



**US Army Corps  
of Engineers®**  
Little Rock District

**Draft**  
**Environmental Assessment**

**Little Rock District Shoreline Management  
Plan Revision**  
**Lake Dardanelle, Arkansas**

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**SHORELINE MANAGEMENT PLAN REVISION  
LAKE DARDANELLE, ARKANSAS  
ENVIRONMENTAL ASSESSMENT**

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## List of Acronyms

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ABB	American Burying Beetle
ACQR	Air Quality Control Regions
ADEE	Arkansas Department of Energy and Environment
ADEQ	Arkansas Department of Environmental Quality
AGFC	Arkansas Game and Fish Commission
ANHC	Arkansas Natural Heritage Commission
ARPA	Archeological Resources Protection Act
CAA	Clean Air Act of 1977, as amended
EA	Environmental Assessment
EM	Engineer Manual
EO	Executive Order
EPA	Environmental Protection Agency
ER	Engineer Regulation
ERDC	USACE Engineering Research and Development Center
ESA	Endangered Species Act
ESA	Environmental Sensitive Area
FWCA	Fish and Wildlife Coordination Act
ILT	Interior Least Tern
IPaC	USFWS Information for Planning and Consultation
MKARNS	McClellan-Kerr Arkansas River Navigation System
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NAGPRA	Native American Graves Protection and Repatriation Act
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
SHPO	State Historic Preservation Office
SWL	Southwestern Little Rock District
T&E	Threatened and Endangered
TMDL	Total Daily Maximum Load
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WMA	Wildlife Management Area

1 **1. INTRODUCTION**

2 The Lake Dardanelle Shoreline Management Plan (SMP) is the required U.S. Army Corps of  
3 Engineers approval document (Title 36, Section 327.30 and ER 1130-2-406) that protects and  
4 manages shorelines of U.S. Army Corps of Engineers (USACE) Civil Works water resource  
5 development projects under USACE jurisdiction in a manner that promotes safe and healthful  
6 public use of shorelines while maintaining environmental safeguards. The objectives of  
7 management actions in this SMP are to balance permitted private uses and natural resource  
8 protection for general public use. USACE last updated the Lake Dardanelle SMP in June 2012;  
9 and thus, the document is currently out of date.

10 The Lake Dardanelle SMP, once approved by the Southwestern Division Engineer, will become  
11 an appendix to the Operation Management Plan (OMP) for the lake. The objectives of the SMP  
12 are to:

- 13 • To achieve a balance between permitted private uses and resource protection on project  
14 lands and waters while maintaining the shoreline for general public use.
- 15 • To achieve a balance between permitted private uses and resource protection on project  
16 lands and waters while maintaining the shoreline for general public use.
- 17 • To ensure compatibility between the recreating public, the environment, and project  
18 resources.
- 19 • To manage and conserve project lands and waters in a sustainable manner that will  
20 protect natural resources and environmental quality for future generations.
- 21 • To give special consideration for the protection of threatened and endangered plant and  
22 animal species.
- 23 • To establish a means of conservation, enhancement, protection, and restoration (where  
24 degradation has occurred) of the shoreline and manage recreational and natural resources  
25 in a manner that is responsive to the general public.
- 26 • To manage the project’s shoreline to properly establish, enhance, and maintain acceptable  
27 fish and wildlife habitat, aesthetic quality, and sustain natural environmental conditions.
- 28 • To manage public services and permitted private use through commercial sites, marinas,  
29 and other public use areas.
- 30 • To preserve important historic, cultural, and natural aspects of our heritage.
- 31 • To establish a consistent means of education and communication with the project user.
- 32 • To provide efficient and effective administration of the shoreline use permit program.

33 With the draft SMP update, the USACE is completing this Environmental Assessment (EA) that  
34 evaluates existing conditions and potential impacts of proposed alternatives. This EA is prepared  
35 pursuant to the National Environmental Policy Act (NEPA) (42 U.S. Code [USC] 4321 et seq.),

36 as amended by the Fiscal Responsibility Act, and U.S. Army Corps of Engineers (USACE)  
37 regulations at 33 CFR Part 230: Procedures for Implementing NEPA. The Environmental  
38 Assessment (EA) dated January 2026, evaluated potential impacts to biological and cultural  
39 resources from implementing the 2026 Lake Dardanelle SMP.

## 40 2. PURPOSE AND NEED FOR ACTION

### 41 2.1 Purpose and Need

42 The Shoreline Management Plan for Lake Dardanelle establishes policy and furnishes guidelines  
43 for the protection and conservation of the desirable environmental characteristics of the shoreline  
44 while maintaining a balance between public and private shoreline uses. The plan also considers  
45 means of restoration of the shoreline where degradation has occurred because of private  
46 exclusive use. This plan is intended to develop management strategies for the review, approval,  
47 and administration of private shoreline uses on Lake Dardanelle. It is not intended to evaluate or  
48 develop management measures for application in the review, approval and administration of  
49 public shoreline uses, such as commercial concession leases, limited motel/resort leases, and  
50 public utilities, except as specifically stated herein. The purpose of the Lake Dardanelle SMP  
51 update is to reassess current and long-term needs and trends of shoreline use at the lake and  
52 develop guidelines via shoreline allocations for the long term management of shoreline  
53 resources.

54 The USACE approved the original Lake Dardanelle SMP (also known as the Lakeshore  
55 Management Plan) in July of 1973; and the Little Rock District Division Commander reviewed,  
56 updated and approved the SMP in November of 1975. Engineering Regulation (ER) 1130-2-408  
57 dictates that SMPs be reviewed every five years and revised as necessary. The last review/update  
58 of the SMP was conducted in 2012, thus is due for a review.

59 Updating the 2012 SMP is necessary because:

- 60 • Current technology allows for more accurate representation of shoreline allocations.
- 61 • Current USACE policies/regulations, budget processes, business line performance  
62 measures, and priorities are not reflected.
- 63 • Shoreline Management and private development have resulted in environmental and  
64 management issues.
- 65 • Partners are increasingly concerned with management of lake resources and impacts to  
66 environmental quality.

### 67 2.2 Policy

68 It is the policy of the Chief of Engineers to protect and manage shorelines of all Civil Works  
69 water resource development projects under USACE jurisdiction in a manner which will promote  
70 the safe and healthful use of these shorelines by the public while maintaining environmental  
71 safeguards to ensure a quality resource for use by the public. Authority for administering this  
72 policy is granted under Public Laws 86-717 and 87-874; which charge the Chief of Engineers  
73 with the application of good conservation practices which promote recreation, and with the  
74 operation and maintenance of water resource projects in the public interest.

75 In this document when the title *Operations Project Manager* is used it is intended to include his  
76 or her authorized representatives, except for where specifically excluded.

77 **2.3 Project History**

78 **2.3.1 Lake Dardanelle**

79 Dardanelle Dam is located at Arkansas River navigation mile 205.5 in Pope and Yell Counties,  
80 Arkansas, at the north edge of the city of Dardanelle, Arkansas, and two miles southwest of  
81 Russellville, Arkansas. The lake extends 51 miles westerly along the Arkansas River into Pope,  
82 Yell, Johnson, Logan, and Franklin Counties, Arkansas, to Ozark Lock and Dam. The lake area  
83 is located in the Arkansas River Valley which is bounded on the north by the Boston Mountains  
84 and on the south by the Ouachita Mountains. Numerous clear-water streams enter the Arkansas  
85 River within the lakes' reach. Topography varies from fertile farmland in the upper one half of  
86 the Lake to tree-covered rocky slopes on the lower one half, which includes several clear water  
87 tributary streams.

88 The Dardanelle Dam and Lake was authorized by the River and Harbor Act of 1946 for  
89 navigation and production of hydroelectric power. This act approved the multi-purpose plan  
90 recommended in reports to the Chief of Engineers from 1945 and 1946. Dardanelle is a major  
91 unit in the multiple-purpose plan of development for the Arkansas River and tributaries,  
92 Arkansas and Oklahoma, now named the McClellan-Kerr Arkansas River Navigation System.  
93 Hydroelectric power generation, navigation, recreation, bank stabilization, and enhancement of  
94 fish and wildlife resources are authorized project purposes.

95 Overall construction of the project was initiated in June 1957. The dam was completed in  
96 August 1964, the powerplant was completed in June 1966, and the navigation lock was  
97 completed in December 1969. The reservoir was declared navigable in December 1969. Initial  
98 recreational facilities were constructed during the period from 1964 to 1972.

99 Flowing from west to east across the map (Figure 2-1), the Arkansas River widens to form the  
100 deep blue expanse of Lake Dardanelle, the central feature of this region. Following the river's  
101 path, Interstate 40 serves as the primary artery, connecting the city of Fort Smith in the west to  
102 Russellville and Clarksville, which are situated near the lake's shores. The highway continues  
103 eastward toward Conway and Little Rock. Branching off from this main corridor, a network of  
104 US and State Highways creates a web connecting smaller communities and providing access to  
105 the U.S. Army Corps of Engineers property that borders the lake. Figure 2-1 illustrates a  
106 landscape where a major waterway and a primary interstate work in tandem as a vital corridor for  
107 transportation and settlement in Arkansas.

108 Lake Dardanelle, situated on the Arkansas River in Arkansas, is a large reservoir with a drainage  
109 area of 153,666 square miles (Table 2-1). It serves multiple functions, including power  
110 generation, navigation, recreation, and fish and wildlife conservation. The dam creating the lake  
111 is 2,683 feet long and 85.5 feet high. For power generation, it utilizes four main units, each with  
112 a capacity of 35,000 kilowatts. The lake's surface area fluctuates with its operational levels; for  
113 instance, at its power pool elevation of 338 feet, it covers 34,300 acres, while at the navigation  
114 pool elevation of 336 feet, it covers 31,100 acres.

115 **2.3.2 Shoreline Management**

116 The SMP for Lake Dardanelle is the required U.S. Army Corps of Engineers (USACE) approval  
117 document (ER 1130-2-406) that protects and manages the shorelines of all Civil Works water  
118 resource development projects under USACE jurisdiction in a manner which will promote the

119 safe and healthful use of these shorelines by the public while maintaining environmental  
120 safeguards to ensure a quality resource for use by the public.

121  
122 The SMP for Lake Dardanelle main objectives are to manage and protect the shoreline; to  
123 establish and maintain acceptable fish and wildlife habitat, aesthetic quality, and natural  
124 environment conditions; and to promote the safe and healthful use of the lake and shoreline for  
125 recreational purposes.

126 • The original SMP for Lake Dardanelle (also known as the Lakeshore Management Plan)  
127 was approved in 1973.

128 • This plan was subsequently reviewed, updated with public involvement, and approved by  
129 the Division Engineer, Southwestern, in November 1975.

130 • This plan was reviewed again and updated with additional public involvement in 1981.

131 • Revision of 36 Code of Federal Regulations (CFR) 327. 30 in 1990 required the Little  
132 Rock District to convert its currently approved Lakeshore Management Plans to  
133 *Shoreline Management Plans*. The Little Rock District, prior to converting the shoreline  
134 management plans, implemented a District-wide shoreline management policy, SWLOM  
135 1130-2-33, in September 1992. This policy was developed following a series of public  
136 meetings with consideration of the written comments.

137 • In 1995, an update was conducted to recommend changes in shoreline allocations at  
138 various locations around the lake. A public workshop was held at the Lake Dardanelle  
139 Site Office to notify the public of the Shoreline Management Plan review. The Lake  
140 Dardanelle Office evaluated 38 rezoning request resulting in the approval of 27 requests.  
141 The plan was approved on 15 Dec 1995.

142 • Administrative reviews have since been approved in 2006 and 2012 with the last updated  
143 version of the Shoreline Management Plan for Lake Dardanelle went into effect in June  
144 2012.

145 The SMP for Lake Dardanelle will be reviewed at least once every five years, in accordance with  
146 regulations in place at the time of the review. Rezoning requests will not be accepted or  
147 considered in future reviews.

148 The Russellville Site Office annually assesses the SMP for Lake Dardanelle in accordance with  
149 the “Annual Assessment of the SMP for Little Rock District Lakes”. These assessments may  
150 serve as the Five-Year Review/Update providing there are no major issues or changes needed to  
151 the plan. The assessment will consider any revision to the Little Rock District’s operating policy  
152 on shoreline management, changes in recreational use patterns on the project, amount of  
153 available Limited Development Area’s (LDA), and other pertinent shoreline factors.

154



Table 2-1. Pertinent Data of Lake Dardanelle

<b>General Information</b>	
Purpose	P, N, Rec, F&W (1)
River	Arkansas
State	Arkansas
Drainage area, square miles	153,666
<b>Dam</b>	
Length in feet	2,683
Height, feet above streambed	85.5
Top of spillway piers elevation, feet above National Geodetic Vertical Datum of 1929	350.5
<b>Generators</b>	
Main units, number	4
Rated capacity each unit, kilowatts	35,000
Station service units, number	
Rated capacity each unit, kilowatts	
<b>Feature</b>	
Open river elevation, feet above National Geodetic Vertical Datum of 1929	337
Area, acres	32,700
Power pool elevation, feet above National Geodetic Vertical Datum of 1929	338.2
Area, acres	34,300
Navigation pool elevation, feet above National Geodetic Vertical Datum of 1929	336
Area, acres	31,100
(1) P – Power N – Navigation Rec – Recreation F&W – Fish and Wildlife	

159 **3. ALTERNATIVES**

160 Three alternatives evaluated for the draft EA:

- 161 • Alternative 1 (No Action)
- 162 • Alternative 2 (Preferred)
- 163 • Alternative 3 (Conservative Growth)

164 At the writing of this document, Alternative 2 (Preferred) is identified as the USACE Preferred  
165 Alternative. Locations of each alternatives land allocations can be found in Appendix C.

166 **3.1 Alternative 1 (No Action)**

167 The No-Action alternative is defined as USACE continuing utilization of the current SMP, which  
168 was last updated in 2012. Since this update, Lake Dardanelle’s Ambulatory Assist Vehicle  
169 (AAV) policy was implemented in 2006 and the SWL District Shoreline Management Policy  
170 (SWLR 1130-2-48) was implemented in December 2024.

171 **3.2 Alternative 2 (Preferred)**

172 In this alternative, components are very similar to the No Action alternative.

173 Components of this alternative include:

- 174 • New boat dock permits and slip additions would only be permitted to adjoining  
175 property owners whose access is within 200 ft from an LDA shoreline allocation.
- 176 • New vegetation modification permits would only be allowed out to 200 feet from the  
177 foundation of the home and in between the lot lines.
- 178 • Mowing and/or underbrushing will not be permitted across any natural or manmade  
179 break in vegetation such as a road or railroad right-of-way.
- 180 • Perpetual access easements would not be recognized as legal access for new slips or  
181 dock placement.
- 182 • Existing easements would still be honored as long as the permit is maintained in  
183 accordance with the *Shoreline Use Permit Conditions*, even if not in compliance with  
184 the current SMP.
- 185 • Vegetation which consists of non-flowering trees or shrubs that are two inches or less  
186 in diameter at ground level are allowed to be removed through a permit.
- 187 • No new foot path or vegetation modification permits in Wildlife Management (WM),  
188 Project Operations, High Density Recreation (HDR), or Environmentally Sensitive  
189 Areas (ESA) Master Plan classifications.
- 190 • Maximum width for foot paths is 6 feet.

- 191 • Generally, no new outgrants for steps/stairs will be approved.
- 192 • Navigation Channel, Scenic, and Natural Protected Shoreline Areas would be combined
- 193 under Protected Shoreline Areas.
- 194 • Public Recreation Areas would be allocated on a case-by-case basis.
- 195 • Existing Low Density Recreation re-zoning requests would be considered.
- 196 • Public Recreation Allocations would be reallocated on a case-by-case basis to
- 197 accommodate for existing grandfathered dock facilities and vegetation permits along
- 198 with dock rezoning requests.
- 199 • No new power lines to private floating facilities. Existing power line licenses at private
- 200 floating facilities would be allowed to renew as long as the dock permit is in
- 201 compliance with the *Shoreline Use Permit Conditions*, even if not in compliance with
- 202 the current SMP. All new electric service to private floating facilities must be provided
- 203 by an alternative power source (i.e. wind, solar, etc.)
- 204 • No new outgrants would be issued for tramways, embayments, or mooring buoys.
- 205 • No permits will be issued within the Federal/State recommended distance of a known
- 206 federally protected, threatened, or endangered species location and/or habitat.

### 207 **3.3 Alternative 3 (Conservative Growth)**

208 Under this alternative, opportunities for expanding public and private use of the lake would be  
 209 limited, allowing more protection of the shoreline compared to Alternative 1 (No Action).  
 210 Components of this alternative include:

- 211 • New boat dock permits would only be permitted to property owners whose access is
- 212 within 100 ft from an LDA shoreline.
- 213 • New vegetation modification permits would only be allowed out to 100 feet from the
- 214 foundation of the home.
- 215 • Perpetual access easements would not be recognized as legal access for new dock
- 216 placement. Existing easements would still be honored as long as the permit is
- 217 maintained in accordance with the Shoreline Use Permit Conditions, even if not in
- 218 compliance with the current SMP.
- 219 • Underbrush which consists of non-flowering trees or shrubs that are two inches or less
- 220 in diameter at ground level are allowed to be removed through a permit.
- 221 • No new foot path or vegetation modification permits in Wildlife Management (WMA),
- 222 Project Operations (PO), High Density Recreation (HDR), and Environmentally
- 223 Sensitive Areas (ESA) Master Plan classifications.

- 224 • Maximum width for foot paths is 3 feet.
- 225 • No new steps/stairs requests.
- 226 • Scenic Protected Shoreline Areas would be allocated as Protected Shoreline  
227 Allocations.
- 228 • New Public Recreation Areas would be allocated on a case-by-case basis.
- 229 • Navigation Channel Protected Shoreline Areas would be allocated as Protected  
230 Shoreline Allocations.
- 231 • Low Density Recreation zoning requests would NOT be considered.
- 232 • Park buffers would be reallocated on a case-by-case basis to accommodate for existing  
233 grandfathered dock facilities and vegetation permits.
- 234 • No new power lines to private floating facilities. Existing power line licenses at private  
235 floating facilities would be allowed to renew as long as the dock permit is in  
236 compliance with the *Shoreline Use Permit Conditions*, even if not in compliance with  
237 the current SMP. All new electric service to private floating facilities must be provided  
238 by an alternative power source (i.e. wind, solar, etc.)
- 239 • No new outgrants or permits would be issued for tramways, embayments, and mooring  
240 buoys.
- 241 • No permits will be issued within the Federal/State recommended distance of a known  
242 federally protected, threatened, or endangered species location and/or habitat.
- 243 • Limit community dock permits to a maximum of 7 slips.

244 Table 3-1 and Figure 3-1 below summarize and compare alternatives described above. Table 3-1  
245 compares changes in miles of shoreline allocated to Public Recreation Areas, Protected Areas,  
246 Prohibited Areas, and Limited Development Areas for each alternative. Alternative 1 (No  
247 Action) serves as the baseline for each action alternative, and Figure 3-1 shows the percentage of  
248 shoreline allocations for each alternative.

249

250  
251

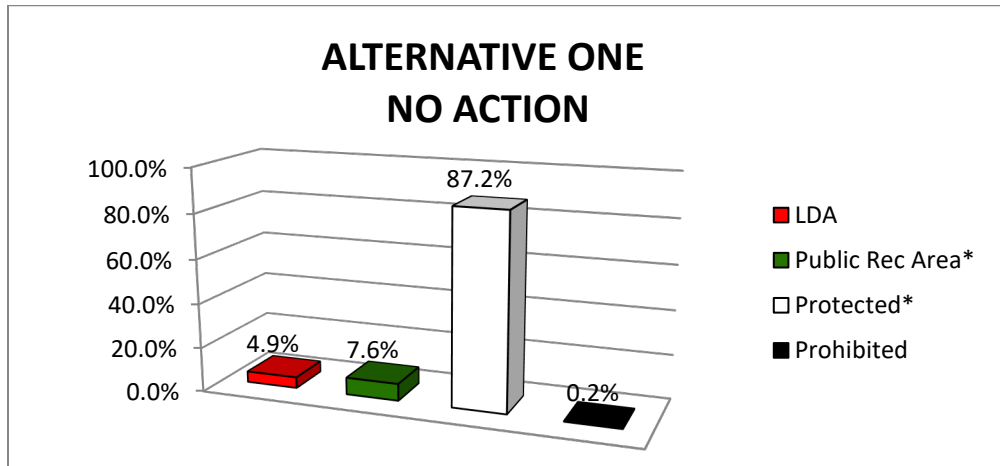
**Table 3-1. Changes in Miles of Shoreline Allocated to Limited Development Areas, Public Recreation Areas, Protected Areas and Prohibited Areas for each Alternative**

<b>Alternative 1 (No Growth)</b>	<b>Miles</b>	<b>Percent of Shoreline</b>	<b>Change in miles</b>	<b>Percent change in miles</b>
LDA	21.4	4.9%	0	0%
Public Recreation Area*	33.2	7.6%	0	0%
Protected*	378.5	87.2%	0	0%
Prohibited	1.0	0.2%	0	0%
Total Shoreline	434.0	100%	-	-
<b>Alternative 2 (Preferred)</b>	<b>Miles</b>	<b>Percent of Shoreline</b>	<b>Change in miles</b>	<b>Percent change in miles</b>
LDA	21.0	4.8%	-0.4	-0.1%
Public Recreation Area	40.8	9.4%	7.6	1.8%
Protected	364.8	84.1%	-13.7	-3.1%
Prohibited	7.4	1.7%	6.5	1.5%
Total Shoreline	434.0	100.0%	-	-
<b>Alternative 3 (Conservative Growth)</b>	<b>Miles</b>	<b>Percent of Shoreline</b>	<b>Change in miles</b>	<b>Percent change in miles</b>
LDA	20.6	4.8%	-0.8	-0.2%
Public Recreation Area	40.8	9.4%	7.6	1.8%
Protected	365.2	84.1%	-13.3	-3.1%
Prohibited	7.4	1.7%	6.5	1.5%
Total Shoreline	434.0	100.0%	-	-

252

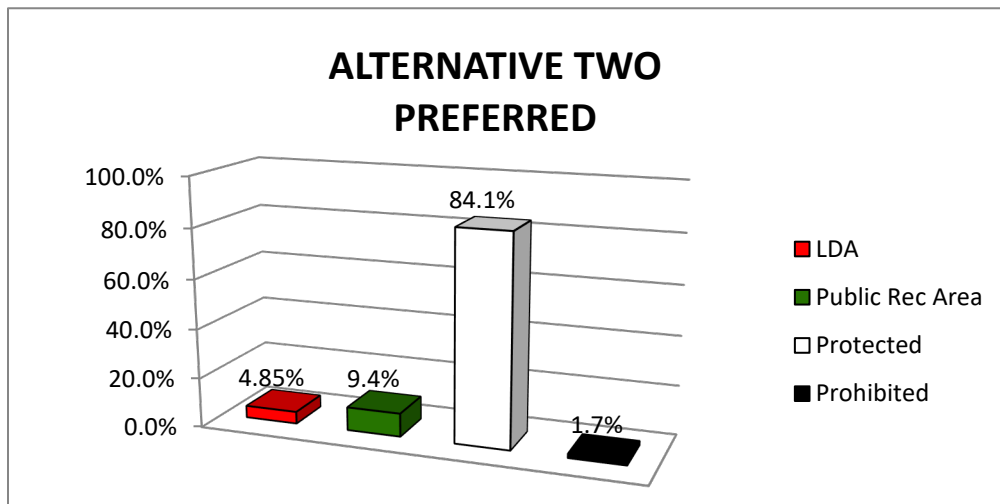
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254 **Figure 3-1. Percentage of Shoreline Allocations for Each Alternative**

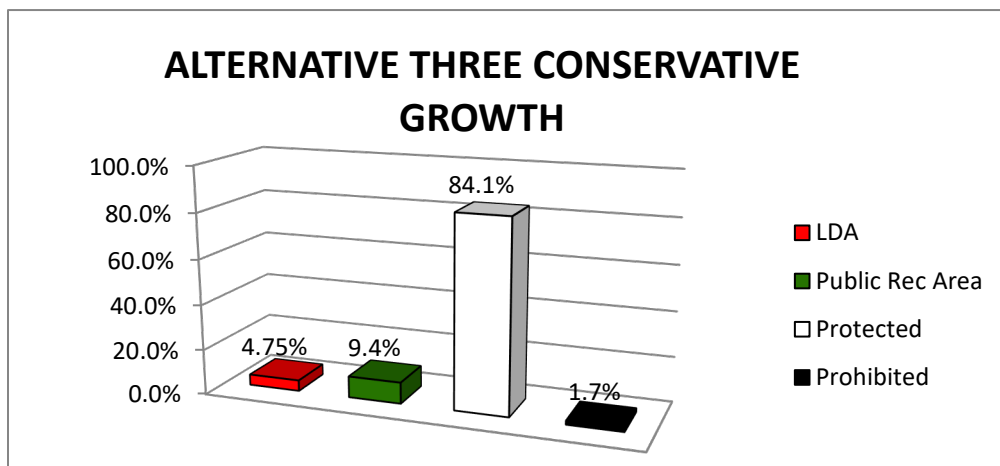


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257



258

259 **4. AFFECTED ENVIRONMENT AND CONSEQUENCES**

260 This section describes the natural and human environments that exist at the project and the  
261 potential impacts of Alternative 1 (No Action Alternative), Alternative 2 (Preferred Alternative),  
262 and Alternative 3 (Conservative Growth), outlined in Section 3 of this document. Pursuant to the  
263 Department of Defense National Environmental Policy Act Implementing Procedures (June 30,  
264 2025), the environmental assessment will focus on reasonably foreseeable environmental effects  
265 of the proposed agency action and determine whether the environmental effects of the action or  
266 project at hand are significant. Only those resources that have the potential to be affected by any  
267 of the alternatives are described in detail. Some topics are limited in scope due to the lack of  
268 direct effect from Alternatives 2 and 3 on the resource or because that particular resource or  
269 subject matter topic is not located, or is not a factor, within the project area.

270 In considering the degree of the effects, DoD may consider the following, as appropriate to the  
271 specific action: both short- and long-term effects; both beneficial and adverse effects; effects on  
272 public health and safety; economic effects; and effects on the quality of life of the American  
273 people. As discussed in this section, the alternatives may create temporary (less than 1 year),  
274 short-term (up to 3 years), long-term (3 to 10 years) or permanent effects.

275 In considering whether the effects of the Proposed Alternative and Alternative 3 are significant,  
276 agencies shall analyze the potentially affected environment and degree of the effects of the  
277 action. Impacts on each resource can vary in degree or magnitude from a slightly noticeable  
278 change to a total change in the environment. For this analysis, the intensity of impacts would be  
279 classified as negligible, minor, moderate, or major. The intensity thresholds are defined as  
280 follows:

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

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

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

#### 303 **4.1 Project Setting**

304 Lake Dardanelle is impounded by Dardanelle Dam which is located at Arkansas River  
305 navigation mile 205.5 in Pope and Yell Counties in Arkansas. Lake Dardanelle extends 51 miles  
306 westerly through Pope, Yell, Johnson, Logan, and Franklin Counties to the Ozark-Jeta Taylor  
307 Lock and Dam. Topography varies from fertile farmland in the upper one half of the Lake to  
308 tree-covered rocky slopes on the lower one half, which includes several clear water tributary  
309 streams. The water level at the Dardanelle Dam fluctuates from elevation 336.0 MSL  
310 (navigation pool) to elevation 338.2 MSL (power pool). Fluctuations increase progressively  
311 towards the upper end of the lake up to 25-30 feet for short periods. There are 56,874 acres of  
312 land and water area on Lake Dardanelle. This includes 31,551 acres of water and 25,374 acres of  
313 government land above pool elevation of 338 MSL. Flowage easements have been acquired for  
314 8,673 acres. There are 6,750 acres in the original riverbed. Measured at elevation 338.2 MSL,  
315 the shoreline has a total length of 573 miles. There are 343 miles of surveyed and monumented  
316 government boundary.

#### 317 **4.2 Resources Considered but Not Analyzed**

318 Typically, an EA would analyze Noise; and Hazardous, Toxic, and Radioactive (HTRW)  
319 resources; however, given that no alternative would entail construction and associated impact to  
320 these resources, they are not further discussed in this EA.

#### 321 **4.3 Land Use**

322 Land classification categories are established in the MKARNS Master Plan and provide the basic  
323 framework that will guide the development, management, and operation of all resources and  
324 facilities. The shoreline adjoining all reservoir lands have been classified into shoreline  
325 allocations as described in the Shoreline Allocation Section below. The Shoreline Allocations  
326 and permitted activities shall not contradict the MKARNS Master Plan. Should there be cases  
327 where the MKARNS Master Plan conflicts with this Shoreline Management Plan for Lake  
328 Dardanelle, the MKARNS Master Plan is the overriding document.

329 Lake Dardanelle provides a wide variety of opportunities for the public to recreate on public  
330 lands and waters. Paved access roads wind through 37 public use areas with 324 campsites and  
331 approximately 21 public boat launching ramps. There are two commercial concessionaires with  
332 114 wet boat slips.

333 Currently, there are over 2,373 privately owned land parcels adjacent to public lands, with  
334 approximately 994 structures. There are 416 vegetation modification permits and 196 active  
335 private floating facility permits (single-owner/multiple-owner docks) with 314 boat slips. There  
336 are approximately 201 outgrants for private uses on public lands, uses such as steps/stairs, roads,

337 tramways, water lines, and electric service lines to boat docks.

#### 338 **4.3.1 Alternative 1 (No Action)**

339 Under the No Action Alternative, the 2012 Shoreline Management Plan would remain in effect,  
340 allowing for the continuation of existing land use patterns and permitting processes. Land use at  
341 Lake Dardanelle is currently characterized by a mix of public recreation, conservation, and  
342 permitted private use. As described in the affected environment, there are 37 public use areas,  
343 two commercial concessions, and numerous permitted private activities, including 416  
344 vegetation modification permits and 196 private floating facility permits.

345 Continuation of the 2012 SMP would mean that new requests for private uses, such as boat  
346 docks, vegetation clearing, and access paths, would continue to be evaluated under existing rules.  
347 Of the 14.1 miles of available LDA under the No Action Alternative, there are 9.8 miles of  
348 available LDA within the 200 ft vegetation modification that have the potential of conversion of  
349 natural shoreline to accommodate private use. The ongoing issuance of permits would sustain the  
350 existing balance of land uses but would not address the increasing pressure on public lands for  
351 recreation. Conflicts between preserving the natural character of the shoreline for public  
352 enjoyment and allowing exclusive private use would persist.

353 Overall, no change from the current impacts to land use would result from implementing the No  
354 Action Alternative, as there would be no change to the existing conditions and management  
355 practices.

#### 356 **4.3.2 Alternative 2 (Preferred)**

357 Implementation of the Preferred Alternative would result in negligible, long-term, beneficial  
358 impacts on land use by establishing a more defined balance between private use and the  
359 protection of public lands. This alternative refines the conditions for private use by discontinuing  
360 perpetual access easements for new slips and dock placements. Furthermore, it prohibits new  
361 footpath and vegetation modification permits in sensitive areas such as Wildlife Management  
362 Areas (WMAs) and Environmentally Sensitive Areas (ESAs) and generally disallows new  
363 outgrants for steps or stairs.

364 This alternative would slow the rate of new private modifications on public land compared to the  
365 No Action Alternative. Of the 13.5 miles of available LDA under the Preferred Alternative, there  
366 are 9.51 miles within the 200 ft vegetation modification boundary that have the potential of  
367 conversion of natural shoreline to accommodate private use, compared to the 9.8 miles in the No  
368 Action Alternative. The shoreline allocations under this alternative shift slightly, increasing  
369 Public Recreation Areas by 1.8% (7.6 miles) and Prohibited Areas by 1.5% (6.5 miles). These  
370 changes would lightly reducing the shoreline available for intensive private development. This  
371 reallocation directs land use toward conservation, public access, and restricts areas for public  
372 safety, preserving the natural and recreational character of the shoreline for the general public.  
373 While existing permitted uses would be honored, these new restrictions would guide future  
374 development in a more sustainable manner, ensuring that land use at the lake is managed to  
375 protect its long-term ecological and recreational value.

#### 376 **4.3.3 Alternative 3 (Conservative Growth)**

377 Alternative 3 would result in minor, long-term, beneficial impacts on land use by prioritizing  
378 conservation and more strictly limiting the expansion of private uses on public land. This

379 alternative imposes the most stringent controls on new development, allowing new boat dock and  
380 vegetation modification permits only within 100 feet of a property's access point or a home's  
381 foundation, respectively. It also reduces the maximum width of footpaths to three feet, prohibits  
382 all new requests for steps or stairs, and limits community docks to a maximum of seven slips.

383 These measures would significantly curtail the potential for future private shoreline alterations,  
384 thereby offering the strongest protection for the lake's natural landscape. Shoreline reallocations  
385 under this alternative increase Public Recreation by 1.8% (7.6 miles) and Prohibited areas by  
386 1.5% (6.5 miles) while reducing LDAs -0.2% (-0.8 miles) and disallowing future rezoning  
387 requests for Low-Density Recreation. Of the 13.4 miles of available LDA under the  
388 Conservative Growth Alternative, there are 4.98 miles within the 100 ft vegetation modification  
389 boundary that have the potential of conversion of natural shoreline to accommodate private use,  
390 compared to the 9.8 miles in the No Action Alternative, decreasing the potential for nature  
391 shoreline to private development. This firmly shifts the long-term land use focus away from  
392 private development and toward resource preservation and public enjoyment, while restricting  
393 areas that unsafe for public use. By severely constraining future private modifications, this  
394 alternative would most effectively preserve the existing undeveloped character of the shoreline  
395 for public use and environmental conservation, resulting in a beneficial impact on land use when  
396 compared to the No Action Alternative.

#### 397 **4.4 Climate and Changing Conditions**

398 Climate within the Lake Dardanelle watershed is classified as humid subtropical, with long, hot  
399 summers and mild to cool winters. Summer temperature extremes frequently exceed 100°F,  
400 particularly in western and central Arkansas, while winter lows can occasionally reach 0°F.  
401 Extreme temperatures may occur for short periods at any location within the watershed.  
402 Precipitation is distributed relatively evenly throughout the year, with average annual rainfall  
403 near 46 inches in the western portion of the state, increasing to 48–50 inches toward central and  
404 southeastern Arkansas. Monthly rainfall typically ranges from 2.5 inches during the winter to 5  
405 inches during spring. Snowfall averages between 3 and 6 inches per year, with greater amounts  
406 at higher elevations in the western part of the watershed; snowpacks are generally short-lived and  
407 rarely pose a significant flood concern.

408 However, climate projections for Arkansas indicate that heavy rainfall events are likely to  
409 become more intense even as total annual precipitation stabilizes or decreases, while  
410 concurrently, drought periods are expected to become more frequent and severe, notably  
411 affecting runoff, evaporation, and groundwater recharge (EPA, 2016). If these trends continue,  
412 the Lake Dardanelle region may experience fewer but more extreme downpours, interspersed  
413 with prolonged dry spells. Should these changes materially impact water resources or shoreline  
414 stability, the Shoreline Management Plan and supporting documents (e.g., the Operations  
415 Management Plan) would be reviewed and updated as needed.

##### 416 **4.4.1 Alternative 1 (No Action)**

417 Under the No Action Alternative, USACE would continue implementation of the 2012 Shoreline  
418 Management Plan without adopting new policies. This would maintain the current system of  
419 dock and vegetation modification permits and allow existing management practices to continue.

420 Localized vegetation removal associated with shoreline permits may result in increased sunlight

421 penetration, which can cause slight temperature fluctuations along the shoreline. Loss of  
422 vegetative cover can also contribute to minor increases in erosion and sedimentation during  
423 heavy rainfall events, which in turn may affect water clarity and temperature stability. These  
424 effects would remain small in scale and localized to areas where shoreline modifications occur.

425 Overall, there would be no change from current impacts to climate under this alternative, because  
426 the existing conditions and management practices would remain unchanged. The No Action  
427 Alternative primarily serves as the baseline for comparison with the other action alternatives,  
428 reflecting continuation of current practices at Lake Dardanelle.

#### 429 **4.4.2 Alternative 2 (Preferred)**

430 Alternative 2 is similar to the No Action Alternative in terms of potential impacts from changing  
431 weather patterns, such as localized temperature fluctuations and storm intensity effects. The  
432 reallocation of shoreline under this alternative—slightly reducing Limited Development Areas (–  
433 0.1%) while expanding Public Recreation Areas (+1.8%) and Prohibited Areas (+1.5%)—further  
434 limits the extent of developable shoreline, leaving the majority (84.1%) in Protected status.  
435 These shifts, combined could potentially contribute to lower local temperatures from decreased  
436 emissions and the retention of vegetation along the shoreline.

437 While Alternative 2 would still permit some new dock and vegetation modifications, the scale of  
438 disturbance would be limited by permit conditions. Localized soil compaction and increased  
439 runoff may occur where access paths and docks are added, but the reduced shoreline available  
440 for development would help reduce sedimentation and turbidity compared to the No Action  
441 Alternative.

442 Overall, Alternative 2 is expected to have negligible, long-term beneficial impacts, as  
443 maintaining vegetative buffers would contribute to modest decreases in localized weather  
444 temperatures (via shading) and shoreline resilience under projected increases in heat waves and  
445 heavy rainfall events.

#### 446 **4.4.3 Alternative 3 (Conservative Growth)**

447 Alternative 3 poses fewer risks from changing weather patterns compared to the No Action  
448 Alternative, with the potential for negligible, indirect beneficial impacts over time. Under this  
449 alternative, opportunities for new shoreline disturbance would be more limited, as stricter  
450 restrictions on dock and vegetation modification permits would apply. New dock permits would  
451 only be allowed within 100 feet of shoreline access, footpath widths would be reduced to a  
452 maximum of 3 feet, new vegetation modification permits would only be allowed out to 100 feet  
453 from the foundation of a home, and there would be a 7 stall limit for all new community boat  
454 docks.

455 The reallocation of shoreline under this alternative slightly reduces Limited Development Areas  
456 (-0.2 percent) while expanding Public Recreation Areas (+1.8 percent) and Prohibited Areas  
457 (+1.5 percent), further reducing areas available for private shoreline modification while leaving  
458 84.1 percent in Protected status. The total potential community boat dock slips would be reduced  
459 from 11,822 in the No Action Alternative to 2,079. These changes, combined with more  
460 restrictive permit conditions, would help maintain intact vegetative cover along the shoreline.  
461 This alternative would provide buffering benefits that reduce erosion, slow stormwater runoff,  
462 and help stabilize water temperatures in near-shore areas.

463 While existing permitted activities would continue, the new permitting restrictions over time  
464 would allow some previously disturbed shoreline areas to re-vegetate, further reducing erosion  
465 potential and enhancing shoreline resilience. Localized soil compaction and erosion may still  
466 occur where permits remain in place, but the potential impacts would be less than under No  
467 Action or Alternative 2.

468 Overall, Alternative 3 would likely result in negligible, long-term beneficial impacts by  
469 restricting future shoreline disturbance, maintaining vegetative buffers, and supporting the  
470 natural capacity of Lake Dardanelle's shoreline to stabilize local temperatures (via shading) and  
471 to absorb the effects of projected increases in heat waves, droughts, and heavy rainfall events.

#### 472 **4.5 Topography, Geology, Soils, and Prime Farmland**

473 Lake Dardanelle lies within the Arkansas Valley Section of the Ouachita Physiographic Province  
474 (Fenneman et al., 1946) and is underlain by Pennsylvanian sandstone and shale with sandy  
475 residuum. The Ouachita Physiographic Province typically consists of east-west trending ridges  
476 and valleys and the Arkansas Valley Section is a structural synclinorium generally lying between  
477 dipping rocks of the Boston Mountains to the north and the highly folded rocks of the Ouachita  
478 Mountains to the south (Kresse et al., 2014). Faults are common in the region with thrust faults  
479 prevalent in the southern part of the province and normal faults in the northern part. Topography  
480 is rolling lowlands, interrupted by ridges and isolated prominences. Elevations within Lake  
481 Dardanelle project area range from approximately 288 feet (NAVD 88) to 564 feet (NAVD 88).  
482 However, the surrounding area and the Lake Dardanelle watershed have elevations that are much  
483 higher. Elevations near the northern watershed divide are over 2,400 feet; the watershed divide to  
484 the south is in the Ouachita Mountains with elevations that exceed 2,700 feet.

485 The upper (western) half of the reservoir is characterized by fertile floodplains and agricultural  
486 lands with gentle slopes, particularly near upstream regions. In contrast, the lower (eastern)  
487 portion transitions into more rugged terrain, with forested uplands and rocky slopes along  
488 tributaries. These differences reflect changes in underlying geology and sub-ecoregion character  
489 along the length of the lake.

490 Soils in the region are diverse, including mollisols, alfisols, entisols, ultisols, and inceptisols.  
491 These soil types support land uses ranging from oak-hickory-pine forests in upland areas to  
492 highly productive pastureland and hayfields in lower-lying areas. The Arkansas Valley Plains  
493 sub-ecoregion, which borders Lake Dardanelle near Russellville in Pope County, is characterized  
494 by undulating slopes and nutrient-rich soils that support ongoing agricultural activity.

495 Soil conservation is an important consideration for shoreline and natural resource management.  
496 While factors such as soil type, topography, and climate are largely uncontrollable, human-  
497 induced impacts such as vegetation removal, compaction, and altered flow regimes (e.g., high  
498 discharge events) can exacerbate erosion and soil movement along the shoreline.

499 The Farmland Protection Policy Act (FPPA) of 1981 (Public Law 97-98), as amended, aims to  
500 minimize the irreversible conversion of productive farmland to non-agricultural uses (USDA,  
501 2022). According to the U.S. Department of Agriculture (USDA) Natural Resources  
502 Conservation Service Web Soil Survey, lands within the Lake Dardanelle study area are  
503 classified as follows: 14.7% prime farmland, 10% farmland of statewide importance, 4%  
504 conditionally prime (if protected from flooding or drained), and 70.6% is not considered prime

505 farmland.

506 Although protected farmland exists within the project area, the proposed Shoreline Management  
507 Plan update does not include any construction or land conversion and would not result in the loss  
508 of prime farmland. Existing agricultural leases would remain in effect, and none of the  
509 alternatives would prevent the continuation or establishment of future agricultural leasing along  
510 the shoreline.

#### 511 **4.6 Alternative 1 (No Action)**

512 Under this alternative, the 2012 Shoreline Management Plan would remain in effect, allowing  
513 continuation of dock and vegetation modification permits under existing rules. While no major  
514 construction or land conversion would occur through the Lake Dardanelle SMP revision, soil  
515 disturbance associated with shoreline use permits would persist.

516 Vegetation removal near the shoreline, footpath creation, and soil compaction from increased  
517 foot traffic to permitted docks can result in localized erosion. In areas with steeper slopes and  
518 more fragile soils, especially along the eastern portion of the reservoir, this may accelerate runoff  
519 and contribute to sedimentation. The conversion of natural pervious surfaces to compacted paths  
520 or disturbed areas would continue to reduce natural infiltration capacity, increasing localized  
521 erosion risks.

522 Although prime farmland is present within the Lake Dardanelle project area—approximately  
523 14.7% of lands classified as prime farmland, 10% as farmland of statewide importance, and 4%  
524 as conditionally prime—the No Action Alternative would not directly convert farmland to non-  
525 agricultural uses. Agricultural leases would remain unaffected, and no new restrictions would be  
526 imposed on their continuation or establishment.

527 Overall, there would be no change from current impacts to topography, geology, soils, and prime  
528 farmland under this alternative, because the existing conditions and management practices would  
529 remain unchanged.

#### 530 **4.6.1 Alternative 2 (Preferred)**

531 The Preferred Alternative would result in little to no change in impacts to existing topography,  
532 geology, and soils compared to current conditions, as it largely reflects ongoing use patterns.  
533 This alternative would allow some new shoreline use permits for boat docks and vegetation  
534 modifications, similar to restrictions under the No Action Alternative. Vegetation modification  
535 would continue to be limited to 200 feet from the foundation of the home and footpaths would be  
536 restricted to a maximum width of 6 feet.

537 Localized soil disturbance could still occur from permitted dock access paths and limited  
538 vegetation removal, but these effects would remain small in scale. Shoreline allocations under  
539 this alternative shift slightly, with Protected Shoreline Areas decreasing by 3.1% (a reduction of  
540 13.7 miles), Public Recreation Areas increasing by 1.8% (7.6 miles), and Prohibited Areas  
541 increasing by 1.5% (6.5 miles). These reallocations, along with the limitations on new stairs and  
542 steps; and restrictions on new footpaths and vegetation modifications permits in Wildlife  
543 Management Area (WMA), High Density Recreation (HDR), Environmentally Sensitive Areas  
544 (ESA), and Project Operations (PO) Master Plan classification areas; would reduce soil  
545 exposure, supporting stronger protections in areas sensitive to erosion while concentrating

546 development in designated recreation areas. The continued predominance of Protected Shoreline  
547 Areas (364.8 miles, or 84.1% of total shoreline) provides an extensive buffer against widespread  
548 soil disturbance.

549 Prime farmland within the project area (approximately 14.7% classified as prime, 10% farmland  
550 of statewide importance, and 4% conditionally prime) would remain unaffected under this  
551 alternative, as the Preferred Alternative does not involve construction or land conversion.  
552 Existing agricultural leases would continue without restriction.

553 Overall, the Preferred Alternative is expected to have negligible to minor, long-term beneficial  
554 effects on soils and farmland compared to the No Action Alternative, due to reduced vegetation  
555 modification and stronger shoreline protections.

## 556 **4.6.2 Alternative 3 (Conservative Growth)**

557 Under Alternative 3, negligible to minor, long-term beneficial impacts would be expected. This  
558 alternative imposes stricter limits than No Action—such as reducing footpath widths to 3 feet,  
559 restricting vegetation modification permits to 100 feet from the foundation of a home,  
560 disallowing new steps or stairs, and limiting community boat dock slips to 7 per dock—which  
561 would preserve more shoreline vegetation and reduce soil disturbance, erosion, and  
562 sedimentation.

563 Some localized impacts could still occur from limited dock and vegetation modification permits,  
564 including soil compaction along access paths and erosion on steeper slopes. However, overall  
565 disturbance would be less than under No Action and the Preferred Alternative. Shoreline  
566 reallocations under this alternative include a 0.2% reduction in Limited Development Areas (–  
567 0.8 miles), a 3.1% decrease in Protected Shoreline Areas (–13.3 miles), and a 1.8% increase in  
568 Public Recreation Areas (+7.6 miles). With 365.2 miles (84.1%) of shoreline remaining in  
569 Protected status and 7.4 miles (1.7%) in Prohibited status, the majority of shoreline would  
570 continue to buffer erosion and maintain stability. The reduction of total potential slips from  
571 11,822 in the No Action Alternative to 2,079, prohibition of new stairs and steps, and foot path  
572 and vegetation modification restrictions in Wildlife Management Area (WMA), High Density  
573 Recreation (HDR), Environmentally Sensitive Areas (ESA), and Project Operations (PO) Master  
574 Plan classification areas would reduce soil exposure, lending further erosion protections by  
575 decreasing the amount of boats on the lake.

576 Prime farmland within the project area (approximately 14.7% classified as prime, 10% as  
577 farmland of statewide importance, and 4% conditionally prime) would remain unaffected, as no  
578 land conversion is proposed, and agricultural leases would continue.

579 Overall, Alternative 3 would likely result in negligible to minor beneficial effects, with improved  
580 shoreline stability compared to No Action, but somewhat more protection than the Preferred  
581 Alternative.

## 582 **4.7 Water Resources**

### 583 **4.7.1 Hydrology and Groundwater**

#### 584 **Surface Water**

585 The Arkansas River Basin covers a large territory encompassing portions of seven states:

586 Colorado, New Mexico, Kansas, Oklahoma, Texas, Missouri, and Arkansas with a total drainage  
587 area above Dardanelle Lock and Dam of 153,666 square miles. The drainage area between  
588 Dardanelle Lock and Dam and the next upstream navigation project, Ozark-Jeta Taylor is 1,865  
589 square miles. Lake Dardanelle is formed by Dardanelle Lock and Dam and is located at  
590 Navigation Mile 205.5 on the Arkansas River. Lake Dardanelle Lock and Dam is part of  
591 McClellan-Kerr Navigation System. This portion of the River forms the boundary between Pope  
592 and Yell Counties and separates the cities of Russellville on the left bank and Dardanelle on the  
593 right bank. The Arkansas River channel in this area has been straightened extensively to shorten  
594 the overall length of the navigation channel to accommodate the Navigation System. The banks  
595 have been stabilized to aid in the maintenance of depth and alignment of the navigation system.  
596 Major tributaries in the Dardanelle Lock and Dam watershed include Illinois Bayou, Big Piney  
597 Creek, Spadra Creek, Six Mile Creek, Big Shoal Creek, and Horsehead Creek. The northern  
598 drainage divide of the Lake Dardanelle watershed is located in the Boston Mountains and the  
599 southern divide is located in the Ouachita Mountains.

## 600 **Groundwater**

601 Lake Dardanelle and its project area lie within the Arkansas River Valley. The Arkansas River  
602 Valley consists of alluvial deposits that overlie consolidated rocks along the Arkansas River and  
603 its major tributaries. The alluvial deposits are comprised of terrace and flood-plain deposits that  
604 occur along the river in discontinuous segments. These segments range in length from 3 to 43  
605 miles and 1 to 5 miles across the river valley (Kresse et al., 2014). In some locations, the  
606 alluvium and terrace deposits are absent, and the river is bordered by consolidated rocks of the  
607 Interior Highlands (Kresse et al., 2014).

608 The River Valley consists of older and younger terrace deposits. The older deposits consist of  
609 interbedded gravel, clay, and sand, while the younger deposits are composed of a coarsening  
610 downward sequence of clay, sand, and gravel. The younger terrace deposits typically are  
611 hydraulically well connected to the flood-plain alluvium, which consists of gravel, sand, silt, and  
612 clay (Kresse et al., 2014). Within the valley, alluvial deposits typically are about 40 feet thick  
613 near Fort Smith and thicken downstream to about 80 feet near Little Rock (Kresse et al., 2014).  
614 These alluvial deposits make up the Arkansas River Valley alluvial aquifer.

615 The Arkansas River Valley alluvial aquifer unconfined and, historically during normal and low  
616 river stages, the water table sloped toward the river and larger tributary streams. During high  
617 river stages, the groundwater gradient is reversed with groundwater flowing away from the river  
618 (Kresse et al., 2014). Recharge to the aquifer is primarily by downward percolation of  
619 precipitation, as well as leakage from rivers.

### 620 **4.7.1.1 Alternative 1 (No Action)**

621 Under the No Action Alternative, hydrology and groundwater conditions at Lake Dardanelle  
622 would remain largely consistent with existing conditions. Continuation of the current Shoreline  
623 Management Plan would allow new vegetation modification and dock permits, which could  
624 result in localized soil disturbance, compaction, and ground cover removal. These activities may  
625 reduce natural infiltration and groundwater recharge in the Arkansas River Valley alluvial  
626 aquifer while also increasing stormwater velocity and erosion along disturbed shorelines.

627 Increased impervious surfaces from foot traffic, paths to docks, or limited shoreline clearing  
628 could also reduce percolation through soils, marginally affecting aquifer replenishment. While

629 such impacts would be small in scale, cumulatively they may increase sedimentation and  
630 turbidity in near-shore waters, particularly during heavy rainfall events.

631 Overall, there would be no change from current impacts to hydrology and groundwater under  
632 this alternative, because the existing conditions and management practices would remain  
633 unchanged.

#### 634 **4.7.1.2 Alternative 2 (Preferred)**

635 The Preferred Alternative would result in negligible to minor beneficial impacts on hydrology  
636 and groundwater conditions at Lake Dardanelle. This alternative would allow some new  
637 shoreline use permits for boat docks and vegetation modifications, similar to the No Action  
638 Alternative, but with restrictions that limit disturbance.

639 Vegetation modifications and new dock permit conditions would remain consistent with the No  
640 Action Alternative, however, shoreline reallocations under this alternative reduce Protected  
641 shoreline by 13.7 miles (-3.1%), while increasing Public Recreation Areas by 7.6 miles (1.8%),  
642 and Prohibited Access Areas by 6.5 miles (1.5%). These shifts maintain 84.1 percent of the  
643 shoreline in protected status and would potentially decrease the amount of boats using the lake,  
644 supporting intact vegetative buffers that slow runoff, reduce erosion, and filter sediments before  
645 reaching the reservoir.

646 Localized soil compaction and erosion may still occur near new dock or vegetation modification  
647 sites, but the limited scale of new disturbance and the continued dominance of protected  
648 allocations would help reduce sedimentation and turbidity compared to No Action. Groundwater  
649 recharge in the Arkansas River Valley alluvial aquifer is largely controlled by precipitation, but  
650 maintaining shoreline vegetation under this alternative would preserve infiltration conditions  
651 favorable for percolation.

652 Overall, the Preferred Alternative would support the long-term stability of Lake Dardanelle's  
653 hydrology and groundwater by retaining extensive protected shoreline, limiting new permits, and  
654 preserving natural vegetative cover, resulting in negligible to minor beneficial impacts compared  
655 to No Action.

#### 656 **4.7.1.3 Alternative 3 (Conservative Growth)**

657 Alternative 3 would have similar effects to the Preferred Alternative on hydrology and  
658 groundwater, with no direct or indirect impacts expected on the Arkansas River Valley alluvial  
659 aquifer. Shoreline reallocations under this alternative reduce Limited Development Areas by 0.8  
660 miles (-0.2%) while increasing Public Recreation Areas by 7.6 miles (1.8%) and Prohibited  
661 Access Areas by 6.5 miles (1.5%). Protected shoreline remains extensive, at 365.2 miles or  
662 84.1% of the total. Community boat dock slips would be limited to 2,079 in total compared to  
663 11,822 in the No Action Alternative. These changes leave less shoreline available for private  
664 modification, strengthening protections for natural buffers that slow runoff, reduce erosion, and  
665 filter sediments before reaching the reservoir.

666 Over time, attrition of existing vegetation modification permits could allow previously disturbed  
667 areas to naturally revegetate, further improving shoreline stability and slowing stormwater  
668 runoff. These conditions would also enhance filtration of sediments and nutrients before they  
669 reach the reservoir, indirectly supporting water quality and aquatic habitat resilience.

670 Localized impacts from permitted dock access paths and vegetation modifications would  
671 continue, but at a reduced scale compared to the No Action Alternative. Because fewer new  
672 permits would be issued and shoreline reallocations shift additional miles into Prohibited and  
673 Public Recreation Area allocations, the potential for soil compaction, reduced infiltration, and  
674 altered runoff patterns would be minimized.

675 Overall, Alternative 3 would result in negligible to minor beneficial impacts to surface water,  
676 similar to the Preferred Alternative, but with slightly stronger protections due to the stricter  
677 shoreline reallocations and reduced availability of shoreline for private modification.

## 678 **4.7.2 Water Quality**

679 Historically, the Arkansas River—which forms Lake Dardanelle—carried high loads of  
680 sediment, dissolved minerals, and organic materials from natural sources upstream, leading to  
681 the perception of “polluted” conditions even before urban or industrial development occurred.  
682 The construction of the McClellan-Kerr Arkansas River Navigation System (MKARNS),  
683 including the series of dams, has significantly improved water clarity and reduced sediment and  
684 salt concentrations by allowing these particles to settle in the navigation pools (USACE, 2020b).

685 Surface water within the MKARNS—including Lake Dardanelle—is currently classified as  
686 suitable for multiple uses, including primary and secondary contact recreation, fish and wildlife  
687 propagation, and domestic, agricultural, and industrial water supply, based on water quality  
688 standards established by the Arkansas Department of Energy and Environment (ADEE) (ADEE,  
689 2024a). These standards are codified in ADEE Regulation No. 2, which outlines designated uses  
690 and establishes criteria for parameters such as temperature, nutrients, bacteria, dissolved oxygen,  
691 turbidity, and pH (ADEE, 2024b). A statewide network of ambient monitoring stations,  
692 including locations above and below Lake Dardanelle at Russellville and Ozark, supports  
693 ongoing water quality evaluation (ADEE, 2024c).

694 In compliance with Section 303(d) of the Clean Water Act, ADEE regularly identifies impaired  
695 waters that do not meet state water quality standards. While Lake Dardanelle is not listed as  
696 impaired on the draft 2024 303(d) list, one of its tributaries— East Fork of the Illinois Bayou—is  
697 listed (ADEE, 2024d). The East Fork of the Illinois Bayou is impaired due to critical season  
698 (water temps above 22°C, typically mid-May to mid-September, majority of fish spawning has  
699 ceased) and primary season (water temps are 22°C or below, typically mid-September to mid-  
700 May, spawning season of most fishes) DO (dissolved oxygen). Total Maximum Daily Loads  
701 (TMDLs) will be developed for the Illinois Bayou to limit pollutant loads and improve water  
702 quality over time (ADEE, 2024e). Spadra Creek and Big Piney Creek, the two remaining  
703 tributaries of Lake Dardanelle, are not listed on the Arkansas 303(d) 2024 Draft List.

704 Additionally, the Arkansas Department of Health (ADH) monitors public swim beaches for  
705 bacterial contamination, particularly *E. coli*. For example, swim beaches at Piney Bay and Shoal  
706 Bay parks were temporarily closed in June 2020 due to elevated bacterial levels, but were  
707 reopened following subsequent testing that confirmed safe conditions (USACE, 2020a).

708 Continued coordination with ADEE and ADH would ensure shoreline activities remain in  
709 compliance with applicable state and federal water quality protections.

### 710 **4.7.2.1 Alternative 1 (No Action)**

711 Under the No Action Alternative, water quality conditions at Lake Dardanelle would remain

712 largely consistent with current conditions but could experience adverse effects due to continued  
713 shoreline permitting activity and associated development. Shoreline allocations under this  
714 alternative would allow ongoing issuance of vegetation modification permits, dock permits, and  
715 related activities. These actions have the potential to disturb soils, remove protective vegetation,  
716 and increase impervious surfaces near the shoreline.

717 Localized vegetation removal and soil compaction from access paths and docks could accelerate  
718 stormwater runoff, leading to increases in turbidity and sedimentation during rainfall events.  
719 Elevated sediment loads in near-shore areas may reduce water clarity and contribute to  
720 resuspension of nutrients, which could promote algal growth. During the spring and summer  
721 recreation season, increased boat traffic would further influence water quality through emissions,  
722 wave action that destabilizes shoreline soils, and occasional fuel leakage or spillage. These  
723 impacts would remain minor in scale but could degrade habitat quality in coves and embayments  
724 important for fish spawning and recreational swimming.

725 Surface water conditions could also be indirectly affected. Additional boat traffic associated with  
726 new permits has the potential to increase fuel leakage or spillage risks, and increased wave action  
727 may exacerbate localized shoreline erosion. Nutrient resuspension from sediment disturbance  
728 could contribute to algal growth in shallow embayments or near popular recreation areas.

729 Although Lake Dardanelle itself is not currently listed as impaired under the ADEE 2024 Draft  
730 303(d) list, localized disturbances could interact with tributary impairments, such as the East  
731 Fork Illinois Bayou's dissolved oxygen listing, by adding additional stressors downstream.  
732 Periodic closures of designated swim beaches in the past (e.g., Piney Bay and Shoal Bay in  
733 2020) due to bacterial contamination underscore the sensitivity of public health resources to  
734 runoff and near-shore disturbances.

735 Overall, no changes from current impacts to water quality are expected under the No Action  
736 Alternative because the existing conditions will remain consistent with current trends and  
737 management practices would remain unchanged.

#### 738 **4.7.2.2 Alternative 2 (Preferred)**

739 Implementation of the Preferred Alternative would likely result in minor, long-term beneficial  
740 impacts to water quality at Lake Dardanelle. Shoreline allocations under this alternative shift to  
741 21.0 miles of LDA (4.8%), 40.8 miles of Public Recreation Area (9.4%), 364.8 miles of  
742 Protected shoreline (84.1%), and 7.4 miles of Prohibited shoreline (1.7%). Compared to the No  
743 Action Alternative, this represents a net decrease in developable shoreline and an increase in  
744 areas under more restrictive allocations, thereby limiting the extent of disturbance from private  
745 shoreline development.

746 The affected environment highlights that Lake Dardanelle is within acceptable limits of Arkansas  
747 Department of Energy and Environment (ADEE) water quality standards. However, tributary  
748 streams such as the East Fork of the Illinois Bayou are impaired for dissolved oxygen.  
749 Expanding Prohibited shoreline allocations reduces the potential for new disturbance in sensitive  
750 areas, helping to maintain vegetative buffers that filter runoff, trap sediment, and stabilize  
751 dissolved oxygen levels in nearshore waters.

752 Permit conditions under Alternative 2 will have the same protections as the No Action  
753 Alternative. Limitations on new stairs and steps and vegetation modification restrictions in  
754 Wildlife Management Area (WMA), High Density Recreation (HDR), Environmentally

755 Sensitive Areas (ESA), and Project Operations (PO) Master Plan classification areas reduce soil  
756 exposure, slowing stormwater velocity and decreasing turbidity during rainfall events. While  
757 localized effects may still occur where dock or vegetation permits are issued, they would be  
758 offset by broader protections provided through reallocation of shoreline to less developable  
759 categories.

760 Overall, Alternative 2 would likely enhance shoreline stability, reduce erosion, and maintain  
761 water clarity compared to current conditions, contributing to negligible to minor beneficial  
762 impacts on water quality.

#### 763 **4.7.2.3 Alternative 3 (Conservative Growth)**

764 Implementation of Alternative 3 would similarly support water quality improvements, with  
765 slightly stronger protections than Alternative 2. Shoreline allocations under this alternative are  
766 20.6 miles of LDA (4.8%), 40.8 miles of Public Recreation Area (9.4%), 365.2 miles of  
767 Protected shoreline (84.1%), and 7.4 miles of Prohibited shoreline (1.7%). Compared to the No  
768 Action Alternative, this further reduces the amount of shoreline open to private development  
769 while increasing the extent of Prohibited allocation, which enhances long-term water quality  
770 protections. Additionally, community boat dock slips would be limit to 7 per dock, making the  
771 potential total boat docks 2,079 compared to 11,822 in the No Action Alternative.

772 As noted in the affected environment, water quality in Lake Dardanelle has improved since the  
773 construction of MKARNS due to reduced sediment loads, though localized risks remain from  
774 stormwater runoff, erosion, bacterial inputs at recreation sites, and oil pollution from recreational  
775 boats. Alternative 3 addresses these issues with more restrictive permitting rules: new dock  
776 permits are limited to properties within 100 feet of an LDA allocation, vegetation modification  
777 permits are capped at 100 feet from the foundation of a home, footpath widths are reduced to 3  
778 feet, and no new stair requests are permitted. These measures collectively limit vegetation loss  
779 and shoreline destabilization, strengthening the role of vegetated buffers in filtering runoff,  
780 stabilizing banks, and reducing sediment and nutrient inputs into the reservoir. Additionally, the  
781 restriction on the number of slips on community boat docks would contribute to decreased  
782 turbidity and oil pollution entering the lake.

783 Over time, attrition of existing vegetation modification permits would also allow disturbed areas  
784 to gradually revegetate, further improving shoreline stability and enhancing water clarity. While  
785 some localized effects from permitted access paths and docks would continue, the cumulative  
786 disturbance would be smaller than under either No Action or the Preferred Alternative.

787 Overall, Alternative 3 would provide minor, long-term beneficial impacts to water quality, with  
788 slightly greater protection than Alternative 2 due to stricter shoreline allocation conditions and  
789 tighter permitting restrictions that limit development opportunities.

#### 790 **4.7.3 Fish Species and Habitat**

791 The development of the McClellan–Kerr Arkansas River Navigation System (MKARNS)  
792 transformed the Arkansas River from a free-flowing system with variable hydrology into a series  
793 of impounded reservoirs—Lake Dardanelle (Pool 10) being the largest. Before impoundment,  
794 the river experienced extreme fluctuations in flow. During low flows, sandbars dominated the  
795 riverbed; during high flows, adjacent floodplain and oxbow lakes were inundated, supporting  
796 diverse, dynamic habitat. After MKARNS construction, flows stabilized, creating extensive

797 surface, deep, and backwater habitat. While this increased habitat for many species, it also  
798 reduced habitat for river-specialist fishes such as plains minnow, speckled chub, Arkansas River  
799 shiner, and suckermouth minnow, which are now absent in current collections (USACE, 2022).

800 The stabilization of flow and formation of deep-lake zones resulted in expanded habitat for  
801 species that thrive in impounded conditions. The Arkansas Game and Fish Commission (AGFC)  
802 now oversees a rich, diverse fish community in Lake Dardanelle, including largemouth bass,  
803 white and striped bass, crappie, and catfish species (channel, flathead, and blue catfish).  
804 Additional fish present include sunfish (bluegill, green sunfish, redear sunfish), sauger, carp,  
805 buffalo, gar, drum, and paddlefish. AGFC also manages non-game species such as minnows,  
806 shad, silversides, mussels, and other invertebrates (USACE, 2022).

807 Lake Dardanelle has historically served as a site for paddlefish harvest, although intense early  
808 fishing pressure for caviar led to a decline by 2002, and resultant closure of the river to harvest.  
809 Lake Dardanelle was subsequently reopened to limited commercial harvest under special  
810 regulation, while upstream reservoirs remained closed (Quinn et al., 2008).

811 Based on electrofishing and habitat studies, Lake Dardanelle differs from most MKARNS pools:  
812 it is a large reservoir with defined riverine, transitional, and lacustrine zones, resulting in  
813 approximately 40% extrachannel habitat—compared to roughly 20% in other pools (Eggleton et  
814 al., 2007; Eggleton et al., 2010). Total pool area exceeds 13,800 ha, with mean retention time  
815 near 7 days (Eggleton et al., 2010).

816 AGFC releases 5,000 largemouth bass annually and 100,000 black crappie biannually into Lake  
817 Dardanelle.

818 Recreational fishing and tournament activity around Lake Dardanelle is robust. The annual Big  
819 Bass Bonanza spans MKARNS pools, including Dardanelle, and high-quality tournament  
820 facilities have been built at Lake Dardanelle State Park in Russellville to support numerous  
821 regional and national events (USACE, 2022).

#### 822 **4.7.3.1 Alternative 1 (No Action)**

823 Under the No Action Alternative, adverse impacts to fish species and aquatic habitat have  
824 negligible potential to occur over the long term. Continuation of the 2012 Shoreline Management  
825 Plan would allow private development along 4.9% of the shoreline through dock and vegetation  
826 modification permits, which together cover a small portion of the shoreline, however the  
827 potential for new foot path and vegetation modification permits in Wildlife Management,  
828 Environmentally Sensitive Areas, and other classifications under this alternative would leave  
829 shorelines susceptible to increased disturbance, which could negatively impact the nearby  
830 shoreline habitat for fish species.

831 Development near the water's edge often leads to removal of vegetation that provides critical  
832 habitat functions such as shading, bank stabilization, and cover for fish. Loss of overhanging  
833 vegetation, tree roots, and woody debris would reduce the availability of spawning and nursery  
834 habitat for sport and forage fishes, including largemouth bass, crappie, and sunfish. Increased  
835 shoreline disturbance could also heighten stormwater erosion and sedimentation, particularly in  
836 embayments and coves that serve as important spawning areas. Sediment deposition during  
837 spring high flows may disrupt spawning activity and reduce recruitment success.

838 Continued issuance of vegetation modification permits—such as mowing and underbrushing—

839 would further reduce shoreline complexity, potentially diminishing nearshore habitat quality for  
840 juvenile fish. Localized erosion and turbidity from increased boat traffic could resuspend  
841 nutrients and fine sediments, potentially leading to algal blooms and degraded water clarity in  
842 shallow areas. While Lake Dardanelle’s fish community remains diverse and resilient due to  
843 active AGFC management and restocking efforts, long-term shoreline disturbance under this  
844 alternative may gradually reduce habitat quality for sensitive or spawning-dependent species.  
845 Overall, there would be no change from the current impact to fish species and habitat resulting  
846 from the No Action Alternative as Lake Dardanelle would maintain current management  
847 practices and existing conditions would remain unchanged.

#### 848 **4.7.3.2 Alternative 2 (Preferred)**

849 Implementation of the Preferred Alternative would likely result in minor, long-term beneficial  
850 impacts to fish species and habitat when compared to the No Action Alternative. Shoreline  
851 allocations under this alternative shift to 21.0 miles of LDA (4.8%), 40.8 miles of Public  
852 Recreation Area (9.4%), 364.8 miles of Protected shoreline (84.1%), and 7.4 miles of Prohibited  
853 shoreline (1.7%). This redistribution increases the amount of shoreline under prohibited  
854 allocations and reduces the extent available for intensive private development.

855 Under the Preferred Alternative, new footpath and vegetation modification permits in Wildlife  
856 Management, Environmentally Sensitive Areas, and other classifications would be prohibited,  
857 potentially contributing to reduced shoreline disturbance and preserve more natural vegetation  
858 than the No Action Alternative.

859 By continuing to maintain vegetative buffers, the Preferred Alternative would stabilize soils,  
860 reduce erosion, and filter stormwater runoff before it enters the reservoir. These processes  
861 improve water clarity and reduce sediment deposition in coves and embayments that serve as  
862 critical spawning areas. The preservation of overhanging vegetation and woody cover also  
863 enhances shading and in-water structure for species such as largemouth bass, crappie, and  
864 sunfish, improving nursery habitat and community resilience.

865 Localized impacts may still occur at permitted dock sites from soil compaction and disturbance,  
866 but these are expected to be small in scale. The combination of decreased LDA and increased  
867 Prohibited shoreline allocations reduces the likelihood of habitat loss compared to No Action.

868 Overall, the Preferred Alternative would result in negligible to minor beneficial impacts to fish  
869 habitat by preserving shoreline vegetation, supporting spawning conditions, and strengthening  
870 aquatic ecosystem stability under Lake Dardanelle’s managed flow conditions.

#### 871 **4.7.4 Alternative 3 (Conservative Growth)**

872 Similar to the Preferred Alternative, Alternative 3 would likely result in minor, long-term  
873 beneficial impacts to fish species and habitat at Lake Dardanelle. Shoreline allocations under this  
874 alternative are 20.6 miles of LDA (4.8%), 40.8 miles of Public Recreation Area (9.4%), 365.2  
875 miles of Protected shoreline (84.1%), and 7.4 miles of Prohibited shoreline (1.7%). Compared  
876 with the No Action Alternative, these changes reduce the extent of shoreline available for  
877 intensive development.

878 By limiting vegetation modification to 100 feet from residences, restricting dock placement to  
879 properties within 100 feet of an LDA allocation, and narrowing footpaths to 3 feet, and

880 prohibiting new foot paths and vegetation modification permits in WM, ESA, HDR, and Project  
881 Operations MKARNS Master Plan land classifications, Alternative 3 reduces shoreline  
882 disturbance and maintains intact vegetative buffers. These buffers stabilize banks, filter runoff,  
883 and provide overhanging cover and woody structure essential for spawning and nursery habitat  
884 for sport fishes such as largemouth bass, crappie, and sunfish. Benefits to fish populations would  
885 be similar to the Preferred Alternative, but would be potentially greater due to only 2,079 total  
886 potential slips on community docks compared to 11,822 in the No Action Alternative. However,  
887 smaller sizes of community boat docks could negatively affect fish species at the lake, as many  
888 fish species use boat docks as cover from predators.

889 Over time, attrition of existing vegetation modification permits may allow disturbed areas to  
890 naturally revegetate, further enhancing shoreline stability, reducing turbidity, and improving  
891 aquatic habitat quality. Although some localized impacts from permitted docks and paths would  
892 continue, the stricter limits compared to No Action offer stronger safeguards for shoreline  
893 vegetation and fish habitat.

894 Overall, Alternative 3 would result in minor beneficial, long-term impacts to fish populations,  
895 with protections slightly stronger than those provided under the Preferred Alternative.

## 896 **4.8 Terrestrial Resources**

### 897 **Wildlife**

898 Lake Dardanelle lies within the MKARNS—a multi-use landscape managed in coordination with  
899 the Arkansas Game and Fish Commission (AGFC) and the U.S. Army Corps of Engineers  
900 (USACE) for both recreational access and wildlife resource conservation (USACE, 2025a).  
901 Common wildlife species observed include white-tailed deer, turkey, gray and fox squirrels,  
902 cottontail and swamp rabbits, and migratory waterfowl—especially mallard, pintail, wood duck,  
903 teal, scaup, and bufflehead (AGFC, 2025). The area sees notably high densities of bald eagles,  
904 which winter along the Arkansas River and Lake Dardanelle shoreline (USACE, 2025a).

905 Small game species, particularly rabbits and squirrels, are managed through open grassland and  
906 forested lease areas coordinated by USACE and AGFC. Hunting is a prominent recreational and  
907 economic use of the shoreline, with deer and waterfowl especially managed through multi-  
908 agency partnerships (AGFC, 2025).

909 Nuisance wildlife like beaver and resident Canada geese have increased beyond sustainable  
910 levels in localized areas. Beaver trapping and humane goose population control are routinely  
911 managed to prevent habitat damage and public sanitation issues (USACE, 2025a). Black vultures  
912 have also been a concern near infrastructure, with USDA efforts to deter roosting and nesting in  
913 some recreation zones (AGFC/USACE, summary).

### 914 **Invasive Species**

915 Lake Dardanelle is subject to invasive species management under Executive Order 13112 and  
916 USACE's National Invasive Species Management Plan (NISMP). Biological, mechanical, and  
917 chemical prevention and control strategies address threats such as feral swine, zebra mussels,  
918 sericea lespedeza, alligator weed, water hyacinth, emerald ash borer, tree of heaven, Chinese  
919 privet, Chinaberry, Nandina and Callery pear (USACE, 2025b). USACE collaborates with  
920 partners including USDA, AGFC, university researchers, and the U.S. Engineering, Research,  
921 and Development Center (ERDC) Aquatic Nuisance Species Task Force on research and

922 monitoring. In 2021, a Memorandum of Understanding with USDA APHIS (Animal Plant  
923 Health Inspection Service) allowed aerial hunting and trapping of feral swine to reduce  
924 population impacts on habitat and recreation access (USACE internal summary).

## 925 **Vegetation**

926 Vegetation along the Lake Dardanelle shoreline primarily consists of bottomland hardwood  
927 forests, grasslands, and maintained public use areas. Common overstory species include eastern  
928 cottonwood, green ash, willow oak, water oak, sycamore, pecan, and bur oak, particularly in  
929 low-lying floodplain areas (USACE, 2025a). Upland and transitional zones contain mixed  
930 hardwoods such as white oak, post oak, southern red oak, mockernut hickory, and shortleaf pine  
931 (*Pinus echinata*), as well as midstory and understory vegetation like dogwood, pawpaw, and red  
932 mulberry (USACE, 2025a; AGFC, 2025).

933 In areas with shallower slopes or disturbed soils, herbaceous ground cover includes native  
934 grasses, goldenrod, phlox, and other forbs. These vegetated buffers provide critical ecosystem  
935 services such as erosion control, wildlife habitat, and stormwater filtration.

936 Shoreline management policies under the revised SMP encourage the preservation of native  
937 vegetation to maintain ecological integrity and minimize sedimentation. Vegetation clearing is  
938 regulated through permitting, and vegetative modification near the shoreline is subject to  
939 USACE standards to prevent erosion and habitat degradation (USACE, 2025).

## 940 **Migratory Birds**

941 The diverse landscape of Lake Dardanelle, which includes bottomland hardwood forests,  
942 grasslands, open water, and associated wetlands, provides crucial habitat for a wide array of  
943 migratory birds. These species are protected under the Migratory Bird Treaty Act (MBTA), and  
944 the area serves as an important stopover point during spring and fall migrations, as well as a  
945 breeding and wintering ground for many.

946 The lake and its shoreline provide essential foraging, resting, and nesting opportunities.  
947 Migratory waterfowl, in particular, are common during the winter months, with notable species  
948 including mallard, pintail, wood duck, teal, scaup, and bufflehead. The area also supports notably  
949 high wintering densities of bald eagles, which are protected under both the MBTA and the Bald  
950 and Golden Eagle Protection Act. Several active bald eagle nests are present along the Lake  
951 Dardanelle shoreline, and their breeding season in the area extends from September 1 to July 31.

952 The U.S. Fish and Wildlife Service (USFWS) has identified numerous migratory birds of  
953 concern that are known or expected to be in the project area. This includes several species  
954 designated as Birds of Conservation Concern (BCC), which are species that are priorities for  
955 conservation action.

956 In addition to the species listed above, federally protected birds such as the Eastern black rail  
957 (Threatened), piping plover (Threatened), and rufa red knot (Threatened) may migrate through  
958 the project area. Any occurrences are expected to be transient, involving short-term use of  
959 sandbars for foraging and roosting during migration. The interior least tern, while delisted from  
960 the Endangered Species Act, is known to occur on Lake Dardanelle and remains protected under  
961 the MBTA. It is subject to post-delisting monitoring to ensure its population remains stable.

962 Table 4-1 lists the migratory Birds of Conservation Concern identified for the Lake Dardanelle  
963 project area and their typical breeding seasons ((USFWS, 2025a).

**Table 4-1. Birds of Conservation Concern that May Occur at Lake Dardanelle**

Species Name	Scientific Name	BCC Status	Breeding Season
American Kestrel	<i>Falco sparverius paulus</i>	BCC in specific regions	Apr 1 to Aug 31
American Golden-plover	<i>Pluvialis dominica</i>	BCC Rangewide	Breeds elsewhere
Bachman's Sparrow	<i>Peucaea aestivalis</i>	BCC Rangewide	May 1 to Sep 30
Bald eagle	<i>Haliaeetus leucocephalus</i>	N/A	Sep 1 to Jul 31
Brown-headed Nuthatch	<i>Sitta pusilla</i>	BCC in specific regions	Mar 1 to Jul 15
Chimney Swift	<i>Chaetura pelagica</i>	BCC Rangewide	Mar 15 to Aug 25
Chuck-will's-widow	<i>Antrostomus carolinensis</i>	BCC in specific regions	May 10 to Jul 10
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	BCC Rangewide	May 1 to Aug 20
Kentucky Warbler	<i>Geothlypis formosa</i>	BCC Rangewide	Apr 20 to Aug 20
Le Conte's Sparrow	<i>Ammospiza leconteii</i>	BCC Rangewide	Breeds elsewhere
Least Tern	<i>Sternula antillarum antillarum</i>	BCC Rangewide	Apr 25 to Sep 5
Lesser Yellowlegs	<i>Tringa flavipes</i>	BCC Rangewide	Breeds elsewhere
Pectoral Sandpiper	<i>Calidris melanotos</i>	BCC Rangewide	Breeds elsewhere
Prairie Warbler	<i>Setophaga discolor</i>	BCC Rangewide	May 1 to Jul 31
Prothonotary Warbler	<i>Protonotaria citrea</i>	BCC Rangewide	Apr 1 to Jul 31
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	BCC Rangewide	May 10 to Sep 10
Wood Thrush	<i>Hylocichla mustelina</i>	BCC Rangewide	May 10 to Aug 31
Source: USFWS 2025a			

#### 965 **4.8.1 Alternative 1 (No Action)**

966 Under the No Action Alternative, lands around Lake Dardanelle would continue to follow the  
 967 shoreline reallocations established in the 2012 Shoreline Management Plan.

968 This level of access and disturbance would likely result in continued vegetation clearing,  
 969 mowing, and underbrushing within permitted areas. Vegetation modification permits under the  
 970 2012 Lake Dardanelle SMP allow the cutting of woody vegetation greater than 2 inches at 4.5'  
 971 above ground level. By continuing these permitting conditions, habitat quality for wildlife  
 972 species such as deer, turkey, small mammals, and migratory birds may be adversely affected.

973 Over time, fragmentation and loss of native vegetation may affect food availability and shelter,  
 974 potentially altering seasonal wildlife distribution.

975 Additionally, continued shoreline modification increases the risk of soil erosion and stormwater  
976 runoff, degrading terrestrial and riparian habitats. Nuisance species such as resident Canada  
977 geese, beaver, and black vultures could further proliferate in disturbed or modified areas,  
978 requiring ongoing control measures. Invasive plant and animal species (e.g., feral swine, zebra  
979 mussels, gypsy moth, alligator weed, emerald ash borer, etc.) are also more likely to expand in  
980 disturbed corridors, reducing ecosystem resilience, although currently the lake employs invasive  
981 species management protocols currently for feral swine, gypsy moth, and alligator weed.

982 Overall, there would be no changes from the current impacts to terrestrial resources resulting  
983 from the No Action Alternative, as Lake Dardanelle would maintain current management  
984 practices and existing conditions would remain unchanged.

#### 985 **4.8.2 Alternative 2 (Preferred)**

986 Implementation of the Preferred Alternative would result in negligible to minor, long-term  
987 beneficial impacts to terrestrial resources compared to the No Action Alternative. Shoreline  
988 allocations under this alternative shift to 21.0 miles of LDA (4.8%), 40.8 miles of Public  
989 Recreation Area (9.4%), 364.8 miles of Protected shoreline (84.1%), and 7.4 miles of Prohibited  
990 shoreline (1.7%). Compared to No Action, the increase in Prohibited shoreline allocations and  
991 decrease in LDA, reduces the percentage of shoreline open to private use and development.

992 Boat dock and vegetation modification permits would remain the same as the No Action  
993 Alternative. However, new stair and step and would generally not be permitted, and the  
994 maximum diameter of cut vegetation would be limited to 2 inches at ground level compared to 2  
995 inches at breast height in the No Action Alternative. These provisions provide modest benefits to  
996 shoreline vegetation, supporting habitat for deer, turkey, rabbits, squirrels, and numerous  
997 migratory birds, while reducing disturbance to sensitive nesting and feeding areas.

998 Although some vegetation modification would still occur—such as limited underbrush removal  
999 in designated areas—the scope of disturbance would be more limited than under the No Action  
1000 Alternative. This would reduce fragmentation, limit soil compaction along shoreline paths, and  
1001 help mitigate invasive species spread. Restrictions on goose management, beaver control, and  
1002 other nuisance species measures would remain in effect, supporting balanced terrestrial  
1003 ecosystem conditions.

1004 Overall, Alternative 2 would marginally enhance terrestrial habitat protection compared to  
1005 current conditions by reducing the proportion of shoreline available for disturbance and  
1006 expanding allocations that prioritize natural vegetation. These measures are expected to benefit  
1007 both resident and migratory wildlife populations and contribute to long-term shoreline stability.

#### 1008 **4.8.3 Alternative 3 (Conservative Growth)**

1009 Alternative 3 would result in minor, long-term beneficial impacts to terrestrial resources, similar  
1010 to the Preferred Alternative. Shoreline allocations under this alternative include 20.6 miles of  
1011 LDA (4.8%), 40.8 miles of Public Recreation Area (9.4%), 365.2 miles of Protected shoreline  
1012 (84.1%), and 7.4 miles of Prohibited shoreline (1.7%). With (0.8%) of the shoreline no longer  
1013 classified as LDA, opportunities for disturbance are further reduced compared to the No Action  
1014 Alternative, helping preserve large areas of intact wildlife habitat.

1015 New dock permits would only be given to properties with access within 100 feet of an LDA  
1016 allocation, and vegetation modification permits would also be capped at 100 feet from the

1017 foundation of a residence. In addition, permitted footpaths would be restricted to a maximum  
1018 width of 3 feet. These measures provide stricter limits than the Preferred Alternative, further  
1019 reducing shoreline disturbance, protecting vegetative buffers, and supporting wildlife corridors  
1020 along the shoreline.

1021 Potential slips for community docks would be limited to 7 per dock, which would substantially  
1022 decrease the amount of recreation boats on the lake, providing substantial benefits to terrestrial  
1023 resources as boats contribute to erosion of shorelines from their wake, which decreases the  
1024 vegetation along the shoreline which provides habitat and food for wildlife.

1025 Although existing vegetation and dock permits would remain in place, attrition of older permits  
1026 over time would allow disturbed areas to revegetate naturally, enhancing food availability,  
1027 nesting habitat, and migration corridors for terrestrial wildlife such as deer, small mammals, and  
1028 migratory birds.

1029 Overall, Alternative 3 offers a high level of protection for terrestrial resources by minimizing  
1030 future disturbance through stricter permitting qualifications, decreasing shoreline areas under  
1031 LDA allocations, and encouraging natural regeneration. The cumulative effect would be  
1032 beneficial to wildlife habitat and ecosystem function, with slightly stronger protections than  
1033 Alternative 2.

#### 1034 **4.9 Threatened and Endangered Species**

1035 There are many species in the Arkansas Valley ecoregion that are considered either threatened,  
1036 endangered, or state species of concern. Species become listed for a variety of reasons including  
1037 over-hunting, over-fishing, and habitat loss as a result of human development and pollution. Of  
1038 these, habitat loss is the main contributor that imperils most species.

#### 1039 **Federally Listed Threatened and Endangered Species**

1040 The Endangered Species Act (ESA) of 1973 establishes protections for fish, wildlife, and plants  
1041 that are listed as threatened or endangered. Threatened species are those which are likely to  
1042 become endangered within the foreseeable future. Endangered species are in danger of extinction  
1043 throughout all or a significant portion of their range. The U.S. Fish and Wildlife Service  
1044 (USFWS) also identifies species that are candidates and proposed for listing as a result of  
1045 identified threats to their continued existence. The Candidate designation includes those species  
1046 for which USFWS has sufficient information to support proposals to list as endangered or  
1047 threatened under the Endangered Species Act; however, proposed rules have not yet been issued  
1048 because such actions are precluded at present by other listing activity. The Proposed designation  
1049 (either threatened or endangered) includes those species that USFWS has determined are in  
1050 danger of extinction or likely to become endangered throughout all or significant portions of its  
1051 range, and for which a draft rule to list as threatened or endangered has been proposed. The  
1052 USFWS Information for Planning and Consultation (IPaC) tool was utilized to determine species  
1053 listed under the Endangered Species Act potentially located in the Lake Dardanelle area, and the  
1054 IPaC report can be found in Appendix B of this EA and in Table 4-2 below (USFWS, 2026a). No  
1055 critical habitat was found within the project area.

1056 **Table 4-2: USFWS Special Status and Threatened and Endangered Species**

Common Name	Scientific Name	Federal Status
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bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA*
gray bat	<i>Myotis grisescens</i>	Endangered
Indiana bat	<i>Myotis sodalis</i>	Endangered
tricolored bat	<i>Perimyotis subflavus</i>	Proposed Endangered
interior least tern	<i>Sterna antillarum athalassos</i>	Delisted***
Eastern black rail	<i>Laterallus jamaicensis ssp. Jamaicensis</i>	Threatened
piping plover	<i>Charadrius melodus</i>	Threatened
rufa red knot	<i>Calidris canutus rufa</i>	Threatened
alligator snapping turtle	<i>Macrochelys temminckii</i>	Proposed Threatened
Western fanshell	<i>Cyprogenia aberti</i>	Threatened
American burying beetle	<i>Nicrophorus americanus</i>	Threatened
monarch butterfly	<i>Danaus Plexippus</i>	Proposed Threatened
Source: USFWS 2026a		
* Protected under Bald and Golden Eagle Protection Act.		
*** ILT has been delisted - ESA requires the Service, in cooperation with states, and USACE to monitor species after delisting to ensure species remains stable.		

1057 The bald eagle (*Haliaeetus leucocephalus*) is common around the MKARNS and several active  
1058 nests are present along the Lake Dardanelle shoreline. In addition, bald eagle nests are frequently  
1059 dispersed around the Arkansas River. Although the bald eagle was delisted by the USFWS in  
1060 2007 due to recovery of the species, both the bald and golden eagles are still protected in  
1061 accordance with the Bald and Golden Eagle Protection Act. USACE works closely with the  
1062 USFWS to protect the USACE owned riparian areas surrounding eagle critical habitat while  
1063 managing the project lands and waters of Lake Dardanelle to protect the water and habitat  
1064 quality of federally listed threatened and endangered (T&E) species.

1065 The gray bat is a medium-size bat with a 10-11 inch wingspan. It has grayish-brown fur and is  
1066 the only bat in its range with unicolored dorsal hairs. The fur is usually gray in color, but may be  
1067 chestnut brown or russet. The distribution of this species is limited to areas of the Southeastern  
1068 United States containing limestone caves and have been documented at Lake Dardanelle. Major  
1069 populations are located in Alabama, Arkansas, Kentucky, Missouri, and Tennessee. Transient  
1070 populations of gray bats might be present in the upper pools of the MKARNS. This species  
1071 roosts almost exclusively in caves year-round and has very specific requirements. However,  
1072 there are some reports of colonies using storm sewers and mines as roosts. Winter caves must be  
1073 cold, deep, and have vertical walls. This species is very temperature sensitive, and winter roosts  
1074 must range in temperature between 42 °F and 52 °F. Summer caves must be warm (57 °F-77 °F)  
1075 or contain tightly restricted rooms that can trap the body heat of roosting bats. Summer caves are  
1076 usually located close to rivers and lake shorelines near feeding areas. Bats are known to travel up  
1077 to 12 miles from their colonies to feed. The primary reasons for decline of this species are  
1078 considered to be White-nose Syndrome, a deadly disease affecting cave-dwelling bats across the  
1079 continent; human disturbances of hibernacula and maternity caves: poisoning from pesticides;  
1080 loss of habitat due to construction of impoundments and commercialization of caves. As a result,  
1081 the gray bat was listed as Endangered by the USFWS on April 28, 1976 (41 FR 17740). No  
1082 critical habitat is listed for this species. No known caves, hibernaculum, or roosting sites for gray

1083 bats are known to be located on Lake Dardanelle. One hibernaculum utilized by gray bats is in  
1084 proximity of the USACE fee property on Lake Dardanelle near Old Post Road Park.  
1085 Additionally, a radio telemetry study conducted in 2019 indicated that gray bats were detected on  
1086 Lake Dardanelle for only one night, suggesting the seasonal movement rather than continual use  
1087 of the area (Britzke, 2019).

1088 The Indiana bat is a small, insectivorous, migratory bat that hibernates colonially in caves and  
1089 mines in the winter. Indiana bats require forests for foraging and roosting and are found in  
1090 forested areas in the eastern half of the United States, which includes Lake Dardanelle. In winter,  
1091 Indiana bats hibernate in caves and mines. Threats to the species include human disturbance of  
1092 hibernating bats, commercialization of caves where the bats hibernate, loss of summer habitat,  
1093 pesticides and other contaminants, and most recently, the disease White-nose syndrome. The  
1094 range-wide population has declined by 19% since 2007, when white-nose syndrome first arrived  
1095 in North America. A radio telemetry study conducted in 2021 indicated a female Indiana bat  
1096 stayed a few nights on the lake during her spring migration (Roby, et al. 2021).

1097 The tricolored bat (TCB) is currently listed as a proposed endangered species as they face  
1098 extinction due to the impacts of White-nose syndrome. During the winter, tricolored bats are  
1099 found in caves and mines, and occasionally road-associated culverts in the southern United  
1100 States. During the spring, summer, and fall, these bats are found in forested habitats where they  
1101 roost in deciduous hardwood trees, both alive and recently dead. They have also been observed  
1102 roosting in Spanish moss, lichen, and manmade structures like barns, bridges, and culverts  
1103 (USFWS, 2025a). The TCB bat has a wide range that encompasses most of the American  
1104 southeast, which includes Lake Dardanelle. Tricolored bats are not known to occur on Lake  
1105 Dardanelle, but have been recorded on acoustic in neighboring Ozark Lake according to ERDC  
1106 surveys (Britzke, 2019). The USACE Little Rock District plans to coordinate with the USFWS to  
1107 create a Programmatic Biological Opinion (PBO) for all listed bat species, which would cover  
1108 each Little Rock District Project, but in the interim, presence/absence surveys will continue to be  
1109 conducted for all necessary upcoming projects.

1110 The Northern long-eared bat, which is also listed as endangered, have been captured in mist nets  
1111 in the Spadra Creek region of Lake Dardanelle in the past, but their current range extent does not  
1112 include Lake Dardanelle.

1113 Attention is provided when conducting prescribed burning as to not negatively impact important  
1114 habitat. Tree cutting as a forestry practice would only occur in coordination with the USFWS to  
1115 remove timber during the winter months or with a negative population survey for harvesting in  
1116 the summer months.

1117 Federally-listed bird species known to migrate through Franklin, Pope, Logan, Johnson, Yell  
1118 County include the Eastern black rail, piping plover, and rufa red knot. While these bird species  
1119 may migrate through the Lake Dardanelle area, there are no known occurrences or critical habitat  
1120 within the footprint of this project. Any occurrences would be short-term use of sandbars for  
1121 foraging and roosting during fall and spring migrations.

1122 Alligator Snapping Turtles (AST) are generally found in deeper water of large rivers and their  
1123 major tributaries; however, they are also found in a wide variety of habitats, including small  
1124 streams, bayous, canals, swamps, lakes, reservoirs, ponds, and oxbows. ASTs more often select  
1125 structure (i.e. tree root masses, stumps, submerged trees, etc.) than open water and may select  
1126 sites with a high percentage of canopy cover. These turtles are opportunistic scavengers, with

1127 fish comprising a significant portion of their diet. They may also consume crayfish, mollusks,  
1128 smaller turtles, insects, nutria, snakes, birds, and vegetation (USFWS, 2025b). ASTs are known  
1129 to occur within Lake Dardanelle, its surrounding lands, and its tributaries.

1130 The interior least tern (ILT) (*Sterna antillarum athalassos*) was listed in 1985 and is known to  
1131 occur on Lake Dardanelle. Since 2000, the USACE has partnered with Arkansas Tech University  
1132 to survey for ILT. In 2021, the USFWS issued a final rule to remove the inland population from  
1133 the Endangered Species Act (ESA) and in turn add the ILT to the delisting monitoring period.  
1134 The USFWS in cooperation with the USACE and Arkansas Tech University will continue to  
1135 monitor the ILT population and manage habitat under guidance established by the Southwestern  
1136 Division Conservation Plan. The ESA requires a minimum post monitoring period of 5-years  
1137 and, considering the longevity of the species, this time could increase. In addition, the interior  
1138 least tern, is also protected by the Migratory Bird Treaty Protection Act.

1139 The western fanshell (*Cyprogenia aberti*) is a freshwater mussel. They have a thick, compressed  
1140 to moderately inflated, round to triangular shell that is up to 3 inches in length, that is dull tan in  
1141 color and has a wrinkled appearance. The western fanshell is currently found in the Lower  
1142 Mississippi-St. Francis, Neosho-Verdigris and Upper White River basins, in Arkansas, Kansas,  
1143 Missouri and Oklahoma. It is considered extirpated from the Lower Arkansas basin. This species  
1144 is typically found in large creeks and rivers with good water quality, moderate to swift current  
1145 and gravel-sand substrates. Like all mussels, the western fanshell is an omnivore that primarily  
1146 filter feeds on a wide variety of microscopic particulate matter suspended in the water column,  
1147 including phytoplankton, zooplankton, bacteria, detritus and dissolved organic matter. As with  
1148 most freshwater mussels, western fanshells have a unique life cycle that relies on fish hosts for  
1149 successful reproduction. Larval-stage mussels, called glochidia, attach themselves to host fish.  
1150 Logperch, slenderhead darter, fantail darter and rainbow darter serve as host fish for the western  
1151 fanshell. The western fanshell may occur on Lake Dardanelle but has not been observed at the  
1152 lake (USFWS, 2025c).

1153 The American burying beetle (ABB) (*Nicrophorus americanus*) is classified as threatened under  
1154 the Endangered Species Act (reclassified in 2020). Its remaining U.S. populations include  
1155 scattered occurrences in Arkansas. Although the species has not been documented directly in the  
1156 Lake Dardanelle shoreline area, the area may occur on Lake Dardanelle. ABB habitat typically  
1157 includes grassland or lightly wooded areas with accessible carrion and suitable soil conditions.  
1158 When the species was listed as endangered, a Conservation Management Plan for ABB was  
1159 developed and approved by USFWS. The plan places 1,546 acres aside for mitigation in  
1160 neighboring Blue Mountain Lake in response to land management practices determined to be  
1161 detrimental to the consultation areas of the species identified by the USFWS in the MKARNS,  
1162 Ozark Lake, and Blue Mountain Lake fee land area. The permit for this survey expired in 2023,  
1163 therefore mitigation efforts for the ABB are no longer active at Blue Mountain Lake.

1164 The monarch butterfly is listed as a proposed threatened species due to its population decline  
1165 over the past two decades. The iconic orange and black butterfly is known for its lengthy  
1166 migration, from as far as Canada and across the United States to forested overwintering sites in  
1167 the mountains of central Mexico and coastal California. Primary drivers affecting the health of  
1168 the two North American migratory populations are changes in breeding, migratory, and  
1169 overwintering habitat as well as continued exposure to insecticides and effects of climate change  
1170 (USFWS, 2025d). Monarchs are known to occur on fee lands associated with Lake Dardanelle.

1171 **State-Listed Rare, Threatened and Endangered Species**

1172 The Arkansas Natural Heritage Commission (ANHC) maintains a biodiversity database that  
 1173 tracks the location and status of rare species of animals and plants as well as natural communities  
 1174 in Arkansas. Table 4-3 below depicts state listed species of concern that may be located within  
 1175 Lake Dardanelle project lands and/or surrounding areas that have been documented by the  
 1176 ANHC (ANHC, 2025).

1177 **Table 4-3: Arkansas Natural Heritage Special Status Species**

Common Name	Scientific Name	Federal/State Status	State/Global Rank
American Eel	<i>Anguilla rostrata</i>	INV	S2S3 / G4
Highland Darter	<i>Etheostoma teddyroosevelt</i>	INV	S3 / GNR
six-angled Spurge	<i>Euphorbia hexagona</i>	INV	S1 / G5
Bald Eagle	<i>Haliaeetus leucocephalus</i>	INV	S3B,S4N / G5
Crawfish Frog	<i>Lithobates areolatus</i>	SOC	S2 / G4
Alligator Snapping Turtle	<i>Macrochelys temminckii</i>	PT, INV	S3S4 / G3
Pealip Redhorse	<i>Moxostoma pisolabrum</i>	INV	S3 / G5
gray bat	<i>Myotis grisescens</i>	LE, INV	S2S3 / G3G4
northern long-eared bat	<i>Myotis septentrionalis</i>	LE, INV	S1S2 / G2G3
Slenderhead Darter	<i>Percina sp. cf. phoxocephala 2</i>	INV	S1 / G3G4
Osage Burrowing Crayfish	<i>Procambarus liberorum</i>	INV	S3S4 / G3G4
Strecker's Chorus Frog	<i>Pseudacris streckeri</i>	INV	S2 / G5
Queensnake	<i>Regina septemvittata</i>	INV	S1 / G5
California bulrush	<i>Schoenoplectus californicus</i>	INV	S1S2 / G5
Riddell's Spikemoss	<i>Selaginella arenicola ssp. riddellii</i>	INV	S3 / G4T4
fragrant ladies'-tresses	<i>Spiranthes odorata</i>	INV	S1 / G5
Interior Least Tern	<i>Sternula antillarum athalassos</i>	INV	S3B / G4T3
Ozark Cornsalad	<i>Valerianella ozarkana</i>	INV	S3 / G3
squirrel-tail six-weeks grass	<i>Vulpia sciurea</i>	INV	S1 / G5
Colonial nesting site, swallows & swifts		INV	SNR / GNR
Colonial nesting site, water birds		INV	SNR / GNR
<p>*<b>LE:</b> Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.</p> <p>*<b>PT:</b> Proposed Threatened; the U.S. Fish and Wildlife Service has proposed this species for listing as threatened. Species Act.</p> <p>*<b>INV:</b> Inventory Element - The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may</p>			

include outstanding examples of Natural Communities or animal assemblages as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements. The ranking system helps clarify the conservation status of each species at both the state (Arkansas) and global levels.

**\*T-RANKS - Intraspecific Taxon (trinomial):** The status of intraspecific taxa (subspecies or varieties) are indicated by a "Trank" following the species' global rank. Rules for assigning T-ranks follow the same principles as those for GRANKS.

**\*S-Rank (State Rank for Arkansas):**

**S1:** Critically imperiled in the state. At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

**S2:** Imperiled in the state. At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

**S3:** Vulnerable in the state. At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

**S4:** Apparently secure in the state. At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

**SNR:** Unranked. The state rank not yet assessed.

**B/N Qualifiers:** For migratory species like the Bald Eagle, "B" refers to the breeding population and "N" refers to the non-breeding population. So, S2B,S4N means the breeding population is Imperiled, but the non-breeding (wintering) population is Apparently Secure.

**\*G-Rank (Global Rank):**

**G1:** Critically imperiled globally. At a very high risk of extinction due to extreme rarity, very steep declines, very severe threats or other factors.

**G2:** Imperiled globally. At high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats or other factors.

**G3:** Vulnerable globally. At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

**G4:** Apparently secure globally At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

**G5:** Secure globally. At very low risk or extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.

**GNR =** Unranked. The global rank not yet assessed.

1178 **4.9.1 Alternative 1 (No Action)**

1179 Under the No Action Alternative, Lake Dardanelle would continue operating under the 2012  
1180 Shoreline Management Plan with no new shoreline policies. Existing allocations, including  
1181 Limited Development Areas (LDAs), Protected Areas, Public Recreation Areas, and Prohibited  
1182 Areas, would remain unchanged. The greatest potential for impacts to T&E species would occur  
1183 in LDAs, where new boat dock and vegetation modification permits are allowed, increasing the  
1184 likelihood of localized ground disturbance.

1185 Species such as the Indiana bat and tricolored bat may roost in mature hardwoods or pine stands  
1186 near shorelines. Increased vegetation removal or trimming in LDAs could negatively affect

1187 potential roosting habitat, though impacts would be expected to be negligible to minor due to  
1188 permit restrictions requiring case-by-case review and coordination with USFWS. Similarly, the  
1189 American burying beetle could be indirectly affected if shoreline disturbance alters soils in  
1190 riparian consultation zones.

1191 The bald eagle is commonly observed around Lake Dardanelle, and nests are dispersed along the  
1192 river. Potential dock construction and vegetation modification could remove large dead trees  
1193 used for perching or nesting, but any ground-disturbing activity would require a NEPA review  
1194 and if impacts to a listed species is expected, consultation with USFWS.

1195 Other species of concern, including the alligator snapping turtle and monarch butterfly, could  
1196 face minimal indirect impacts through increased shoreline disturbance, particularly in LDAs,  
1197 though current SMP permitting practices already include avoidance and minimization measures.  
1198 The western fanshell would continue to face moderate indirect impacts through the oil pollution  
1199 from recreational boats and potential decreased water quality that could be exacerbated by  
1200 boating wakes that cause erosion of the shoreline.

1201 Shoreline management plans provide management guidelines for a multitude of activities on  
1202 USACE-owned properties. While this alternative would entail the continued use of the 2012  
1203 SMP, approval of any ground disturbing activities would require site-specific permit review and  
1204 NEPA analyses. As such, the USACE has determined that implementation of the No Action  
1205 Alternative will have No Effect on the gray bat, Indiana bat, Eastern black rail, piping plover,  
1206 rufa red knot, western fanshell, and American burying beetle, and would not threatened the  
1207 continued existence of the tricolored bat, alligator snapping turtle, and monarch butterfly.

1208 By allowing continued dock permitting and vegetation modification in LDAs, there is the  
1209 potential for adverse impacts on roosting habitat, nesting trees, and shoreline soils important to  
1210 species such as bats, bald eagles, and the American burying beetle. Any future proposed ground-  
1211 disturbing activities would require permit review and compliance with the ESA, which serves as  
1212 the primary safeguard for these resources.

#### 1213 **4.9.2 Alternative 2 (Preferred)**

1214 Under Alternative 2, shoreline allocations would shift to 21.0 miles of LDA (4.8%), 40.8 miles  
1215 of Public Recreation Area (9.4%), 364.8 miles of Protected shoreline (84.1%), and 7.4 miles of  
1216 Prohibited shoreline (1.7%). Compared to the No Action Alternative, this reduces LDA mileage  
1217 by 0.4 miles and increases Prohibited shoreline by a combined 6.5 miles, expanding areas where  
1218 development is restricted. Permit conditions would be the same as the No Action Alternative,  
1219 however, no permits will be issued within the Federal recommended distance of a known  
1220 federally protected, threatened, or endangered species location and/or habitat.

1221 These changes directly benefit T&E species by reducing opportunities for new docks, vegetation  
1222 clearing, and footpath construction that could otherwise disturb roosting or foraging habitat for  
1223 bats (gray bat and tricolored bat), eagle nesting trees, and shoreline soils or aquatic margins used  
1224 by American burying beetles, alligator snapping turtles, monarch butterflies, Rufa red knots,  
1225 interior least terns, Eastern black rail, and piping plovers.

1226 Localized impacts could still occur in LDAs, but with fewer shoreline miles allocated to that use  
1227 and added restrictions, the potential scale of effects is greatly reduced. All ground-disturbing  
1228 activities would continue to require a NEPA review.

1229 Similar to the No Action Alternative, implementation of the Preferred Alternative does not entail  
1230 any ground disturbing activities that could in any way disturb species, USACE has determined  
1231 that the Preferred Alternative will have No Effect on the gray bat, Indiana bat, Eastern black rail,  
1232 piping plover, rufa red knot, western fanshell, and American burying beetle and would not  
1233 threatened the continued existence of the tricolored bat, alligator snapping turtle, and monarch  
1234 butterfly.

#### 1235 **4.9.3 Alternative 3 (Conservative Growth)**

1236 Under Alternative 3, shoreline allocations shift to 20.6 miles of LDA (4.8%), 40.8 miles of  
1237 Public Recreation Area (9.4%), 365.2 miles of Protected shoreline (84.1%), and 7.4 miles of  
1238 Prohibited shoreline (1.7%). Compared to the No Action Alternative, this reduces LDA mileage  
1239 by 0.8 miles and expands Prohibited shoreline by 6.5 miles, further limiting areas subject to  
1240 potential disturbance.

1241 These reallocations enhance protection of T&E species habitat. Reductions in LDA shoreline  
1242 decrease potential impacts to roosting and foraging habitat for bats and eagle nesting trees. The  
1243 larger share of shoreline in Prohibited status and limitations on community boat dock slips to 7  
1244 per dock compared to 20 in the No Action Alternative provides stronger safeguards for riparian  
1245 buffers and aquatic margins critical to sensitive species.

1246 Restrictions under Alternative 3 are stricter than those under Alternative 2. New dock permits  
1247 would only allowed for properties within 100 feet of an LDA allocation, vegetation modification  
1248 permits would be capped at 100 feet from a home's foundation, and permitted footpaths would  
1249 be limited to 3 feet in width. No new steps or stairs would be authorized. In addition, no permits  
1250 will be issued within the Federal/State recommended distance of a known federally protected,  
1251 threatened, or endangered species location and/or habitat, further minimizing potential impacts.

1252 While minor localized impacts could still occur in LDAs, the stricter permit limits and reduced  
1253 shoreline mileage allocated to development make overall effects less likely than under  
1254 Alternative 2 or No Action.

1255 Because implementation of the Conservative Growth Alternative does not entail any ground  
1256 disturbing activities that could in any way disturb species, USACE has determined that the  
1257 Preferred Alternative will have No Effect on the gray bat, Indiana bat, Eastern black rail, piping  
1258 plover, rufa red knot, western fanshell, and American burying beetle and would not threatened  
1259 the continued existence of the tricolored bat, alligator snapping turtle, and monarch butterfly.

#### 1260 **4.10 Wetlands**

1261 Wetlands are dynamic habitats at the interface of land and water, characterized by hydric soils,  
1262 hydrophytic vegetation, and frequent saturation—providing critical resources for waterfowl, fish,  
1263 amphibians, and other wildlife. In accordance with national USACE policy, wetlands at  
1264 operational projects are inventoried using the protocol established by the USFWS in their  
1265 Classification of Wetlands and Deepwater Habitats of the United States. While the main river  
1266 channel of Lake Dardanelle is classified as lacustrine, the shoreline acreage in the system is  
1267 classified as palustrine (standing dead timber and vegetated shorelines). Palustrine wetlands  
1268 include freshwater ponds, freshwater emergent, and shoreline wetlands, which include a mixture  
1269 of scrub/shrub (species of 6 meters or less in height) or forested (species of greater than 6 meters  
1270 in height) wetland species. Palustrine forested/shrub wetlands also occur in the feeder streams'

1271 floodplains and are called riverine wetlands. According to the USFWS NWI, palustrine wetlands  
1272 occupy approximately 2,106 acres of the 31,100 acres in the project area (NWI, 2025). Wetland  
1273 acreages designated by the NWI are subdivided by pools created by the locks and dams in the  
1274 navigation system and listed in the subsequent paragraphs. composed of freshwater forested and  
1275 emergent zones, including embayments formed by Illinois Bayou, Big Piney Creek, and Shoal  
1276 Creek (USFWS NWI, data compiled by USACE). These wetlands provide essential buffers,  
1277 habitat, and water filtration functions along the shoreline.

#### 1278 **4.10.1 Alternative 1 (No Action)**

1279 Under the No Action Alternative, the 2012 Shoreline Management Plan would remain in effect,  
1280 and shoreline use permits for docks, vegetation modification, and mowing would continue under  
1281 existing conditions. Wetlands within Lake Dardanelle—including palustrine emergent, scrub-  
1282 shrub, and forested wetlands located along embayments such as Illinois Bayou, Big Piney Creek,  
1283 and Shoal Creek—could be indirectly affected by these ongoing activities. Continued  
1284 development pressure in Limited Development Areas could lead to incremental vegetation  
1285 removal, mowing, and ground disturbance, which may reduce the abundance and diversity of  
1286 hydrophytic plants that support amphibians, reptiles, migratory birds, and mammals.

1287 Soil disturbance associated with dock access and vegetation modification could also increase  
1288 erosion and runoff during storm events, leading to localized sedimentation in wetland areas.  
1289 Over time, this could alter wetland hydrology by reducing infiltration capacity and diminishing  
1290 the wetlands' ability to filter pollutants and buffer stormwater flows. Wildlife that relies on these  
1291 wetlands for nesting, foraging, and shelter may experience localized habitat fragmentation or  
1292 reduced cover, particularly during critical breeding and migration periods.

1293 There would be no change from the current impacts to wetlands as a result of implementing the  
1294 No Action Alternative, since there would be no change to the existing Shoreline Management  
1295 Plan.

#### 1296 **4.10.2 Alternative 2 (Preferred)**

1297 Under the Preferred Alternative, wetlands along Lake Dardanelle would generally be afforded  
1298 greater protection compared to the No Action Alternative. Shoreline allocations under this  
1299 alternative shift to 21.0 miles of LDA (4.8%), 40.8 miles of Public Recreation Area (9.4%),  
1300 364.8 miles of Protected shoreline (84.1%), and 7.4 miles of Prohibited shoreline (1.7%).  
1301 Compared to the No Action Alternative, this reduces the extent of LDA shoreline and increases  
1302 Prohibited allocations, limiting opportunities for new disturbance in wetland areas.

1303 Permit conditions such as limiting dock placement and vegetation modification to within 200  
1304 feet of residences remain consistent with the No Action Alternative. However, because fewer  
1305 shoreline miles would be allocated to LDAs compared to the No Action Alternative, the overall  
1306 scale of potential wetland disturbance from permitted docks and vegetation clearing would be  
1307 marginally lower. The increase in Prohibited shoreline further ensures that wetland vegetation  
1308 and soils are maintained in sensitive areas, preserving hydrophytic communities that stabilize  
1309 banks, filter runoff, and provide habitat for amphibians, reptiles, birds, and mammals.

1310 Overall, impacts under this alternative would be minor, long-term, and beneficial. By shifting  
1311 shoreline allocations toward greater protection and limiting disturbance to shorelines by  
1312 marginally decreasing LDA and increasing Prohibited shoreline, Alternative 2 would provide

1313 marginally improvements to the preservation of wetland functions—habitat support, water  
1314 filtration, and shoreline buffering—while slightly reducing development pressure compared to  
1315 the No Action Alternative.

### 1316 **4.10.3 Alternative 3 (Conservative Growth)**

1317 Under Alternative 3, wetlands at Lake Dardanelle would benefit from more protective shoreline  
1318 allocations compared to the No Action Alternative, with slightly stronger restrictions than  
1319 Alternative 2. Shoreline allocations under this alternative include 20.6 miles of LDA (4.8%),  
1320 40.8 miles of Public Recreation Area (9.4%), 365.2 miles of Protected shoreline (84.1%), and 7.4  
1321 miles of Prohibited shoreline (1.7%). Compared to No Action, this reduces LDA mileage and  
1322 increases Prohibited allocations, limiting opportunities for wetland disturbance.

1323 New dock permits would only be allowed within 100 feet of shoreline access, and vegetation  
1324 modification permits would be capped at 100 feet from the foundation of a home and community  
1325 boat docks would be limited to 7 per dock. These limits would substantially reduce the risk of  
1326 disturbance to palustrine wetlands around embayments such as Illinois Bayou, Big Piney Creek,  
1327 and Shoal Creek. The narrower setback distances mean greater retention of shoreline vegetation,  
1328 which supports wetland hydrology, stabilizes soils, and provides essential cover and food sources  
1329 for amphibians, reptiles, birds, and mammals.

1330 While localized impacts could still occur from continued use of existing permits or limited  
1331 underbrush removal, the overall scale of disturbance would remain low. Over time, attrition of  
1332 older permits may allow natural revegetation of disturbed areas, further strengthening wetland  
1333 buffers and enhancing habitat functions.

1334 Overall, impacts under Alternative 3 would be minor, long-term, and beneficial. Compared with  
1335 both No Action and the Preferred Alternative, this alternative provides stronger wetland  
1336 protections due to more restrictive shoreline allocations and reduced scope for new disturbance.

## 1337 **4.11 Archaeological and Historic Resources**

### 1338 **4.11.1 Cultural Resources**

1339 This section presents information on archeological and architectural resources located on  
1340 USACE lands of Lake Dardanelle. The discussion includes a description of methods used to  
1341 identify existing archeological and architectural resources, and the number and types of  
1342 archeological and architectural resources known within the areas owned in fee and the number  
1343 of archeological and architectural resources that are listed or eligible for the National Register  
1344 of Historic Places (NRHP) in those areas.

1345 Cultural resources are prehistoric and historic sites, structures, districts, artifacts, or any other  
1346 physical evidence of human activity considered important to a culture, subculture, or  
1347 community for traditional, religious, scientific, or any other reason. Cultural resources are  
1348 discussed in terms of archeological sites, which include both prehistoric and historical  
1349 occupations either submerged or on land, and architectural resources. Archeological sites can  
1350 become submerged when they are inundated following impoundment of rivers, and shipwrecks  
1351 are a specific type of submerged archeological site.

1352 Stewardship of cultural resources on USACE Civil Works water resources projects is an  
1353 important part of the overall Federal responsibility. Numerous laws pertaining to identification,

1354 evaluation, and protection of cultural resources, Native American rights, curation and  
1355 collections management, and the protection of resources from looting and vandalism establish  
1356 the importance of cultural resources to our Nation’s heritage. Guidance is derived from  
1357 numerous cultural resources laws and regulations, including Sections 106 and 110 of the  
1358 National Historic Preservation Act (NHPA) of 1966; Archaeological Resources Protection Act  
1359 (ARPA) of 1979; Native American Graves Protection and Repatriation Act (NAGPRA); and 36  
1360 CFR Part 79, Curation of Federally-Owned and Administered Archeological Collections.  
1361 Implementing regulations for Section 106 of the NHPA and NAGPRA are 36 CFR Part 800 and  
1362 43 CFR Part 10, respectively. All cultural resources laws and regulations should be addressed  
1363 under the requirements of NEPA, as applicable.

1364 In accordance with Section 106 of the NHPA, any proposed ground-disturbing activities or  
1365 projects, such as those described in the Shoreline Management Plan may be subject to review  
1366 by the district archeologist. Resources determined eligible for the NRHP must be protected  
1367 from proposed project impacts or the impacts must be mitigated. All future cultural resource  
1368 investigations at Lake Dardanelle would be coordinated with the State Historic Preservation  
1369 Officer (SHPO) and federally recognized Tribes to ensure compliance with the NHPA, the  
1370 ARPA, and the NAGPRA.

#### 1371 **4.11.2 Cultural Overview**

1372 Use of the Arkansas River system as a major means of travel, commerce, and for military  
1373 purposes predates European contact. Cultural resources are present along the river spanning the  
1374 period of human occupation in the region, from Paleoindian through the historic era to the  
1375 present. Sites in the project area include lithic scatters, rock or bluff shelters, camps, villages,  
1376 special use/resource extraction sites, fish weirs, mounds, burials, middens, historic sites such as  
1377 farmstead and town sites, ferry landings, wharfs, mills, dams, bridges, and watercraft –  
1378 including canoes, boats, flatboats, barges, keelboats, dredges, and steamboats. These sites may  
1379 be on land or submerged beneath the waters of the system. Only portions of Lake Dardanelle  
1380 have been systematically surveyed for cultural resources, so the known cultural resources are  
1381 discussed below. These resources include all archeological sites and architectural resources,  
1382 including those listed on and eligible for the NRHP or listed in the State inventory.

#### 1383 **Recorded Cultural Resources of Lake Dardanelle, Dardanelle Lock & Dam**

1384 A number of archeological surveys have been conducted at the Lake Dardanelle reservoir  
1385 bottom, at all non-inundated fee land, and at all of the public use areas. To date, 258  
1386 archeological sites have been recorded on USACE lands at Pool 10 (Almy et al 2018, Almy et al  
1387 2019, Almy et al 2020, Bennett et al 1986, Caldwell 1960, Cole 1969, Greengo 1957, Hogan et  
1388 al 2021, Klinger 2001, Klinger 2008, Blakely and Bennett 1988, Thomas et al 2022). Of the  
1389 sites, 182 are prehistoric, dating to the Archaic, Woodland, Mississippian and Caddoan periods.  
1390 The archeological record at these sites is composed primarily of isolated finds, deflated surface  
1391 scatters of lithic debris, as well as some intact deposits. Forty-seven archeological sites are  
1392 historic and twenty-nine of the recorded sites are multicomponent. Two of the prehistoric sites  
1393 and two of the historic sites are considered eligible for listing on the NRHP. One prehistoric and  
1394 one historic site are considered ineligible for listing, and the remaining sites are unevaluated.

1395 No architectural surveys have been undertaken at Lake Dardanelle to date.

1396 **4.11.3 Alternative 1 (No Action)**

1397 Under the No Action Alternative, the current 2012 Shoreline Management Plan allocations and  
1398 policies would remain in effect. The greatest potential for impacts on cultural resources and  
1399 historic properties would occur in areas designated as LDAs and in segments of shoreline with  
1400 no specific allocation, where shoreline use permits and associated activities are permitted.  
1401 Ground-disturbing activities such as construction of private boat docks, access paths, vegetation  
1402 modification, or other shoreline infrastructure have the potential to disturb intact archaeological  
1403 deposits or historic features.

1404 Currently, there are four LDAs within 200 feet of a known cultural resource area under the No  
1405 Action Alternative, with 14.1 miles being available for future use. Cultural resource sites in these  
1406 areas are at the highest risk because shoreline alterations often involve clearing, grading,  
1407 excavation, or installation of footpaths that directly affect the ground surface.

1408 If significant cultural materials are identified, avoidance or mitigation measures would be  
1409 developed in coordination with the Arkansas SHPO and Tribal representatives. Federal permit  
1410 reviews are subject to Section 106 of the NHPA (36 CFR Part 800).

1411 Overall, under the No Action Alternative, cultural resources would remain protected through  
1412 regulatory review and permitting.

1413 **4.11.4 Alternative 2 (Preferred)**

1414 Under the Preferred Alternative, cultural resources and historic properties around Lake  
1415 Dardanelle would be afforded similar protections to the No Action Alternative. By continuing to  
1416 limit new dock permits to properties with access within 200 feet of a designated LDA, the scale  
1417 of ground disturbance from new construction would remain consistent with the No Action  
1418 Alternative. Vegetation modification permits would be restricted to 200 feet from a home's  
1419 foundation and prohibited in Protected Shoreline Areas, Public Recreation Areas, and Prohibited  
1420 Areas.

1421 Currently, there are four LDAs within 200 feet of a known cultural resource area under the  
1422 Preferred Alternative, with 13.5 miles being available for future use. Additional restrictions—  
1423 such as generally prohibiting new stairways and excluding new vegetation modification permits  
1424 in Wildlife Management and Environmentally Sensitive classifications—would further reduce  
1425 incremental clearing, grading, and erosion that might otherwise expose or damage cultural sites.  
1426 These measures collectively lower the risk of disturbance compared to the broader flexibility  
1427 under the current SMP.

1428 If significant cultural materials are identified, avoidance or mitigation measures would be  
1429 developed in coordination with the Arkansas SHPO and Tribal representatives. Federal permit  
1430 reviews may be subject to Section 106 of the NHPA (36 CFR Part 800).

1431 Overall, Alternative 2 would result in minor, long-term beneficial impacts to cultural resources  
1432 and historic properties by reducing the scope of new shoreline disturbance and strengthening  
1433 protections compared to the No Action Alternative.

1434 **4.11.5 Alternative 3 (Conservative Growth)**

1435 Under Alternative 3, restrictions on shoreline use would be more conservative than the No  
1436 Action Alternative, further reducing the potential for ground disturbance. New dock and

1437 vegetation modification permits would be limited to within 100 feet of eligible properties, and no  
1438 new permits would be issued in Protected, Public Recreation, or Prohibited Areas. Footpaths  
1439 would be restricted to 3 feet, no new stairs/steps or tramways would be permitted, and  
1440 community docks would be limited to 7 slips per dock.

1441 Currently, there is one LDA within 200 feet of a known cultural resource under the No Action  
1442 Alternative, with zero miles being available for future use. Stricter limitations would lessen  
1443 disturbance to soils and vegetation near the shoreline, reducing the risk of inadvertently  
1444 impacting cultural sites.

1445 If significant cultural materials are identified, through preliminary undertaking Section 106  
1446 review, archeological survey, or inadvertent discovery, avoidance or mitigation measures would  
1447 be developed in coordination with the Arkansas SHPO and Tribal representatives. Federal permit  
1448 reviews may be subject to Section 106 of the NHPA (36 CFR Part 800).

1449 Overall, Alternative 3 would provide minor, long-term beneficial impacts, slightly more  
1450 protective than the No Action Alternative and comparable to the Preferred Alternative.

## 1451 **4.12 Air Quality**

1452 Air quality in the Lake Dardanelle area is regulated under the Clean Air Act (CAA) (42 U.S.C.  
1453 7401 et seq.) by the U.S. Environmental Protection Agency (EPA) in coordination with the  
1454 Arkansas Department of Energy & Environment (ADEE). The Clean Air Act requires the  
1455 establishment of National Ambient Air Quality Standards (NAAQS) for seven criteria pollutants:  
1456 carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>),  
1457 sulfur dioxide (SO<sub>2</sub>), and lead (Pb) (EPA, 2025).

1458 Lake Dardanelle is located in the Central Arkansas Intrastate Air Quality Control Region  
1459 (AQCR), which includes Pope and Yell Counties—the two counties that encompass most of the  
1460 lake’s shoreline. This AQCR is currently in attainment for all NAAQS pollutants, meaning  
1461 measured concentrations are below federal limits (ADEE, 2024f). Ozone levels are the only  
1462 pollutant that occasionally approach the standard but have not exceeded it in recent monitoring  
1463 years.

1464 Local emission sources around Lake Dardanelle are relatively limited and include light industrial  
1465 facilities in Russellville and Dardanelle, vehicular traffic along Interstate 40 and State Highways  
1466 7 and 22, and marine engine emissions from towboats, barges, and recreational vessels operating  
1467 on the Arkansas River and the lake. Ambient monitoring data indicate these sources do not  
1468 significantly impact overall compliance with NAAQS in the region (ADEE, 2024f).

### 1469 **4.12.1 Alternative 1 (No Action)**

1470 Under the No Action Alternative, air quality at Lake Dardanelle would remain consistent with  
1471 current conditions. Minor increases in emissions could result from localized construction, vehicle  
1472 traffic, and recreational boating associated with continued shoreline use. However, the area is in  
1473 attainment for all NAAQS, and these activities are not expected to cause exceedances. Impacts  
1474 would be negligible and long-term, but remain within federal standards.

### 1475 **4.12.2 Alternative 2 (Preferred)**

1476 Implementation of the Preferred Alternative would likely result in minor, beneficial impacts to

1477 air quality compared to the No Action Alternative. Shoreline allocations under this alternative  
1478 shift to 21.0 miles of LDA (4.8%), 40.8 miles of Public Recreation Area (9.4%), 364.8 miles of  
1479 Protected shoreline (84.1%), and 7.4 miles of Prohibited shoreline (1.7%). These changes reduce  
1480 the total mileage of LDA shoreline available for private development and increase Prohibited  
1481 categories, thereby marginally decreasing opportunities for construction activity that could  
1482 generate dust, vehicle and boating emissions, or localized particulate matter.

1483 By limiting shoreline disturbance through decreased LDA and increased Prohibited shoreline  
1484 allocations, regulating dock and vegetation modification permits, and expanding protective  
1485 allocations, this alternative would indirectly help maintain localized air quality. Retention of  
1486 vegetative cover along the shoreline also provides secondary benefits, such as moderating  
1487 localized temperatures and reducing airborne particulates through natural filtering. No  
1488 exceedances of National Ambient Air Quality Standards (NAAQS) are anticipated under this  
1489 alternative.

#### 1490 **4.12.3 Alternative 3 (Conservative Growth)**

1491 Alternative 3 would result in negligible to minor beneficial effects on air quality compared to the  
1492 No Action Alternative. Shoreline allocations under this alternative shift to 20.6 miles of LDA  
1493 (4.8%), 40.8 miles of Public Recreation Area (9.4%), 365.2 miles of Protected shoreline  
1494 (84.1%), and 7.4 miles of Prohibited shoreline (1.7%). These changes represent a decrease in  
1495 LDA and an increase in Prohibited shorelines compared to No Action, thereby marginally  
1496 reducing the acreage available for construction or vegetation modification that could generate  
1497 dust, emissions, or combustion byproducts.

1498 By limiting new vegetation modification permits to 100 feet from residences, restricting  
1499 footpaths to 3 feet in width, and prohibiting new steps or stair requests, Alternative 3 further  
1500 reduces the likelihood of localized emissions from vegetation clearing, equipment use, and  
1501 shoreline alteration activities. Maintaining larger proportions of shoreline in Prohibited  
1502 allocations helps preserve natural vegetation, which provides secondary benefits by filtering air  
1503 pollutants and moderating localized temperatures. Restricting the amount of community boat  
1504 docks to 7 slips per dock would reduce air pollution from less boats on the lake.

1505 Overall, no exceedances of NAAQS are anticipated, and Alternative 3 would result in negligible  
1506 to minor long-term beneficial impacts on air quality.

### 1507 **4.13 Socioeconomics and Recreation**

1508 Section 4.11 describes existing socioeconomic, recreation, and communities at risk resources  
1509 potentially directly and indirectly affected by the SMP. The area of analysis includes counties  
1510 adjacent to the lake including Franklin, Johnson, Logan, Pope, and Yell.

#### 1511 **4.13.1 Population**

1512 Data from the 2010 and 2020 Census, along with population projections to 2030, were used to  
1513 summarize existing socioeconomic conditions in the Project area. Table 4-4 displays population  
1514 for each county in the study area as well as statewide totals. As of 2020, the five-county project  
1515 area had a combined population of 147,601 people. Pope County was the largest in terms of  
1516 population with 63,407 residents, followed by Johnson County with 26,980. Populations in  
1517 Franklin, Johnson, Logan, and Pope counties have remained relatively stable over the last

1518 decade, with compound annual growth rates (CAGR) ranging from -90 percent in Yell County  
 1519 to 21 percent in Pope County between 2010 and 2020.

1520 Table 4-4 also presents projected populations for Arkansas and each county in the project area  
 1521 through 2030. At the state level, Arkansas is expected to grow modestly, with population  
 1522 increasing from 3,011,524 in 2020 to 3,196,124 in 2030 (a CAGR of 60 percent). Within the  
 1523 study area, growth is expected to be slow but positive in most counties. Franklin, Johnson, Logan  
 1524 and Pope counties are projected to grow by 11 to 60 percent by from 2020-2030, while Yell  
 1525 County is projected to slightly decline (-8 percent CAGR). Overall, the five-county project area  
 1526 population is projected to increase modestly, from 147,601 in 2020 to 153,237 in 2030,  
 1527 representing an annual decrease of 38 percent.

1528 **Table 4-4. Existing Population Levels and Trends in Project Area**

Region	2020 Population density (persons per square mile)	2010 population	2020 population	2030 population (projected)	Compound annual growth rate (2010-2020)	Compound annual growth rate (2020-2030)
Arkansas	57.9	2,951,502	3,011,524	3,196,124	30%	60%
Franklin County, AR	28.1	18,127	17,141	17,601	-56%	27%
Johnson County, AR	39	25,532	25,727	26,980	8%	48%
Logan County, AR	29.8	22,288	21,109	21,349	-54%	11%
Pope County, AR	78.1	60,065	63,407	67,248	21%	59%
Yell County, AR	21.8	22,140	20,217	20,059	-90%	-8%
<b>Total project area*</b>	196.8	148,152	147,601	153,237		

Source: Woods and Poole Economics Inc. 2025

1529 Population density (2020) was calculated by dividing the 2020 population for each county or state by its land area  
 1530 (square miles), as reported by the U.S. Census Bureau, Geography Division (Cartographic Boundary Files /  
 1531 TIGER/Line shapefiles).

1532 **4.13.2 Economy and Employment**

1533 Key income indicators (per capita and median household income) for counties in the Project area  
 1534 show variation, with lower values characteristic of the more rural counties and slightly higher  
 1535 values in counties with larger population centers (Table 4-5). Overall, both per capita income and  
 1536 median household income for the five-county impact area are below statewide averages,  
 1537 reflecting the predominantly rural character of the region. For example, Franklin County has a  
 1538 per capita income of \$27,137, while Johnson County is lower at \$24,865. Pope County, the most  
 1539 populous county in the project area, has a per capita income of \$29,516, still below the statewide

1540 average of \$33,147.

1541 The distribution of employment by occupation further illustrates these differences. Pope County  
 1542 has the highest proportion of its workforce in management, business, science, and arts  
 1543 occupations (32.1 percent), which tend to have higher earnings compared to other sectors. By  
 1544 contrast, Yell County shows the highest concentration of employment in production and  
 1545 transportation (30.8 percent) and a relatively smaller share in management occupations (23.3  
 1546 percent), reflecting its more industrial and agricultural economy. Logan and Franklin Counties  
 1547 have more balanced distributions, with notable shares of workers in both production-related  
 1548 fields and service occupations.

1549 Across the project area, employment by sector generally mirrors statewide patterns, though with  
 1550 slightly higher shares in natural resources, construction, and maintenance occupations due to the  
 1551 region’s rural economy. Service, retail, and tourism-related employment also contribute to local  
 1552 economies, though less prominently than in larger urban or tourism-centered counties elsewhere  
 1553 in the state.

1554 **Table 4-5: Existing Employment and Income in Project Area**

County	Per capita income	Median household income	Total civilian workforce	Distribution of workforce by sector				
				Management, business, science, and arts	Natural resources, construction, and maintenance	Production and transportation	Sales and office workers	Service
State of Arkansas	\$33,147	\$58,773	1,399,009	36.30%	10.20%	16.80%	20.50%	16.10%
Franklin County, AR	\$27,137	\$51,919	7,240	30.30%	12.80%	24.90%	15.70%	16.30%
Johnson County, AR	\$24,865	\$44,808	10,799	32.80%	9.50%	28.30%	14.40%	15.00%
Logan County, AR	\$29,471	\$54,237	9,644	31.20%	13.20%	21.20%	18.90%	15.50%
Pope County, AR	\$29,516	\$54,606	28,952	32.10%	9.10%	22.00%	20.50%	16.30%
Yell County, AR	\$26,871	\$58,870	9,144	23.30%	11.50%	30.80%	16.60%	17.70%
<b>Total impact area</b>	\$27,572	\$52,888	65,779	30.66%	10.51%	24.46%	18.19%	16.16%

Source: American Community Survey, 5-Year Estimates (2018-2023)

Population, income, and workforce data are derived from the U.S. Census Bureau’s *American Community Survey 5-Year Estimates (2018–2023)* and county-level profiles available through the Arkansas Economic Regions database (Arkansas Economic Development Institute, University of Arkansas at Little Rock). Total impact area values were calculated by summing civilian workforce totals across Franklin, Johnson, Logan, Pope, and Yell Counties and by computing weighted averages for workforce sector distribution based on each county’s proportional share of the workforce. Average per capita and median household income for the impact area were calculated as the unweighted mean of the five county values.

1555 **4.13.3 Recreation**

1556 Given the scenic and natural beauty of west-central Arkansas, Lake Dardanelle is a popular

1557 recreation destination for both local and non-local visitors. From 2014 through 2024, the lake  
 1558 received an average of approximately 1,259,956 visitors annually (Table 4-6). Annual visitation  
 1559 during this period fluctuated between a low of 1,068,198 visitors in 2024 and a high of 1,452,894  
 1560 visitors in 2018, reflecting both regional recreation trends and broader factors affecting outdoor  
 1561 use. Lake Dardanelle offers a variety of recreational facilities (Table 4-7). Paved access roads  
 1562 wind through multiple developed parks that include campgrounds, swimming beaches, hiking  
 1563 trails, boat launching ramps, sanitary dump stations, and picnic shelters. In addition, numerous  
 1564 public marinas provide thousands of boat slips and a variety of amenities, including groceries,  
 1565 fuel, boat rentals and storage, fishing guides, and related services. Private boat docks are also  
 1566 common on Lake Dardanelle.

1567 USACE continues to collect and report annual visitation statistics for Lake Dardanelle. These  
 1568 data demonstrate the ongoing importance of the lake as a recreation resource for the region.

1569 **Table 4-6. Annual Number of Visitors at Lake Dardanelle (2014 through 2024)**

Year	Number of Visitors
2014	1,160,203
2015	1,146,140
2016	1,344,107
2017	1,422,475
2018	1,452,894
2019	1,229,828
2020	1,373,785
2021	1,394,230
2022	1,103,722
2023	1,163,939
2024	1,068,198
Average (2014 through 2024)	1,259,956
Source: U.S. Army Corps of Engineers, Little Rock District	

1570 **Table 4-7. Recreational Sites at Lake Dardanelle**

Facilities	Number of sites
Recreation sites	37
Picnic sites	172
Camping sites	324
Playgrounds	14
Swimming areas	3
Trails	6
Trail miles	25.85

Fishing docks	6
Boat ramps	21
Marina slips	142
Source: U.S. Army Corps of Engineers, Little Rock District	

1571 Water-based recreation dominates the Lake Dardanelle experience, with activities such as  
1572 boating, fishing, swimming, and kayaking accounting for nearly half of all visitor use. The  
1573 USACE managed project provides 21 boat ramps and 142 marina slips, facilitating wide access  
1574 for pleasure crafts and fishing vessels. The lake supports a rich fishery, including largemouth  
1575 bass, white bass, striped hybrid bass, crappie, catfish, and bream.

1576 The shoreline is equipped with a full suite of developed amenities: 37 recreation sites, 172 picnic  
1577 sites, 324 campsites, 14 playgrounds, three designated swimming areas, six trails totaling  
1578 approximately 25.9 miles, and six fishing docks. These facilities support a variety of land-based  
1579 activities, including camping, picnicking, trail hiking, and nature appreciation.

1580 Lake Dardanelle State Park, split between Dardanelle and Russellville, features additional  
1581 amenities such as visitor centers with aquariums, a fish weigh-in pavilion, fishing piers, and  
1582 interpretive programs, further enhancing the recreational diversity and appeal of the lake.

1583 Recreation at the lake has substantial impact to local economies based on surveys of visitor  
1584 spending and attendance at USACE projects. In FY 2023, nearly 1.2 million people visited the  
1585 lake and spent \$59 million generating substantial impacts to local communities including:

- 1586 • \$48.5 million in sales revenues for local businesses that supported 368 full and part-time  
1587 local jobs (within 30 miles of the lake)
- 1588 • \$13 million in labor income (within 30 miles of the lake)
- 1589 • \$10.6 million in National Economic Development Benefits.

1590 With regional economic multiplier effects, visitor spending generated:

- 1591 • \$76.6 million in total sales that support 541 local jobs
- 1592 • \$21 million in wages and salaries
- 1593 • \$34.9 million in value added (wages & salaries, payroll benefits, profits, rents, and  
1594 indirect business taxes).

1595 Camping, fishing, and hunting account for the majority of tourism related expenditures and local  
1596 economic impacts associated with the lake.

1597 \*The Corps Institute for Water Resources estimated the economic impacts of recreation at Lake Dardanelle (and all  
1598 USACE lakes around the nation) using various methods and tools including the IMPLAN regional economic  
1599 modeling system. “Local” is defined as any economic activity within a 30-mile radius of the lake. Results and a  
1600 description of the methodology are available at USACE “Value to the Nation,” URL: [www.CorpsResults.us](http://www.CorpsResults.us).

#### 1601 **4.13.4 Incorporating the Needs and Considerations of All Communities at Risk**

1602 Incorporating the needs and considerations of all at-risk communities is the fair treatment and

1603 meaningful involvement of all people regardless of race, color, national origin, or income with  
 1604 respect to the development, implementation, and enforcement of environmental laws,  
 1605 regulations, and policies. Incorporating the needs and considerations of all at risk communities is  
 1606 achieved when everyone enjoys the same degree of protections and equal access to Civil Works  
 1607 programs and services to achieve a healthy environment in which to live.

1608 Table 4-8 displays census data summarizing racial and ethnic characteristics of the area of  
 1609 analysis, which includes counties that surround Lake Dardanelle (Franklin, Johnson, Logan,  
 1610 Pope and Yell). Table 4-9 displays poverty indicators for the area of analysis. The purpose is to  
 1611 analyze whether the demographics of the affected area differ in the context of the broader region.  
 1612 Based on the analysis, it does not appear that minority or low-income populations in the project  
 1613 area are disproportionately affected.

1614 The poverty indicators presented in Table 4-9 indicate the area of analysis is reflective of the  
 1615 State of Arkansas. The area of analysis has a poverty percentage that is 4% greater compared to  
 1616 the United States.

1617 **Table 4-8: Population Distribution by Race and Ethnicity (2023)**

	<b>White Alone</b>	<b>Black or African American alone</b>	<b>American Indian and Alaska Native alone</b>	<b>Asian Alone</b>	<b>Native Hawaiian and Other Pacific Islander alone</b>	<b>Two or more races</b>	<b>Hispanic or Latino (of any race)</b>
<b>United States</b>	58.20%	12.00%	0.50%	5.70%	0.20%	3.90%	19.00%
<b>State of Arkansas</b>	68.40%	14.80%	0.40%	1.50%	0.40%	5.50%	8.80%
<b>Franklin County</b>	85.60%	0.20%	0.90%	0.90%	0.00%	9.00%	3.20%
<b>Johnson County</b>	77.40%	1.50%	0.20%	3.10%	0.10%	3.90%	13.60%
<b>Logan County</b>	88.40%	1.70%	0.20%	1.30%	0.00%	4.90%	3.30%
<b>Pope County</b>	81.30%	2.20%	0.20%	1.00%	0.20%	4.40%	10.60%
<b>Yell County</b>	73.80%	1.70%	0.30%	1.30%	0.00%	1.90%	20.90%
Source: U.S. Bureau of the Census, American Community Survey (2023 Estimate)							

1618

**Table 4-9: Poverty Indicators and Number of Children**

Area	Unemployment Rate	Percent of Population in Poverty	Percent of Population Under 18 Years Old
United States	5.2%	12.4%	22.2%
Arkansas	5.1%	16%	23.3%
Franklin County	4.4%	18.9%	22.6%
Johnson County	4.9%	19.4%	24.5%
Logan County	5.9%	14.4%	21.4%
Pope County	4.7%	17.6%	23.2%
Yell County	3.5%	13.3%	24.1%
Area of Analysis (avg)	4.68%	16.72%	23.16%

Source: U.S. Bureau of the Census, American Community Survey (2023 Estimate)

#### 1620 **4.13.5 Alternative 1 (No Action)**

1621 Under the No Action Alternative, the U.S. Army Corps of Engineers would continue  
 1622 implementation of the 2012 Shoreline Management Plan without adopting new shoreline  
 1623 allocation policies. Existing allocations and shoreline use permits (e.g., vegetation modification  
 1624 and boat dock permits) would remain in effect and continue under current conditions.

1625 Regional demographic trends would continue independently of shoreline management decisions.  
 1626 Recreational opportunities and tourism associated with fishing, boating, and camping would  
 1627 persist, providing ongoing support for local economies. However, no measurable changes in  
 1628 employment or labor force participation are expected, as this alternative represents continuation  
 1629 of current conditions without new economic opportunities. Household income levels and poverty  
 1630 rates across the area of analysis would remain stable. While recreation-related spending would  
 1631 continue to provide minor contributions to local businesses, no significant growth in revenue  
 1632 streams would occur. Continuation of existing shoreline allocations would not create  
 1633 disproportionately high or adverse effects on minority or low-income populations. Recreational  
 1634 access would remain unchanged, and shoreline use permits would be applied consistently across  
 1635 user groups.

1636 Under the No Action Alternative, no significant short- or long-term impacts to Socioeconomics,  
 1637 Recreation, or Communities at Risk would result as there would be no change to the existing  
 1638 conditions and management practices in the existing Shoreline Management Plan.

#### 1639 **4.13.6 Alternative 2 (Preferred)**

1640 Implementation of the Preferred Alternative would adjust shoreline allocations to 21.0 miles of  
 1641 LDA (4.8%), 40.8 miles of Public Recreation Area (9.4%), 364.8 miles of Protected shoreline  
 1642 (84.1%), and 7.4 miles of Prohibited shoreline (1.7%). These changes reduce opportunities for  
 1643 new private development while increasing areas managed for public use purposes.

1644 Recreational opportunities would remain strong, sustaining tourism that generates millions in  
 1645 visitor spending and supports local jobs. The greater expansion of Public Recreation Area

1646 shoreline allocations under the Preferred Alternative is expected to enhance recreational quality  
1647 and visitor experience, indirectly benefiting local service and tourism-based businesses.

1648 No measurable change is expected in regional employment, income levels, or poverty rates, and  
1649 no disproportionate effects to minority or low-income populations would occur. Recreational  
1650 access would remain open to all users, with equitable opportunities to enjoy the lake.

1651 Overall, the Preferred Alternative would result in negligible to minor, long-term beneficial  
1652 socioeconomic impacts and would continue to safeguard shoreline quality, maintain tourism  
1653 stability, and sustain local economic benefits tied to recreation.

#### 1654 **4.13.7 Alternative 3 (Conservative Growth)**

1655 Under Alternative 3, shoreline allocations would shift to 20.6 miles of LDA (4.8%), 40.8 miles  
1656 of Public Recreation Area (9.4%), 365.2 miles of Protected shoreline (84.1%), and 7.4 miles of  
1657 Prohibited shoreline (1.7%). This represents a further reduction in LDA compared to both the No  
1658 Action and Preferred Alternatives, while Prohibited shoreline categories increase. These changes  
1659 would place stronger limits on private shoreline development and emphasize preservation of  
1660 natural and recreational resources.

1661 Regional population and employment trends in Franklin, Johnson, Logan, Pope, and Yell  
1662 Counties would remain largely unaffected, as shoreline management decisions do not directly  
1663 alter demographic or workforce patterns. However, by restricting the qualifications for boat  
1664 docks for property owners whose access is within 100 feet and limiting new vegetation  
1665 modification to 100 from the foundation of a home, Alternative 3 would reduce opportunities for  
1666 new private docks, vegetation modification, or shoreline clearing, potentially limiting small-scale  
1667 private investment.

1668 At the same time, the greater emphasis on preservation through permitting restrictions would  
1669 help sustain tourism-related employment and revenues by ensuring high-quality recreational  
1670 opportunities. Recreation is a major driver of local economies, with annual visitation averaging  
1671 1.26 million people and generating tens of millions of dollars in sales, jobs, and wages within the  
1672 30-mile region. By protecting more shoreline from disturbance, Alternative 3 would help  
1673 maintain the appeal of Lake Dardanelle for both residents and non-local visitors.

1674 Income and poverty conditions across the area of analysis would remain unchanged. No  
1675 disproportionate impacts are anticipated for minority or low-income populations, as public  
1676 recreational access would remain open and equitably available. Stronger protections under  
1677 Alternative 3 would ensure continued enjoyment of Lake Dardanelle's resources for all user  
1678 groups while maintaining the local economic contributions of tourism.

1679 Overall, Alternative 3 would result in negligible to minor, long-term beneficial socioeconomic  
1680 impacts. While it would allow less shoreline development than the Preferred Alternative, its  
1681 stronger focus on protection would preserve and potentially enhance recreational and tourism  
1682 value for surrounding communities.

#### 1683 **4.14 Health and Safety**

1684 Safety remains a paramount concern in all daily operations at Lake Dardanelle. Recreational  
1685 sites—including boat ramps, trails, and shoreline access points—are regularly inspected by  
1686 USACE staff to ensure safe conditions for visitors. Water safety programs, such as the

1687 nationwide “Wear It” initiative, are actively promoted, encouraging the use of Coast Guard–  
1688 approved life jackets, especially around platforms and boats where risk is heightened. USACE’s  
1689 National Water Safety Program further supports local efforts through educational resources, life  
1690 jacket loaner programs, and safety messaging materials.

1691 Collaboration with local and state agencies strengthens safety enforcement on the water. Water  
1692 safety measures such as markers (i.e. buoys indicating hazards or no-wake zones) are used on  
1693 Lake Dardanelle, additionally staff adhere to USACE regulations and cooperate with partners  
1694 like the Arkansas Game and Fish Commission and local law enforcement to manage potential  
1695 threats and ensure compliance with safe navigation practices.

1696 At Corps-operated lock facilities on the MKARNS, including those within the Lake Dardanelle  
1697 system, vessel operators are reminded to follow strict safety procedures. Before entering locks,  
1698 boaters must contact lock operators (via VHF or cell phone) and proceed only on the green  
1699 signal. Navigation is closely controlled with clear instructions to maintain slow, no-wake speeds  
1700 and to follow lock personnel guidance for safe passage.

1701 Water safety hazards are marked with buoys by USACE. Park Rangers provide visitor assistance  
1702 and work with county law enforcement agencies to ensure public safety. AGFC provides water  
1703 safety patrols on the lake as their budgets allow. Water quality on Lake Dardanelle is tested for  
1704 pH and dissolved oxygen levels, nutrients, turbidity, and presence of fecal coliform bacteria is  
1705 tested by the Arkansas Department of Energy and Environmental Quality (ADEEQ).

#### 1706 **4.14.1 Alternative 1 (No Action)**

1707 Under the No Action Alternative, safety conditions for visitors and staff at Lake Dardanelle  
1708 would remain consistent with current practices. Corps staff would continue to inspect recreation  
1709 areas, operate public safety programs (such as the National Water Safety Program and the “Wear  
1710 It” life jacket campaign), and coordinate with the Arkansas Game and Fish Commission (AGFC)  
1711 and local law enforcement agencies to manage enforcement on the water. Standard navigation  
1712 safety protocols at the Dardanelle Lock and Dam, including lock-through requirements and no-  
1713 wake rules, would also remain unchanged. Shoreline use permits are inspected on a regular basis  
1714 to ensure compliance with permit conditions.

1715 However, this alternative maintains existing permitting practices for private docks and vegetation  
1716 modifications, which could allow for incremental increases in boat slips, shoreline access points,  
1717 and recreational use over time. As shoreline development and use expands, localized congestion  
1718 on the water could increase, leading to a higher potential for boating accidents, conflicts between  
1719 users, or stress on enforcement resources. Additional dock construction and shoreline  
1720 modifications could also increase pedestrian and vehicular activity at access points, creating  
1721 minor risks for visitor safety.

1722 Under the No Action Alternative, no change from current impacts to human health or safety  
1723 would result as there would be no change to the existing conditions and management practices in  
1724 the current Shoreline Management Plan.

#### 1725 **4.14.2 Alternative 2 (Preferred)**

1726 The Preferred Alternative would still allow potential shoreline development opportunities, but  
1727 with a potential to slow an increase of boat congestion and water related accidents marginally,  
1728 due to reduced number of potential slips associated with the reduction of LDA (-0.1% or -0.4

1729 miles of total shoreline). The increased recreational opportunities due to an increase in Public  
1730 Recreation Areas (+1.8% or 7.6 miles of total shoreline), balanced with conservation of  
1731 natural environment could lead to better health, both mental and physical, of the visiting  
1732 population.

1733 The recreational opportunities, balanced with conservation of the natural environment, could  
1734 lead to better health, both mental and physical, of the visiting population. Implementation of  
1735 the Preferred Alternative would marginally reduce the potential for recreation congestion. The  
1736 increase in Prohibited areas could potentially increase safety by further restricting areas that  
1737 are unsafe for public use, contributing to potential minor, beneficial impacts to health and  
1738 safety are expected under the Preferred Alternative.

#### 1739 **4.14.3 Alternative 3 (Conservative Growth)**

1740 Alternative 3 would provide similar but slightly stronger health and safety protections compared  
1741 to Alternative 2. Shoreline allocations under this alternative also expand Public Recreation Areas  
1742 to 40.8 miles (9.4% of total shoreline) and Prohibited Areas to 7.4 miles (1.7% of total  
1743 shoreline), ensuring greater access to managed recreation facilities and more protective buffer  
1744 zones at high-risk sites. These allocations, coupled with stricter permit limits (dock and  
1745 vegetation modification capped at 100 feet and 3-foot path widths), could further reduce  
1746 shoreline disturbance and congestion. The prohibition of new stairs/steps could potentially  
1747 decrease the safety of private dock owners by constricting safe access to docks.

1748 By directing recreation toward designated areas and expanding restricted zones and limiting the  
1749 amount of slips on community boat docks to 7 per dock, this alternative decreases the potential  
1750 for water-related accidents and conflicts along the shoreline. Although overall visitor patterns  
1751 would remain similar, the added safety provided by more extensive Prohibited and Public  
1752 Recreation Area allocations would contribute to minor, long-term beneficial effects on public  
1753 health and safety.

1754 Overall, Alternative 3 would reduce the likelihood of boating congestion and preserve natural  
1755 buffers that contribute to safer visitor use, but would potentially decrease the safety of private  
1756 dock owners trying to access the shoreline. As such, this alternative is expected to result in less  
1757 than significant impacts to visitor and staff safety relative to current conditions.

#### 1758 **4.15 Aesthetics**

1759 Preserving scenic vistas and natural landscapes around Lake Dardanelle is a fundamental  
1760 management objective under the Lake Dardanelle SMP, aimed at maintaining both the aesthetic  
1761 and ecological integrity of the shoreline while balancing public and private uses. Approximately  
1762 84.1% of shoreline is currently designated as Protected, specifically set aside to safeguard  
1763 environmental and visual qualities by prohibiting floating facilities and similar infrastructure.

1764 However, aesthetic integrity faces ongoing threats. The USACE maintains 362 miles of  
1765 boundary lines by clearing brush, repainting markers, and documenting encroachments such as  
1766 unauthorized mowing, ATV trails, timber cutting, and structures like sheds—highlighting  
1767 persistent trespass issues. Unauthorized recreational vehicles and path creation continue to  
1768 degrade vegetative buffers and visual quality. Additionally, littering and illegal dumping on both  
1769 land and water remain persistent problems, while vandalism in recreation areas also detracts  
1770 from the natural setting.

1771 Infrastructure demands further challenge visual resources; road and utility corridor requests, as  
1772 well as dock and access path developments, often come at the expense of the native landscape  
1773 and shoreline vegetation. As development pressures increase in the lake’s vicinity, project staff  
1774 must actively enforce SMP shoreline permit conditions and issue citations under 36 CFR 327.19,  
1775 ensuring new development does not compromise natural vistas.

#### 1776 **4.15.1 Alternative 1 (No Action)**

1777 Under the No Action Alternative, the scenic and natural character of Lake Dardanelle’s shoreline  
1778 could gradually decline as shoreline use requests and associated development continue under  
1779 existing policies. New boat dock permits, vegetation modification permits, and requests for  
1780 access paths would allow incremental clearing of natural vegetation. This would increase visual  
1781 contrast between undeveloped, natural landscapes and areas where structures, cleared paths, or  
1782 mowing activity occur.

1783 Ongoing challenges such as unauthorized mowing, ATV trails, timber cutting, and littering  
1784 would likely persist at similar or higher levels without additional restrictions, further degrading  
1785 the visual quality of the shoreline. Increased dock density and associated shoreline modifications  
1786 could also erode the “natural” aesthetic experience for boaters and shoreline visitors.

1787 Under the No Action Alternative, no change from current impacts to aesthetics would result as  
1788 there would be no change to the existing conditions and management practices in the Lake  
1789 Dardanelle SMP.

#### 1790 **4.15.2 Alternative 2 (Preferred)**

1791 Implementation of the Preferred Alternative would result in negligible to minor, long-term  
1792 beneficial impacts on aesthetics compared to the No Action Alternative. Shoreline allocations  
1793 would shift to 21.0 miles of Limited Development Area (LDA), 40.8 miles of Public Recreation  
1794 Area, 364.8 miles of Protected shoreline, and 7.4 miles of Prohibited shoreline. These changes  
1795 increase the amount of shoreline protected from private development, which directly supports the  
1796 preservation of scenic vistas and natural landscapes around Lake Dardanelle.

1797 This alternative would have the same permitting conditions for boat dock and vegetation  
1798 modification as the No Action alternative. This alternative would additionally prohibit new  
1799 stairs/steps, or mowing in WMA, ESA, and Project Operations areas. These components would  
1800 continue to preserve visual fragmentation along the shoreline, maintain natural buffers, protect  
1801 vegetative cover, and minimize intrusions that detract from the lake’s aesthetic integrity.  
1802 Additionally, limiting outgrants for new stair/step requests, mooring docks, tramways and  
1803 embayments; and requiring alternative energy sources for new docks would prevent new  
1804 infrastructure from diminishing the scenic quality of the shoreline.

1805 By decreasing shoreline mileage allocated to LDAs and expanding Prohibited allocations, this  
1806 alternative reduces opportunities for unauthorized encroachment and development pressures that  
1807 can degrade visual quality. While some localized effects could still occur from dock construction  
1808 or vegetation clearing in LDAs, the increase in Prohibited allocations may strengthen protections  
1809 against littering, unauthorized trails, and other trespass issues identified in the affected  
1810 environment. However, the increase in Public Recreational Areas may contribute to increased  
1811 amounts of litter around the shoreline.

1812 Overall, Alternative 2 would improve USACE’s ability to safeguard scenic vistas and natural

1813 landscapes by limiting shoreline disturbance and better preserving intact visual resources. The  
 1814 result would be negligible to minor beneficial impacts on aesthetics compared to the No Action  
 1815 Alternative.

1816 **4.15.3 Alternative 3 (Conservative Growth)**

1817 Implementation of Alternative 3 would have similar effects on aesthetics as the Preferred  
 1818 Alternative, though slightly more restrictive in terms of shoreline use. By limiting new boat  
 1819 docks to within 100 feet of access points and community dock slips to 7 per dock, as well as,  
 1820 restricting vegetation modification permits to within 100 feet of a home, this alternative reduces  
 1821 the overall scale of disturbance and would provide further protections to the aesthetic value  
 1822 shoreline vegetation provides. As such, this alternative is expected to result in minor beneficial  
 1823 impacts to aesthetics.

1824 **4.16 SUMMARY OF ENVIRONMENTAL CONSEQUENCES**

1825 Tables 4-10 compare the shoreline allocation changes from No Action Alternative to the  
 1826 Preferred Alternative and Table 4-11 compares the shoreline allocation changes from the No  
 1827 Action Alternative to the Conservative Growth Alternative. Table 4-12 summarizes which  
 1828 resources are likely to be affected by implementation of any of the evaluated Shoreline  
 1829 Management Plan revision Action Alternatives, or a No Action Alternative, which would retain  
 1830 the existing requirements of the current management plan. Discussion of potential impacts  
 1831 follows the table.

1832 **Table 4-10. No Action Alternative to the Preferred Alternative**

Alternative 1 -No Action	Miles	Converted to	Alternative 2 - Preferred	Miles	% of No Action Zoning
<b>LDA</b>	21.4		LDA	20.6	96.4%
			Public Rec Area	0.1	0.2%
			Protected	0.7	0.2%
			Prohibited	0.0	0.0%
<b>Public Rec Area</b>	33.2		LDA	0.177	0.8%
			Public Rec Area	25.9	78.0%
			Protected	5.9	1.6%
			Prohibited	1.2	120.3%
<b>Protected</b>	378.5		LDA	0.2	1.0%
			Public Rec Area	14.8	44.7%
			Protected	358.2	94.6%
			Prohibited	5.303	550.8%

			LDA	0.0	0.0%
<b>Prohibited</b>	1.0		Public Rec Area	0.0	0.0%
			Protected	0.0	0.0%
			Prohibited	1.0	100.0%
<b>Total</b>	<b>434.0</b>			<b>434.0</b>	

1833

1834

**Table 4-11. No Action Alternative to the Conservative Growth Alternative**

<b>Alternative 1- No Action</b>	<b>Miles</b>	<b>Converted to</b>	<b>Alternative 3 - Conservative Growth</b>	<b>Miles</b>	<b>% of No Action Zoning</b>
<b>LDA</b>	21.4		LDA	20.6	96.4%
			Public Rec Area	0.1	0.2%
			Protected	0.7	0.2%
			Prohibited	0.0	0.0%
<b>Public Rec Area</b>	33.2		LDA	0.000	0.0%
			Public Rec Area	25.9	78.0%
			Protected	6.1	1.6%
			Prohibited	1.2	120.3%
<b>Protected</b>	378.5		LDA	0.0	0.0%
			Public Rec Area	14.8	44.7%
			Protected	358.4	94.7%
			Prohibited	5.303	550.8%
<b>Prohibited</b>	1.0		LDA	0.0	0.0%
			Public Rec Area	0.0	0.0%
			Protected	0.0	0.0%
			Prohibited	1.0	100.0%
<b>Total</b>	<b>434.0</b>			<b>434.0</b>	

1835

**Table 4-12: Resources Likely Affected with Implementation of Alternatives**

Resource	Alternative 1 – No Action	Alternative 2 – Preferred	Alternative 3 – Conservative Growth
Land Use	No change from current impacts	Negligible beneficial impacts. Refined permit conditions would slow private modifications and direct land use toward conservation and public access.	Minor beneficial impacts. The stricter restrictions on private use would shift the focus from private development to resource preservation and public enjoyment.
Climate and Changing Conditions	No change from current impacts	Negligible beneficial effects. Localized soil compaction from limited new permits could still occur.	Negligible beneficial effects. Stricter limits (100 ft setbacks, narrower footpaths) would reduce disturbance further. Over time, re-vegetation of disturbed areas would increase shoreline resilience to heavy rain and heat extremes.
Topography, Geology, and Soils	No change from current impacts	Negligible to minor beneficial effects. Reduced vegetation disturbance through reductions in LDA and increased Prohibited allocations compared to No Action would protect shoreline soils, geology, and topography. Prime farmland continues unaffected.	Negligible to minor beneficial effects. Even stricter limits on clearing, path widths, and community boat dock slips would preserve more shoreline vegetation, further reducing resource impact. Over time, older disturbed areas may revegetate. Prime farmland continues unaffected.
Water Resources (Hydrology & Groundwater)	No change from current impacts	Negligible to minor beneficial effects. Vegetative buffers would be preserved, improving	Negligible to minor beneficial effects. Similar to Alternative 2, but fewer permits allowed.

		infiltration, reducing runoff, and protecting water table recharge. Disturbance localized to permitted access.	Restrictions encourage natural revegetation, further stabilizing hydrology and reducing erosion.
Water Quality	No change from current impacts	Negligible to minor, long-term beneficial effects. Limitations on new stair/step outgrants and vegetation modification in certain MP classifications would reduce erosion and pollution, maintaining clarity and aquatic habitat. Disturbances from new docks/paths remain limited in scale.	Minor, long-term beneficial effects. With narrower buffers for disturbance and stricter shoreline allocations, turbidity and nutrient runoff could potentially be reduced.
Fish Species & Habitat	No change from current impacts	Negligible to minor beneficial effects. Restrictions maintain vegetative buffers and woody habitat, reduce erosion, and protect spawning coves. Habitat conditions would potentially improve compared to the No Action.	Minor beneficial effects. Stronger restrictions and natural revegetation trends further protect spawning habitat and shoreline complexity. Long-term effects improve conditions slightly more than Alternative 2.
Wildlife & Terrestrial Resources	No change from current impacts	Negligible to minor beneficial effects. Maintained restrictions on vegetation modification along the shoreline. Migratory and resident species benefit from reduced disturbance.	Minor beneficial effects. Stricter limits further restrict new disturbance and encourage natural regeneration of shoreline vegetation. Wildlife corridors remain intact, habitat conditions improve over time.
Threatened & Endangered Species	No change from current impacts	No effect. Continued shoreline protections reduce potential risks	No effect. Stricter shoreline protection further minimizes the

		to listed bat species, ABB, and other sensitive species.	potential for indirect effects on listed species.
Wetlands	No change from current impacts	Minor beneficial effects. Continued shoreline protections prevent disturbance of wetlands.	Minor beneficial effects. Stricter protections ensure wetlands remain intact.
Cultural, Historic, and Architectural Resources	No change from current impacts	Potential to Effect Archeological, Historic, and Architectural Resources	Potential to Effect Archeological, Historic, and Architectural Resources
Air Quality	No change from current impacts	Negligible to minor benefits impacts. Limitations on shoreline disturbance would indirectly help maintain local air quality.	Negligible to minor benefits impacts. Limitations on shoreline disturbance would indirectly help maintain local air quality.
Socioeconomics, Recreation, and Communities at Risk	No change from current impacts	Minor beneficial effects. Balanced access and resource protection support long-term recreational and economic opportunities.	Minor beneficial effects. Slightly more restrictive, but long-term resource quality and public access supports sustained recreation and local tourism.
Health & Safety	No change from current impacts	Minor beneficial impacts. Increased public recreation and prohibited areas may improve user safety and health, and lower risks tied to shoreline development.	Minor beneficial impacts. More restrictive allocations and limits on private shoreline use further reduce safety hazards and conflict, enhancing long-term safe recreation. Prohibition of new step/stair requests may increase safety risks to dock owners.
Aesthetics	No change from current impacts	Negligible to minor beneficial effects. More shoreline vegetation preserved, reducing visible impacts of development.	Minor beneficial. Stricter restrictions and limitations on shoreline use further enhance natural shoreline appearance.



1 **5. Reasonably Foreseeable**

2 Reasonably Foreseeable impacts are those that may result from the incremental impact of the  
3 evaluated alternatives added to those of other past, present, or reasonably foreseeable future  
4 actions in the local area. The current Lake Dardanelle Shoreline Management Plan was  
5 developed over 13 years ago (2012), and development and public use patterns have increased  
6 modestly, due to marginal increases in population in surrounding counties. The SMP will  
7 reallocate the Government shoreline managed by USACE along Lake Dardanelle based on  
8 environmental and socioeconomic considerations, public input, and an evaluation of past,  
9 present, and forecasted trends.

10 **5.1 Past Impacts Within the Area of Analysis**

11 The Rivers and Harbors Act of 1946 authorized the development of the Arkansas River and its  
12 tributaries for the purposes of navigation and production of hydroelectric power. Public Law 91-  
13 649 stated that the project would be known as the McClellan-Kerr Arkansas River Navigation  
14 System. Subsequent acts authorized recreation, and enhancement of fish and wildlife resources  
15 as project purposes. The dam was completed in August 1964, the powerplant was completed in  
16 June 1966, and the navigation lock was completed in December 1969.

17 After flood events, most recently the flood of 2019, maintenance to recreation facilities, dams,  
18 levees, hydroelectric power plants, and other structures along the Arkansas Rivers occurred.  
19 Dredging was also implemented after channel sediments migrated and depths decreased below  
20 the nine-foot depths required for navigation. In addition to emergency maintenance, routine  
21 maintenance occurs periodically to ensure all functions of Lake Dardanelle are operating  
22 properly and safely. Every year there is flooding to some extent, severity and longevity are  
23 dependent upon up and downstream flooding.

24 **5.2 Current and Reasonably Foreseeable Projects Within and Near the**  
25 **Affected Area**

26 At present, there are no known large-scale development or infrastructure projects within the Lake  
27 Dardanelle watershed that would significantly add to reasonably and foreseeable shoreline  
28 impacts beyond those considered in this Shoreline Management Plan updated. No new dams,  
29 major reservoir expansions, or industrial shoreline developments have been publicly announced  
30 that would substantially affect water levels, shoreline geometry, or habitat in a way that  
31 compounds SMP allocations.

32 Against this largely stable backdrop, existing trends in real estate outgrant data signal important  
33 trajectories for future impact. From 2016 through 2025, total slips and docks have remained  
34 roughly stable, but private floating facilities have increased marginally. Vegetation modification  
35 have increased slightly, adding only 5 vegetation modifications over the past eleven years.

36 If these trends continue, new private dock development will continue to increase slowly.  
37 Vegetation modification is likely to remain consistent with current trends. In conclusion, the  
38 absence of large external drivers, paired with shoreline use patterns remaining relatively stable,  
39 pattern of shoreline use overtime rather than external development pressures will likely be the

40 dominant factor shaping reasonable and foreseeable impacts over time.

### 41 **5.2.1 MKARNS 12 Foot Channel Deepening**

42 To optimize commercial navigation productivity, plans are in place to deepen the Arkansas River  
43 channel from a minimum depth of nine feet to a minimum depth of 12 feet. Deepening the  
44 channel would likely result in an increase in barge traffic; however, this alteration is not likely to  
45 have a significant impact on the MKARNS environmental conditions as a majority of the  
46 channel is already 15 feet or greater in depth. Additionally, some approved dredged material  
47 disposal sites have reached capacity and new disposal sites are required to continue channel  
48 maintenance activities. Mitigation would be conducted for adverse impacts associated with the  
49 channel deepening project. Mitigation for terrestrial and aquatic impacts would consist of a  
50 combination of avoidance, minimization, and compensation. The mitigation has been developed  
51 in coordination with the USFWS, AGFC, and the Oklahoma Department of Wildlife and  
52 Conservation. The terrestrial habitat mitigation plan has been thoroughly evaluated. The  
53 mitigation plan provides for significant further study of habitat to be used to adapt mitigation  
54 features in conjunction with close interagency coordination. Mitigation would be associated  
55 with:

- 56 • Terrestrial habitat loss associated with the disposal of dredged material
- 57 • Aquatic resources impacts and habitat loss associated with dredging and dredged material  
58 disposal;
- 59 • Aquatic habitat loss associated with raising and extending dikes and revetments
- 60 • Federal threatened and endangered species (USACE, 2005).

61 Currently, there are no construction funds for this project.

### 62 **5.2.2 Arkansas Nuclear One**

63 Arkansas Nuclear One (ANO) is a two-unit pressurized water nuclear power plant located on  
64 Lake Dardanelle. The power plant uses approximately 1.2 billion gallons of water per day to cool  
65 the reactors, however most of that water is returned to the lake. The water from Lake Dardanelle  
66 is used in a closed-loop system and does not come in contact with ANO reactors. The cooling  
67 process warms the waters of the lake, and there is fish impingement mortality from fish being  
68 pinned against intake screens. To reduce the quantity fish mortality, ANO deploys a fish net  
69 between the months of November-April every year, when fish impingement is most likely. The  
70 net showed an 82% reduction in impingement mortality during the monitoring period between  
71 1977-1988.

## 72 **5.3 Analysis of Reasonable and Foreseeable Impacts**

73 Marginal growth and development are expected to continue in the vicinity of Lake Dardanelle, as  
74 well as the projects associated with the navigation channel operation and real estate outgrants.  
75 Impacts associated with the MKARNS 12' channel dredging will be fully mitigated, resulting in  
76 no net loss of habitat quality. The Arkansas Nuclear One nuclear power plant contributes to  
77 warmer water and fish impingement at Lake Dardanelle, however the impacts of these projects

78 would not result in reasonable and foreseeable impacts in conjunction with land allocation  
 79 changes associated with this SMP as the SMP would not entail ground disturbing activities and  
 80 does not issue shoreline modification permits. Therefore, significant reasonable and foreseeable  
 81 adverse impacts on resources would not be expected when added to the impacts and activities  
 82 associated with the No Action Alternative, the Preferred Alternative, and Conservative Growth  
 83 Alternative. For all alternatives evaluated, any future shoreline modification requests are  
 84 received by USACE, they are evaluated to ensure minimal impacts occur to resources to include  
 85 various BMPs and in some instances, mitigation.

## 86 6. ENVIRONMENTAL COMPLIANCE

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

88 **Table 6-1: Federal Act/Executive Order Compliance**

Act/Executive Order	Status	Compliance
Wetlands (EO 11990)	N/A	C
Prime/Unique Farmlands	N/A	C
Floodplain Management (EO 11988)	N/A	C
Clean Water Act	N/A	C
Section 404	N/A	C
Section 401	N/A	C
Bald and Golden Eagle Protection Act	N/A	C
Fish and Wildlife Coordination Act	N/A	C
Endangered Species Act	No effect	C
National Historic Preservation Act	No effect	C
Migratory Bird Treaty Act	N/A	C
Clean Air Act	N/A	C
Comprehensive Environmental Response Compensation and Liability Act (CERCLA)	N/A	C
Resource Conservation and Recovery Act (RCRA)	N/A	C
Wild and Scenic Rivers Act	N/A	C
Rivers and Harbors Act	N/A	C
<i>N/A — not applicable; C – Compliant</i>		

### 89 6.1 Fish and Wildlife Coordination Act

90 The USACE is required to coordinate with the USFWS and ANHC under the Fish and Wildlife  
 91 Coordination Act (FWCA) (48 Stat. 401, as amended; 16 USC 661 et. seq.) however, the FWCA  
 92 is not triggered because there is no altering or impounding of water bodies as part of the  
 93 proposed project. Coordination was still initiated with a scoping notice as agencies may still have  
 94 valuable information to contribute; no concerns were raised by these agencies. Review of the  
 95 Environmental Assessment is pending; no concerns are anticipated.

96 **6.2 Endangered Species Act**

97 The Endangered Species Act requires the determination of possible effects on species or  
98 degradation of habitat critical to Federally listed endangered or threatened species. USACE has  
99 determined that implementation of Alternative 2 would have No Effect on any Federally listed  
100 species that may occur in the Project Area. Individual requests for use of project lands would be  
101 evaluated to ensure compliance with this Act.

102 **6.3 Communities at Risk**

103 Federal agencies must identify and address a disproportionately high and adverse human health  
104 and environmental effects of their programs, policies, and activities on minority and low-income  
105 populations. The final step in the Communities at Risk evaluation process is to evaluate the  
106 impact of the project on the population and to ascertain whether target populations are affected  
107 more adversely than other residents.

108 Implementing the proposed Shoreline Management revision would not disproportionately affect  
109 minority or low-income populations.

110 **6.4 National Historic Preservation Act**

111 Section 106 of the National Historic Preservation Act of 1966 requires USACE to identify  
112 historic properties affected by the Preferred Alternative and to evaluate the eligibility of those  
113 properties for the National Register of Historic Places. Section 110 of the Act requires USACE to  
114 assume responsibility for the preservation of historic properties in its ownership. The Act also  
115 requires Federal agencies to provide the Advisory Council on Historic Preservation an  
116 opportunity to comment on undertakings through the process outlined in the Council's  
117 regulations (36 CFR 800).

118 The potential to effect cultural resources remains with the implementation of an updated  
119 Shoreline Management Plan. Individual requests for use of project lands would be evaluated on a  
120 case-by-case basis to ensure compliance with this act.

121 **7. SCOPING AND PUBLIC CONCERN**

122 **7.1 Introduction**

123 No single agency has complete oversight of stewardship activities on the public lands and waters  
124 encompassing Lake Dardanelle. Responsibility for natural resource and recreation management  
125 falls to several agencies that have jurisdiction over these public lands and waters.

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

131 To sustain healthy and productive public lands and water with the most efficient approach  
132 requires individuals and organizations to recognize their unique ability to contribute to

133 commonly held goals. The key to progress is building on the strengths of each sector, achieving  
134 goals collectively that could not be reasonably achieved individually. Given the inter-  
135 jurisdictional nature of Lake Dardanelle, partnering opportunities exist and can promote the  
136 leveraging of limited financial and human resources. Partnering and identification of innovative  
137 approaches to deliver justified levels of service defuse polarization among interest groups, and  
138 lead to a common understanding and appreciation of individual roles, priorities, and  
139 responsibilities.

140 To the extent practicable, this Shoreline Management Plan and a proactive approach to  
141 partnering would position USACE to leverage project financial capability and human resources  
142 in order to identify and satisfy customer expectations, protect and sustain natural and cultural  
143 resources and recreational infrastructure, and programmatically bring USACE management  
144 efforts and outputs up to a justified level of service. Public involvement and extensive  
145 coordination within USACE and with other affected agencies and organizations is a critical  
146 feature required in developing or revising a Project Shoreline Management Plan.

147 Agency and public involvement and coordination are a key element in every phase of the Lake  
148 Dardanelle SMP update.

## 149 **7.2 Scoping**

150 On February 4, 2025, USACE initiated the public scoping process for the Lake Dardanelle  
151 Shoreline Management Plan (SMP) update in accordance with NEPA. A 30-day scoping  
152 comment period was held from February 4 to March 5, 2025, during which agencies, tribes, and  
153 the public were invited to provide input on issues that should be addressed in the Environmental  
154 Assessment.

155 To support this effort, a Lake Dardanelle SMP update website was created to serve as the  
156 primary source of information during the scoping period. The website included information  
157 about the SMP update process, interactive maps, a copy of the existing SMP, fact sheets, and a  
158 public comment form. Notifications directing stakeholders to the project website were distributed  
159 by multiple means, including 19,058 postcards, 4,807 e-mail blasts, press releases, social media  
160 announcements, flyers, and agency/tribal coordination letters. The website received 203 visits  
161 during the comment period.

162 A public scoping workshop was scheduled for February 18, 2025, at the USACE Russellville  
163 Site Office, but was cancelled due to inclement winter weather. USACE issued additional  
164 notifications regarding the cancellation and responded to four inquiries about rescheduling.

### 165 **Public Comments**

166 In total, 19 comment submittals were received: 15 from members of the public, two from  
167 agencies, and two from tribal governments. Public comments most frequently requested changes  
168 to shoreline allocations to allow new docks, vegetation modification, or path permits. Other  
169 recurring topics included:

- 170 • Requests for more shoreline erosion protection.
- 171 • Maintaining or re-opening recreation areas and campgrounds.
- 172 • Protection of cultural resources.
- 173 • Allowing more mowing or vegetation modification.

- 174 • Preserving the natural shoreline character.
- 175 • Returning impounded lands to private use.

### 176 **Agency and Tribal Comments**

177 Agencies and tribes provided broader planning-level feedback. The Arkansas Department of  
178 Transportation highlighted the need for coordination where highway facilities intersect USACE  
179 lands. The Arkansas Historic Preservation Program emphasized the presence of significant  
180 archaeological and historic sites along Lake Dardanelle and requested consultation as the SMP  
181 update progresses. The Choctaw Nation requested Section 106 consultation for all undertakings  
182 and recommended consideration of ARPA protections. The Delaware Nation noted the project is  
183 outside its ancestral area and deferred to other federally recognized tribes.

184 A complete record of all scoping comments and agency responses is provided in Appendix A of  
185 this EA.

### 186 **Draft Shoreline Management Plan/Draft Environmental Assessment/FONSI**

187 The draft Lake Dardanelle SMP, EA, and draft Finding of No Significant Impact (FONSI) were  
188 released for comments on May 4, 2026. Public workshop was held on May 19<sup>th</sup>, 2026 to discuss  
189 the Preferred Alternative with interested parties. Notification of the draft review comment period  
190 and public workshops was completed via several forms of media, and will be included in  
191 Appendix D, Draft Release Comments Report, of the final EA. As part of the draft plans release  
192 phase of the environmental process, a 30-day comment period was held from May 4<sup>th</sup> to June  
193 3<sup>rd</sup>, 2026. During this time, the public, resource agencies, and Tribal Nations had the opportunity  
194 to review the draft documents and provide comments.

### 195 **Final SMP/Final Environmental Assessment**

196 The final Lake Dardanelle Shoreline Management Plan is expected to be completed in Spring  
197 2026. No public workshops were held for the Final SMP release. The final Lake Dardanelle  
198 SMP will be posted on the Lake Dardanelle SMP update website once signed by the District  
199 Commander.

## 200 **8. CONCLUSIONS**

201 The Lake Dardanelle SMP EA evaluates how updated shoreline allocations and shoreline use  
202 policies would influence the natural, cultural, and socioeconomic resources around Lake  
203 Dardanelle. Since the SMP was last updated in 2012, shoreline use patterns, public expectations,  
204 and permitting needs have gradually shifted. Real estate outgrant trends show only modest  
205 growth in private dock and vegetation modification requests, but the opportunity for more Public  
206 Recreational Areas to accommodate the public use of the lake and Prohibited Areas to protect  
207 infrastructure and hazardous areas is needed. Updating the SMP ensures that shoreline  
208 management policies keep pace with these trends, maintain equitable public access, and preserve  
209 the ecological and recreational integrity of the lake.

210 The SMP does not direct or control regional water management, flood risk management, or water  
211 quality programs, nor does it authorize construction or land development beyond shoreline use  
212 permits. However, the SMP plays a critical role in balancing private access, recreation, and  
213 shoreline protection by defining where shoreline use permits may occur and under what  
214 conditions. Issues identified during the SMP scoping process were coordinated with the

215 appropriate agencies or USACE functional areas responsible for associated management  
216 programs.

217 Three alternatives were evaluated in detail: the No Action Alternative, the Preferred Alternative  
218 (Alternative 2), and the Conservative Growth Alternative (Alternative 3). These alternatives  
219 represent a range from maintaining current shoreline allocations to implementing more  
220 restrictive shoreline buffers and narrower allowances for private shoreline use.

221 The No Action Alternative would continue existing conditions under the 2012 SMP without  
222 modifying shoreline allocations or permitting requirements. Under this alternative, no new  
223 impacts to environmental resources would occur because current practices would continue  
224 unchanged. The No Action Alternative serves as the baseline against which the action  
225 alternatives are compared.

226 The Preferred Alternative (Alternative 2) updates shoreline allocations and refines permitting  
227 conditions to reduce shoreline disturbance and maintain ecological stability while still providing  
228 opportunities for private shoreline use. Under this alternative, changes to dock permitting  
229 distances, vegetation modification limits, and restrictions on new outgrants and stairs/footpaths  
230 would decrease localized erosion, reduce vegetation loss, and maintain more cohesive shoreline  
231 buffers. Public Recreation Areas and Prohibited Access Areas would increase slightly, enhancing  
232 shoreline protection and promoting equitable recreational access. Overall, Alternative 2 provides  
233 a balanced approach, supporting recreation, protecting sensitive areas, and reducing long-term  
234 environmental degradation.

235 The Conservative Growth Alternative (Alternative 3) applies more restrictive limits to private  
236 shoreline use, including reduced dock permit distances (100 ft), narrower footpaths (3 ft), and  
237 tighter vegetation modification limits. This alternative would result in the least amount of new  
238 permitted shoreline disturbance. Over time, natural regeneration of vegetation at previously  
239 disturbed sites would support improved water quality, shoreline stability, and habitat continuity.  
240 While private shoreline development potential would be more constrained under this alternative,  
241 recreational quality and aesthetics would be maintained or enhanced because of the stronger  
242 protective measures.

243 Across all three alternatives, no significant adverse impacts on water quality, aquatic habitat,  
244 threatened and endangered species, cultural resources, air quality, socioeconomics, recreation, or  
245 aesthetics were identified. Alternatives 2 and 3 would result in minor to negligible beneficial  
246 impacts due to stronger vegetation retention, reduced shoreline modification, and enhanced  
247 shoreline protection measures. Necessary compliance for ground disturbing activities, including  
248 consultation under the Endangered Species Act, coordination with the Arkansas Historic  
249 Preservation Program, and adherence to USACE shoreline permitting regulations, would  
250 continue regardless of the alternative selected.

251 The SMP update was informed by extensive public and agency engagement, including a 30-day  
252 scoping comment period, direct outreach to stakeholders, and coordination with multiple state  
253 and tribal governments. Stakeholder input emphasized shoreline erosion concerns, dock  
254 allocation requests, vegetation management, recreation maintenance, and cultural resource  
255 protection—issues that were taken into consideration in the updated allocations and permitting  
256 requirements contained in the action alternatives.

257 Based on the analysis conducted in this EA, implementation of the updated SMP is expected to

258 have insignificant events to environmental conditions around Lake Dardanelle while preserving  
259 public recreation opportunities and managing private shoreline access responsibly. The Preferred  
260 Alternative best balances shoreline protection, private use, and long-term sustainability, ensuring  
261 that Lake Dardanelle continues to support recreation, ecological health, and public enjoyment for  
262 future generations.

## 9. BIBLIOGRAPHY

- ADEE. 2024a. *Water Quality Planning Branch Overview*. Arkansas Department of Energy & Environment. Retrieved from: <https://www.adeq.state.ar.us/water/planning/>
- ADEE. 2024b. *Regulation No. 2: Establishing Water Quality Standards for Surface Waters of the State of Arkansas*. Retrieved from: <https://www.adeq.state.ar.us/regs/detail-reg.aspx?show=2>
- ADEE. 2024c. *Ambient Water Quality Monitoring Stations*. Retrieved from: [https://www.adeq.state.ar.us/techsvs/env\\_multi\\_lab/p\\_station\\_list.aspx](https://www.adeq.state.ar.us/techsvs/env_multi_lab/p_station_list.aspx)
- ADEE. 2024d. *2024 Draft 303(d) List of Impaired Waterbodies*. Retrieved from: <https://www.adeq.state.ar.us/water/planning/integrated/>
- ADEE. 2024e. *Total Maximum Daily Load (TMDL) Program*. Retrieved from: <https://www.adeq.state.ar.us/water/planning/integrated/tmdl/>
- ADEE. 2024f. *State of Arkansas Air Quality Status and NAAQS Compliance*. Retrieved from: <https://www.adeq.state.ar.us/>
- Arkansas Game & Fish Commission (AGFC). 2022. AGFC restocking largemouth bass in Lake Dardanelle due to low reproduction. *Arkansas Game and Fish Commission News Release*. Retrieved from: <https://www.agfc.com/news/agfc-planting-bass-and-habitat-on-arkansas-river>
- AGFC. 2025. *Dardanelle Wildlife Management Area Overview*. Retrieved from: <https://www.agfc.com/wma/dardanelle-wma/>
- Arkansas Natural Heritage Commission (ANHC). *Elements of Species Concern Dataset*. ANHC No.: F-COEO-25-001. 2025.
- Almy, Marion, Elizabeth A. Horvath, Della Fahnestock, Nicholas Bourgeois and Philip Jungeblut. 2018. *Cultural Resource Assessment Survey, Lake Dardanelle and Ozark Lake, FY17-MK-D-1, Johnson County Ducks; FY17-MK-D-2, Johnson County Waterfowl Rest Area; FY17-MK-D-3, Horsehead WRA; and FY17-MK-O-1, Mulberry Bottom*. Archaeological Consultants, Inc., Sarasota, Florida and Coastal Environments, Inc., Baton Rouge, Louisiana. Report submitted to the U.S. Army Corps of Engineers, Little Rock District.
- Almy, Marion, Elizabeth A. Horvath, Della Fahnestock, and Aden Jenkins. 2019. *Cultural Resource Assessment Survey Ozark Lake and Lake Dardanelle Mk-Ozark, Fy18-Mk-O-1, Bectum Hill Mk-Dardanelle, Fy18-D-1, O’kane Island Franklin County, Arkansas*. Archaeological Consultants, Inc., Sarasota, Florida and Coastal Environments, Inc., Baton Rouge, Louisiana. Report submitted to the U.S. Army Corps of Engineers, Little Rock District.

- Almy, Marion, Elizabeth A. Horvath, and Aden Jenkins. 2020. Cultural Resource Assessment Survey McClellan-Kerr Arkansas River Navigation System (Lake Dardanelle) Haroldton Access (Fy19.1-Mk-1), Sweeden (Fy19.1-Mk-2), Fletcher Bend (Fy19.1-Mk-3), Maumell Day Use Area (Fy19.1-Mk-4), Merrisach (Fy19.1-Mk-5), and Rifle Pit (Fy19.1-Mk-6) Crawford, Pope, Faulkner, Pulaski, And Arkansas Counties, Arkansas. Archaeological Consultants, Inc., Sarasota, Florida and Coastal Environments, Inc., Baton Rouge, Louisiana. Report submitted to the U.S. Army Corps of Engineers, Little Rock District.
- Almy, Marion, Elizabeth A. Horvath, Della Fahnestock, and Aden Jenkins. 2019. Cultural Resource Assessment Survey Ozark Lake and Lake Dardanelle Mk-Ozark, Fy18-Mk-O-1, Bectum Hill Mk-Dardanelle, Fy18-D-1, O'kane Island Franklin County, Arkansas. Archaeological Consultants, Inc., Sarasota, Florida and Coastal Environments, Inc., Baton Rouge, Louisiana. Report submitted to the U.S. Army Corps of Engineers, Little Rock District.
- Blakely, Jeffery A. and W.J. Bennett, Jr. 1988. Cultural Resources Priority Plan for the U.S. Army Engineer District, Little Rock. Archeological Assessments Report No. 76. Report Submitted to US Army Corps of Engineers, Little Rock District.
- Bennett, W.J., Jr., Anne Frances Gettys. Aubra lee, Lawson M. Smith, and Beverly Watkins. 1986. Archeology in the Arkansas River Valley: A Cultural Resources Survey in the Central Arkansas River Valley, Lake Dardanelle and Ozark Lake Arkansas. Archeological Assessments, Inc., Nashville, Arkansas. Archeological Assessments Report No 47. Report submitted to the U.S. Army Corps of Engineers, Little Rock District.
- Bennett, W.J., Jr., Beverly Watkins, Joe Dunbar, and Robert Brinkmann. 1989b. Archeological Investigations at Montgomery Point Desha County, Arkansas. Archeological Assessments Report No. 116, Nashville, Arkansas. Report submitted to the U.S. Army Corps of Engineers, Little Rock District.
- Bennett, W.J., Jr., Phyllis L. Breland, and Lawson M. Smith. 1989a. Cultural Resources and Geomorphological Reconnaissance of the McClellan-Kerr Arkansas River Navigation System Pools 1 through 9. Archeological Assessments Report No. 79, Nashville, Arkansas. Report submitted to the U.S. Army Corps of Engineers, Little Rock District.
- Britzke, Eric. 2019. Results of Bat Survey of Dardanelle Lake, Arkansas. U.S. Army Corps of Engineers.
- Caldwell, Warren W. 1960. Archeological Investigations in the Dardanelle Reservoir, West-Central Arkansas. Smithsonian Institution.
- Cole, Kenneth W. 1969. Archeological Survey of the Arkansas Power and Light Company Nuclear Power Plant Construction Area, Pope County, Arkansas, 1969. Arkansas Archeological Survey.

- Eggleton, M. A., Adams, B. L., Payne, D. B., & Williams, C. J. 2007. Spotted bass population characteristics and relationships in Arkansas River pools. Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies, 61, 49–56. Retrieved from: <https://seafwa.org/sites/default/files/journal-articles/10Eggletonetal49-56.pdf>
- Eggleton, M. A., Schramm, H. L., Jr., et al. 2010. Largemouth bass fishery characteristics in the Arkansas River Navigation System and Pool 10 (Lake Dardanelle). Proceedings of the Southeastern Association of Fish and Wildlife Agencies, 64, 160–167. Retrieved from: <https://seafwa.org/sites/default/files/journal-articles/27%252520Eggleton%252520et%252520al%252520160-167.pdf>
- Executive Order No. 13112. Invasive Species. 3 February 1999.
- Fenneman, N.M. and Johnson, D.W. 1946. Physiographic divisions of the conterminous U.S.: U.S. Geological Survey data release. <https://doi.org/10.5066/P9B1S3K8>.
- Greengo, Robert E. 1957. Appraisal of the Archeological Resources of the Dardanelle Reservoir, Arkansas. Smithsonian Institution.
- Hogan, Maura, Adam Parker, Bryan Heisinger, Sara Mackenzie Parkin, and Katherine Seikel. 2021. Cultural Resource Assessment Survey of 403 Acres at Lake Dardanelle In Franklin and Johnson Counties, Arkansas. AmaTerra Environmental, Inc, Austin, Texas. Report submitted to the U.S. Army Corps of Engineers, Little Rock District.
- Klinger, Timothy C. 2008. City of London Wastewater Treatment Plant (Pope County) Identification of Historic Properties. Historic Preservation Associates, Inc., Fayetteville, Arkansas.
- Klinger, Timothy C., James A. Ross, and John L. Gray, IV. 2001. Entergy Arkansas Nuclear One Records Review. Historic Preservation Associates, Inc., Fayetteville, Arkansas.
- Kresse, T.M., Hays, P.D., Merriman, K.R., Gillip, J.A., Fugitt, D.T., Spellman, J.L., Nottmeier, A.M., Westerman, D.A., Blackstock, J.M., and Battreal, J.L. 2014. Aquifers of Arkansas—Protection, management, and hydrologic and geochemical characteristics of groundwater resources in Arkansas: U.S. Geological Survey Scientific Investigations Report 2014–5149, 334 p. <http://dx.doi.org/10.3133/sir20145149>.
- Maintenance Guidance and Procedures. HQUSACE, Washington DC. Management. 21 April 2000. Management. 24 January 2007.
- Quinn, J. W., & Limbird, R. L. 2008. Trends over time in fish communities of Lake Dardanelle (Pool 10, MKARNS) in response to length limits and largemouth bass virus. In: Allen, M. S., Sammons, S. M., & Maceina, M. J. (Eds.), Balancing Fisheries Management and Water Uses for Impounded River Systems. American Fisheries Society Symposium 62, 169–191. Retrieved from: <https://fisheries.org/docs/books/54062P/12.pdf>

- Roby, Piper, Crystal Birdsall, and Andrew Taylor. 2021. Spring migration of Indiana bats from Newton County, AR and Summer follow up survey – 2021, Arkansas DOT Job 001799. Copperhead Environmental Consulting, Inc., Paint Lick, Kentucky. Report submitted to the Arkansas Department of Transportation.
- Thomas, Sunshine, Adam K. Parker, Matthew R. Carter, and Kurt Korfmacher. 2022. Cultural Resources Assessment Survey Of 551 Acres at Lake Dardanelle In Franklin, Johnson, And Logan Counties, Arkansas. AmaTerra Environmental, Inc, Austin, Texas. Report submitted to the U.S. Army Corps of Engineers, Little Rock District.
- USACE. 2005. Arkansas River Navigation Study, Arkansas and Oklahoma, McClellan-Kerr Arkansas River Navigation System. USACE, Little Rock District and Tulsa District. Little Rock, AR.
- USACE. 2013. Little Rock District Water Management. Accessed at: [www.swl-wc.usace.army.mil](http://www.swl-wc.usace.army.mil). 2022.
- USACE. 2013. USACE Dam Safety Program. Accessed at:
- USACE. 2018. Three Rivers Southeast Arkansas Integrated Feasibility Report and Environmental Assessment, Final Report. USACE, Little Rock District.
- USACE. 2020a. Corps reopens swim beaches on Lake Dardanelle. Press Releases. Accessed at: <https://www.usace.army.mil/Media/News-Releases/News-Release-Article-View/Article/2218497/corps-reopens-swim-beaches-on-lake-dardanelle/>
- USACE. 2020b. Final McClellan-Kerr Arkansas River Navigation System Master Plan. Little Rock District, U.S. Army Corps of Engineers. Retrieved from: [https://www.swl.usace.army.mil/Portals/50/docs/planningandenvironmental/MKARNS-MPR/Documents/Final%20MP/Final\\_MKARNS\\_MP.pdf](https://www.swl.usace.army.mil/Portals/50/docs/planningandenvironmental/MKARNS-MPR/Documents/Final%20MP/Final_MKARNS_MP.pdf)
- USACE. 2022. Little Rock District. McClellan–Kerr Arkansas River Navigation System Master Plan. Retrieved from: [https://www.swl.usace.army.mil/Portals/50/docs/planningandenvironmental/MKARNS-MPR/Documents/Final%20MP/Final\\_MKARNS\\_MP.pdf](https://www.swl.usace.army.mil/Portals/50/docs/planningandenvironmental/MKARNS-MPR/Documents/Final%20MP/Final_MKARNS_MP.pdf)
- USACE. 2025a. Lake Dardanelle Shoreline Management Plan – Vegetation and Wildlife Guidance. Retrieved from: <https://www.usace.army.mil/Missions/Civil-Works/Recreation/Vegetation-Management/>
- USACE. 2025b. Invasive Species Management Program. Retrieved from: <https://www.usace.army.mil/Missions/Environmental/Invasive-Species-Management/>
- United States Department of Agriculture (USDA). 2022, Natural Resources Conservation Service. Farmland Protection Policy Act. Available at:

<https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/land/cropland/farmland-protection-policy-act>. 2022.

U.S. Environmental Protection Agency (EPA). 2016. What Climate Change Means for Arkansas. EPA 430-F-16-006. Retrieved from: <https://nepis.epa.gov/>

USEPA. 2025. NAAQS Table. Available at: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>

USFWS. 2022. National Wetlands Inventory, Projects Mapper. Available at: <https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>. 2025.

USFWS. 2025a. Tricolored Bat (*Perimyotis subflavus*) *Species Profile*. U.S. Fish & Wildlife Service. Retrieved from: <https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus>

USFWS, 2025b. Alligator Snapping Turtle (*Macrochelys temminckii*) *Species Profile*. U.S. Fish and Wildlife Service. Available at: <https://www.fws.gov/species/alligator-snapping-turtle-macrochelys-temminckii>

USFWS, 2025c. Western Fanshell (*Cyprogenia aberti*) *Species Profile*. U.S. Fish and Wildlife Service. Available at: <https://www.fws.gov/species/western-fanshell-cyprogenia-aberti>

USFWS, 2025d. Monarch Butterfly (*Danaus plexippus*) *Species Profile*. U.S. Fish and Wildlife Service. Available at: <https://www.fws.gov/species/monarch-danaus-plexippus>

USFWS. 2026. Information, Planning, and Consultation (IPAC) System, Environmental Conservation Online System. Official Species List. Project Code: 2025-0098719. Created on November 12, 2025. Available at: <https://ecos.fws.gov>.

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