central portion of Yell County. The soil formations in this part of the county are like that of Scott and Polk counties with the Carnasaw-Sherless-Clebit complex being the predominant soil series. In addition to previously mentioned series, the soil formations in this part of the county are primarily the Leadvale-Cane-Taft series located on foot slopes and toe slopes. These soils are characterized as being deep to very deep, level to gently sloping, moderately well drained, and silty alluvium. On a smaller scale, the Guthrie-Barling and Spadra-Barling-Pickwick complexes are also present. Major land uses include woodland, pasture, and hayland (Soil Survey Staff, 2023).

The Fourche La Fave flows through central Perry County before draining into the Arkansas River. The soil formations in Perry County are also like that of Scott and Polk counties with the addition of soils formed in Arkansas River alluvium. These areas consist primarily of the Carnasaw complex that now includes the Pirum series and the Leadvale complex, which is mixed with the Guthrie series. Both are characterized as being very deep, level to gently sloping, well to poorly drained, and loamy to clayey alluvium having slopes less than 1 percent. This soil series is best suited for woodlands and wildlife habitat and accommodates crops such as rice and soybeans. The Perry-Moreland complex, which is characterized as somewhat poorly drained, level to gently sloping, deep, clayey alluvium, on broad flood plains and low terraces, is located where the Fourche La Fave drains into the Arkansas River (Soil Survey Staff, 2023).

Soil surveys published by the Natural Resources Conservation Service (NRCS) are available for all counties located in the Fourche La Fave watershed. These could be utilized for developing specific resource management plans for the Operational Management Plan.

Soil conservation and management are major considerations when planning natural resource and recreation management practices. Soil movement is influenced by uncontrollable factors, such

as climate, soil type, and topography. Additionally, 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.

3.4.4 Prime Farmland

The Farmland Protection Policy Act (FPPA), part of the 1981 Farm Bill, is intended to limit federal activities that contribute to the unnecessary conversion of farmland to other uses. The law applies to construction projects funded by the federal government such as highways, airports, and dams, and to the management of federal lands. As part of the implementation of this law, the Natural Resources Conservation Service (NRCS) identified high quality agricultural soils as prime farmland, unique farmland, and land of statewide or local importance. Farmlands are extremely important to meet the Nation's short- and long-range needs for food and fiber.

Prime farmland, as defined by the USDA, is land that has the best combination of physical and chemical characteristics to produce food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. Soil quality, length of growing season, and soil moisture are factors that contribute to the ability to produce cost effective, high yield crops.

The NRCS Web Soil Survey tool was used to evaluate prime farmland presence within the Nimrod Lake project area, inclusive of roughly 25,298 acres including surface waters. Approximately 18,849.8 acres were found to exhibit farmland characteristics, with 10,222.5 acres classified as prime farmland and 2,008.8 acres designated as farmland of statewide importance (NRCS 2024). Much of the acreage identified as farmland is currently being used as such through USACE agricultural leases or Arkansas Game and Fish Commission (AGFC) subleases. Some areas considered farmland are currently serving other purposes, including timber management and fish and wildlife stewardship. Lands not classified as Prime Farmlands includes open water areas, developed areas, and soils with a slope greater than eight percent.

Table 3-1. Prime Farmland Acreage at Nimrod Lake

Farmland Classification	Area (acres)	Percent of Fee Area
Not prime farmland	6,448.7	25.5%
All areas are prime farmland	10,222.5	40.4%
Farmland of statewide importance	2,008.8	8%
Prime farmland if drained	6,618.5	26.2%

3.4.5 Mineral Resources

There is no current extraction or mining of minerals on Nimrod Lake project lands.

3.5 Aquatic Environment

3.5.1 Hydrology and Groundwater

3.5.1.1 Surface Water

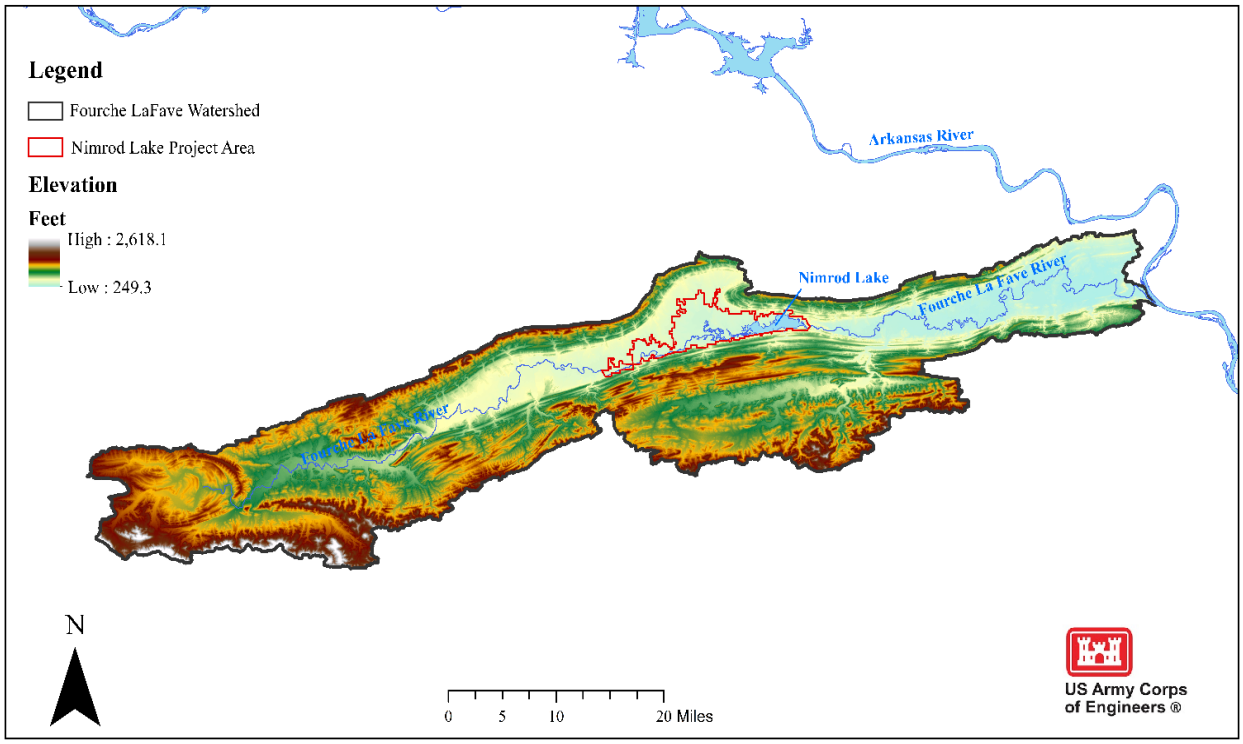
The Fourche La Fave River, located entirely in western Arkansas, is a major tributary to the

Arkansas River. The Fourche La Fave watershed lies entirely within the Ouachita Mountains physiographic section (Woods et al., 2004) and the Environmental Protection Agency's (EPA) Ouachita Mountains Level III Ecoregion (Woods et al., 2004). A small portion of the watershed, at the confluence with the Arkansas River, lies within the Arkansas Valley Plains and Arkansas River Floodplain Level IV Ecoregions, but most of the watershed lies within the Fourche Mountains Level IV Ecoregion (Woods et al., 2004).

The Fourche La Fave watershed is located in the Ouachita Mountains physiographic section (Fenneman and Johnson, 1946). Fenneman and Johnson (1946) broke out each of these broad-scale divisions based on geomorphology, i.e., terrain texture, rock type, and geologic structure and history. Elevation within the watershed ranges from approximately 2,618 feet above North American Vertical Datum of 1988 (NAVD88) at the western end of the watershed to approximately 249 feet NAVD88 at the eastern end and an average basin elevation of approximately 775 feet above msl (Figure 3-4). The relatively large change in elevation within the watershed is indicative of the physiography and geology in this area.

The Fourche La Fave River drops, on average, approximately 3.3 feet per mile from the headwaters (elevation 797.2 feet above msl) to the confluence with the Arkansas River (elevation 249.3 feet above msl) (Figure 3-4). The most notable tributary is the South Fourche La Fave River and joins the Fourche La Fave River below Nimrod Dam.

Figure 3-4. Fourche LaFave Watershed and Surrounding Topography



3.5.1.2 Groundwater

Nimrod Lake is located in the Pennsylvanian-aged Atoka Formation. This formation comprises the Ouachita Mountains aquifer and is located within the Interior Highlands aquifer system. This aquifer system is formed by rocks of sedimentary origin and were deposited by a regionally extensive sinking trough (geosyncline) that extended at minimum from central Oklahoma to central Arkansas (Kresse et al, 2014). Filling and lithification of this geosyncline were followed by orogenic activity resulting in a complexly folded and thrust-faulted anticlinorium that trended east to west, in which many of the folds were broken by thrusts or high-angle reverse faults.

Groundwater availability occurs primarily through secondary porosity and permeability provided by faults, fractures, joints, and bedding planes and yields are highly dependent on the degree of fracturing. Because of this dependency on degree of fracturing, well yields have a fairly large range but typically are low throughout the aquifer and, therefore, the primary use of groundwater is for domestic supply (Kresse et al, 2014).

Other information about water management may be found in the Arkansas Water Plan, the state's policy for long term water management, which was last updated in 2014. The update brings data, science, and public input together to define water demands, water supplies, issues, and potential solutions to meet the state's needs for the next 40 years.

3.5.2 Water Quality

Regional water quality is influenced by lithology, soil composition and land use activities. In the Ouachita Mountains, logging and recreation are major land uses while pasture and hay lands are found in the broader valleys accommodating cattle and broiler chickens farm products (Fowler, 2015). Rivers within the Fourche Mountains often have higher turbidity than elsewhere in the Ouachita's (Woods et al., 2004).

Section 303(d) of the Clean Water Act (CWA) requires states to identify waters where existing pollution controls are not stringent enough to achieve state water quality standards and establish a priority ranking of these waters. The Arkansas Department of Energy and Environment (ADEE) is responsible for assessing water quality monitoring data and developing a 303(d) list every two years in accordance with the CWA. The Arkansas Draft 2022 303(d) List represents the most recent evaluation of water quality data. Sections of the Fourche La Fave directly above Nimrod Lake and below the reservoir are listed on the Draft 2020 Impaired Waterbodies 303(d) List as Category 5 (truly impaired) for dissolved oxygen (DO) and temperature, which are tied to the aquatic life use, and pH, which impairs other uses (ADEE, 2022).

Approximately 1,370 surface acres on Nimrod Lake are also placed in Category 4a (impaired, but with a Total Maximum Daily Load) for mercury found by testing bioaccumulation of residues in aquatic organisms (ADEE, 2022). From Nimrod Dam to the South Fourche area, specific regulations are in place to not eat more than two meals per month of largemouth bass longer than 16 inches because of mercury contamination. For women who are pregnant and or breast feeding or are of childbearing age, they are advised not to consume largemouth bass from the area (AGFC, 2023).

3.5.3 Wetlands

Wetlands are complex habitats that are transitional from dry land to open water, and they have soil, water, and plant components. Wetlands are defined as those areas inundated or saturated by surface or ground water at a frequency and duration to support a prevalence of vegetation typically adapted for life in saturated soil conditions (40 CFR 120.2[c]). Many common species of waterfowl, fish, birds, mammals, and amphibians also live in wetlands during certain stages of their lives.

According to the USFWS National Wetland Inventory Mapper, there are approximately 5,740 total acres of wetlands within the Nimrod Lake project boundary, with approximately 4,036 of the total acreage characterized as lacustrine with water features including the lake itself as well as flowing and standing water within fee land. However, wetland acreages within the project area can and do fluctuate seasonally in response to precipitation and lake level. The remaining 1,704 acres of wetlands are characterized as palustrine, typically surrounded by standing dead timber and vegetated shorelines. Nimrod Lake palustrine wetlands can be further categorized as freshwater emergent (approximately 7 acres) and freshwater forested/shrub wetlands (approximately 1,697 acres). The forested/shrub wetlands include a mixture of scrub/shrub (six meters or less in height) or forested wetland species of greater than six meters in height. Common woody wetland species typically include buttonbush, willow, green ash, hackberry, elm, willow oak, water oak, overcup oak, sweetgum, and river birch. Some locations may have cypress as well. Palustrine forested/shrub wetlands also occur in the feeder streams' floodplains and are called riverine wetlands (USFWS, 2023b).

3.5.4 Sedimentation and Shoreline Erosion

Throughout the lifespan of the project, silt and sediment has accumulated in Nimrod Lake. Most of the sediments entering Nimrod Lake come from the inflow of the Fourche La Fave River. Other contributing factors to accumulated sediment include sedimentation from upland areas and land use changes from areas within the watershed that are beyond USACE control and, to a lesser extent, from shoreline erosion.

There were no bathymetric surveys conducted immediately post-impoundment of Nimrod Lake. However, in collaboration with the United States Geological Survey (USGS), the USACE conducted the first bathymetric survey for Nimrod Lake in April to mid-May 2016 (Wagner, 2018). The results of this survey produced a terrain dataset which combined the results of the bathymetric survey with a USACE provided December 2010 LiDAR dataset. The degree of sedimentation could be determined by examining the changes between historical, preimpoundment topography (given the contour interval is small enough), and the April to mid-May 2016 bathymetric survey.

Reduced capacity of the lake will ultimately negatively impact the primary purposes of flood risk management and water supply. Furthermore, excessive sediment accumulation could cause a reduction in aquatic habitat in some areas of the lake.

3.5.5 Fish Species and Habitat

Management of the fisheries resource at Nimrod Lake is the responsibility of the AGFC. The overall function of USACE in support of fisheries has been primarily one of support with planning and management. The waters of Nimrod Lake are categorized as a warm-water fishery. The lake is relatively shallow (at conservation pool level, more than 75% of the lake is less than ten feet deep), receives strong wind action, and regularly contains heavy concentration of colloidal turbidity.

The current Water Control Manual was devised and implemented in 1968. It came about as a solution to the shallow water areas which in turn created boating and fishing problems. The plan increased the water surface elevation seasonally by three feet (from 342’ to 345’). The plan enhanced the fishery by increasing natural reproduction of fish and improving survival and growth rate of young fish.

Recent community sampling identified at least 25 fish species representing 15 taxonomic genus groups that have been identified in Nimrod Lake (see Table 3-2). The AGFC conducts various types of fish sampling surveys on Nimrod Lake to guide management decisions. Surveys may help determine the need for a drawdown, habitat work, or regulation modifications such as daily limits, slot limits, and commercial fishing seasons. Lake drawdowns have been utilized often, through at irregular intervals, to address lake water turbidity and for fisheries benefits. Drawdowns, both partial and total, should continue to be used to help manage the fisheries of the lake. These drawdowns are to be requested by the AGFC and should be coordinated to include efforts such as lakebed seeding, fish habitat work, and shoreline work.

The seasonal fluctuations of lake levels can have either beneficial or negative affects depending on the timing and duration of flooding. Fish stocking is not an annual practice but can occur as deemed necessary by AGFC. This can include stocking of smaller bodies of water that occur within the Project. Fish structures should continue to be placed within the conservation pool area of the lake to create additional habitat for suspending fish. These artificial structures can be

constructed of wood, plastic, or other non-toxic materials.

Table 3-2. Common Fish Species at Nimrod Lake

SCIENTIFIC NAME	COMMON NAME
Notropis boops	Bigeye Shiner
Ictiobus cyprinellus	Bigmouth Buffalo
Pomoxis nigromaculatus	Black Crappie
Fundulus olivaceus	Blackspotted Topminnow
Lepomis macrochirus	Bluegill
Ictalurus punctatus	Channel Catfish
Cyprinus carpio	Common Carp
Etheostoma proeliar	Cypress Darter
Notropis atherinoides	Emerald Shiner
Aplodinotus grunniens	Freshwater Drum
Dorosoma cepedianum	Gizzard Shad
Lepomis cyanellus	Green Sunfish
Lepomis spp.	Hybrid Sunfish
Micropterus salmoides	Largemouth Bass
Lepomis megalotis	Longear Sunfish
Lepisosteus osseus	Longnose Gar
Menidia audens	Mississippi Silverside
Lepomis humilis	Orangespotted Sunfish
Percina fulvitaenia	Ozark Logperch
Lepomis microlophus	Redear Sunfish
Micropterus punctulatus	Spotted Bass
Lepisosteus oculatus	Spotted Gar
Minytrema melanops	Spotted Sucker
Lepomis gulosus	Warmouth
Pomoxis annularis	White Crappie

3.6 Terrestrial Resources

3.6.1 Wildlife

Nimrod Lake provides a diversity of habitat, which support a wide variety of wildlife species. The area provides a mix of wetlands, open fields, and woodlands of varied age and composition. White-tailed deer (*Odocoileus virginianus*) are the most abundant big game animal found on the project area. Eastern wild turkey (*Meleagris gallopavo*) and black bears (*Ursus americanus*) are also common. Additional common species in the area may be found in Table 3-3. AGFC has been and will continue to monitor the whitetail deer population for Chronic Wasting Disease (CWD), which has not yet been detected in Yell or Perry counties but has been recorded within 40 miles of the Project in Pope and Logan counties.

The entirety of the Nimrod Lake Project lands is managed cooperatively with the AGFC through a license agreement. The license establishes the Project land as the Nimrod Lloyd Millwood WMA (Wildlife Management Area). Also, within the WMA is the Lloyd Millwood Green Tree Reservoir (GTR).

Field work fluctuates annually, but AGFC plants an area of about 40 to 50 acres in the spring and then seed in a winter cover crop on the same area in the fall. USACE regularly plants approximately another 100-120 acres of food plots, food strips, and waterfowl patches. Other wildlife management at Nimrod Lake may include mowing, soil disturbance, silvicultural activities such as mechanical and/or chemical wildlife stand improvements (WSI), removal/ treatment of exotic species, and application of prescribed fire. There are also areas within the Project that will benefit local wildlife by the creation of small watering holes. Additional information can be found in the Fish and Wildlife Management Plan for Nimrod Lake, Appendix D to the 1975 Master Plan, until revised in the future.

Table 3-3. Common Wildlife at Nimrod Lake

SCIENTIFIC NAME	COMMON NAME
Neogale vison	American Mink
Ursus americanus	Black Bears
Lynx rufus	Bobcat
Colinus virginianus	Bobwhite Quail
Sylvilagus floridanus	Eastern Cottontail Rabbit
Canis latrans	Coyote
Sciurus niger	Fox Squirrels
Urocyon cinereoargenteus	Gray Fox
Sciurus carolinensis G	Gray Squirrels
Lenaida macroura	Mourning Dove
Castor canadensis	North American Beaver
Didelphis virginiana	Virginia Opossum
Procyon lotor	Raccoon
Lontra canadensis	River Otter
Mephitis mephitis	Striped Skunk
Sylvilagus aquaticus	Swamp Rabbit
Odocoileus virginianus	White-Tailed Deer
Meleagris gallopavo	Eastern Wild Turkey

The American beaver (*Castor canadensis*) has emerged as a somewhat nuisance species on the Nimrod Lake Project. When gone unchecked their population exploded, which led to the inundation of dozens of acres while killing the trees therein. Additionally, since the areas that are chosen to impound water are on creeks, these creek channels become silted in from the turbid inflow. Beaver often choose to build along roads, so they can utilize a raised roadbed as part of their dam, which leads to road culverts being filled with mud and sticks creating road maintenance issues. Annual control measures need to continually be incorporated to reduce damage to natural resources and infrastructure.

Birding enthusiasts are provided an excellent opportunity for viewing in the Nimrod Lake area. Additionally, a wide variety of waterfowl species migrating along the central flyway utilize Nimrod Lake. Of the birds on the state list, over 300 have been recorded on or near the lake. These species can be found at the Cornell Lab of Ornithology eBird website. Winter flooding, which spreads into bottomland hardwoods, provides feeding opportunities for many of the dabbling species while the open water of the lake is utilized by other diving duck species. A list of common bird species at the lake may be found in Table 3-4.

Vultures, primarily black vultures, have been increasing in numbers over the past decade, and are beginning to become a nuisance within the recreation areas causing significant damage to vehicles and boats. Mitigation may include cutting of dead trees (snags) in and around recreation areas to reduce roosting opportunities to these areas. Additional deterrents such as pyrotechnics, noise-making devices, chemical repellants, or even lethal means may become necessary with

expanding populations utilizing the parks.

Table 3-4. Common Birds Species at Nimrod Lake

SCIENTIFIC NAME	COMMON NAME
Corvus brachyrhynchos	American Crow
Pelecanus erythrorhynchos	American White Pelicans
Mareca americana	American Wigeon
Haliaeetus leucocephalus	Bald Eagle
Coragyps atratus	Black Vulture
Passerina caerulea	Blue Grosbeak
Spatula discors	Blue-Winged Teal
Sitta pusilla	Brown-Headed Nuthatch
Branta canadensis	Canada Geese
Petrochelidon fulva	Cave Swallow
Bucephala clangula	Common Goldeneye
Phalacrocorax auritus	Double Crested Cormorant
Mareca strepera	Gadwall
Ardea herodias	Great Blue Heron
Ardea alba	Great Egret
Butorides virescens	Green Heron
Anas carolinensis	Green-Winged Teal
Lophodytes cucullatus	Hooded Merganser
Passerina cyanea	Indigo bunting
Aythya affinis	Lesser Scaup
Anas platyrhynchos	Mallard Duck
Pandion haliaetus	Osprey
Passerina ciris	Painted Bunting
Dryocopus pileatus	Pileated Woodpecker
Anas acuta	Northern Pintail
Podilymbus podiceps	Pied-billed Grebe
Protonotaria citrea	Prothonotary Warbler
Melanerpes erythrocephalus	Red-headed Woodpecker
Aythya collaris	Ring-Necked Duck
Oxyura jamaicensis	Ruddy Ducks
Tachycineta bicolor	Tree Swallows
Spatula clypeata	Northern Shoveler

3.6.2 Vegetation

The lands of the Nimrod Lake Project offer a mix of open land and forested land with diverse species populations (see Table 3-5 and Figure 3-2). This diversity can be attributed to the area's

physiographic variations from river valleys to steep, rocky slopes.

Nimrod Lake Project utilizes the Agriculture and Grazing (A&G) leasing program to maintain some of the open lands in their current condition. Other open land is maintained by USACE through infrequent brush-hogging, rotational food plots, and prescribed burning. AGFC maintains a 60-acre block of land in a manner similarly to that of the USACE.

Most of the Nimrod Lake Project is made up of various woodland types. The major types are bottomland hardwood, upland hardwood, pine-hardwood, and pine. The most common forest type within the bottomland hardwood is of a red oak-sweetgum composition. The frequent high water that occurs within the flood pool area has significantly impacted the bottomland hardwood forest, particularly those areas that fall below an elevation of 352 feet msl. Over the past 15 years, there has been an increase in high water events that have frequently extended into the growing season. The result has been a massive die off of multiple tree species. The greatest impact has been on the red oak species. A few of the pioneer species that have emerged in their stead include buttonbush (*Cephalanthus occidentalis*), water elm (*Planera aqutica*), and silver maple (*Acer saccharinum*), which are far less desirable than the preexisting species. Reforestation efforts are difficult due to spring flooding, but also due to the changing hydric soil conditions in these low lying areas. Also, common in these die-off areas are various vine species such as trumpet creeper (*Campsis radicans*) and buckwheat/red vine (*Brunnichia ovata*), which present in dense mats of vegetation and severely hinder the natural regeneration process. Regeneration efforts should continue to be explored where soil conditions allow. It may be necessary to shift species composition to more water tolerant species which may include species such as overcup oak (*Quercus lyrata*), water hickory (*Carya aquatica*), or possibly bald cypress (*Taxodium distichum*) in the wettest of areas. In areas where reforestation may not be conducive with current land conditions, they may be examined for their suitability to transition to open land.

Nimrod Lake Project utilizes/may utilize a wide array of tools to meet management objectives. Open land management may include mowing, disking, mulching, herbicide spraying, utilization of food plots and strips, mechanical clearing, and/ or utilization of prescribed fire. Silvicultural prescriptions for woodland areas may include site prep actions that utilize chemical or mechanical methods. Equipment utilized includes dozer, roller chopping, or mulching equipment. Timber stand improvement (TSI) work includes pre-merchantable thinning, understory/midstory removal with or without herbicide (cut stump treatment), hack-and-squirt, basal spray applications, and foliar spray applications. Prescribed burning is also utilized within forested stands. Timber sales to include Minor Forest Products Sales in the form of small manager sales, salvage sales, and firewood sales, as well as major Forest Product sales will be utilized. Forest product sales will be coordinated with Real Estate as required in ER 405-1-12.

Additional information can be found in the Forest Management Plan for Nimrod Lake, Appendix B to the 1975 Master Plan, until revised in the future.

Table 3-5. Common Vegetation at Nimrod Lake

SCIENTIFIC NAME	COMMON NAME
Teucrium canadense	American Germander
Styrax americanus	American Snowbell
Taxodium distichum	Bald Cypress
Vernonia baldwinii	Baldwin's Ironweed
Andropogon gerardii	Big Bluestem
Salix nigra	Black Willow
Rubus spp.	Brambles: Blackberry, Dewberry
Andropogon virginicus	Broom Sedge
Brunnichia ovata	Buckwheat Vine
Cephalanthus occidentalis	Buttonbush
Rudbeckia triloba	Brown-Eyed Susan
Solidago auriculata	Eared Goldenrod
Tripsacum dactyloides	Eastern Gamagrass
Juniperus virginiana	Eastern Red Cedar
Ulmus spp.	Elms
Cyperus echinatus	Globe flatsedge
Celtis spp.	Hackberries
Carya spp.	Hickory: Bitternut, Mockernut, Pignut, Shagbark, Water
Schizachyrium scoparium	Little Bluestem
Pinus taeda	Loblolly Pine
Chamaecrista fasciculata	Partridge Pea
Diospyros virginiana	Persimmon
Quercus spp.	Red Oaks: Cherrybark, Northern, Pin, Shumard, Southern, Water, Willow
Carex spp.	Sedges
Pinus echinata	Shortleaf Pine
Senna obtusifolia	Sicklepod
Polygonum pensylvanicum	Smartweed
Bidens spp.	Spanish Needles
Platanus occidentalis	Sycamore
Liquidambar styraciflua	Sweet Gum
Campsis radicans	Trumpet Vine
Vicia spp.	Vetches
Planera aqutica	Water Elm/Planertree
Quercus spp.	White Oaks: Bur, Post, Overcup, White
Hibiscus lasiocarpos	Wooly Rosemallow

3.6.3 Forestry

Nimrod Lake is surrounded by forested land, which is managed for multi-use, sustained yield as outlined in the Public Law 86-717:

> *To provide for the protection of forest cover for reservoir areas under the jurisdiction of the Secretary of the Army and the Chief of Engineers.*
>
> *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it is hereby declared to be the policy of the United States to provide that reservoir areas of projects for flood control, navigation, hydroelectric power development, and other related purposes owned in fee and under the jurisdiction of the Secretary of the Army and the Chief of Engineers shall be developed and maintained so as to encourage, promote, and assure fully adequate and dependable future resources of readily available timber, through sustained yield programs, reforestation, and areas for conservation, recreation, and other beneficial uses: Provided, That such development and management shall be accomplished to the extent practicable and compatible with other uses of the project.*

USACE utilizes multiple tools as part of a timber management program. One management tool is timber disposal in the form of timber sales, which are administered through the Real Estate Branch of the Little Rock District. These timber sales are conducted as outlined in ER 405-1-90.

Additionally, forest management on Nimrod Lake will be conducted in consonance with PL 86-717, ER 1130-2-400, TM 5-631, and AR 420-74. See Nimrod Dam and Lake Design Memorandum No. 1-D (1975 Nimrod Lake Master Plan), Appendix B: Forest Management Plan.

3.7 Threatened and Endangered Species

There are many species in the Ouachita Mountains ecoregion that are considered either threatened or endangered. 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.

3.7.1 Federally Listed Threatened and Endangered Species

The Endangered Species Act of 1973 establishes protections for fish, wildlife, and plants that are listed as threatened or endangered. Threatened species are those which are likely to become endangered within the foreseeable future. Endangered species are in danger of extinction throughout all or a significant portion of their range. The U.S. Fish and Wildlife Service (USFWS) also identifies species that are candidates and proposed for listing as a result of identified threats to their continued existence. The Candidate designation includes those species for which USFWS has sufficient information to support proposals to list as endangered or threatened under the Endangered Species Act; however, proposed rules have not yet been issued because such actions are precluded at present by other listing activity. The Proposed designation (either threatened or endangered) includes those species that USFWS has determined are in danger of extinction or likely to become endangered throughout all or signification portions of its range, and for which a draft rule to list as threatened or endangered has been proposed.

The USFWS Information for Planning and Consultation (IPaC) tool was utilized to determine

species listed under the Endangered Species Act potentially located in the Nimrod Lake area, and the IPaC report can be found in Appendix B (USFWS, 2024b). Table 3-6 below depicts federally listed species that may occur on project lands and/or on surrounding lands.

Table 3-6. Federally Listed Species

Scientific Name	Common Name	Status
Mammals		
Myotis sodalis	Indiana Bat	Endangered
Myotis septentrionalis	Northern Long-eared Bat	Endangered
Perimyotis subflavus	Tricolored Bat	Proposed Endangered
Birds		
Laterallus jamaicensis ssp. jamaicensis	Eastern Black Rail	Threatened
Charadius melodus	Piping Plover	Threatened
Calidris canutus rufa	Rufa Red Knot	Threatened
Picoides borealis	Red-Cockaded Woodpecker	Endangered
Reptiles		
Macrochelys temminckii	Alligator Snapping Turtle	Proposed Threatened
Insects		
Nicrophorus americanus	American Burying Beetle	Threatened
Danaus plexippus	Monarch Butterfly	Candidate
Flowering Plants		
Ptilimnium nodosum	Harperella	Endangered
Source: USFWS 2024a		

Federally-listed bird species known to migrate through Pulaski County include the eastern black rail, piping plover, and Rufa red knot. While these bird species may migrate through the Nimrod Lake area, there are no known occurrences or critical habitat within the footprint of this project.

The alligator snapping turtle (AST) is proposed to be listed as a Federally threatened species and may occur within the study area. ASTs are generally found in deeper water of large rivers and their major tributaries; however, they are also found in a wide variety of habitats, including small streams, bayous, canals, swamps, lakes, reservoirs, ponds, and oxbows. ASTs more often select structure (i.e. tree root masses, stumps, submerged trees, etc.) than open water and may select sites with a high percentage of canopy cover. These turtles are opportunistic scavengers, with fish comprising a significant portion of their diet. They may also consume crayfish, mollusks, smaller turtles, insects, nutria, snakes, birds, and vegetation (USFWS, 2021). ASTs may occur within Nimrod Lake, its surrounding lands, and its tributaries.

The monarch butterfly is listed as a candidate species due to its population decline over the past two decades. The iconic orange and black butterfly is known for its lengthy migration, from as far as Canada and across the United States to forested overwintering sites in the mountains of central Mexico and coastal California. Primary drivers affecting the health of the two North American migratory populations are changes in breeding, migratory, and overwintering habitat as well as continued exposure to insecticides and effects of climate change (USFWS, 2024c).

Monarchs may occur on the federally-owned lands associated with Nimrod Lake.

3.7.1.1 Federally Listed Bat Species

The northern long-eared bat (NLEB) roosts in cavities of both live trees and snags or caves, mines, and other manmade structures during the active season. Hibernation occurs in caves and mines (USFWS, 2024d). The NLEB was first listed as threatened in April 2015 with an Interim 4(d) Rule. In November 2022, the NLEB was reclassified as endangered. The NLEB range includes all of the USACE Little Rock District, including Nimrod Lake.

The Indiana bat (IBAT), an insectivorous species, hibernates colonially in caves and mines in the winter and utilizes forests for foraging and roosting in the summer months. Threats to the species include human disturbance during hibernation, habitat loss, pesticides and other contaminants, and white-nose syndrome (USFWS, 2024a). Nimrod Lake was not initially in the consultation area for the species. However, in 2021 a radio-tagged female IBAT traveled to southwest Arkansas. During her monitored period, she spent about 10 days at Nimrod Lake. This monitoring and tracking project led to an updated species range for the IBAT and thus, an updated and significantly expanded consultation range, which now includes Blue Mountain Lake.

The tricolored bat (TCB) is currently listed as a proposed endangered species as they face extinction due to the impacts of white-nose syndrome, a deadly disease affecting cave-dwelling bats across the continent. During the winter, tricolored bats are found in caves and mines, and occasionally road-associated culverts in the southern United States. During the spring, summer, and fall, these bats are found in forested habitats where they roost in deciduous hardwood trees, both alive and recently dead. They have also been observed roosting in Spanish moss, lichen, and manmade structures such as barns, bridges, and culverts (USFWS, 2024e). The TCB bat has a wide range that encompasses most of the American southeast, which includes Blue Mountain Lake, which neighbors Nimrod Lake northwest roughly 50 miles.

Although bat monitoring isn't conducted on Nimrod Lake, nearby Blue Mountain Lake has monitored the presence of bat species since 2020. Since then, Blue Mountain Lake has confirmed presence of the TCB. The USACE Little Rock District plans to create a PBO for all listed bat species, which would cover each Little Rock District Project, but in the interim, presence/absence surveys will continue to be conducted for all necessary upcoming projects.

3.7.1.2 American Burying Beetle

The American Burying Beetle (ABB) is a large, black beetle with orange-red markings that utilize dead animals (carrion) for food, moisture, and reproduction. They are a nocturnal species, active from late spring through early fall. ABBs occupy a range of habitats excluding agricultural lands that are frequently disturbed and areas that are frequently inundated (USFWS, 2019).

3.7.1.3 Harperella

The Harperella flowering plant grows in rocky/gravelly shoals or cracks in bedrock outcrops beneath the water surface in clear, swift-flowing streams; edges of intermittent pineland ponds or low, wet savannah meadows on the Coastal Plain; and granite outcrop seeps. In all habitat-types, the species occurs in a narrow range of water depths because of its intolerance of deep waters

and of conditions that are too dry. The Harperella was first listed as endangered in September 1988. Threats to the species are primarily related to habitat degradation, including alterations to natural hydrologic regime, siltation and erosion, and water quality reductions. The Harperella range includes central-west Arkansas, including Nimrod Lake (NatureServe Explorer, 2024). The Arkansas Natural Heritage Commission (ANHC) states that it is possibly located on a tributary of Nimrod Lake.

3.7.2 State Listed Rare, Threatened, and Endangered Species

The Arkansas Natural Heritage Commission (ANHC) maintains a biodiversity database that tracks the location and status of rare species of animals and plants as well as natural communities in Arkansas. Table 3-7 below depicts state listed species of concern that may be located within or near the Nimrod Lake project and/or surrounding areas (ANHC, 2023).

Table 3-7. State Listed Species found at Nimrod Lake

SCIENTIFIC NAME	COMMON NAME	STATE STATUS	GLOBAL RANK	STATE RANK
Amsonia hubrichtii	Ouachita Bluestar*	INV	G3	S3
Callophrys irus hadros	Frosted Elfin*	INV	G3T2T3	S1
Carex latebracteata	Waterfall's Sedge	ST	G3	S3
Clematis glaucophylla	White-Leaf Leather-Flower*	N/A	G4	S1
Cypripedium kentuckiense	Kentucky Lady's-Slipper	INV	G3	S2
Diphasiastrum digitatum	Southern Running-Pine	INV	G5T5	S1S3
Dulichium arundinaceum var. arundinaceum	Three-Way Sedge	INV	G5T5	S2S3
Etheostoma teddyroosevelt	Highland Darter*	INV	GNR	S3
Gratiola brevifolia	Sticky Hedge-Hyssop	INV	G4	S3
Liatris compacta	Ouachita Blazing-Star	INV	G3	S3
Myotis septentrionalis	Northern Long-Eared Bat*	SE	G1G2	S1S2
Procambarus liberorum	Osage Burrowing Crayfish	INV	G3G4	S3S4
Ptilimnium nodosum	Harperella*	INV	G2	S2
Riparia riparia	Bank Swallow	INV	G5T5	S3B
Source: ANHC 2023				

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.

*Known species occurrence on project lands.

3.8 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, fungi, plants, or animals that are not native to an

ecosystem. Invasive species can take over and out-compete native species by consuming their forage, invading their habitat, 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 Nimrod Lake Project has been impacted by the spread of invasive species. Table 3-8 identifies some of the more impactful invasive species recorded at Nimrod Lake. In addition to the known species, there are some species of concern that occur at other USACE lake projects that could potentially affect Nimrod Lake in the future. These include zebra mussels, hydrilla, giant salvinia, and Eurasian watermilfoil. Nimrod Lake staff will continue to work with other agencies and participate in species monitoring, public education through signage, preventative measures, and control measures on Project lands as possible when needed.

Invasive species control measures may include mechanical and/or chemical treatment of species. These measures may be prescribed across any land classification category to include Environmentally Sensitive Areas in order to prevent or control the spread of certain microbe, fungi, plant, or animal species.

Table 3-8. Invasive Species Identified at Nimrod Lake

SCIENTIFIC NAME	COMMON NAME
Pyrus calleryana	Callery Pear
Agrilus planipennis	Emerald Ash Borer
Hedera helix	English Ivy
Sus scrofa	Feral Hogs
Lonicera japonica	Japanese Honeysuckle
Pueraria montana	Kudzu
Rosa multiflora	Multiflora Rose
Ligustrum spp.	Privets
Solenopsis invicta	Red Imported Fire Ant
Nandina domestica	Sacred Bamboo / Nandina
Lespedeza cuneata	Sericea Lespedeza
Albizia julibrissin	Silk Tree / Mimosa
Poncirus trifoliata	Trifoliate Orange

3.9 Cultural, Archaeological, and Historic Resources

Cultural resources preservation and management is an equal and integral part of all resource management at USACE-administered operational projects. The term "cultural resources" is a broad term that includes, but is not limited to, historic and prehistoric archaeological sites, deposits, and features; burials and cemeteries; historic and prehistoric districts comprised of groups of structures or sites; cultural landscapes; built environment resources such as buildings, structures (such as bridges), and objects; Traditional Cultural Properties (TCP) and sacred sites. These property types may be listed on the National Register of Historic Places (NRHP) if they meet the criteria specified by 36 CFR 60.4 as authorized by the NHPA, reflecting significance in architecture, history, archaeology, engineering, and culture. Cultural resources that are identified

as eligible for listing in the NRHP are referred to as "historic properties," regardless of category. A TCP is a property that is eligible for inclusion in the NRHP based on its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community. Ceremonies, hunting practices, plant-gathering, and social practices which are part of a culture's traditional lifeways, are also 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. With the passage of these laws, the historical intent of Congress has been to ensure that the Federal government protects cultural resources. Guidance is derived from a number of cultural resources laws and regulations, including but not limited to Sections 106 and 110 of the National Historic Preservation Act (NHPA) of 1966 (as amended); 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 amended), as applicable. USACE summarizes the guidance provided in these laws in ER and EP 1130-2-540.

Cultural History Sequence

The cultural chronology of Arkansas is generally separated into Precontact and Historical Periods with each further subdivided into chronological periods of time as denoted by the archaeological and historical records. This cultural history sequence was derived primarily from two archaeological reports recently submitted to USACE: Cultural Resources Assessment Survey of 384 Acres at Blue Mountain Lake in Yell County, Arkansas by AmaTerra Environmental, LLC and Cultural Resource Assessment Survey Blue Mountain Lake: FY 18.3-BM-1 (Area 1), FY 18.3-BM-2 (Area 2), FY18.3-BM-3 (Area 3), and Fy18.3-BM-4 (Area 4) Logan County, Arkansas (Thomas, 2022b) (Horvath, 2019b).

Precontact Period Chronology

Paleoindian Period (13,500 – 10,500 BP)

Information used to reconstruct the Paleoindian Period in Arkansas has relied heavily on diagnostic Paleoindian projectile point surface finds, as well as archaeological data collected in other states (Sabo and Early, 1990; Morrow, 2011). Diagnostic fluted Paleoindian projectile points include the Clovis, Folsom, Sedgwick, and Gailey types (Morrow, 2011). Coldwater, Quad, and Pelican projectile points represent a transition from the Paleoindian Period to the Dalton Period. Stratified Paleoindian deposits have not been identified within the Ouachita Mountains and Arkansas Valley regions. Surface finds of fluted points and buried remains of megafauna indicate the presence and preservation of buried sites that date to this period is possible (Gillam, 1996; Sabo and Early, 1990: 38-39). Potential Paleoindian residents in the Ouachita Mountains region may have traveled from the Crowley's Ridge area to the east, which appears to be a focal point of populations during the period (Morrow, 2011). Foraging opportunities would be changing as the previous boreal forests with a megafauna presence were transitioning to deciduous forests and the extinction of megafauna by 10,000 BP.

Dalton Period (10,500 – 9,500 BP)

The Dalton Period (10,500 – 9,500 BP) is a transitional phase between the Paleoindian and Archaic Periods (Sabo and Early, 1990). The most prominent temporal marker from this period are Dalton points, which are thin, concave-base, unnotched types found throughout Arkansas. Raw materials for the chipped stone tools of this period preference regional sources in the Ozark and Ouachita Mountains (Sabo and Early, 1990:44-46). Stratified Dalton Period deposits have not been found in the Ouachita Mountains and Arkansas Valley regions. However, the identification of surface recovered diagnostics indicate that alluvial valleys are areas with potential for the discovery of sites with buried context.

Archaic Period (9,500 – 2,700 BP)

The Archaic Period was a time of cultural development and population growth in central North America that corresponds to peak warmth after the end of the last Ice Age, followed by amelioration to modern climatic conditions (Trubitt, 2019). The Archaic Period is commonly broken up into the Early, Middle, and Late Archaic. Habitation during this time was concentrated along major river basins such as the Ouachita, Arkansas, Mississippi, and Red River valleys. The Early Archaic (9,500 – 7,000 BP) is marked by an increase in marine, small game, and wild plant subsistence resources, as well as the development and diversification of tools such as grooved axes and grinding stones. During the Middle Archaic from 7000 – 5000 BP, larger village sites in major river valleys were occupied on a year-round basis as climatic drying was taking place across most of central North America. Evidence of fabrics, basketry, and cordage first appear in the archaeological record during this time. During the Late Archaic (5,000 – 2,700 BP), climatic drying ended and the earliest pottery in the Midwest begins to appear at archaeological sites in the region. Additionally, early evidence of horticulture and Late Archaic burial mounds begin to occur in some areas of Arkansas. Although this phase is not well documented in the Arkansas Valley or upland in the Ouachita Mountains, researchers have suggested these are hunting-focused sites with intensive use of river environments.

Woodland Period (2,700 – 1,000 BP)

The Woodland Period is a cultural phase characterized by permanent settlements with social and economic hierarchies that intensified pottery manufacturing, mound building, and agriculture (Mainfort, 2020). Like the Archaic Period, the Woodland Period is divided into three subperiods: The Early, Middle, and Late Woodland.

The Early Woodland Period (2,700 – 2,100 BP) within the Ouachita Mountains region is generally recognized as a continuation of the Wister phase (Sabo and Early, 1990:77. The Fourche Maline phase people intensively reoccupied some of the same site locations on first level terraces adjacent to fresh water. Evidence of subsistence does not indicate large changes from the previous Archaic Period, but chipped stone hoes are found suggesting some digging activities.

People during the Middle Woodland Period (2,100 – 1,500 BP) experienced social changes most evident in the archaeological record through earthwork construction and variation in pottery production. Arkansas peoples lived in small communities and built small mounds in some areas (Mainfort, 2020). Some sites have been recorded along tributary streams that extend upwards into the Ouachita Mountains (Sabo and Early, 1990:76-79). Local materials and material evidence of burial ceremonialism increases in occurrence from the Early Woodland Period.

The Late Woodland Period (1,550 – 1,000 BP) is generally defined by larger settlements and the introduction of the bow and arrow (Mainfort, 2020). Maygrass, lambs quarters, knotweed, sunflowers, and marsh elder were commonly cultivated during this time. In the latter half of the Late Woodland Period, maize production intensified in some areas of Arkansas. Plant remains indicate that cultivated foods became a marked portion of the diet. While exotic goods indicative of long-distance exchange remained infrequent, exchange between areas of the Ouachita Mountains and areas of the Arkansas Valley seem common as pottery styles and shared raw materials seem common on sites in both regions.

Mississippian Period (1,000 – 400 BP)

Complex social, political, and economic structures coupled with a shared religious belief system developed during the Mississippian Period (Payne, 2018). Mississippian Chiefdoms had a ruling class that gained power through hereditary succession (Payne, 2018). With structured social hierarchies, came increased food production and wide-spread trade networks. Maize, squash, and beans were the primary crops produced throughout Mississippian settlements, although utilization of non-cultivated foods remained an important element of people's foodways.

Home and town structures of the Mississippian Period were typically rectangular in shape and organized around a fortified central plaza with a pyramid-shaped mound (Payne, 2018). The population in Mississippian settlements greatly increased following the development of agriculture but left people vulnerable to crop blights and drought. Increased populations also hastened the spread of disease through local communities.

The de Soto Spanish expedition of 1541 into the interior of North America wrote detailed accounts of Mississippian towns and cultures they encountered. When Jacques Marquette and Louis Joliet traveled south along the Mississippi River for France in 1673, large towns along the river had deflated, and native peoples had depopulated city centers. Widespread disease, warfare, and crop-crippling drought are thought to be the causes of this evacuation of population centers within less than 100 years of colonial contact (Hoffman, 1992; Key 2020; Mitchem 2017; Payne 2018).

Historic Period Chronology

Contact Period (520-250 BP)

The Contact Period (520–250 BP/1430-1700) contact between Native American cultures and Europeans (Jeter et al., 1989:221). With the presence of European records this overview will now shift to using the European Common Era dating system. In 1541, Hernando de Soto's Spanish expedition was the first group of Europeans to enter the Arkansas Valley region and possibly the southern Ouachita Mountains (Mitchem, 2017b).

Much of the Arkansas Valley and the Ouachita Mountains regions into the 1700s was the home of the Caddo. Caddo communities utilized constructed mounds as centers for community ceremonies and burials. Communities expanded well beyond these centers as family farms with multiple, circular thatched homes, fields, and other structures for farm use were clustered across the landscape (Mitchem, 2017). Early French travelers in 1687 and Joliet of the Marquette-Joliet French expedition in 1673 forged initial contacts with the Caddo for the French in the South-Central Plains region of Arkansas. The French encouraged trade with the Caddo. This trade and political contact grew in importance into the 1700s as the Caddo faced demographic shifts and hostility from the Osage in the north.

Eighteenth Century to Present (1700 – Present)

As the eighteenth century progressed, northern Caddo people increasingly relocated settlements closer to the Red River and to trading centers established by the French. Hostility between the Caddo and the Osage intensified in the 1730s and 1740s (Bailey, 2001). However, traditionally occupied lands were still recognized as part of their home and used for foraging (Mitchem, 2017a). The Osage also used areas of the Arkansas Valley region during the eighteenth century. Villages were recognized as permanent residences by the Osage with seasonal subsistence and community activities undertaken in areas away from the village (Chapman, 1974). Housing consisted of rectangular longhouses while circular structures were erected for temporary use away from the village. The Ouachita Mountains and Arkansas Valley regions of the late eighteenth century were also used for hunting and lightly occupied by various settlements of the Quapaw (Sabo, 1990b:122-134; Young and Hoffman, 2001).

The eighteenth and nineteenth century was a significant period of transition as Native, European, and African Americans moved into areas west of the Mississippi River. To establish trade with local Native American groups and colonize their territory, the French continued to establish trading posts along other major river ways in the states (Key, 2020). By the late 1700s, French, Spanish, and British colonial forces laid claims to various parts of the country. In 1776, the United States claimed independence from Britain, and in 1783, through the Treaty of Paris, most of the land east of the Mississippi was owned by the United States. The earliest European Americans to settle west of the Mississippi River were often engaged in the fur trade in the late eighteenth and early nineteenth century. As more people moved into Arkansas, settlements were established within the Ouachita Mountains in the early nineteenth century. Settlers in this region chose locations within the mountain uplands, often foraging and herding livestock, or within the narrow river bottoms on small farms (Sabo, 1990a:136-156).

In 1803, all of Arkansas, Missouri, and Oklahoma was purchased by the United States as part of the Louisiana Purchase (Bolton, 2018; Key, 2020). Many areas of Arkansas were sparsely populated by Native peoples, already impacted by conflict and introduced disease, and traders were typically the only non-Native residents.

Removal Era History

Tens of thousands of Native Americans were forced to move west into Indian Territory after Andrew Jackson's administration passed the Federal Indian Removal Act in 1830 (Remini, 2001).

Arkansas, home to the Quapaw, Caddo, Osage, and Kickapoo tribes in the early nineteenth century, was the westward relocation destination of many tribes (Oklahoma Historical Society, 2021). Cherokee, Quapaw, Choctaw, Shawnee, Delaware, and Kickapoo were among the groups either relocated into or within Arkansas in the early nineteenth century (Sabo et al., 1990:121-134). As actions of the Federal Indian Removal Act gained momentum, pressure in the form of other acts, treaties, and aggression from new settlers would push Native American residents of Arkansas and other states into Indian Territory in Oklahoma.

Growth in the population and markets of Arkansas coincided with efforts to remove Native Americans from the states. Arkansas was separated from the Missouri Territory in 1819 and became a state in 1836. Growth of Arkansas after the 1830s was spurred by settlers producing cotton with the labor of enslaved Africans, which allied the state socially, culturally, and

politically with the southern U.S. (Bolton, 2018). Larger farms devoted to cash crops typically occurred in the areas of the Arkansas River valley closest to the Mississippi River, near the Red River, or along the Mississippi River itself (Bolton, 1999). Enslaved people were only approximately 11% of the population of the Ouachita Mountains region (Bolton, 1999:5), but slavery became an increasingly powerful political discourse within Arkansas state politics into the mid-nineteenth century (Bolton, 1999: Missouri State Museum, 2020).

The United States Civil War

In 1861, Arkansas voted to secede from the Union and join the Confederacy (DeBlack, 2018). The Civil War negatively impacted the state, and territory shifted constantly between Union and Confederate control. Although no major battles took place near the project location, local skirmishes and guerrilla attacks were common in many areas. In the Ouachita Mountains region in 1863, the Battle of Devil's Backbone occurred on September 1, 1863, when federal forces secured Fort Smith, Arkansas, for the remainder of the war (Arey, 2018). Today, the battlefield is listed in the NRHP. Ongoing local conflicts, paired with financial hardships from the war, devastated the local economies. The Arkansas River was a focal point of conflict throughout the war as well. As a key transportation and supply route, the river was valuable to both the Union and Confederate armies and the strategic city of Dardanelle was severely damaged and held by Union forces for much of the war (Gleason, 2017).

Late Nineteenth and Twentieth Century History

During post-reconstruction, new social and economic trends were witnessed across the nation (Moneyhon, 2018). Termed the "Gilded Age" due to large wealth disparities during a period of economic growth, this period saw the expansion of railroads within the U.S. interior, allowing goods to be traded on a national market. Manufacturing facilities and resource extraction enterprises flourished, and urban populations grew. Railroad construction in previously isolated areas of Arkansas, such as the Ouachita Mountains, led to a "transition from household economies and neighborhood businesses to industrial activities on a larger scale" (Gannon, 1998:9). By 1899, the lumber industry was responsible for two-thirds of the value of the Arkansas manufactured goods total (Strausberg and Hough, 1997:7). Logging would peak within a decade, but the effects would leave long-lasting impacts.

Economic growth favored urban centers, and a cultural divide developed between farmers and city dwellers. These divides became more fractured between black and white citizens in the 1890s when formal segregation laws were passed. Social issues in the twentieth century mirrored those of the past. Race riots and the reemergence of the KKK, a failing and underfunded education system, crop blights, and the 1918 Influenza Pandemic tore the economic and social fabric of Arkansas apart. Arkansas, however, continued to grow and expand its economic and environmental interests until devastated by the effects of the economic collapse of 1929 and the Great Depression of the 1930s. A decline in farm prices and years of drought devastated that farm economy and many moved out of Arkansas in search of employment elsewhere. The state then came to rely heavily on the federal government's "New Deal" programs to recover (Whayne, 2020).

Under the New Deal, a program initiated in the administration of President Franklin D. Roosevelt, the government invested in the welfare and recovery of the American people. Agencies such as the Civilian Conservation Corps (CCC) and the Works Progress Administration (WPA) were created to provide jobs for young, unemployed males. Relief

programs such as these engaged in many conservation activities such as tree planting, development of recreation areas, firefighting, and other measures protecting natural resources. The work projects undertaken by the CCC were directed by the USDA on National Forest lands and by the Department of the Interior on National Park Service lands. The impact of New Deal work programs, including the WPA and most particularly the CCC, whose broad objectives were to alleviate a national economic and natural resource crisis, are represented in the distinct architectural legacy of the physical resources constructed by these programs in Arkansas forests and parks (AHPP, 1990; Smith, 1997).

During WWII, able-bodied men and women flooded to manufacturing centers throughout Arkansas to aid in the war effort and the U.S. government invested in training facilities and bases within the state (Johnson, 2017). Separate barracks were constructed at all military facilities to keep white and black service men and civilians segregated. Arkansas also hosted German and Italian prisoner-of-war (POW) camps. Although none are in or within one mile of the project location, Camp Chaffee located approximately 22 km northwest of the project location housed 3,000 German POWs between 1942 and 1946 (Radcliff, 2017). German and Italian POWs were utilized to harvest cotton.

The Flood of 1927

The Flood of 1927 was one of the largest disasters in American history. The deluge and the following relief efforts spurred major social, political, and economic changes on state and national levels. The following account is summarized from the Encyclopedia of Arkansas (Hendricks, 2017).

By 1927, numerous levees had been built along the rivers of Arkansas to control flooding. Low-lying forested lands behind the levees were drained and timbered. In the Roaring Twenties, farmers and planters with access to easy credit bought many low-lying lands and converted them to croplands. The spring thaw of 1927 arrived early in the northern headwaters of the Mississippi River watershed. Spring rains in the Midwest combined with the meltwaters to fill the Mississippi and its tributaries. In April, heavy rains fell in the South, but the saturated ground and full rivers left nowhere for the water to go.

In Arkansas, the Arkansas, St. Francis, and White Rivers began to back up due to high water in the Mississippi River. The White River even reversed and began to flow upstream due to the water pressure from the Mississippi River. Every levee on the Arkansas River between Oklahoma and Little Rock failed. Floodwaters up to 30 ft deep inundated towns, homes, and farmlands. The disaster was most widespread in Arkansas. In the state, the amount of farmland underwater was more than twice that of Mississippi and Louisiana combined. In some places, lands remained flooded for nearly half the year.

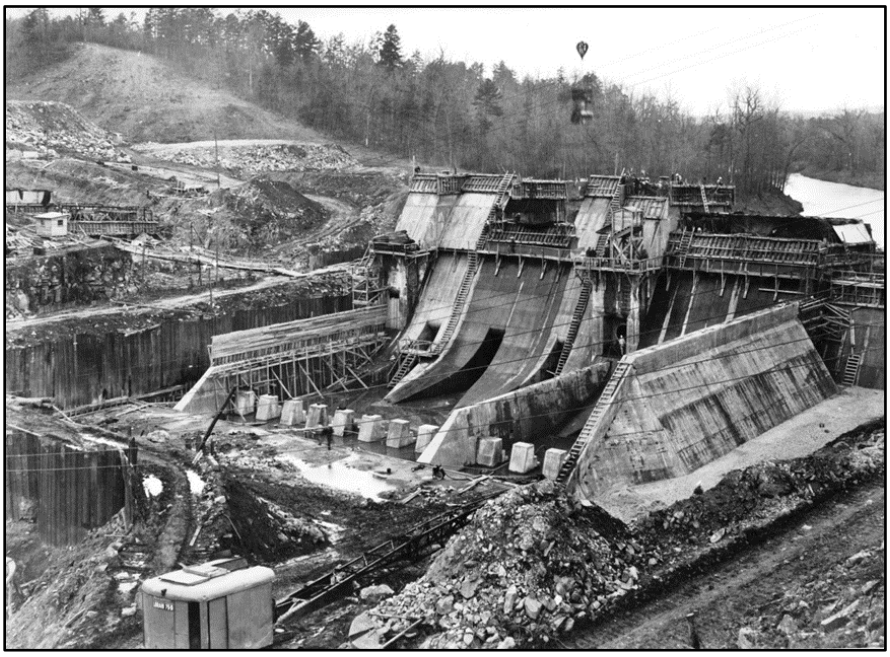
Recently developed technology aided relief efforts. Radios broadcast warnings and bulletins, airplanes helped find survivors, and motorboats carried people to dry land. Trains carried people to aid stations set up by the Red Cross and other organizations. Half of the 154 refugee camps established by the Red Cross were in Arkansas. The camps remained in operation into September of 1927. In Arkansas alone, over 100 people were killed by the flood and 350,000 people affected. The standing water remained for months, clogged with rotting animal carcasses and a breeding ground for mosquitoes. There were outbreaks of malaria, typhoid fever, dysentery, and even smallpox.

The Flood of 1927 had a number of long-term effects. Politically, the large-scale relief efforts and the anger at the lack of federal aid contributed to changing perceptions regarding the role of government in society. The Great Depression and the Dust Bowl drought of the 1930s exacerbated these trends supporting a growing belief among many Americans that the government should play a more active role in securing the welfare of the citizens.

The Construction of Nimrod Dam and Lake

As part of the federal response to the devastating flood in 1927 and additional floods in the 1930s, the Flood Control Act of 1938 was passed. The construction of Nimrod Dam, the oldest project of the USACE in the state of Arkansas, was authorized by the Flood Control Act. Damming the Fourche La Fave was considered an economical means of protecting communities and valuable crop land in Yell and Perry counties, as well as lessening spring flooding of the Arkansas River, into which the Fourche La Fave drained. Engineers began testing the proposed site for Nimrod Dam in October 1938, and the Department of War announced in January of the following year that the Nimrod site would be one of the seven Arkansas River Basin sites chosen for the construction of a dam (Lancaster, 2013).

Figure 3-5. Nimrod Dam Under Construction, January 1941



Core drilling work was completed in August 1939, and by October 1941, the dam was largely complete. Heavy rains the following month filled the reservoir, providing an unexpected test of the dam's stability. By February 1942, the final clearing of trees from the dam's reservoir area was being carried out, with the whole project reaching completion in March 1942. The estimated cost of the entire project came to just under $3.8 million (Lancaster, 2013).

Previous Archaeological Investigations within the Nimrod Fee Boundary

There are more than 270 known archaeological sites located wholly or in part on USACE fee lands associated with Nimrod Lake.

While the majority of archeological sites at Nimrod Lake have been identified individually and

separate from a survey, multiple formal systematic archaeological surveys have been completed at Nimrod Lake beginning the 1980s in response to ongoing activities such as lake construction, inadvertent discoveries, and NHPA Section 106 compliance. This section includes an overview of work conducted in the area. The first archaeological survey known to take place within USACE fee lands of Nimrod Lake was conducted by the AAS (Leatherman, 1980). The AAS conducted another survey in anticipation of the construction of a sewer line. One new site and components of an existing site were identified (Martin, 1981). Burney McClurkan with the AHTD conducted a small survey in 1983 in an area designated for the construction of a new bridge that had been previously destroyed by flooding. No sites were identified in this survey (McClurkan, 1983).

Archaeological Assessments conducted a reconnaissance survey in the Sunlight Bay Recreational Area in 1986 to assess impacts of alternative roadway construction and two previously unrecorded sites were documented (Lee and Gettys, 1986). Panamerican Consultants, Inc. conducted a survey of a National Guard training area within fee boundaries at Nimrod Lake in 2005 that identified no new cultural resources (Cole, 2005). A 2010 survey by Brockington and Associates, Inc identified 10 previously unrecorded sites, none of which were recommended for further investigation (Agha and Whitley, 2011). In 2012, a pedestrian survey ahead of a prescribed burn by the USDA, identified one previously unrecorded site (Angelo, 2012). A 2017 survey conducted by Panamerican Consultants, Inc. resulted in no new sites identified (Buchner and Saatkamp, 2017).

Coastal Environments, Inc. conducted a survey in 2016 that identified six new archeological sites (Weinstein and Phillips et. al., 2019). Archaeological Consultants, Inc. and Coastal Environments, Inc. conducted a series of joint surveys between 2018 and 2020. The 2018 survey identified four new sites, the April 2019 survey identified ten new sites, the November 2019 survey identified nine new sites, the December 2019 survey identified nine sites, and the March 2020 survey identified a single site (Horvath, 2018) (Horvath, 2019a) (Horvath, 2019c) (Horvath, 2019d) (Horvath, 2020). A 2021 survey conducted by AmaTerra Environmental, Inc. identified no new sites (Thomas et. al., 2022a). AmaTerra also conducted a 2022 survey in which ten new sites were identified (Thomas et. al., 2022c).

Long-Term Objectives for Cultural Resources

As funding allows, the Little Rock District will plan and budget for a Historic Preservation Management Plan (HPMP) that shall be developed and incorporated into the Operational Management Plan (OMP) in accordance with EP 1130-2-540. The purpose of the HPMP is to provide a comprehensive program to direct the historic preservation activities and objectives at Nimrod Lake and it will be accomplished if future funding is forthcoming. Completion of a full inventory of cultural resources at Nimrod 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 Nimrod Lake. As more significant sites are identified, they could be protected through further land classifications.

In accordance with Section 106 of the NHPA, any proposed activities or projects at Nimrod Lake will require review by District Archaeologists to assess their potential to impact historic properties. These activities may include those described in this master plan or those that may be

proposed in the future by others for leases, licenses, right-of-way easements, recreational development, construction, wildlife management, or other activities that can be considered undertakings subject to Section 106 of the NHPA. The need for cultural resource surveys to locate and evaluate historic and prehistoric resources, consultation, or other compliance activities related to Section 106 of the NHPA shall be determined and coordinated by a qualified District Archaeologist. Resources determined eligible for the NRHP must be protected from proposed project impacts, or the impacts must be mitigated in consultation with appropriate parties.

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 Nimrod Lake in accordance with ARPA, and 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 over the past 25-30 years, there is still more work to be done.

In recognition of the significance of the responsibility the Little Rock District has to ensure the proper and respectful treatment of the individuals who have been - or may inadvertently be - disinterred from Little Rock District land, and acknowledging the fact that this work requires more than a part-time effort to be accomplished, a new full-time position has been established to focus on the proper execution of this responsibility. The intensive process to verify existing documentation and complete any missing part of the process for all collections of human remains, funerary objects, or sacred objects subject to NAGPRA in Little Rock District archaeological collections is in progress. As a necessity, this renewed effort is starting with research and reorganization of associated records and archaeological collections to ensure the proper identification and initial inventory of all NAGPRA materials that are under the control of Little Rock District. This effort will include NAGPRA collections that have been made – or may yet be discovered – at Nimrod Lake, therefore, compliance with NAGPRA is ongoing.

3.10 Air Quality

The Clean Air Act (CAA) of 1970 is the comprehensive federal law that regulates air emissions from stationary and mobile sources. Among other things, this law authorizes the EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and welfare and to regulate emissions of hazardous air pollutants. NAAQS define the maximum permissible concentrations of six pollutants, known as criteria pollutants. Criteria pollutants include Carbon

Monoxide (CO), Lead (Pb), Nitrogen Dioxide (NO_2), Ozone (O_3), Particulate Matter (PM_{10} and $PM_{2.5}$), and Sulfur Dioxide (SO_2). Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The ADEE Office of Air Quality works to meet Arkansas' federal obligations under the CAA. All counties within the State of Arkansas encompassing the Nimrod Lake are in attainment for all NAAQS criteria pollutants (EPA, 2023). According to the ADEE, the entire state of Arkansas is compliant with all EPA ambient air quality standards. Only ozone concentrations occasionally approach the limit of the standard. The Conformity Rule of the CAA, as amended, states that all Federal actions must conform to appropriate State Implementation Plans (SIPs). This rule took effect on January 31, 1994, and at present applies only to Federal actions in non-attainment areas (those not meeting the National Ambient Air Quality Standards for the criteria pollutants in the CAA). The State of Arkansas, including the Nimrod Lake area, is considered an attainment area and is therefore exempt from the Conformity Rule of the CAA.

The Little Rock Metropolitan Area, roughly 50 miles southeast of Nimrod Lake, is the nearest air quality monitoring site to the lake. ADEE continuously monitors pollutant concentrations for compliance with NAAQS. Typically, the air quality condition of the Little Rock Metropolitan Area is considered "Good," and occasionally "Moderate" for ozone and PM. Only ozone and PM concentrations occasionally approach the limit of the standard (ADEE, 2024).

Although there are some populated areas around Nimrod Lake, they are not in close proximity. Areas surrounding the lake are rural and therefore no major emission sources are located directly on the project lands. Around the lake, agricultural practices may contribute adversely to air quality. Sources at the Nimrod Lake Project produce negligible quantities of emissions. Stationary emissions include those emitted from utilities at lake recreation and operations facilities. Mobile sources include recreational and operational boat engines and area traffic.

3.11 Socio-Economic Resources and Environmental Justice

3.11.1 Zone of Influence

Nimrod Lake is located on the Fourche La Fave River approximately five miles southeast of Plainview, Arkansas in the Arkansas River Basin. The zone of influence (ZOI) for the socio-economic analysis of Nimrod Lake encompasses 12 counties within the State of Arkansas (Table 3-9). The ZOI for the purposes of this Master Plan and EA is defined as those areas within a 50-mile driving distance from the lake, based primarily on historic visitation information. The demographic and socioeconomic description in this section of the report is summarized at the county level.

Table 3-9. Zone of Interest Counties

Zone of Influence Counties	
Conway County	Perry County
Faulkner County	Pope County
Garland County	Pulaski County
Johnson County	Saline County
Logan County	Scott County
Montgomery County	Yell County

3.11.2 Population

The total population for the ZOI in 2020 was 925,797, as shown in Table 3-10. Approximately 43% of the ZOI population resides in Pulaski County, 13% in Faulkner County, and 13% in Saline County. All counties are expected to see growth except Logan County and Montgomery County. From 2020 to 2050, the population in the ZOI is expected to increase from 925,797 to approximately 1,231,551. The distribution of the population among gender in 2021, as shown in Table 3-11 is approximately 49% male and 51% female in the ZOI. Population age 65 and older represented averaged 17.5 % of the total 2020 population within the ZOI for a total of 161,717 persons.

Table 3-10. Population of the Nimrod ZOI

Geographical Area	2010	2020	2021	2050 Projection	65 years of Age and Older
Arkansas	2,915,918	3,011,524	3,006,309	3,832,115	536,051
Conway County	21,273	20,715	20,687	23,482	4,164
Faulkner County	113,237	123,498	123,191	169,228	17,784
Garland County	96,024	100,180	99,694	108,554	25,145
Johnson County	25,540	25,749	25,853	27,228	4,583
Logan County	22,353	21,131	21,299	19,871	4,332
Montgomery County	9,487	8,484	8,525	6,795	2,325
Perry County	10,445	10,019	10,056	10,353	2,114
Pope County	61,754	63,381	63,234	83,366	4,517
Pulaski County	382,748	399,125	397,931	499,818	67,851
Saline County	107,118	123,416	122,308	250,446	23,079
Scott County	11,233	9,836	9,928	10,949	2,115
Yell County	22,185	20,263	20,489	21,461	3,708
ZOI Total	**883,397**	**925,797**	**923,195**	**1,231,551**	**161,717**

Source: U.S. Census Bureau, 2010 and 2020 Decennial Census. U.S. Census Bureau, 2021 American Community Survey 5-Year (2017-2021). 2050 Population Projections from Arkansas Economic Development Institute.

Table 3-11. 2021 Percent of Population Estimate by Gender

Geographical Area	Male	Female
Arkansas	1,483,520	1,522,789
Conway County	10,264	10,423
Faulkner County	60,286	62,905
Garland County	48,107	51,587
Johnson County	12,872	12,981
Logan County	10,492	10,807
Montgomery County	4,305	4,220
Perry County	5,110	4,946
Pope County	31,348	31,886
Pulaski County	190,929	207,302
Saline County	60,066	62,242
Scott County	5,302	4,626
Yell County	10,426	10,063
ZOI Total	**449,507**	**473,988**

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year (2017-2021)

Population by Race and Hispanic Origin is displayed in Table 3-12. The ZOI is approximately 67% white, 6.4% Hispanic or Latino, 19.8% Black, 0.3% American Indian and Alaska native, 2.9% Asian, <0.0% native Hawaiian-Pacific Islander, 0.2% some other race and 2.9% two or more races.

Table 3-12. Population Estimate by Race/Hispanic Origin

Area	White	Hispanic or Latino	Black	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some other race	Two or more races
Arkansas	2,123,715	236,001	455,748	13,665	45,575	10,408	6,267	114,930
Conway County	16,774	871	2,119	85	125	-	-	713
Faulkner County	97,514	5,281	14,370	368	15,377	-	563	3,558
Garland County	80,861	5,982	8,213	702	692	80	32	3,132
Johnson County	20,179	3,668	412	29	83	40	82	760
Logan County	18,851	652	306	92	35	-	10	1,023
Montgomery County	7,716	383	43	94	83	-	-	206
Perry County	9,181	310	256	7	6	-	-	296
Pope County	52,601	6,026	1,493	139	764	8	56	2,147
Pulaski County	202,990	25,021	147,819	834	8,691	118	994	11,464
Saline County	101,130	6,383	9,817	171	1,376	107	199	3,125
Scott County	8,319	794	291	34	76	-	-	414
Yell County	15,210	4,274	342	59	228	-	-	376
ZOI	**631,326**	**59,645**	**185,481**	**2,614**	**27,536**	**353**	**1,936**	**27,214**

Source: U.S. Census Bureau, 2021 American Community Survey 5 Year (2017-2021)

3.11.3 Education and Employment

Table 3-13 displays the highest level of education attained by the population ages 25 and over. In the ZOI, 3.5% of the population has less than a 9th grade education, and another 6.4% has between a 9th and 12th grade education; 30.1% has a high school diploma or equivalent, and another 22.3% has some college and no degree; 8.0% has an associate degree; 18.6% has a bachelor's degree, and 11.1% has a graduate or professional degree.

Table 3-13 Highest Level of Educational Attainment, Population 25 Years of Age and Older

Area	Population 25 years and over	Less than 9th grade	9th to 12th grade, no diploma	High school graduate (includes equivalency)	Some college, no degree	Associate degree	Bachelor's degree	Graduate or professional degree
Arkansas	2,021,290	93,191	155,530	688,732	437,893	154,675	313,527	177,742
Conway County	14,381	640	1,066	5,896	2,790	1,303	2,009	677
Faulkner County	76,466	1,863	3,405	23,020	17,072	5,951	15,682	9,473
Garland County	72,278	1,885	5,070	23,014	18,195	6,936	11,173	6,005
Johnson County	16,953	1,552	1,825	6,929	3,143	788	1,751	965
Logan County	15,100	579	1,274	6,704	3,432	1,203	1,260	648
Montgomery County	6,421	318	712	2,111	1,729	566	701	284
Perry County	7,090	245	372	3,076	1,727	429	893	348
Pope County	40,886	2,344	4,098	13,836	8,388	2,718	6,480	3,022
Pulaski County	270,836	8,215	14,868	69,538	58,689	21,094	58,292	40,140
Saline County	84,850	2,294	4,658	26,015	20,179	8,019	16,275	7,410
Scott County	6,921	536	851	2,827	1,436	514	562	195
Yell County	13,905	1,249	1,886	5,240	2,739	838	1,372	581
ZOI	**626,087**	**21,720**	**40,085**	**188,206**	**139,519**	**50,359**	**116,450**	**69,748**

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year (2017-2021)

Employment by sector is presented Table 3-14, showing that the largest percentage of the ZOI is employed in the educational services, and health care and social assistance sector at 26.1%, followed by retail trade at 11.8%, and manufacturing at 9.5%.

Table 3-14. Annual Average Employment by Sector

Employment Sector	Arkansas	Conway County	Faulkner County	Garland County	Johnson County	Logan County	Montgomery County	Perry County	Pope County	Pulaski County	Saline County	Scott County	Yell County	ZOI
Civilian employed population 16 years and over	1,310,863	9,044	58,974	41,466	10,535	9,118	3,119	3,782	26,903	187,423	59,150	4,192	9,120	422,826
Agriculture, forestry, fishing and hunting, and mining	33,858	663	777	572	391	540	304	215	560	905	504	302	616	6,349
Construction	93,603	731	4,497	3,668	690	374	286	599	1,559	10,883	4,628	213	587	28,715
Manufacturing	173,633	1,614	4,462	2,882	2,675	2,079	325	474	4,672	12,844	4,806	1,167	1,976	39,976
Wholesale trade	31,953	204	1,338	955	57	48	71	48	646	4,972	2,120	127	95	10,681
Retail trade	170,365	822	7,374	5,832	1,538	1,190	445	544	3,245	20,676	6,911	301	935	49,813
Transportation warehousing, and utilities	78,705	506	2,824	1,054	616	519	199	190	2,137	10,507	3,719	205	619	23,095
Information	17,000	118	1,346	811	62	103	14	49	239	4,036	1,132	29	120	8,059
Finance and insurance, and real estate and rental and leasing	65,352	186	2,900	2,258	320	231	136	118	1,235	13,943	4,500	231	262	26,320
Professional, scientific, management, and administrative and waste management services	101,903	778	5,356	4,004	340	518	245	282	1,860	20,141	4,875	329	642	39,370
Educational services, health care and social assistance	319,672	2,132	17,462	9,403	2,107	2,230	665	730	6,370	51,054	15,899	805	1,703	110,560
Arts, entertainment, recreation, and accommodation and food services	103,712	498	5,729	5,291	724	503	164	246	2,560	15,774	3,649	169	884	36,191
Other services, except public administration	62,683	306	2,505	2,970	612	437	145	98	1,151	9,525	2,836	149	399	21,133
Public administration	58,424	486	2,404	1,766	403	346	120	189	669	12,163	3,571	165	282	22,564

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year (2017-2021)

3.11.4 Households, Income and Poverty

Table 3-15 displays the number of households and average household sizes in the state and ZOI. In 2021, There were approximately 369,293 households in the ZOI with an average household size of 2.5 people.

Table 3-15. 2021 Households and Household Sizes

Geographic Area	Total Households	Average Household Size
Arkansas	1,158,460	2.53
Conway County	8,460	2.43
Faulkner County	46,445	2.55
Garland County	41,919	2.34
Johnson County	9,849	2.55
Logan County	8,271	2.51
Montgomery County	3,669	2.29
Perry County	3,732	2.66
Pope County	23,304	2.58
Pulaski County	164,697	2.38
Saline County	47,468	2.55
Scott County	3,938	2.51
Yell County	7,541	2.67
Zone of Interest	**369,293**	**2.50**
Source: U.S. Census Bureau, 2021 American Community Survey 5-Year (2017-2021)		

The median household income in the ZOI ranged from $40,628 in Johnson County, AR to $68,605 in Saline County, AR displayed in Table 3-16. Per capita income in the ZOI was $26,978, which is lower than the state of Arkansas's total per capita income.

Table 3-16. 2021 Median and Per Capita Income

Geographic Area	Median Household Income	Per Capita Income
Arkansas	52,123	29,210
Conway County	45,812	27,435
Faulkner County	54,845	28,851
Garland County	49,985	29,214
Johnson County	40,628	22,509
Logan County	46,570	24,061
Montgomery County	41,032	24,184
Perry County	47,500	24,857
Pope County	47,322	26,212
Pulaski County	55,235	35,718
Saline County	68,605	33,861
Scott County	43,577	22,064
Yell County	51,070	24,771
ZOI	**49,348**	**26,978**
Source: U.S. Census Bureau, 2021 American Community Survey 5-Year (2017-2021)		

Table 3-17 displays the percentage of persons and families whose incomes fell below the poverty level in 2021. Within the ZOI, Johnson, Conway, and Montgomery County had the greatest share of people with incomes below the poverty level at 18.9%. In terms of families below the poverty level, Montgomery County had the greatest share of people with incomes below the poverty level at 16.1%, followed by Johnson County at 13.9%. The average poverty rate for the ZOI in the year 2021 was 15.8% compared to the United States that was 11.5%.

Table 3-17. Percent of Families and People Whose Income in the Prior 12 Months was Below the Poverty Level (2021)

Geographic Area	All Families	All People
Arkansas	11.6	16.0
Conway County	13.3	18.9
Faulkner County	9.8	14.8
Garland County	10.9	16.2
Johnson County	13.9	18.9
Logan County	10.5	15.7
Montgomery County	16.1	18.9
Perry County	13.1	15.3
Pope County	12.5	17.4
Pulaski County	11.7	15.8
Saline County	6.3	8.6
Scott County	11.2	15.2
Yell County	11.0	13.8
ZOI	**11.7**	**15.8**

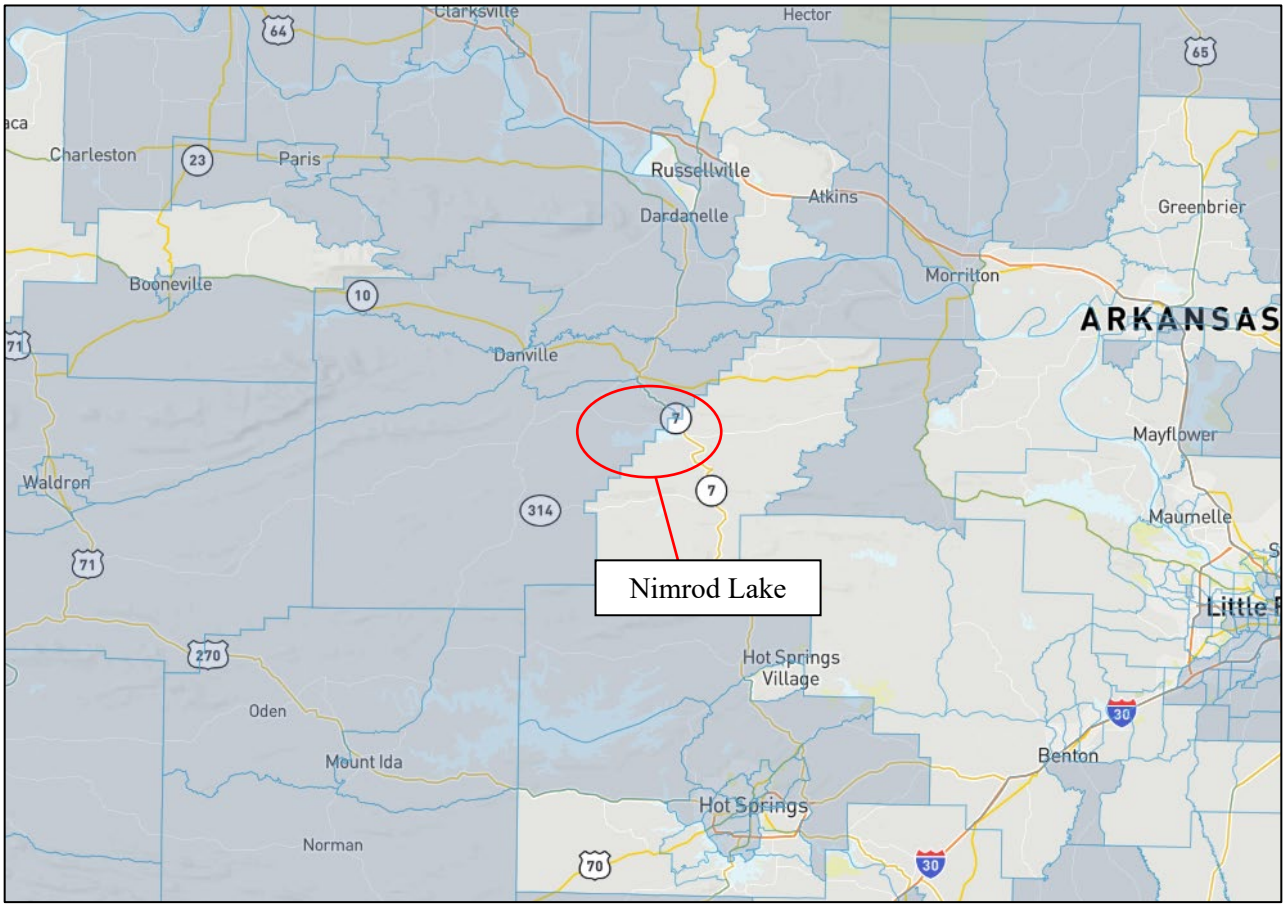
Source: U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates (2017-2021)

3.11.5 Environmental Justice

Environmental Justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EJ is achieved when everyone enjoys the same degree of protections and equal access to Civil Works programs and services to achieve a healthy environment in which to live. The CEQ Climate and Economic Justice Screening Tool (CEJST) was utilized to conduct a review of disadvantaged census tracts within the project area (CEQ, 2023).

Figure 3-6 below is a screenshot of the CEJST mapping tool spanning the study area, which shades census tracts in blue if they are considered disadvantaged by CEQ definition. Census tracts in light gray are not considered disadvantaged, while those in light blue are considered disadvantaged for any metric evaluated that exceeds the CEQ's acceptable threshold.

Figure 3-6. CEJST Map of the Nimrod Lake Area



Roughly half of the census tracts within the ZOI are identified in CEJST as economically disadvantaged. Contributing factors across the more rural areas surrounding Nimrod Lake include climate change, related to expected building and population loss rates resulting from natural hazards; health, including high rates of diabetes, heart disease, and low life expectancy; and legacy pollution, related to proximity to Superfund sites, all paired with a low income rate that exceeds the acceptable threshold when compared to the nation.

Two census tracts intersect and encompass Nimrod Lake. The western tract is not considered disadvantaged, while the eastern tract located in Yell County is considered economically disadvantaged (Tract Number 05149952600). Here, expected building loss rate, defined as economic loss to building value resulting from natural hazards each year, and expected population loss rate, defined as fatalities and injuries resulting from natural hazards each year, both exceed the acceptable 90th percentile threshold when compared to the nation, paired with a low income in the 87th percentile. Health metrics contributing to EJ concerns include the occurrence of diabetes and heart disease at the 90th and 98th percentiles, respectively. Proximity to Superfund sites in the 93rd percentile also exceeds the acceptable threshold, further contributing to the tract's designation as disadvantaged.

3.12 Recreation Resources

The recreational resources of Nimrod Lake are considered to be of great importance to this Ouachita Mountains region. Tourism and lake visitation are major sources of income for the counties surrounding this lake. USACE has taken advantage of the natural and scenic beauty and constructed a variety of recreational facilities around the lake. The Project offers many

recreational activities such as wildlife viewing, boating, fishing, hunting, swimming, picnics, and camping, as well as hiking and biking trails. There are 14 public use areas around Nimrod Lake operated by USACE, and one additional leased area. Available recreation facilities are listed in Table 3-18 below. Future development of parks and recreation facilities will follow the guidelines as stated in the 2019-2023 Arkansas Statewide Comprehensive Outdoor Recreation Plan. These criteria furnish guidelines for determining the type and number of facilities needed to satisfy the current and projected demand and also furnishes guidelines for serviceability, operation, and maintenance of facilities. Considerations for the physically handicapped will be included in the design of facilities.

Multiple parks and campgrounds, lake access points, boat ramps, and primitive camping areas exist on Nimrod Lake. Recreation area maps can be found in Appendix C. If adequate funding becomes available for park operation; recreation areas or portions of recreation areas will be updated to current design standards and future development may occur as identified in the park descriptions below. However, these proposed improvements are not indicated on the park plates.

Table 3-18. Recreation Facilities at Nimrod Lake

Facility	Number of Sites
Recreation areas	15
Group Shelters	6
Camping sites	110
Playgrounds	6
Swimming areas	3
Boat ramps	17

For a detailed description of the available recreational resources, as well as visitation data at Nimrod Lake, see Chapter 2 of the Nimrod Revised Master Plan.

3.13 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. Life jacket loaner stations are provided for visitor use. Park Rangers provide visitor assistance and work with county law enforcement agencies to ensure public safety. Park Rangers and AGFC personnel provide water safety and enforcement patrols on the lake as their budgets allow.

3.14 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 Nimrod Lake provide a natural setting that is aesthetically pleasing while 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 investigate trespasses that include activities such as timber cutting and land destruction by unauthorized off-road vehicles. In addition, litter and illegal trash dumping both on project lands and in project waters are continual problems. Vandalism within recreation areas also occurs. Other concerns that impact aesthetics are demands put upon project resources for uses such as road and utility line corridors.

3.15 Hazardous, Toxic, and Radioactive Waste

This section describes existing conditions within the Project area with regard to potential environmental contamination and the sources of releases to the environment. One site that may contain contaminants exists within the Nimrod Lake boundary. The 1975 master plan identified a location on fee-owned property on the north side of the lake as a "sanitary landfill." This location was historically used to dispose of garbage generated on project lands, but has been out of use for decades and is excluded from recreation areas.

Contaminants could enter the lake environment via air or water pathways or through illegal trash dumping. While no marinas exist at Nimrod Lake, there are numerous public campgrounds and recreational areas that could contribute small amounts of hazardous materials and waste to the watershed. USACE and area law enforcement officials work cooperatively to apprehend those responsible for illegal trash dumping.

There are two known Superfund sites in Yell County. One is the Mountain Pine Pressure Treating site located 6 miles northwest of Nimrod Lake in Plainview, AR. The site consists of three inactive abandoned wood-treating facilities that operated from the mid-1960s to the late 1980s. Wood-treating operations used solutions of pentachlorophenol (PCP) and copper chromated arsenate (CCA). The second is the Old Midland Products site located 6 miles north of Nimrod Lake in the cities of Ola and Birta, AR. Old Midland Products operated from 1969 to 1979 as a wood-preserving treatment plant. A sawmill operated at the site as early as 1960. Wood-treating operations used creosote and pentachlorophenol (PCP) (EPA, 2024). These sites do not impact the project area in any way.

4 ENVIRONMENTAL CONSEQUENCES

This section describes the potential impacts to the human and physical environments that would result from the implementation of Alternative 1 – No Action (1975 Plan), Alternative 2 – Selected, and Alternative 3 –Limited Development, which are outlined in Section 3 of this document. Only those resources that have the potential to be affected by any of the alternatives are described, as per CEQ guidance (40 CFR § 1501.7 [3]). Some topics are limited in scope due to the lack of direct effect from Alternatives 2 and 3 on the resource or because that particular resource or subject matter topic is not located, or is not a factor, within the project area.

Impacts (consequence or effect) can be either beneficial or adverse and can be either directly related to the action or indirectly caused by the action. Direct effects are caused by the action and occur at the same time and place (40 CFR § 1508.8[a]). Indirect effects are caused by the action and are later in time or further removed in distance but are still reasonably foreseeable (40 CFR § 1508.8[b]). As discussed in this section, the alternatives may create temporary (less than 1 year), short-term (up to 3 years), long-term (3 to 10 years), or permanent effects.

In considering whether the effects of each alternative are significant, agencies shall analyze the potentially affected environment and degree of the effects of the action (40 CFR 1501.3). Impacts on each resource can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. For this analysis, the intensity of impacts would be classified as negligible, minor, moderate, or major. The intensity thresholds are defined as follows:

- Negligible: A resource would not be affected, or the effects would be at or below the level of detection, and changes would not be of any measurable or perceptible consequence.
- Minor: Effects on a resource would be detectable, although the effects would be localized, small, and of little consequence to the sustainability of the resource. Mitigation measures, if needed to offset adverse effects, would be simple and achievable.
- Moderate: Effects on a resource would be readily detectable, long-term, localized, and measurable. Mitigation measures, if needed to offset adverse effects, would be extensive and likely achievable.
- Major: Effects on a resource would be obvious and long-term and would have substantial consequences on a regional scale. Mitigation measures to offset adverse effects would be required and extensive, and success of the mitigation measures would not be guaranteed.

In considering the potentially affected environment, agencies should consider, as appropriate to the specific action, the affected area (national, regional, or local) and its resources, such as listed species and designated critical habitat under the Endangered Species Act. Significance varies with the setting of the alternatives, and significance is dependent on the extent of the affected area. In considering the degree of the effects, agencies should consider the following, as appropriate to the specific action.

- Both short- and long-term effects.
- Both beneficial and adverse effects.
- Effects on public health and safety.
- Effects that would violate Federal, State, Tribal, or local law protecting the environment.

4.1 Land Use

4.1.1 Alternative 1 – No Action

Under the No Action Alternative, there will be no impacts to land use within the project area as no action will take place and existing conditions will not be altered.

4.1.2 Alternative 2 – Selected

The Selected Alternative would have no impact on existing land uses within the Nimrod project area or surrounding areas. The land classification revisions proposed under the Selected Alternative are intended to reflect current and anticipated land uses and management practices, and no construction efforts or changes to existing uses would occur as a result. Therefore, there will be no significant short- or long-term impacts to land use as a result of implementing the Selected Alternative.

4.1.3 Alternative 3 – Limited Development

Similar to the Selected Alternative, the Limited Development Alternative would have no impact on existing land uses within the Nimrod Lake project area or surrounding areas. While this alternative involves further limiting High and Low Density Recreation acreage and proposes an increase in Environmentally Sensitive Areas, the permitted activities under each of these classifications would still enable existing uses and management practices to occur. The land classification revisions proposed under the Limited Development Alternative are largely representative of current and anticipated land uses and management practices, and no construction efforts or changes to existing uses would occur as a result. Therefore, there will be no significant short- or long-term impacts to land use as a result of implementing the Limited Development Alternative.

4.2 Climate, Climate Change, and Greenhouse Gases

4.2.1 Alternative 1 — No Action

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions. There would be no impacts to climate, climate change or GHG emissions as a result of implementing the No Action Alternative.

4.2.2 Alternative 2 — Selected

The Selected Alternative would have no significant impact on the climate of the study area, nor on climate change. The land classification conversions proposed in the Selected Alternative are reflective of existing land use and land management practices at Nimrod Lake, and no construction efforts are involved under this alternative that would contribute to GHG emissions. No impacts to climate, climate change, or GHG emissions are expected as a result of its implementation.

4.2.3 Alternative 3 — Limited Development

Similar to the Selected Alternative, the Limited Development Alternative would have no significant impact on the climate of the study area, nor on climate change or GHG emissions. While land area available for future development will decrease under this alternative, the reclassification of land largely reflects existing management practices. No construction efforts that would contribute to GHG emissions are involved under the Limited Development Alternative, and therefore no impacts to climate, climate change, or GHG emissions are expected as a result of its implementation.

4.3 Topography, Geology, Soils, Prime Farmland, and Mineral Resources

4.3.1 Alternative 1 — No Action

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions, therefore there would be no impacts on topography, geology, soils, prime farmland, or mineral resources as a result of implementing the No Action Alternative.

4.3.2 Alternative 2 — Selected

Topography, geology, and soils were considered during the refining process of land reclassifications for the 2024 Master Plan. Under the Selected Alternative, total acreage for High Density Recreation was reduced from 3,185.2 acres to 637.2 acres. This net reduction is based on the realization that the amount of acreage originally planned for intensive recreation use per the 1975 Master Plan was, in reality, being utilized as other land classifications under current land management practices and uses. Additionally, under Alternative 2, existing park areas would remain largely unchanged.

Land reclassifications and new resource objectives proposed as part of the Selected Alternative would have a potential long-term beneficial impact on soil conservation at Nimrod Lake. The reduction of High and Low Density Recreation Areas will limit future intensive development, thus reducing potential adverse impacts from soil erosion and pervious surface conversion. The new resource objectives will provide a level of consistency in beneficial management practices that would not occur with the No Action Alternative. As described in Chapter 3 of the revised Master Plan, resource goals B, C, D, and E, and several natural resource management objectives, particularly those that concern addressing unauthorized uses of public land, evaluating erosion control, and addressing sedimentation issues, are supported by the proposed land classifications. Prime and unique farmlands at Nimrod Lake, including areas leased for agricultural practices by USACE and through AGFC, will remain. Therefore, under the Selected Alternative, there would be long-term, minor beneficial impacts to topography, geology, and soils at the Project. Additionally, no current extraction or mining of minerals occur on project lands, therefore no impact is expected on mineral resources.

4.3.3 Alternative 3 — Limited Development

Similar to the Selected Alternative, land reclassification proposed as a part of the Limited Development Alternative would have a potential for minor, long-term beneficial impact on topography, geology, and soils. Total acreage for High Density Recreation would be reduced from 3,185.2 acres to 217.3 acres, which would limit future intensive development, providing increased protection to existing soils. Roughly 2,712 acres of High Density Recreation lands will be converted to Wildlife Development, contributing to reduced soil and topography protection by retaining natural vegetation communities in these areas and allowing for management practices that would enhance these resources. Environmentally Sensitive Areas totals 928.7 acres, compared to 429.4 acres in the No Action Alternative. This would provide increased protection to landscapes with scientific, ecological, cultural, and aesthetic features that have been identified. Prime and unique farmlands at Nimrod Lake, including areas leased for agricultural practices by USACE and through AGFC, will remain. Additionally, no extraction or mining of minerals occur on project lands, therefore no impact is expected on mineral resources. Though land development would be further restricted in Alternative 3 compared to Alternative 2, this alternative would also have minor, long-term beneficial impacts to topography, geology, and soils.

4.4 Aquatic Environment

4.4.1 Hydrology and Groundwater

4.4.1.1 Alternative 1 — No Action

There would be no short- or long-term impacts on hydrology and groundwater as a result of implementing the No Action Alternative, since there would be no change to the existing Master Plan.

4.4.1.2 Alternative 2 — Selected

The reclassifications included in the Selected Action would allow land management and land uses to be compatible with the goals of good stewardship of natural resources. Land reclassifications and new resource objectives proposed as part of the Selected Alternative would have a potential for negligible, long-term beneficial impacts on hydrology and groundwater. For example, 925.2 acres would be classified as Environmentally Sensitive Areas compared to the No Action Alternative, which allocates 429.4 acres to strictly Environmentally Sensitive Areas (see Table 2-2). This directly supports resource goals B, D, and E and several natural resource management objectives, including the resource goals that consider watershed approach during decision-making process, all of which are further described in Chapter 3 of the revised Master Plan. Wildlife Management area totals 16,301.7 acres, compared to 3,684.1 in the No Action Alternative. This increase in Wildlife Management would potentially contribute to improved groundwater quality by conserving vegetation in these areas. Vegetation reduces the amount of contaminates infiltrating the groundwater. The net reduction of High Density Recreation lands from 3,185.2 acres to 637.2 acres will limit future intensive development, thus reducing the potential for erosion, sedimentation, and conversion of pervious surfaces to impervious which increases runoff. Natural vegetation communities act as buffers to trap runoff, thus potentially reducing sedimentation. The Selected Alternative would provide negligible, long-term beneficial impacts to hydrology and groundwater resources.

4.4.1.3 Alternative 3 — Limited Development

Similar to the Selected Alternative, land reclassification proposed as a part of the Limited Development Alternative would have a potential for negligible, long-term beneficial impacts on hydrology and groundwater. Under this alternative, Wildlife Management lands total 20,201.2 acres, compared to 3,684.1 in the No Action Alternative. This increase in Wildlife Management would potentially contribute to improved groundwater quality by conserving vegetation in these areas, which can reduce the amount of contaminates infiltrating into the groundwater. Environmentally Sensitive Areas totals 928.7 acres, compared to 429.4 acres in the No Action Alternative. This increase in Environmentally Sensitive Areas would potentially contribute to an increased rate of groundwater recharge by increasing rain fall absorption through vegetation. The net reduction of High Density Recreation lands from 3,185.2 acres to 217.3 acres will limit future intensive development, thus reducing potential infrastructure development, such as buildings, roads, and other impervious surfaces, that reduce groundwater recharge. Though land development would be further restricted in Alternative 3 compared to Alternative 2, this alternative would also have negligible, long-term beneficial impacts on hydrology and groundwater resources.

4.4.2 Water Quality

4.4.2.1 Alternative 1 — No Action

There would be no short- or long-term impacts to existing water quality conditions as a result of implementing the No Action Alternative as there would be no change to the existing Master Plan.

4.4.2.2 Alternative 2 — Selected

The reclassifications included in the Selected Alternative would allow land management and land uses to be compatible with the goals of natural resource stewardship. Land reclassifications and new resource objectives proposed under 2024 Master Plan as part of the Selected Action would have a potential for negligible, long-term beneficial impacts on water quality. Under the Selected Alternative, 925.2 acres would be classified as Environmentally Sensitive Areas compared to the No Action Alternative, and this classification serves to conserve existing biotic features by limiting future intensive development. This directly supports resource goals B, D, and E, and several natural resource management objectives, including the resource goals that aim to protect natural habitat, all of which are further described in Chapter 3 of the revised Master Plan. Under the Selected Alternative, Wildlife Management lands total 16,301.7 acres, compared to 3,684.1 in the No Action Alternative. This increase in Wildlife Management acreage would potentially contribute to improved groundwater quality by conserving vegetation in these areas, which reduces the amount of contaminates infiltrating into the groundwater. The net reduction of High Density Recreation lands from 3,185.2 acres to 637.2 acres will limit future intensive development, thus reducing the potential for erosion and sedimentation by retaining natural vegetation communities which act as buffers to trap runoff. As a result, the Selected Alternative would provide negligible, long-term beneficial impacts to water quality.

4.4.2.3 Alternative 3 — Limited Development

Similar to the Selected Alternative, the reclassifications included in the Limited Development Alternative would allow land management and land uses to be compatible with the goals of natural resource stewardship. Land reclassifications and new resource objectives would have a potential for negligible, long-term beneficial impact on water quality. Under the Limited Development Alternative, 928.7 acres would be classified as Environmentally Sensitive compared to 429.4 acres in the No Action Alternative, and this classification serves to conserve existing biotic features by limiting future intensive development. This directly supports resource goals B, D, and E, and several natural resource management objectives, including the resource goals that aim to protect natural habitat, all of which are further described in Chapter 3 of the revised Master Plan. Under this alternative, Wildlife Management totals 20,201.2 acres, compared to 3,684.1 in the No Action Alternative. This increase in Wildlife Management would potentially contribute to improved water quality by conserving vegetation in these areas for the benefit of wildlife. Retaining natural vegetation communities around the lake would contribute to increased water quality by reducing stormwater runoff and erosion, which leads to sedimentation. The net reduction of High Density Recreation lands from 3,185.2 acres to 217.3 acres will limit future intensive development, thus reducing the potential for erosion and sedimentation by retaining natural vegetation communities which act as buffers to trap runoff. As a result, the Selected Alternative would provide negligible, long-term beneficial impacts to water quality.

4.4.3 Wetlands

4.4.3.1 Alternative 1 — No Action

There would be no significant short- or long-term impacts to wetlands as a result of implementing the No Action Alternative, since there would be no change to the existing Master Plan.

4.4.3.2 Alternative 2 — Selected

The land reclassifications included in the Selected Alternative would allow land management and land use to be compatible with the goal of wetland stewardship. Land reclassifications proposed as part of the Selected Alternative would have a potential for negligible, long-term beneficial impacts on wetlands. For example, 925.2 acres are classified as Environmentally Sensitive Areas compared to the No Action Alternative, which allocates 429.4 acres to Environmentally Sensitive Areas (see Table 2-2). While wetlands are not extremely prevalent at Nimrod Lake, under this alternative, lands classified as Environmentally Sensitive Areas were primarily around shoreline and isolated areas, many of which encompass wet areas. Most wetland acreage has been identified in the lower reaches of the major tributary streams, and the limited High Density classification near the lower end of the lake, as reflected in this alternative, would prevent potential impacts to wetland resources by limiting the potential for intensive development in the future. This classification would protect wetlands included under its designation from adverse impacts such as land development and vegetation removal. The net reduction of High Density Recreation lands from 3,185.2 acres to 637.2 acres will limit future intensive development, further reducing the potential vegetation removal, increased erosion, and general disturbances that could impact wetland area and quality. The Selected Alternative would provide negligible, long-term beneficial impacts to wetlands.

4.4.3.3 Alternative 3 — Limited Development

Similar to the Selected Alternative, land reclassification proposed under the Limited Development Alternative would have a potential for negligible, long-term beneficial impacts to wetlands. Under this alternative, Environmentally Sensitive Areas acreage totals 928.7 acres, compared to 429.4 acres in the No Action Alternative. The Environmentally Sensitive Areas classification would protect wetlands from adverse impacts such as erosion, land development, and sedimentation. The net reduction of High Density Recreation lands from 3,185.2 acres to 217.3 acres will limit future intensive development, thus reducing the potential for erosion and sedimentation. Though land development would be further restricted in Alternative 3 compared to Alternative 2 with 97% of available land acreage classified as Environmentally Sensitive or Wildlife Management, this alternative would also have negligible, long-term, beneficial impacts to wetlands.

4.4.4 Fish Species and Habitat

4.4.4.1 Alternative 1 — No Action

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions; therefore, no significant short- or long-term impacts to fish species and their habitat would be anticipated as a result of implementing the No Action Alternative.

4.4.4.2 Alternative 2 — Selected

Under the Selected Alternative, the proposed net increase of Environmentally Sensitive Areas by 495.8 acres may cause negligible, long-term beneficial impacts to fish species and habitat within

these areas. The Environmentally Sensitive Area classification provides the highest form of protection for fish species as it decreases the potential for soil erosion and sedimentation by retaining natural vegetative communities which act as buffers to trap runoff and filter water, thus improving water quality and available habitat for fish species. Additionally, protected vegetation could potentially contribute to reduced localized ambient air and water temperatures, benefitting fish habitat. In the Selected Alternative, Wildlife Management totals 16,301.7 acres, compared to 3,684.1 in the No Action Alternative, and this classification acreage increase would result in positive impacts to fisheries for those reasons listed above.

The Selected Alternative would allow project lands to continue supporting the USFWS missions associated with fish and wildlife conservation, such as drawdowns for fish habitat planting, and implementation of operational practices that would protect and enhance fishery populations and habitat.

4.4.4.3 Alternative 3 — Limited Development

Similar to the Selected Alternative, land reclassification proposed as a part of the Limited Development Alternative would have a potential for minor, long-term beneficial impact on fish species and habitat. Under this alternative, Wildlife Management lands total 20,207 acres, compared to 3,684.1 in the No Action Alternative. Environmentally Sensitive Areas total 928.7 acres, compared to 429.4 acres in the No Action Alternative. This increase in Wildlife Management and Environmentally Sensitive classifications would help to decrease soil erosion and sedimentation by retaining natural vegetative communities, which act as buffers to trap runoff and filter water, thus improving water quality and available habitat for fish species. Additionally, protected vegetation could potentially contribute to reduced air and water temperatures by providing shade, benefitting fish habitat. The net reduction of High Density Recreation lands from 3,185.2 acres to 217.3 acres will limit future intensive development, thus reducing the potential impacts of soil erosion and subsequent sedimentation. Though land development would be further restricted in Alternative 3 compared to Alternative 2, this alternative would also have minor, long-term, beneficial impacts to fish species and habitat.

4.5 Terrestrial Resources

4.5.1 Wildlife

4.5.1.1 Alternative 1 — No Action

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions; therefore, no significant short- or long-term impacts to wildlife would be anticipated as a result of implementing the No Action Alternative.

4.5.1.2 Alternative 2 — Selected

Under the Selected Alternative, the proposed net increase in Environmentally Sensitive Areas by 495.8 acres would cause minor, long-term beneficial impacts to wildlife within these areas. The Environmentally Sensitive Areas classification provides the highest form of protection for wildlife by limiting most all anthropogenic disturbances, such as habitat fragmentation resulting from land development. Wildlife Management lands total 16,301.7 acres, compared to 3,684.1 in the No Action Alternative. This would result in 75% of available acreage classified as Wildlife Management lands, under which land management practices could be used to combat invasive species, implement beneficial prescribed burning, create food plots, and otherwise promote habitat for local wildlife and migratory birds. While Low Density Recreation acreage represents 17% of

total land area in this alternative, the majority of the recreation activities under this alternative do not involve the creation and upkeep of infrastructure, such as hunting activities and primitive camping.

The Selected Alternative would allow project lands to continue supporting federal and state missions associated with wildlife conservation and implementation of operational practices that would protect and enhance wildlife populations and habitat. In addition, the Selected Alternative would be compatible with conservation principles and measures to protect migratory birds as mandated by EO 13186.

4.5.1.3 Alternative 3 — Limited Development

Land reclassification proposed as a part of the Limited Development Alternative would have a potential for minor, long-term beneficial impact on wildlife. The Environmentally Sensitive Areas classification totals 928.7 acres under Alternative 3, compared to 429.4 acres in the No Action Alternative. The Environmentally Sensitive Areas classification provides the highest form of protection for natural resources by preventing adverse disturbances that harm wildlife, such as habitat fragmentation. Wildlife Management lands total 20,201.2 acres, compared to 3,684.1 in the No Action Alternative. This would result in 93% of available acreage classified as Wildlife Management lands, under which land management practices could be used to combat invasive species, implement beneficial prescribed burning, create food plots, and otherwise promote habitat for local wildlife and migratory birds. While Wildlife Management Areas acreage represented in this alternative is greater than that of the Selected Alternative, the Limited Development Alternative would also have minor, long-term, beneficial impacts to fish species and habitat.

The Limited Development Alternative would allow project lands to continue supporting the USFWS missions associated with wildlife conservation and implementation of operational practices that would protect and enhance wildlife populations and habitat. In addition, this alternative would be compatible with conservation principles and measures to protect migratory birds as mandated by EO 13186.

4.5.2 Vegetation

4.5.2.1 Alternative 1 — No Action

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions; therefore, no significant short- or long-term impacts to vegetation resources in the project area would be anticipated as a result of implementing the No Action Alternative.

4.5.2.2 Alternative 2 — Selected

The proposed net increase of Environmentally Sensitive Areas by 495.8 acres would cause minor, long-term beneficial impacts to vegetation within these areas. The Environmentally Sensitive Areas classification protects vegetation from various adverse impacts such as removal for the land development. The net reduction of High Density Recreation lands from 3,185.2 acres to 637.2 acres will limit future intensive development, thus retaining natural vegetation communities which act as buffers to trap runoff. Additionally, the increase in Wildlife Management acreage will allow Project Staff to continue forest management activities including timber harvesting and prescribed burning as well as invasive species removal efforts, all of which promote healthy regeneration and biodiversity. The Selected Alternative would provide minor, long-term beneficial impacts to vegetation.

4.5.2.3 Alternative 3 — Limited Development

Similar to the Selected Alternative, land reclassification proposed as a part of the Limited Development Alternative would have a potential for minor, long-term beneficial impact on vegetation. Environmentally Sensitive Areas totals 928.7 acres, compared to 429.4 acres in the No Action Alternative. The Environmentally Sensitive Areas classification protects vegetation from various adverse impacts such as removal for the land development. In this alternative, Wildlife Management lands total 20,201.2 acres, compared to 3,684.1 in the No Action Alternative. This increase in Wildlife Management acreage will allow Project Staff to continue forest management activities including timber harvesting and prescribed burning as well as invasive species removal efforts, all of which promote healthy regeneration and biodiversity. Though land development would be further restricted and Wildlife Management Area acreage further increased in Alternative 3 compared to Alternative 2, this alternative would also have minor, long-term beneficial impacts to vegetation.

4.6 Threatened and Endangered Species

4.6.1 Alternative 1 — No Action

The No Action Alternative does not involve any activities that would adversely impact threatened or endangered species or critical habitat protected under the Endangered Species Act. USACE has determined that the No Action Alternative will have No Effect on the Indiana Bat, Northern Long-eared Bat, Tricolored Bat, Eastern Black Rail, Piping Plover, Red Knot, Red-cockaded Woodpecker, Alligator Snapping Turtle, American Burying Beetle, Monarch Butterfly, or Harperella.

4.6.2 Alternative 2 — Selected

Under the Selected Alternative, USACE would continue to manage federally owned lands to preserve, enhance, and protect wildlife habitat resources. To further management opportunities and beneficially impact habitat diversity, the reclassifications proposed in the Selected Alternative include 925.2 total acres designated as Environmentally Sensitive land, which is protected from future development and ground disturbing activities, and 16,301.7 total acres designated as Wildlife Management land, under which land management activities that would enhance wildlife habitat are conducted. Because the Selected Alternative does not entail any ground disturbing activities that could in any way disturb species, USACE has determined that the Selected Alternative will have No Effect on the Indiana Bat, Northern Long-eared Bat, Tricolored Bat, Eastern Black Rail, Piping Plover, Red Knot, Red-cockaded Woodpecker, Alligator Snapping Turtle, American Burying Beetle, Monarch Butterfly, or Harperella.

4.6.3 Alternative 3 — Limited Development

Under the Limited Development Alternative, the USACE would continue to manage federally owned lands to preserve, enhance, and protect wildlife habitat resources. To further management opportunities and beneficially impact habitat diversity, the reclassifications under the Limited Development Alternative include 928.7 total acres as Environmentally Sensitive Areas, which recognize those areas having the highest ecological value and ensures they are given the highest order of protection among possible land classifications. Under the Environmentally Sensitive classification, threatened or endangered species, and state-listed plant and animal species found in these areas, will benefit from the prevention of ground disturbing activities. The 20,201.2 acres of Wildlife Management lands, under which programs such as planting food plots to enhance wildlife habitat are conducted, will further benefit threatened and endangered species. Because the Limited Development Alternative does not entail any ground disturbing activities that could in any way

disturb species, USACE has determined that the Alternative 3 will have No Effect on the Indiana Bat, Northern Long-eared Bat, Tricolored Bat, Eastern Black Rail, Piping Plover, Red Knot, Red-cockaded Woodpecker, Alligator Snapping Turtle, American Burying Beetle, Monarch Butterfly, or Harperella.

4.7 Invasive Species

4.7.1 Alternative 1 — No Action

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions, so Nimrod Lake would continue to be managed according to the existing invasive species management practices. There would be no significant short- or long-term impacts to invasive species as a result of implementing the No Action Alternative.

4.7.2 Alternative 2 — Selected

The land reclassifications, resource objectives, and resource plan required to revise the Nimrod Lake Master Plan are compatible with the lake's invasive species management practices. The 16,301.7 acres classified as Wildlife Management may result in long-term benefits to native species as these areas are subjected to invasive species management measures, including prescribed burning and mechanical or chemical treatment. Environmentally Sensitive Areas may also be subjected to invasive species management measures. The objectives developed under the Selected Alternative as explained in detail in Chapter 3 of the revised Master Plan will result in minor, long-term beneficial impacts by reducing and preventing the spread of invasive species. The primary objective as related to invasive species include optimizing resources, labor, funds, and partnerships for the management and prevention of invasive species in and around Nimrod Lake. All of these would include a public outreach and education emphasis. Under the Selected Alternative, there would be long-term, minor beneficial impacts to invasive species management to prevent or control the spread non-native of microbe, fungi, plant, or animal species.

4.7.3 Alternative 3 — Limited Development

The land reclassifications, resource objectives, and resource plan required to revise the Nimrod Lake Master Plan are compatible with the lake's invasive species management practices. The addition of 499.3 acres to the Environmentally Sensitive classification and 16,522.9 acres to Wildlife Management may provide long-term benefits as these areas may receive additional invasive species management measures. These measures include both mechanical and chemical treatment, as well as prescribed burns at Wildlife Management Areas, to prevent or control the spread of microbe, fungi, plant, or animal species as needed. The objectives developed under the Limited Development Alternative as explained in detail in Chapter 3 of the revised Master Plan will result in minor, long-term beneficial impacts by reducing and preventing the spread of invasive species. The primary objective as related to invasive species include optimizing resources, labor, funds, and partnerships for the management and prevention of invasive species in and around Nimrod Lake. All of these would include a public outreach and education emphasis. Because invasive species control measures may be prescribed across any land classification category, Alternative 3 will result in minor, long-term beneficial impacts to invasive species similar to Alternative 2.

4.8 Cultural, Archaeological, and Historic Resources

4.8.1 Alternative 1 — No Action

There would be no major adverse impacts on cultural, archaeological, or historic resources as a

result of implementing the No Action Alternative, as there would be no changes to the existing 1975 Master Plan. However, maintaining existing land classifications would not recognize the presence or importance of cultural resources, which could lead to long-term negative moderate or major impacts as a result of implementing the No Action Alternative.

4.8.2 Alternative 2 — Selected

Impacts on cultural, historical, and archaeological resources were considered during the refinement processes of land reclassifications under the Selected Alternative. Land reclassifications would not change current cultural resource management plans or alter areas where these resources exist. The Selected Alternative would potentially result in long-term, moderate beneficial impacts to the 495.8 acres reclassified as Environmentally Sensitive as those lands afford more protection against development and ground disturbing activities. All individual USACE undertakings at Nimrod Lake are subject to compliance with Section 106 of the NHPA. In addition, stewardship priorities and goals as noted in the revised Master Plan (and required under Section 110 of the NHPA as well as other laws and regulations) emphasize the need to continue inventorying and protecting cultural resources on the project and prevent unauthorized or illegal looting. No significant adverse impacts to cultural, historical, or archaeological resources would occur as a result of implementing the Selected Alternative.

4.8.3 Alternative 3 — Limited Development

Impacts on cultural, historical, and archaeological resources were considered during the refinement processes of land reclassifications under the Limited Development Alternative. Under this alternative, land reclassifications would not change current cultural resource management plans or alter areas where these resources exist. The Limited Development Alternative would potentially result in long-term, moderate beneficial impacts to the 499.3 acres reclassified as Environmentally Sensitive as those lands afford more protection against development and ground disturbing activities. All individual USACE undertakings at Nimrod Lake are subject to compliance with Section 106 of the NHPA. In addition, stewardship priorities and goals as noted in the revised Master Plan (and required under Section 110 of the NHPA as well as other laws and regulations) emphasize the need to continue inventorying and protecting cultural resources on the project and prevent unauthorized or illegal looting. No significant adverse impacts to cultural, historical, or archaeological resources would occur as a result of implementing the Limited Development Alternative.

4.9 Air Quality

4.9.1 Alternative 1 — No Action

Under the No Action Alternative, no significant short- or long-term impacts to air quality would result as there would be no change to the existing 1975 Master Plan.

4.9.2 Alternative 2 — Selected

Existing operation and management of Nimrod Lake is compliant with the Clean Air Act and would not change with implementation of the Selected Alternative. Land reclassifications proposed as part of the Selected Alternative would have a potential for negligible, long-term beneficial impacts on air quality. The net reduction of High Density Recreation lands from 3,185.2 acres to 637.2 acres will limit future intensive development, thus reducing the potential for increased vehicular traffic, boat traffic, construction equipment usage, and mower exhaust emissions at these areas. Because Alternative 2 does not entail ground disturbance or construction activities resulting in greenhouse gas emissions, and the project is not located in a designated non-

attainment or maintenance areas where air quality is impaired, a General Air Conformity Analysis and Determination is not required. The Selected Alternative would provide long-term, negligible benefits to air quality.

4.9.3 Alternative 3 — Limited Development

Existing operation and management of Nimrod Lake is compliant with the Clean Air Act and would not change with implementation of the 2024 Master Plan. Land reclassifications proposed as part of the Limited Development Alternative would have a potential for negligible, long-term beneficial impacts on air quality. The net reduction of High Density Recreation lands from 3,185.2 acres to 217.3 acres will limit future intensive development, thus reducing the potential for potential vehicular traffic, boat traffic, construction equipment usage, and mower exhaust emissions on these lands. Because the proposed Master Plan revision does not entail ground disturbance or construction activities resulting in greenhouse gas emissions, and the project is not located in a designated non-attainment or maintenance area where air quality is impaired, a General Air Conformity Analysis and Determination is not required. The Limited Development Alternative would provide long-term, negligible benefits to air quality.

4.10 Socio-Economic Resources and Environmental Justice

4.10.1 Alternative 1 — No Action

Under the No Action Alternative, there would be no changes to the existing Master Plan, with the USACE continuing to manage Nimrod Lake natural resources as set forth in the 1975 Master Plan. There would be no significant short- or long-term impacts on socio-economic resources. Beneficial socioeconomic impacts existing as a result of the implementation of the 1975 Master Plan would continue, as visitors would continue to visit the lake from surrounding areas. In addition to camping in campgrounds, many visitors purchase goods such as groceries, fuel, and camping supplies semi-locally, eat in semi-local restaurants, stay in semi-local hotels and resorts, and shop in local retail establishments. These activities would continue to bring revenues to local companies, provide jobs for semi-local residents, and generate local and state tax revenues. Any changes to socio-economic conditions in the Nimrod Lake area would be the result of outside influences and unrelated to those created by the No Action Alternative. There would be no disproportionately high or adverse impacts on minority or low-income populations or children with the implementation of the No Action Alternative (CEQ, 2023).

4.10.2 Alternative 2 — Selected

Nimrod Lake is negligibly beneficial to the semi-local economy through local spending by visitors, and also offers a variety of recreation opportunities. The 637.2 acres of High Density Recreation and 3,667.8 acres of Low Density Recreation will continue to provide recreation opportunities and provides a means to potentially reopen County Line Park, as desired by the public. Forest management efforts will continue on lands classified for Wildlife Management, and timber sales will continue to contribute to the regional economy. Under this alternative, socio-economic conditions such as demographic makeup, income, and housing units are not expected to be affected. Since recreational opportunities remain abundant, and the Selected Alternative recognizes and reinforces projected recreational trends, there would be negligible, long-term beneficial impacts to area socio-economic resources as a result. The Selected Alternative would not result in any disproportionate adverse impacts to economically disadvantaged individuals or communities, and instead would allow Nimrod Lake staff to more effectively manage public lands for the enjoyment of future generations.

4.10.3 Alternative 3 — Limited Development

Nimrod Lake is negligibly beneficial to the semi-local economy through local spending by visitors, and also offers a variety of recreation opportunities. The Limited Development alternative would maintain the present-day availability of public lands for recreation activities, although the reduction of High Density lands to 217.3 acres and Low Density lands to 184.7 acres could indirectly decrease local spending by visitors in the future as park development is more limited. Forest management efforts will continue on lands classified for Wildlife Management, and timber sales will continue to contribute to the regional economy. Under this alternative, socio-economic conditions such as demographic makeup, income, and housing units are not expected to be affected. While Alternative 3 limits the future development and enhancement of parks for the public, including those communities and individuals considered economically disadvantaged, to enjoy, this alternative does not recognize public preference to reopen previously closed parks or provide additional recreation opportunities. Under Alternative 3, there may be negligible, long-term adverse impacts to area socio-economic resources resulting as it limits the future development of project lands for some recreational uses desired by its patrons, thereby limiting user capacity. The Selected Alternative would not result in any disproportionate adverse impacts to economically disadvantaged individuals or communities, and instead would focus on preserving and enhancing environmental stewardship while still offering existing recreation opportunities.

4.11 Recreation Resources

4.11.1 Alternative 1 — No Action

Under the No Action Alternative, there would be no significant short- or long-term impacts on recreational resources, as there would be no changes to the existing Master Plan.

4.11.2 Alternative 2 — Selected

The primary objective for revising the 1975 Nimrod Lake Master Plan is to capture current land use and management that has evolved to meet day-to-day operational needs. Under the Selected Alternative, the required revisions to the Nimrod Lake Master Plan would be compatible with current recreation management plans while recognizing regional outdoor recreation trends and local preferences. The 637.2 acres of High Density Recreation and 3,667.8 acres of Low Density Recreation will continue to provide existing recreation opportunities, including camping, day-use, and swim beaches. Under these classifications, the opportunity exists to reopen the previously closed County Line Park and construct a roughly 13-mile bike trail. Wildlife Management areas converted to Low Density Recreation better reflect the existing wildlife and recreation programs offered at the Lloyd Millwood Green Tree Reservoir. The 16,301.7 total acres of Wildlife Management lands will allow for numerous recreation activities such as hunting. The 925.2 acres of Environmentally Sensitive lands will also allow minimally invasive recreation activities such as wildlife viewing and hiking. Since recreational opportunities remain abundant, and the revised Master Plan balances recreation and environmental stewardship objectives in line with projected recreational trends, there would be minor, long-term beneficial impacts on recreation resulting from the revision of the Master Plan from the Selected Action.

4.11.3 Alternative 3 — Limited Development

The primary objective of revising the 1975 Nimrod Lake Master Plan is to capture current land use and management that has evolved to meet day-to-day operational needs. Under the Limited Development Alternative, the required revisions to the Nimrod Lake Master Plan would be not compatible with current recreation management plans, recognize regional recreation trends, or represent public desire for development. Although it maintains the present-day availability of

public lands for recreation activities, the reduction of High Density lands to 217.3 acres and Low Density lands to 184.7 acres would not take into consideration the public desire for the improvement of existing recreation infrastructure, reopening of the previously closed County Line Park, availability of primitive camping, and construction of new hike and bike trails as expressed during the scoping period. Although it minimizes potential for development, land-based recreational opportunities such as hunting, hiking, and bird watching would still be available under the 20,201.2 acres classified as Wildlife Management. The 928.7 acres of Environmentally Sensitive Areas will also allow minimally invasive recreation activities such as wildlife viewing and hiking. Despite recreational opportunities provided through an increase in Wildlife Management and Environmentally Sensitive Areas, Alternative 3 may have long-term, negligible adverse impacts to recreation resources as it prioritizes environmental preservation over recreation purposes, limiting potential increased and/or improved public use opportunities and overlooking input from the public provided during scoping.

4.12 Health & Safety

4.12.1 Alternative 1 — No Action

Under the No Action Alternative, the 1975 Master Plan would not be revised. No significant short- or long-term impacts on human health or safety would be anticipated because no action will be taken.

4.12.2 Alternative 2 — Selected

Under the Selected Alternative, the required revisions to the 1975 Nimrod Lake Master Plan would be compatible with project safety management plans. The project would continue to have reporting guidelines in place should water quality become a threat to public health. Existing regulations and safety programs throughout the Nimrod Lake area would continue to be enforced to ensure public safety. Therefore, the implementation of the Selected Alternative would have no effect on public health and safety.

4.12.3 Alternative 3 — Limited Development

Under the Limited Development Alternative, the required revisions to the 1975 Nimrod Lake Master Plan would be compatible with project safety management plans. The project would continue to have reporting guidelines in place should water quality become a threat to public health. Existing regulations and safety programs throughout the Nimrod Lake area would continue to be enforced to ensure public safety. Therefore, there would be no effect on public health and safety as a result of implementing the Limited Development Alternative.

4.13 Aesthetics

4.13.1 Alternative 1 — No Action

There would be no significant short- or long-term impacts on visual resources as a result of implementing the No Action Alternative, as there would be no change to the existing 1975 Master Plan.

4.13.2 Alternative 2 — Selected

The wide panorama of Nimrod Lake and the scenic beauty conveys a sense of tranquility to the lake visitors. The conversion of 2,454.7 acres of High Density lands and 12.2 acres of unallocated lands to Environmentally Sensitive and Wildlife Management acreage would continue to preserve the aesthetic value of the lake while reflecting changes in land management and land uses that have

occurred since 1975 at Nimrod Lake. Because no construction or development would occur as part of the Selected Alternative, conversion of these lands would have no significant adverse impacts on current or projected public use or visual aesthetics. Furthermore, the addition of 495.8 acres of land classified as Environmentally Sensitive Areas would protect lands that are aesthetically pleasing at Nimrod Lake and limit future development.

Lake Natural Resources Management Objectives will continue to minimize activities which will disturb the scenic beauty and aesthetics of the lake. By balancing environmental stewardship and recreation priorities, the protection and improvement of natural, native vegetation would enhance the viewscapes enjoyed by those recreating at the lake. Under the Selected Alternative, impacts to visual aesthetics would be long-term, negligible, and beneficial.

4.13.3 Alternative 3 — Limited Development

Similar to the Selected Alternative, the Limited Development Alternative would have long-term, negligible benefits to aesthetic resources. The conversion of 2,757.2 acres of High Density lands and 12.2 acres of unallocated lands to Environmentally Sensitive and Wildlife Management acreage would continue to preserve the aesthetic value of the lake. The addition of 928.7 acres of land classified as Environmentally Sensitive Areas would protect lands that are visually pleasing at Nimrod Lake and limit future development.

Lake Natural Resources Management Objectives will continue to prioritize minimizing activities which will disturb scenic beauty and aesthetics. However, by decreasing High and Low Density Recreation classifications and restricting the ability for further development, annual wear and deterioration of lands and existing facilities may result as the increased demand for recreation opportunities continues to increase. Additionally, opportunities for the public to enjoy lake viewscapes would be more limited as the primitive camping areas within lands reclassified as Wildlife Management would no longer be authorized. While Alternative 3 prioritizes environmental preservation, it may result in long-term, negligible adverse impacts to aesthetics by overlooking the recreation needs at Nimrod Lake.

4.14 Hazardous, Toxic, and Radioactive Waste

The location on the north side of the lake that was historically used as “sanitary landfill” will not be affected by 2024 Nimrod Lake Master Plan revision. Additionally, the Superfund sites located near the project are outside of the project boundaries and therefore will not be affected. Therefore, the No Action Alternative, Selected Alternative, and Limited Development Alternative are all expected to have no effect on hazardous, toxic, and radioactive waste. If implemented, the existing land classifications under the No Action and proposed reclassifications under the two action alternatives would not significantly impact any existing or external sources of pollution.

4.15 Summary of Environmental Consequences

The following table summarizes the impacts of the three alternatives evaluated on each resource category (Table 4-1).

Table 4-1. Resources Likely Affected by the Implementation of Each Alternative

Resource	Environmental Consequences		
	No Action Alternative	Selected Alternative	Limited Development Alternative
Land Use	No Impact	No Impact; Reflective of existing land uses	No Impact; Largely reflective of existing land uses
Climate and Climate Change	No Impact	No Impact; Promotes land management practices and design standards that promote sustainability	No Impact; Promotes land management practices and design standards that promote sustainability
Topography, Geology, Soils, Prime Farmland, Mineral Resources	No Impact	Long-term, minor beneficial impacts resulting from restricting future development opportunities and decrease erosion potential; No impact to Prime Farmland or mineral resources; Encourages good stewardship that would reduce existing and potential erosion	Long-term, minor beneficial impacts resulting from restricting future development opportunities and decrease erosion potential; No impact to Prime Farmland or mineral resources; Encourages good stewardship that would reduce existing and potential erosion
Hydrology and Groundwater	No Impact	Long-term, negligible benefits from retaining pervious surfaces and encouraging groundwater filtration and retention	Long-term, negligible benefits from retaining pervious surfaces and encouraging groundwater filtration and retention
Water Quality	No Impact	Long-term, negligible benefits from retaining pervious surfaces and decreasing potential stormwater runoff	Long-term, negligible benefits from retaining pervious surfaces and decreasing potential stormwater runoff
Wetlands	No Impact	Long-term, negligible benefits from protection under Environmentally Sensitive classification and potential water quality improvements; Promotes restoration and protection of the lake's wetlands and good land stewardship	Long-term, negligible benefits from protection under Environmentally Sensitive classification and potential water quality improvements; Promotes restoration and protection of the lake's wetlands and good land stewardship
Fish Species and Habitat	No Impact	Long-term, negligible benefits to fisheries through preservation of aquatic and shoreline vegetation; Gives full recognition of sensitive resources and regional trends and priorities related to natural resources	Long-term, negligible benefits to fisheries through preservation of aquatic and shoreline vegetation; Gives full recognition of sensitive resources and regional trends and priorities related to natural resources
Wildlife	No Impact	Long-term, minor benefits through increased protection and availability of programs for wildlife species; Gives full recognition of sensitive resources and regional trends and priorities related to natural resources	Long-term, minor benefits through increased protection and availability of programs for wildlife species; Gives full recognition of sensitive resources and regional trends and priorities related to natural resources.

Resource	Environmental Consequences		
	No Action Alternative	Selected Alternative	Limited Development Alternative
Vegetation	No Impact	Minor, long-term benefits from increased protections and invasive management strategies; No impact to existing timber management practices	Gives full recognition of sensitive resources and priorities related to natural resources; No impact to existing timber management practices
Threatened & Endangered Species	No Effect	No Effect; Fully recognizes federal and state-listed species	No Effect; Fully recognizes federal and state-listed species
Invasive Species	No Impact	Long-term, minor beneficial impacts from invasive management practices and objectives outlined in revised Master Plan	Long-term, minor beneficial impacts from invasive management practices and objectives outlined in revised Master Plan
Cultural, Historical and Archaeological Resources	Potential to Effect Historic Resources	Potential to Effect Historic Resources	Potential to Effect Historic Resources
Socioeconomics and Environmental Justice	No Impact	Long-term, negligible benefits to local economy if park improvements are made; No adverse impacts to economically disadvantaged communities	Long-term, negligible benefits to local economy if park improvements are made; No adverse impacts to economically disadvantaged communities
Recreation	No Impact; Fails to recognize current outdoor recreation trends	Long-term, minor benefits; Fully recognizes current outdoor recreation trends and provides opportunity for future development of parks	Long-term, negligible adverse impacts; Fails to recognize current outdoor recreation trends and public desires, and limits opportunity for future development of parks
Air Quality	No Impact	Long-term, negligible benefits; Promotes activities and goals that will help to reduce emissions	Long-term, negligible benefits; Promotes activities and goals that will help to reduce emissions
Health and Safety	No Impact; Fails to emphasize public safety programs.	No Impact; Recognizes the need for public safety programs.	No Impact; Recognizes the need for public safety programs.
Aesthetic Resources	No Impact; Fails to minimize activities that disturb the scenic beauty and aesthetics of the lake.	Long-term, negligible benefits; Promotes activities that limit disturbance to the scenic beauty and aesthetics of the lake.	Long-term, negligible benefits; Promotes activities that limit disturbance to the scenic beauty and aesthetics of the lake.
Hazardous, Toxic, & Radioactive Waste	No Impact	No Impact to historical “sanitary landfill” and Superfund sites outside of project boundaries	No Impact to historical “sanitary landfill” and Superfund sites outside of project boundaries

5 CUMULATIVE IMPACTS

NEPA regulations updated May 20, 2023, require that cumulative impacts of a proposed action be assessed and disclosed in an EA. CEQ regulations define a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). Cumulative impacts can be positive or negative. CEQ recommends narrowing the focus of cumulative impacts analyses to important issues of local, regional, or national significance.

For each resource topic, the timeframe for analysis of cumulative impacts is the time since the 1975 Master Plan was implemented (past) and through the anticipated life of the proposed 2024 Master Plan (25 years, to 2049). The zone of interest for all resources is Perry and Logan counties, and the ZOI for socioeconomics is that which was used in Sections 3.11 and 4.10.

5.1 Past Impacts Within the Zone of Influence

Nimrod Lake was originally authorized for construction in 1938 as a multi-purpose reservoir for flood control, followed by subsequent authorizations for recreation, water supply, and hydroelectric power. Construction of the Nimrod Dam began in April 1940 and was completed in March 1942. The total project area at Nimrod Lake encompasses approximately 25,278 acres, including about 3,236 acres of surface water at conservation pool. The Master Plan for Nimrod Lake was last approved in 1975, followed by multiple supplements over the last 50 years.

5.2 Current and Reasonably Foreseeable Projects Within and Near the Zone of Influence

Current recreation and fish and wildlife management practices at Nimrod Lake are expected to continue into the future. The populations for Perry and Yell Counties are estimated to increase slightly by 2050. Similar population trends are expected within the majority of the surrounding counties included in the ZOI, and the State of Arkansas as a whole is expected to experience population growth.

The State of Arkansas is currently revising their Arkansas Water Plan, the state's policy for long-term water management. This revision is intended to utilize data, science, and public input to inform water demands, water supplies, issues, and solutions to meet future water needs (ADA 2024). While the Arkansas Water Plan implicates water resources at Nimrod Lake, the revision is not expected to impact existing flood risk management at the project.

National USACE policy set forth in ER 1130-2-550, Appendix H, states that USACE lands will, in most cases, only be made available for roads that are regional arterials or freeways (as defined in ER 1130-2-550). All other types of proposed roads, including driveways and alleys, are generally not permitted on USACE lands. The proposed expansion or widening of existing roadways on USACE lands will be considered on a case-by-case basis.

5.3 Analysis of Cumulative Impacts

Impacts on each resource were analyzed according to how other actions and projects within the ZOI might be affected by the No Action Alternative, Selected Alternative, and Limited Development Alternative. Impacts can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. For the purpose of this analysis the intensity of impacts will be classified as negligible, minor, moderate, or major. These intensity thresholds were previously defined in Section 4.0. Minimal growth and development are expected in the vicinity of Nimrod Lake, and cumulative adverse impacts on resources will not be expected when added to the impacts of activities associated with any of the alternatives. A summary of the anticipated cumulative impacts on each resource is presented below. The topics of Socioeconomics and Environmental Justice as well as Hazardous, Toxic, and Radioactive Waste have been excluded from further cumulative analysis as they will not result in any direct or indirect impacts and therefore would not contribute to cumulative impacts, and/or the nature of the resource is such that impacts do not have the potential to cumulate.

5.3.1 Land Use

Land use at the Nimrod Lake project and surrounding areas has remained largely the same since the dam's construction. Under the No Action Alternative, no impacts to land use are expected. While the Selected Alternative and Limited Development Alternative will result in the reclassification of project lands, the reclassifications were developed to help fulfill regional goals associated with good stewardship of land resources that will allow for continued use of project lands, and these reclassifications largely reflect existing land use practices. Cumulative impacts on land use within the area surrounding Nimrod Lake, when combined with past and proposed actions in the region, are anticipated to be negligible.

5.3.2 Climate, Climate Change, Greenhouse Gases, and Air Quality

No projects are known to be proposed within the ZOI that would significantly contribute to stationary nor non-stationary air pollution. Neither the Selected Alternative nor the Limited Development Alternative would adversely impact air quality, contribute adversely to climate change, or otherwise adversely impact ambient air conditions. Vehicle traffic along the park and area roadways and routine daily activities at the project and in nearby communities contribute to current and future emission sources; however, the impacts associated with the reclassification of lands at Nimrod Lake under both the Selected Alternative and the Limited Development Alternative would be negligible. Seasonal prescribed burning could occur on project lands or surrounding forested areas to further ecological health, but would have minor, negative impacts on air quality through elevated ground-level O_3 and PM concentrations; however, these seasonal burns will be scheduled so that impacts are minimized. Implementation of the revised Master Plan, when combined with other existing and proposed projects in the region, could result in both minor adverse and beneficial cumulative impacts on climate, climate change, greenhouse gas emissions, and air quality.

5.3.3 Topography, Geology, Soils, and Prime Farmland

Substantial impacts could occur if a proposed future action exacerbates or promotes long-term erosion, if the soils are inappropriate for the proposed construction and would create a risk to life or property, or if there would be a substantial reduction in agricultural production or loss of Prime Farmland soils. Cumulative impacts on topography, geology, soils, and Prime Farmland at and

around Nimrod Lake, when combined with past and proposed actions in the region, are anticipated to be negligible.

5.3.4 Aquatic Resources

Major impacts to water resources would occur if external actions were inconsistent with adopted surface water classifications or water use plans, or if an action would substantially alter those resources required for, supporting, or benefitting the current use. The Arkansas Water Plan revision is being conducted to reflect current and anticipated water needs, problems, and solutions, benefitting aquatic resources across the state. Nimrod Lake was developed for flood control, and later on recreation, water supply, and hydroelectric power were authorized as project purposes. Fish and wildlife and general environmental stewardship practices are also an inherent USACE responsibility. The reclassifications and resource objectives required to revise the Nimrod Lake Master Plan are compatible with water use plans and surface water classifications; further, they were developed to help fulfill regional goals associated with good stewardship of water resources that will allow for continued use of water resources associated with Nimrod Lake. Therefore, cumulative impacts on water resources within the area surrounding the project, when combined with past and anticipated future actions in the region, are anticipated to be negligible.

5.3.5 Natural Resources

The significance threshold for natural resources would include a substantial reduction in ecological processes, communities, or populations that would threaten the long-term viability of a species or result in the substantial loss of a sensitive community that could not be offset or otherwise compensated. Past, present, and future projects are not anticipated to impact the viability of any plant species or community, rare or sensitive habitats, or wildlife. The defining of Environmentally Sensitive Areas and Wildlife Management Areas, as well as resource objectives that favor protection and restoration of valuable natural resources, will have beneficial cumulative impacts. No identified projects will threaten the viability of natural resources. Therefore, there will be minor, long-term beneficial impacts to natural resources resulting from the revision of the Master Plan when combined with past and proposed actions in the area.

5.3.6 Cultural, Historical, and Archaeological Resources

Neither the Selected Alternative nor Limited Development Alternative will affect cultural resources or historic properties, as the master plan revision does not involve any ground disturbing activities. However, Environmentally Sensitive and Wildlife Management lands provide additional protection against ground disturbances. Therefore, this action, when combined with other existing and proposed projects in the region, will not result in major cumulative impacts on cultural resources or historic properties.

5.3.7 Recreation

Nimrod Lake provides regionally significant outdoor recreation benefits including a variety of recreation opportunities. Even though the amount of acreage available for High Density Recreation and Low Density Recreation will decrease as a result of implementing the reclassifications, resources objectives, and resource plan in the MP, these changes reflect changes in land management and historic recreation use patterns that have occurred since 1975. The conversion of these lands will have no effect on current or projected public use and are representative of existing and anticipated recreation needs and uses. Therefore, the action alternatives, when combined with other existing and proposed projects in the region, will result in

negligible beneficial cumulative impacts on area recreational resources.

5.3.8 Aesthetic Resources

No impacts on visual resources will occur as a result of implementing the reclassifications, resource objectives, and resource plan in the revised Master Plan. The Selected Alternative and Limited Alternative Development, especially the classification of Environmentally Sensitive and Wildlife Management Areas, in conjugation with other projects in the region, will result in negligible, beneficial cumulative impacts on the visual resources in the Nimrod Lake area.

5.3.9 Health and Safety

No health or safety risks will be created by either action alternative. The effects of implementing the revised Master Plan, when combined with other ongoing and proposed projects in the project area, will not be considered a significant cumulative effect.

6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that federal agencies identify "any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented" (42 U.S.C. 4332). An irreversible commitment of resources occurs when the primary or secondary impacts of an action result in the loss of future options for a resource. Usually, this is when the action affects the use of a nonrenewable resource, or it affects a renewable resource that takes a long time to renew. The impacts of reclassification of land would not be considered an irreversible commitment because subsequent Master Plan revisions could result in some lands being reclassified to a prior, similar land classification. An irretrievable commitment of resources is typically associated with the loss of productivity or use of a natural resource (i.e., loss of production or harvest). No irreversible or irretrievable impacts on federally protected species or their habitat is anticipated from implementing revisions to the 1975 Nimrod Lake Master Plan.

7 ENVIRONMENTAL COMPLIANCE

Compliance with Federal Acts and Executive Orders are summarized in Table 7-1 below.

Table 7-1. Federal Act/Executive Order Compliance

Act/Executive Order	Status	Compliance
Protection of Wetlands (EO 11990)	No effect	C
Farmland Protection Policy Act (FPPA) of 1980 and 1994	No effect	C
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
Migratory Bird Habitat Protection (EO 13186)	No effect	C
Migratory Bird Treaty 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	No effect	C
Rivers and Harbors Act	N/A	N/A
N/A—not applicable; C—Compliant; P—Pending		

7.1 Fish and Wildlife Coordination Act

USACE is required to coordinate with the USFWS and applicable state agencies 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.

7.2 Endangered Species Act

The Endangered Species Act requires the determination of possible effects on species or degradation of habitat critical to Federally listed endangered or threatened species. Implementation of a revised 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.

7.3 Environmental Justice

It is USACE policy and priority to fully comply with all applicable laws and guidance on environmental justice, as well as the USACE policies on environmental justice, by incorporating environmental justice concerns in decision-making processes. In this regard, USACE ensures that it will identify, disclose, and respond to potential adverse social and environmental impacts on minority, low-income, and economically disadvantaged populations within the area affected by a proposed USACE action.

EO 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” tasks Federal Agencies to identify and address disproportionately high and adverse human health and environmental effects of their programs, policies, and activities on minority and low-income populations. Additionally, recent EOs have been executed, along with several new USACE regulations, to promote EJ considerations within Federal projects. These include EO 13985, “Advancing Racial Equity and Support for Underserved Communities Through the Federal Government,” EO 14008, “Tackling the Climate Crisis at Home and Abroad,” and EO 14082, “Implementation of the Energy and Infrastructure Provisions of the Inflation Reduction Act of 2022.”

Impacts to economically disadvantaged and sensitive communities were fully considered during the development of this EA and evaluation of each alternative. The public and resource agencies, as well as the appropriate Federally Recognized Tribes, were invited to participate in a scoping period and will continue to be involved during the draft release comment period. Comments received during scoping were thoroughly considered and integrated into the Master Plan and EA. This EA is fully compliant with all EJ-related laws, regulations, and guidance. It was found that the proportion of minority and low-income populations in the study area were comparable to the respective state averages, and no disproportionate impacts to disadvantaged communities are expected as a result of the implementation of the Selected Alternative. Contrarily, the Selected Alternative proposed in the Master Plan revision is expected to balance recreation with fish and wildlife management objectives, promoting the longevity of public resources for all to enjoy regardless of race, ethnicity, income, or any other discriminating characteristics.

7.4 Cultural Resource Requirements

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, all Federal undertakings within the Nimrod Lake fee boundary are subject to Section 106 review and coordination with the Arkansas State Historic Preservation Officer (SHPO) and appropriate Tribal Nations in accordance with 36 CFR Part 800, regardless of land classification.” 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 effect on cultural resources with implementation of a revised Master Plan. Individual requests for use of project lands would be evaluated on a case-by-case basis to ensure compliance with this act.

8 Scoping and Public Concern

8.1 Introduction

No single agency has complete oversight of stewardship activities on the public lands and waters surrounding Nimrod 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 Nimrod 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, implementing the Nimrod Lake Master Plan with a proactive approach to partnering would position Nimrod 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 USACE and with other affected agencies and organizations is a critical feature required in developing or revising a Project Master Plan. In accordance with NEPA, ER 200-2-2, and ER/EP 1130-2-550, USACE initiated the environmental compliance and review process for the Nimrod Lake Master Plan revision project. The following sections contain brief summaries of each phase of the public involvement and review process for the Nimrod Lake Master Plan revision.

8.2 Scoping

This EA is being prepared to identify potential direct, indirect, and cumulative impacts related to implementation of the Master Plan. The process of determining the scope, focus, and content of a NEPA document is known as “scoping” and this occurs at the initial phases of development of the Master Plan. Scoping is a useful tool to obtain information from the public and governmental agencies in order to help set the parameters of issues to focus on and analyze.

The Nimrod Lake Master Plan was revised concurrently with the Blue Mountain Lake Master Plan. Each revised plan was prepared as an individual, lake-specific document, each with its own accompanying EA; however, public review periods were held concurrently for both projects due to the close proximity of the lakes that likely see public visitation from similar entities. Tribal Nation and resource agency interests also overlap. To streamline the public

involvement process, outreach efforts and public comment opportunities were advertised and occurred simultaneously for both MP revision efforts.

The Blue Mountain Lake and Nimrod Lake Master Plan Revision website, https://www.swl.usace.army.mil/Missions/Planning/Nimrod-Blue-Mountain-Master-Plan/, was created as a primary source of project information. Website information was provided through various sources, such as 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 revise the 1975 Master Plan and to solicit comments for scoping. As part of the initial phase of the environmental process, a public scoping comment period was held between March 16, 2023, and April 30, 2023, to gather agency and public comments on the Master Plan revision process and issues that should be examined as part of the environmental analysis.

In particular, the scoping process was used as an opportunity to solicit input from the public and agencies about the vision for the Master Plan revision and the issues that the Master Plan should address. When people visited the Blue Mountain Lake and Nimrod Lake Master Plan revision website, they were encouraged to provide input by completing a comment form that asked for responses to specific questions in addition to soliciting for general comments about the plan and the environmental review. Between March 16, and April 30, 2023, 518 individuals visited the project website.

USACE published notice of the scoping period through an email blast, direct mail postcards, press releases, and agency notification letters. The postcard notice and email blast were sent to landowners adjacent to USACE-owned lands around both Blue Mountain Lake and Nimrod Lake, holders of fishing permits purchased in Arkansas whose listed zip code is within seven miles of the two lakes, and those who held reservations to camp at the two lakes' campgrounds within the 2022 recreational season. Postcards were sent to those for whom only a postal address was available; all others received the email blast. Agency coordination letters were sent to potentially interested agencies.

Agencies were invited to participate in the scoping process and provide input on the vision for the Nimrod Lake Master Plan on issues that should be addressed through the land classification designations as well as this EA. Notifications were provided by email and, where email addresses were unavailable, by mail to 33 agencies and eight Federally Recognized Tribes (Appendix A) providing notification of the upcoming agency scoping comment period and links to the project website where more information could be found.

Agencies, members of the public, and other interested parties submitted a total of 24 letters, e-mails, and comment cards related to both the Blue Mountain Lake and Nimrod Lake Master Plan revisions during the scoping period, which were thoroughly considered and integrated into the drafting of the Master Plan and this EA.

8.3 Draft Master Plan/Draft Environmental Assessment.

The Draft Master Plan and EA were released to the public on May 8, 2024. Notification of the draft review comment period and public workshop was completed via several forms of media as described in Appendix D of the EA within the Draft Release Comments Report. As part of the draft plans release phase of the environmental process, a 32-day comment period was held from

May 8 to June 8, 2024. During this time, the public, resource agencies, and Tribal Nations had the opportunity to review the draft documents and provide comments.

A public workshop was held on May 21, 2024, in Danville, AR. This workshop gave the public an opportunity to learn about the alternatives and provide input on the Draft Master Plan and Draft EA. A hybrid in-person and online resource agency meeting was also held on May 22, 2024, in Little Rock, AR and over Webex to provide information to agencies, answer questions, and hear feedback.

In total, seven comment submittals from members of the public and three comment submittals from resource agencies were received by the end of the draft release period. A full breakdown of comments and analysis are available in the Draft Release Comments Report, which may be found in Appendix D of this EA.

8.4 Final Master Plan/Final EA

The Final Nimrod Lake Master Plan, EA, and FONSI were completed in September 2024. No public workshops were held for the final master plan release. The Final Nimrod Lake Master Plan, EA, and FONSI were posted on the Nimrod Lake and Blue Mountain Lake Master Plan Revisions website once signed by the District Commander.

9 Conclusions

The Master Plan for Nimrod Lake was last approved in 1975; this was followed by multiple supplements over the last roughly 50 years. During that time, public use patterns have remained similar, but trends, facility and service demands have shifted due to the need for alternative experiences in recreation and tourism. Nimrod Lake receives pressure for 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.

The Master Plan is not intended to address the specifics of regional water quality or water level management; these areas are covered in a project's Water Control Manual. However, specific issues identified through the Master Plan revision process can still be communicated and coordinated with the appropriate internal USACE resource or external resource agency responsible for that specific area. To facilitate this action, the current Master Plan development evaluated three alternatives relative to their potential impacts on both the physical and human resources of Nimrod Lake.

These alternatives ranged from retaining the existing Master Plan in the No Action Alternative, in which recreation development is prioritized and High and Low Density land classifications are at their highest, to prioritizing the conservation and preservation of natural resources in the Limited Development Alternative, in which Environmentally Sensitive and Wildlife Management Area acreages are at their highest. Potential effects on the human, terrestrial, and aquatic environment from the implementation of each of these alternatives was evaluated. The No Action Alternative looked at leaving the lake as it currently exists in terms of developable areas and protected areas. Of the roughly 25,300 acres of available land around the lake, 15% of this is classified as High Density and 66% is classified as Low Density in the No Action Alternative, allowing for potential future development in these areas. While 17% of available acreage is classified as Wildlife Management and 2% is Environmentally Sensitive, 12 acres of land currently have no classification. The No Action Alternative would leave some lands unclassified, and the land classification designations are not reflective of historical, current, and projected recreation and wildlife management objectives.

The action alternatives included Alternative 2, the Selected Alternative, and Alternative 3, the Limited Development Alternative. The Limited Development Alternative (Alternative 3) shifted the majority of the available shoreline acreage toward future protection and/or preservation, with 1% classified as High Density, 1% classified as Low Density, 4% classified as Environmentally Sensitive, and 93% 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 High and Low Density lands as Environmentally Sensitive or Wildlife Management, thereby decreasing 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 in Wildlife Management areas would allow for increased resource management opportunities, including prescribed burning and timber management. While the

Limited Development Alternative maximizes protections and increases management opportunities for natural resources, it does not accurately account for Nimrod Lake's authorized purpose of recreation, nor does it reflect the public desire for improved and increased recreational opportunities.

The Selected Alternative (Alternative 2) includes 3% High Density lands, while Low Density lands decrease from 66% to 17%. Wildlife Management lands increase from 17% of all available acreage in the No Action to 75%, and Environmentally Sensitive areas make up 4% of Project lands. Although acreage increased slightly, the Project Operations classification remains at 1% of available area. The Selected 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. This action would protect and/or preserve vegetation and unique habitats in areas classified as Environmentally Sensitive and reduce stormwater runoff quantity and velocity, resulting in less in-lake sedimentation and turbidity thereby improving water quality and fisheries. The increase in Wildlife Management Area reflects the importance of natural resource management objectives as well as public hunting recreational opportunities. In High and Low Density areas, the opportunity would still exist to reopen, modify, or expand existing or potential future recreation areas. Additionally, the reclassification of the Lloyd Millwood GTR as Low Density Recreation more accurately reflects its existing infrastructure and recreational purposes, much of which is not condoned under the existing Wildlife Management land classification. The Selected Alternative best meets both the recreation and fish and wildlife objectives desired by the public and resource agencies as verbalized in the scoping period, and exemplifies the objectives set by Nimrod Lake Project staff.

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