Section B. 2021 Central Arkansas NWR Complex Hunting and Fishing Plans Environmental Assessment and Appendices

ENVIRONMENTAL ASSESSMENT AND APPENDICES

USFWS

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SECTION B. ENVIRONMENTAL ASSESSMENT FOR THE CENTRAL ARKANSAS NATIONAL WILDLIFE REFUGE COMPLEX HUNTING AND FISHING PLANS

Date: July 2021

Estimated Lead Agency Total Costs Associated Environmental Assessment: $14,000

INTRODUCTION

This Environmental Assessment (EA) is being prepared to evaluate the effects associated with the proposed action, opening new hunting and fishing opportunities on Big Lake, Bald Knob, Cache River, Holla Bend, and Wapanocca National Wildlife Refuges (NWR or refuge) in the Central Arkansas NWR Complex (Complex) and complies with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality regulations (40 CFR §§1500-1509) and Department of the Interior (43 CFR Part 46; 516 DM 8) and U.S. Fish and Wildlife Service (550 FW 3) regulations and policies. NEPA requires examination of the effects of proposed actions on the natural and human environment. Other applicable statutes, executive orders and regulation compliance are addressed in Appendix A.

PROPOSED ACTION

The U.S. Fish and Wildlife Service (Service) is proposing to open new hunting and fishing opportunities for several new species on the Complex in accordance with the Central Arkansas NWR Complex ‘s respective refuges (Figure 1 and See Table 3) 2021 Hunting and Sport Fishing Plans and establishing legislation and refuge purposes (Table 1). In accordance with the existing Comprehensive Conservation Plans (CCPs) and the EAs and Findings of No Significant Impact (FONSIs) for the CCPs, the Service is proposing Alternative B, to update and replace the existing hunt and sport fishing plans and existing compatibility determinations (CDs) for five of the six national wildlife refuges (NWRs) in the Central Arkansas NWR Complex (Logan Cave NWR is excluded from this analysis) (USFWS 2009 and 2010). This effort is also to better align with the State of Arkansas’s regulations and seasons.

This proposed action is often iterative and evolves over time during the process as the agency refines its proposal and learns more from the public, Native American Tribes, and other agencies. Therefore, the final proposed action may be different from the original. The final decision on the proposed action will be made after the conclusion of the public comment period for the EA and the 2021-2022 Refuge-Specific Hunting and Sport Fishing Plans.

BACKGROUND

National Wildlife Refuges are guided by the mission and goals of the National Wildlife Refuge System (NWRS), the purposes of an individual refuge, Service policy, and laws and international treaties. Relevant guidance includes the NWRS Administration Act of 1966 (NWRSAA), as amended by the National Wildlife Refuge System Improvement Act (NWRSIA) of 1997 (16 U.S.C. §668dd et seq.), Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations (CFR), Fish and Wildlife Service Manual, and other pertinent legislation (Appendix A).

Figure 1. Central Arkansas National Wildlife Refuge Complex.

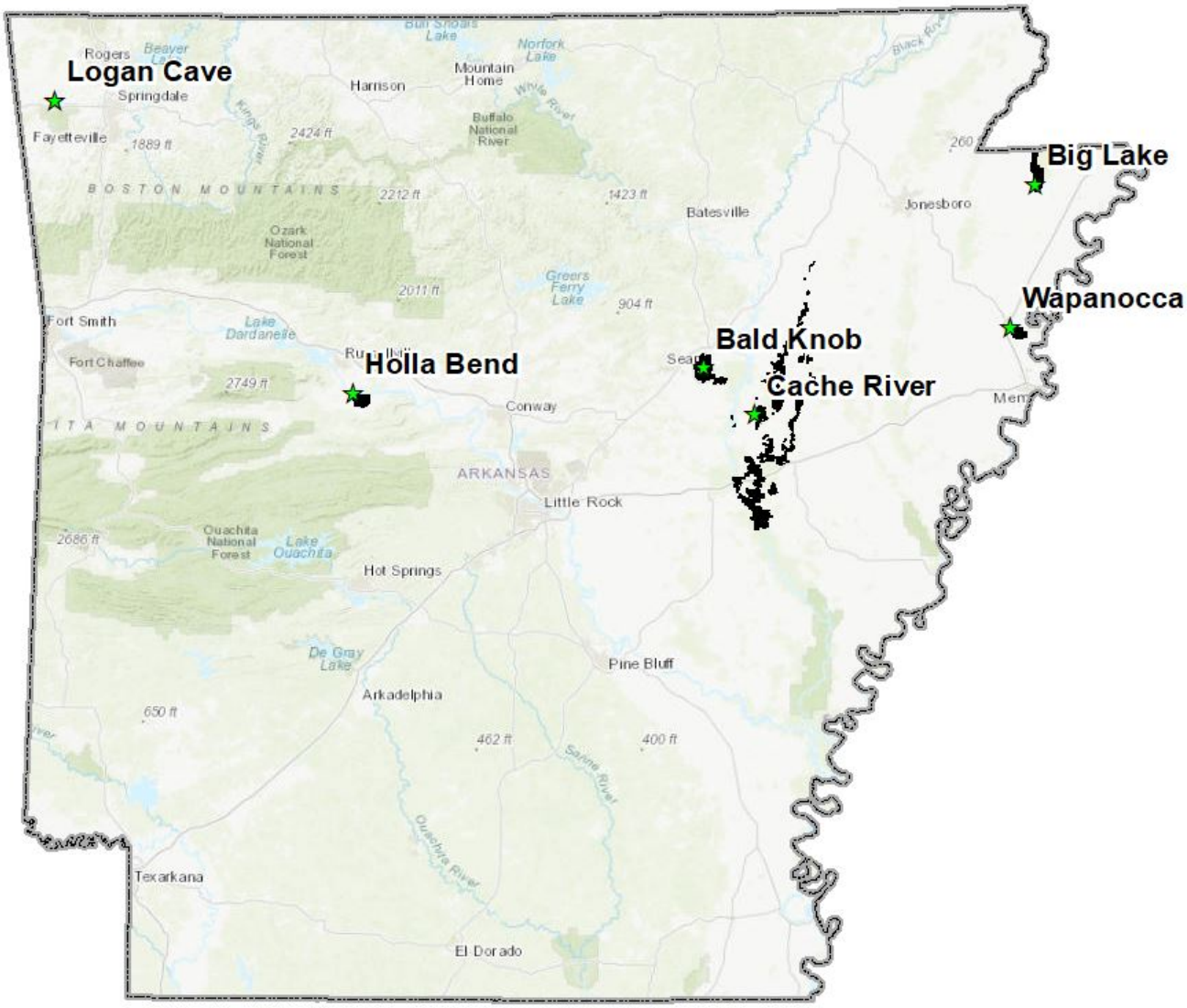


Table 1. Central Arkansas National Wildlife Refuge Complex Establishing Legislation and Refuge Purposes.

Refuge	Year Established	Establishment Legislation	Refuge Purpose
Bald Knob NWR	1993	Migratory Bird Conservation Act of 1934 (16 U.S.C. § 715d); Fish and Wildlife Act of 1956 (16 U.S.C. § 742f(b)(l)); Emergency Wetlands Resource Act of 1986 (16 U.S.C. § 390l(b), Stat. 3583)	"...for use as inviolate sanctuary, or for any other management purpose, for migratory birds;" "…for the development, advancement, management, conservation, and protection of fish and wildlife resources…;" and "for the conservation of the Wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions;" "…for the benefit of the United States Fish and Wildlife Service (Service), in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude."
Big Lake NWR	1915	Executive Order 2230, dated August 2, 1915; Migratory Bird Conservation Act of 1934 (16 U.S.C. § 715d); The Wilderness Act of 1964 (16 U.S.C. § 1131-1136)	"…as a refuge, reserve, and breeding ground for native birds;" "...for use as inviolate sanctuary, or for any other management purpose, for migratory birds;" "To manage the Big Lake Wilderness as part of the National Wilderness Preservation System, as compatible with the purpose for which Big Lake NWR was established."
Cache River NWR	1986	Migratory Bird Conservation Act of 1934 (16 U.S.C. § 715d); Fish and Wildlife Act of 1956 (16 U.S.C. § 742f(b)(l));	"...for use as inviolate sanctuary, or for any other management purpose, for migratory birds;"

Refuge	Year Established	Establishment Legislation	Refuge Purpose
		Emergency Wetlands Resource Act of 1986 (16 U.S.C. § 390l(b), Stat. 3583); North American Wetlands Conservation Act (16 U.S.C. § 4401-4412)	"…for the development, advancement, management, conservation, and protection of fish and wildlife resources…;" "…for the benefit of the United States Fish and Wildlife Service (Service), in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude;" "for the conservation of the Wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions; "…to protect, enhance, restore, and manage an appropriate distribution and diversity of wetland ecosystems and other habitats for migratory birds and other fish and wildlife in North America; to maintain current or improved distributions of migratory bird populations, and to sustain an abundance of waterfowl and other migratory birds consistent with the goals of the North American Waterfowl Management Plan…"
Holla Bend NWR	1957	Transfer of Certain Real Property for Wildlife Conservation Purposes Act, (16 U.S.C. 667b); Migratory Bird Conservation Act of 1934 (16 U.S.C. 715d); Fish and Wildlife Act of 1956 (16 U.S.C. 742f(a)(4)) ; Refuge Recreation Act of 1962 (16 U.S.C. 460k – 460k-4)	"… particular value in carrying out the national migratory bird management program;" "… for use as an inviolate sanctuary, or for any other management purpose, for migratory birds;" "…for the development, advancement, management, conservation, and protection of fish and wildlife resources…for the benefit of the United States Fish and Wildlife Service, in performing its activities and services;" and

Refuge	Year Established	Establishment Legislation	Refuge Purpose
			"…suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species…".
Wapanocca NWR	1961	Migratory Bird Conservation Act of 1934 (16 U.S.C. 715d); Consolidated Farmers Home Administration Act of 1961 [Title III (P.L. 87-128] 7 U.S.C. 1926 et seq.; Consolidated Farm and Rural Development Act of l 972 [Title V, P.L. 92-419]	"...for use as inviolate sanctuary, or for any other management purpose, for migratory birds."

The mission of the NWRS, as outlined by the NWRSAA, and as amended by the NWRSIA, is to:

"... to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans"

The NWRSIA mandates the Secretary of the Interior in administering the System to:

- Provide for the conservation of fish, wildlife, and plants, and their habitats within the NWRS;
- Ensure that the biological integrity, diversity, and environmental health of the NWRS are maintained for the benefit of present and future generations of Americans;
- Ensure that the mission of the NWRS described at 16 U.S.C. §668dd(a)(2) and the purposes of each refuge are carried out;
- Ensure effective coordination, interaction, and cooperation with owners of land adjoining refuges and the fish and wildlife agency of the States in which the units of the NWRS are located;
- Assist in the maintenance of adequate water quantity and water quality to fulfill the mission of the NWRS and the purposes of each refuge;
- Recognize compatible wildlife-dependent recreational uses as the priority general public uses of the NWRS through which the American public can develop an appreciation for fish and wildlife;
- Ensure that opportunities are provided within the NWRS for compatible wildlife-dependent recreational uses; and
- Monitor the status and trends of fish, wildlife, and plants in each refuge.

Therefore, it is a priority of the Service to provide for wildlife-dependent recreation opportunities, including hunting and fishing, when those opportunities are compatible with the purposes for which the refuge was established and the mission of the NWRS.

Public hunting and fishing were determined to be compatible wildlife-dependent recreational uses based on the Central Arkansas NWR Complex (which included Bald Knob, Big Lake, Cache River, and Wapanocca NWR) and the Holla Bend NWR final CCPs and FONSIs (USFWS 2009, 2010, respectively). Hunting and fishing objectives in the Complex and Holla Bend NWR CCPs were designed to provide quality hunting and fishing experiences that meet Service guidelines and policies and refuge goals and objectives. The designs of the existing and proposed hunt and fish plans directly support multiple goals and objectives of the CCPs, including:

Bald Knob NWR Goal 4: Develop compatible, wildlife-dependent recreational programs that lead to enjoyable experiences, a greater understanding of fish, wildlife, and habitat conservation, and a greater appreciation for the value of Bald Knob NWR.

> **Bald Knob NWR Objective 4-3.** Hunting. Annually provide and expand quality, compatible hunting opportunities as feasible.
>
> **Bald Knob NWR Objective 4-4:** Fishing. Annually provide and expand quality, compatible fishing opportunities as feasible.

Big Lake NWR Goal 4: Develop compatible, wildlife-dependent recreation programs that lead to enjoyable experiences, a greater understanding of fish, wildlife, and habitat conservation, and a greater appreciation for the value of Big Lake NWR.

> **Big Lake NWR Objective 4-3:** Hunting. Annually provide and expand quality, compatible hunting opportunities as feasible.
>
> **Big Lake NWR Objective 4-4:** Fishing. Annually provide and expand quality, compatible fishing opportunities as feasible.

Cache River NWR Goal 4: Develop compatible, wildlife-dependent recreation programs that lead to enjoyable experiences; a greater understanding of fish, wildlife, and habitat conservation; and a greater appreciation for the value of Cache River NWR.

> **Cache River NWR Objective 4-3:** Hunting. Annually provide and expand quality, compatible hunting opportunities as feasible.
>
> **Cache River NWR Objective 4-4:** Fishing. Annually provide and expand quality, compatible fishing opportunities as feasible.

Wapanocca Goal 4: Develop compatible, wildlife-dependent recreation programs that lead to enjoyable experiences; a greater understanding of fish, wildlife, and habitat conservation; and a greater appreciation for the value of Wapanocca NWR.

> **Wapanocca NWR Objective 4-3:** Hunting. Annually provide and expand quality, compatible hunting opportunities as feasible.

Wapanocca NWR Objective 4-4: Fishing. Annually provide and expand quality, compatible fishing opportunities as feasible.

Holla Bend NWR CCP Goal 4. Visitor Services. Develop and implement a quality wildlife-dependent recreation program that leads to a greater understanding and appreciation of fish and wildlife resources and enjoyable recreational experiences.

Holla Bend NWR CCP Objective 4.1 Hunting - Over the 15-year life of this CCP, provide safe, quality hunting opportunities consistent with sound biological principals, in support of the refuge's wildlife management objectives and established purposes, and in accordance with Refuge System policy and state and federal laws.

Holla Bend NWR CCP Objective 4.2 Fishing - Over the 15-year life of this CCP, conduct a safe, quality fishing program in accordance with Refuge System policy, and state and federal laws.

PURPOSE AND NEED

The purpose of this EA is to evaluate compatible wildlife-dependent hunting and fishing recreational opportunities on Central Arkansas NWR Complex and propose to replace the respective refuges' Sport Hunting and Fishing Plans and associated FONSIs:

- Bald Knob NWR Hunt (USFWS 1995) and Fish (USFWS 1996) Plans;
- Big Lake NWR Hunt (USFWS 1985) and Fish (USFWS 1987) Plans;
- Cache River NWR Hunt (USFWS 1995) and Fish (USFWS 1995) Plans;
- Holla Bend NWR Hunt (USFWS 1980) and Fish (USFWS 1990) Plans; and
- Wapanocca NWR Hunt (USFWS 2007) and Fish (USFWS 1989) Plans.

The need of the EA is to meet the Service's priorities and mandates; implement the Service's Secretarial Order (S.O.) 3347 *Conservation Stewardship and Outdoor Recreation* and S.O. 3356 *Hunting, Fishing, Recreational Shooting, and Wildlife Conservation Opportunities and Coordination with States, Tribes, and Territories* by expanding hunting and fishing opportunities and better aligning Service regulations with State regulations.

ALTERNATIVES

Several ideas were initially considered and closely evaluated for inclusion in this EA. Two alternatives were fully developed for review: Alternative A, Continue Current Management (No Action Alternative) and Alternative B, Implement the 2021 Hunt and Fish Plans for the Central Arkansas NWR Complex NWR (Proposed Action). The 2021 Central Arkansas NWR Complex Hunt and Fish Plans were developed for implementation based on the Proposed Action outlined in Alternative B.

ALTERNATIVE A – CONTINUE CURRENT MANAGEMENT (NO ACTION ALTERNATIVE)

The Central Arkansas NWR Complex manages hunting and fishing on Bald Knob NWR (15,436 acres), Big Lake NWR (10,913 acres), Cache River NWR (73,546 acres), Holla Bend NWR (6,013 acres), and Wapanocca NWR (5,624 acres) (Figure 2-7). Under Alternative A, hunting and fishing would continue as outlined in the existing respective refuges Sport Hunting and Fishing Plans and associated FONSIs:

- Bald Knob NWR Hunt (USFWS 1995) and Fish (USFWS 1996) Plans;
- Big Lake NWR Hunt (USFWS 1985) and Fish (USFWS 1987) Plans;
- Cache River NWR Hunt (USFWS 1995) and Fish (USFWS 1995) Plans;
- Holla Bend NWR Hunt (USFWS 1980) and Fish (USFWS 1990) Plans; and
- Wapanocca NWR Hunt (USFWS 2007) and Fish (USFWS 1989) Plans.

Under this alternative, as presented in Table 3, beaver, coyote, crawfish, fish, frogs, beaver, nutria, opossum, rabbit, raccoon, squirrel, and white-tailed deer are species that currently can and would continue to be hunted on Big Lake NWR. Beaver, coyote, crawfish, feral hog, fish, beaver, nutria, opossum, rabbit, raccoon, squirrel, and white-tailed deer are species that currently can and would continue to be hunted on Wapanocca NWR (Table 3). Beaver, bobcat, coyote, fish, frogs, opossum, rabbit, raccoon, squirrel, turkey, and white-tailed deer are species that currently can and would continue to be hunted on Holla Bend NWR (Table 3).Beaver, coot, coyote, crawfish, dark geese, dove, merganser, duck, feral hog, fish, frogs, light geese, muskrat, nutria, opossum, quail, rabbit, raccoon, snipe, squirrel, teal, turkey, white-tailed deer, and woodcock are species that currently can and would continue to be hunted on Bald Knob and Cache River NWRs (Table 3). No additional species would be hunted or fished and only minimal changes to seasons and locations would occur. There would be no change in current refuge implementation of this compatible, wildlife-dependent recreational use that is allowed and considered a priority public use.

ALTERNATIVE B – IMPLEMENT 2021 HUNT/FISH PLANS FOR CENTRAL ARKANSAS NWR COMPLEX (PROPOSED ACTION ALTERNATIVE)

The Refuges have prepared refuge-specific 2021 Hunting and Fishing Plans, which are presented in this document as the Proposed Action Alternative. The hunt and fish plans in Section A and the hunting and fishing CDs in Appendix B and C were developed for implementation based on Alternative B in and are incorporated herein by reference.

The Central Arkansas NWR Complex manages hunting and fishing on Bald Knob NWR (15,436 acres), Big Lake NWR (10,913 acres), Cache River NWR (73,546 acres), Holla Bend NWR (6,013 acres), and Wapanocca NWR (5,624 acres) (Figure 2-7). Cache River NWR currently has an active land acquisition program (See Figure 4); for this refuge, those anticipated acquisitions are included in this analysis and would be added to the Cache River NWR Hunt and Fish Plan upon acquisition without the development of an additional or amended hunt and fish plan, unless specific conditions or circumstances bar this action. The existing total of 73,346 acres open to hunting on Cache River NWR would increase over time from Alternative A by 213,332 acres up to approximately 286,684 acres, as also analyzed in the LPP (USFWS 2012).

Under the Proposed Action Alternative, in addition to the current hunting seasons, Bald Knob and Cache River NWRs would add hunting seasons for sora and Virginia rail, purple and common gallinule, white-winged, Eurasian collared, and rock dove, American and fish crow, striped skunk, red and gray fox, bobcat, river otter, and mink. In addition to current seasons, Bald Knob NWR would add a youth gun turkey hunt (See Table 3). In addition to current seasons on Big Lake, hunting seasons for modern gun deer, youth gun deer, quail, turkey, feral hog, striped skunk, red and gray fox, bobcat, river otter, mink, and muskratwould occur (See Table 3). On Holla Bend NWR, in addition to current seasons, additional youth gun deer, black bear, gun squirrel and rabbit, striped skunk, red and gray fox, river otter, mink, muskrat, nutria, quail, and crawfish seasons would be added. On Wapanocca NWR, in addition to current seasons, youth gun deer, quail, turkey, striped skunk, red and gray fox, bobcat, river otter, mink, muskrat, and frog seasons would be added (See Table 3). Increased methods of take for fishing and frogging will be offered on Wapanocca NWR (See Table 3). Opportunities for wheelchair-bound hunters and anglers on the Complex would be enhanced by placement of wheelchair-accessible hunting blinds and fishing platforms where suitable.

This alternative is often iterative and evolves over time during the process as the agency refines its proposal and learns more from the public, tribes, and other agencies. The final proposed action may be different from the original and the hunt and fish plans will also need to be revised to reflect any changes.

This alternative offers increased opportunities for public hunting/fishing and fulfills the Service's mandate under the NWRSIA. The Service has determined that the hunt and fish plans are compatible with the purposes of the refuges and the mission of the NWRS.

The Service prepared Refuge-specific Hunting and Fishing Plans (Section A), which are incorporated herein by reference, to more fully develop Alternative B. The proposed additions were designed to minimize potential conflicts with refuge purposes and other priority public uses, while providing increased opportunities for a compatible priority public use.

These regulations will be imposed under the Proposed Action and published in the Federal Register as part of the 2021-2022 Refuge-Specific Hunting and Sport Fishing Regulations.

Figure 2. Hunt units and acres open to hunting for Bald Knob National Wildlife Refuge within the Central Arkansas NWR Complex.

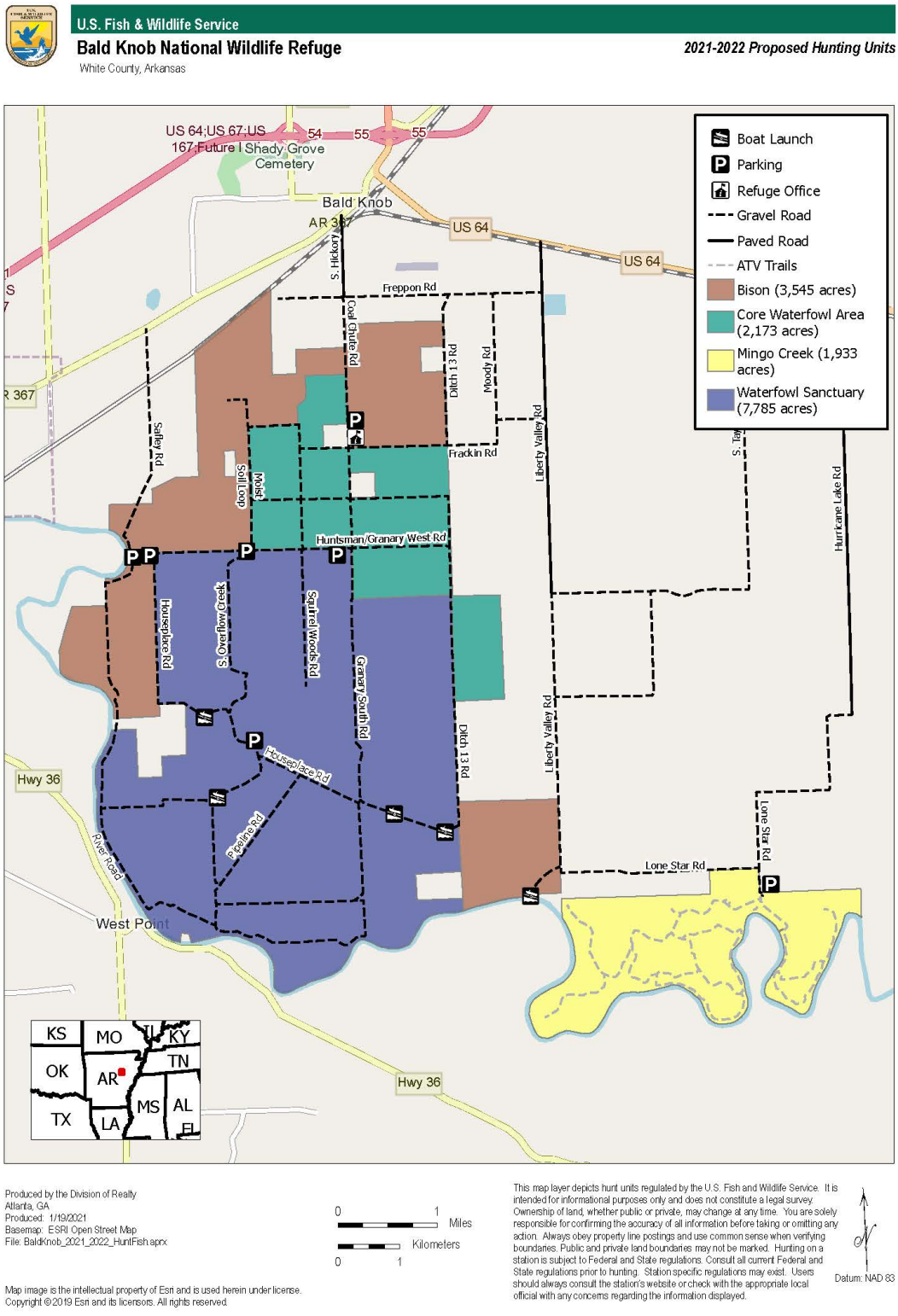


Figure 3. Hunt units and acres open to hunting for Big Lake National Wildlife Refuge within the Central Arkansas NWR Complex.

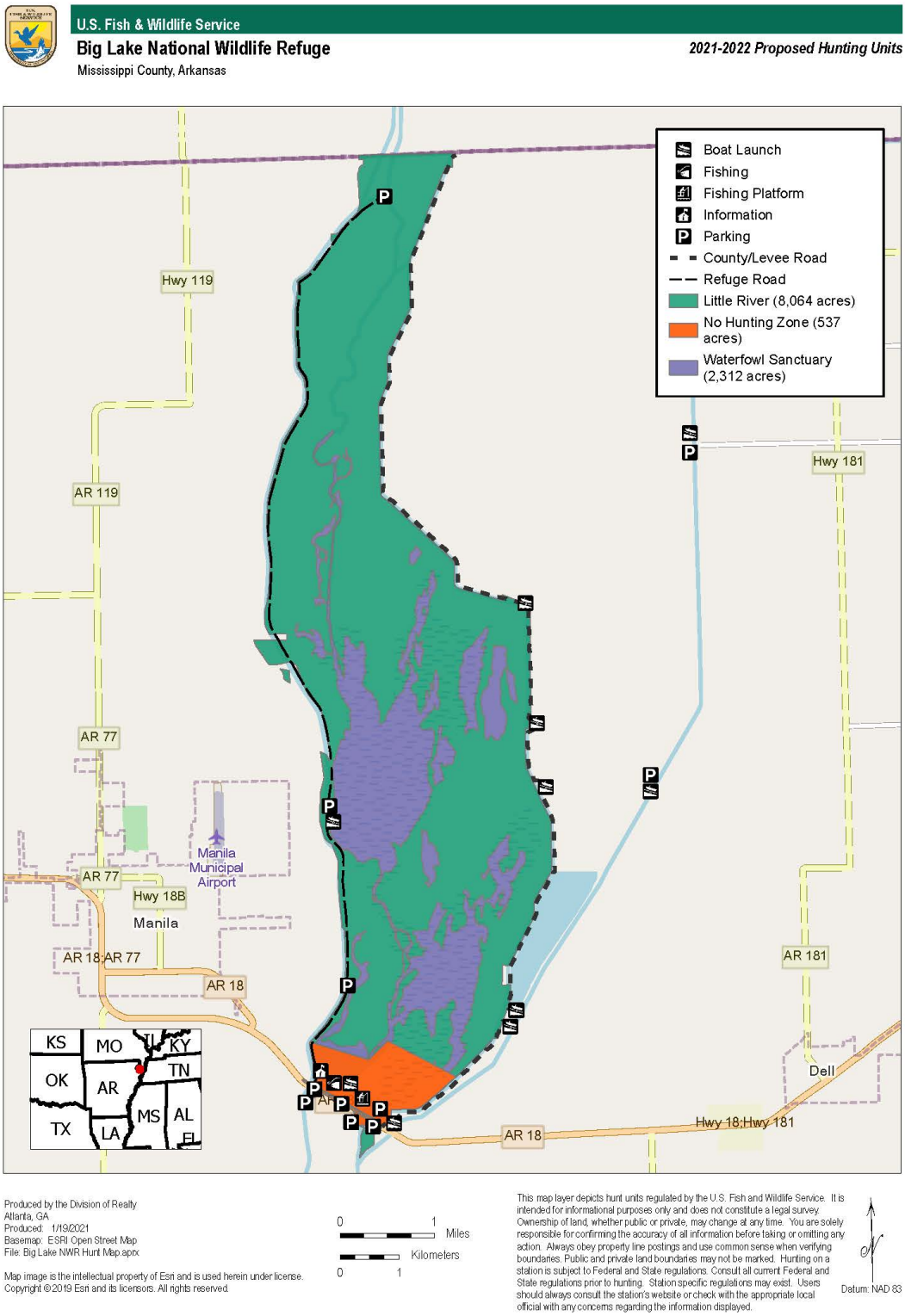


Figure 4. Hunt units and acres open to hunting for Cache River National Wildlife Refuge within the Central Arkansas NWR Complex.

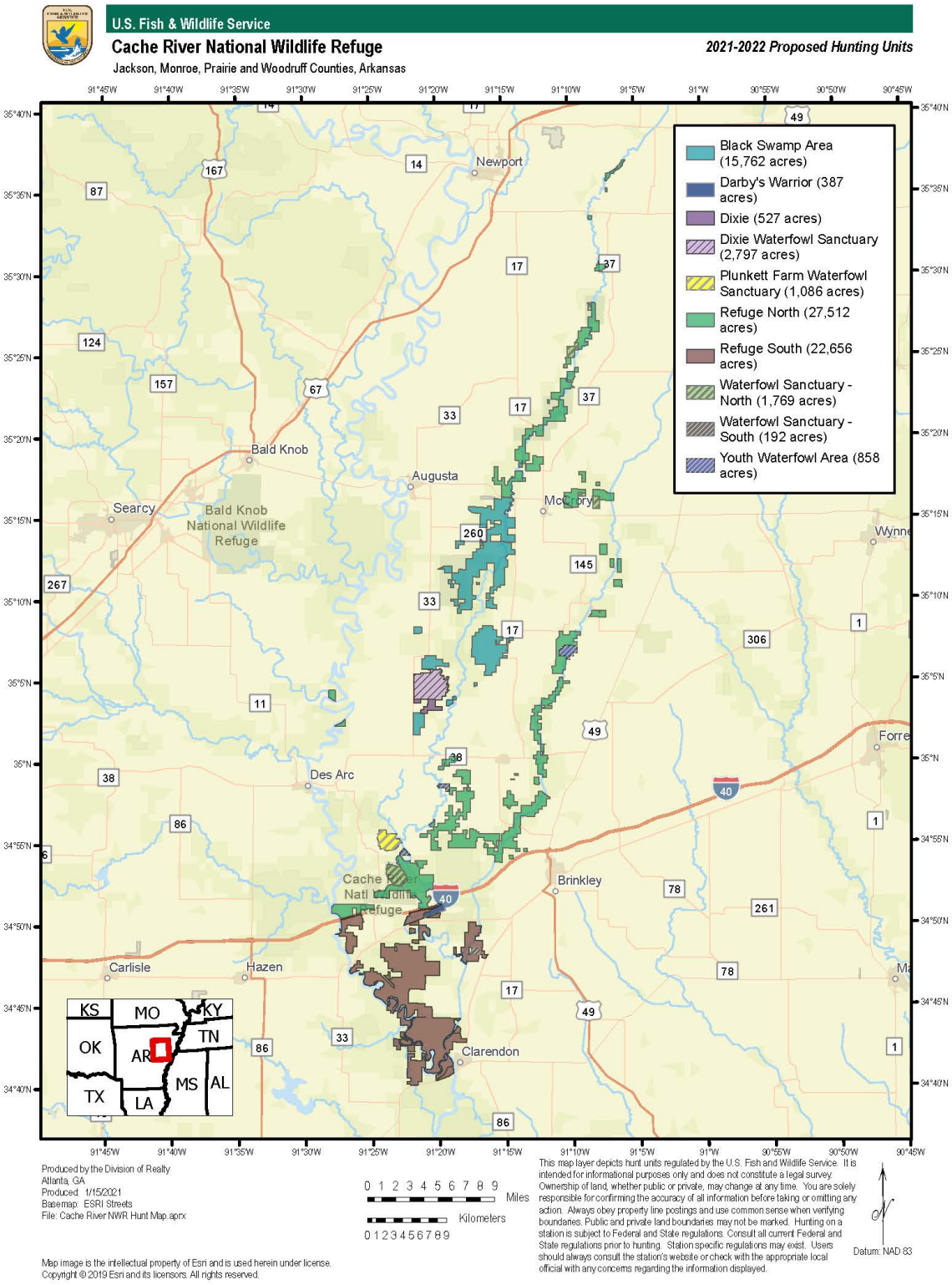


Figure 5. Cache River NWR Present and Future Hunt/Fish Areas, Pending Future Acquisitions.

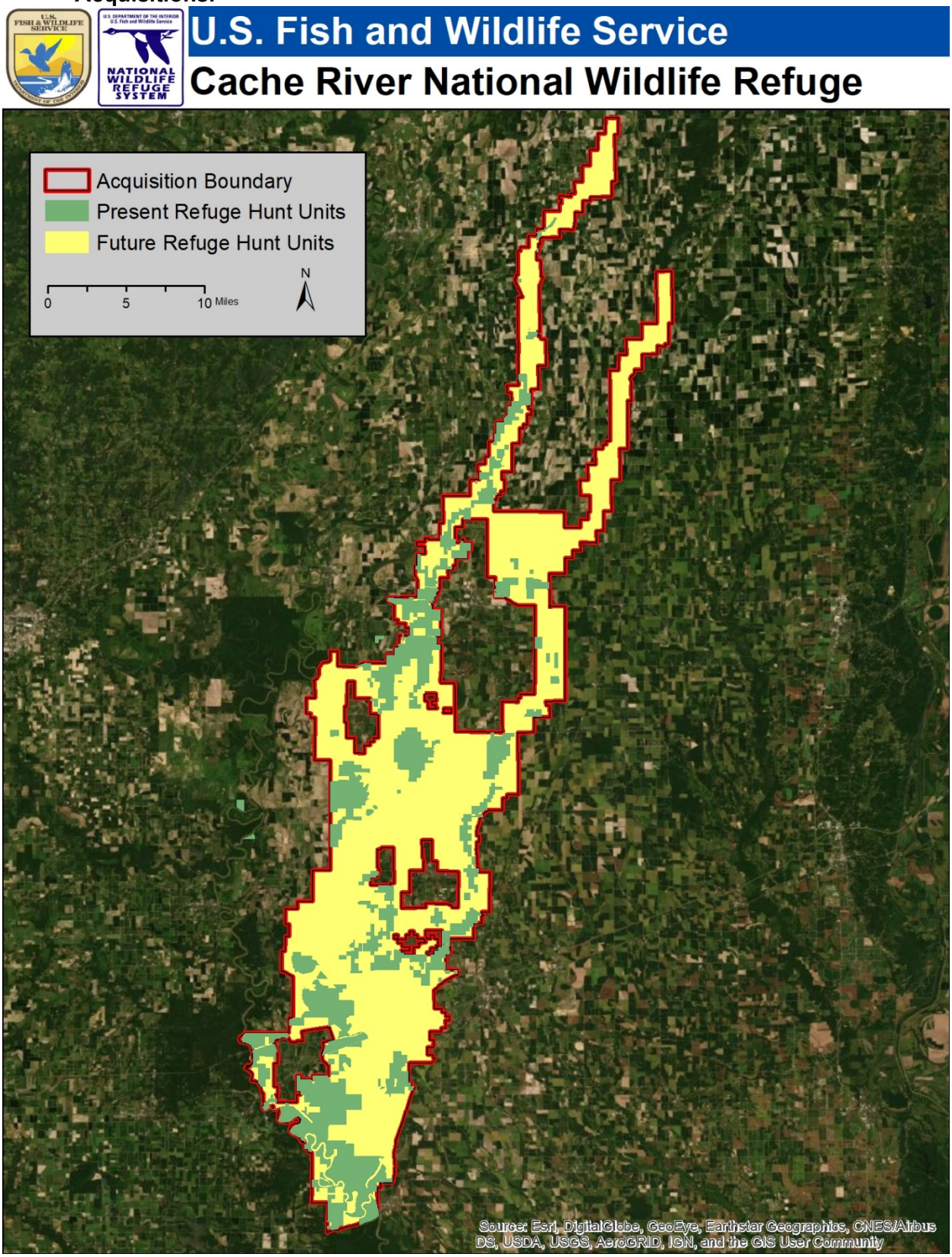


Figure 6. Hunt units and acres open to hunting for Holla Bend National Wildlife Refuge within the Central Arkansas NWR Complex.

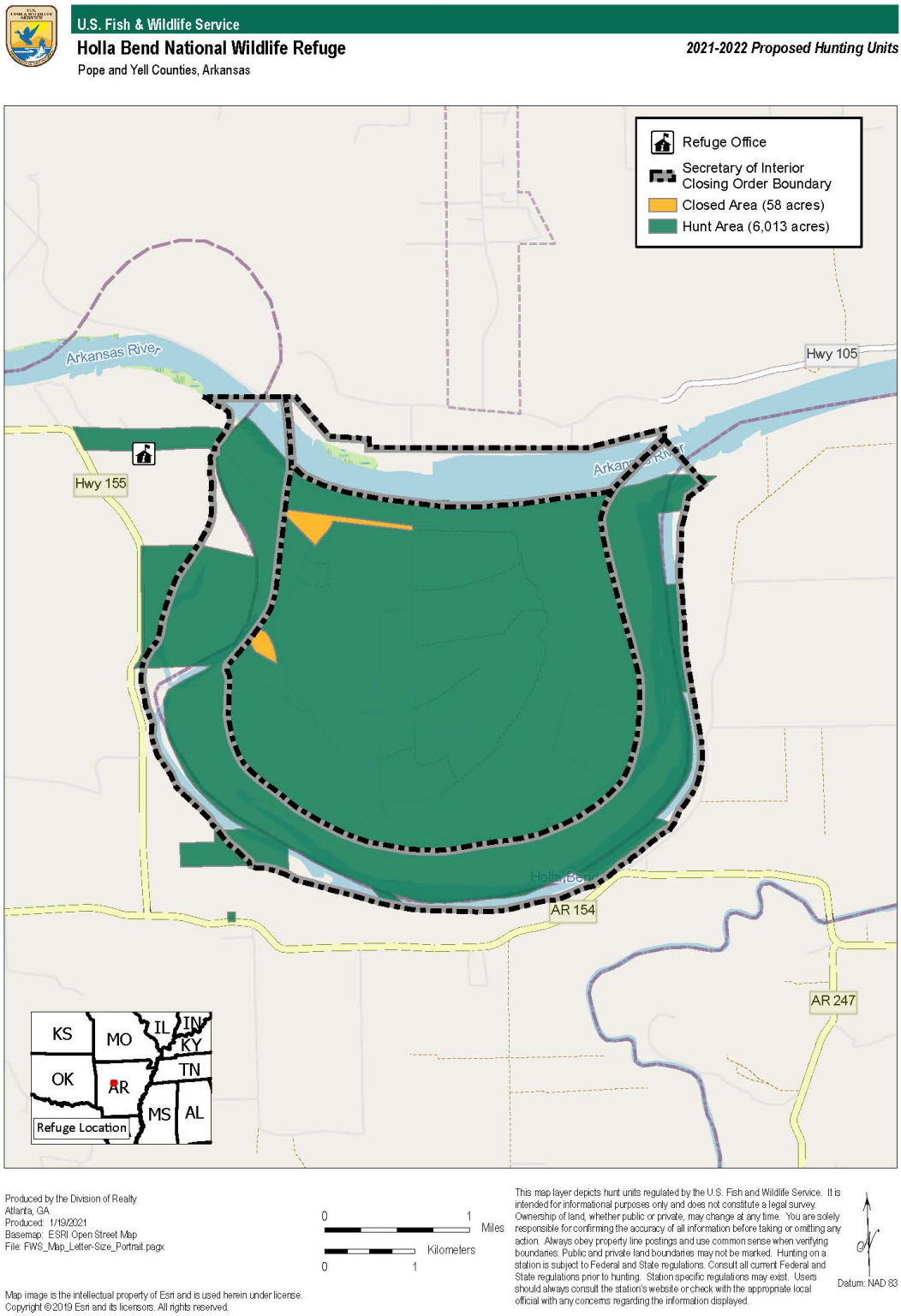
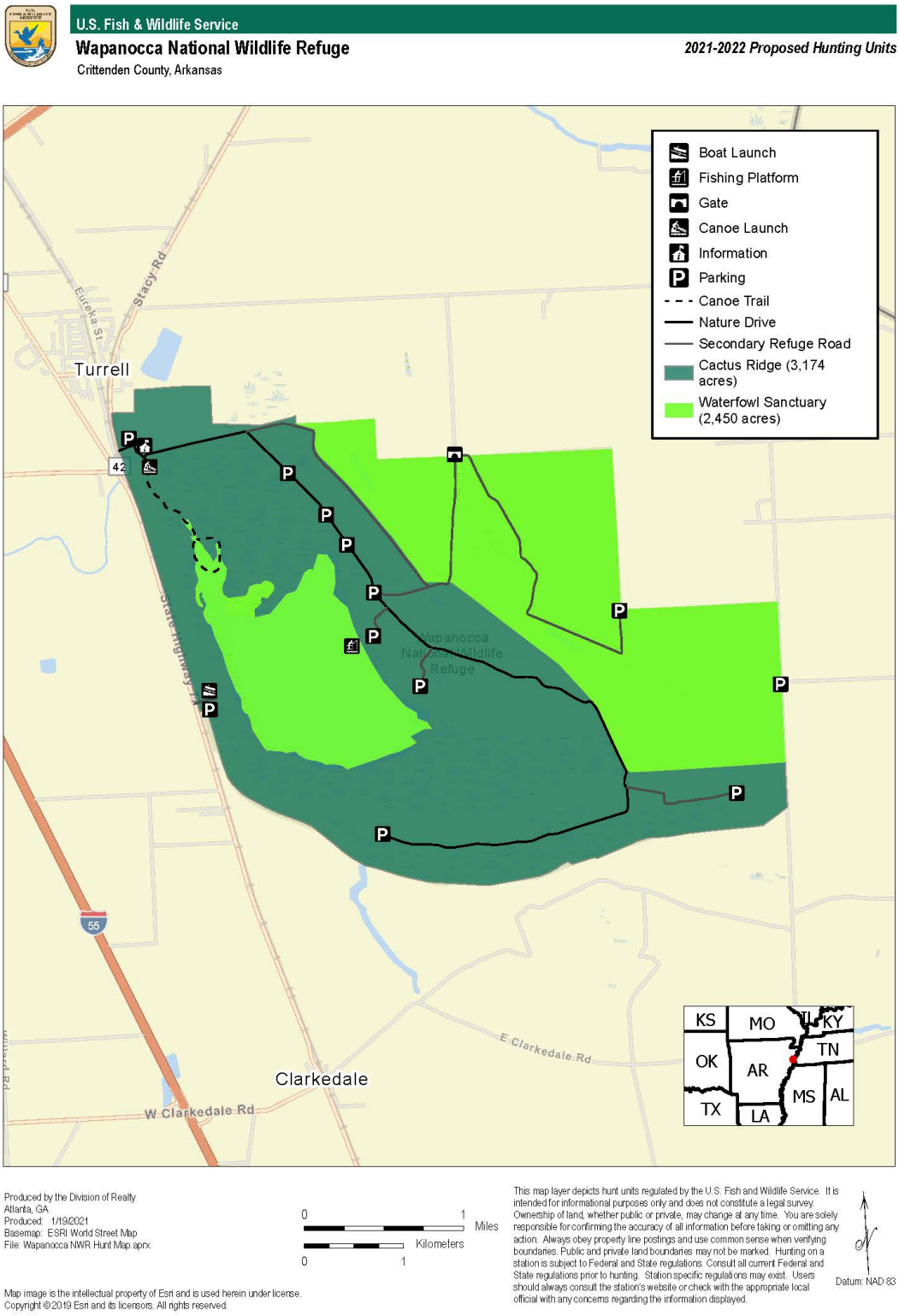


Figure 7. Hunt units and acres open to hunting for Wapanocca National Wildlife Refuge within the Central Arkansas NWR Complex.



AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section is organized by affected resource categories and for each affected resource discusses both (1) the existing environmental and socioeconomic baseline in the action area for each resource and (2) the effects and impacts of the proposed action and any alternatives on each resource. The effects and impacts of the proposed action considered here are changes to the human environment, whether adverse or beneficial, that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives. This EA includes the written analyses of the environmental consequences on a resource only when the impacts on that resource could be more than negligible and therefore considered an "affected resource." Any resources that will not be more than negligibly impacted by the action have been dismissed from further analyses.

Bald Knob, Big Lake, Cache River, Holla Bend, and Wapanocca NWRs are within the Central Arkansas NWR Complex. Hunting and fishing is subject to various area/zone/temporal closures on each refuge. Some refuges have areas in which no hunting or fishing is allowed at any times, generally for the safety of public and staff. Hunting and fishing occurs in various habitat types including bottomland hardwood forest and afforestation areas, scrub/shrub thickets, bald cypress/tupelo swamps, harvested and unharvested croplands, moist-soil management areas, grasslands, impoundments, rivers, streams, lakes, and ponds. Hunt Units and corresponding acreages for each refuge on which hunting and fishing are allowed, including future planned acquisitions where the Cache River NWR boundary would expand to encompass 286,684 acres with similar habitats, are depicted in Figure 2-7.

For more information regarding the affected environment, please see Chapter 2 of the refuge's CCPs, which can be found here: https://ecos.fws.gov/ServCat/Reference/Profile/8478 and https://ecos.fws.gov/ServCat/Reference/Profile/8481, and the Cache River NWR LPP (USFWS 2012) are incorporated herein by reference (USFWS 2009, 2010).

Table 2 identifies those resources that either don't exist within the project area or would either not be affected or only negligibly affected by the proposed action and those resources that may have greater than negligible impacts. Those resources for which the action is not applicable are not further analyzed in this EA.

Table 2. Potential for Adverse Impacts from Proposed Action and Alternatives

Resources	**Not Applicable:** Resource does not exist in project area	**No/Negligible Impacts:** Exists but no or negligible impacts	**Greater than Negligible Impacts:** Impacts analyzed in this EA
Species to Be Hunted/Fished	☐	☐	☒
Non-Target Wildlife and Aquatic Species	☐	☐	☒
Threatened and Endangered Species and Other Special Status Species	☐	☐	☒

Resources	**Not Applicable:** Resource does not exist in project area	**No/Negligible Impacts:** Exists but no or negligible impacts	**Greater than Negligible Impacts:** Impacts analyzed in this EA
Habitat and Vegetation (including vegetation of special management concern)	☐	☐	☒
Hydrology, Geology and Soils	☐	☐	☒
Air Quality	☒	☐	☐
Water Quality	☒	☐	☐
Floodplains	☒	☐	☐
Wilderness	☐	☐	☒
Visitor Use and Experience	☐	☐	☒
Cultural Resources	☐	☐	☒
Refuge Management and Operations	☐	☐	☒
Socioeconomics	☐	☐	☒

Tables 4-8 provide, for each resource of the refuge:

1. A brief description of the relevant general features of the affected environment;
2. A description of relevant environmental trends and planned actions;
3. A brief description of the affected resources in the proposed action area;
4. Impacts of the proposed action and any alternatives on those resources.

Table 3. Central Arkansas NWR Complex Current and Proposed Hunting and Fishing Seasons

Species	Bald Knob [1/2]	Big Lake [1/2]	Cache River [1/2]	Wapanocca [1/2]	Holla Bend [1/2]
Deer – Archery	State Season	State Season	State Season	State Season	Possibly Expand to Dec. 31; Increase Bag Limit
Deer – Muzzleloader	State Season (Early Season Only) Increase Bag Limit	Closed	Expand Early Season to Full State Season; Maintain Full Late Season	Closed	Closed
Deer- Modern Gun Permit Only	Opening Weekend of State Wide Season Only Increase Bag Limit	Muzzleloader/Shotgun Second Weekend of State Season	Continue Quota Gun Hunt	Muzzleloader/Shotgun Second Weekend of State Season	Closed
Deer-Youth Modern Gun	State Season (Early Season Only) Increase Bag Limit	Muzzleloader/Shotgun State Season (Early Season Only)	State Season (Early Season Only)	Muzzleloader/Shotgun State Season (Early Season Only)	Expand to Include Second Hunt State Season; Increase Bag Limit
Black Bear	Closed	Closed	Closed	Closed	May be Taken Incidental to First Youth Gun and Archery Deer Hunts During State Season
Quail	State Season	Open Once State and Fed Officials Agree	State Season	Open Once State and Fed Officials Agree	Open Once State and Fed Officials Agree
Woodcock	State Season	Closed	State Season	Closed	Closed
Rail - Sora and Virginia	State Season	Closed	State Season	Closed	Closed
Gallinule - Purple and Common	State Season	Closed	State Season	Closed	Closed
Dove – Mourning	State Season (All day)	Closed	State Season (All Day)	Closed	Closed
Dove - White-winged, Eurasian Collared, Rock	State Season	Closed	State Season	Closed	Closed
Snipe	State Season (All Day)	Closed	State Season (All Day)	Closed	Closed
Crow	State Season	Closed	State Season	Closed	Closed
Turkey	Youth Hunt - State Season - Quota Archery/Firearms	Youth Hunt- State Season - Quota Archery/Firearms	State season on all refuge lands south of I-40. Remainder of refuge closed except refuge lands included in combined Black Swamp WMA/Cache River NWR quota permit hunts administered by AGFC.	Open once State and Fed Officials Agree	Two Youth Quota Permit Hunts and Archery State Season; Contact Refuge Office for Details
Dark Geese	State Seasons Morning Hunt Only	Closed	State Seasons Morning Hunt Only	Closed	Closed
Light geese	State Seasons Morning Hunt Only	Closed	State Seasons Morning Hunt Only	Closed	Closed
Duck	State Seasons Morning Hunt Only	Closed	State Seasons Morning Hunt Only	Closed	Closed
Merganser	State Seasons Morning Hunt Only	Closed	State Seasons Morning Hunt Only	Closed	Closed
Coot	State Seasons Morning Hunt Only	Closed	State Seasons Morning Hunt Only	Closed	Closed
Waterfowl - Youth/Active Duty Military/Veteran Hunt	State Seasons Morning Hunt Only	Closed	State Seasons Morning Hunt Only	Closed	Closed
Rabbit	Sep 1 - Feb 29 Dogs permitted	Sep 1 - Feb 29 Dogs Permitted North of Timm's Point	Sep 1 - Feb 29 Dogs permitted	Sep 1 - Feb 29 Dogs permitted	Sep 28 - Dec 15; Archery and Expand to Mentored Youth Hunt during Feb; Allow Dogs

Squirrel	Sep 1 - Feb 29 Dogs permitted	Sep 1 - Feb 29 Dogs Permitted North of Timm's Point	Sep 1 - Feb 29 Dogs permitted	Sep 1 - Feb 29 Dogs permitted	Archery and Expand to Mentored Youth Hunt during Feb; Allow Dogs
Raccoon	Sep 1 - March 31	Sep 1 - March 31	Sep 1 - Mar 31	Sep 1 - March 31	All Nights during Feb; Allow .22 Rimfire Only and Shotguns (Nontoxic Shot No Larger than T)
Opossum	Sep 1 - Feb 29	Sep 1 - Feb 29.	Sep 1 - Feb 29	Sep 1 - Feb 29	All Nights during Feb; Allow .22 Rimfire Only and Shotguns (Nontoxic Shot No Larger than T)
Feral Hogs	You may take feral hog during refuge muzzleloader and gun deer hunts with those devices legal during those hunts and by archery hunters November 1 - December 31.	You may take feral hog during refuge gun deer hunts with those devices legal during those hunts and by archery hunters November 1 - December 31.	You may take feral hog during refuge muzzleloader and gun deer hunts with those devices legal during those hunts and by archery hunters November 1 - December 31.	You may take feral hog during refuge gun deer hunts with those devices legal during those hunts and by archery hunters November 1 - December 31.	Closed
Coyote	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.				
Striped Skunk	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.				
Fox - Red & Gray	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.				
Bobcat	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.				Remain Incidental to Refuge Hunting
Beaver	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.				
River Otter	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.				
Mink	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.				
Muskrat	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.
Nutria	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.	May be taken incidental to any refuge hunt with the use of the device appropriate for that hunt and according to any applicable state regulations.
Fish	State Season (Restricted to 4am till Sunset)	State Season	State Season	State Season - Specify Daytime Only	Open March 1 - October 31
Frogs	State Season (Restricted to 4am till Sunset)	State Season	State Season	State Season - Daytime Use Only	March 1 - October 31; Specify Daytime Only
Crawfish	State Season (Restricted to 4am till Sunset)	State Season	State Season	State Season - Specify Daytime Only	March 1 - October 31; Daytime Only

[1]Refuge is CLOSED to all entry and public use during Quota Gun Deer Hunts. Only Quota Gun Deer Hunt permit holders are allowed on the refuge and only for the purpose of deer hunting
[2] Subject to Waterfowl Sanctuary and Core Waterfowl Area (Bald Knob Only) closures

	Existing Hunt/Fishing w/No Change
	Not Open to Hunting
	Existing Hunt/Fishing w/Change
	New Hunt/Fishing

Table 4. Affected Natural Resources and Anticipated Impacts

AFFECTED RESOURCE	ANTICIPATED IMPACTS
Dove (Mourning, White-Winged, Eurasian Collared, and Rock) ***Affected Environment Description*** The Mourning Dove is one of the most abundant and widespread birds in the United States. They occupy a variety of habitats, preferring open lands and have adapted well to human altered landscapes, such as agriculture and urban. Mourning Doves are abundant in Arkansas as a year-round resident. Northern migrants add to the resident population making Mourning Doves a very abundant species during fall migration. This has led to dove hunting being one of the most popular pursuits among hunters in Arkansas. The process of setting migratory upland gamebird hunting regulations is conducted annually in the United States (USFWS 2013a). In addition, the Service publishes proposed regulations in the Federal Register to allow public comment. The mourning dove harvest management strategy was developed to inform annual mourning dove harvest management decision in the three Management Units (Eastern, Central, and Western). The objectives of the strategy are to: conserve mourning dove populations in the three Management Units; and to minimize annual regulatory change. Regulatory alternatives (packages) are prescribed for each Management Unit based on critical abundance thresholds. These thresholds represent a percentage of the population size expected when at maximum productivity (one-half of carrying capacity or maximum sustained yield). A discrete logistic model is used to estimate abundance from the previous year (USFWS 2017). The Central Arkansas NWR Complex is part of the Central Management Unit. Mourning Doves are abundant on the Bald Knob and Cache River NWRs and are typically most numerous in and around fields. White-winged Dove are common in Texas and some are showing up in Arkansas, primarily western Arkansas. They have been also noted in western Tennessee and it is expected their range and numbers will increased in time in Arkansas. Given their similarity to Mourning doves in appearance, an occasional White-winged dove may be harvested by dove hunters in Arkansas. They are legal for harvest according to AGFC seasons and regulations. Eurasian Collared Dove are an invasive species of dove that were first sighted in Arkansas in 1989. The species is considered an exotic and is not protected by the Migratory Bird Treaty Act. They are legal for harvest according to AGFC seasons and regulations. Rock dove (Feral Pigeon) are non-migratory, domestic species of pigeons that occasionally visit wildlife habitats and could possibly be harvested by dove hunters in some areas. They are not protected under AGFC seasons and regulations. ***Environmental Trends and Planned Actions Description*** There were about 279 million doves in the U.S. in 2016 and 243 million in 2018 (Seamans, M. E. 2018). Estimates for mourning dove total harvest in 2016 was 13.5 million, and 11.6 million in 2018 (Seamans, M. E. 2018). There were an estimated 838,000 dove hunters in 2016 and 709,000 active dove hunters in 2018 Seamans, M. E. 2018). In 2016, those hunters spent 2.4 million days in the field and in 2018 spent 2.1 million days in the field to harvest doves Seamans, M. E. 2018). Mourning dove harvest and hunter participation declined between the 2016–17 and 2017–18 seasons in the Central Management Unit, but remained relatively the same in the Eastern Management Unit."(Seamens 2016 and 2018). Migratory Bird Harvest Information Program estimates for mourning dove total harvest, active hunters, and total days afield in the U.S. in the CMU was 4,749,100 ±283,900 birds, 332,900 hunters, and 852,100 ±53,100 days afield (Seamans 2019). In a regional or statewide context, hunting on the refuge under either alternative would provide only a small percentage of hunting opportunities in the larger area. Visitors that use the refuge would continue to partake in non-hunting wildlife-dependent recreational activities, such as wildlife observation, photography, and environmental education and interpretation. Outdoor recreation would be expected to continue to be an important component of the lives of Americans. Wildlife-dependent recreation would be expected to continue to be a socioeconomic driver locally, regionally, and/or at the state level. Based on the process to establish hunting frameworks, hunting at a national level would not have significant impacts on species hunted. Locally, the refuge represents only a small portion of that national impact.	**Alternative A:** Under the No Action Alternative, doves will remain closed from hunting on Big Lake, Wapanocca, and Holla Bend NWR, open to hunting on Bald Knob and Cache River NWRs and the population trends will remain similar to current conditions. Regulations will not cover white-winged or Eurasian dove hunting on Bald Knob and Cache River NWRs. Estimated Hunters: 110 Estimated Take: 1,320 **Alternative B:** Estimated Hunters: 440 Estimated Take: 5,280 Under current refuge management actions (Alternative A), dove numbers on the Refuge are minimal and do not offer much opportunity for hunting. Under the proposed alternative (Alternative B), the Refuge will seek to provide optimal habitat conditions for dove across parts of the Refuge that will likely benefit dove more than Alternative A (in spite of the hunting that would occur). Hunting is not expected to adversely affect migratory game bird populations that occur on the refuge. The Service works closely with state and provincial governments, as well as with the public, in a joint effort to establish annual hunting regulations for migratory birds. The Service's Division of Migratory Birds establishes regulation frameworks to manage all migratory bird hunting in the United States. These regulations establish limitations by which States can then create season lengths, bag limits and areas of migratory bird hunting. Regulations on migratory bird hunting are determined through the assessment of annual surveys, banding data, and hunter harvest data. Hunter surveys and questionnaires determine the number of hunters participating yearly and the impacts they have on dove. The 2018 mourning dove population status report indicate that there were 249 million mourning doves in the U.S. immediately prior to the 2018 hunting season (USFWS 2019). Compared to 2017, in 2018, abundance remained about the same in the CMU. Increasing hunting opportunities on the refuges would not be expected to decrease hunting opportunities on other areas near the refuges. While trends show that the number of hunters participating in the sport is declining, providing additional opportunities would potentially increase the numbers of hunters that utilize public land for hunting recreation from current levels. Private land hunting would not be impacted by the use of public land for hunting. Because of the regulatory process for harvest management in place within the Service, the setting of hunting seasons largely outside of the breeding seasons of resident and migratory wildlife, the ability of individual refuge hunt programs to adapt refuge-specific hunting regulations to changing local conditions, and the wide geographic separation of individual refuges, the Service would anticipate no significant beneficial or adverse impacts to migratory game birds by the use of hunting on the refuges.
Migratory Birds (Coot, Duck, Dark Geese, Light Geese, Mergansers) ***Affected Environment Description***	**Alternative A and B:** Number of Hunters: 21,676 Estimated Harvest: 411,844

AFFECTED RESOURCE	ANTICIPATED IMPACTS
Frameworks for season lengths, bag limits, and areas for migratory bird hunting are established by the Service. For each species, frameworks, seasons and regulations are developed annually using factors such as population size and trends, geographic distribution, annual breeding effort, condition of breeding and wintering habitat, number of hunters, and anticipated harvest. Once the outside limits are set, each state selects hunting seasons within these frameworks. The Cache River Basin is widely recognized for its importance as wintering habitat for waterfowl. It is identified in the North American Waterfowl Management Plan as the most important wintering area for Mallards in North America. During peak years, 400,000 to 500,000 Mallards have been estimated to winter within the acquisition boundary of the Cache River NWR. Bald Knob NWR is noted for large numbers of wintering waterfowl, which have at times exceeded 650,000 birds. While Mallards are the dominant species, Green-winged Teal, Northern Pintail, and Gadwalls are also common. Arkansas regularly leads the nation in mallard harvest. Waterfowl numbers usually start gradually increasing from November to December, peak in January, and drop off significantly in February. Wood Ducks and Hooded Mergansers are the primary species of waterfowl that breed on Cache River and Bald Knob NWRs. ***Environmental Trends and Planned Actions Description*** The refuges are located in the Mississippi Flyway for waterfowl. During the 2018 and 2019 hunting seasons, duck harvests in the State of Arkansas were estimated to be 1,006,200 (±25%) and 1,091,000 (±12%), respectively, with 60,700 (±15%), estimated duck hunters in 2018 and 75,400 (±10%) estimated hunters in 2019 (Raftovich 2020). During the 2017 season, 345 hunters harvested 425 ducks on the refuge, whereas 223 hunters harvested 356 ducks in 2018. Annual aerial duck flyover counts conducted by MDWFP during the 2017 and 2018 seasons estimated a total of 500,591 (2017) and 214,371 (2018) ducks in the Mississippi Delta in November (Havens and Hardesty 2020d), 675,940 (2017) and 403,519 (2018) ducks in December (Havens and Hardesty 2020c), 1,128,912 (2017) and 268,211 (2018) ducks in early January (Havens and Hardesty 2020b), and 895,968 (2017) and 532,413 (2018) ducks in late January (Havens and Hardesty 2020a). The Mississippi Flyway's 418,100 waterfowlers shot 4.17 million ducks and 1.02 million geese — by far the largest waterfowl harvest of any flyway. Arkansas was dominant in terms of hunter numbers and duck harvest. The state's 77,500 active waterfowlers is an increase of more than 15,000 hunters over two seasons ago. Arkansas hunters bagged 1.09 million ducks — just 150,000 shy of the entire Atlantic Flyway — including 509,879 mallards. Louisiana's 50,100 waterfowlers bagged 572,400 ducks, the second-highest harvest in the flyway. Refuges conduct hunting programs within the framework of state and federal regulations. Waterfowl hunting is restricted to half days. Available habitat conducive for waterfowl refuge and feeding in the form of seasonally flooded hardwood forest, sloughs, oxbows, streams, etc. is scattered across the refuges, and provides habitat to both migratory and resident waterfowl species. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and sanctuaries) can be an effective tool in reducing negative effects to all wildlife species.	Under both Alternatives, duck, coot, goose, and merganser harvest will remain the same as in past years on Bald Knob and Cache River NWRs and remain closed to hunting on Big Lake, Holla Bend, and Wapanocca NWRs. Hunting is not expected to adversely affect waterfowl and other migratory game bird populations that occur on the refuge. The Service works closely with state and provincial governments, as well as with the public, in a joint effort to establish annual hunting regulations for migratory birds. The Service's Division of Migratory Birds establishes regulation frameworks to manage all migratory bird hunting in the United States. These regulations establish limitations by which States can then create season lengths, bag limits and areas of migratory bird hunting. Regulations on migratory bird hunting are determined through the assessment of annual surveys, waterfowl banding data, and hunter harvest data. Survey data are obtained through aerial surveys of the North American Flyways, which count birds, ponds and nests, and provide information for analyzing population and habitat conditions. Hunter surveys and questionnaires determine the number of hunters participating yearly and the impacts they have on waterfowl. Recommendations from the Flyway Council are considered when original rules are created. Rules are presented to the public through the Federal Register and followed by a series of public meetings for any recommendations. The final regulations are assessed based on a collective analysis of all factual information as well as council and public recommendations. The 2019 Trends in Duck Breeding Populations estimated overall duck populations at 38.9 million breeding ducks (USFWS 2019b). This estimate was 6% lower than the 2018 estimate, but 10% higher than the long-term average. During the 2018-2019 hunting season, Arkansas hunters harvested more than 477,000 mallards, more than any other state in the country (Raftovich et al. 2019). To limit impacts, morning only hunting for waterfowl is allowed in order to limit disturbance for waterfowl throughout the refuge. Approximately 49% of Bald Knob NWR and about 8% of Cache River NWR will serve as waterfowl sanctuary and will not be subject to hunting of any kind, including migratory birds, from November 15- February 28. During this time period no public entry or use is allowed in these areas. Additionally, Bald Knob NWR has a "Core Waterfowl Area" into which public entry is prohibited after 1pm daily to provide enhanced security and resting/roosting conditions for waterfowl from November 15-February 28. Hunting will reduce the number of migratory game birds (ducks, light geese, dark geese, merganser, dove, snipe, American woodcock, rail, gallinule, coot) using the refuges during hunting season, but it is not expected to adversely affect their populations in the long term. The Service works closely with state and provincial governments, as well as with the public, in a joint effort to establish annual hunting regulations for migratory birds. The Service's Division of Migratory Birds establishes regulatory frameworks to manage all migratory bird hunting in the United States. These regulations establish limitations by which States can then create season lengths, bag limits and areas of migratory bird hunting. Refuges conduct waterfowl hunting within federal and state season frameworks and regulations. Impacts to waterfowl and other species can be reduced by providing adjacent sanctuary areas where hunting does not occur and where birds can feed and rest relatively undisturbed. Sanctuaries or non-hunt areas have been identified as the most common solution to disturbance problems caused from hunting (Havera et. al 1992). In Denmark, hunting disturbance effects were experimentally tested by establishing two sanctuaries (Madsen 1995). Over a 5-year period, these sanctuaries became two of the most important staging areas for coastal waterfowl. Numbers of dabbling ducks and geese increased four- to 20-fold within the sanctuary (Madsen 1995). Thus, non-hunt areas are very important to waterfowl populations subject to hunting as they ensure the continued presence of the affected species within the general vicinity of the hunt area, but perhaps more importantly, they allow waterfowl to minimize energy losses due to disturbance-caused movements and to forage, rest, and roost without interference.

AFFECTED RESOURCE	ANTICIPATED IMPACTS
	On Bald Knob and Cache River NWRs, where waterfowl hunting is allowed, waterfowl sanctuary areas limit public disturbance (including hunting) and provide areas of escape and respite from disturbances caused by all forms of public use. Waterfowl using these refuges (in both sanctuary and non-sanctuary areas) typically do not spend 24 hours per day onsite; they move from place to place within the refuges and trade back and forth between the refuges and adjacent non-refuge lands. Ending waterfowl hunting at noon on both refuges and restricting public entry after 1 p.m. into the Core Waterfowl Area on Bald Knob NWR limit the severity of disturbance (hunting and otherwise) for waterfowl. Because of their establishing authorities and purposes, Big Lake, Holla Bend, and Wapanocca NWRs are closed to migratory bird hunting, but also use waterfowl sanctuaries to limit non-hunting public-caused disturbance to waterfowl and other migratory birds. In a regional or statewide context, hunting on the refuges under either alternative would provide only a small percentage of hunting opportunities in the larger area. Visitors that use the refuges would continue to partake in non-hunting wildlife-dependent recreational activities, such as wildlife observation, photography, and environmental education and interpretation. Placement of additional hunting blinds for wheelchair-bound waterfowl hunters will facilitate and enhance opportunities on Bald Knob and Cache River NWRs in a manner that will not adversely impact environmental conditions nor other refuge users. Outdoor recreation would be expected to continue to be an important component of the lives of Americans. Wildlife-dependent recreation would be expected to continue to be a socioeconomic driver locally, regionally, and/or at the state level. Based on the process to establish hunting frameworks, hunting at a national level would not have significant impacts on species hunted. Locally, the refuges represents only a small portion of that national impact.
American and Fish Crow ***Affected Environment Description*** Crows are highly regarded for their adaptability and intelligence, but due to their predatory nature and diet they tend to be agricultural pests. There are two species of crows in Arkansas: the American crow and the fish crow. Similar in appearance and biology, the American crow is commonly found across a wide array of open and forested habitats, while the fish crow is more commonly associated with larger bodies of water such as lakes and rivers. ***Environmental Trends and Planned Actions Description*** Crows continue to increase in Arkansas (AGFC 2018). The Service is unaware of any other adverse environmental trends or planned actions that would adversely impact crow populations.	**Alternative A:** Under the No Action Alternative, crow will remain closed to hunting on the Complex and the population trends will remain similar to current conditions. **Alternative B:** Estimated Crow hunters: 120 Estimated take: 240 Crow hunting is not expected to adversely affect populations that occur on the Refuges. Hunting will occur only on Bald Knob and Cache River NWRs within the State Seasons.
Quail ***Affected Environment Description*** Northern bobwhites occur in every county in Arkansas and in more than 25 states in central and eastern U.S., as well as Mexico. Despite considerable interest and effort directed toward quail population restoration during the last 60-plus years, the population has continued to decline in most of their range, including considerable declines in Arkansas (Fowler, 1992). However, it is the top priority species for restoration within AGFC habitat management programs. ***Environmental Trends and Planned Actions Description*** Bobwhite management occurred on at least 3,217,523 acres in 2019—78 percent of that on private land, according to the latest edition of the National Bobwhite Conservation Initiative's (NBCI) State of the Bobwhite 2020 report, the 10th such report since its inception in 2011. State of the Bobwhite 2020 is a range-wide snapshot of population, hunting, and conservation status of the northern bobwhite, as well as features on various projects of interest around the core bobwhite range. The digital version may be accessed at https://bringbackbobwhites.org/download/nbcis-bobwhite-almanac-state-of-the-bobwhite-2020/ which summarizes quail counts in Arkansas:	**Alternative A:** Under the No Action Alternative, quail will remain open to hunting on Bald Knob and Cache River NWRs and remain closed on Big Lake, Wapanocca, and Holla Bend NWRs and the population trends will remain similar to current conditions. **Alternative B:** Estimated quail hunters: 105 Estimated take: 425 Current quail hunting on Bald Knob and Cache River NWRs and new quail hunting seasons (when favorable population status allow) on Big Lake, Wapanocca, and Holla Bend NWRs are not expected to adversely affect populations that occur on the Refuges. In close coordination with AGFC, quail hunting will open as appropriate to State seasons following population surveys and assessment. These seasons will be incorporated into the Statewide Quail Strategic Plan in which the goal is to provide for sustainable population management which includes harvest opportunities.

AFFECTED RESOURCE	ANTICIPATED IMPACTS
• "AGFC 2019 call count route data showed a 15% decrease from 2018 and 22% decrease from the 5-year average. 2019 brood survey data found that chicks/observer was 18% less than the 10-year average, while numbers of adult quail observed during brood surveys was up 63%. Spring bird count results from focal areas showed increases in the numbers of quail heard and the number of points where quail were heard on four of the seven focal areas. Hunting: No formal surveys are taken, but overall the quail hunting season was down from the previous two years, especially in the western portions of the state."	
Purple and Common Gallinule/Sora and Virginia Rail/Snipe ***Affected Environment Description*** In Arkansas, population information on secretive marsh birds, such as status and distribution, is limited, although all species occur on the Complex. Michael Budd and Dr. David Krementz from the USGS Arkansas Cooperative Fish and Wildlife Research Unit at the University of Arkansas have completed preliminary secretive marsh bird surveys in the Delta region of eastern Arkansas. ***Environmental Trends and Planned Actions Description*** In 2006, the Migratory Shore and Upland Game Bird Working Group established a Migratory Shore and Upland Game Bird Support Task Force (Case et. Al 2010). These Strategies contains recommendations for obtaining priority information needed to improve habitat and harvest management decisions for migratory populations of American coot, purple gallinule and common gallinule (moorhen), rail, and snipe by focusing on evaluating and improving knowledge of monitoring efforts, vital rates (survival, reproduction, and recruitment) and habitat needs during the annual life cycle of these birds. All species show non-significant long-term (1966 – 2006) trends and significant declining short-term (1997– 2007) trends. Common and purple gallinule harvest has been variable, with harvest estimates never exceeding 100,000 birds per year. The majority of the U.S. harvest for these species takes place in the states of Louisiana, California, Florida, and Texas (Raftovich et al. 2009). In the U.S., there has been an average of 4,500 gallinule hunters per year since 1999 (U.S. Fish and Wildlife Service 2009). The Service monitors these populations and harvest through adaptive harvest management. Approximately 5,100 rail hunters harvested 14,600 (± 83%) rails in 2018 and 6,900 rail hunters harvested 29,800 (± 53%) rails in 2019 (Raftovich et al. 2020). About 23,400 people hunted snipe in 2018 and 21,300 in 2019, and they harvested 83,600 (± 121%) and 92,700 (± 60%) snipe in 2018 and 2019, respectively (Raftovich et al. 2020).	**Alternative A:** Under the No Action Alternative, gallinule and rail will remain closed to hunting on the Complex and the population trends will remain similar to current conditions. **Alternative B:** Estimated gallinule/rail/snipe hunters: 24 Estimated take: 72 Gallinule, rail, and snipe seasons will be open on Bald Knob and Cache River NWRs and hunting is not expected to adversely affect populations that occur on the Refuges. Hunting will occur in suitable wetland habitats hunt units throughout the refuges, including areas also open to duck hunting, according to state seasons.
Woodcock ***Affected Environment Description*** The American Woodcock is a popular gamebird in the eastern U.S. and Arkansas is considered to be in the Woodcock's Central Management Region. According to Seamans and Rau (2019), singing-ground survey data from the Central Management Region in 2019 indicated that the index was similar to 2018; however, there has been a significant, long-term negative trend from 1968-2019. The 2018 recruitment index for the U.S. portion of the Central Region was 22.8% more than the 2017 index but was 7.9% below the long-term regional average. According to the 2018-19 Harvest Information Program (Raftovich et al. 2019), among Central Region States, Arkansas had the fifth highest harvest of woodcocks with an estimated 10,100 being harvested. In total, it was estimated that 130,600 woodcocks were harvested in the Central Region in 2018-19. ***Environmental Trends and Planned Actions Description*** Although the American woodcock is showing declines in numbers on their breeding grounds, habitat loss is considered to be the culprit, not hunting (Kelly and Rau 2006). This assertion was tested in a study conducted by the U.S. Geological Survey Patuxent Wildlife Research Center in 2005 (McAuley *et al.* 2005). Results showed no significant differences in woodcock survival between hunted and non-hunted areas. Furthermore, the authors concluded that hunting was not having a considerable impact on woodcock numbers in the Northeast (McAuley *et al.* 2005).	**Alternative A and B:** Estimated number of hunters: 70 Estimated take: 140 Woodcock seasons will remain open on Bald Knob and Cache River NWRs and will remain closed to hunting on Big Lake, Wapanocca, and Holla Bend NWRs, and the population trends will remain similar to current conditions. Hunting is not expected to adversely affect populations that occur on the Refuges.

AFFECTED RESOURCE	ANTICIPATED IMPACTS
While woodcock populations would be expected to continue to be impacted by outside factors, including human population increases and associated development patterns, diseases, climate change, and invasive species, the Service is unaware of any other adverse environmental trends or planned actions that would adversely impact the local or regional populations of woodcocks.	
Furbearers (as defined by AGFC - raccoon, opossum, striped skunk, river otter, mink, muskrat, beaver, nutria, red fox, gray fox, coyote, and bobcat**)** ***Affected Environment Description*** Furbearing animals of Arkansas were a factor in the early settlement of this state. In 1820, the first governor of Arkansas wrote the following in a letter describing Arkansas: "Of animals in this country, both winged and quadruped, we have no want. There is almost every species of bird and fowl in great abundance; wild geese and swans, turkeys, quails, rabbits, raccoons, bear, wolf, catamount, wild cat, beaver, otter, elk and buffalo – a hunts-man has full scope." With the settlement of Arkansas, came the over-utilization of the state's furbearers as they were used to supply fur to the 'civilized world' back East. Act 276 in 1915 established the state's game and fish commission to protect fur-bearing animals of the state and to regulate the killing and taking of them. Since that time, a decline in the lack of demand for fur and corresponding increase in furbearer harvest has created many furbearer management problems in Arkansas (AGFC 2014). Conditions on the Refuge are highly favorable for a variety of furbearers, including raccoon, opossum, striped skunk, river otter, mink, muskrat, beaver, nutria, red fox, gray fox, coyote, and bobcat. The raccoon is the most numerous of furbearers on the Refuge and raccoon hunting with dogs remains popular. According to the AGFC's 2018-19 Furbearing Animal Report (https://drive.google.com/file/d/1Rwo8c_E3Kx4ukxFo2FPZH8ib1rdiCqTl/view), the perception of Arkansas trappers is that populations of mink may be decreasing; gray fox, muskrat, and red fox are probably stable; and that beaver, bobcat, coyote, opossum, otter and raccoon are increasing. Recognizing the expansion of some of these populations, and associated nuisance complaints, the AGFC expanded hunting seasons and limits on private lands for furbearing species like coyote, opossum, raccoon and striped skunk in 2019. These furbearers can now be hunted year-around with no daily or possession limits. ***Environmental Trends and Planned Actions Description*** While furbearer populations would be expected to continue to be impacted by outside factors, including human population increases and associated development patterns, diseases, climate change, and invasive species, the Service is unaware of any other adverse environmental trends or planned actions that would adversely impact the local or regional populations.	**Alternative A:** Incidental taking of striped skunks, red and grey fox, bobcat (currently open only on Holla Bend NWR), river otter, and mink will remain closed on the Complex with only coyote, beaver, muskrat, and nutria open to incidental take, depending on the refuge (see Table 3). Estimated number of hunters: 100 Estimated take: 200 Under the No Action Alternative, harvest numbers and effects would not change as hunting seasons and dates will remain the same as in past years. **Alternative B:** Estimated number of hunters: 450 Estimated take: 900 Opening incidental take of striped skunks, red and gray fox, bobcat, river otter and mink in addition to coyote, beaver, muskrat, and nutria will align with AGFCs management of these populations statewide. This will also allow more hunting opportunity on the Complex. The populations will remain at sustainable levels. However, the level of take of these species will not adversely affect their long-term population status. AGFC approves refuge hunting seasons, bag limits, methods of take, and other regulations annually. Approval by AGFC is based on their monitoring of game harvests, population trends, and habitat and range occupancy throughout the state and assessment of hunter effort/participation, and the determination/acknowledgement that hunting seasons on the refuges will not be detrimental to game species on a local, regional, or statewide scale. Incidental take of other wildlife including beaver, muskrats, and nutria (exotic species) will complement nuisance control activities conducted on the refuges to reduce damage to wildlife habitats, refuge roads, levees and other infrastructure critical to wildlife habitat management programs. However, such take is primarily of recreational value and generally ineffective compared to targeted control activities toward these species conducted by refuge, AGFC, or other authorized agents.
Eastern Wild Turkey ***Affected Environment Description*** Unregulated turkey hunting decimated Arkansas populations in the early 1900s. Shortly after the creation of the AGFC in 1915, hunting seasons were shortened in 1927 and by 1945, turkey hunting was eliminated in Arkansas. Statewide relocation efforts began in the 1950s and by 1986, Arkansas had trapped and relocated more than 5,000 turkeys. The statewide population and annual harvest have both increased significantly since then with a record total of 19,947 wild turkeys being harvested in 2003. Recent annual totals for spring turkey harvest have ranged from 11,561 in 2015 to 8,217 in 2019.	**Alternative A:** Estimated number of hunters: 95 Estimated take: 10

AFFECTED RESOURCE	ANTICIPATED IMPACTS
Environmental Trends and Planned Actions Description Harvest information provided by the AGFC for resident wildlife hunt program is compiled at the state, county, or management unit level. AGFC periodically reviews populations of all harvested resident species, and has determined that populations are adequate to support hunting efforts throughout the State. The refuge provides habitat to support stable resident wildlife populations. Turkey hunting, which occurs in April, is expected to minimally affect non-target wildlife since only a very small number of hunters are selected for the hunt. Turkey hunting in all forested areas will increase off-trail use that could possibly disturb breeding birds attempting to establish and settle into nesting territories, nest-building and incubating phases of landbird breeding cycles, particularly for low-elevation and ground-nesting landbirds. Everett (1982), monitored movements of wild turkeys before, during and after squirrel, deer, and turkey hunts and found no permanent movement out of established ranges which could be attributed to hunting. Statewide harvest of wild turkeys from 2007 to 2019 was 130,224 with a yearly average of 10,017. The major factor affecting turkey populations in the Central Arkansas area is the limited acreage of forested lands above the 1- or 2-year floodplain. Although turkeys will readily roost over water, they require dry land for feeding. Flooding during the nesting season adversely impacts recruitment by flooding nests which might have already been initiated, by pushing mesocarnivore predators (like raccoons) out of the bottomland habitats, and by affecting survival of young poults. Turkey populations in the area have demonstrated the capability to grow relatively rapidly with successive years of favorable water conditions, but are observed to decrease as a result of late spring and summer flooding, particularly if it occurs in successive years. Much of the forest and openland management that occurs on the Refuge provides benefits to turkeys. Selective forest management can benefit turkeys by increasing the diversity and availability of foods, in the form of hard and soft mast, as well as grasses, sedges and forbs. Nesting habitat is often improved by selective thinning of trees which provides more ground cover for nest concealment. Continued habitat management through timber harvests, with an objective of providing desired forest conditions (forest structure and species composition) for priority wildlife, should increase turkey nesting cover and improve hard and soft mast production beneficial to turkeys.	Spring turkey hunting for gobblers has occurred on the Holla Bend NWR and Cache River NWR since 1995, and on Bald Knob NWR since 1995, but hunts have not been conducted in recent years (on Bald Knob NWR) due to low numbers. The Refuges generally follow state season and bag limits, however, due to recent successive years of high water during the nesting season and changing habitat conditions, AGFC closed fall turkey season and reduced season and bag limits for spring turkey. They also have placed restrictions on harvest of jakes and reduced bag limits. Under the No Action Alternative, harvest numbers and effects would not change as hunting seasons and dates will remain the same on all refuges as in past years. **Alternative B:** Estimated number of hunters: 405 Estimated take: 41 Turkey seasons (Youth quota gun/archery) will be open on Bald Knob, Big Lake, and Wapanocca NWRs .In consultation with and approval by AGFC, the refuges will open hunting as appropriate habitat and population objectives are met. Adult quota turkey hunts could occur in the future on these refuges if favorable populations occur and when AGFC and refuge officials agree hunts would be sustainable. Placement of hunting blinds for wheelchair-bound hunters will facilitate and enhance opportunities on the Complex in a manner that will not adversely impact environmental conditions nor other refuge users. The number of turkeys taken by hunting can be limited by closing certain hunt units to turkey hunting, limiting method of take, limiting participation by issuing quota permits, or allowing only limited youth hunting – all in coordination with, and by approval of the AGFC.
Feral Hog ***Affected Environment Description*** Early European explorers brought domestic swine to the Southeastern U.S. in the 1500's as livestock and over time they have both escaped and been intentionally released to create hunting opportunities. The feral hogs we know today are descendants from those domestic swine. Some of the largest concentrations of feral swine in Arkansas exist on public lands, which are often located around sensitive habitats including streams, rivers, and swamps. Rapid range expansion has occurred in Arkansas largely as a result of illegal release of live hogs around the state to establish populations that would enable hunting with hounds. Feral hogs compete for wildlife food resources, destroy habitat, and are known to eat ground nesting birds, fawns, and livestock, and can transmit diseases to wildlife, domestic stock, and humans. Feral hogs interfere with the management of habitat for the Refuges' establishing purposes, threaten the integrity of Refuge infrastructure, and impact surrounding private agricultural lands. ***Environmental Trends and Planned Actions Description*** Feral hogs are among the most widely distributed mammals in the world with the highest reproductive output compared with other ungulates. Feral hogs are increasing in range and numbers worldwide. Feral hogs are a problem both on refuge lands and adjoining privately owned lands. They occur throughout the refuge and their numbers appear to be stable but fluctuate greatly depending on water levels. During prolonged events of flooding in the wetlands along the river, feral hog numbers generally decline but soon recover as flood waters recede and rapid reproduction is achieved. The incidental take of feral hogs during restricted seasons would provide the refuge with added control of hogs.	**Alternative A:** Estimated number of hunters: 1,575 Estimated take: 158 The control of feral hogs on the Complex, including shooting by agency officials and hunters is closely coordinated with the AGFC and take by Refuge hunters is restricted to incidental take by Refuge hunters on Bald Knob, Cache River, and Wapanocca NWRs. The incidental take of feral hogs allows the public the opportunity to harvest a hog on these refuges only while gun or muzzleloader hunting for deer or during archery deer hunting from November 1 – December 31. These stipulations allows hunters to complement AGFC and refuge efforts to reduce feral hog populations. The Complex has a close working relationship with AGFC and United States Department of Agriculture (USDA) Wildlife Services, who assists with controlling feral hogs through multiple means of removal, including incidental harvest by hunters. Incidental take has been implemented rather than an specific hunting season because the Service and the AGFC have agreed that feral hogs should not be promoted as a game species, but rather as a nuisance species to be removed. By offering a specific hunting season on feral hogs, there is an expectation on the part of interested hunters for the agencies to manage for that species and ensure there will be a stable huntable population. This is in direct conflict to agency goals to eradicate, or at least control, feral hog populations at a level at which they are a minor or insignificant negative consequence for habitat, wildlife populations, and humans. Additionally, there is a documented history of individuals moving feral hogs to new locations on NWRs and state wildlife management areas to establish huntable populations. It is illegal to capture and purposefully release a hog into the wild on public or private land in Arkansas (Act 697 of 91st General Assembly of the Arkansas State Legislature, 2016). By not offering a specific hunting season for feral hogs on the Refuges and state wildlife management areas, AGFC and the Refuge hope to discourage anyone from releasing feral hogs. The take of feral hogs is prohibited on Holla Bend NWR because feral hogs are not present. Should they begin to use the refuge and in conjunction with AGFC feral swine control efforts feral hog would be allowed in accordance with AGFC's statewide feral hog control program. **Alternative B:**

AFFECTED RESOURCE	ANTICIPATED IMPACTS
	Estimated number of hunters: 4,950 Estimated take: 555 Similar to Alternative A, shooting of feral hogs will be opened on Big Lake NWR similar to seasons described above. The goal of feral hog management is to remove this invasive species from the refuges. This alternative will have similar effects with increased feral hog removal at Big Lake NWR.
American Black Bear ***Affected Environment Description*** Means et. al (2019), documented that between 1958 and 1968, approximately 254 bears from Minnesota and Manitoba, Canada were released into Arkansas' Interior Highlands. The reintroductions were successful and in 1980, after a 52-year prohibition, bear hunting resumed in the Interior Highlands of Arkansas. The objectives of the hunt were to provide recreational opportunity to hunters and to collect biological data that would help manage the black bear as a renewable resource and a game species. Today, AGFC estimates there to be 5,000+ bears in the Interior Highlands. Harvest quotas and season dates have been liberalized in recent years to increase harvest rates closer to 15% rather than 10% to help stabilize the interior highlands population. The 2018 statewide bear harvest (577 bears) is the highest harvest year since modern-day bear hunting began in 1980 (AGFC 2018). Harvest was very high most likely due to the low availability of hard mast which makes bears much more susceptible to bait. Holla Bend NWR is located in Bear Zone 2 and Pope County, Arkansas where bear harvest in 2018 was between 5-12 bears (AGFC 2018). Most bear harvest in Arkansas occurs in Zone 1. AGFC manages the bear population at a sustainable level and closes certain zones in the state in order for populations to expand to these areas. ***Environmental Trends and Planned Actions Description*** Black bear continue to increase in Arkansas (AGFC 2018). The Service is unaware of any other adverse environmental trends or planned actions that would adversely impact black bear populations.	**Alternative A:** Under the No Action Alternative, hunting for American black bear will remain closed on the Complex and the population trends will remain similar to current conditions. **Alternative B:** Estimated number of hunters: 100 Estimated take: 0-1 The limited open hunting season for black bear would only be allowed on Holla Bend NWR during the state season incidental to the first youth gun and archery deer hunts. This limited hunting of bear on the refuge will have negligible effects to the population. Although harvest in Pope County, AR is one of the moderate ones, it is well within the Statewide management goals for black bear. The level of take of this species will not adversely affect their long-term population status. AGFC approves refuge hunting seasons, bag limits, methods of take, and other regulations annually.
White-tailed Deer ***Affected Environment Description*** Deer populations in Arkansas were thought to be eliminated from many counties in the 1920's due to over-harvest. Donaldson et al. (1951) estimated the statewide deer population at 500. Through restriction of harvest and establishing federal "game refuges", Arkansas' deer population was estimated at 500,000 in the 1980's and the statewide deer harvest surpassed 100,000 for the first time in 1987. The AGFC's fourth White-tailed Deer Strategic Plan (AGFC 2019, https://www.agfc.com/en/hunting/big-game/deer/2019-strategic-deer-management-plan/) provides long-term, strategic goals using sound, scientific, deer management principles in conjunction with public input. The plan will be evaluated and updated on a six-year cycle in accordance with the agency's biennial, regulation proposal cycle. ***Environmental Trends and Planned Actions Description*** Based on a nationwide survey of all states (Krausman 1992), deer were effectively controlled with hunting and habitat manipulation in many areas where they were overpopulated. The remaining overpopulated herds were either not hunted, had an inadequate doe harvest, or an inadequate general harvest. Because the refuge boundary area is open, with numerous tracts and corridors for movement and contact with other herds, it is unlikely that hunting will reduce the population to such low levels as to place it at risk of becoming genetically bottlenecked. Also, no prevention or control of epizootic hemorrhagic disease exists to date except by keeping populations below the carrying capacity of their habitats. Species richness and abundance of shrubs and herbaceous vegetation also has been shown to decline when deer densities reach between 4-8 deer/km2 (deCalesta and Stout 1997). At high densities, deer may act as a host reservoir for Lyme-disease bearing ticks (Jones et al. 1998). Based on these considerations, it is anticipated that hunting would have a positive impact on deer health and quality and habitat condition.	**Alternative A:** Estimated number of hunters: 4125 Estimated take: 800 Deer hunting is open on all refuges in the Complex except Logan Cave NWR. Harvest numbers and effects would not change as hunting seasons and dates will remain the same on all refuges as in past years. From a public use perspective, deer are the most popular game animal on the Complex. The refuges consists of a mixture of farm fields, afforestation, moist-soil impoundments, and bottomland hardwood forests that create a mosaic of different habitats that provide for excellent cover and forage for white-tailed deer and other wildlife. Deer appear to be abundant based on general observations and harvest data. Deer herd health checks conducted by the Southeastern Cooperative Wildlife Disease Study (SCWDS) in 2007 indicate that deer on the south part of the Cache River NWR were in good physical condition and the herd was thought to be below carrying capacity. However, deer collected by SCWDS in the central part of Cache River NWR showed signs of a higher population size close to carrying capacity, and SCWDS recommended reducing the population to a more healthy level. Annual deer harvest on the Refuge generally ranges from 700 – 1,100. In coordination with the AGFC, deer harvest objectives will be evaluated on an annual basis. Under the No Action Alternative, harvest numbers and effects would not change as hunting seasons and dates will remain the same as in past years. **Alternative B** Estimated number of hunters: 12,465 Estimated take: 2,445

AFFECTED RESOURCE	ANTICIPATED IMPACTS
An active deer hunting program on all areas open to hunting is necessary at the Complex to provide and maintain quality habitat for breeding, migrant, and resident birds. The overall health and welfare of the refuge deer herd is also maintained or improved through an active hunting program.	Same as Alternative A, except some seasons may be expanded to better align with AGFC. The October muzzleloader season on Cache River will be lengthened to the full state season adding four days. On Holla Bend NWR, the archery deer season will be extended 2 weeks to the end of December. A quota gun deer hunt will be added at Big Lake NWR. Youth quota gun hunts will be opened on Big Lake and Wapanocca NWRs. Holla Bend NWR will add a second quota youth gun deer hunt. Placement of hunting blinds for wheelchair-bound deer hunters will facilitate and enhance opportunities on the Complex in a manner that will not adversely impact environmental conditions nor other refuge users. The harvest numbers may increase slightly on these refuges with increased methods/opportunities for take; however, this increase will have negligible effects on the population and environment.
Squirrel (Gray and Fox) and Rabbit ***Affected Environment Description*** The reproductive potential of these species is very high with multiple litters produced each year. Both species (fox and gray) of squirrels are common on the Refuge, and squirrel hunting is by far the most popular type of small game hunting. Squirrels tend to have variable annual population levels, and are highly responsive to annual variations in habitat condition (e.g., hard mast, drought) and mortality factors (e.g., predation). Gray and fox squirrels are both abundant and distributed throughout the refuges where suitable, mast-producing forested habitat is available. Although they share habitats to some degree, gray squirrels are most common in deep woods, whereas fox squirrels prefer small woodlots and the edges of larger forested tracts. Their high potential recruitment rate (controlled largely by levels of available hard mast and availability of agricultural crops), high natural mortality rates, and other population processes would lead to the expectation that no significant long-term changes in their population densities within available habitat have occurred. The Complex contains both cottontail and swamp rabbits. Cottontail rabbits and swamp rabbits are relatively common throughout the refuge; their numbers are largely controlled by the extent of available habitat. The rabbit population is usually higher in and around afforestation sites. ***Environmental Trends and Planned Actions Description*** Gray squirrels and fox squirrels are prolific breeders, and their populations have never been threatened by hunting even prior to the passing of modern hunting regulations. While squirrel populations would be expected to continue to be impacted by outside factors, including human population increases and associated development patterns, diseases, climate change, and invasive species, the Service is unaware of any other adverse environmental trends or planned actions that would adversely impact the local or regional populations of squirrels. Studies have been conducted to determine the effects of hunting on the population dynamics of small game. Results have consistently shown that small game populations, such as swamp and eastern cottontail rabbits, are not affected by hunting but rather are limited by food resources (USFWS 2014). Eastern cottontails and swamp rabbits are prolific breeders, and their populations have never been threatened by hunting even prior to the passing of modern hunting regulations. Research shows that there are only small differences in density and/or mortality rates in gray squirrels on hunted verses non-hunted populations (Mosby 1969, Rose 1977). Rabbit populations are similarly immune to additive mortality from hunting. While rabbit populations would be expected to continue to be impacted by outside factors, including human population increases and associated development patterns, diseases, climate change, and invasive species, the Service is unaware of any other adverse environmental trends or planned actions that would adversely impact the local or regional populations of rabbits.	**Alternative A:** Estimated number of hunters: 2,205 Estimated take: 22,050 Both species (fox and gray) of squirrels are common on the Refuge, and squirrel hunting is by far the most popular type of small game hunting. Squirrels tend to have variable annual population levels, and are highly responsive to annual variations in habitat condition (e.g., hard mast, drought) and mortality factors (e.g., predation). Mosby (1969) found that 38 percent of the population of gray squirrels could be removed from the population by hunting and "not adversely affect recruitment in the exploited population and had no significant influence on the average annual mortality rate. Nixon et al. (1975) reported that hunting could remove one squirrel per two acres and the population remains stable. Under the No Action Alternative, harvest numbers and effects would not change as hunting seasons and dates will remain the same as in past years. **Alternative B:** Estimated number of hunters: 4,560 Estimated take: 44,850 Holla Bend NWR would expand hunting opportunity for squirrels and rabbits from incidental take during archery hunts to also include mentored gun hunting involving a hunting adult that must be accompanied by up to two hunting youths less than 16; unlimited participants, daily, during the month of February. Method of take would be according to state regulations. Dogs would be allowed. The habitat is of sufficient quality to support abundant numbers of squirrels and rabbits and take is very limited during the archery season. These hunts are not expected to negatively impact either species, both of which have high reproductive rates. Same as Alternative A.
Fish, Frogs and Crawfish ***Affected Environment Description*** Bottomland hardwood wetlands provide spawning and nursery habitat to many species of fish. Hydrology (primarily extent, duration, and periodicity of flooding) is one of the primary factors regulating utilization and reproductive success of fishes in wetlands. A total of 36 species of larval fish and 51 adult species was collected in a 1994 fisheries study in the flooded bottomland forest in the Cache River. Fisheries appear to be thriving in the bayous and numerous oxbows throughout the Complex. Among the fish found in refuge waters are various species of crappie, bream, catfish, bass, buffalo, carp, alligator gar, and paddlefish. Frogs and crawfish are abundant in wetlands, ditches, ponds, riverbanks, and bayous.	**Alternative A:** Under the No Action Alternative, harvest numbers and effects would not change as fishing seasons and dates will remain the same as in past years.

AFFECTED RESOURCE	ANTICIPATED IMPACTS
Environmental Trends and Planned Actions Description Fish, frogs and crawfish are not expected to be negatively impacted by the increased fishing opportunities. They could be positively impacted due to a decrease in predators such as otters for this action. However, these impacts are expected to be negligible due to the small number of hunters and take estimated to occur on the Refuge.	**Alternative B:** Current seasons on fishing, frogging and crawfish will remain the same on Big Lake, Bald Knob, and Cache River NWRs and fishing and frogging will remain the same on Holla Bend NWR. Fishing, frogging, and crawfish harvesting are for personal use only and not commercial purposes. Frogging will be opened on Wapanocca NWR and seasons on crawfish will open on Holla Bend NWR. Nighttime use of Bald Knob, Holla Bend and Wapanocca NWRs is prohibited including for fishing and frogging. Methods of take on Wapanocca will be expanded to allow various fishing devices, such as nets, seines, yo-yos, limb lines, trotlines, jugs, etc. to align with State regulations. Placement of additional fishing platforms for wheelchair-bound anglers will facilitate and enhance opportunities on the Complex in a manner that will not adversely impact environmental conditions nor other refuge users. Harvest numbers for fish would increase slightly but the effects would not change as seasons and dates will remain the same as in past years, except for minor changes in frogs and crawfish taken for the Complex. These changes will be negligible; however and will not result in negative impacts for fisheries resources including frogs and crawfish.
Other Wildlife and Aquatic Species ***Affected Environment Description*** The diversity of aquatic and terrestrial habitats supports a variety of resident and migratory wildlife species. A species list of Refuge biota is provided in Appendix G of the 2009 Complex CCP and Appendix I of the 2010 Holla Bend NWR CCP. *Birds* - Because of the prominence of the Cache/Lower White Rivers ecosystem as the largest remaining habitat of its type in the Lower Mississippi Alluvial Valley (LMAV), and because its north-south orientation serves as a migration corridor traversing approximately one-quarter of the total length of the LMAV, the system must be considered one of the most important sites in the region for this group of species (USFWS 1994). This area was designated as a Globally Important Bird Area by the American Bird Conservancy and it has been designated as an Audubon Important Bird Area. *Mammals* - Some 72 species of mammals occur in Arkansas and many of them have been documented, or are likely to occur in the Cache/Lower White River ecosystem. There is limited information regarding bat species found on the Complex; however there are believed to be nine species of bats that inhabit the refuges. Mobile acoustical bat surveys began in 2012 and according to the detections, the tricolored and evening bats appear to be the most common on the Refuge (https://ecos.fws.gov/ServCat/DownloadFile/100113). *Amphibians and Reptiles* - The Complex's moist, forested bottomland hardwood habitat, bayous, oxbows, and impoundments are conducive for an abundant and diverse reptile and amphibian community. Numerous species of salamanders, frogs, toads, turtles, snakes, lizards, and skinks occur. *Fish* - Populations of fish and other aquatic resources on the Complex are highly dependent on the connectivity of the rivers with the floodplain habitat. All of these water bodies vary slightly in their connectivity date with the rivers. Several fish species of special concern occur, or may occur in the system; these include the pallid sturgeon, blue sucker, crystal darter, paddlefish, and alligator gar. ***Environmental Trends and Planned Actions Description*** Because of the regulatory process for harvest management in place within the Service, the setting of hunting seasons largely outside of the breeding seasons of resident and migratory wildlife, the ability of individual refuge hunt programs to adapt refuge-specific hunting regulations to changing local conditions, and the wide geographic separation of individual refuges, the Service would anticipate no significant beneficial or adverse impacts to non-target wildlife and aquatic species by the use of hunting on the refuges. While concerns do exist regarding the bioavailability of spent lead ammunition, lead associated with the proposed increased hunting would not be anticipated to have significant impacts for non-target wildlife and aquatic species.	**Alternative A:** Under the No Action Alternative, hunting and fishing seasons and impacts will not change from what they have been since the implementation of the seasons identified earlier in this document. Hunting likely results in short-term disturbance to wildlife over a larger area and for a longer period. This includes temporary displacement of migratory and resident wildlife from vehicle, boat and foot traffic moving through the area, as well as disturbance resulting from the discharge of firearms. Disturbances of these types are minimal and result in little, if any, effects to the population levels of non-hunted wildlife. To balance hunting/angling opportunities with wintering waterfowl management goals, the Refuge maintains areas that are closed to all public use including hunting and fishing. Waterfowl sanctuaries close to all public entry and use from November 1 through February 28 depending on the refuge. These closed areas provide habitat for wildlife displaced by hunting and other public use activities. Non-toxic shot requirements for all game species pursued with a shotgun will prevent waterfowl and other birds from being exposed to lead shot. Increased hunting may have temporary, localized impacts to populations of game and non-game species. The short-term effects of hunting include mortality, wounding, and disturbance of target and non-target species (De Long 2002). Hunting can alter behavior (e.g., foraging time), population structure, general health (e.g., weight loss), and distribution patterns of all wildlife within the hunt area (Owens 1977, Raveling 1979, White-Robinson 1982, Thomas 1983, Bartelt 1987, Madsen 1985, Cole and Knight 1990). The level of disturbance associated with hunting can be high due to the loud noises produced by guns and the rapid movement of both hunters and hunting dogs within the hunt area. Disturbance to wildlife that causes shifts in habitat use, abandonment of habitat, increased energy demands on affected wildlife, changes in nesting and reproductive success, and singing behavior (Knight and Cole 1991, Miller et al. 1998, Shulz and Stock 1993, Gill et al. 1996, Arrese 1987, Gill et al. 2001). However, disturbance is not a long-term threat to populations because the relocation is temporary. Hunters are dispersed over a large area. To further minimize wildlife disturbance, the Complex establishes no hunting zones and areas which are closed to all public entry, and well as temporal zones. Intermittent hunting can also be a means of minimizing disturbance, especially if rest periods in between hunting events are weeks rather than days (Fox and Madsen 1997). Quota hunts help to manage wildlife disturbance. Hunter/angler disturbance, especially when repeated over a period of time, compels waterfowl and other species to change foraging habits (e.g., foraging at night) or abandon areas of disturbance (Madsen 1995, Wolder 1993). In fact, studies indicate that prolonged and extensive disturbances can cause large numbers of waterfowl to leave disturbed areas and migrate elsewhere (Madsen 1995, Paulus 1984). Various studies indicate an inverse relationship between the numbers of birds using an area and hunting intensity (DeLong 2002). Following the close of hunting season, ducks generally increased their use of the hunt area on the Refuge but use of this area was lower than before the hunting season began. Impacts to waterfowl and other species can be reduced by providing adjacent sanctuary areas where hunting does not occur and where birds can feed and rest relatively undisturbed. Sanctuaries or non-hunt areas have been identified as the most common solution to disturbance problems caused from hunting (Havera et. al 1992). Another mitigation measure is requiring non-toxic shot. Use of non-toxic shot reduces the potential of lead poisoning to waterfowl as well as up the food chain.

AFFECTED RESOURCE	ANTICIPATED IMPACTS
The trends of several non-hunted or non-target wildlife species populations are in decline. Several species of migratory birds benefit from the removal of outlaw quadrupeds which are predators to many of these species. An encompassing research report presented in Science magazine in 2019 reported the decline of many north American avifauna. The research described population losses across much of the North American avifauna over 48 years, indicating a net loss approaching 3 billion birds, or 29% of 1970 abundance. Of the 529 species listed, a net loss of 2.9 billion breeding birds across the continental avifauna since 1970 was shown. A total of 419 native migratory species experienced a net loss of 2.5 billion individuals, whereas 100 native resident species showed a small net increase. Overall proportional loss was greatest among species overwintering in coastal regions of North America. (Rosenberg et al. 2019) Many shorebird populations have remained stabilized after years of large declines in the 1980s and mid-1990s (Kushlan et al. 2012). However, some shorebird populations have shown decline. Morrison and others reported in 2006 that out of 52 species of shorebirds in North America, 24 had been increasing and 15 were decreasing (Morrison et al. 2006). Although many shorebird populations listed as threatened or endangered by the U.S. and Canadian governments have increasing population trends, none have reached recovery targets. Information on population trends remains virtually unknown for 25% of the shorebirds occurring in North America, and surveys are needed to determine the state of these populations (Andres et al. 2012). North American waterbirds are also in decline. Of 210 species of waterbirds, including seabirds, coastal waterbirds, wading birds, and marsh birds utilizing aquatic habitats in the Americas, one-third are considered to be at risk of serious population loss. Eleven species of pelagic seabirds are highly imperiled, and 36 species of pelagic and coastal seabirds as well as seven species of wading birds are of high conservation concern (Kushlan et al. 2002). Kushlan et al. suggest promoting habitat and site based actions, increasing knowledge base on monitoring, and identifying informational needs. Beyond their cultural significance, waterbirds are often useful as indicators of environmental quality and ecosystem health. As seen by the crash of the brown pelican population in the Gulf of Mexico due to contaminants, waterbirds are still at risk due to human activities. Other threats identified by Kushlan and others are: longline and gill net fisheries that kill large numbers of seabirds through entanglement and drowning, oil spills from ships and chronic bilge discharges that sicken and kill hundreds of thousands of waterbirds, and chemical impacts (e.g., declines in double-crested cormorants in the 1960s and 1970s due to chemicals). The solution to recovering these species lies in conservation of aquatic habitats through multiuse management (Kushlan et al. 2002). Many of these species are experiencing declines or are at risk. The State Wildlife Action Plan (SWAP) provides detailed descriptions of the habitats, assessment of threats to those habitats, and conservation actions are needed to address those threats. The SWAP recognizes that over 90% of the state is privately owned, and state and federal land management is only a small part of the conservation efforts Statewide. The SWAP describes the need for limiting habitat fragmentation, degradation, and reduced conversion of habitats from development and agriculture as examples of the major stressors to populations of reptiles, amphibians, and other none game animals in the state. The SWAP identifies Conservation Opportunity Areas where partners are needed to create opportunities for conservation in identified priority geographic areas.	Excluding public entry and use (including hunting and fishing) hunting activities on certain areas of the refuges specifically to provide areas of waterfowl sanctuary helps decrease disturbance. The refuges limit hunting hours and restrict entry and public use into certain areas, and provide sanctuary areas. By restricting entry on these managed impoundments, croplands, and natural habitats, waterfowl can use the areas as sanctuary for the majority of the winter. In areas of the refuges where waterfowl hunting is allowed, in order to minimized additional disturbance to both waterfowl and resident wildlife, the refuges (that allow waterfowl hunting) require all waterfowl hunters to end hunting at noon daily and be out of the field prior by to 1 pm each day of the season. Disturbance to non-hunted migratory birds could have regional, local, and flyway effects. Regional and flyway effects would not be applicable to species that do not migrate such as most woodpeckers, and some songbirds including cardinals, titmice, wrens, chickadees, etc. The effects of disturbance to non-hunted migratory birds under the present/proposed action are expected to be negligible due to the limited number of hunters drawn through quota hunts and most of the seasons would not coincide with the nesting season. Some small mammals, including bats, are generally inactive during winter when hunting season occurs. Bats and some other small mammal species are also nocturnal. Both of these qualities make hunter interactions with small mammals infrequent. Hibernation or torpor by cold-blood reptiles and amphibians also limits their activity during the hunting season when temperatures are low. Hunters would generally not encounter reptiles and amphibians during most of the hunting season. Encounters with reptiles and amphibians in early fall are few and should not have negative effects on reptile and/or amphibian populations. Hunters during spring, late summer, and early fall may encounter some reptiles and amphibians, which could result in disturbance or mortality. However, the impact to the population of amphibians and reptiles during this periods is expected to be minimal and similar to that of other users. Invertebrates are also not active during cold weather and would have few interactions with hunters during the hunting season. Refuge regulations further mitigate possible disturbance by hunters to non-hunted wildlife. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted. Some species of bats, butterflies and moths are migratory. Negative effects to these species at the "flyway" level should be negligible. These species are in torpor or have completely passed through the refuges by peak hunting season, which occurs in October - January. Some hunting occurs during other months when these species are migrating; however, hunter interaction may be commensurate with that of other users. Fish are not expected to be negatively impacted by the increased hunting/fishing opportunities. Fish could be positively impacted due to a decrease in predators such as otters for this action. However, these impacts are expected to be negligible due to the small number of hunters and take estimated to occur on the Refuge. Disturbed wildlife will relocate to avoid hunters or flush and expend more energy than if they had remained at rest. While, increased hunting will have temporary, localized short-term impacts to populations of game and non-game species, as described above, disturbance is not a long-term threat to populations because the relocation is temporary and food is generally not a limiting factor. Most animals will be able to readily replace those energy reserves they use to escape from hunters. Overall, hunting/fishing impacts to other wildlife and their habitats and impacts to the biological diversity of the refuge will be minor. As public use levels on the refuge expand across time, unanticipated conflicts between user groups may occur. The refuge's Visitor Services programs will be adjusted as needed to eliminate or minimize each problem and provide quality wildlife dependent recreational opportunities while promoting public safety and maintaining healthy populations of wildlife. **Alternative B:**

AFFECTED RESOURCE	ANTICIPATED IMPACTS
	Impacts would be similar to those described in Alternative A (disturbance related to increased human presence and noise associated with hunting). Increased hunting/fishing may result in additional short-term disturbance to wildlife over a larger area, since additional units would be open to hunting. Under the Proposed Action Alternative, increased opportunities resulting from additional hunted species, increased method of take, lengthened/additional seasons will increase disturbances to non-target species, primarily resulting from hunter movements and activities in wildlife terrestrial and aquatic habitats. Some additional trampling of vegetation and small ground dwelling invertebrates will occur and littering likely will increase. These impacts are expected to minor, and will not present a threat to continued existence of non-target species.
Threatened and Endangered Species and Other Special Status Species ***Affected Environment Description*** A key objective of the Complex is to provide habitat and protection for threatened, endangered, Candidate, and experimental, non-essential populations/species (Intra-Service Section 7 Consultation Analysis). The following species could occur on the refuge: • Ivory-billed Woodpecker (*Campephilus principalis*) - Endangered • Pink Mucket (*Lampsilus abrupta*) - Endangered • Fat Pocketbook (*Potamilus capax*) - Endangered • Scaleshell (*Leptodea leptodon*) - Endangered • Rabbitsfoot Mussel (Theliderma cylindrica) - Threatened, Critical Habitat • Pondberry (*Lindera melissifolia*) - Endangered • Missouri Bladderpond (*Physaria liformis*) - Threatened • Indiana Bat (*Myotis sodalis*) - Endangered • Northern Long-eared Bat (*Myotis septentrionalis*) - Threatened • Gray Bat (*Myotis grisescens*) – Endangered • Piping Plover (*Charadrius melodus*) - Threatened • Eastern Black Rail (*Laterallus jamaicensis*) - Threatened • Red Knot (*Calidris canutus*) – Threatened • Whooping Crane (*Grus americana*) - Experimental, Non-Essential • Monarch Butterfly (*Danaus plexippus*) – Candidate species ***Ivory-billed Woodpecker (IBWO)*** - The IBWO was once an inhabitant of forested habitats throughout the southeastern United States and Cuba. Although little specific population data are available, it is likely that European settlement and the clearing of the forest caused the species to decline in the latter half of the 19th century. By the mid-20th century the IBWO was reduced to a very small population. The most famous of these birds were those studied by Arthur Allen and James Tanner at the Tensas River in Louisiana in the late 1930s. The last widely accepted sightings were made in the Tensas area by Don Eckleberry in 1944. Since that time there have been numerous unconfirmed sightings throughout the historic range of the species. Many of these sightings seemed highly credible but lacked hard evidence. In February of 2004, Cornell Laboratory of Ornithology biologists became aware of credible sight reports of the IBWO in a portion of Bayou DeView which is located on Cache River NWR. Subsequently, Cornell biologists and their partners documented the presence of at least one IBWO (Fitzpatrick et al. 2005) in that area. It was thought that that portion of the Bayou De View was providing some or all of the life cycle requirements for this species' persistence. The sixteen sightings of the IBWO were documented deep within the baldcypress-tupelo swamp of the Bayou De View. Thousands of hours of intensive searching using a variety of techniques during the search seasons from 2004 through 2009 produced only a few additional reported observations in Arkansas. ***Pink Mucket-*** The pink mucket mussel inhabits the White River and its major tributaries. ***Fat Pocketbook*** - The fat pocketbook mussel inhabits the White River and has been found in other streams but has not been found in the Cache River on any recent surveys.	**Alternative A:** A consultation pursuant to Section 7 of the Endangered Species Act (ESA) was formerly conducted as part of the past Central Arkansas NWR Complex Hunt and Fish Plans. Another consultation pursuant to the ESA was made during the development of the CCP in 2009 and 2010 (USFWS 2009 and 2010). A determination of "Not Likely to Adversely Affect" was made for the Bald Eagle, Interior Least Tern and fat pocketbook mussel for all the consultations. Non-toxic shot is currently required by all users hunting with a shotgun on the Refuge **Alternative B:** Under the Proposed Action Alternative an Intra-service ESA Biological Evaluation is included as part of this hunt and fish plan package. A determination of "Not Likely to Adversely Affect" was suggested for all species. The Service's Division of Migratory Bird Management (DMBM) establishes regulation frameworks to manage all migratory bird hunting in the United States. These regulations establish frameworks by which States can then select season lengths, bag limits and areas of migratory bird hunting. The Service also conducts a nationwide ESA Intra-Service Section 7 Analysis and Biological Opinion on all migratory bird hunting regulations, of which the current and proposed seasons are within. The DMBM ESA analysis and biological opinion covers the proposed action as well and conditions apply to the refuge hunt program (USFWS 2019). In 1991, the United States banned lead shot for waterfowl hunting. While lead shot remained in the environment, research estimated a 64 % decline in lead shot exposure for mallards along the Mississippi Flyway (Tranel and Kimmel, 2009). In the U.S., lead ammunition continues to be used in other types of hunting and shooting activities. Some of the most popular types of hunting, which contribute to lead entering the environment, is deer hunting, small game hunting, turkey hunting, dove hunting, and varmint hunting. In some cases, such as with deer, it is common practice to field dress game and discard the internal organs and tissues and potentially lead bullets or bullet fragments, resulting in an offal pile that may be accessed by scavenging birds and other wildlife (Golden et al. 2016). Scavengers and predators that feed on game species have a higher likelihood of being secondarily poisoned by ingesting lead shot (Tranel and Kimmel, 2009). Avian predators and scavengers can be particularly susceptible to lead poisoning if they ingest lead fragments or pellets in the tissues of animals harvested or wounded by lead ammunition. Case files from the National Wildlife Health Center which analyzed 484 bald eagles between 1982-2013 and 68 golden eagles between 1975-2013 for lead poisoning reported lead ammunition or fragments were detected in 14.2 % and 11.8 % of bald and golden eagles respectively. The demographic and pathologic data from these cases revealed lead poisoned carcasses were found in greater frequency in the late autumn and winter than spring and summer months, and lead poisoning was greater in eagles from the Mississippi and Central flyway versus the Atlantic and Pacific flyway. (Golden et al. 2016) The level of dietary lead exposure to wildlife is highly influenced by the season and local hunting intensity (Pain et al. 2009) The NWRSAA, as amended, directs the Service to make refuge regulations as consistent with State regulations as practicable. We share a strong partnership with the States in managing wildlife, and, therefore, we are proceeding with the phase-out of toxic ammunition in a coordinated manner with each respective State wildlife agency. Under the Proposed Action Alternative, hunters will also be required to use non-toxic shot for all species except wild turkey and deer. Nontoxic shot is required for all migratory bird hunting on Bald Knob and Cache River NWRs (Big Lake, Holla Bend, and Wapanocca NWRs are closed to migratory

AFFECTED RESOURCE	ANTICIPATED IMPACTS
Scaleshell- Scaleshell inhabits medium-sized to large rivers with stable channels and good water quality. The abundance and distribution of scaleshell have decreased due to habitat loss and adverse effects associated with water quality degradation, reservoir construction, sedimentation, channelization, and dredging. These habitat changes have resulted in significant extirpations, restricted and fragmented distributions, and poor recruitment within the White River system this species is typically restricted to the upper tributaries and the mainstem downstream to near the confluence with the Black River. One specimen was documented from the White River in Jackson County near Newport in 1999. ***Rabbitsfoot-*** Rabbitsfoot is primarily an inhabitant of small to medium sized streams and some larger rivers. It usually occurs in shallow water areas along the bank and adjacent runs and shoals with reduced water velocity. The rabbitsfoot population on the White River is categorized as sizable, but remains extant in two disjunct reaches separated by approximately 161 rkm (100 rmi). The uppermost reach extends from the Batesville Dam at Batesville, Independence County, Arkansas, downstream to the Little Red River confluence north of Georgetown, White and Woodruff Counties, Arkansas. The lowermost reach extends from U.S. Highway 79 at Clarendon, Monroe County, Arkansas, downstream to Arkansas Highway 1 near St. Charles, Arkansas County, Arkansas (Butler 2005, p. 66; AGFC mussel database 2011). ***Pondberry*** - Pondberry occupies microhabitats of seasonally flooded depressions and sinks in wooded areas, where it characteristically grows in discrete colony patches of sparsely branched deciduous woody stems with aromatic leaves. In Arkansas, few scattered colonies are known. Pondberry is mapped and believed extant at about 99 sites, although some of these are in close proximity, so the number of extant populations may be somewhat less. A few extant populations appear quite large, but may contain few different genetic individuals; many sites are small and isolated. Believed extirpated from Louisiana and possibly Florida; extant populations are known from the coastal plain in North Carolina south to Georgia and Alabama and from the Mississippi Embayment in Mississippi, Arkansas, and Missouri. Extensive clearing and drainage of bottomland forests is probably the major factor affecting the species, both historically and currently. Also the species appears susceptible to the emerging Red Bay or Laural Wilt disease; one Georgia population is known to be infected, but the full potential range and impact of the disease is unknown at this time. Limited sexual reproduction, dispersal, and recruitment are also a concern for the species' persistence in its now highly-fragmented habitat. In Arkansas, pondberry colonies are found in the upper reaches of the Village Creek bottoms and other tributaries to the Black River in Jackson, Lawrence, and Clay Counties; the St. Francis Sunken Lands WMA in Craighead County, and the most recently discovered colony at Wapanocca NWR, in Crittenden County. It has not yet been documented on Cache River NWR. ***Missouri Bladderpod***- The Missouri bladderpod is a small annual plant, about 4 to 8 inches tall, with distinctive canary-yellow flowers cluster at the top of the stems and bloom from April to May. It grows strictly in southern Missouri and northern Arkansas (known from only two sites in two counties in Arkansas. Missouri bladderpods grow mostly in open limestone glades; but it has been found on one dolomite glade in Arkansas. Glades are naturally dry, treeless areas with shallow, loose soil and areas of exposed rock. Glades are described by the underlying rock (e.g., limestone or dolomite). Sometimes the bladderpod is found on highway rights-of-way and pastures where mowing and grazing have kept the area open. Occasionally it is found in open rocky woods. No specimens have been documented on Holla Bend NWR. ***Indiana Bat-*** Indiana bats are found over most of the eastern half of the United States. Summer habitat includes small to medium river and stream corridors with well developed riparian woods; woodlots within 1 to 3 miles of small to medium rivers and streams; and upland forests. Uses caves and mines as hibernacula. ***Northern Long-eared Bat-*** The Northern Long-eared Bat has a large range in the eastern and north-central United States and much of southern Canada; most abundant in the northern part of the range but relatively rare rangewide both in terms of hibernacula and in summer foraging and maternity areas; frequently comprises less than 10% of the bat community. Significant recent declines associated with rapidly spreading white-nose syndrome have occurred in eastern North America, and some habitat has been lost, degraded, or fragmented, primarily through the disturbance of hibernacula and land development. Mortality caused by wind turbines is expected to increase.	bird hunting). Non-toxic shot is also required for upland game hunting on all refuges. However, lead ammunition is allowed on all refuges for upland game hunting in the form of rifles chambered for rimfire cartridges. For deer and feral hog (not open on Holla Bend NWR) hunting on Bald Knob, Cache River, and Holla Bend NWRs, centerfire rifles, shotguns with slugs, muzzleloaders shooting a single projectile, handguns, and large-bore air rifles are legal for use with lead ammunition. On Big Lake and Wapanocca NWRs, shotguns with slugs, muzzleloaders shooting a single projectile, handguns, and large-bore air rifles using lead ammunition are legal for use for deer and feral hog hunting. On Holla Bend NWR, centerfire rifles, shotguns with slugs, muzzleloaders shooting a single projectile, and handguns using lead ammunition can be used for black bear (no other refuges are open for bear hunting). On all refuges, turkey can be hunted with shotguns using lead shot. However, Non-toxic rimfire, centerfire, and shotgun ammunition also is allowed on all refuges for all species/seasons for which these devices can be used. Fishing tackle containing lead (e.g., sinkers, split shot, line weights, etc.) are allowed for use. However, non-lead products also are allowed. The exposure of the above listed species (Section VI. E./VII. A.) to lead introduced to the environment as a result of hunting and fishing activities on the Complex is negligible. Ivory-billed Woodpeckers are insectivores and will not be exposed to ingestion of lead due to hunting and fishing activities. Pink mucket, fat pocketbook, rabbitsfoot, and scaleshell mussels, although potentially exposed to lead ammunition and lead fishing tackle, would be unaffected due to their feeding habits. As plants, pondberry and Missouri bladderpod will not be affected by use of lead ammunition or tackle. Indiana, northern long-eared, and gray bats are insectivores feeding on the wing and will not be exposed to ingestion of lead from hunting and fishing activities. Piping plovers feed on small crustaceans, mollusks, and insects and likely will not be exposed to lead ingestion. Interior least terns feed on small fish, crustaceans, mollusks, and insects and will not be exposed to lead ingestion. Eastern black rails, red knot, and whooping crane feed on small invertebrates and seeds and their diet and feeding behavior make it unlikely that lead items would be ingested. Monarch butterflies consume nectar and will not be exposed to ingestion of lead from hunting and fishing activities. We also encourage the use of non-toxic ammunition and fishing tackle and educate hunters and anglers about lead. As a result, there are no anticipated adverse impacts to any of the above listed species. The Service continues to monitor research findings and work in coordination with the State to mitigate the impacts of lead on refuge habitats or wildlife. The Complex and other refuges within the NWRS have been educating hunters about the risk to wildlife from lead ammunition and use of lead sinkers/weights for fishing. Refuge staff provide information on websites, signage and through other means to ensure hunters have relevant information regarding the use of non-toxic ammunition for hunting. .

AFFECTED RESOURCE	ANTICIPATED IMPACTS
Gray Bat- The gray bat occupies a limited geographic range in limestone karst areas of the southeastern United States, including northern Arkansas. With rare exceptions, gray bats live in caves year-round. During the winter gray bats hibernate in deep, vertical caves. In the summer, they roost in caves that are scattered along rivers. These caves are in limestone karst areas of the southeastern United States. They do not use houses or barns. Females give birth to a single young in late May or early June. Gray bats eat a variety of flying aquatic and terrestrial insects present along rivers or lakes. They are extremely vulnerable to disturbance in their caves. No gray bats have been detected in Cache River or Holla Bend NWRs. ***Piping Plover*** – Piping plover is a transient migrant that uses mud flats. Occurrences are infrequent and of short duration (1-2 days) during the summer months. For example, only one bird was recorded over a two day period in August 2000 on Bald Knob NWR. Breeding occurs along the Atlantic coast from North Carolina to southern Canada and along rivers and wetlands of the northern Great Plains from Nebraska to the southern Prairie Provinces. Plover use on the refuges may occur on mud flats that are created in July and August from fields that were planted in crops and flooded the previous year. Shorebirds may also occur near areas of active soybean production. ***Eastern Black Rail -*** The rail is a transient migrant that uses shallow emergent freshwater wetland habitats areas. Occurrences would be infrequent and of short duration during the spring and fall months. Use on the refuges has yet to be documented but would most likely occur in marsh or moist soil managed type habitats. ***Red Knot*** – The Red Knot is a transient migrant that uses shorelines of lakes or freshwater marshes. The Red Knot is mostly a migrant and winter resident along the Atlantic and Gulf coasts during hunting seasons for Rallidae and Scolopacidae species. Inexperienced hunters could possibly mistake Red knots for rails or snipe in coastal bays and marshes. We have no reports of red knot being subjected to hunting mortality and we believe the probability is discountable, especially considering the brief overlap in timing when red knots could be present and migratory bird hunting is in effect on Bald Knob and Cache River NWRs. Occurrences are likely to be infrequent and of short duration during the summer to early fall. Sightings have occurred on Bald Knob NWR, and they are occasionally made on lands near the Complex according to eBird (ebird.org). Red Knot use of the Complex would likely occur on mudflats that are created when fields flooded for waterfowl are de-watered or when lakes dry up during late summer. ***Whooping Crane*** –The only fully wild population of whooping cranes nests in the Northwest Territories and adjacent areas of Alberta, Canada, primarily within the boundaries of Wood Buffalo National Park. Whooping cranes arrive at this breeding area in late April. The birds winter along the central Texas Gulf of Mexico coast at Aransas NWR and adjacent areas, typically arriving between late October and mid-November. Occasionally, stragglers may not arrive until late December. It would be rare for individuals from this population to occur on refuges within the Complex. A migratory non-essential experimental Eastern Population was designated in 2001 its designated range includes Arkansas. (66 FR 33903-33917). This population would summer and breed in central Wisconsin and winter in west-central Florida. Whooping cranes from this population may occur anywhere in the southeastern United States, including Arkansas. Another attempt to establish a non-migratory, non-essential experimental population occurred in Louisiana in 2011 (76 FR 6066-6082). More than 60 birds were known to be alive as of October 2018. Occurrences are likely to be infrequent on the Complex. However, a female crane from this population has visited Holla Bend NWR in the fall of 2019 and 2020 before traveling to Wheeler NWR in Alabama to winter and then onto Louisiana. This crane used moist-soil units and croplands on the refuge that are managed for wintering waterfowl. Migratory bird hunting is not permitted on Holla Bend NWR, so there is no danger of this crane being mistakenly shot in mistake for waterfowl. Whooping cranes have never been observed on the other refuges in the Complex. ***Monarch Butterfly*** – The Monarch Butterfly travels through Arkansas on its way to central Mexico where they overwinter. While in Arkansas, they depend on flowering plants that are being lost due to habitat loss and degradation (from conversion of grasslands to agriculture, widespread use of herbicides, logging/thinning at overwintering sites in Mexico, urban development, and drought) (USFWS 2020). The diversity of the habitats on the refuge are managed in a way (i.e. selective timber thinning, and early successional scrub-shrub, grassland, and moist-soil habitat restoration and management) that actually encourages flowering plants that would be used by Monarchs. ***Environmental Trends and Planned Actions Description*** It is the policy of the Service to protect and preserve all native species of fish, amphibians, reptiles, birds, mammals, invertebrates, and plants, which are designated threatened or endangered, including their habitats. Several endangered species, threatened species, and species of concern inhabit refuge lands.	

AFFECTED RESOURCE	ANTICIPATED IMPACTS
With hunting being limited in most areas and more restrictive than state seasons (or sanctioned by AGFC for the few hunts that vary from state seasons), the proposed action would not likely affect any threatened species, endangered species, or species of concern. Optimally matching hunting seasons with times that hunting would cause the least amount of disturbance and the legal authority available to the Refuge Manager to close areas to public access, when necessary, ensures that Alternative B would not be any more likely to adversely affect threatened and endangered species than the no action alternative. There is a concern about the bioavailability of spent lead ammunition (bullets) and sinkers on the environment, endangered and threatened species, birds (especially raptors), mammals, and humans or other fish and wildlife susceptible to biomagnification. Lead shot and bullet fragments found in animal carcasses and gut piles are the most likely source of lead exposure. (Kelly et al. 2011). Many hunters do not realize that the carcass (of a lost/unretrieved animal) or gut pile they leave in the field usually contains lead bullet fragments. Research continues on the effects of lead ammunition and the fragments it can deposit in killed game. Avian predators and scavengers can be susceptible to lead poisoning when they ingest lead fragments or pellets in the tissues of animals killed or wounded by lead ammunition. Lead poison may weaken raptors and increase mortality rate by leaving them unable to hunt or more susceptible to vehicles or power line accidents (Kramer and Redig 1997). In a study of bald eagles and golden eagles admitted to the Raptor Rehabilitation Program, College of Veterinary Medicine, at Washington State University from 1991 to 2008 it was found that 48% of bald eagles and 62% of golden eagles tested had blood lead levels considered toxic by current standards. Of the bald and golden eagles with toxic lead levels, 91% (bald) and 58% (golden) respectively, were admitted to the rehabilitation facility after the end of the general deer and elk hunting seasons in December (Stauber 2010). Additionally, recent studies have found that wildlife hunted with lead ammunition can increase risks to human health due to the ingestion of lead (Hunt et. al 2009). While no lead poisoning of humans has been documented from ingestion of wild game, some experts, including the Center for Disease Control, have recommended the use of non-toxic bullets when hunting to avoid lead exposure and that pregnant women and children under 6 should not consume wild game shot with lead ammunition. (Streater 2009). This recommendation comes after a study done in North Dakota found that those who ate wild game had significantly higher levels of lead in their blood than those who did not (Iqbal et. al 2009). All migratory bird hunting on the refuge is limited to non-toxic ammunition. Refuge staff provide information on websites, signage and through other means to ensure hunters have relevant information regarding the use of non-toxic ammunition for hunting. Non-toxic shot is also required for all upland hunting, however, lead ammunition used for deer hunting and in rim fire rifles for small game hunting and lead shot for turkey hunting is permitted.	
Habitat/Vegetation (including vegetation of special management concern) ***Affected Environment Description*** Hunting and fishing will occur in bottomland hardwood forest, cypress lakes, baldcypress/tupelo swamps, bayous, rivers, natural and constructed ponds, grasslands, scrub/shrub, harvested and unharvested croplands, and reforestation areas. Federally-listed Ponberry occurs in Wapanocca NWR. ***Environmental Trends and Planned Actions Description*** Hiking or walking can alter habitats by trampling vegetation, compacting soils, and increasing the potential of erosion. For each mile of trail, approximately 0.6 acres of soil is affected. Soil compaction makes root penetration more difficult, making it harder for seedlings to become established. In moderate cases of soil compaction, plant cover and biomass is decreased. In highly compacted soils, plant species abundance and diversity is reduced in the long-term as only the most resistant species survive (Liddle 1975). Hiking may impact vegetation succession as disturbance of vegetation not only results in an alteration of vegetation but also a change in light and moisture and topographical changes that can reduce ground and shrub-nesting avian species. Nesting success of ground-nesting birds is also influenced by vegetation cover and disturbance (Blakesly and Reese 1988). The reduction of the vegetation's physical structure and diversity due to overbrowsing by deer also can negatively impact landbirds. Casey and Hein (1983) have found greatly reduced bird species diversity in areas with long term, high density populations of deer. These changes were mainly attributed to habitual landscape alteration with pronounced browse line and sparse cover caused by overbrowsing. Not allowing hunting on newly acquired lands may have adverse impacts to landbirds.	**Alternative A:** Damage to vegetation (primarily trampling), littering, minor surface damage on roads/trails from motor vehicles and ATV/UTVs can result due to hunting and fishing, but slightly less than Alternative B because of the lower number of users and days of use. Conflicts between hunters/anglers and non-hunting/fishing visitors to the refuges could occur. These conflicts typically involve the disturbance of wildlife with which hunters and non-hunters are both seeking; however, these impacts are expected to be minimal. **Alternative B:** Under the Proposed Action Alternative, some minor effect is expected to vegetation from trampling, because of the increased number of users and days of use expected. However, hunters are dispersed over a large area and impacts to vegetation are expected to be negligible and vegetation will respond within the growing season that diminishes the effects of disturbance. Placement of additional hunting blinds for wheelchair-bound waterfowl hunters on Bald Knob and Cache River NWRs and for big game species on refuges across the Complex and placement of fishing platforms across the Complex will facilitate and enhance opportunities in a manner that will not adversely impact environmental conditions, including soil, vegetation, or habitat resources. Pondberry will not be affected by foot travel or hunting activity. Some littering will occur, primarily food containers, food wrappers, drink bottles/cans, disposable handwarmers and casings of spent shotgun shells and rifle cartridges, fishing lines and bait containers.

AFFECTED RESOURCE	ANTICIPATED IMPACTS
Repeated visitation to any particular locale at the refuge could cause damage to vegetation and therefore, wildlife habitat. Substantial, widespread habitat degradation could through time result in negative effects to wildlife by reducing available cover, food, nesting habitat, etc., along heavily used access routes. For hunters, impacts to wildlife habitat are expected to be minimal as most species will have already undergone senescence or become dormant. Repeated use of an area by boats equipped with “go-devils” can damage emergent and submergent vegetation beds. Portions of, or whole plants, can be torn, sometimes by roots, and boat wakes contribute to erosion. Accidental introduction of invasive plants, pathogens, or exotic invertebrates attached to boats or trailers is another source of adverse impacts. People can be vectors for invasive plants when seeds or other propagules are moved from one area to another. Once established, invasives can out-compete native plants, thereby altering habitats and impacting wildlife. The threat of invasive plant establishment will always be an issue requiring annual monitoring, and when necessary, treatment. In the event new undesirable invasive species are found on the refuge, staff will work to eradicate the weeds and educate the visiting public about the problem through the Friends Group, news releases, and postings on the informational kiosks and other popular access points. Negative ecological effects associated with an overpopulated deer herd include lack of oak and other hardwood regeneration, a notable lack of shrub component, and a depauperate herbaceous layer. High deer densities denude the forest of shrubs and saplings jeopardizing future regeneration and natural successional processes. As trees mature and die there are no young trees to fill the gaps. Management and control of the deer herd is imperative to accomplish refuge objectives. If left uncontrolled, deer herds can become so numerous that they will adversely affect associated plant and animal communities, by reducing ecological diversity and negatively impacting healthy ecosystem functions. Deer populations would likely increase without controlled hunting and could result in measurable negative impacts on other plant and animal species. When habitat carrying capacity is exceeded, competition for limited food resources results in over-browsing by deer. Severe over-browsing alters plant species composition, distribution, and abundance, and reduces understory structural diversity. These changes may have a deleterious impact on local animal communities which depend on healthy vegetative systems for food and cover (Ellingwood and Caturano 1988). Additionally, feral hogs can have an impact on abundance and richness of plant and animal species, damage crops, promote soil erosion, cause vehicle collisions, and transmit diseases to wildlife, livestock, and humans. (Massei et. al. 2011). Traditional uses, such as hunting and fishing, have been a way of life for many of the rural communities near the refuge. Providing additional hunting opportunities by opening new parcels, managing limited and quota youth and wheelchair-dependent hunts, and adding new species to the hunt program would continue these traditional uses and would have a positive economic impact on local communities.	
Physical Resources ***Affected Environment Description*** **Hydrology** An understanding of the basic geology of Arkansas' Delta is important for understanding the interrelationships of the soil and hydrologic components and processes of the ecosystem, which provide the basis for the associated biotic communities. Paleozoic bedrock outcrops occur on the western edge of the Delta, and declines to the southeast, where outcrops are overlain by more recent alluvial and loessal strata deposited during alternating inundations and recessions of the Gulf of Mexico. The bedrock below the Cache/Lower White Rivers’ system originated nearly 1,000 to over 4,000 feet below sea level. Various overlying strata of gravel and sand support several important and productive aquifers, alternating with confining strata of silts and clays (ASWCC 1988). The surface strata of the Cache/Lower White River basin are all Quaternary deposits of alluvium and loess. Holocene alluvial deposits of the existing major rivers, abandoned meanders, and areas near channels form the current "bottomland" areas. These are the lowest areas in the basin, and most likely to be forested and retain other obvious wetland characteristics. Immediately upslope of these most recent deposits are one or more terraces of Pleistocene alluvial deposits. Lands at this and higher elevations have largely been cleared for agricultural production. Older deposits are exposed in only very limited circumstances in the basin. These include an area of dune sand located in Woodruff County between the Cache River and Bayou DeView, and some isolated pockets of exposed silt and sand along Bayou DeView north and east of Jonesboro.	**Alternatives A and B:** Disturbance to water or soils could occur while hunters/anglers are accessing or scouting hunt sites by foot, bicycle, ATV/UTV, vehicle, or boat. All conveyances must remain on designated corridors for their use. Potential impacts include soil compaction, soil erosion, and changes in hydrology from use of motorized and mechanical conveyances and foot traffic on highly traveled trails. However, hunters are dispersed over large areas and there is not such concentrated use that it would cause excessive impacts to water or soils. Under both alternatives, the Complex would use an adaptive management approach for its hunt and fish programs, reviewing the hunt and fish programs annually and revising (whenever necessary to ensure compatibility with refuge purposes). The Service’s hunt and fish programs can be adjusted to ensure that it does not substantially contribute to the impacts of climate change on Refuge habitats or wildlife.

AFFECTED RESOURCE	ANTICIPATED IMPACTS
The elevation at the north end of the basin at the Missouri state line is approximately 300' mean sea level (MSL), compared to 125' MSL at the mouth of the White River. This drop in elevation across 185 air miles represents an average slope of only 0.018 percent (approximately 1 ft/1 mi) across the entire basin. Although relatively flat, the topography of the basin can be somewhat complex, with numerous current stream and river channels, old meanders, and oxbow lakes surrounded by one or more terrace levels or bottoms. **Geology & Soils** The majority of the soil types in the basin is hydric. The spatial relationships of the various soil types and associations present further evidence of their fluvial origin and influence. By and large, the soils of the basin are rich and fertile, and thus the reason for draining and clearing of most of the original forests for agricultural production. Most of the soils have a high clay content, which results in their capability to perch water at the surface, but this also prevents most areas from contributing to significant groundwater recharge through infiltration. These soil characteristics allow the cultivation of rice over a significant percentage of the lands in the basin. Where water retention and flooding characteristics of individual soils are not suited to rice, the dominant crops are soybeans, winter wheat, and milo, with minor acreages of corn and cotton occurring on the highest, most well-drained sites. Physiochemical and physiographic characteristics of soils (e.g., high clay content, susceptibility to erosion, water retention capabilities, and compressibility), and their relationships to ongoing hydrologic processes necessitate careful consideration during assessment of potential impacts of management and land use activities. ***Environmental Trends and Planned Actions Description*** Changing climate, whether it results from anthropogenic or natural sources, is expected to affect a variety of natural processes and associated resources. The complexity of ecological systems within the Complex points to a tremendous amount of uncertainty about the impact climate change will actually have. In particular, the localized effects of climate change are still a matter of much debate. The primary role of the Refuges in light of future change associated with global climate change and other anthropogenic factors is maintenance of a functioning ecosystem for native wildlife and fisheries, and monitoring to contribute to an understanding of the ongoing changes and potential for mitigation through active management. Monitoring of range expansions of invasive or exotic species, and monitoring of composition, distribution and health of forests are also potentially valuable efforts, particularly if in coordination with regional efforts.	
Wilderness ***Affected Environment Description*** Big Lake NWR contains about 5,000 acres of lands designated as a National Natural Landmark Area in the mid-1970s. The tract includes seasonally flooded bottomlands, open water, and permanently flooded swamplands. Pure stands of bald cypress, the only significant stands of virgin timber in the area, dominate the overstory species. A mixture of white ash, tupelo, and some scattered oaks also occur in the forested areas. A 2,144-acre tract within the National Natural Landmark Area was designated as The Big Lake Wilderness , part of the National Wilderness System. The American Bird Conservancy also has listed the refuge as a Globally Important Bird Area. The Cache River Natural Area, dedicated by the Arkansas Natural Heritage Commission (ANHC) in 1982, is a 937-acre area located within the AGFC Rex Hancock/Black Swamp Wildlife Management Area, which is intermingled with tracts of the Cache River NWR. This Natural Area contains outstanding examples of baldcypress-tupelo swamp and willow-oak forest. Baldcypress trees in this and several other locations within the ecosystem are estimated to be in excess of 500-1,000 years old by University of Arkansas dendrochronological research (e.g., Stahle et al. 1985). Bald Knob, Wapanocca, and Holla Bend NWRs are designated as Important Bird Areas. ***Environmental Trends and Planned Actions Description*** The Service is unaware of any other adverse environmental trends or planned actions that would adversely impact wilderness.	**Alternatives A and B:** Hunter/angler activities do not pose any threats to these specially designated areas. No motorized or mechanized equipment are allowed in the Big Lake Wilderness. Wheelchair accessible hunting blinds or fishing platforms would not be constructed in the Wilderness Area. The characteristics of the refuges that enabled Important Bird Area designations will not be affected by hunting and fishing. Restrictions are in place, including waterfowl sanctuaries, that prevent excessive/negative disturbance to species and their habitats.

Table 5. Affected Visitor Use and Experience and Anticipated Impacts

AFFECTED RESOURCE	ANTICIPATED IMPACTS
Affected Environment Description The Refuge is open to all six priority wildlife dependent public uses – hunting, fishing, wildlife observation, photography, environmental education, and interpretation. Based off the number of public user permits issued, the number of consumptive user (hunting and fishing) visits to the Refuge in 2019 was estimated at 425,960 visits. ***Environmental Trends and Planned Actions Description*** In an effort to minimize conflicts with priority non-hunting recreational uses outlined in the NWRS Improvement Act, and for public safety, the refuge designates areas open to hunting and enforces refuge-specific regulations. Areas administratively closed to hunting are clearly marked with "No Hunting Zone" or "Area Beyond This Sign Closed" signs and/or illustrated in the refuge hunting public use brochure map. Overall, hunting impacts to visitor services/recreation opportunities are considered short-term, minor, and local. Past conflicts have been minimal, and we anticipate future conflicts to be about the same.	**Alternative A:** Under this alternative, current Refuge hunting and fishing opportunities would continue across the Refuge. The Refuge would continue to serve as habitat for fish and wildlife as well as provide outdoor recreational opportunities for all six priority wildlife dependent public uses – hunting, fishing, wildlife observation, photography, environmental education and interpretation. Opportunities to create additional outdoor recreation experiences by adding additional species would be lost. In addition, the Refuge's ability to connect with certain segments of the public would potentially be diminished since hunting for some popular game species would not be permitted. Hunters would pursue these species off-refuge and thus the Refuge's ability to reach those members of the public and promote natural resources conservation, environmental education and natural resources stewardship would be more limited. **Alternative B:** With more hunting and fishing opportunities available under the Proposed Alternative, the potential for conflict with other visitor groups increases. If necessary, the Refuge will employ time and space zoning measures to separate the user groups and reduce the likelihood and impacts of the conflict. All other public uses on the Refuge would not change and would continue to be managed as described in current plans. Placement of hunting blinds for wheelchair-bound waterfowl (Bald Knob and Cache River NWRs) and big game hunters (Complex-wide) and wheelchair-accessible fishing platforms (Complex-wide) will facilitate and enhance hunting and angling opportunities on the Complex in a manner that will not adversely impact other refuge users. Visitor facilities including boardwalks are provided in some areas closed to hunting to minimize conflict between different user groups. Overall, hunting impacts to visitor services or other recreation opportunities are considered short-term, minor and local since other parts of the refuge are available for use by non-hunters (other wildlife-dependent recreation users). Impacts between hunters and non-hunters are anticipated to be similar to the impacts between other user groups (e.g., like that between hikers and photographers) and will be negligible.

Table 6. Affected Cultural Resources and Anticipated Impacts

AFFECTED RESOURCE	ANTICIPATED IMPACTS
Affected Environment Description The earliest evidence of humans in the Cache River Basin area is from the Paleo-Indian period, circa 10,000 B.C. The majority of these prehistoric sites were located on natural levees, low-lying terraces, and low sandy knolls. In addition to elevation, the major factor determining the location and utilization of sites appeared to be soils. A strong correlation was observed between site location and areas of sandy soil with high natural fertility. These soils are all of the Bosket fine sandy loam, Dubbs fine sandy loam, and Dundee fine sandy loam types. In contrast, no sites were associated with the areas of sandy well-drained soils which have low natural fertility (Beulah-Bruno association). There are several cemeteries dating to the late 1800s that are located on Cache River NWR. The remnants of railroad spurs that facilitated the first logging of the forests, also dating to the late 1800s, an old railroad tram crossing the refuge, and a steam-powered water pump that was used to fill steam engines also are located on Cache River NWR. Currently, there are 18 historic properties recorded on Bald Knob NWR. The majority of these are pre-Columbian archaeological sites, although several are 19th century farm or house sites. Big Lake NWR has one major archaeological site, called the Zebree site, which is located at the north end of the refuge just south of the water control structures. Wapanocca NWR had multiple pre-historic and historic sites. There are no known architectural resources on Holla Bend NWR that are listed or eligible for listing on the National Register of Historic Places. ***Environmental Trends and Planned Actions Description*** The Service is unaware of any other adverse environmental trends or planned actions that would adversely impact cultural resources on the refuge or surrounding areas.	**Alternatives A and B:** Neither of these alternatives will have any impacts to cultural resources. Hunting and fishing (including wheelchair-accessible hunting blinds and fishing platforms), regardless of method or species targeted, is a consumptive activity that does not pose any threat to historic properties on and/or near the Refuge.

AFFECTED RESOURCE	ANTICIPATED IMPACTS

Table 7. Affected Refuge Management and Operations and Anticipated Impacts

AFFECTED RESOURCE	ANTICIPATED IMPACTS
Refuge Management and Operations **Land Use:** ***Affected Environment Description*** The refuges provide valuable habitat for migratory birds as well as numerous species of resident mammals, birds, reptiles, amphibians, and fish. The predominant land uses are associated with refuge management actions that support the Complex's mission for the conservation of wildlife and provide recreational opportunities. Consistent with its authorizing legislations, the Complex conducts a broad array of activities with wildlife, recreation, and habitat management. Efforts are made to balance competing demands for natural resources, wildlife, and the public. Refuge planning and management, however, are a continual work in progress and evolve over time, depending on feedback and monitoring as well as changing values, needs, and priorities in wildlife management at the refuge, regional, and national scale. The Central Arkansas NWR Complex and Holla Bend NWR CCPs and associated step down plans will provide direction for refuge habitat management programs, visitor services activities, and wildlife management programs (USFWS 2010 and 2009). ***Environmental Trends and Planned Actions Description*** Unlike many parts of Arkansas that have experienced population growth, the population in the counties surrounding the Refuge has decreased by 25% in the last 18 years (US Department of Commerce 2018). It is unlikely that this trend will be reversed and most users of the Refuge will continue to be from outside the 'local area'. Refuge management can do nothing to stem population growth or declines but refuges and other tracts of conserved habitats will become even more important as repositories of biodiversity. Development and population growth outside of the local refuge area will most likely affect migratory birds and resident wildlife, making the Refuge even more important to these species.	**Alternatives A and B:** The refuges will continue to engage in current management activities during the hunting and fishing seasons to ensure the Refuge meets its management objectives. Management activities can generally be separated by time or area from peak hunting seasons and areas. No impacts are anticipated under Alternative A or B to habitat, buildings, infrastructure, traffic or roadways. Wildlife dependent recreation in either alternative is a socio-economic driver locally, regionally, and at the State level. ATV trails serve to distribute the hunters across the large landscape of the Complex and allow access to areas that would otherwise be difficult to access (ATVs are not allowed on Big Lake, Holla Bend, and Wapanocca NWRs, except for those hunters with mobility-impaired permits). No additional roads or trails will need to be created to facilitate the hunting and fishing that is being proposed under the Proposed Action Alternative.
Refuge Hunt and Fish Administration ***Affected Environment Description*** The costs of administering and enforcing the refuge's hunting and fishing program comes out of the refuge's annual budget. Expenses include program management, staff resources, boundary posting, signage, brochures, parking lot maintenance/construction, facility maintenance, gate installation, and other hunting specific activities. Providing accurate and understandable information to the public in the form of public use brochures, website information, and personal contacts, in addition to Refuge law enforcement are the primary methods necessary to ensure proper and safe administration of hunts on the Refuge. Currently, there are two full-time Federal Wildlife Officers (FWO) for the Refuge. AGFC Wildlife Officers (WO) provide additional law enforcement support. Check stations are used on Bald Knob, Cache River, and Holla Bend NWRs to collect biological information from hunter-harvested deer. Road and parking lot maintenance, mowing, and spraying is necessary for the support of the refuge hunting program. However, these activities are funded as part of the routine refuge maintenance activities. Bald Knob NWR has 65 miles, Big Lake NWR has 11 miles, Cache River NWR has 126 miles, Holla Bend NWR has 14 mile, and Wapanocca NWR has 13 miles of gravel roads and ATV trails being used to access areas for hunting and fishing on the Refuge. ***Environmental Trends and Planned Actions Description*** Outdoor recreation is a socio-economic driver in the vicinity of the Refuge. The local communities thrive economically on opportunities to hunt, fish, and observe wildlife. The Service is unaware of any environmental trends or planned actions that would adversely impact funding or staffing in this area.	**Alternative A:** Under this alternative, there would be no additional increase in costs for administration, law enforcement, biological monitoring and research, or annual maintenance is anticipated. **Alternative B:** Expenses inherent to the hunt and fish program include: law enforcement-related expenditures; road, trail and parking area maintenance; information signage; brochure printing; boundary signs/paint; administrative costs associated with quota hunts; website maintenance; and addressing needs of mobility impaired hunters. Under the Proposed Action Alternative, there will likely be a minor increase in annual Law Enforcement operation, refuge management and administration, and biological monitoring. Additional expenses related to improving Refuge habitats and placing wheelchair accessible hunting blinds and fishing platforms will increase but this increase will be covered by the Refuge's annual budget and revenues.

Table 8. Affected Socioeconomics, Environmental Justice, Indian Trust Resources and Anticipated Impacts

AFFECTED RESOURCE	ANTICIPATED IMPACTS
Local and Regional Economies ***Affected Environment Description*** The general socioeconomic setting of the Central Arkansas NWR Complex is generally similar to that of the broader Mississippi River Delta and Arkansas River Valley, and can be characterized as follows: (1) Strongly agriculturally oriented; (2) low relative per capita incomes; (3) relatively high rates of unemployment; and (4) relatively low, sparsely distributed, and stable or decreasing population. Jonesboro is situated at the northeast edge of the watershed, and is by far its largest city with a population of 46,535. In 2019, Arkansas had 513,834 total hunting licenses sold, with 146,870 of these being non-resident hunters. The number of non-resident hunters in Arkansas was sixth highest among all 50 states reported in 2019. ***Environmental Trends and Planned Actions Description*** Some recent studies have indicated that there is a shift away from nature-based recreation (Pergams and Zaradic 2008). Related to nature-based recreation, the USFWS analyzed trends in hunting and fishing from 2001 to 2011 (USFWS 2011). Hunting participants showed increases during this time period from 13.0 million hunters in 2001 to 13.7 million in 2011 (USFWS 2011). In Arkansas, hunters in state declined from 2001 (431,000 hunters) to 2011 (363,000 hunters); however, the numbers show an increase from the 2006 survey (354,000 hunters) (USFWS 2011). Changing dynamics in a person's preference for outdoor recreation will affect visitation levels on the refuge, which consequently impact the economy of the local communities.	**Alternative A:** Hunting and fishing of current allowed species would continue with similar visitation and expenditures. There would be no additional impact to the local economy beyond continued revenue generated from existing opportunities. **Alternative B:** Since hunting and fishing already occurs, under the Proposed Action Alternative, we anticipate only a slight increase in visitation and expenditure for the additional species proposed. This will result in a minor, but positive, impact to the local economy with revenues representing a minor impact in the context of the local economy. In addition to environmental health, there also are other beneficial effects to hunting and fishing on the refuges (and future acquired lands). Increased wildlife-dependent recreation (hunting, wildlife observation and photography, environmental education), including increased opportunities for mobility-impaired hunters and anglers;; beneficial use of renewable, sustainable wildlife resources; increased appreciation for wildlife conservation, and the role of national wildlife refuges in wildlife conservation, habitat management and restoration all ultimately result from hunting programs on national wildlife refuges. The Central Arkansas NWR Complex consistently coordinates with AGFC concerning the hunting and fishing program. Under the Proposed Action Alternative, the Complex would expand hunting and fishing opportunities as described above. Increases in harvest of these species is expected to be minimal. Due to low anticipated hunter participation and the relative abundance of these species, the impacts of harvest is also expected to be minimal. The State already allows hunting for these species on lands surrounding the Complex refuges. The proposed hunts/fishing programs would have a negligible effect on regional and statewide wildlife populations. Wildlife management of populations is important to ensure the health of the ecosystem. The Complex's hunt and fish programs provide additional beneficial impacts to the wildlife management in the State. As a result, changes or additions to hunting and fishing on the Refuge will have minor effects on wildlife and fisheries species in Arkansas. The slight increase in hunter/angler activity that may occur will not rise to a significant effect locally, regionally, or nationally, especially with hunter numbers declining nationally. Increased revenues at the local, state, and national levels benefit economies and provide (federal) funding for wildlife research, habitat management, acquisition of wildlife habitats, supportive infrastructure, and educational programs designed to raise public awareness and support for wildlife conservation at the local, state, national, and international scales
Environmental Justice ***Affected Environment Description*** Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires all Federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. ***Environmental Trends and Planned Actions Description***	**Alternatives A and B**: The Service has not identified any potential high and adverse environmental or human health impacts from this proposed action or any of the alternatives. The Service has identified no minority or low income communities within the impact area. Minority or low income communities will not be disproportionately affected by any impacts from this proposed action or any of the alternatives.

AFFECTED RESOURCE	ANTICIPATED IMPACTS
The Service has not identified any potential high and adverse environmental or human health impacts from this proposed action or any of the alternatives. The Service has identified no minority or low income communities within the impact area. Minority or low income communities will not be disproportionately affected by any impacts from this proposed action or any of the alternatives.	

MINIMIZATION MEASURES TO AVOID CONFLICTS

The Proposed Action Alternative would allow new hunting and fishing opportunities on the Complex as described in the 2021Hunt and Fish Plans by expanding the number of species allowed to be hunted. These new hunting and fishing opportunities would attract users currently not using the Refuges, thus affording an opportunity to engage new segments of the public to promote natural resources conservation, environmental education and natural resources stewardship. Opportunities to create additional outdoor recreation experiences would be consistent with goals and priority uses identified by the NWRSIA and Secretarial Orders 3347 and 3356. The Service determined the 2021 Hunt and Fish Plans are compatible with the purposes of the Refuge and the mission of the NWRS (Appendix B and C).

The Refuge Manager may establish specific regulations for individual species or portions of the Refuge depending on conflicts with other wildlife dependent recreation priorities. Permanent or periodic hunting/fishing closures for specific species or closures of portions of the Refuge may be necessary if the Refuge Manager determines that there is specific habitat, wildlife protection, public safety requirements, or hunt/fish quality considerations. The need to implement mitigation measures will be evaluated annually. All hunting/fishing would be conducted in accordance with all applicable State, Refuge and federal regulations. Coordination with the public and Refuge stakeholders including AGFC will promote continuity and understanding of Refuge and Service resource goals and objectives, and will help assure that the decision-making process takes into account all interests.

Hunting and fishing on the Central Arkansas NWR Complex are administered in a manner that ensures compatibility with refuge purposes and the mission of the NWRS. Hunting and fishing are annually evaluated within the refuges and coordinated with and approved by AGFC. The refuges continue to adapt the hunting/fishing program as necessary to maintain compatibility. Constructing/placing wheelchair accessible hunting blinds and fishing platforms will be conducted in a manner that will ensure compatibility. Hunting/fishing shall be considered to be compatible on future lands acquired by the refuges given they can be administered in accordance with stipulations presented herein. The stipulations necessary to ensure compatibility are encompassed in the annual regulations for hunting on the refuges; these are presented in the 2021 Sport Hunt and Fish Plans Section A and Complex Hunting and Fishing CDs (Appendix B and C).

MONITORING

The Service will maintain compliance with hunting and fishing regulations by dispatching Service Federal Wildlife Officers to perform field checks. Wildlife Officers from AGFC also assist with enforcement activities. Hunters must possess an Annual Public Use Permit (signed brochure) that can be acquired online or on the front of Refuge public use brochures that are available online, local vendors, at refuge and AGFC offices, and at kiosks at most refuge access points.

SUMMARY OF ANALYSIS

Alternative A – Continue Current Management (No Action Alternative)

As described above, hunting/fishing on the Complex would be maintained at current levels with no significant changes. Conflicts between hunters/anglers and other users will likely be unchanged from current levels, as well as the mitigation measures employed to reduce conflicts. There is not likely to be an adverse effect on endangered or threatened species. The populations of the species currently being hunted/fished will likely continue to increase or at least remain at current levels. Impacts to habitat and non-hunted wildlife caused by overabundant species will continue and potentially worsen.

This alternative also meets the purpose and needs of the Service as described above, because it would continue to provide wildlife-dependent recreation opportunities. However, there would not be any expanded hunting/fishing opportunities.

Alternative B – Implement 2021 Hunt and Fish Plans for Central Arkansas NWR Complex (Proposed Action)

In addition to the current hunting seasons, Bald Knob and Cache River NWR would add hunting seasons for sora and Virginia rail, purple and common gallinule, white-winged, Eurasian collared, and rock dove, American and fish crow, turkey (Bald Knob NWR), striped skunk, red and grey fox, bobcat, river otter, and mink (Table 3 and Appendix B and C). In addition to current seasons on Big Lake, seasons for deer (modern gun and youth gun), quail, turkey, feral hogs, striped skunk, red and gray fox, bobcat, river otter, mink, and muskrat hunting would occur (Table 3 and Appendix B and C). On Holla Bend NWR, in addition to current seasons, gun seasons (mentored youth) for rabbit and squirrel, black bear, striped skunk, red and gray fox, river otter, mink, muskrat, nutria, quail, and crawfish seasons would be added. On Wapanocca NWR, in addition to current seasons, youth gun deer, quail, turkey, striped skunk, red and gray fox, bobcat, river otter, mink, muskrat, and frog seasons would be added (See Table 3 and Appendix B and C). Also on Wapanocca NWR, additional methods of take would be allowed for fishing.

These additional opportunities are likely to attract more hunters and anglers, potentially increasing conflicts with other users, increasing harvest (especially as Cache River NWR increases fee title lands within the approved acquisition boundary), and increasing opportunities. We believe that these potential conflicts can be easily mitigated by the continued use of time and space zoning measures to separate the user groups when and where needed that reduce the likelihood and impacts of the conflict. Since harvest levels are within State and Federal frameworks, populations of hunted and fished species will have negligible effects. There is not likely to be an adverse effect on endangered or threatened species. On a large scale, the effects on wildlife and habitat would be negligible. The local populations of the hunted species under this proposal would potentially be managed at levels more favorable for the species overall health. Habitat damage and predation by some of the hunted species would be reduced and this would have positive impacts to some non-hunted wildlife. Potential for disease transmission within and among hunted populations and from hunted to non-hunted species will be reduced.

This alternative helps meet the purposes and needs of the Service as described above, because it provides additional wildlife-dependent recreation opportunities (including for youth and mobility-impaired hunters/anglers) on each of the refuges meeting the Service's priorities and mandates. Refuge habitat objectives for migratory birds will be more easily achieved with the reduction of habitat damage caused by some hunted species. This alternative also helps align Service regulations with State regulations in an effort to making hunting more accessible by the American public. The National Wildlife Refuge System Improvement Act of 1997 identified hunting and fishing as appropriate uses for Refuges. The Compatibility Determinations for hunting and fishing were used to determine that the 2021 Hunt and Fish Plans are compatible with the purposes of the Refuges and the mission of the NWRS.

Conclusion

Based on the above analyses, the Service has determined that none of the alternatives considered above would have any significant impacts on the human environment. No adverse or beneficial impacts would be anticipated under either of the alternatives (See Appendix F).

Determination

X The Service's action will not result in a significant impact on the quality of the human environment. See the attached **"Finding of No Significant Impact" (Appendix F).**

☐ The Service's action **may significantly affect** the quality of the human environment and the Service will prepare an Environmental Impact Statement.

LIST OF PREPARERS AND COORDINATION

LIST OF PREPARERS
Tina Chouinard
Keith Weaver

STATE COORDINATION
National Wildlife Refuges, including the Central Arkansas NWR Complex's, conduct hunting and fishing programs within the framework of state and federal regulations. All authorized hunts are approved by the state of Arkansas. By maintaining hunting and fishing seasons and regulations that are as, or more, restrictive than the state, (or if varying from the State, they are approved and sanctioned by AGFC) refuges ensure that they are maintaining seasons which are supportive of management on a local, statewide, and regional basis. Support was indicated for aligning the Complex's hunt and fish program with State seasons and regulations and increasing opportunities as much as feasible and to still ensure compatibility of these programs. The Complex will follow AGFC's guidance on Best Management Practices for the Prevention, Surveillance, and Management of Chronic Wasting Disease and work jointly to implement the response plan for CWD or any other disease which surfaces in Arkansas. The Complex will follow AGFC guidance on feral hog control. The AGFC was formally notified of the additional hunt and fish plans, EA and CDs in October 2020. Comments from AGFC were requested in April 2021. Refuge staff will continue to coordinate with AGFC to address annual implementation of hunting and fishing activities.

TRIBAL CONSULTATION
The Service sent letters on October 1, 2020, requesting consultation and on April 15, 2021 requesting comments on the 2021-22 Central Arkansas NWR Complex Draft Hunt and Fish Plans, EA, and Ds to:

- Osage Nation;
- Quapaw Tribe;
- Shawnee Tribe;
- Choctaw Nation;
- Jena Band of Choctaw;
- Mississippi Band of Choctaw;
- Chickasaw Nation;
- United Keetoowah Band of Cherokee;
- Muscogee Creek Nation;
- Alabama-Quassarte Tribal Town;
- Kialegee Tribal Town;
- Thlopthlocco Tribal Town;
- Seminole Nation;
- Delaware Tribe;
- Delaware Nation;
- Shawnee Tribe; and
- Stockbridge Munsee Community

PUBLIC OUTREACH

Public input was sought on the Central Arkansas NWR Complex Draft Hunt and Fish Plans, EA, and Draft Hunt and Fish CDs for 60 days from May 04, 2021 to July 07, 2021. Notice was posted at each refuge Headquarters, refuge websites, and the Refuges' Friends Facebook page. Further, a public information bulletin announcing the availability of the documents for public review and comment was provided to *Woodruff County Monitor, Town Courier, Daily Citizen, Evening Times, Jonesboro Sun, Monroe County Herald, Prairie County Herald, Wynne Progress, Times Herald, Newport Independent, Log Cabin Democrat, Courier, Dardanelle Post Dispatch*, and *The Democrat Gazette*. Additionally, public comments were requested through the Federal Register process announced on May 4, 2021 and ended on July 6, 2021 (86 FR Number 23794). Eleven members of the general public, the Arkansas Game and Fish Commission, the Friends of Holla Bend National Wildlife Refuge, the Humane Society of the United States (via the Federal Register process), and the Shawnee Tribe of Oklahoma submitted comments and Service responses to these comments are addressed in Appendix D.

REFERENCES

Arkansas Game and Fish Commission. 2014. Strategic Furbearer Management Plan, https://drive.google.com/file/d/122dmS3P7uMZABHOJmu2Lg17-zj-hyh2u/view

Arkansas Game and Fish Commission. 2018. 2018 Black Bear Harvest Report, https://drive.google.com/file/d/1EOmP0M23gyR5oFvad3LO5ej0cpSWoK_z/view

Arkansas Game and Fish Commission. 2019. 2019 White-tailed Deer Strategic Management Plan, https://drive.google.com/file/d/1SXIPHVXC6y4wQ80W62U5Vo4_XnvDOesJ/view

Arkansas Game and Fish Commission. 2018. 2018-19 Annual Harvest Report, https://drive.google.com/file/d/10Zh9NjZm-mdvBT0udhR2Q1DYicKoC3pB/view

Arrese, P. 1987. Age, intrusion pressure and defense against floaters by territorial male Song Sparrows. Animal Behavior 35:773-784.

Bartelt, G.A 1987. Effects of disturbance and hunting on the behavior of Canada goose family groups in east central Wisconsin. Journal of Wildlife Management 51:517-522.

Blakesley, J. A. and K. P. Reese. 1988. Avian use of campground and non-campground sites in riparian zones. Journal Wildlife Management 52(3): 399-402.

Casey, D. and D. Hein. 1983. Effects of heavy browsing on a bird community in deciduous forest. *Journal Wildlife Management 47*(3): 829-836.

Caudill, James and Erin Carver. 2019. Banking on Nature 2017: The Economic Contributions of National Wildlife Refuge Recreational Visitation to Local Communities. U.S. Fish and Wildlife Service, Falls Church, Virginia.

Chapman, S. A., J. G. Doty, M. K. Foley, J. L. Hodges, and J. J. Morgan. 2020. National Bobwhite Conservation Initiative. NBCI's Bobwhite Almanac, State of the Bobwhite 2020. National Bobwhite Technical Committee publication, Knoxville, TN. 72 pages.

Christman, S. 1984. Amphibians and Reptiles. Department of Interior, U.S. Fish and Wildlife Service. RF-43670-5.

Cole, D. N. and R. L. Knight. 1990. Impacts of recreation on biodiversity in wilderness. Utah State University.

deCalesta D. 1997. Deer and ecosystem management. Pages 267-279 *in* W. J. McShea, H. B. Underwood, and J. H. Rappole, editors. The science of overabundance: deer ecology and population management. Smithsonian Institution Press, Washington, D.C.

deCalesta D. S. and S. L. Stout. 1997. Relative deer density and sustainability: a conceptual framework for integrating deer management with ecosystem management. Wildlife Society Bulletin 25 (2): 252-258.

deCalesta, D. S. 1994. Effects of white-tailed deer on songbirds within managed forests in Pennsylvania. Journal of Wildlife Management 58: 711-718.

DeLong. A. K. 2002. Managing visitor use and disturbance of waterbirds – a literature review of impacts and mitigation measures – prepared for Stillwater National Wildlife Refuge. Appendix L (114 pp.) in Stillwater National Wildlife Refuge Complex final environmental impact statement for the comprehensive conservation plan and boundary revision (Vol. II). Dept. of the Interior, U.S. Fish & Wildlife Service, Region 1, Portland, OR.

D.J. Case and Associates (editor). 2010. Priority Information Needs for American Coots, Purple Gallinules and Common Moorhens: A Funding Strategy. Developed for the Association of Fish and Wildlife Agencies by the Migratory Shore and Upland Game Bird Support Task Force. 13pp.

Donaldson, D., C. Hunter, and T. H. Holder. 1951. *Arkansas' Deer Herd*. Arkansas Game and Fish Commission. Little Rock, Arkansas.

Ellingwood, M. R., and S. L. Caturano. 1988. An evaluation of deer management options. New England Chapter of The Wild- life Society and Northeast Deer Technical Committee

Everett, D.D., Jr. 1982. Factors limiting populations of wild turkeys on state wildlife management areas in North America. Ph.D. Dissertation. Audubon University. 135pp.

Fox, A. D. and J. Madsen. 1997. Behavioral and distributional effects of hunting disturbance on waterbirds in Europe: implications for refuge design. Journal of Applied Ecology 34:1-13.

Gill, Jennifer A., Ken Norris, and William J. Sutherland. 2001. The effects of disturbance on habitat use by black-tailed godwits Limosa Limosa. Journal of Applied Ecology. Vol. 38 pp.846-856.

Gill, J. A., W. J. Sutherland, and A.R. Watkinson. 1996. A method to quantify the effects of human disturbance on animal populations. Journal of Applied Ecology 33:786-792.

Hunt, W.G., R.T. Watson, J.L. Oaks, C.N. Parish, K.K. Burnham, R.L. Tucker, J.R. Belthoff, and G.
Hart. 2009. Lead bullet fragments in venison from rifle-killed deer: potential for human dietary exposure. PLOS ONE 4(4): e5330.

Iqbal, S., W. blumenthal, C. Kennedy, F.Y. Yip, S. Pickard, W. Dana Flanders, K. Loringer, K. Kruger, K.L. Caldwell, and M. J. Brown. 2009. Hunting with lead: association between blood lead
levels and wild game consumption. Environmental Research 109(8): 952-959.

Johnson, C.K., T.R. Kelly, and B.A. Rideout. 2013. Lead in ammunition: a persistent threat to health and conservation. *EcoHealth* 10(4): 455-464.

Kelly, T.R., P.H. Bloom, S.G. Torres, Y.Z. Herandez, R. H. Poppenga, W.M. Boyce, and C.K. Johnson. 2011. Impact of the California lead ammunition ban on reducing lead exposure in golden eagles and turkey vultures. PLOS ONE 6(4): e17656.

Knight, R.L. and D.N. Cole. 1991. Effects of recreational activity on wildlife in wildlands. Transactions of the North American Wildlife and Natural Resources Conference 56:238-247.

Kramer, J.L., and P.T. Redig. 1997. Sixteen year of lead poisoning in eagles, 180-95: an epizootiologic view. J. Raptor Research 31 (4): 327-332.

Krausman, P.R., L.K. Sowls, and B.D. Leopold. 1992. Revisiting overpopulated deer ranges in the United States. California Fish & Game Journal. 78:1-10.

Liddle, M. J. 1975. A selective review of the ecological effects of human trampling on natural ecosystems. Biol. Conserv.7: 17-36.

Liddle, M. J. and H. R. A. Scorgie. 1980. The effects of recreation in freshwater plants and animals: a review. Biol. Conserv. 17: 183-206.

Madsen, J. 1995. Impacts of disturbance on migratory waterfowl. Ibis 137:S67-S74.

Massei, Giovanna, Sugoto Roy, and Richard Bunting. 2011. Too many hogs?: A review of methods to mitigate impact by wild boar and feral hogs. Human-Wildlife Interactions Vol. 5, No. 1, pp. 79-99.

McAuley, D.G, J.R. Longcore, D.A. Clugston, R. B. Allen, A. Weik, S. Staats, G.F. Sepik, Wl Halteman. 2005. Effects of hunting on survival of American woodcock in the northeast. Journal of Wildlife Management 69(4): 1565–1577.

Miller, S. G., R. L. Knight, and C. K. Miller. 1998. Influence of recreational trails on breeding bird communities. Ecological Applications 8:162-169.

Mosby, H. S. 1969. The Influence of Hunting on the Population Dynamics of a Woodlot Gray Squirrel Population. *Journal of Wildlife Management* 33(1):59-73.

Nixon, C. M., M. W. McClain and R. W. Donohoe. 1975. Effects of Hunting and Mast Crops on a Squirrel Population. *Journal of Wildlife Management* 39(1):1-25.

Owen, M. 1973. The management of grassland areas for wintering geese. Wildfowl. 24:123-130.

Owens, N. W. 1977. Responses of wintering brant geese to human disturbance. Wildfowl 28:5-14.

Raftovich, R.V., K.A. Wilkins, K.D. Richkus, S.S. Williams, and H.L. Spriggs. 2009. Migratory bird hunting activity and harvest during the 2007 and 2008 hunting seasons. U.S. Fish and Wildlife Service, Laurel, MD.

Raftovich, R.V., K.K. Fleming, S. C. Chandler, and C.M. Cain. 2019. Migratory bird hunting activity and harvest during the 2017-18 and 2018-19 hunting seasons. U.S. Fish and Wildlife Service, Laurel, Maryland, USA.

Raftovich, R.V., K.K. Fleming, S.C. Chandler, and C.M. Cain. 2020. Migratory bird hunting activity and harvest during the 2018–19 and 2019-20 hunting seasons. U.S. Fish and Wildlife Service, Laurel, Maryland, USA.

Raveling, D. G. 1979. The annual cycle of body composition of Canada geese with special reference to control of reproduction. Auk 96:234-252.

Roberts, N. M., & Crimmins, S. M. (2010). Bobcat population status and management in North America: evidence of large-scale population increase. *Journal of Fish and Wildlife Management*, *1*(2), 169-174.

Rose, G.B. 1984. Mortality rates of tagged adult cottontail rabbits. J. Wildlife Management 41(3): 511-514.

Seamans, M.E. and R.D. Rau. 2019. American woodcock population status, 2019. U.S. Fish and Wildlife Service, Laurel, Maryland.

Seamans, M.E. 2018. Mourning dove population status, 2017. U.S. Fish and Wildlife Service, Laurel, Maryland.

Seamans, M.E.. 2016. Mourning dove population status, 2015. U.S. Fish and Wildlife Service, Laurel, Maryland.

Schultz, R.D., and M. Stock. 1993. Kentish plovers and tourist-competitors on sandy coasts? Wader Study Group Bulletin 68 (special issue): 83-92.

Stauber, E., N. Finch, P. A. Talcott, and J. M. Gay. 2010. Lead Poisoning of Bald (*Haliaeetus leucocephalus*) and Golden (*Aquila chrysaetos*) Eagles in the US Inland Pacific Northwest Region—An 18-year Retrospective Study: 1991–2008, *Journal of Avian Medicine and Surgery* 24(4), 279-287, (1 December 2010). https://doi.org/10.1647/2009-006.1

Streater, S. 2009. Wild Meat Raises Lead Exposure. Environmental Health News. New York City, NY.

Thomas, V. G. 1983. Spring migration: the prelude to goose reproduction and a review of its implication. In Fourth Western Hemisphere Waterfowl and Waterbird Symposium, edited by H. Boyd. Ottawa, Canada: Canadian Wildlife Service.

U.S. Department of Commerce. 2018. Census Bureau, American Community Survey Office, Washington, D.C., as reported in Headwaters Economics' U.S. Fish and Wildlife Service Socioeconomic Profile. Retrieved May 11, 2020 from https://headwaterseconomics.org/tools/usfws-profiles/.

U.S. Fish and Wildlife Service. 1995. Bald Knob NWR Hunt Plan. Atlanta, GA: U.S. Department of the Interior Fish and Wildlife Service, Southeast Region.

U.S. Fish and Wildlife Service. 1996. Bald Knob NWR Fish Plan. Atlanta, GA: U.S. Department of the Interior Fish and Wildlife Service, Southeast Region.

U.S. Fish and Wildlife Service. 1985. Big Lake NWR Hunt Plan. Atlanta, GA: U.S. Department of the Interior Fish and Wildlife Service, Southeast Region.

U.S. Fish and Wildlife Service. 1987. Big Lake NWR Fish Plan. Atlanta, GA: U.S. Department of the Interior Fish and Wildlife Service, Southeast Region.

U.S. Fish and Wildlife Service. 1995. Cache River NWR Hunt Plan. Atlanta, GA: U.S. Department of the Interior Fish and Wildlife Service, Southeast Region.

U.S. Fish and Wildlife Service. 1995. Cache River NWR Fish Plan. Atlanta, GA: U.S. Department of the Interior Fish and Wildlife Service, Southeast Region.

U.S. Fish and Wildlife Service. 1980. Holla Bend NWR Hunt Plan. Atlanta, GA: U.S. Department of the Interior Fish and Wildlife Service, Southeast Region.

U.S. Fish and Wildlife Service. 1990. Holla Bend NWR Fish Plan. Atlanta, GA: U.S. Department of the Interior Fish and Wildlife Service, Southeast Region.

U.S. Fish and Wildlife Service. 2007. Wapanocca NWR Hunt Plan. Atlanta, GA: U.S. Department of the Interior Fish and Wildlife Service, Southeast Region.

U.S. Fish and Wildlife Service. 1989. Wapanocca NWR Fish Plan. Atlanta, GA: U.S. Department of the Interior Fish and Wildlife Service, Southeast Region.

U.S. Fish and Wildlife Service. 1994b. Comprehensive Management Plan for the Cache River and White River National Wildlife Refuges, within the Cache/Lower White River Ecosystem. 131 pp.

U.S. Fish and Wildlife Service. “Migratory Bird Hunting Statistics.” Migratory Bird Harvest Surveys. Last updated: December 11, 2009. Accessed August 8, 2020.

U.S. Fish and Wildlife Service. 2009. *Central Arkansas National Wildlife Refuge Complex Comprehensive Conservation Plan.* Atlanta, GA: U.S. Department of the Interior Fish and Wildlife Service, Southeast Region. 521 pp.

U.S. Fish and Wildlife Service. 2010. *Holla Bend National Wildlife Refuge Comprehensive Conservation Plan.* Atlanta, GA: U.S. Department of the Interior Fish and Wildlife Service, Southeast Region. 191 pp.

U.S. Department of the Interior, 2013. Final Supplemental Environmental Impact Statement: Issuance of Annual Regulations Permitting the Hunting of Migratory Birds. U.S. Fish and Wildlife Service, Washington, D.C. 418pp., URL http://www.fws.gov/migratorybirds/pdfs/FSEIS%20Issuance%20of%20Annual%20Regulations%20Permitting%20the%20Hunting%20of%20Migratory%20Birds.pdf

U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2016 Net Economic Values for Wildlife-Related Recreation in 2011, Addendum to the 2011 National Survey of Fishing, Hunting, and Wildlife–Associated Recreation. 25pp.

U.S. Fish and Wildlife Service. 2012. Cache River National Wildlife Refuge Final Land Protection Plan and Environmental Assessment. Atlanta, GA. Department of the Interior Fish and Wildlife Service, Southeast Region. 100 pp.

U.S. Fish and Wildlife Service. 2017. Mourning Dove Harvest Strategy 2017. U.S. Department of the Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Washington, D.C.

U.S. Fish and Wildlife Service. 2019. *Central Arkansas National Wildlife Refuge Complex Spatial Habitat Management Plan.* Atlanta, GA: U.S. Department of the Interior Fish and Wildlife Service, Southeast Region. 31pp.

U.S. Fish and Wildlife Service. 2019. Waterfowl population status, 2019. U.S. Department of the Interior, Washington, D.C. USA.

U.S. Fish and Wildlife Service. 2021a. Bald Knob NWR Hunting and Fishing Plan. Atlanta, GA.

U.S. Fish and Wildlife Service. 2021b. Big Lake NWR Hunting and Fishing Plan. Atlanta, GA.

U.S. Fish and Wildlife Service. 2021c. Cache River NWR Hunting and Fishing Plan. Atlanta, GA.

U.S. Fish and Wildlife Service. 2021d. Holla Bend NWR Hunting and Fishing Plan. Atlanta, GA.

U.S. Fish and Wildlife Service. 2021e. Wapanocca NWR Hunting and Fishing Plan. Atlanta, GA.

White-Robinson, R. 1982. Inland and salt marsh feeding of wintering brant geese in Essex. Wildfowl 33:113-118.

APPENDIX A - OTHER APPLICABLE STATUES, EXECUTIVE ORDERS & REGULATIONS

STATUTES, EXECUTIVE ORDERS, AND REGULATIONS
Cultural Resources American Indian Religious Freedom Act, as amended, 42 U.S.C. 1996 – 1996a; 43 CFR Part 7 Antiquities Act of 1906, 16 U.S.C. 431-433; 43 CFR Part 3 Archaeological Resources Protection Act of 1979, 16 U.S.C. 470aa – 470mm; 18 CFR Part 1312; 32 CFR Part 229; 36 CFR Part 296; 43 CFR Part 7 National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470-470x-6; 36 CFR Parts 60, 63, 78, 79, 800, 801, and 810 Paleontological Resources Protection Act, 16 U.S.C. 470aaa – 470aaa-11 Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001-3013; 43 CFR Part 10 Executive Order 11593 – Protection and Enhancement of the Cultural Environment, 36 Fed. Reg. 8921 (1971) Executive Order 13007 – Indian Sacred Sites, 61 Fed. Reg. 26771 (1996)
Fish & Wildlife Bald and Golden Eagle Protection Act, as amended, 16 U.S.C. 668-668c, 50 CFR 22 Endangered Species Act of 1973, as amended, 16 U.S.C. 1531-1544; 36 CFR Part 13; 50 CFR Parts 10, 17, 23, 81, 217, 222, 225, 402, and 450 Fish and Wildlife Act of 1956, 16 U.S.C. 742 a-m Lacey Act, as amended, 16 U.S.C. 3371 et seq.; 15 CFR Parts 10, 11, 12, 14, 300, and 904 Migratory Bird Treaty Act, as amended, 16 U.S.C. 703-712; 50 CFR Parts 10, 12, 20, and 21 Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds, 66 Fed. Reg. 3853 (2001)
Natural Resources Clean Air Act, as amended, 42 U.S.C. 7401-7671q; 40 CFR Parts 23, 50, 51, 52, 58, 60, 61, 82, and 93; 48 CFR Part 23 Wilderness Act, 16 U.S.C. 1131 et seq.

Wild and Scenic Rivers Act, 16 U.S.C. 1271 et seq. Executive Order 13112 – Invasive Species, 64 Fed. Reg. 6183 (1999)
Water Resources Coastal Zone Management Act of 1972, 16 U.S.C. 1451 et seq.; 15 CFR Parts 923, 930, 933 Federal Water Pollution Control Act of 1972 (commonly referred to as Clean Water Act), 33 U.S.C. 1251 et seq.; 33 CFR Parts 320-330; 40 CFR Parts 110, 112, 116, 117, 230-232, 323, and 328 Rivers and Harbors Act of 1899, as amended, 33 U.S.C. 401 et seq.; 33 CFR Parts 114, 115, 116, 321, 322, and 333 Safe Drinking Water Act of 1974, 42 U.S.C. 300f et seq.; 40 CFR Parts 141-148 Executive Order 11988 – Floodplain Management, 42 Fed. Reg. 26951 (1977) Executive Order 11990 – Protection of Wetlands, 42 Fed. Reg. 26961 (1977)

APPENDIX B. CENTRAL ARKANSAS NATIONAL WILDLIFE REFUGE COMPLEX HUNTING COMPATIBILITY DETERMINATION

COMPATIBILITY DETERMINATION

Use: Hunting

Refuge name: Central Arkansas National Wildlife Refuge (NWR or refuge) Complex: Bald Knob NWR, Big Lake NWR, Cache River NWR, Holla Bend NWR, and Wapanocca NWR (CANWRC or Complex)

**Please note that although Logan Cave NWR is part of the Complex, this compatibility determination (CD) does not apply and Logan Cave NWR is not included.

Date established
Bald Knob – September 22, 1993
Big Lake – August 2, 1915
Cache River – June 16, 1986
Holla Bend – August 10, 1957
Wapanocca – January 24, 1961

Establishing and Acquisition Authorities

Bald Knob NWR:
- Emergency Wetlands Resources Act of 1986 (16 U.S.C. § 390l(b), Stat. 3583)
- Fish and Wildlife Act of 1956 [16 U.S.C. § 742f(b) (l)]
- Migratory Bird Conservation Act of 1934 (16 U.S.C. § 715d)

Big Lake NWR:
- Executive Order 2230, the Migratory Bird Conservation Act (16 U.S.C. § 715d)
- Migratory Bird Conservation Act of 1934 (16 U.S.C. § 715d)
- The Wilderness Act of 1964 (16 U.S.C. § 1131-1136)

Cache River NWR:
- Emergency Wetlands Resources Act of 1986 (16 U.S.C. § 390l(b), Stat. 3583)
- Migratory Bird Conservation Act of 1934 (16 U.S.C. § 715d)
- Fish and Wildlife Act of 1956 (16 U.S.C. § 742f(b)(l))
- North American Wetlands Conservation Act (16 U.S.C. § 4401-4412)

Holla Bend NWR:
- Migratory Bird Conservation Act of 1934 (16 U.S.C. § 715d)
- Fish and Wildlife Act of 1956 (16 U.S.C. § 742f(b)(l))
- Refuge Recreation Act of 1962 (16 U.S.C. § 460k)

Wapanocca NWR:
- Migratory Bird Conservation Act of 1934 (16 U.S.C. § 715d)

Consolidated Farmers Home Administration Act of 1961 [Title III (P.L. 87-128]
7 U.S.C. 1926 et seq.
Consolidated Farm and Rural Development Act of l 972 [Title V, P.L. 92-419]

Refuge Purpose(s)

Bald Knob NWR

"... the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ..." 16 U.S.C. § 3901(b), 100 Stat. 3583 (Emergency Wetlands Resources Act of 1986);

"...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." 16 U.S.C. § 742f(a) (4) (Fish and Wildlife Act of 1956);

"…for the benefit of the United States Fish and Wildlife Service (Service), in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." 16 U.S.C. § 742f(b)(l) (Fish and Wildlife Act of 1956);

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 751d (Migratory Bird Conservation Act of 1934).

Big Lake NWR

"... as a refuge, reserve, and breeding grounds for native birds" (Executive Order 2230, dated August 2, 1915);

"...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 751d (Migratory Bird Conservation Act of 1934);

To manage the Big Lake Wilderness as part of the National Wilderness Preservation System, as compatible with the purpose for which Big Lake NWR was established 16 U.S.C. § 1131-1136 (The Wilderness Act of 1964).

Cache River NWR

"... the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ..." 16 U.S.C. § 3901(b), 100 Stat. 3583 (Emergency Wetlands Resources Act of 1986);

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 751d (Migratory Bird Conservation Act of 1934);

"...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." 16 U.S.C. § 742f(a)(4) (Fish and Wildlife Act of 1956);

"…for the benefit of the United States Fish and Wildlife Service (Service), in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude." 16 U.S.C. § 742f(b)(l) (Fish and Wildlife Act of 1956);

"…to protect, enhance, restore, and manage an appropriate distribution and diversity of wetland ecosystems and other habitats for migratory birds and other fish and wildlife in North America; to maintain current or improved distributions of migratory bird populations, and to sustain an abundance of waterfowl and other migratory birds consistent with the goals of the North American Waterfowl Management Plan…" 16 U.S.C. § 4401-4412 (North American Wetlands Conservation Act).

Holla Bend NWR

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 751d (Migratory Bird Conservation Act of 1934).

"...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." 16 U.S.C. § 742f(a)(4)... "for the benefit of the United States Fish and Wildlife Service (Service), in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." 16 U.S.C. § 742f(b)(l) (Fish and Wildlife Act of 1956).

"…suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species…" 16 U.S.C. § 460k (Refuge Recreation Act of 1962).

Wapanocca NWR

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 751d (Migratory Bird Conservation Act of 1934).

National Wildlife Refuge System Mission:

The mission of the Refuge System, as defined by the National Wildlife Refuge System Improvement Act of 1997 (NWRSIA), is:

…to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of the Use

What is the use? Is the use a priority public use?

Hunting is a priority public use as defined by the National Wildlife Refuge System Administration Act of 1966 (NWRSAA), as amended by the National Wildlife Refuge System Improvement Act of 1997 (NWRSIA) (Public Law 105-57). Hunting is a legitimate and appropriate use of refuges in the Central Arkansas NWR Complex as supported by the Central Arkansas NWR Complex and Holla Bend Comprehensive Conservation Plans (CCP) and Finding of No Significant Impacts (FONSIs) (USFWS 2009, 2010, respectively), with the exception of Logan Cave NWR, which is closed to public entry and use. Hunting of the species listed in Table 1 will be evaluated for compatibility with purposes of the refuges within the Complex and the mission of the National Wildlife Refuge System (NWRS):

Table 1. Species open for hunting on refuges within the Central Arkansas NWR Complex.

Species	Bald Knob NWR	Big Lake NWR	Cache River NWR	Holla Bend NWR	Wapanocca NWR
Migratory Birds					
Duck	X		X		
Light Geese	X		X		
Dark Geese	X		X		
Merganser	X		X		
Coot	X		X		
Rail (sora and Virginia)	X*		X*		
Gallinule (common and purple)	X*		X*		
Snipe	X		X		
Woodcock	X		X		
Dove (mourning, white-winged, Eurasian collared, rock	X		X		
Crow (American and fish)	X*		X*		
Upland Game					
Squirrel (gray and fox)	X	X	X	X	X
Rabbit (cottontail and swamp)	X	X	X	X	X
Northern bobwhite quail	X	X*	X	X*	X*
Raccoon	X	X	X	X	X
Opossum	X	X	X	X	X

Species	Bald Knob NWR	Big Lake NWR	Cache River NWR	Holla Bend NWR	Wapanocca NWR
Beaver	X	X	X	X	X
Muskrat	X	X*	X	X*	X*
Nutria	X	X	X	X*	X
River otter	X*	X*	X*	X*	X*
Mink	X*	X*	X*	X*	X*
Coyote	X	X	X	X	X
Fox (red and gray)	X*	X*	X*	X*	X*
Bobcat	X*	X*	X*	X	X*
Striped skunk	X*	X*	X*	X*	X*
Big Game					
Black bear				X*	
White-tailed deer	X	X	X	X	X
Eastern wild turkey	X	X*	X	X	X*
Feral hog	X	X*	X		X

Where is the use conducted?

Bald Knob, Big Lake, Cache River, Holla Bend, and Wapanocca NWRs are within the Central Arkansas NWR Complex (Figures 1-6). Hunting is subject to various area/zone/temporal closures (identified in each refuge's annual public use brochure, refuge websites, refuge maps) on each refuge. Some refuges have areas in which no hunting is allowed at any times, generally for the safety of public and staff. Hunting occurs in various habitat types including bottomland hardwood forest and afforestation areas, scrub/shrub thickets, bald cypress/tupelo swamps, harvested and unharvested croplands, moist-soil management areas, grasslands, impoundments, rivers, streams, lakes, and ponds. Additionally, in accordance with the approved CCP and Land Protection Plan (LPP) (USFWS 2009 and 2012), Cache River NWR currently has an active acquisition program; for this refuge, those anticipated, appropriate acquisitions up to approximately 213,332 acres within the 286,684 acre acquisition boundary, would be added to the hunt and fish program in the future (Figure 4) (See also 2021 Cache River NWR Hunting and Fishing Plan). Hunt Units and corresponding acreages for each refuge on which hunting and fishing are allowed, including future planned acquisitions where the Cache River NWR boundary, are depicted in Figure 1-6. (See also 2021 Hunting and Fishing Plans as well as refuge-specific annual public use brochures).

When is the use conducted?

Hunting is conducted annually, seasonally, and daily within the framework of hunting seasons as established by the Arkansas Game and Fish Commission (AGFC). Generally, hunting on the Complex occurs from September 1st through April 30th. Most hunting occurs during the day; however, raccoon and opossum can be hunted at night. Waterfowl hunting, if allowed on the specific refuge, ends at noon and hunters must leave the hunting area by 1:00 pm. Certain areas on each refuge are designated as waterfowl sanctuaries and are closed seasonally to all public entry and use, including hunting. Other types of seasonal closures may occur in certain areas on each refuge. Hunt season dates, hunting hours, seasonal zone closures and other regulations pertaining to timing of hunting are provided in an annual public use brochure and on the refuge website for each refuge (see Appendix B1).

Figure 1. Hunt units and acres open to hunting for Bald Knob National Wildlife Refuge within the Central Arkansas NWR Complex.

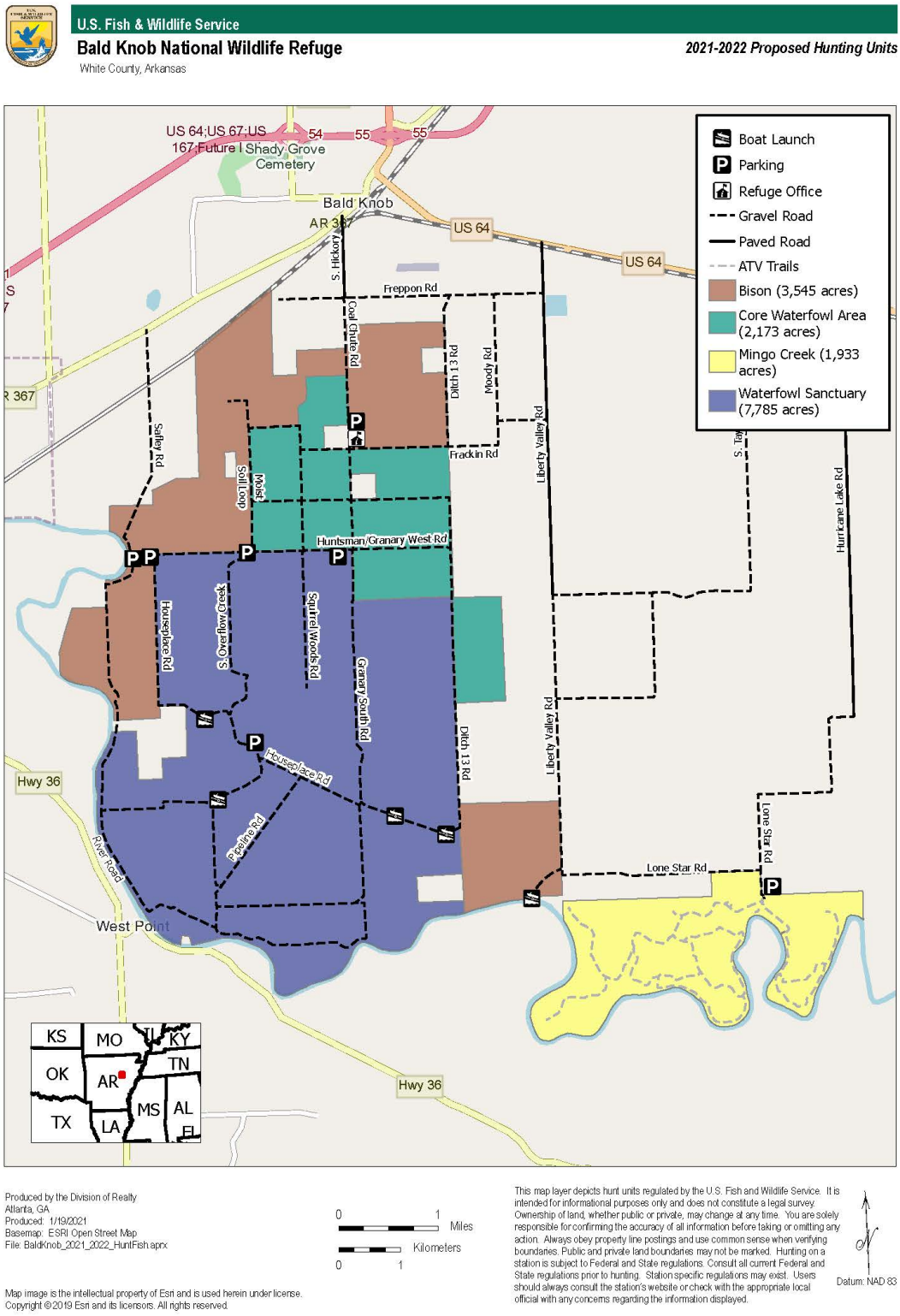


Figure 2. Hunt units and acres open to hunting for Big Lake National Wildlife Refuge within the Central Arkansas NWR Complex.

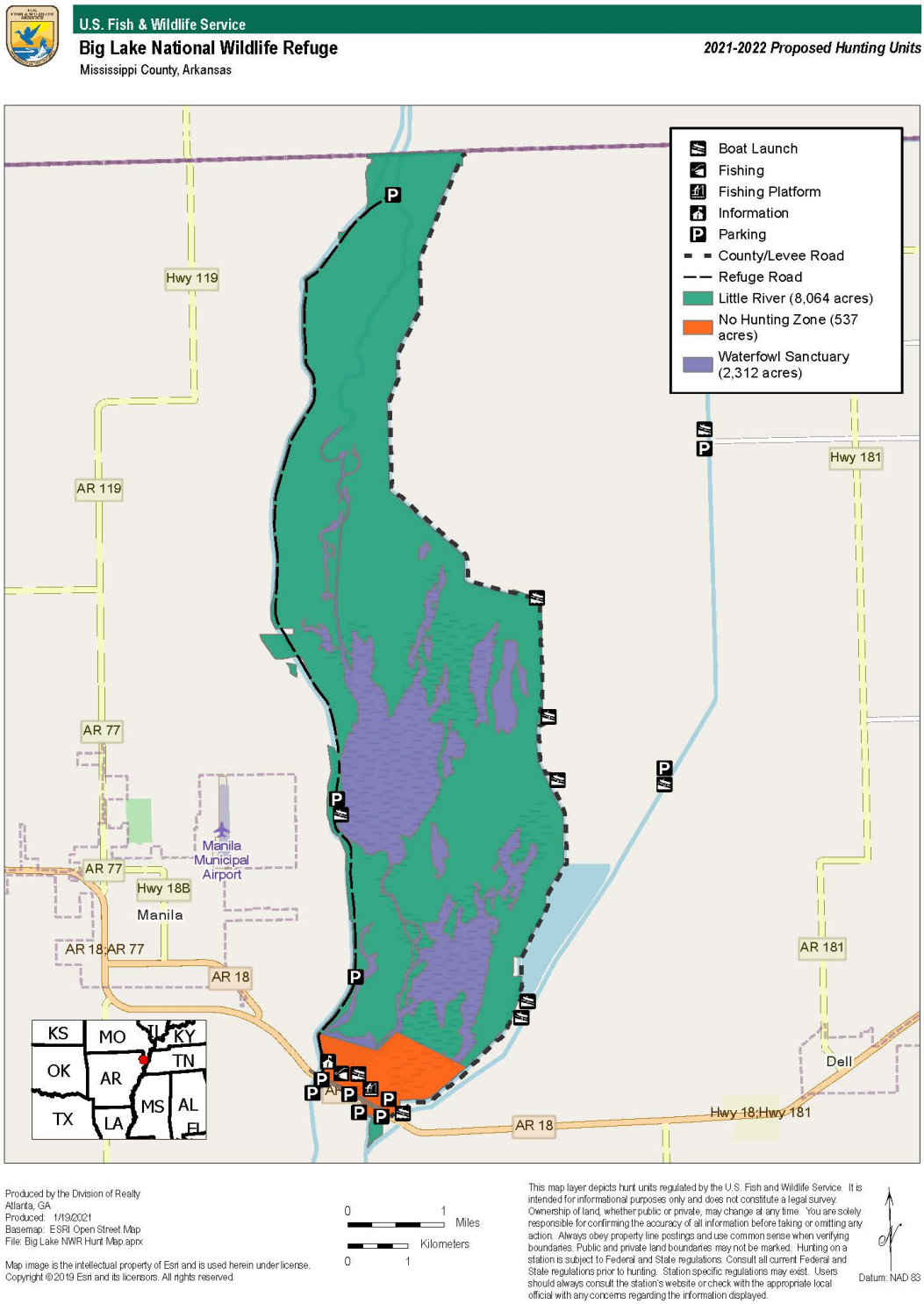


Figure 3. Hunt units and acres open to hunting for Cache River National Wildlife Refuge within the Central Arkansas NWR Complex.

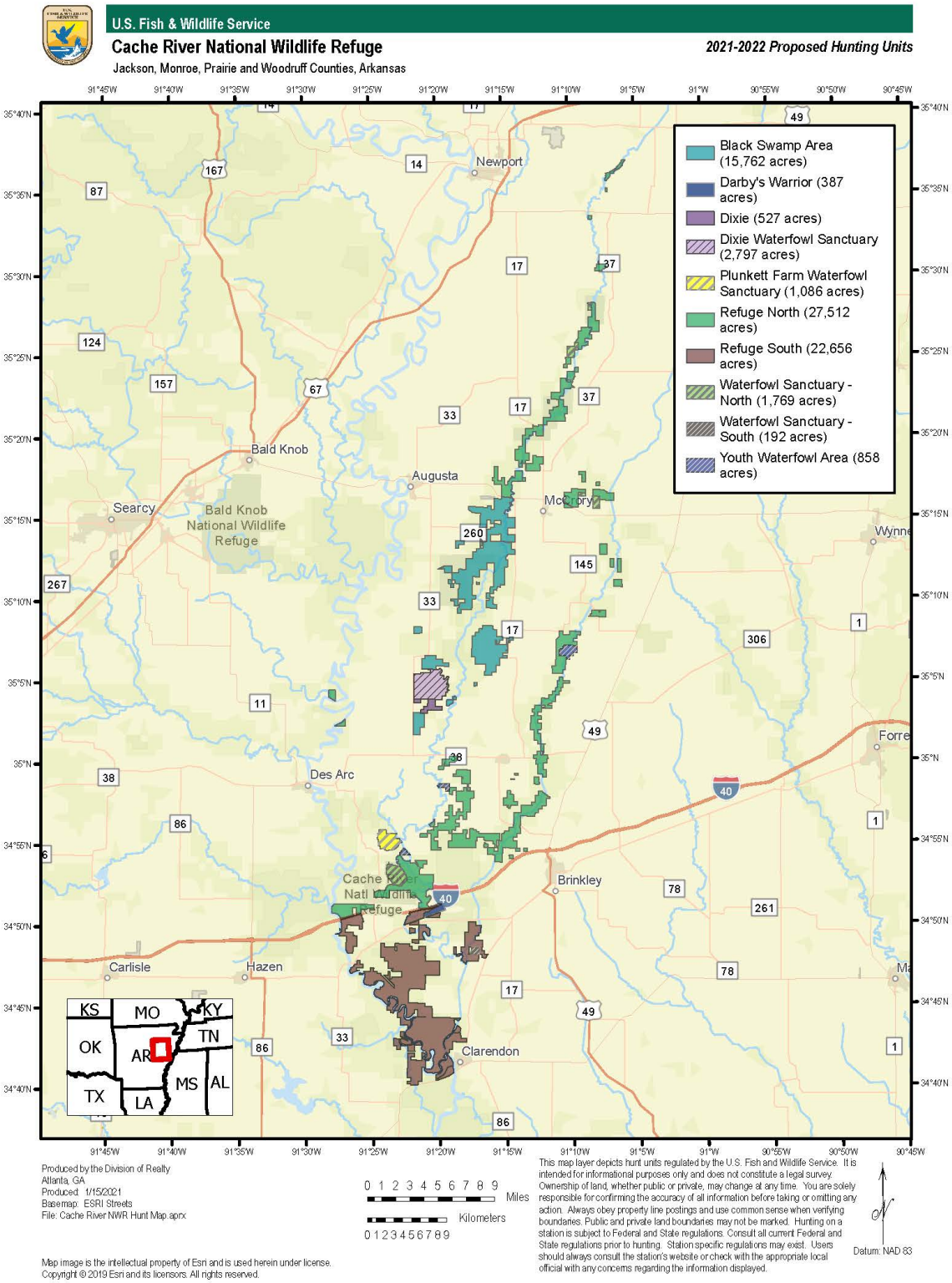


Figure 4. Cache River NWR Present and Future Hunt and Fish Areas, Pending Future Acquisitions.

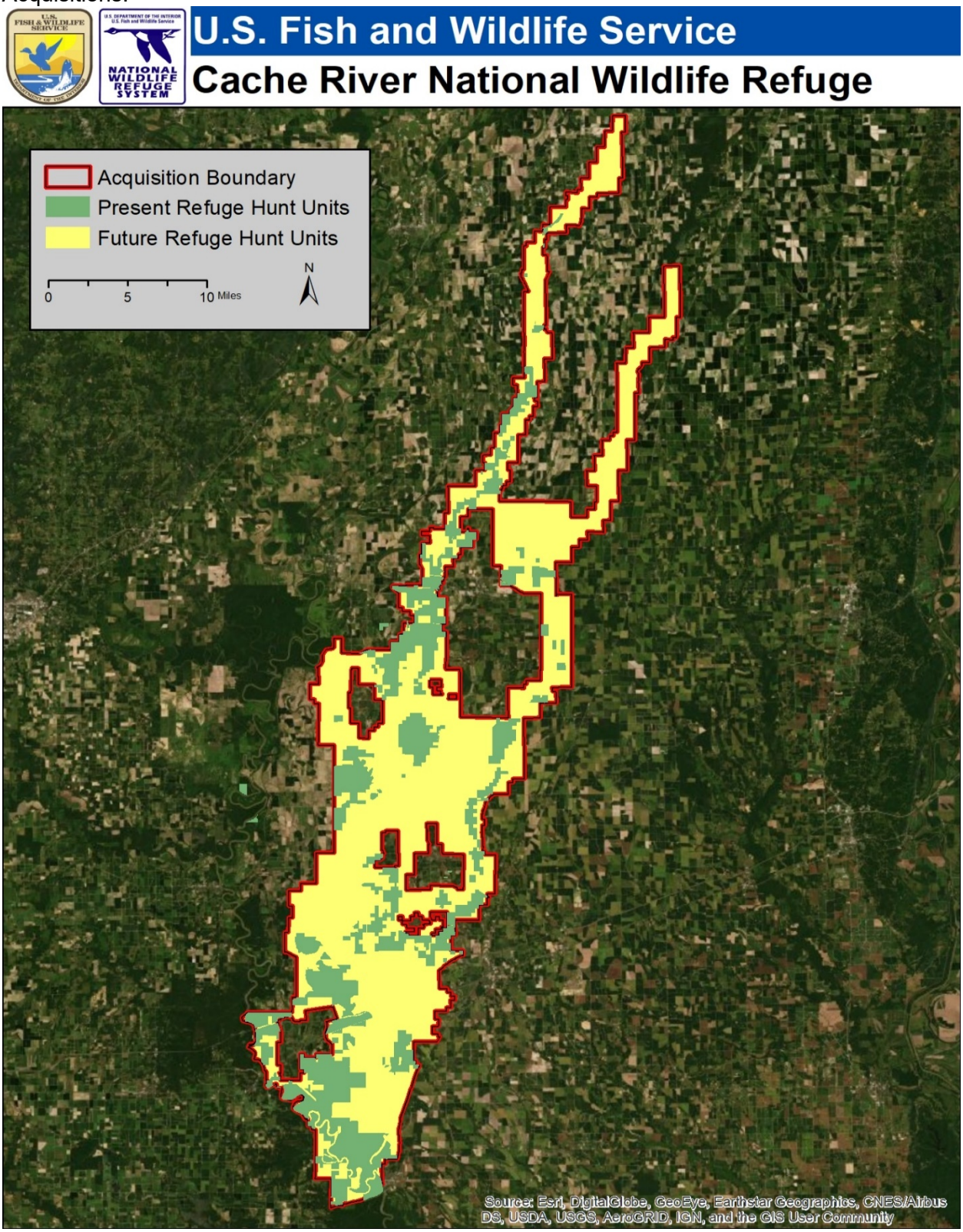


Figure 5. Hunt units and acres open to hunting for Holla Bend National Wildlife Refuge within the Central Arkansas NWR Complex.

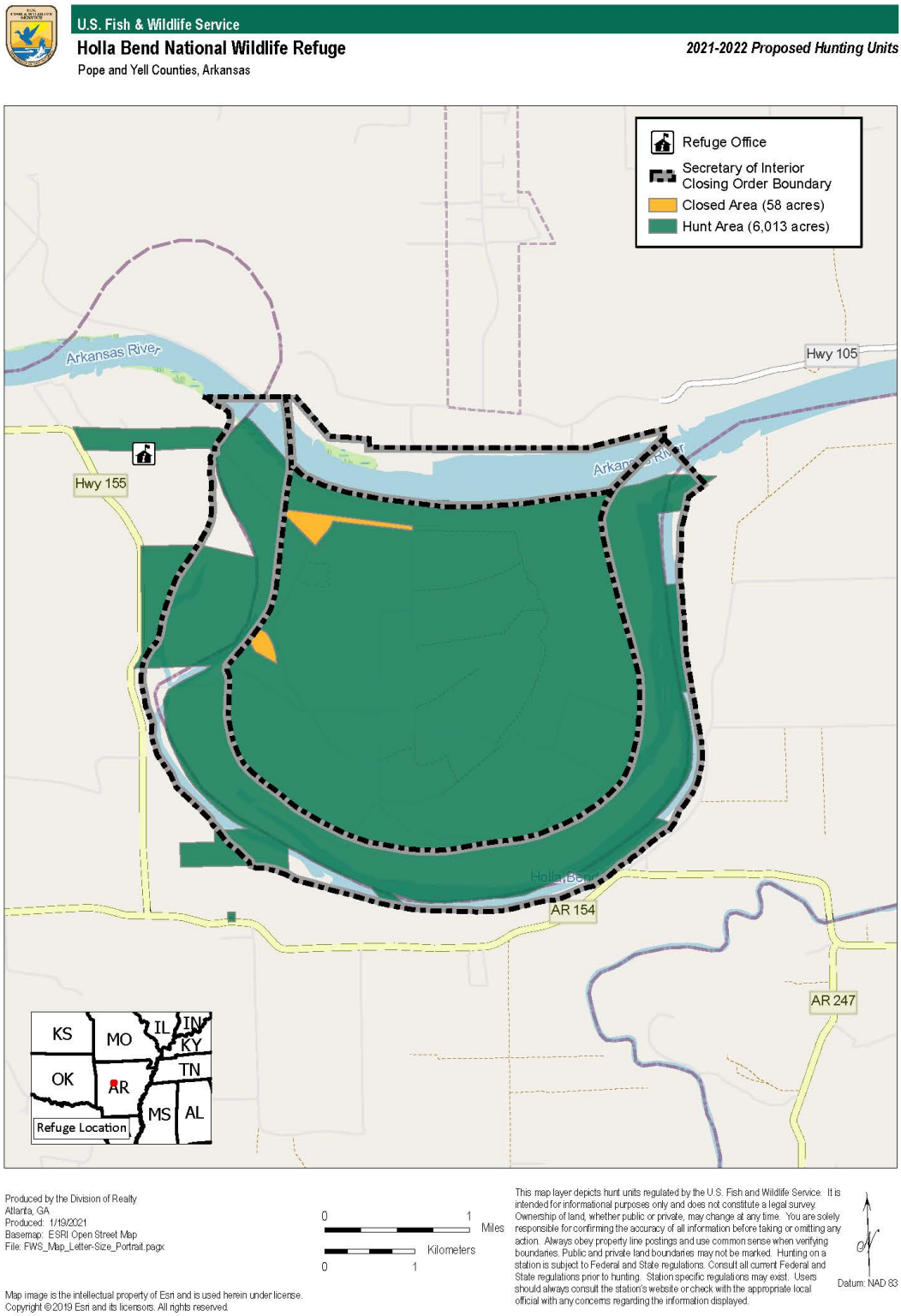
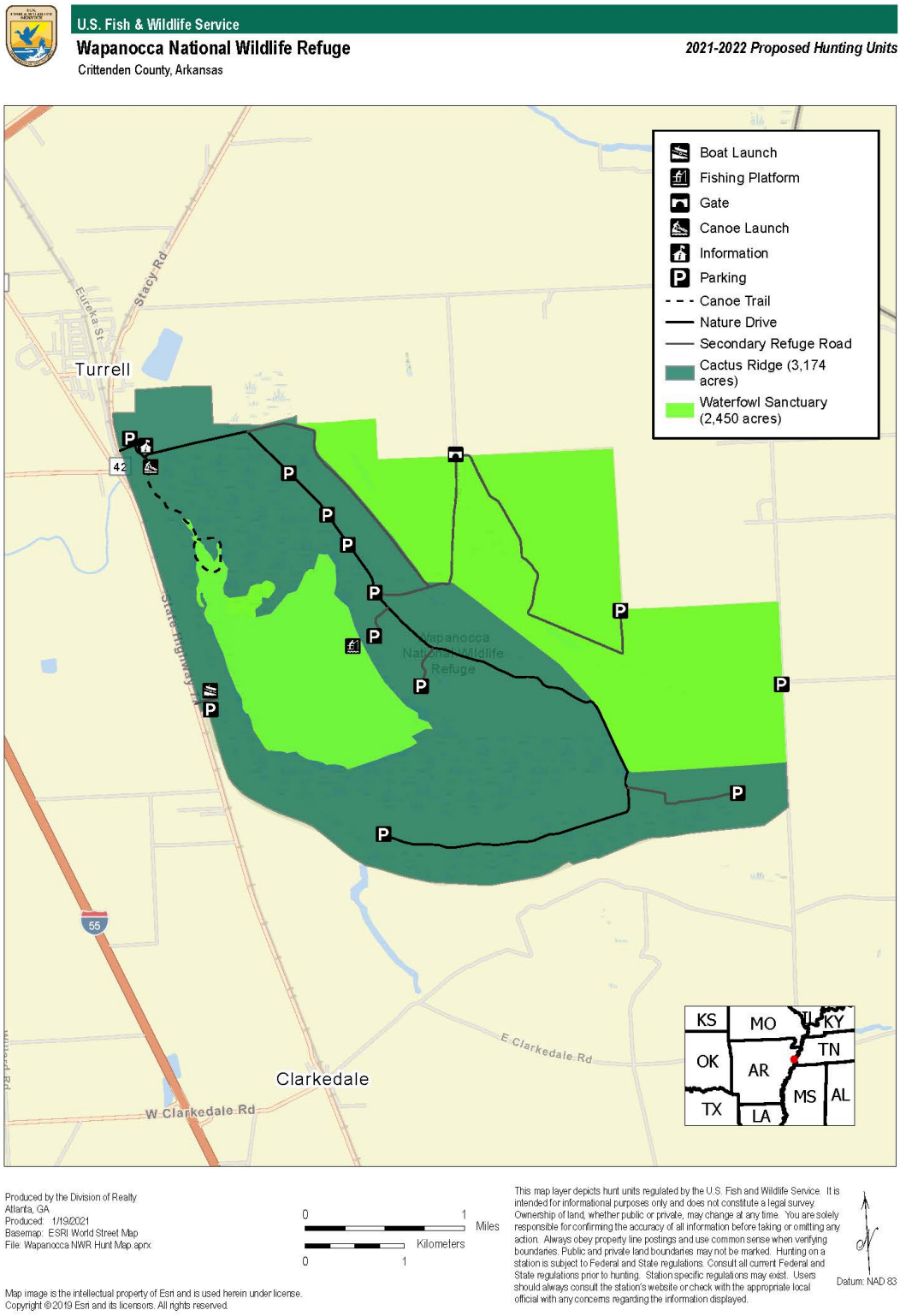


Figure 6. Hunt units and acres open to hunting for Wapanocca National Wildlife Refuge within the Central Arkansas NWR Complex.



How is the use conducted?

Hunting is conducted in accordance with applicable State and Federal regulations and refuge-specific regulations published in *50 CFR 32*. Hunting seasons, bag limits, rules, and other regulations are published for each refuge in annual refuge public use brochures (See Appendix B1). A free, signed, refuge-specific, general hunting permit (available online, at refuge offices, kiosks, and websites and at local vendors and AGFC Regional offices) is required of all persons on the refuges possessing hunting equipment. Modern gun deer hunting is conducted on Bald Knob, Big Lake, Cache River, Holla Bend (Youth only) and Wapanocca NWRs and requires quota permits (FWS Form 3-2439) ($12.50 each) available from an online vendor or at the Holla Bend NWR office. Archery spring turkey hunting on Holla Bend NWR also requires a quota permit (FWS Form 3-2439) ($12.50 each). Other quota permits (FWS Form 3-2439) (free) are required for youth waterfowl hunting in designated special hunt areas on Cache River NWR, youth gun deer hunting on Big Lake, Holla Bend, and Wapanocca NWRs, and youth spring turkey on Bald Knob, Holla Bend, and Big Lake NWRs. Archery deer and archery spring turkey hunting on Holla Bend NWR both require a $12.50 permit available online. Fees for quota permits are subject to change based on administrative needs Youth hunters are defined as ages 6 – 15 and supervision requirements for youth hunters can be found in each refuge's annual public use brochure.

Hunting is administered to ensure compatibility and to maintain safe, high quality, low-impact recreational opportunities. Hunter numbers are limited on some refuges for specific deer and turkey hunts and for specific youth hunts (deer, turkey, and waterfowl). Certain areas of refuges may be closed to hunting or to public entry to limit disturbance to wildlife and to minimize hazardous conditions. Method of take may be restricted on certain refuges in specific areas, during certain hunts, and in certain seasons for public safety, hunt quality, and to maintain sustainable populations.

Access to hunting areas will be by foot, motor vehicle, All Terrain Vehicles/Utility Terrain Vehicles (ATV/UTVs), bicycles, e-bikes, motorized boats, canoes, and kayaks, subject to refuge-specific regulations defined in the annual public use brochure. These modes of travel, which are allowed to facilitate hunting (and other compatible, wildlife-dependent recreation) will be conducted in a manner that ensures compatibility. Motor vehicles (automobiles/trucks), bicycles and e-bikes will use established, open roads only. ATV/UTVs, if allowed, will be confined to designated trails only and only for the purpose of facilitating hunting access; such use will be permitted only between September 1 and March 31 unless otherwise authorized through a Special Use Permit (SUP) (FWS Form 3-1383). SUPs are required for Mobility-impaired ATV/UTV access and will be issued upon request to hunters (and anglers on Holla Bend NWR) possessing valid State-issued mobility impaired permits. Waterfowl hunting blinds accessible by wheelchair-bound hunters may be provided in designated areas on Bald Knob and Cache River NWRs. Wheelchair accessible blinds for hunting other species such as deer or turkey may be provided on all refuges in the Complex. Blinds may be moveable and their placement sites may vary depending on water/habitat conditions and use of selected areas by the target game species. Blinds/access paths will be of such construction and placement that will ensure compatibility, safety, and minimize conflicts with other users. A draw permit system would be used to assign hunters to these blinds. Use of horses and mules are not allowed on the Complex.

Use of dogs for hunting various species of migratory birds and upland game will be allowed subject to refuge-specific regulations defined in the annual public use brochure. Nighttime hunting of raccoons and opossums requires the use of dogs as per State regulations. Use of dogs for hunting deer is prohibited. On Bald Knob and Cache River NWRs, training/testing of hunting dogs will be allowed between September 1 and April 1, corresponding with such use on adjacent State Wildlife Management Areas, and during the timing of hunting seasons which allow the use of dogs, subject to any area closures (e.g., waterfowl sanctuaries) and refuge closures during quota gun deer hunts.

Why is the use being proposed?

Hunting is an approved and existing use on this Complex (USFWS 2009, 2010) and a legitimate wildlife-dependent recreational use that, when compatible, is one of the priority public uses of the NWRS as defined in the NWRSAA, as amended by the NWRSIA (Public Law 105-57). Hunting is a legitimate and appropriate use of refuges in the Central Arkansas NWR Complex as supported by the Central Arkansas NWR Complex and Holla Bend CCPs and FONSIs (USFWS 2009, 2010, respectively). The need of the proposed action will further align the refuge with the Department of the Interior's Secretarial Order (S.O.) 3347 *Conservation Stewardship and Outdoor Recreation* and S.O. 3356 *Hunting, Fishing, Recreational Shooting, and Wildlife Conservation Opportunities and Coordination with States, Tribes, and Territories* by expanding hunting and fishing opportunities and better aligning Service regulations with State regulations. The proposed action will promote one of the priority public uses of the Refuge System. Hunting will also promote the stewardship of our natural resources and increase the public's appreciation and support for the refuges.

Hunting and fishing are the most popular public uses of the Refuges in the Complex. As the availability of private lands open to the public for hunting decreases, demand for access to public lands for hunting is increasing. Therefore, refuges in the Complex are fulfilling a need/demand for increased opportunities for those hunters that do not own hunting land, are not hunt lessees or hunt club members, or do not pay for hunting on private reserves. The refuges in the Complex on which hunting occurs all host abundant and sustainable populations of the game species for which hunts are conducted. Take of non-native species (feral hog and nutria) is also accomplished through public hunting.

Availability of Resources

Hunting is an existing use on the Complex and the proposed expansions of hunts and opening additional species for take are not expected to result in significantly increased operational costs that can be attributed directly to expanded opportunities. Two Federal Wildlife Officers (FWO) and a District Patrol Captain enforce federal, state, and refuge hunting regulations throughout the Complex. Assistance with law enforcement and compliance with regulations is provided by Wildlife Officers from AGFC. Some additional staff time involving refuge managers will be required to issue new permits for youth hunting and/or wheelchair accessible hunting blinds, but it is expected to be minimal. The Complex wildlife biologist will expend minor amounts of increased time gathering and analyzing hunt data. The overall hunting program can be successfully administered by existing staff and budgets. Offsetting revenues will be generated from hunt permit fees. Annual hunt revenues total approximately $40,000. Estimated costs of administering the hunting and fishing programs on the Complex are presented in Table 2.

Table 2. Staff involvement and estimated annual costs to administer the Central Arkansas NWR Complex Hunting and Fishing Programs and Offsetting Revenues from hunt permit sales and entrance fees associated with fishing.

Hunt and Fishing program needs and staff involved	Cost
Equipment/Tractor Operators – Maintain/repair roads, levees, parking lots, trails, signage	$27,000
Biologist, Interns, Contractors – Operate deer check stations, analyze data, prepare reports	$6,100
Senior Federal Wildlife Officers – Law Enforcement program	$45,650
Refuge Managers, Forester, Administrative Officer – Program administration, coordination, brochures, mapping, website content, signage, public information	$34,550
Online Vendor Fee	$3,000
Bald Knob ($41,450); Big Lake ($12,400); Cache River ($36,200); Holla Bend ($12,600); Wapanocca ($13,650) Total	$116,300
Offsetting Revenue for the Complex (Hunting = $39,662; Fishing = $2,960) Total	$42,622

Anticipated Impacts of the Use

Short Term and Long Term Impacts:

Hunting on the Central Arkansas NWR Complex is highly regulated to ensure compatibility with refuge purposes and mission of the NWRS, to contribute to goals and objectives for wildlife populations developed by the AGFC and the Complex Comprehensive Conservation Plans (CCP) (USFWS 2009 and 2010), and provide safe, low-impact, high-quality, wildlife-dependent recreational opportunities for resident and nonresident visitors on the refuges within the Complex. Hunting was further stepped-down and analyzed in the Complex Refuge-specific hunting and fishing plans and associated Environmental Assessment (USFWS 2021a, 2021b, 2021c, 2021d, 2021e, and 2021f). Hunting allows beneficial use of renewable and sustainable natural resources. While hunting on the refuges, participants should gain an increased understanding of wildlife conservation practices, habitat/wildlife relationships, wildlife behavior, and the value of habitat management and public use programs that occur on the refuges. Furthermore, most hunters consume the meat from harvested game and therefore derive sustenance from the refuges. Some hunters may use parts from certain species as decorations or memorabilia of times afield. These opportunities encourage visitor appreciation for wildlife conservation on NWRs, and stimulate hunters to more highly value and support NWRs, the NWRS, and the Service. Hunting also combines the features of other priority public uses such as wildlife observation and photography and there is a valuable wildlife/environmental educational component involved, particularly with the youth hunts and mentored youths hunts conducted on the refuges, and with experienced hunters sharing knowledge and skills with less-experienced hunting partners.

Hunting invariably results in some target animals being killed, and others will be wounded and succumb later. However, wildlife management is directed toward wildlife populations and not individuals. Direct effects of hunting include mortality, wounding, and disturbance of target and non-target species (De Long 2002). Mortality from hunting is considered compensatory. Hunting potentially can alter behavior (e.g., foraging time), population structure, general health (e.g., weight loss), and distribution patterns of all wildlife within the hunt area (Owens 1977, Raveling 1979, White-Robinson 1982, Thomas 1983, Bartelt 1987, Cole and Knight 1990, Madsen 1995). Other target and non-target species will be disturbed (De Long 2002), but such disturbance is temporary and short term and not considered pervasive enough to result in negative impacts to populations. Most displacement of wildlife is minor; animals typically will remain within their normal home ranges. Most hunting on the refuges occurs during times of the year when most wildlife are not nesting, birthing, or raising offspring. The likelihood of a threatened, endangered, or candidate species suffering mortality or the hunting activities causing disturbance rising to the level of take for federally-listed species occurring on the Complex is remote.

All refuge hunting seasons on the Complex are approved by AGFC, which continually monitors wildlife populations and evaluates hunting harvest and determines game population status. Hunting harvests and wildlife populations are evaluated at the local, state, and national levels by various agencies and are regulated to ensure sustainability in perpetuity. Examples of harvest analyses and populations status reports for Arkansas are available from AGFC at this site: https://www.agfc.com/en/wildlife-management/scientific-reports/

The refuges defer to AGFC for evaluation and determination of status and health of statewide game populations and conduct seasons generally in accordance with state seasons, frameworks, and regulations governing take and harvest, except in certain instances in which AGFC approves any variance from general State seasons and regulations. Hunting can help maintain a healthy balance between game animals and habitats upon which they and other wildlife species depend (Yarrow and Yarrow 1999, Knight 2008, McShea 2012).

Other potential short-term impacts from hunting include damage to vegetation (primarily trampling), littering, minor surface damage on roads/trails from motor vehicles and ATV/UTVs. Occasional conflicts between hunters and between hunters and non-hunting visitors to the refuges could occur. These conflicts typically involve the disturbance of wildlife with which hunters and non-hunters are both trying to find.

Hunting will reduce the number of migratory game birds (ducks, light geese, dark geese, merganser, dove, crow, snipe, American woodcock, rail, gallinule, coot) using the refuges based on the number killed during hunting season, but it is not expected to adversely affect their populations in the long term (only Bald Knob and Cache River NWRs are open for migratoru bird hunting). The Service works closely with state and provincial governments, as well as with the public, in a joint effort to establish annual hunting regulations for migratory birds. The Service's Division of Migratory Birds establishes regulatory frameworks to manage all migratory bird hunting in the United States. These regulations establish limitations by which States can then create season lengths, bag limits and areas of migratory bird hunting. Refuges conduct waterfowl hunting within federal and state season frameworks and regulations.

Impacts to waterfowl and other species can be reduced by providing adjacent sanctuary areas where hunting does not occur and where birds can feed and rest relatively undisturbed. Sanctuaries or non-hunt areas have been identified as the most common solution to disturbance problems caused from hunting (Havera et. al 1992). In Denmark, hunting disturbance effects were experimentally tested by establishing two sanctuaries (Madsen 1995). Over a 5-year period, these sanctuaries became two of the most important staging areas for coastal waterfowl. Numbers of dabbling ducks and geese increased four- to 20-fold within the sanctuary (Madsen 1995). Thus, non-hunt areas apparently are very important to waterfowl populations subject to hunting as they ensure the continued presence of the affected species within the general vicinity of the hunt area, but perhaps more importantly, they allow waterfowl to minimize energy losses due to disturbance-caused movements and to forage, rest, and roost without interference.

On Bald Knob and Cache River NWRs, where waterfowl hunting is allowed, waterfowl sanctuary areas limit public disturbance (including hunting) and provide areas of escape and respite from disturbances caused by all forms of public use. Waterfowl using these refuges (in both sanctuary and non-sanctuary areas) typically do not spend 24 hours per day onsite; they move from place to place within the refuges and trade back and forth between the refuges and adjacent non-refuge lands. Ending waterfowl hunting at noon on both refuges and restricting public entry after 1 p.m. into the Core Waterfowl Area on Bald Knob NWR limit the extent of disturbance (hunting and otherwise) for waterfowl. Because of their establishing authorities and purposes, Big Lake, Holla Bend, and Wapanocca NWRs are closed to migratory bird hunting, but also use waterfowl sanctuaries to limit public-caused disturbance to waterfowl and other migratory birds.

Hunting will temporarily reduce numbers of upland game (rabbit, squirrel, northern bobwhite), and big game (white-tailed deer, black bear [Holla Bend NWR only], turkey) and furbearers (raccoon, opossum, beaver, muskrat, nutria, mink, river otter, red and grey fox, coyote, bobcat, and striped skunk) based on the number of animals killed on the refuges within the Complex. However, the level of take of these species will not adversely affect their long-term population status. AGFC approves refuge hunting seasons, bag limits, methods of take, and other regulations annually. Approval by AGFC is based on their monitoring of game harvests, population trends, and habitat and range occupancy throughout the state and assessment of hunter effort/participation, and the determination/acknowledgement that hunting seasons on the refuges will not be detrimental to game species on a local, regional, or statewide scale. Hunter harvests of deer on the refuges are limited by number of days of hunting, and for modern gun deer hunting, by limiting number of hunters via quota permit hunts or limiting gun hunting to youth only (Holla Bend NWR). Take of furbearers other than raccoon and opossum is restricted to incidental take during other refuge hunts with the devices legal for use for those species. The number of turkeys taken by hunting can be limited by closing certain hunt units to turkey hunting, limiting method of take, limiting participation by issuing quota permits, or allowing only limited youth hunting – all in coordination with, and by approval of the AGFC.

Feral hogs are non-native, invasive species that compete with native wildlife species for habitat and food resources, damage wildlife habitat and habitat restoration areas, and can be vectors of disease to wildlife, domestic livestock, and humans (Arkansas Department of Agriculture 2020). The take of feral hogs on the refuges in the Central Arkansas NWR Complex is restricted to incidental take during deer hunting, with the exception of Holla Bend NWR where take of feral hogs is prohibited because none currently exist. This restriction complies with AGFC management programs for feral hog control within the state on their Wildlife Management Areas (WMA). The intent of restricted, incidental take is to avoid creating a sport-hunting constituency that promotes live-trapping, transport, and release of feral hogs around the state, including public hunting lands, to create future hunting opportunities, particularly with the use of dogs. Additionally, this restriction reduces likelihood of interference with statewide feral hog population control activities, particularly trapping. This restriction often is not popular with feral hog hunting constituencies, but is necessary to combat artificial spread of this invasive and injurious species into wildlife habitats across the state.

Incidental take of other wildlife including beaver, muskrats, and nutria (non-native species) will complement nuisance control activities conducted on the refuges to reduce damage to wildlife habitats, refuge roads, levees and other infrastructure critical to wildlife habitat management programs (Hygnstrom et al. 1994). However, such take is primarily of recreational value and generally ineffective compared to direct and targeted control activities toward these species conducted by refuge, AGFC, USDA, or other authorized agents.

Cumulative Impacts:

Incremental increases in activities by people engaged in the variety of allowed uses, including hunting, on the Complex that continue unchecked potentially could result in cumulative detrimental consequences to wildlife and/or habitats. However, Complex and AGFC staff monitor these activities to ensure wildlife and other refuge resources are not affected in a detrimental manner. Various methods are available to refuge managers that can readily be implemented to effectively manage participant numbers and activity patterns to maintain a compatible, high-quality, low-impact, and safe hunting program on the refuges.

Hunting conducted in accordance with State and federal regulations is not expected to adversely affect wildlife populations that occur on the refuge and likely assists in maintaining the biological integrity, diversity, and environmental health of the refuges. Some species, such as white-tailed deer, now occur at population levels well above historical numbers. Left unchecked, high numbers of such species could adversely affect biological integrity, diversity, and environmental health. Hunting is a closely monitored and regulated wildlife management tool that aids in maintaining stability within wildlife populations and a healthy balance between wildlife populations and habitats. There will be no adverse cumulative effects to refuge plant or wildlife communities attributable to hunting.

In addition to environmental health, there also are other cumulative beneficial effects to hunting on the refuges (and future acquired lands). Increased wildlife-dependent recreation (hunting, wildlife observation and photography, environmental education); beneficial use of renewable, sustainable wildlife resources; increased appreciation for wildlife conservation, and the role of national wildlife refuges in wildlife conservation, habitat management and restoration all ultimately result from hunting programs on national wildlife refuges. Additionally, increased revenues at the local, state, and national levels benefit economies and provide (federal) funding for wildlife research, habitat management, acquisition of wildlife habitats, supportive infrastructure, and educational programs designed to raise public awareness and support for wildlife conservation at the local, state, national, and international scales.

Cumulative impacts potentially could occur from the combination of uses on the refuge including hunting, wildlife observation, photography, education, interpretation, habitat management and research. Programs that occur in the same space and time can cause decreased satisfaction from user groups and increase disturbance to wildlife from frequent human visitation, consumptive or non-consumptive. Management actions such as prescribed fire, water management and timber management are necessary aspects of refuge management but the conduct of these activities may not be conducive to hunting activities occurring in the same time and location. Certain research activities may require areas free of public use/disturbance to accomplish research objectives. The refuge considers all uses as activities that are planned/implemented on a yearly basis and programs are structured and administered to allow multiple uses to occur with minimal conflict. Conflicts are infrequent. Hunting seasons and locations allow for hunters to pursue this public use while other uses may be located in other areas of the refuge or at other times to reduce potential conflicts.

Public Review and Comment

The proposal has been thoroughly coordinated with all interested and/or affected parties. The Service sent letters regarding the Draft Hunting and Fishing Plans, draft hunting and fishing compatibility determinations, regulations, and EA to the state of Arkansas in October 2020 and April 2021. Refuge staff will continue to coordinate with AGFC to address annual implementation of hunting activities. The Service also sent letters requesting comments and consultation in October 2020 and follow up emails in April 2021 to:

- Osage Nation;
- Quapaw Tribe;
- Shawnee Tribe;
- Choctaw Nation;
- Jena Band of Choctaw;
- Mississippi Band of Choctaw;
- Chickasaw Nation;
- United Keetoowah Band of Cherokee;
- Muscogee Creek Nation;
- Alabama-Quassarte Tribal Town;
- Kialegee Tribal Town;
- Thlopthlocco Tribal Town;
- Seminole Nation;
- Delaware Tribe;
- Delaware Nation;
- Shawnee Tribe; and

- Stockbridge Munsee Community

The Bald Knob, Big Lake, Cache River, Holla Bend, and Wapanocca NWRs Draft Hunting and Fishing Plans, Environmental Assessment, and Hunting and Fishing Draft Compatibility Determinations were made available for public review and comment from April 14 to July 6, 2021. Notice was posted at the Central Arkansas NWR Complex Headquarters, refuge websites and refuge Facebook pages. Further, an information bulletin announcing the availability of the documents for public review and comment was provided to *Woodruff County Monitor, Town Courier, Daily Citizen, Evening Times, Jonesboro Sun, Monroe County Herald, Prairie County Herald, Wynne Progress, Times Herald, Newport Independent, Log Cabin Democrat, Courier, Dardanelle Post Dispatch*, and *The Democrat Gazette*. Additionally, public comments were requested through the Federal Register process announced on May 4, 2021, and ended on July 6, 2021 (86 FR Number 23794). Eleven members of the general public, the Arkansas Game and Fish Commission, the Friends of Holla Bend National Wildlife Refuge, the Humane Society of the United States (via the Federal Register process), and the Shawnee Tribe of Oklahoma submitted comments and Service responses to these comments are addressed in Appendix D.

We received no comments regarding this compatibility determination.

Determination

_____ Use is not compatible

___X___ Use is compatible, with the following stipulations

Stipulations necessary to ensure compatibility

Hunting on the Central Arkansas NWR Complex is administered in a manner that ensures compatibility with refuge purposes and the mission of the NWRS. Hunting is annually evaluated within the refuges and coordinated with and approved by AGFC. The refuges continue to adapt the hunting program as necessary to maintain compatibility. Hunting shall be considered to be compatible on future lands acquired by the refuges given they can be administered in accordance with stipulations presented herein. The stipulations necessary to ensure compatibility are encompassed in the annual hunting regulations for each refuge presented in Appendix B1.

Justification

Hunting is a priority public use as defined by the NWRSAA/NWRSIA. Hunting is a legitimate and appropriate use of refuges in the Central Arkansas NWR Complex as supported by the Central Arkansas NWR Complex and Holla Bend Comprehensive Conservation Plans Plans (CCP) and Finding of No Significant Impacts (FONSIs) (USFWS 2009, 2010, respectively, and 2021). Hunting also envelopes at least three other wildlife-dependent uses – wildlife observation, wildlife photography, and environmental education. Service policy is to provide expanded opportunities for wildlife-dependent uses when compatible and consistent with sound fish and wildlife management and ensure that they receive enhanced attention during planning and management. Allowing hunting on the refuges not only satisfies a great demand by the public for use of public lands, but also enables the refuges to connect with an influential constituency that hopefully highly values and supports NWRs and appreciates and supports the North American Model of Wildlife Conservation and how refuges fulfill a role in that paradigm. Hunting on the refuges in the Complex also inspires support for the art, science, and practice of wildlife conservation and management in the NWRS. Compatible hunting programs on refuges also promotes the use of sustainable natural resources, not only for recreational and educational benefits but also for human sustenance (e.g., food, clothing). Offsetting revenues from hunting on the refuges help accomplish projects that benefit visitor services on the refuges for hunters and other visitors. On a local and statewide scale, revenues generated by hunter trip expenses, purchases of gear and supplies, and purchase of hunting licenses provide primary and secondary economic benefits including sales and fuel tax revenues, employment, and installation of boat ramps and other supportive infrastructure, that benefit hunters and non-hunters. Federal excise taxes on firearms and ammunition and other equipment used for hunting generate funds that support state conservation, research, management, and educational efforts that benefit wildlife and consumptive and non-consumptive users of wildlife.

Furthermore, hunting on refuges is closely monitored and highly regulated and is designed to perpetuate game populations and the habitats on which they and other wildlife depend. Hunting can aid in maintaining a healthy balance between wildlife and their habitats and with the human socio-economic environment. Although short-term disturbances and direct mortality occurs with the conduct of hunting, these effects are short-term, generally dispersed, and do not result in detrimental long-term or cumulative impacts. Hunting on the refuges is administered in a manner that minimizes conflicts with other wildlife-dependent uses and is safe, high quality, low-impact recreational use. Hunting as described above will not adversely affect the biological integrity, diversity, and environmental health of the refuges. Therefore, through this compatibility determination process, we have determined that hunting on the refuges within the Central Arkansas NWR Complex, (and subsequent land acquisitions) as described herein, and in accordance with the stipulations provided above, is a compatible use that will not materially interfere with, or detract from, the fulfillment of the NWRS mission or the purposes of the refuges.

NEPA Compliance for Refuge Use (Check one below):

____ Categorical Exclusion Without Environmental Action Statement

____ Categorical Exclusion and Environmental Action Statement

__**X**__ Environmental Assessment and Finding of No Significant Impact

____ Environmental Impact Statement and Record of Decision

Literature Cited

Arkansas Department of Agriculture. 2020. Arkansas Feral Hog Handbook. Little Rock, AR. 20 pp.

Bartelt, G. A. 1987. Effects of disturbance and hunting on the behavior of Canada goose family groups in east central Wisconsin. Journal of Wildlife Management 51:517-522.

Cole, D. N. and R. L. Knight. 1990. Impacts of recreation on biodiversity in wilderness. Utah State University. Vol. 0, Article 6.

DeLong, A. K. 2002. Managing visitor use and disturbance of waterbirds - literature review of impacts and mitigation measures - prepared for Stillwater National Wildlife Refuge. Appendix L. In Stillwater National Wildlife Refuge Complex final environmental impact statement for the comprehensive conservation plan and boundary revision (Vol. II). Portland, Oregon: Department of the Interior, U.S. Fish and Wildlife Service, Region 1.

Havera, S. P., L. R. Boens, M. M. Georgi, and R. T. Shealy. 1992. Human disturbance of waterfowl on Keokuk Pool, Mississippi River. Wildlife Society Bulletin 20:290-298.

Hygnstrom, S., R.M. Timm, and G.E. Larson. 1994. Prevention and control of wildlife damage. University of Nebraska Cooperative Extension Service, Lincoln, NE. 449 pp.

Knight, J.E. 2008. Manage your land for wildlife: a wildlife management handbook for Rocky Mountain landowners. Montana State University Extension. Bozeman, MT. 256pp.

Madsen, J. 1995. Impacts of disturbance on migratory waterfowl. Ibis 137:S67-S74.

McShea, W.J. 2012. Ecology and management of white-tailed deer in a changing world. Annals of the New York Academy of Sciences 1249 (1): 45–56.

Owens, N. W. 1977. Responses of wintering brant geese to human disturbance. Wildfowl 28:5-14.

Raveling, D. G. 1979. The annual cycle of body composition of Canada geese with special reference to control of reproduction. Auk 96:234-252.

Thomas, V. G. 1983. Spring migration: the prelude to goose reproduction and a review of its implication. In Fourth Western Hemisphere Waterfowl and Waterbird Symposium, edited by H. Boyd. Ottawa, Canada: Canadian Wildlife Service.

White-Robinson, R. 1982. Inland and salt marsh feeding of wintering brant geese in Essex. Wildfowl 33:113-118.

U.S. Fish and Wildlife Service (USFWS). 2009. Comprehensive Conservation Plan, Central Arkansas National Wildlife Refuge Complex Bald Knob, Big Lake, Cache River, and Wapanocca National Wildlife Refuges. Atlanta, GA. 523 pp.

U.S. Fish and Wildlife Service (USFWS). 2010. Comprehensive Conservation Plan, Holla Bend National Wildlife Refuge. Atlanta, GA. 191 pp.

U.S. Fish and Wildlife Service (USFWS). 2021a. Bald Knob NWR Hunting and Fishing Plan. Atlanta, GA.

U.S. Fish and Wildlife Service (USFWS). 2021b. Big Lake NWR Hunting and Fishing Plan. Atlanta, GA.

U.S. Fish and Wildlife Service (USFWS). 2021c. Cache River Hunting and Fishing Plan. Atlanta, GA.

U.S. Fish and Wildlife Service (USFWS). 2021d. Holla Bend Hunting and Fishing Plan. Atlanta, GA.

U.S. Fish and Wildlife Service (USFWS). 2021e. Wapanocca NWR Hunting and Fishing Plan. Atlanta, GA.

U.S. Fish and Wildlife Service (USFWS). 2021f. Central Arkansas NWR Complex Hunting and Fishing Plan Environmental Assessment and Finding of No Significant Impact. Atlanta, GA.

Yarrow G.K. and D.T. Yarrow. 1999. Managing wildlife on private lands in Alabama and the southeast. Sweetwater Press. 588pp.

SIGNATURE

Refuge Manager KEITH WEAVER Digitally signed by KEITH WEAVER Date: 2021.08.06 15:57:36 -04'00'
Signature/Date

CONCURRENCE

Area Supervisor ANITRA FIRMENICH Digitally signed by ANITRA FIRMENICH Date: 2021.08.10 06:14:08 -06'00'
NWRS, Interior Regions 2 and 4 Signature/Date

Compatibility Coordinator Pamala J Wingrove Digitally signed by Pamala J. Wingrove Date: 2021.08.10 11:21:38 -04'00'
NWRS, Interior Regions 2 and 4 Signature/Date

Regional Refuge Chief BRETT HUNTER Digitally signed by BRETT HUNTER Date: 2021.08.12 08:41:57 -04'00'
NWRS, Interior Regions 2 and 4 Signature/Date

MANDATORY 15 YEAR RE-EVALUATION DATE: _____August 2036_____

APPENDIX B1. STATION-SPECIFIC HUNTING REGULATIONS AND STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

Bald Knob NWR

Specific hunting and fishing seasons, days, and times may vary in some instances from state frameworks, however, these differences are approved by AGFC. The Bald Knob NWR annual public use brochure will be updated to reflect more specific information and conditions, including seasons, days, times, bag limits, access, licenses and permits, allowable hunting and fishing devices and ammunition, other equipment, quota application process, and other refuge-specific regulations. To ensure compatibility with refuge purposes and the mission of the Refuge System, hunting must be conducted in accordance with Federal and State season frameworks and regulations, as supplemented by refuge-specific regulations, and information sheets/brochures.

Refuge-Specific Hunting Regulations (as published in 50 *CFR* 32.23)

(1) *Migratory game bird hunting*. We allow hunting of duck, goose, coot, merganser, snipe, woodcock, rail, gallinule, crow, and dove on designated areas of the refuge subject to the following conditions:

(i) We require a signed refuge hunting permit (FWS Form 3-2439). Anyone on the refuge in possession of hunting equipment must sign and possess the permit (FWS Form 3-2439) at all times.
(ii) During the quota gun deer hunt, we close the refuge to all other hunts and public entry, unless the refuge is closed to deer hunting at that time due to implementation of State flood closure zone regulations.
(iii) Hunters may enter the refuge beginning at 4 a.m. Except when hunting applicable goose species during the State Conservation Order, waterfowl hunters must exit the refuge by 1 p.m. All other hunters, including those hunting applicable goose species during the State Conservation Order, must exit the refuge no later than 1 hour after legal sunset.
(iv) We allow waterfowl hunting until 12 p.m. (noon), except that during the State Conservation Order, you may hunt for applicable goose species until legal sunset. Snipe, woodcock, rail, gallinule, crow, and dove hunters may hunt until legal sunset.
(v) When waterfowl hunting, you may not possess more than 25 shotgun shells while in the field, except that during the State Conservation Order, there is no limit on the number of shells you may possess while hunting applicable goose species.
(vi) We prohibit hunting closer than 100 yards (91 meters) to another hunter or hunting party.
(vii) You must remove decoys, blinds, boats, and all other equipment at the end of each day's hunt (see §27.93 of this chapter).
(viii) All hunters age 11 and younger who possess valid hunter education certification must remain within normal sight and voice contact with an adult age 18 or older who possesses a valid State hunting license. Hunters age 15 and younger who have not completed hunter education must be under the direct supervision (within arm's reach) of an adult age 21 or older who possesses a valid State hunting license. One adult may supervise up to two youth hunters for migratory bird and upland game hunting, but may supervise only one youth during big game hunting.

(ix) We allow incidental take of beaver, muskrat, nutria, river otter, mink, bobcat, fox, striped skunk, and coyote during any refuge hunt with the weapons legal for that hunt, subject to applicable State seasons and regulations.
(x) We allow the use of dogs when migratory game bird hunting.
(xi) We close the Waterfowl Sanctuary Hunt Unit to all entry and hunting from November 15 to February 28, except that quota gun deer hunters may hunt in that Unit when the season overlaps with these dates.
(xii) We allow waterfowl hunting from mowed and/or graveled road rights-of-way, but we prohibit all other hunting from these rights-of-way.
(xiii) We allow only hunters to use all-terrain vehicles (ATVs) and only from September 1 through March 31, except that during the State Conservation Order, hunters may use ATVs for hunting applicable goose species.
(xiv) Hunters may use conventional motor vehicles, ATVs, bicycles, and e-bikes only on public use roads, levee tops, designated ATV trails (open to ATVs only), and established parking lots not closed by a locked gate, other barrier, or signage.
(xv) Hunters and anglers may use conventional motor vehicles only in the Bison, Waterfowl Sanctuary, and Core Waterfowl Area Hunt Units and only from March 1 through November 14.
(xvi) From November 15 through February 28, we close the Core Waterfowl Area Hunt Unit to all hunting, fishing, and public entry at 1 p.m. daily, except that during the State Conservation Order, you may hunt applicable goose species in this Unit until legal sunset.
(xvii) We prohibit the use of personal watercraft (e.g., jet skis), airboats, and hovercraft for hunting and fishing on the refuge.

(2) *Upland game hunting*. We allow hunting of squirrel, rabbit, quail, raccoon, opossum, beaver, muskrat, nutria, river otter, mink, bobcat, fox, striped skunk, and coyote on designated areas of the refuge subject to the following conditions:

(i) The conditions set forth at paragraphs (a)(1)(i), (ii), (viii), (ix), and (xi) through (xvii) of this section apply.
(ii) Hunters may use shotguns, rifles and handguns chambered for rimfire cartridges, air rifles, and archery tackle.
(iii) We allow squirrel, rabbit, opossum, raccoon, and quail hunting according to season dates and bag limits provided in the annual refuge public use brochure.
(iv) We allow the use of dogs when hunting upland game.
(v) Hunters may enter the refuge beginning at 4 a.m. and must exit the refuge by 1 hour after legal sunset, except that we allow hunting of raccoon and opossum at night (from 30 minutes after legal sunset to 30 minutes before legal sunrise) on the refuge.
(vi) We prohibit hunting from a vehicle.

(3) *Big game hunting*. We allow hunting of deer and turkey, and the incidental take of feral hog, on designated areas of the refuge subject to the following conditions:

(i) The conditions set forth at paragraphs (a)(1)(i), (ii), (viii), (ix), and (xi) through (xvii), (2)(v), and (2)(vi) of this section apply.
(ii) We allow archery/crossbow, modern gun, and muzzleloader deer hunting according to season dates and bag limits provided in the annual refuge public use brochure.

(iii) Turkey hunting will be conducted in the Bison, Waterfowl Sanctuary, and Mingo Creek Hunt Units according to season dates and bag limits provided in the annual refuge public use brochure.
(iv) Hunters may use only shotguns with slugs, muzzleloaders, handguns with barrel lengths greater than 4 inches, large-bore air rifles, and archery/crossbow tackle for modern gun deer hunting on the Bison, Core Waterfowl Area, and Waterfowl Sanctuary Hunt Units.
(v) You may erect portable stands and blinds 7 days prior to the refuge deer season and must remove them from the waterfowl sanctuary prior to November 15, except for stands used by quota gun deer hunters, which you must remove by the last day of the quota gun deer hunt (see §27.93 of this chapter). You must remove all stands on the remainder of the refuge within 7 days of the closure of archery season (see §27.93 of this chapter).
(vi) We prohibit leaving any tree stand, blind, or game camera on the refuge without the owner's Arkansas Game and Fish Commission customer identification number clearly written on it in a conspicuous location.
(vii) We prohibit the possession or use of lead shot and buckshot for deer hunting. We allow lead shot for turkey hunting.
(viii) During the quota gun deer hunt, we allow only hunters possessing a valid quota gun deer hunting permit (FWS Form 3-2439) on the refuge and only for the purposes of deer hunting and the incidental take of allowable species.
(ix) Hunters may only take feral hog incidental to modern gun and muzzleloader deer hunts and during specified periods for archery deer hunting according to season dates provided in the annual refuge public use brochure.
(x) We prohibit the use of dogs for deer hunting.
(xi) During the quota turkey hunts, only hunters possessing a valid quota turkey hunting permit (FWS Form 3-2439) will be allowed to enter the open hunt units and only for the purposes of turkey hunting.

Other Refuge Rules and Regulations for Hunting

<u>Access and Vehicle Use</u>

- A portion of the waterfowl hunt area (Core Waterfowl Area) will be closed from November 15 – February 28 to ALL public entry and use after 1 pm to reduce waterfowl disturbance and improve hunt quality in the public use brochure and on refuge websites (see Figure 1). During this period Coal Chute Road, Granary West Road parking area and Frackin Road will remain open to vehicular access. NOTE: This closure will NOT apply to all-day hunting for geese during the State Conservation Order.
- Conventional motor vehicles may be used only on the Bison, Waterfowl Sanctuary, and Core Waterfowl Area Hunt Units and ONLY from March 1-November 14. Conventional motor vehicles must meet all applicable federal and state requirements regulating the use of licensed motor vehicles. Vehicles equipped with oversize tractor lug type tires are prohibited.
- Use of conventional motor vehicles is prohibited on the Mingo Creek Unit.
- Speed Limit for motor vehicles (including ATVs, UTVs, etc.) is 25 mph unless otherwise posted.

- Recreational use of ATVs is not allowed. ATVs may ONLY be used September 1 to March 31 and ONLY to provide access for hunting. ATVs may be used after March 31 ONLY for goose hunting during the State Conservation Order. An ATV is defined as a vehicle with a maximum tire pressure of 15 psi, maximum dry weight of 1550 lbs., and with tires having a maximum centerline lug depth of one inch. Only those vehicles originally designed by their manufacturer to be ATVs are allowed; mini-trucks or other modified off-road vehicles are prohibited.
- Conventional motor vehicles and ATVs are not allowed in fields and must stay on maintained roads, levee tops, or established parking areas at all times.
- Mobility-impaired hunters may apply for a refuge SUP allowing the specialized use of ATVs on existing roads and trails.
- Roads may be closed any time conditions or other administrative needs warrant. A locked gate or other barrier, road closed sign, or no vehicle sign means the road is closed to ALL vehicle travel, but not to foot travel unless signed otherwise.
- Parking of vehicles on roadsides that prevents the passage of extra-wide farm equipment is prohibited. Vehicles are subject to be towed at owner's expense.
- Personal watercraft (jet-ski, etc.), hover craft, and airboats are prohibited.
- Hunters trailing or retrieving deer after hours should call the Refuge Office and leave a message stating their name, phone number and the general area in which they are searching for or retrieving deer.

<u>Prohibited activities while hunting include:</u>

- Open alcohol containers on refuge roads, ATV trails, parking areas, boat ramps, fishing piers, or observation decks
- Camping
- Building fires
- Cutting or defacing trees, shrubs, or other plants
- Littering (including, but not limited to, shotgun shell hulls and cigarette butts)
- Use of horses or mules
- Commercial hunting/fishing/guiding
- Driving on the Little Red River Protection Levee
- Off road vehicling, or driving conventional vehicles on wet/ muddy ungraveled roads
- Use of artificial lights to locate wildlife except as authorized for raccoon/opossum hunting
- Target practice or non-hunting discharge of firearms
- Use of drones

<u>General Hunting Regulations</u>

- General Refuge Hunting Permit – required for all hunting. NOTE: A Quota Permit (FWS Form 3-2439) also is required for the Quota Gun Deer Hunt.
- Hunter Orange or Chartreuse must be worn in accordance with AGFC regulations during Quota Gun and Muzzleloader Deer hunts. Portable, pop-up blinds must have 144 square inches of blaze orange or chartreuse visible from all sides of the blind during firearm big-game seasons on the Refuge.
- Bag limits for all species, except deer, are the same as state limits.
- Dog training/testing is allowed September 1 – April 1. Release of live animals for training is prohibited.
- Use of firearms and possession or use of archery equipment and crossbows, except during refuge hunts that allow their use.

Prohibited Hunting Activities include:

- The use of dogs for deer hunting
- Driving or screwing any metal object into a tree or hunting from a tree in which a metal object has been driven or screwed to support a hunter
- Building or hunting from permanent blinds or stands
- Hunting from a vehicle or use of a vehicle as a deer stand
- Possession or distribution of bait or hunting over bait, salt, grain, or other feed that could serve as a lure or attraction for wildlife.
- Loaded hunting firearms or muzzleloaders in or on a vehicle, ATV, or boat under power "Loaded" is defined as having shells in the firearm or an ignition device on/in the muzzleloader
- Failure to remove all marking materials from the Refuge following the hunt
- Possession or use of alcoholic beverages while hunting
- Use of natural scents or lures that contain natural deer and elk urine or other biofluids

Big Lake NWR

Specific hunting and fishing seasons, days, and times may vary in some instances from state frameworks, however, these differences are approved by AGFC. The Big Lake NWR annual public use brochures will be updated to reflect more specific information and conditions, including seasons, days, times, bag limits, access, licenses and permits, allowable hunting and fishing devices and ammunition, other equipment, quota application process, and other refuge-specific regulations. To ensure compatibility with refuge purposes and the mission of the NWRS, hunting must be conducted in accordance with State and Federal regulations, as supplemented by refuge-specific regulations, and information sheets/brochures.

Refuge-Specific Hunting Regulations (as published in 50 *CFR* 32.23)

(1) [Reserved]
(2) *Upland game hunting*. We allow hunting of squirrel, rabbit, quail, raccoon, nutria, coyote, beaver, muskrat, river otter, mink, bobcat, fox, striped skunk, and opossum on designated areas of the refuge subject to the following conditions:

(i) We require a signed refuge hunt permit (FWS Form 3-2439). Anyone on the refuge in possession of hunting equipment must sign and possess the permit (FWS Form 3-2439) at all times.
(ii) During the quota gun deer hunt, we close the refuge to all other hunts and public entry.
(iii) We allow incidental take of nutria, beaver, muskrat, river otter, mink, bobcat, fox, striped skunk, and coyote during any refuge hunt with the weapons legal for that hunt, subject to applicable State seasons and regulations.
(iv) We allow squirrel, rabbit, raccoon, opossum, and quail hunting according to season dates and bag limits provided in the annual refuge public use brochure.
(v) We allow the use of dogs only for squirrel, rabbit, and quail hunting in the refuge area north of Timm's Point.
(vi) Hunters may only use shotguns, rifles and handguns chambered for rimfire cartridges, air rifles, and archery tackle.
(vii) We prohibit hunting from mowed and/or gravel road rights-of-way.

(viii) Hunters may enter the refuge beginning at 4 a.m. and must exit the refuge by 1 hour after legal sunset, except that we allow hunting of raccoon and opossum at night (from 30 minutes after legal sunset to 30 minutes before legal sunrise) on the refuge.
(ix) All hunters age 11 and younger who possess valid hunter education certification must remain within normal sight and voice contact with an adult age 18 or older who possesses a valid State hunting license. Hunters age 15 and younger who have not completed hunter education must be under the direct supervision (within arm's reach) of an adult age 21 or older who possesses a valid State hunting license. One adult may supervise up to two youth hunters for upland game hunting, but may supervise only one youth during big game hunting.
(x) From November 1 to February 28, we close all waterfowl sanctuaries to all hunting and public entry.
(xi) Hunters and anglers may not leave motor vehicles, bicycles, e-bikes, or boats overnight on the refuge.
(xii) We only allow use of all-terrain vehicles (ATVs) by hunters with mobility-impairments, and the refuge manager must authorize this use in writing.
(xiii) Hunters and anglers may use motor vehicles, bicycles, and e-bikes only on public use roads not closed by a locked gate, other barrier, or signage.
(xiv) From November 1 through February 28, boat access is restricted to launching at Seven Mile boat ramp and using Ditch 28 only.
(xv) We prohibit the use of personal watercraft (e.g., jet skis), airboats, and hovercraft for hunting and fishing on the refuge.
(xvi) We prohibit hunting from a vehicle.

(3) *Big game hunting*. We allow hunting of white-tailed deer, turkey, and incidental take of feral hog on designated areas of the refuge subject to the following conditions:
(i) The conditions set forth at paragraphs (b)(2)(i) through (iii), and (vii) through (xvi) of this section apply.
(ii) We allow archery/crossbow, modern gun, and muzzleloader deer hunting according to season dates and bag limits provided in the annual refuge public use brochure.
(iii) Modern gun deer hunters may only use shotguns with slugs, muzzleloaders, handguns with barrel lengths greater than 4 inches, large-bore air rifles, and archery/crossbow tackle.
(iv) You may erect portable stands or blinds 7 days prior to the refuge deer season and must remove them 7 days after the closure of archery season (see §27.93 of this chapter).
(v) We prohibit leaving any tree stand, blind, or game camera on the refuge without the owner's Arkansas Game and Fish Commission customer identification number clearly written on it in a conspicuous location.
(vi) Hunters may only take feral hog incidental to modern gun and muzzleloader deer hunts and during a specified period during archery deer hunting according to season dates provided in the annual refuge public use brochure.
(vii) We prohibit the possession or use of lead shot or buckshot for deer hunting. We allow lead shot for turkey hunting.
(viii) Turkey hunting is conducted according to season dates and bag limits provided in the annual refuge public use brochure.
(ix) During the quota gun deer hunts, only hunters possessing a valid quota gun deer permit (FWS Form 3-2439) may use the refuge and only for the purposes of deer hunting and the incidental take of allowable species.

(x) During the quota gun turkey hunts, we close the refuge Wildlife Auto Drive Road to other hunting and public entry, and only hunters possessing a valid quota gun turkey permit (FWS Form 3-2439) may use that area of the refuge and only for the purposes of turkey hunting.
(xi) We prohibit the use of dogs for deer hunting.

Other Refuge Rules and Regulations for Hunting

Access and Vehicle Use

- The Refuge is closed to all other entry and public use during the Quota Gun Deer Hunts, and portions of the refuge will be closed during Quota Gun Spring Turkey Hunts. Only Quota Gun Deer or Turkey Hunt permit (FWS Form 3-2439) holders are allowed to enter or use the Refuge during these hunts and only for the purpose of deer or turkey hunting and the of incidental take of beaver, muskrat, nutria, coyote, red and gray fox, bobcat, river otter, mink, striped skunk, , and feral hog according to any applicable state seasons and regulations.
- The entire Big Lake, Baker's Field Island, and the Sand-Slough Moist Soil Unit are waterfowl sanctuaries and are closed to all entry and public use, including hunting and fishing, from November 1 - February 28.
- Access into the refuge is through an automatically time-controlled gate that opens at 4:00 a.m. and closes at 8:00 p.m. If you are locked in the refuge or need assistance, call 911 on a cell phone and you will be connected to the Sheriff's office.
- Hunters trailing or retrieving deer after hours should call the Refuge Office and leave a message stating their name, phone number and the general area in which they are searching for or retrieving deer.
- Refuge-administered FmHA Tracts in Lawrence & Craighead Counties currently are closed to all entry and public use, including hunting.
- Boats may be launched only in designated areas.
- Boats may not be left overnight on the refuge.
- Boats are prohibited in any refuge waters November 1 - February 28, except in Ditch 28, Ditch 81 and south of Sand Slough Dam.
- Boat access by hunters from November 1 - February 28 is limited to launching at Seven Mile boat ramp and boat use in Ditch 28 only.
- Motorized boat entry into the Big Lake Wilderness is prohibited any time.
- Personal watercraft (e.g., jet-skis, etc.), hover craft, and airboats are prohibited.
- Climbing onto from any water control structure and associated wingwalls and fences, or the top of the Floodway Dam south of Highway 18, or entering any closed areas (areas are designated by signs) are prohibited.
- Roads may be closed at any time hazardous or poor road conditions exist or other administrative needs warrant. A locked gate or other barrier, road closed sign, or no vehicle sign means the road is closed to ALL vehicle travel but not to foot travel unless signed otherwise.
- All vehicles must stay on maintained roads or established parking areas and meet all applicable federal and state requirements regulating the use of a licensed motor vehicle. Vehicles equipped with oversize tractor lug type tires are prohibited.
- Motor vehicle speed limit is 25 mph unless otherwise posted.

- ATVs are prohibited, except for use by mobility-impaired hunters possessing a SUP. Mobility-impaired hunters may apply for a refuge SUP allowing the use of an ATV/UTV on Oak Island Trail.
- Horses/mules are prohibited.

Prohibited activities while hunting include:

- Possession of open alcohol containers on refuge roads, ATV trails, parking areas, boat ramps, fishing piers, or observation decks
- Camping
- Building fires
- Cutting or defacing trees, shrubs, or other plants
- Littering (including, but not limited to shotgun shell hulls and cigarette butts)
- Horseback riding
- Loaded hunting firearms in or on a vehicle or boat under power. "Loaded" is defined as having shells in the firearm or an ignition device on/in the muzzleloader
- Target practice or non-hunting discharge of firearms
- Dog field trials and organized training events
- Artificial light may not be used to locate wildlife, except as authorized for raccoon/opossum hunting.
- Use of Drones
- Use of natural scents or lures that contain natural deer and elk urine or other biofluids

General Hunting Regulations:

- General Refuge Hunting Permit – required for all hunting.
- NOTE: A Quota Permit (FWS Form 3-2439) also is required for the Quota Gun Deer Hunt.
- Bag limits for all species are the same as state limits unless specified otherwise.
- Use of firearms and possession or use of archery equipment and crossbows, except during refuge hunts that allow their use.

Prohibited Hunting Activities include:

- The use of dogs for deer hunting
- Driving or screwing any metal object into a tree or hunting from a tree in which a metal object has been driven or screwed to support a hunter
- Building or hunting from permanent blinds or stands
- Possession or distribution of bait or hunting over bait, salt, grain, or other feed that could serve as a lure or attraction for wildlife
- Hunting in Sand Slough Moist Soil Unit, Baker's Island Field, and refuge headquarters area (see map)
- Failure to remove all marking materials from the Refuge following the hunt
- Possession or use of alcoholic beverages while hunting

Cache River NWR

Specific hunting and fishing seasons, days, and times may vary in some instances from state frameworks, however, these differences are approved by AGFC. The Cache River NWR annual public use brochures will be updated to reflect more specific information and conditions, including seasons, days, times, bag limits, access, licenses and permits, allowable hunting and fishing devices and ammunition, other equipment, quota application process, and other refuge-specific regulations. To ensure compatibility with refuge purposes and the mission of the NWRS, hunting must be conducted in accordance with State and Federal regulations, as supplemented by refuge-specific regulations, and information sheets/brochures.

Refuge-Specific Hunting Regulations (as published in 50 *CFR* 32.23)

(1) *Migratory game bird hunting*. We allow hunting of duck, goose, coot, merganser, snipe, woodcock, rail, gallinule, crow, and dove on designated areas of the refuge subject to the following conditions:

(i) We require a signed refuge hunting permit (FWS Form 3-2439). Anyone on the refuge in possession of hunting equipment must sign and possess the permit (FWS Form 3-2439) at all times.

(ii) Hunters may enter the refuge beginning at 4 a.m. Except when hunting applicable goose species during the State Conservation Order, waterfowl hunters must exit the refuge by 1 p.m. All other hunters, including those hunting applicable goose species during the State Conservation Order, must exit the refuge no later than 1 hour after legal sunset.

(iii) We allow waterfowl hunting until 12 p.m. (noon), except that during the State Conservation Order, you may hunt for applicable goose species until legal sunset.

(iv) You must remove decoys, blinds, boats, and all other equipment at the end of each day's hunt (see §27.93 of this chapter).

(v) From March 1 through October 31, hunters and anglers may leave boats displaying valid registration on the refuge.

(vi) During the regular State waterfowl hunting season, we prohibit the use of boats on the refuge from 12 a.m. (midnight) to 4 a.m.

(vii) We allow the use of dogs when migratory game bird hunting.

(viii) We allow waterfowl hunting on flooded refuge roads.

(ix) During the quota gun deer hunt, we close the refuge to all other hunts and public entry, unless the refuge is closed to deer hunting at that time due to implementation of State flood closure zone regulations.

(x) All hunters age 11 and younger who possess valid hunter education certification must remain within normal sight and voice contact with an adult age 18 or older who possesses a valid State hunting license. Hunters age 15 and younger who have not completed hunter education must be under the direct supervision (within arm's reach) of an adult age 21 or older who possesses a valid State hunting license. One adult may supervise up to two youth hunters for migratory bird and upland game hunting, but may supervise only one youth during big game hunting.

(xi) We allow incidental take of beaver, muskrat, nutria, river otter, mink, bobcat, fox, striped skunk, and coyote during any refuge hunt with the weapons legal for that hunt, subject to applicable State season and regulations.

(xii) From November 15 to February 28, we close all waterfowl sanctuaries to all hunting and public entry.

(xiii) We allow only hunters to use all-terrain vehicles (ATVs) and only from September 1 through March 31, except that during the State Conservation Order, hunters may use ATVs for hunting applicable goose species.

(xiv) Hunters and anglers may not operate conventional motor vehicles, ATVs, bicycles, or e-bikes on any road or trail closed by a locked gate, other barrier, or signage.

(xv) Hunter and anglers may not leave motor vehicles, ATVs, bicycles, or e-bikes unattended overnight on the refuge.

(xvi) We prohibit the use of personal watercraft (e.g., jet skis), airboats, and hovercraft for hunting and fishing on the refuge.

(2) *Upland game hunting*. We allow hunting of squirrel, rabbit, quail, raccoon, opossum, beaver, muskrat, nutria, river otter, mink, bobcat, fox, striped skunk, and coyote on designated areas of the refuge subject to the following conditions:

(i) The conditions set forth at paragraphs (c)(1)(i), (v), (vi), and (ix) through (xvi) of this section apply.

(ii) We allow squirrel, rabbit, raccoon, opossum, and quail hunting according to season dates and bag limits provided in the annual refuge public use brochure.

(iii) We allow the use of dogs when hunting upland game.

(iv) We prohibit hunting from mowed and/or graveled road rights-of-way.

(v) Hunters may use only shotguns, rifles and handguns chambered for rimfire cartridges, air rifles, and archery tackle.

(vi) Hunters may enter the refuge beginning at 4 a.m. and must exit the refuge by 1 hour after legal sunset, except that we allow hunting of raccoon and opossum at night (from 30 minutes after legal sunset to 30 minutes before legal sunrise) on the refuge.

(vii) We prohibit hunting from a vehicle.

(3) *Big game hunting*. We allow hunting of deer and turkey, and incidental take of feral hog, on designated areas of the refuge subject to the following conditions:

(i) The conditions set forth at paragraphs (c)(1)(i), (v), (vi), and (ix) through (xvi), and (c)(2)(iv), (vi) and (vii) of this section apply.

(ii) We allow archery/crossbow, modern gun, and muzzleloader deer hunting according to season dates and bag limits provided in the annual refuge public use brochure.

(iii) Hunters may take only feral hog incidental to modern gun and muzzleloader deer hunts and during a specified period during archery deer hunting according to season dates provided in the annual refuge public use brochure.

(iv) Hunters may only use shotguns with slugs, muzzleloaders, handguns with barrel lengths greater than 4 inches, large-bore air rifles, and archery/crossbow tackle for modern gun deer hunting on the Dixie, Dixie Waterfowl Sanctuary, and Plunkett Farm Waterfowl Sanctuary Hunt Units.

(v) You may erect portable stands or blinds 7 days prior to the refuge deer season, and you must remove them from the waterfowl sanctuaries prior to November 15, and from the rest of the refuge within 7 days of the closure of archery season (see §27.93 of this chapter).

(vi) We prohibit leaving any tree stand, blind, or game camera on the refuge without the owner's Arkansas Game and Fish Commission customer identification number clearly written on it in a conspicuous location.

(vii) We prohibit the possession or use of lead shot and buckshot for deer hunting. We allow lead shot for turkey hunting.

(viii) During the quota gun deer hunt, we allow only hunters possessing a valid quota gun deer hunting permit (FWS Form 3-2439) on the refuge and only for the purposes of deer hunting and the incidental take of allowable species.

(ix) Turkey hunting will be conducted in designated areas according to season dates and bag limits provided in the annual refuge public use brochure.

(x) We prohibit the use of dogs for deer hunting.

Other Refuge Rules and Regulations for Hunting

Access and Vehicle Use

- Cache River National Wildlife Refuge is in the acquisition phase and the current ownership is depicted in Section B - Figure 4 and 5, the public use brochure, and refuge website. Isolated land tracts that have been purchased are scattered throughout the acquisition boundary and have been posted with refuge boundary signs or marked with yellow boundary paint. Access to many of these refuge lands is currently through private lands and all refuge visitors must obtain permission from adjacent landowners prior to crossing private land to reach refuge lands.

- Roads may be closed at any time road conditions or other administrative needs warrant. A locked gate or other barrier, road closed sign, or no vehicle sign means the road is closed to ALL vehicle travel, but not to foot travel unless signed otherwise.

- All vehicles must stay on maintained roads or established parking areas and meet all applicable federal and state requirements regulating the use of a licensed motor vehicle. Vehicles equipped with oversize tractor lug type tires are prohibited.
- Recreational use of ATVs is not allowed. ATVs may ONLY be used September 1 to March 31 and ONLY to provide access for hunting. ATVs may be used after March 31 ONLY for goose hunting during the State Conservation Order. An ATV is defined as a vehicle with a maximum tire pressure of 15 psi, maximum dry weight of 1550 lbs., and with tires having a maximum centerline lug depth of one inch. Only those vehicles originally designed by their manufacturer to be ATVs are allowed; mini-trucks or other modified off-road vehicles are prohibited.
- Mobility-impaired hunters may apply for a refuge SUP allowing the specialized use of ATVs on existing roads and trails.
- Speed Limit for motor vehicles (including ATVs, UTVs, etc.) is 25 mph unless otherwise posted.
- ATVs and motor vehicles may not be left unattended overnight on the refuge.
- Personal watercraft (jet-ski, etc.), hover craft, and airboats are prohibited.
- Boats with a valid registration may be left on the Refuge from March 1 through October 31.
- During waterfowl season, no boats are allowed on the Refuge from 12 am - 4 am.
- Hunters may enter the refuge at 4 am and must depart by one hour after legal sunset except for those engaged in raccoon/opossum hunting.
- Hunters trailing or retrieving deer after hours should call the Refuge Office and leave a message stating their name, phone number and the general area in which they are searching for or retrieving deer.

Prohibited activities while hunting include:

- Open alcohol containers on refuge roads, ATV trails, parking areas, boat ramps, fishing piers, or observation decks
- Camping
- Building fires
- Cutting or defacing trees, shrubs, or other plants

- Littering (including, but not limited to, shotgun shell hulls and cigarette butts)
- Use of horses or mules
- Use of artificial lights to locate wildlife except as authorized for raccoon/opossum hunting
- Loaded hunting firearms or muzzleloaders in or on a vehicle, ATV, or boat under power. "Loaded" is defined as having shells in the firearm or an ignition device on/in the muzzleloader
- Target practice or non-hunting discharge of firearms
- Use of drones

General Hunting Regulations

- General Refuge Hunting Permit – required for all hunting.
- NOTE: A Quota Permit (FWS Form 3-2439) also is required for the Quota Gun Deer Hunt.
- Hunter Orange or Chartreuse must be worn in accordance with AGFC regulations during Quota Gun and Muzzleloader Deer hunts. Portable, pop-up blinds must have 144 square inches of blaze orange or chartreuse visible from all sides of the blind during firearm big-game seasons on the Refuge.
- Bag limits for all species, except deer, are the same as state limits.
- Dog training/testing is allowed September 1 – April 1. Release of live animals for training is prohibited.
- Use of firearms and possession or use of archery equipment and crossbows, except during refuge hunts that allow their use.

Prohibited Hunting Activities include:

- Commercial guiding/hunting for waterfowl hunting or any other hunting activity. For the purpose of this regulation, any fee paid or services rendered to a person for lodging, meals, club membership or similar services will be considered compensation.
- Commercial filming on refuge land, lakes, streams or waters, or on adjacent waters where riparian rights may be vested with the Refuge without first obtaining a refuge SUP.
- The use of dogs for deer hunting.
- Driving or screwing any metal object into a tree or hunting from a tree in which a metal object has been driven or screwed to support a hunter.
- Building or hunting from permanent blinds or stands.
- Hunting from a vehicle or use of a vehicle as a deer stand.
- Possession or distribution of bait or hunting over bait, salt, grain, or other feed that could serve as a lure or attraction for wildlife.
-
- Failure to remove all marking materials from the Refuge following the hunt.
- Possession or use of alcoholic beverages while hunting.
- Use of natural scents or lures that contain natural deer and elk urine or other biofluids.

Holla Bend NWR

Specific hunting and fishing seasons, days, and times may vary in some instances from state frameworks, however, these differences are approved by AGFC. The Holla Bend NWR annual public use brochures will be updated to reflect more specific information and conditions, including seasons, days, times, bag limits, access, licenses and permits, allowable hunting and fishing devices and ammunition, other equipment, quota application process, and other refuge-specific regulations. To ensure compatibility with refuge purposes and the mission of the NWRS, hunting must be conducted in accordance with State and Federal regulations, as supplemented by refuge-specific regulations, and information sheets/brochures.

Refuge-Specific Hunting Regulations (as published in 50 *CFR* 32.23)

(1) *Migratory game bird hunting* [Reserved]

(2) *Upland game hunting*. We allow hunting of squirrel, rabbit, quail, raccoon, opossum, beaver, muskrat, nutria, river otter, mink, fox, striped skunk, coyote, and bobcat on designated areas of the refuge subject to the following conditions:

(i) We require a signed refuge hunting permit (FWS Form 3-2439). Anyone on the refuge in possession of hunting equipment must sign and possess the permit (FWS Form 3-2439) at all times.
(ii) We allow squirrel, rabbit, raccoon, opossum, and quail hunting according to season dates and bag limits provided in the annual refuge public use brochure.
(iii) We only allow use of all-terrain vehicles (ATVs) by hunters and anglers with mobility impairments, and the refuge manager must authorize this use in writing.
(iv) Hunters and anglers may use boats in designated areas and at times provided in the annual refuge public use brochure.
(v) All hunters age 11 and younger who possess valid hunter education certification must remain within normal sight and voice contact with an adult age 18 or older who possesses a valid State hunting license. Hunters age 15 and younger who have not completed hunter education must be under the direct supervision (within arm's reach) of an adult age 21 or older who possesses a valid State hunting license. One adult may supervise up to two youth hunters for upland game hunting, but may supervise only one youth during big game hunting.
(vi) During the quota youth gun deer and turkey hunts, we close the refuge to all other hunting and public entry.
(vii) We allow incidental take of beaver, muskrat, nutria, river otter, mink, bobcat, fox, striped skunk, and coyote during any refuge hunt with the weapons legal for that hunt, subject to applicable State seasons and regulations.
(viii) Hunters and anglers may use bicycles and e-bikes only on public use roads and designated trails not closed by a locked gate, other barrier, or signage.
(ix) During the mentored youth squirrel and rabbit hunts, the mentoring adult may supervise up to two hunting youths. Youth hunters may only use shotguns, rifles and handguns chambered for rimfire cartridges, air rifles, and archery tackle. We prohibit adults from hunting during mentored hunts.
(x) Hunters must enter and exit the refuge from designated roads and parking lots only.
(xi) We limit raccoon and opossum hunting to nighttime hunting only.
(xii) Hunter and anglers may not leave motor vehicles, bicycles, e-bikes, or boats unattended overnight on the refuge.
(xiii) We prohibit hunting from a vehicle.
(xiv) We prohibit the use of personal watercraft (e.g., jet skis), airboats, and hovercraft for hunting and fishing on the refuge.

(3) *Big game hunting*. We allow hunting of deer, black bear, and turkey on designated areas of the refuge subject to the following conditions:

(i) The conditions set forth at paragraphs (f)(2)(i), (iii) through (viii), (x), and (xii) through (xiv) of this section apply.

(ii) We allow archery/crossbow hunting for white-tailed deer and turkey according to season dates and bag limits provided in the annual refuge public use brochure.

(iii) Youth modern gun deer hunts will be conducted according to season dates and bag limits provided in the refuge public use brochure.

(iv) We allow the take of black bear incidental to refuge archery and modern gun deer hunts subject to applicable State seasons and regulations.

(v) The refuge will conduct youth-only quota spring gun turkey hunts according to season dates and bag limits provided in the refuge public use brochure.

(vi) You may erect portable stands or blinds 7 days before the start of the season, and you must remove them from the refuge within 7 days after the season ends (see §27.93 of this chapter).

(vii) We prohibit leaving any tree stand, blind, or game camera on the refuge without the owner's Arkansas Game and Fish Commission customer identification number clearly written on it in a conspicuous location.

(viii) We prohibit organized drives. We define a "drive" as an organized or planned effort to pursue, drive, chase, or otherwise frighten or cause game to move in the direction of any person(s) who is part of the organized or planned hunt and known to be waiting for the game.

(ix) You must check all harvested turkey, bear, and deer at the refuge check station.

(x) We prohibit the use of dogs for deer hunting.

(xi) Big game hunters may enter the refuge 1 hour before legal sunrise and must exit by 1 hour after legal sunset.

Other Refuge Rules and Regulations for Hunting

Access and Vehicle Use

- Holla Bend refuge is a nationally designated Fee Area, and a vehicle entrance pass is required of all visitors traveling through the refuge.
- All refuge access is prohibited after dark unless specifically authorized by the Refuge Manager. Entry and exit times for hunting are provided in the hunt brochure/permit.
- Access into the refuge is through an automatically time-controlled gate. Closing times are posted near the entrance. If you are locked in the refuge or need assistance, call 911 on a cell phone and you will be connected to the Sheriff's office located in Danville.
- Refuge roads are open year around. Vehicles must remain on established roads as indicated on the map.
- The maximum speed for any land vehicle is 25 mph, unless posted otherwise.
- Vehicles may be parked alongside open roads in a manner that will not interfere with the normal flow of traffic.
- A cable, gate, road closed sign, or other barrier (i.e. mounded dirt) means the road is closed to all vehicle travel but not to foot travel unless signed otherwise. Do not block cabled or gated roads, field roads or trails.

- Designated areas of the refuge may be closed to hunting, fishing, and all other public access for resource protection, special management or safety reasons.
- NOTE: Access to refuge waters and land from the Arkansas River is prohibited. Boating over the dam at the Old River Channel, from either direction, is prohibited. Contact Refuge Manager for additional details.

Prohibited activities while hunting include:

- Camping and fires
- Littering (including, but not limited to cigarette butts, shotgun shell hulls, and fishing line)
- Blocking gates or roadways with vehicles
- Use and/or possession of alcoholic beverages or controlled substances
- Cutting, or defacing trees shrubs, or other plants
- Dog field trials and organized training events
- Leaving boats overnight
- Target practice or non-hunting discharge of firearms
- Use airboats personal watercraft (jet-ski, etc.), hover craft, and airboats
- Use of horses or mules
- Use of drones

General Hunting Regulations

- General Refuge Hunting Permit – required for all hunting.
- NOTE: An additional Permit is required for Fall Deer and Spring Turkey hunting.
- Call the refuge office for availability of Spring Turkey permits.
- Archery tackle, crossbows, and hunting firearms are permitted only during designated hunts that allow use of such devices.
- During big game seasons the automatic front gate will open one hour before daylight and close one hour after sunset.
- All hunters must enter and exit the refuge from designated roads and parking lots only.
- Only portable hunting stands or blinds may be used. A portable hunting stand is any device or structure used for the purpose of hunting that can be carried in its entirety and erected by hand including but not limited to tripod stands, lean-to stands, lock-on stands, ladder stands and climbing stands. One tree stand or blind per hunter is allowed.
- Dogs are permitted only for raccoon, opossum, rabbit, and squirrel hunting during specified refuge seasons.
- State bag limits apply unless otherwise noted. Only those species listed in the hunt public use brochure or on refuge hunt permits may be pursued or taken.
- All deer, turkey, and raccoon harvested must be checked at the refuge check station before leaving the refuge. In addition, all deer and turkey harvested on the refuge must be checked according to state regulations. All deer and turkey must be properly tagged before game is moved. For all deer and turkey harvested on the refuge, Holla Bend NWR must be recorded immediately on your game tag.
- Use of firearms and possession or use of archery equipment and crossbows, except during refuge hunts that allow their use.

Prohibited Hunting Activities include:

- Take or attempting to take waterfowl and other migratory birds on Holla Bend National Wildlife Refuge and parts of the surrounding area that fall within the Migratory Bird Closure Zone. Contact the Refuge Manager for more information.

- Commercial guiding/hunting.
- Use of dogs for deer hunting.
- Failure to remove all marking materials from the Refuge following the hunt.
- Baiting or hunting over bait, salt or any ingestible attractant.
- Use of natural scents or lures that contain natural deer and elk urine or other biofluids.
- Loaded hunting firearms in vehicle or boat while under power.
- Using artificial light to locate wildlife, except as authorized for raccoon hunting.
- Hunting within 150 feet of roads and trails open to motor vehicle use.
- Driving or screwing any metal object into a tree or hunting from a tree in which a metal. object has been driven or screwed to support a hunter.
- Building or hunting from permanent blinds or stands.

Wapanocca NWR

Specific hunting and fishing seasons, days, and times may vary in some instances from state frameworks, however, these differences are approved by AGFC. The Wapanocca NWR annual public use brochures will be updated to reflect more specific information and conditions, including seasons, days, times, bag limits, access, licenses and permits, allowable hunting and fishing devices and ammunition, other equipment, quota application process, and other refuge-specific regulations. To ensure compatibility with refuge purposes and the mission of the NWRS, hunting must be conducted in accordance with State and Federal regulations, as supplemented by refuge-specific regulations, and information sheets/brochures.

Refuge-Specific Hunting Regulations (as published in 50 *CFR* 32.23)

(1) *Migratory game bird hunting* [Reserved].

(2) *Upland game hunting*. We allow hunting of squirrel, rabbit, raccoon, nutria, beaver, coyote, quail, muskrat, river otter, mink, bobcat, fox, striped skunk, and opossum on designated areas of the refuge subject to the following conditions:

(i) We require a signed refuge hunting permit (FWS Form 3-2439). Anyone on the refuge in possession of hunting equipment must sign and possess the permit (FWS Form 3-2439) at all times.
(ii) Hunters may enter the refuge at 4 a.m. and must leave the refuge no later than 1 hour after legal sunset, except that we allow hunting of raccoon and opossum at night on the refuge.
(iii) During the quota gun hunts, we close the refuge to all other hunts and public entry.
(iv) We allow squirrel, rabbit, raccoon, opossum, and quail hunting according to season dates and bag limits provided in the annual refuge public use brochure.
(v) We allow the incidental take of nutria, beaver, muskrat, river otter, mink, bobcat, fox, striped skunk, and coyote during any refuge hunt with the weapons allowed for that hunt, subject to applicable State seasons and regulations.
(vi) Hunters may use only shotguns, rifles and handguns chambered for rimfire cartridges, air rifles, and archery tackle.
(vii) We prohibit hunting from mowed and/or gravel road rights-of-way.

(viii) All hunters age 11 and younger who possess valid hunter education certification must remain within normal sight and voice contact with an adult age 18 or older who possesses a valid State hunting license. Hunters age 15 and younger who have not completed hunter education must be under the direct supervision (within arm's reach) of an adult age 21 or older who possesses a valid State hunting license. One adult may supervise up to two youth hunters for upland game hunting, but may supervise only one youth during big game hunting.
(ix) From December 1 to February 28, we close all waterfowl sanctuaries (including Wapanocca Lake) to all hunting and public entry.
(x) We prohibit the use of all-terrain vehicles (ATVs), except that ATVs may be used by mobility-impaired hunters possessing written authorization issued by the refuge manager.
(xi) Hunters and anglers may use motor vehicles, bicycles, and e-bikes only on public use roads not closed by a locked gate, other barrier, or signage.
(xii) Hunters and anglers must use the public boat ramp on Highway 77 to launch motorized boats into Wapanocca Lake.
(xiii) Hunters and anglers must operate boats at speeds of less than 5 miles per hour between the Highway 77 boat launch and the open lake.
(xiv) We prohibit the use of personal watercraft (e.g., jet skis), airboats, and hovercraft for hunting and fishing on the refuge.
(xv) Hunter and anglers may not leave motor vehicles, bicycles, e-bikes, or boats unattended overnight on the refuge.
(xvi) We prohibit hunting from a vehicle.
(xvii) The Round Pond and Pygmon Units in St. Francis County are subject to all regulations for hunting and fishing for Wapanocca NWR.

(3) *Big game hunting*. We allow hunting of white-tailed deer and turkey, and incidental take of feral hog, on designated areas of the refuge subject to the following conditions:
(i) The conditions set forth at paragraphs (i)(2)(i) through (iii), (v), and (vii) through (xvii) of this section apply.
(ii) During the quota gun deer hunts, we allow only hunters possessing a valid quota gun deer hunting permit (FWS Form 3-2439) on the refuge and only for the purposes of deer hunting and the incidental take of allowable species.
(iii) You may erect portable stands or blinds 7 days prior to the refuge deer season, and you must remove them from the waterfowl sanctuaries by December 1 (see §27.93 of this chapter). You must remove all stands and blinds on the remainder of the refuge within 7 days of the closure of archery season (see §27.93 of this chapter).
(iv) We allow portable tree stands, blinds, and game cameras on the refuge only if the owner's Arkansas Game and Fish Commission customer identification number is clearly written on them in a conspicuous location.
(v) We allow archery/crossbow, muzzleloader, and modern gun deer hunting according to season dates and bag limits provided in the annual refuge public use brochure.
(vi) Hunters may only use shotguns with slugs, muzzleloaders, handguns with barrel lengths longer than 4 inches, large-bore air rifles, and archery/crossbow tackle for modern gun deer hunting.
(vii) Hunters may only take feral hog incidental to modern gun and muzzleloader deer hunts and during a specified period during archery deer hunting according to season dates provided in the annual refuge public use brochure.
(viii) The annual refuge public use brochure provides season dates and bag limits for turkey hunting.

(ix) We prohibit the possession or use of lead shot or buckshot for deer hunting. We allow lead shot for turkey hunting.
(x) We prohibit the use of dogs for deer hunting.

Other Refuge Rules and Regulations for Hunting

Access and Vehicle Use

- Access into the refuge is through an automatically time-controlled gate that opens at 4:00 a.m. and closes at 8:00 p.m. If you are locked in the refuge or need assistance, call 911 on a cell phone and you will be connected to the Sheriff's office.
- Hunters trailing or retrieving deer after hours should call the Refuge Office and leave a message stating their name, phone number and the general area in which they are searching for or retrieving deer.
- Roads may be closed at any time road conditions or other administrative needs warrant. A locked gate or other barrier, road closed sign, or no motorized vehicle sign means the road is closed to ALL motorized vehicle travel but not to foot travel unless signed otherwise.
- All vehicles and bicycles must stay on maintained roads or established parking areas. All vehicles must meet all applicable federal and state requirements regulating the use of a licensed motor vehicle. Modified vehicles equipped with oversize tractor lug tires are prohibited.
- Motor vehicle speed limit is 25 mph unless otherwise posted.
- You must use the public boat ramp off Highway 77 to launch motorized boats into Wapanocca Lake. Boats may not be left overnight on the Refuge.
- The boat launch access canal to Wapanocca Lake is a "No Wake Zone."
- ALL boats are prohibited on Wapanocca Lake and Woody Pond from December 1 through February 28.
- Nighttime use of the Refuge is limited to raccoon/opossum hunting and the appropriate gear must be possessed.

Prohibited activities while hunting include:

- Possession of open alcohol containers on refuge roads, parking areas, boat ramps, fishing piers, or observation decks
- Camping
- Building fires
- Use of horses or mules
- Use of airboats, personal watercraft (jet-ski, etc.), and hover craft
- Cutting or defacing trees, shrubs, or other plants
- Littering (including, but not limited to, shotgun shell hulls and cigarette butts)
- Target practice or non-hunting discharge of firearms
- Dog field trials and organized training events
- Use of artificial light to locate wildlife, except as authorized for raccoon/opossum hunting and frogging
- Use of Drones

General Hunting Regulations

- General Refuge Hunting Permit – required for all hunting.
- NOTE: A Quota Permit (FWS Form 3-2439) also is required for the Quota Gun Deer and Quota Youth Gun Deer Hunts5.

- Bag limits for all species, except deer, are the same as state limits unless specified otherwise.
- Hunter Orange or Chartreuse must be worn in accordance with AGFC regulations during the Quota Gun Deer Hunt.
- Portable, pop-up blinds must have 144 square inches of blaze orange or chartreuse visible from all sides of the blind during firearms big-game seasons on the Refuge.
- Mobility-impaired hunters may apply for a SUP issued by the Refuge Manager allowing the use of an ATV on designated roads.
- Use of firearms and possession or use of archery equipment and crossbows, except during refuge hunts that allow their use.

Prohibited Hunting Activities include:

- Driving or screwing any metal object into a tree or hunting from a tree in which a metal object has been driven or screwed to support a hunter.
- Building or hunting from permanent blinds or stands.
- Hunting from a vehicle or use of a vehicle as a deer stand.
- Possession or distribution of bait or hunting over bait, salt, grain, or other feed that could serve as a lure or attraction for wildlife.
- Loaded hunting firearms or muzzleloaders in or on a vehicle, ATV, or boat under power "Loaded" is defined as having shells in the firearm or an ignition device on/in the muzzleloader
- Failure to remove all marking materials from the Refuge following the hunt
- Possession or use of alcoholic beverages while hunting.
- Use of natural scents or lures that contain natural deer and elk urine or other biofluids.

APPENDIX C. CENTRAL ARKANSAS NATIONAL WILDLIFE REFUGE COMPLEX SPORT FISHING COMPATIBILITY DETERMINATION

Use: Sport Fishing

Refuge name: Central Arkansas National Wildlife Refuge (NWR) Complex (CANWRC or Complex): Bald Knob NWR, Big Lake NWR, Cache River NWR, Holla Bend NWR, and Wapanocca NWR

**Please note that although Logan Cave NWR is part of the Complex, this compatibility determination (CD) does not apply and Logan Cave NWR is not included.

Date established:
Bald Knob – September 22, 1993
Big Lake – August 2, 1915
Cache River – June 16, 1986
Holla Bend – August 10, 1957
Wapanocca – January 24, 1961

Establishing and Acquisition Authorities:

Bald Knob NWR:
- Emergency Wetlands Resources Act of 1986 (16 U.S.C. § 390l(b), Stat. 3583)
- Fish and Wildlife Act of 1956 [16 U.S.C. § 742f(b) (l)]
- Migratory Bird Conservation Act of 1934 (16 U.S.C. § 715d)

Big Lake NWR:
- Executive Order 2230, the Migratory Bird Conservation Act (16 U.S.C. § 715d) Migratory Bird Conservation Act of 1934 (16 U.S.C. § 715d)
- The Wilderness Act of 1964 (16 U.S.C. § 1131-1136)

Cache River NWR:
- Emergency Wetlands Resources Act of 1986 (16 U.S.C. § 390l(b), Stat. 3583)
- Migratory Bird Conservation Act of 1934 (16 U.S.C. § 715d)
- Fish and Wildlife Act of 1956 (16 U.S.C. § 742f(b)(l))
- North American Wetlands Conservation Act (16 U.S.C. § 4401-4412)

Holla Bend NWR:
- Migratory Bird Conservation Act of 1934 (16 U.S.C. § 715d)
- Fish and Wildlife Act of 1956 (16 U.S.C. § 742f(b)(l))
- Refuge Recreation Act of 1962 (16 U.S.C. § 460k)

Wapanocca NWR:
- Migratory Bird Conservation Act of 1934 (16 U.S.C. § 715d)
- Consolidated Farmers Home Administration Act of 1961 [Title III (P.L. 87-128]
  7 U.S.C. 1926 et seq.

Consolidated Farm and Rural Development Act of l 972 [Title V, P.L. 92-419]

Refuge Purpose(s):

Bald Knob NWR

"... the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ..." 16 U.S.C. § 3901(b), 100 Stat. 3583 (Emergency Wetlands Resources Act of 1986);

“...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." 16 U.S.C. § 742f(a) (4) (Fish and Wildlife Act of 1956);

“…for the benefit of the United States Fish and Wildlife Service (Service), in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude...” 16 U.S.C. § 742f(b)(l) (Fish and Wildlife Act of 1956);

“... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 751d (Migratory Bird Conservation Act of 1934).

Big Lake NWR

“... as a refuge, reserve, and breeding grounds for native birds” (Executive Order 2230, dated August 2, 1915);

"...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 751d (Migratory Bird Conservation Act of 1934);

To manage the Big Lake Wilderness as part of the National Wilderness Preservation System, as compatible with the purpose for which Big Lake NWR was established 16 U.S.C. § 1131-1136 (The Wilderness Act of 1964).

Cache River NWR

"... the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ..." 16 U.S.C. § 3901(b), 100 Stat. 3583 (Emergency Wetlands Resources Act of 1986);

“... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 751d (Migratory Bird Conservation Act of 1934);

“...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." 16 U.S.C. § 742f(a)(4) (Fish and Wildlife Act of 1956);

“…for the benefit of the United States Fish and Wildlife Service (Service), in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude.” 16 U.S.C. § 742f(b)(l) (Fish and Wildlife Act of

1956);

"…to protect, enhance, restore, and manage an appropriate distribution and diversity of wetland ecosystems and other habitats for migratory birds and other fish and wildlife in North America; to maintain current or improved distributions of migratory bird populations, and to sustain an abundance of waterfowl and other migratory birds consistent with the goals of the North American Waterfowl Management Plan…" 16 U.S.C. § 4401-4412 (North American Wetlands Conservation Act).

Holla Bend NWR

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 751d (Migratory Bird Conservation Act of 1934).

"...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." 16 U.S.C. § 742f(a)(4)... "for the benefit of the United States Fish and Wildlife Service (Service), in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." 16 U.S.C. § 742f(b)(l) (Fish and Wildlife Act of 1956).

"…suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species…" 16 U.S.C. § 460k (Refuge Recreation Act of 1962).

Wapanocca NWR

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 751d (Migratory Bird Conservation Act of 1934).

National Wildlife Refuge System Mission:

The mission of the Refuge System, as defined by the National Wildlife Refuge System Improvement Act of 1997, is:

…to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of the Use:

What is the use? Is the use a priority public use?

Sport Fishing, is an approved and existing use on the Central Arkansas NWR Complex and has been analyzed as part of the Comprehensive Conservation Plans (CCP) and associated National Environmental Policy Act documents (USFWS 2009, 2010), with the exception of Logan Cave NWR, which is closed to public entry and use. Sport Fishing, which includes frogging and crawfishing, will be allowed on Bald Knob, Big Lake, Cache River, Holla Bend, and Wapanocca NWRs. The crawfishing and frogging components of Sport Fishing are current uses at Bald Knob, Big Lake and Cache River NWRs, but are new opportunities being added for Holla Bend and Wapanocca NWRs, respectively. When determined to be compatible, fishing is

identified as one of six priority public uses of the National Wildlife Refuge System (NWRS) by the National Wildlife Refuge System Administration Act of 1966 (NWRSAA), as amended by the National Wildlife Refuge System Improvement Act of 1997 (NWRSIA) (Public Law 105-57).

This determination of compatibility does not pertain to commercial fishing, which is addressed under a different determination and administered under Special Use Permit (SUP) only.

Where is the use conducted?

Bald Knob, Big Lake, Cache River, Holla Bend, and Wapanocca NWRs are within the Central Arkansas NWR Complex. Sport fishing is allowed on all refuge waters subject to various area/zone/temporal closures on each refuge, generally for safety of public and for protection of wildlife or habitat (See 2021 Hunting and Fishing Plans as well as refuge-specific annual public use brochures). Sport fishing occurs in various habitat types including bottomland hardwood forest, baldcypress/tupelo swamps, impoundments, borrow ponds, canals, rivers, streams, lakes, and ponds. Additionally, in accordance with the approved CCP and Land Protection Plan (LPP) (USFWS 2009 and 2012), Cache River NWR currently has an active acquisition program; for this refuge, those anticipated, appropriate acquisitions up to approximately 213,332 acres within the 286,684 acre acquisition boundary, would be added to the fish program in the future (See 2021 Cache River NWR Hunting and Fishing Plan).

When is the use conducted?

Sport fishing are conducted annually, seasonally, and daily within the framework seasons as established by the Arkansas Game and Fish Commission (AGFC) and according to refuge-specific regulations.

Most sport fishing occurs during the day; however, sport fishing on Big Lake and Cache River NWRs also is allowed at night (one hour after legal sunset to 4:00 a.m.). Certain areas on each refuge are closed seasonally to all public entry and use, including sport fishing, as waterfowl sanctuaries. Other types of seasonal closures may occur in certain areas on each refuge (e.g., quota gun deer hunts). Sport fishing season dates, hours, seasonal zone closures and other regulations pertaining to timing of sport fishing are provided in an annual sport fishing public use brochure and refuge website for each refuge (see Appendix C1).

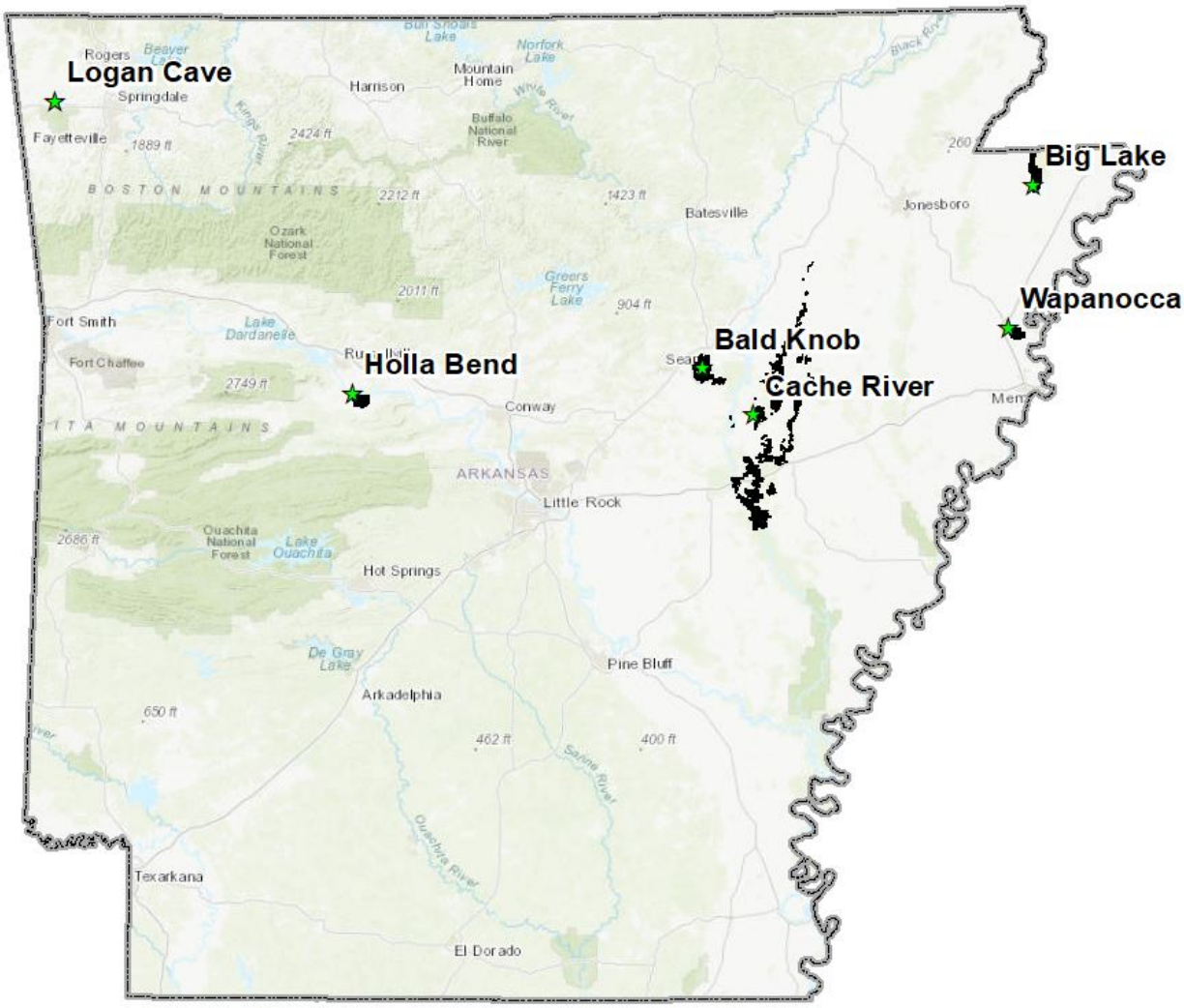
How is the use conducted?

Sport fishing is conducted in accordance with applicable State and Federal regulations and refuge-specific regulations published in 50 CFR 32. Sport fishing seasons and refuge-specific regulations are published for each refuge in annual refuge public use brochures (See Appendix C1).

Sport fishing is administered to ensure compatibility and to maintain a safe, high-quality, low-impact recreational opportunity. Fishing is primarily for bream, crappie, bass, and catfish. Certain areas of some refuges may be closed to fishing or to public entry to limit disturbance to wildlife and to avoid hazardous conditions (e.g., quota gun deer hunt closures, road closures due to flooding, waterfowl sanctuary closures). Bow fishing is allowed according to State and refuge-specific regulations. Frogging and crawfishing are allowed on the refuges according to state and refuge-specific regulations and are included in this determination. These activities are for personal use only. Commercial fishing (fish only) requires a Special Use Permit and is

covered under a separate Compatibility Determination). The take of turtles and mollusks is prohibited on the Complex. Tournament fishing and commercial guiding for fishing are not allowed on the Complex.

Figure 1. Central Arkansas National Wildlife Refuge Complex, including Bald Knob NWR, Big Lake NWR, Cache River NWR, Holla Bend NWR, and Wapanocca NWR.



Access to sport fishing areas will be by foot, motor vehicle, bicycles, e-bikes, motorized boats, canoes, and kayaks, subject to refuge-specific regulations. These modes of travel, which are allowed to facilitate sport fishing (and other compatible, wildlife-dependent recreation), will be conducted in a manner that ensures compatibility. Motor vehicles (automobiles/trucks), bicycles and e-bikes will use established, open roads only. All-Terrain Vehicles/Utility-Terrain Vehicles (ATV/UTVs) are not permitted for fishing, except that SUPs for mobility-impaired ATV/UTV access will be issued upon request to anglers possessing valid State-issued mobility impaired

permits on Holla Bend NWR. Fishing platforms for wheelchair-bound anglers are used on Big Lake and Wapanocca NWRs and additional structures may be constructed in areas suitable for their placement on these and other refuges in the Complex in a manner that will ensure compatibility, safety, and minimize conflicts with other users. Use of horses and mules is not allowed on the Complex.

The refuges may provide various youth fishing special events during which only youth less than 16 years of age can fish, but must be accompanied by an adult. These events are generally conducted in a specific area(s) on the refuges dedicated to this use during the youth fishing events. Additionally, special fishing events may be held on the refuges with certain school programs, disabled individuals, therapy programs, environmental education/outdoors skills programs, and refuge Friends groups. These events will promote sport fishing as a wildlife-dependent activity and to raise awareness of the refuges as conserved aquatic habitats important for fish and other aquatic life and the value of these resources to the public. In some of these circumstances, channel catfish may be stocked in the fishing pond or site by AGFC and/or through a purchase of fish from a private aquaculture operation. Stocking of fish by AGFC or the Service to augment populations solely to benefit general fishing does not occur, but may be permitted in conjunction with request/approval by AGFC for restoration or recreational purposes, but only with native or naturalized species.

Why is the use being proposed?

Sport fishing is an approved and existing use on this Complex (USFWS 2009, 2010) and a legitimate wildlife-dependent recreational use that, when compatible, is one of the priority public uses of the NWRS as defined in the NWRSAA, as amended by the NWRSIA (Public Law 105-57). Fishing is one of the most popular uses of the Refuges in the Complex. Demand for access to, and sport fishing on, public lands appears to be increasing (https://asafishing.org/reports/new-report-highlights-recreational-fishings-broad-economic-and-conservation-impact/) The refuges in the Complex on which sport fishing occurs all host abundant and sustainable populations of game fish and aquatic species.

Availability of Resources:

Sport fishing is an existing use on the Complex (with the exception of adding frogging to Wapanocca NWR and crawfishing to Holla Bend NWR) and costs associated with administering the program are expected to be attributed to inflation rather than increased demand for services. Administration of the hunting and sport fishing programs on the Complex is estimated to cost $116,300 per year. Two Federal Wildlife Officers and a District Patrol Captain enforce federal, state, and refuge sport fishing regulations throughout the Complex. Assistance with law enforcement and compliance with regulations is provided by Wildlife Officers from AGFC. Staff time involving refuge managers to specifically administer sport fishing is minimal. The Complex wildlife biologist will expend minor amounts of time coordinating with AGFC fisheries biologists. The sport fishing program can be successfully administered by existing staff and budgets. Estimated costs of administering the hunting and sport fishing program on the Complex are presented in Table 1.

Table 1. Staff involvement and estimated annual costs to administer the Central Arkansas NWR Complex Hunting and Sport fishing Programs and Offsetting Revenues from hunt permit sales and entrance fees associated with sport fishing.

Hunt and Sport fishing program needs and staff involved	Cost
Equipment/Tractor Operators – Maintain/repair roads, levees, parking lots, trails, signage	$27,000
Biologist, Interns, Contractors – Operate deer check stations, analyze data, prepare reports	$6,100
Senior Federal Wildlife Officers – Law Enforcement program	$45,650
Refuge Managers, Forester, Administrative Officer – Program administration, coordination, brochures, mapping, website content, signage, public information	$34,550
Online Vendor Fee	$3,000
Bald Knob ($41,450); Big Lake ($12,400); Cache River ($36,200); Holla Bend ($12,600); Wapanocca ($13,650) Total	$116,300
Offsetting Revenue for the Complex (Hunting = $39,662; Sport fishing = $2,960) Total	$42,622

Anticipated Impacts of the Use:

Short Term and Long Term Impacts:

Sport fishing on the Central Arkansas NWR Complex is regulated to ensure compatibility with refuge purposes and mission of the NWRS, to contribute to goals and objectives for aquatic species populations developed by the AGFC and the CCPs (USFWS 2009 and 2010), and provide safe, low-impact, high-quality, wildlife-dependent recreational opportunities for the resident and nonresident visitors on the refuges within the Complex. Sport fishing was further stepped-down and analyzed in the Complex Refuge-specific hunting and fishing plans and associated Environmental Assessment (USFWS 2021a, 2021b, 2021c, 2021d, 2021e, and 2021f). Sport fishing allows beneficial use of a renewable and sustainable natural resource. In the course of sport fishing experiences on the refuges, participants should gain an increased understanding of fisheries and aquatic resource conservation practices, habitat/wildlife relationships, aquatic species behavior, and the value of aquatic habitat management and public use programs practiced on the refuges. Furthermore, most anglers consume the fish they catch and may have fish mounted for memorabilia of times afield. These opportunities inspire greater appreciation for fisheries/wildlife conservation on national wildlife refuges, and stimulate anglers to more highly value and support national wildlife refuges, the NWRS, and the Service. Sport fishing also combines the features of other priority public uses such as wildlife observation and photography and there is a valuable wildlife/environmental educational component involved, particularly when experienced anglers impart their knowledge and skills to less-experienced fishing partners. Fishing is often a family activity that facilitates a shared appreciation of conserved habitats and consumptive use of abundant, renewable natural resources.

Sport fishing invariably results in some potential negative effects to habitat and wildlife. Fish are killed; most are taken for consumption. Some individuals that are caught, handled, and released also will succumb. However, fisheries management is directed toward populations and not individuals, and game fish are abundant. Some fish and other aquatic and terrestrial wildlife along anglers' routes of travel and at sport fishing sites will be disturbed and disrupted from their

normal activities (e.g., Cole and Knight 1990), but this disturbance and displacement is sporadic, temporary, dispersed in its occurrence, and is not pervasive enough to result in negative impacts to populations. Noise pollution from motorized boats can occur and its effect on wildlife and humans is dependent on various factors of time of day/night, habitat, and weather conditions. Small invertebrates and vegetation can be trampled and some surface effects such as trail compaction, bank erosion, and minor pollution from boat motors, can occur. Currently, the sport fishing use on the Complex is popular but moderate and time and space zoning

Waterfowl sanctuary areas on the Complex provide wintering waterfowl with areas of escape and respite from disturbances caused by all forms of public use, including sport fishing. However, waterfowl using these refuges (in both sanctuary and non-sanctuary areas) typically do not spend 24 hours per day onsite; they move from place to place within the refuges and trade back and forth between the refuges and adjacent non-refuge lands. In the Core Waterfowl Area on Bald Knob NWR, public entry is not allowed after 1 p.m. to limit the late-day human-caused disturbance (including sport fishing) to waterfowl. During the primary waterfowl wintering period (generally early November to late February) visitation for sport fishing is minimal. The likelihood of a threatened, endangered, or candidate species suffering mortality or the fishing activities causing disturbance rising to the level of take for federally-listed species occurring on the Complex is remote.

Littering is typically evident around sport fishing sites and travel routes. Unfortunately, littering results from all uses of the refuge. Litter is aesthetically unappealing and can be injurious to wildlife and aquatic organisms. Conflicts between anglers and non-fishing visitors to the refuges could occur. These conflicts typically involve the spontaneous disturbance of wildlife/fish with which anglers and non-anglers are both seeking contact. Additionally there may be competition for use of popular sport fishing spots. These conflicts are considered to be minor.

All refuge sport fishing seasons on the Complex are approved by AGFC, which continually monitors fish and wildlife populations, evaluates sport fishing harvest, and determines the status of the fisheries across the state. Fishing harvests and aquatic wildlife populations are evaluated at the local, state, and national levels by various agencies and are regulated to ensure sustainability in perpetuity. Examples of fishing reports for Arkansas are available from AGFC at this site: https://www.agfc.com/en/fishing/fisheries-scientific-reports/

The refuges defer to AGFC for evaluation and determination of status and health of statewide fisheries and conduct seasons generally in accordance with state seasons, frameworks, and regulations governing take and harvest, except in certain instances in which AGFC approves any variance from general State seasons and regulations.

Cumulative Impacts:

Effects that are minor when considered alone, but collectively may be important are known as cumulative effects. Incremental increases in activities by people engaged in the variety of allowed uses, including sport fishing, on the Complex that continue unchecked potentially could result in cumulative detrimental consequences to wildlife and/or habitats. However, Complex and AGFC staff monitor these activities to ensure wildlife and other refuge resources are not affected in a detrimental manner. Various methods are available to refuge managers that can readily be implemented to effectively manage participant numbers and activity patterns to maintain a compatible, high-quality, low-impact, and safe sport fishing program on the refuges.

Sport fishing conducted in accordance with State and federal regulations is not expected to adversely affect fish/wildlife populations that occur on the refuge and may assist in maintaining desirable age structure in fish populations and promoting the biological integrity, diversity, and environmental health of the refuges. Sport fishing is an activity that is monitored and regulated to maintain stability within fisheries and a healthy balance between fish populations and aquatic habitats. Cumulative impacts could occur from the combination of uses on the refuge including hunting, fishing, wildlife observation, photography, education, interpretation, habitat management and research. Conflicting programs that occur in the same space and time can cause decreased satisfaction from user groups and increase disturbance to wildlife from frequent human visitation, consumptive or non-consumptive. The areas used by the public to fish and those areas frequented by users engaged in other activities are dispersed and often not overlapping temporally and spatially to such degree that there are any significant adverse cumulative effects to fish and wildlife and their habitat resources, public safety, or quality of the visitor experience.

Management actions such as prescribed fire, water management and timber management are necessary aspects of refuge management but the conduct of these activities may not be conducive to fishing activities occurring in the same time and location. Certain research activities may require areas free of public use/disturbance to accomplish research objectives. The refuge considers all uses as activities that are planned/implemented on a yearly basis and programs are structured to allow multiple uses to occur with minimal conflict. Sport fishing seasons and locations allow for anglers to pursue this public use while other uses may be located in other areas of the refuge or at other times to reduce potential conflicts. There will be no adverse cumulative effects to refuge aquatic or terrestrial plant/wildlife communities attributable to sport fishing.

In addition to environmental health, there also are other cumulative beneficial effects to sport fishing on the refuges. Increased wildlife-dependent recreation (fishing, wildlife observation and photography, environmental education); beneficial use of renewable, sustainable aquatic resources; increased appreciation for fish/wildlife conservation, and the role of national wildlife refuges in fish/wildlife conservation, habitat management and restoration all ultimately result from sport fishing programs on national wildlife refuges. Additionally, increased revenues at the local, state, and national levels benefit economies and provide (federal) funding for fisheries research, habitat management, acquisition of habitats, supportive infrastructure, and educational programs designed to raise public awareness and support for fisheries conservation at the local, state, and national levels.

Public Review and Comment:

The proposal has been thoroughly coordinated with all interested and/or affected parties. The Service sent letters regarding the Draft Hunting and Fishing Plans, draft hunting and fishing compatibility determinations, regulations, and EA to the State of Arkansas in October 2020 and April 2021. Refuge staff will continue to coordinate with AGFC to address annual implementation of hunting activities. The Service also sent letters requesting comments and consultation in October 2020 and follow up emails in April 2021 to:

- Osage Nation;
- Quapaw Tribe;
- Shawnee Tribe;

- Choctaw Nation;
- Jena Band of Choctaw;
- Mississippi Band of Choctaw;
- Chickasaw Nation;
- United Keetoowah Band of Cherokee;
- Muscogee Creek Nation;
- Alabama-Quassarte Tribal Town;
- Kialegee Tribal Town;
- Thlopthlocco Tribal Town;
- Seminole Nation;
- Delaware Tribe;
- Delaware Nation;
- Shawnee Tribe; and
- Stockbridge Munsee Community

The Bald Knob, Big Lake, Cache River, Holla Bend, and Wapanocca NWRs Draft Hunting and Fishing Plans, Environmental Assessment, and Hunting and Fishing Draft Compatibility Determinations were made available for public review and comment from April 14 to July 6, 2021. Notice was posted at the Central Arkansas NWR Complex Headquarters, refuge websites and refuge Facebook pages. Further, an information bulletin announcing the availability of the documents for public review and comment was provided to *Woodruff County Monitor, Town Courier, Daily Citizen, Evening Times, Jonesboro Sun, Monroe County Herald, Prairie County Herald, Wynne Progress, Times Herald, Newport Independent, Log Cabin Democrat, Courier, Dardanelle Post Dispatch*, and *The Democrat Gazette*. Additionally, public comments were requested through the Federal Register process announced on May 4, 2021, and ended on July 6, 2021 (86 FR Number 23794). Eleven members of the general public, the Arkansas Game and Fish Commission, the Friends of Holla Bend National Wildlife Refuge, the Humane Society of the United States (via the Federal Register process), and the Shawnee Tribe of Oklahoma submitted comments and Service responses to these comments are addressed in Appendix D.

We received no comments regarding this compatibility determination.

Determination:

_____ Use is not compatible

____X_ Use is compatible, with the following stipulations

Stipulations Necessary To Ensure Compatibility:

Sport fishing on the Central Arkansas NWR Complex is administered in a manner that ensures compatibility with refuge purposes and the mission of the NWRS. Sport fishing is annually evaluated within the refuges and coordinated with and approved by AGFC. The refuges continue to adapt the sport fishing program as necessary to maintain compatibility. The stipulations necessary to ensure compatibility are encompassed in the annual regulations for public use/sport fishing on the refuges; these are presented in Appendix C1.

Justification:

Sport fishing is a priority public use as defined by the NWRSAA. Sport fishing, which includes frogging and crawfishing, is legitimate and appropriate use of refuges in the Central Arkansas NWR Complex as supported by the Central Arkansas NWR Complex and Holla Bend CCPs and Finding of No Significant Impacts (FONSIs) (USFWS 2009, 2010, respectively, and USFWS 2021). Sport fishing is potentially connected with at least three other wildlife-dependent uses – wildlife observation, wildlife photography, and environmental education. Service policy is to provide expanded opportunities for wildlife-dependent uses when compatible and consistent with sound fish and wildlife management and ensure that they receive enhanced attention during planning and management. Allowing sport fishing on the refuges not only satisfies a great demand by the public for use of public lands, but also enables the refuges to connect with an influential constituency that hopefully highly values and supports national wildlife refuges and appreciates and supports the North American Model of Wildlife Conservation and how refuges fulfill a role in that paradigm. Sport fishing on the refuges in the Complex also inspires support for the art, science, and practice of fisheries conservation and management in the NWRS. Compatible sport fishing programs on refuges also promote the use of sustainable natural resources, not only for recreational and educational benefits but also for human sustenance (i.e., food). Offsetting revenues from sport fishing on the refuges help accomplish projects that benefit visitor services on the refuges for anglers and other visitors. On a local and statewide scale, revenues generated by angler trip expenses, purchases of gear and supplies, and purchase of fishing licenses provide primary and secondary economic benefits including sales and fuel tax revenues, employment, and installation of boat ramps and other supportive infrastructure, that benefit anglers and non-anglers. Federal excise taxes on sport fishing tackle, trolling motors, fish finders, and other equipment used for sport fishing and federal fuel taxes on motorboat/small engine fuels generate funds that support state fisheries conservation, research, management, stocking, and educational efforts that benefit fish populations and habitats and consumptive users of fisheries resources.

Furthermore, sport fishing on refuges is closely monitored and highly regulated and is designed to perpetuate fisheries populations and the habitats on which they and other wildlife depend. Sport fishing can aid in maintaining a healthy balance between wildlife and their habitats and with the human socio-economic environment. Although short-term disturbances and direct mortality occurs with the conduct of sport fishing, these effects are sporadic, short-term, generally dispersed in time and space, and do not result in detrimental long-term or cumulative impacts. Sport fishing on the refuges is administered in a manner that minimizes potential conflicts with other wildlife-dependent uses and is safe, high quality, low-impact recreational use. Sport fishing as described above will not adversely affect the biological and environmental health and integrity of the refuges. Therefore, through this compatibility determination process, we have determined that sport fishing on the refuges within the Central Arkansas NWR Complex, as described herein, and in accordance with the stipulations provided above, is a compatible use that will not materially interfere with, or detract from, the fulfillment of the NWRS mission or the purposes of the refuges.

NEPA Compliance for Refuge Use:

____ Categorical Exclusion Without Environmental Action Statement

____ Categorical Exclusion and Environmental Action Statement

__X__ Environmental Assessment and Finding of No Significant Impact

____ Environmental Impact Statement and Record of Decision

Literature Cited:

Cole, D. N. and R. L. Knight. 1990. Impacts of recreation on biodiversity in wilderness. Utah State University. Vol. 0, Article 6.

U.S. Fish and Wildlife Service (USFWS). 2009. Comprehensive Conservation Plan, Central Arkansas National Wildlife Refuge Complex Bald Knob, Big Lake, Cache River, and Wapanocca National Wildlife Refuges. Atlanta, GA. 523 pp.

U.S. Fish and Wildlife Service (USFWS). 2010. Comprehensive Conservation Plan, Holla Bend National Wildlife Refuge. Atlanta, GA. 191 pp.

U.S. Fish and Wildlife Service (USFWS). 2021a. Bald Knob NWR Hunting and Fishing Plan. Atlanta, GA.

U.S. Fish and Wildlife Service (USFWS). 2021b. Big Lake NWR Hunting and Fishing Plan. Atlanta, GA.

U.S. Fish and Wildlife Service (USFWS). 2021c. Cache River NWR Hunting and Fishing Plan. Atlanta, GA.

U.S. Fish and Wildlife Service (USFWS). 2021d. Holla Bend NWR Hunting and Fishing Plan. Atlanta, GA.

U.S. Fish and Wildlife Service (USFWS). 2021e. Wapanocca NWR Hunting and Fishing Plan. Atlanta, GA.

U.S. Fish and Wildlife Service (USFWS). 2021f. Central Arkansas NWR Complex Hunting and Fishing Plan Environmental Assessment. Atlanta, GA.

SIGNATURE:

Refuge Manager KEITH WEAVER Digitally signed by KEITH WEAVER Date: 2021.08.06 16:00:29 -04'00'

Signature/Date

CONCURRENCE:

Area Supervisor ANITRA FIRMENICH Digitally signed by ANITRA FIRMENICH Date: 2021.08.10 06:16:43 -06'00'

NWRS, Interior Regions 2 and 4 Signature/Date

Compatibility Coordinator Pamala J Wingrove Digitally signed by Pamala J. Wingrove Date: 2021.08.10 11:23:59 -04'00'

NWRS, Interior Regions 2 and 4 Signature/Date

BRETT HUNTER Digitally signed by BRETT HUNTER
Date: 2021.08.12 08:45:17 -04'00'

Regional Refuge Chief_____
NWRS, Interior Regions 2 and 4 Signature/Date

MANDATORY 15 YEAR RE-EVALUATION DATE: _____

APPENDIX C1. STATION-SPECIFIC REGULATIONS FOR SPORT FISHING AND ASSOCIATED ACTIVITIES - STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

Bald Knob NWR

The Bald Knob NWR public use brochure will be annually updated to reflect more specific information and restrictions, including seasons, days, times, bag limits, access, licenses and permits, allowable sport fishing devices, other equipment, and other refuge-specific regulations. Sport fishing is permitted year-round, subject to State seasons and refuge-specific area closures. To ensure compatibility with refuge purposes and the mission of the Refuge System, sport fishing must be conducted in accordance with State regulations, as supplemented by refuge-specific regulations, and described in refuge information sheets/brochures.

Refuge-Specific Sport Fishing Regulations (as published in 50 *CFR* 32.23)

(4) *Sport fishing*. We allow sport fishing, frogging, and crawfishing on designated areas of the refuge subject to the following conditions:

(i) The conditions set forth at paragraph (a)(1)(ii), (xi), (xv) through (xvii), and (a)(3)(viii) and (xi) of this section apply.
(ii) We prohibit the take or possession of turtles and/or mollusks (see §27.21 of this chapter).
(iii) We allow fishing, frogging, and crawfishing for personal use only. All crawfish traps must have the owner's Arkansas Game and Fish Commission license customer identification number permanently affixed.
(iv) You may enter the refuge to fish, frog, or crawfish beginning at 4 a.m. and must exit by 1 hour after legal sunset.
(v) We prohibit tournament fishing on the refuge.

Other Refuge Rules and Regulations for Fishing

Access and vehicle use:

- Waterfowl sanctuaries, are closed to ALL entry and public use, including sport fishing, from November 15 through February 28.
- ATVs use is prohibited.
- Conventional vehicles may be used only on the Farm Unit and ONLY from March 1-November 14. Conventional vehicles must meet all applicable federal and state requirements regulating the use of licensed motor vehicles. Vehicles equipped with oversize tractor lug type tires are prohibited. Use of conventional vehicles is prohibited on the Mingo Creek Unit.
- A portion of the waterfowl hunt area (Core Waterfowl Area) will be closed from November 15 – February 28 to ALL public entry and use after 1 pm to reduce waterfowl disturbance and improve hunt quality (see map). During this period Coal Chute Road, Granary West Road parking area and Frackin Road will remain open to vehicular access.
- Roads may be closed any time conditions or other administrative needs warrant. A locked gate or other barrier, road closed sign, or no vehicle sign means the road is closed to ALL vehicle travel, but not to foot travel unless signed otherwise.
- Parking of vehicles on roadsides that prevents the passage of extra-wide farm equipment is prohibited. Vehicles are subject to be towed at owner's expense.

- Motor vehicle speed limit is 25 mph, unless posted otherwise

Prohibited activities while sport fishing include:

- Commercial fishing
- Taking or possessing turtles or mollusks
- Tournament fishing
- Use of personal watercraft (jet-ski, etc), hover craft, and airboats
- Open alcohol containers on refuge roads, ATV trails, parking areas, boat ramps, fishing piers, or observation decks
- Swimming
- Camping
- Building fires
- Cutting or defacing trees, shrubs, or other plants
- Littering (including, but not limited to, bait containers, fishing line, other tackle, and cigarette butts)
- Use of horses or mules
- Driving on the Little Red River Protection Levee
- Houseboat mooring to the refuge bank on the Little Red River
- Off road vehicling, or driving conventional vehicles on wet/ muddy ungraveled roads

Big Lake NWR

The Big Lake NWR sport fish public use brochure will be annually updated to reflect more specific information and restrictions, including seasons, days, times, bag limits, access, licenses and permits, allowable sport fishing devices, other equipment, and other refuge-specific regulations. Sport fishing is permitted year-round, subject to State seasons and refuge-specific area closures. To ensure compatibility with refuge purposes and the mission of the Refuge System, sport fishing must be conducted in accordance with State regulations, as supplemented by refuge-specific regulations, and described in refuge information sheets/brochures.

Refuge-Specific Sport Fishing Regulations (as published in 50 *CFR* 32.23)

(4) *Sport fishing*. We allow sport fishing, frogging, and crawfishing on designated areas of the refuge subject to the following conditions:

(i) The conditions set forth at paragraphs (b)(2)(ii), (x), (xi), (xii) through (xv), and (b)(3)(ix) and (x) of this section apply.
(ii) Anglers may launch boats only in designated areas.
(iii) We allow frogging and crawfishing for personal use only. All crawfish traps must have the owner's Arkansas Game and Fish Commission license customer identification number permanently affixed.
(iv) We prohibit the take or possession of turtles and/or mollusks (see §27.21 of this chapter).
(v) We allow fishing, frogging, and crawfishing on all refuge waters from March 1 through October 31.

(vi) We allow fishing in the Sand Slough-Mud Slough area from November 1 through February 28 only with the use of nonmotorized boats and electric trolling motors; anglers may enter this area at 4 a.m. and must depart by 1 hour after legal sunset.
(vii) We prohibit climbing onto or fishing from any water control structure and associated wingwalls and fences, or the top of the Floodway Dam south of Highway 18.
(viii) We prohibit tournament fishing on the refuge.

Other Refuge Rules and Regulations for Hunting and Sport fishing

Access and Vehicle Use:

- Motorized boat entry into the Big Lake Wilderness is prohibited any time.
- The entire lake, Baker's Field Island, and the Sand-Slough Moist Soil Unit are waterfowl sanctuaries and are closed to ALL entry and public use, including hunting and fishing, from November 1 - February 28.
- Boats are prohibited November 1 - February 28, except in Ditch 28, Ditch 81 and south of Sand Slough Dam.
- Personal watercraft (e.g., jet-skis, etc.), hover craft, and airboats are prohibited.
- Roads may be closed at any time hazardous or poor road conditions exist or other administrative needs warrant. A locked gate or other barrier, road closed sign, or no vehicle sign means the road is closed to ALL vehicle travel but not to foot travel unless signed otherwise.
- All vehicles must stay on maintained roads or established parking areas and meet all applicable federal and state requirements regulating the use of a licensed motor vehicle.
- Motor vehicle speed limit is 25 mph, unless posted otherwise
- Vehicles equipped with oversize tractor lug type tires are prohibited.
- ATV use is prohibited.
- Prohibited activities while fishing include:
- Commercial fishing
- Taking or possessing turtles or mollusks
- Tournament fishing
- Use of horses/mules
- Possession of open alcohol containers on refuge roads, ATV trails, parking areas, boat ramps, fishing piers, or observation decks
- Camping
- Building fires
- Cutting or defacing trees, shrubs, or other plants
- Littering (including, but not limited to shotgun shell hulls and cigarette butts)
- Artificial light may not be used to locate wildlife, except as authorized for frogging

Cache River NWR

Specific sport fishing seasons, days, and times may vary in some instances from state frameworks, however, these differences are approved by AGFC. The Cache River NWR sport fish public use brochures will be annually updated to reflect more specific information and restrictions, including seasons, days, times, bag limits, access, licenses and permits, allowable fishing devices, other equipment, and other refuge-specific regulations. To ensure compatibility with refuge purposes and the mission of the Refuge System, sport fishing must be conducted in accordance with State and Federal regulations, as supplemented by refuge-specific regulations, and information

sheets/brochures.

Refuge-Specific Sport Fishing Regulations (as published in 50 *CFR* 32.23)

(4) *Sport fishing*. We allow sport fishing, frogging, and crawfishing on designated areas of the refuge subject to the following conditions:

(i) The conditions set forth at paragraphs (c)(1)(v), (vi), (ix), (xii), (xiv) through (xvi), and (c)(3)(viii) of this section apply.
(ii) We prohibit the take or possession of turtles and/or mollusks (see §27.21 of this chapter).
(iii) We allow frogging and crawfishing for personal use only. All crawfish traps must have the owner's Arkansas Game and Fish Commission license customer identification number permanently affixed.
(iv) We prohibit tournament fishing on the refuge.

Other Refuge Rules and Regulations for Hunting and Sport fishing

Access and Vehicle Use:

- Cache River NWR is in the acquisition phase and the public use brochure and refuge website show the current ownership. Isolated land tracts that have been purchased are scattered throughout the acquisition zone and have been posted with refuge boundary signs or marked with yellow boundary paint. Access to many of these refuge lands is currently through private lands and all refuge visitors must obtain permission from adjacent landowners prior to crossing private land to reach refuge lands.
- Refuges roads are open year around. Vehicles must remain on established roads as indicated on the map in the public use brochure or the refuge website.
- Motor vehicle speed limit is 25 mph, unless posted otherwise
- Vehicles may be parked alongside open roads in a manner that will not interfere with the normal flow of traffic.
- Roads may be closed at any time road conditions or other administrative needs warrant.
- A locked gate or other barrier, road closed sign, or no vehicle sign means the road is closed to ALL vehicle travel, but not to foot travel unless signed otherwise. Do not block cabled or gated roads, field roads or trails.
- All conventional vehicles must stay on maintained roads or established parking areas and meet all applicable federal and state requirements regulating the use of a licensed motor vehicle. Vehicles equipped with oversize tractor lug type tires are prohibited.
- Motor vehicles may not be left unattended overnight on the refuge.
- ATV use is prohibited.

Prohibited activities while fishing include:

- Commercial fishing
- Tournament fishing
- Use of Horses/mules
- Use of personal watercraft (e.g., jet-ski, etc.), hover craft, and airboats are prohibited.
- Open alcohol containers on refuge roads, ATV trails, parking areas, boat ramps, fishing piers, or observation decks
- Camping, including mooring houseboats to refuge property

- Littering (including, but not limited to, bait containers, fishing line, other tackle, and cigarette butts)
- Building fires
- Cutting or defacing trees, shrubs, or other plants

Holla Bend NWR

Specific sport fishing seasons, days, and times may vary in some instances from state frameworks, however, these differences are approved by AGFC. The Holla Bend NWR sport fish public use brochure will be annually updated to reflect more specific information and restrictions, including seasons, days, times, bag limits, access, licenses and permits, allowable fishing devices, other equipment, and other refuge-specific regulations. To ensure compatibility with refuge purposes and the mission of the Refuge System, sport fishing must be conducted in accordance with State and Federal regulations, as supplemented by refuge-specific regulations, and information sheets/brochures.

Refuge-Specific Fishing Regulations (as published in 50 *CFR* 32.23)

(4) *Sport fishing*. We allow sport fishing, frogging, and crawfishing on designated areas of the refuge subject to the following conditions:

(i) The conditions set forth at paragraphs (f)(2)(iii), (iv), (vi), (viii), (xii), and (xiv) of this section apply.
(ii) We allow fishing, frogging, and crawfishing on all waters only from March 1 through October 31 from legal sunrise to legal sunset.
(iii) Anglers must remove boats from the refuge at the end of each day's fishing activity (see §27.93 of this chapter).
(iv) We prohibit the take or possession of turtles and/or mollusks (see §27.21 of this chapter).
(v) We allow frogging and crawfishing for personal use only. All crawfish traps must have the owner's Arkansas Game and Fish Commission license customer identification number permanently affixed.
(vi) We prohibit access to refuge waters and land from the Arkansas River.
(vii) We limit trotlines, setline, limblines, yo-yo and free-floating fishing devices to 20 per person; any line that extends into the water must be cotton.
(viii) Trotlines, setlines, limblines, yo-yos, and free-floating fishing devices must be clearly labelled with the angler's Arkansas Game and Fish Commission license customer identification number, and cannot be left overnight or unattended.

Other Refuge Rules and Regulations for Sport fishing
Access and Vehicle Use

- Holla Bend refuge is a nationally designated Fee Area, and a vehicle entrance pass is required of all visitors traveling through the refuge.
- All refuge access is prohibited after dark unless specifically authorized by the Refuge Manager. Entry and exit times for hunting are provided in the hunt public use brochure/permit.
- Access into the refuge is through an automatically time-controlled gate. Closing times are posted near the entrance. If you are locked in the refuge or need assistance, call 911 on a cell phone and you will be connected to the Sheriff's office located in Danville.
- Refuge roads are open year around. Vehicles must remain on established roads as indicated

on the refuge map found in annual public use brochure and refuge website.

- Motor vehicle speed limit is 25 mph, unless posted otherwise.
- Vehicles may be parked alongside open roads in a manner that will not interfere with the normal flow of traffic.
- A cable, gate, road closed sign, or other barrier (i.e. mounded dirt) means the road is closed to all vehicle travel but not to foot travel unless signed otherwise. Do not block cabled or gated roads, field roads or trails.
- Designated areas of the refuge may be closed to fishing and all other public access for resource protection, special management, or safety reasons.
- NOTE: Access to refuge waters and land from the Arkansas River is prohibited. Boating over the dam at the Old River Channel, from either direction, is prohibited. Contact Refuge Manager for additional details.

Prohibited activities while fishing include:

- Commercial fishing
- Tournament fishing
- Camping and fires
- Swimming
- Littering (including, but not limited to cigarette butts, bait containers, fishing line, other tackle,, and fishing line)
- Use and/or possession of alcoholic beverages or controlled substances
- Cutting, or defacing trees shrubs, or other plants
- Use of airboats, water skiing, jet skis, or other personal watercraft

Wapanocca NWR

Specific sport fishing seasons, days, and times may vary in some instances from state frameworks, however, these differences are approved by AGFC. The Wapanocca NWR sport fish public use brochure will be annually updated to reflect more specific information and restrictions, including seasons, days, times, bag limits, access, licenses and permits, allowable fishing devices, other equipment, quota application process, and other refuge-specific regulations. To ensure compatibility with refuge purposes and the mission of the Refuge System, sport fishing must be conducted in accordance with State and Federal regulations, as supplemented by refuge-specific regulations, and information sheets/brochures.

Refuge-Specific Fishing Regulations (as published in 50 *CFR* 32.23)

(4) *Sport fishing*. We allow sport fishing, frogging, and crawfishing on designated areas of the refuge subject to the following conditions:

(i) The conditions set forth at paragraphs (i)(2)(iii), (ix), (x) through (xv), and (xvii), and (i)(3)(ii) of this section apply.

(ii) From March 1 through November 30, we allow fishing, frogging, and crawfishing on all refuge waters. From December 1 through February 28, we allow bank fishing only on Woody Pond and other non-waterfowl sanctuary areas.

(iii) Anglers, including those frogging and crawfishing, may enter the refuge at 4 a.m. and must leave the refuge no later than 1 hour after legal sunset.

(iv) We prohibit the take or possession of turtles and/or mollusks (see §27.21 of this chapter).
(v) Anglers may launch boats only in designated areas.
(vi) We allow fishing, frogging, and crawfishing for personal use only. All crawfish traps must have the owner's Arkansas Game and Fish Commission license customer identification number permanently affixed.
(vii) We prohibit tournament fishing.

Other Refuge Rules and Regulations for Sport fishing

Access and Vehicle Use:

- Refuge open to daylight use only.
- Access into the refuge is through an automatically time-controlled gate that opens at 4:00 a.m. and closes at 8:00 p.m. If you are locked in the refuge or need assistance, call 911 on a cell phone and you will be connected to the Sheriff's office.
- The Refuge is closed to ALL other entry and public use during any Quota Gun Hunts.
- Portions of the Refuge are closed as waterfowl sanctuary (see map in public use brochure and refuge website) and are closed to ALL entry and public use, including fishing, from December 1 through February 28.
- ALL boats are prohibited on Wapanocca Lake and Woody Pond from December 1 through February 28.
- You must use the public boat ramp off Highway 77 to launch motorized boats into Wapanocca Lake.
- Boats must be operated at speeds less than 5 mph in the "No Wake Zone" located between the boat launch and open lake.
- Roads may be closed at any time road conditions or other administrative needs warrant. A locked gate or other barrier, road closed sign, or no motorized vehicle sign means the road is closed to ALL motorized vehicle travel but not to foot travel unless signed otherwise.
- All vehicles and bicycles must stay on maintained roads or established parking areas. All vehicles must meet all applicable federal and state requirements regulating the use of a licensed motor vehicle. Modified vehicles equipped with oversize tractor lug tires are prohibited.
- Motor vehicle speed limit is 25 mph, unless posted otherwise
- ATV use is prohibited, except for use by mobility-impaired anglers possessing a SUP issued by the Refuge Manager.

Prohibited activities while fishing include:

- Commercial fishing
- Tournament fishing
- Use of horses/mules
- Use of airboats, personal watercraft (jet-ski, etc.), and hover craft
- Possession of open alcohol containers on refuge roads, parking areas, boat ramps, fishing piers, or observation decks
- Camping
- Building fires
- Cutting or defacing trees, shrubs, or other plants
- Littering (including, but not limited to, shotgun shell hulls and cigarette butts).

APPENDIX D. SUMMARY OF PUBLIC COMMENTS AND RESPONSE FROM THE U.S. FISH AND WILDLIFE SERVICE

The U.S. Fish and Wildlife Service (USFWS, Service) appreciates interest in future management and hunting opportunities on national wildlife refuges (NWRs, refuges). The Service provided public notice of the proposal through local and national public notice of the availability of the draft Hunting and Fishing Plans, Environmental Assessment, and draft Hunting and Fishing Compatibility Determinations for refuges within the Central Arkansas National Wildlife Refuge Complex (Complex) for public review and comment. Local public notice included a Public Information Bulletin and information and documents posted on the refuge's website and Holla Bend NWR Facebook page, and public information bulletins provided to local newspapers *Woodruff County Monitor, Town Courier, Daily Citizen, Evening Times, Jonesboro Sun, Monroe County Herald, Prairie County Herald, Wynne Progress, Times Herald, Newport Independent, Log Cabin Democrat, Courier, Dardanelle Post Dispatch*, and *The Democrat Gazette*. Email notices were sent to the following Tribal contacts: Alabama Quassarte, Choctaw, Delaware Nation, Delaware Tribe of Indians, Jena Band of Choctaw, Kialegee, Mississippi Band of Choctaw, Muskogee, Osage, Seminole of Oklahoma, Shawnee Tribe, Thlopthlocco, and United Keetowah.

National public notice was provided through the Federal Register (86 FR 23794), which was published on May 4, 2021. The Service received public comments on the proposal during the public review and comment period (April 14, 2021 through July 7, 2021) from 11 members of the general public, The Friends of Holla Bend National Wildlife Refuge, The Humane Society of the United States, the Shawnee Tribe, and the Arkansas Game and Fish Commission (AGFC). Most comments dealt with multiple topics. The Service's responses to comments received through the Federal Register rulemaking process were published in the final rule in the Federal Register. The Service's responses to comments received locally and refuge-specific comments received through the Federal Register are published here.

Under the National Environmental Policy Act (NEPA), the Service must respond to substantive comments. For purposes of this planning process, a substantive comment is one that was submitted during the public review and comment period, which was within the scope of the proposed action, was specific to the proposed action, had a direct relationship to the proposed action, and included reasons for the Service to consider it. (For example, a substantive comment could be that the document referenced 500 individuals of a particular species, but that current research found 600. In such a case, the Service would likely update the document to reflect the 600, citing the current research. While a comment that would not be considered substantive would be, "We love the proposal.") Comments outside the scope of the proposal were not addressed.

Comments and Service's Response

Comment (1): Several commenters believed that the addition of mentored youth gun hunting for squirrel and rabbits during the month of February on Holla Bend NWR would jeopardize the safety of other hunters and other refuge users due to the use of firearms, the mentoring adult should not be able to hunt, and we should define the ratio of adults per youths.

Service Response: The Service considers safety a top priority on national wildlife refuges. The mentored youth hunts for rabbit/squirrel are designed to be a supervised, educational experience during which adult hunters can coach and counsel youth hunters on hunting techniques and practices, not the least of which is safe gun handling and safe and ethical hunting. These hunts will be conducted consistent with state regulations, which are designed to protect public safety. Hunting-related injuries and deaths, including those involving firearms, are extremely rare across the nation. An adult possessing a valid State hunting license must accompany youth hunters. We modified our original proposal to stipulate that one mentoring adult can supervise a maximum of two youths and cannot hunt themselves, therefore keeping the size of the hunting party small and allowing full attention to be devoted to the youth hunters' actions. No hunting zones already exist around refuge public use roads and trails, and these provide added safety on Holla Bend NWR. We did not make any other changes to the hunting/fishing plan due to these comments.

Comment (2): Several commenters believed that the addition of mentored youth gun rabbit/squirrel hunts during the month of February on Holla Bend NWR and allowing the use of dogs and the use of lead shot would result in an unacceptable amount of disturbance/injury to migratory birds, primarily waterfowl and bald eagles and conflict with refuge purposes.

Service Response: The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (collectively Administration Act) stipulates that hunting (along with fishing, wildlife observation and photography, and environmental education and interpretation), if found to be compatible, is a legitimate and priority public use of a refuge and should be facilitated. The Service has adopted policies and regulations implementing the requirements of the Administration Act that refuge managers comply with when considering hunting and fishing programs.

We allow hunting of resident wildlife on NWRs only if such activity has been determined compatible with the established purpose(s) of the refuge and the mission of the National Wildlife Refuge System (Refuge System) as required by the Administration Act. The mentored youth gun rabbit/squirrel hunts on Holla Bend NWR will be conducted within the framework of State regulations, including seasons and bag limits, and the AGFC approves of this hunt and methods of conduct. The hunt will only be one month in duration, much shorter than State seasons. The areas of Holla Bend NWR where rabbit and squirrel hunting typically will occur will not be in the same area of most concentrations of migrating waterfowl and other migratory birds, including eagles. Any disturbance to wildlife will be temporary, short in duration, sporadic, and non-repetitive. Most migratory bird nesting will not have commenced during this time. Such disturbance will not approach the severity of conflicting with refuge purposes. Although we determined that the use of dogs for the rabbit/squirrel hunts would not affect compatibility of the hunts, we decided, at least initially with the implementation of this new hunt, not to allow their use. We agree that potential lead shot toxicity is a concern, particularly for waterfowl, scavenging birds, and other wildlife. Nontoxic shot will be required for shotguns used for upland game hunting, although it is not required for .22 rimfire, centerfire, or slug ammunition used for upland game and big game hunting. However, some hunters do use nontoxic types of ammunition in these devices. We feel that the potential for direct ingestion or bioaccumulation of lead in the environment will be at a level of minimal risk. We did not make any other changes to the hunting/fishing plan due to these comments.

Comment (3): Several commenters believed that the addition of the mentored youth rabbit/squirrel hunts (including the use of dogs), expanded raccoon/opossum hunting (from three days to seven days/week during February) and an additional youth gun deer hunt on Holla Bend NWR would unacceptably increase disturbance to and interfere with other users of refuge including birdwatchers, photographers, hikers, bicyclists, and archery hunters.

Service Response: Although implementation of the new mentored youth/squirrel rabbit hunt will increase human activity on the refuge, we do not agree that any resulting disturbance will be problematic and significantly interfere with the use/enjoyment of Holla Bend NWR by other users. Since raccoon/opossum hunting is the only nighttime use permitted on the refuge, the expansion to daily hunting (nighttime only and dogs required) will not impact other visitors. Based on our experience with unrestricted rabbit and squirrel hunting with dogs from September 1 to February 28 on refuges of similar size and public use occurrence, we are not aware of any significant conflicts among the uses. The mentored youth hunting parties on Holla Bend NWR will not significantly or consistently overlap the areas of the refuges frequented by other users (e.g., waterfowl viewers) or timing of their uses. This new hunt will occur in February and therefore cannot interfere with archery hunting since that season ends in December (even though archery deer hunting and has been extended via this Hunting/Fishing Plan for an additional two weeks to conclude December 31, which also is not expected to cause significant conflict with other users). As stated in our response to Comment (2) above, we decided, at least initially with this new hunt, not to allow the use of dogs. If participation in this mentored youth rabbit/squirrel becomes so great that conflicts with other uses is significant, we will consider methods to reduce such conflicts including potentially limiting the number of mentored youth hunting parties. Additionally, in considering this concern, we recognize that closing the refuge for the weekend (typically the first weekend in January) with the addition of a second youth gun deer hunt would preclude other visitors from using the refuge during a high visitor use time especially for wildlife observation (eagles and waterfowl) and photography. Although a second youth hunt was determined to be compatible with refuge purposes, and therefore allowable; at this time we will not schedule this hunt during the typical time frame of the second statewide youth gun deer hunt and may in the future consider alternate dates that will better accommodate other visitor interests. We did not make any other changes to the hunting/fishing plan based on this comment.

Comment (4): A few commenters cautioned that the addition of new hunting opportunities (new mentored youth rabbit/squirrel hunt, a second youth gun deer hunt, and an expansion in length of archery deer and raccoon/opossum hunting) would create an unacceptable strain on limited managerial, law enforcement, and volunteer staff resources and the addition of a second refuge youth gun deer hunt during the second statewide youth gun deer hunt would interfere with the conduct of the Christmas Bird Count, which provides needed wildlife inventory data.

Service Response: The Service strives to offer safe and high-quality visitor use opportunities and experiences on national wildlife refuges, including Holla Bend NWR. We also strive to increase opportunities for youth hunting and fishing. All uses of the refuge must be compatible with purposes for which the refuge was established and the mission of the National Wildlife Refuge System. We also consider our employees and volunteers to be our most important resource. We also acknowledge the able assistance and active cooperation with Wildlife Officers from AGFC in enforcing wildlife regulations and providing for public safety and resource protection. Based on our experience administering larger hunting/fishing programs on other refuges with comparable staff resources we believe we can administer certain additional hunting opportunities responsibly and effectively on Holla Bend NWR with existing staff/volunteer/officer resources. However, we recognize that the addition of a second youth gun deer hunt and the amount of time and effort to prepare for and administer the hunt would involve additional burden on limited staff and volunteers, and may interfere with optimal conduct and success of the Christmas Bird Count. Therefore, at this time, we have decided not to implement a second youth gun deer hunt during the first weekend in January, but in the future may consider other dates that would be approved by AGFC and be more feasible for staff and volunteers, particularly if we experience an increase in staff/volunteer resources. We did not make any other changes in the hunting/fishing plan due to this comment.

Comment (5): One commenter believed that frogging and crawfishing should not be allowed on Holla Bend NWR because it will reduce a critically needed prey base for wading birds.

Service Response: As stated in Response to Comment (2) above, the Administration Act stipulates that fishing (along with hunting, wildlife observation and photography, and environmental education and interpretation), if found to be compatible, is a legitimate and priority public use of a refuge and should be facilitated. The Service has adopted policies and regulations implementing the requirements of the Administration Act that refuge managers comply with when considering hunting and fishing programs.

We allow fishing on NWRs only if such activity has been determined compatible with the established purpose(s) of the refuge and the mission of the Refuge System as required by the Administration Act. The sport fishing program on Holla Bend NWR was determined to be compatible and will be conducted within the framework of State regulations, including seasons and bag limits, and the Arkansas Game and Fish Commission (AGFC) approves of the species to be taken and methods of conduct. While frogging and crawfishing will remove some individuals from the populations on the refuge, we cannot imagine that at the level of participation or take of these species that a negative impact to wildlife will result. Our experience administering fishing, frogging, and crawfishing programs on other refuges has not demonstrated any deleterious impacts to refuge wildlife. We made no changes to the hunting/fishing plan due to this comment.

Comment (6): One commenter believed that numbers of rabbits, raccoons, and opossums on Holla Bend NWR were decimated during the 2019 flood and should not be subjected to additional mortality due to hunting.

Service Response: As described in previous Responses above, hunting and fishing as proposed in the hunting/fishing plan, including addition/expansion of hunts were determined to be compatible with refuge purposes and Refuge System mission, and AGFC approved of the new hunts and expanded hunt opportunities. Although it is true that additional hunting opportunities will result in additional rabbits, raccoons, and opossums being removed from the refuge populations, we do not believe that the numbers harvested will cause a decline in population status, even if numbers were lowered due to the flooding. We made no changes to the hunting/fishing plan based on this comment.

Comment (7): Two commenters expressed concern/opposition over proposed quail hunting on Holla Bend NWR and other refuges in the Central Arkansas Complex.

Service Response: As stated in other Responses above, all hunting must be determined to be compatible with refuge purposes and mission of the NWRS. Quail hunting already is practiced on Bald Knob and Cache River NWRs and no evidence exists that it is deleterious to refuge populations. In this hunt/fish plan, we propose to conduct quail hunting on Big Lake, Holla Bend, and Wapanocca NWRs whenever the population status as determined by AGFC and the Service indicates the existence of sustainable populations of quail, and this use will be compatible. We made no change to the hunting/fishing plan based on this comment.

Comment (8): Several commenters supported youth hunting, some of which supported increased opportunities overall, including AGFC; one commenter and AGFC indicated new youth spring turkey hunts should be quota hunts only.

Service Response: When compatible with refuge purposes and Refuge system mission, hunting is one of the priority public uses to be given enhanced consideration on refuges. As stated above in other Responses, the hunting and fishing opportunities presented in the hunting/fishing plan were determined to be compatible, including increased opportunities for youth gun deer, youth gun turkey, and mentored youth gun rabbit/squirrel hunting. The new youth gun turkey hunts on Bald Knob and Big Lake and youth gun deer on Wapanocca NWR will be quota hunts with fairly small numbers (<12) of permits issued. Existing Holla Bend NWR quota youth gun turkey hunts are limited by quota (six per hunt). The Service strives to enhance youth hunting and fishing programs in the Refuge System and to increase hunting and fishing opportunities overall across the Refuge System where compatible.

Comment (9): Two commenters expressed support for addition of crow hunting on Bald Knob and Cache River NWRs.

Service Response: All hunting and fishing activities presented in the hunt/fishing plan were determined to be compatible with refuge purposes and Refuge System mission. Crow hunting (using non-toxic shot) according to State season will be conducted on Bald Knob and Cache River NWRs. Big Lake, Holla Bend, and Wapanocca NWRs are closed to migratory bird hunting.

Comment (10): One commenter was of the opinion that no meaningful changes in hunting were offered for Cache River NWR. That commenter offered an example of “meaningful change” to be opening all waterfowl sanctuaries to hunting except in the farm units.

Service Response: Hunting and fishing, when determined to be compatible with refuge purposes and Refuge System mission, are considered priority public uses of the Refuge System and to be given enhanced consideration (along with the other priority uses i.e., wildlife observation and photography and environmental education and interpretation). One of the stipulations by which we ensure compatibility of hunting is providing sanctuary areas for wintering waterfowl, which enable waterfowl to conserve energy during a period of critical nutritional stress. Sanctuaries (which comprise approximately six percent of the Cache River NWR total acreage) provide habitat that enable waterfowl to feed, rest, roost, and find thermal cover relatively free from human disturbances, including hunting. These sanctuaries are closed to public entry and use from November 15 to February 28. Outside of this date range the sanctuaries are open to hunting. Some sanctuaries provide better habitat, primarily in terms of "hot" foods (energy-rich cereal grains provided through cooperative farming programs) supplies than others, but all are important in providing a disturbance-free setting and helping refuges fulfill their migratory bird purposes. We made no changes to the hunting/fishing plan based on this comment.

Comment (11): One commenter was of the opinion that all future land acquisitions to Cache River NWR should be open to public for all hunting activities; we should present indisputable proof about designating any new lands as sanctuary, youth hunt areas, or other areas where hunting is restricted.

Service Response: As described in our Response to several comments above, we manage hunting and fishing programs to ensure compatibility with refuge purposes and Refuge System mission, we strive to expand hunting and fishing opportunities, especially for youths, and we emphasize safe, high quality, low impact wildlife-dependent recreational uses of refuges. Cache River NWR is a regional and national priority for land acquisition to fulfill the mission of the Service and the Refuge System. In order to accomplish these missions and goals, comply with legislative and other legal authorities for establishment of the refuge, and to conserve, manage, and where appropriate restore fish, wildlife, plants, and their habitats, it is necessary and prudent for managers to evaluate each parcel of land offered to the refuge by willing sellers as to its suitability for inclusion in the refuge and how it should best be managed. Our stated intent in the hunting/fishing plan is that all future acquisitions will be open for hunting and fishing programs as presented in this plan. However, managers need the flexibility to determine the best use of the acquired property in the context of administering refuge programs, including the potential for contributing to wildlife conservation and public use opportunities/benefits including waterfowl sanctuary, youth hunting areas, or safety (no hunting) zones. It is important to note that if an area is designated as a waterfowl sanctuary or even as a youth hunting area, public uses, including hunting and fishing, are generally allowed during the period in which the special designation is not in effect. We made no change to the hunting/fishing plan due to this comment.

Comment (12): One commenter asked that we clarify whether an area of Cache River NWR that is closed to deer hunting subject to the State's Flood Prone Closure Zone system could be open to other uses if the quota gun deer hunt is closed due to flooding.

Service Response: Yes. If during the period of the quota gun deer hunts Bald Knob or Cache River NWR is flooded to the level that causes the area to be closed to deer hunting, then there is no quota gun hunt occurring in that area. Therefore, the regulation that closes the refuge to all other public entry and use during the quota gun deer hunt is no longer in effect - in that particular area. However, Cache River NWR is situated in three different Flood Prone Closure Zones, so any other areas of the refuge not closed to deer hunting due to flooding still would be closed to all other public entry and use during the quota gun deer hunt. No changes to the hunting/fishing plan were necessary due to this comment.

Comment (13): Arkansas Game and Fish Commission "strongly supported" the overall hunting/fishing plan and expansion of hunting opportunities, including those for youth gun turkey and deer. As part of their comment they asked us to consider: (1) allowing the hunting of rabbits from mowed or maintained roads and levees on Bald Knob NWR, (2) allowing deer hunters trailing/retrieving harvested animals after sunset on Wapanocca NWR to continue tracking their deer into the night after leaving a phone message at refuge headquarters, (3) removing armadillo from the list of incidental take species on all refuges because they are classified by AGFC as nongame animals and not open for take except in situations involving damage to personal property, (4) moving the first spring youth turkey gun hunt on Holla Bend NWR to a later date to come into closer alignment with state season framework, game check system, and onset of turkey nesting, (5) conducting the new turkey hunts on Bald Knob and Big Lake NWRs as quota youth hunts, (6) clarifying that implementing a turkey hunt on Wapanocca NWR would occur only after State and federal officials agree that the population can sustain limited harvest.

Service Response: The Service works closely with State partners to ensure hunting and fishing programs on refuges are approved by the States and are consistent with State species, seasons, and regulations to the extent practicable. Refuges conduct hunting and fishing programs in a manner that ensures compatibility with refuge purposes and System mission and provides the public with wildlife-dependent experiences that are safe, high quality, and are low-impact to refuge resources. We have excellent collaboration, coordination, and communication with AGFC concerning our hunting and fishing programs on the Central Arkansas NWR Complex. With regard to AGFC sub-comment (1), we did not make any changes to the hunting/fishing plan based on this comment because we were concerned with potential safety issues with rabbit hunting along roadways during heavy visitor use periods including archery and muzzleloader deer hunting, waterfowl hunting, bird watching, farming and other refuge management operations, and to maintain the spirit of State regulations governing hunting on/along government-maintained roadways open for public travel. Regarding AGFC sub-comment (2), we agree with their request and will implement that provision to allow after hours tracking of deer on Big Lake, Cache River, and Wapanocca NWRs. Regarding AGFC sub-comment (3), we changed the hunting/fishing plan for all refuges in the Complex in compliance with State regulations to remove armadillo from the list of species open for take due to its non-game status. With regard to AGFC sub-comment (4), we changed the hunting/fishing plan by selecting a suggested option by AGFC to move the early quota youth gun turkey hunt from the weekend before the statewide youth turkey hunt to the weekend after the statewide hunt, maintain the refuge youth gun turkey hunt during the statewide youth hunt, and maintain the refuge archery turkey hunt for the full season in Turkey Zone 2. The number of youth hunters is small (six youths per hunt) and the turkey harvest for the youth hunts is low, (0-3 birds total) and the two-day hunts are separated by a week period of no hunting activity, so impact on turkey breeding/nesting activities should be considerably light, and this option still provides maximum opportunity for youth and archery turkey hunters. Total harvest for all turkey hunting on Holla Bend NWR typically is 0-5 birds. We agree with AGFC sub-comment (5) and will proceed as planned with the new turkey hunts on Bald Knob and Big

Lake NWRs as youth gun only with a limited number of permits. We will maintain the intent of the hunting/fishing plan regarding AGFC sub-comment (6) and clarify that the new turkey hunt on Wapanocca NWR only will be conducted after the refuge and AGFC agree that turkey numbers on the refuge can sustain harvest from a quota youth gun hunt. No other changes were made to the hunting/fishing plan based on AGFC comment.

Comment (14): One commenter complained about poor road conditions and sometimes flooded roads encountered while hunting in the Biscoe area of Cache River NWR, and also that hunters encountered areas where refuge boundary/private property lines were not definitively marked.

Service Response: We attempt to provide reasonable motorized access to hunting and fishing areas on the Refuge Complex. The area the commenter is referring to is an area that floods up to six months out of the year and site conditions are often not conducive to road repair and road surfaces are easily damaged by vehicular traffic during wet season often prevalent during hunting seasons and into the early summer. We do our best to repair and maintain roads with only one full-time heavy equipment operator when conditions, time, and funding allow. When flooding is extensive in this area of the refuge we close the roads to prevent vehicular mishaps and potential drowning. We also attempt to maintain satisfactory boundary markings on the refuges with the Complex so visitors know where the boundaries of the refuges are located. On Cache River NWR alone, we have more than 500 miles of boundary to maintain, and with our severe understaffing on this Complex, we sometimes struggle to have the entire boundary meeting our standards simultaneously. However, we cannot control how private landowners maintain their private property lines. We appreciate the commenter's concerns and we will address any road and boundary maintenance deficiencies to the extent possible.

Comment (15): The Shawnee Tribe of Oklahoma commented that they had no concern over the proposed expansion/additions in the hunting/fishing plan but asked to be kept informed about issues/programs affecting water quality or species conservation.

Service Response: We view our obligations to our Tribal nations seriously, value their perspectives and comments, and will keep them informed as requested.

Comment (16): One commenter believes the Service should not allow trophy hunting of bobcats, which is inhumane and not biologically supported. The Service should not expand hunting opportunities for bobcats on Service lands

Service Response: The Administration Act as amended by Improvement Act defines hunting as an appropriate and legitimate wildlife-dependent use of the NWRS when determined to be compatible. The Service relies on state fish and wildlife agencies as the experts on biological and population status of native wildlife and their sustainability including considering the impacts of hunting and trapping. Nationally, bobcat populations have increased significantly since the 1990s (Roberts et al. 2010 https://meridian.allenpress.com/jfwm/article/1/2/169/206731/Bobcat-Population-Status-and-Management-in-North). We disagree with the relevancy and applicability of the various assertions made by the commenter on the deleterious impact of incidental take of bobcat on Bald Knob, Big Lake, Cache River, and Wapanocca NWRs. In Arkansas, the Arkansas Game and Fish Commission (AGFC) conducts both hunting and trapping seasons for bobcats as part of their Strategic Furbearer Management Plan (AGFC 2014) and considers the statewide population to be stable. AGFC monitors and analyzes furbearer trapping and hunting results on an annual basis using a variety of means including tracking purchase of furbearer pelts, issuance of CITES tags for bobcat pelts exported from

the state, trapper surveys, and bowhunter surveys (e.g., 2019-20 Furbearer animal Report) and has determined that these activities are a sustainable use that is not negatively affecting the population status of bobcats in the state. Bobcats are common in around the refuges in the Central Arkansas NWR Complex and bobcat hunting and trapping is open on nearby AGFC Wildlife Management Areas. There is no indication that these hunting seasons are negatively impacting bobcat populations on a local, regional, or statewide basis. We expect the take of bobcats incidental to other hunts to be quite low and biologically inconsequential on a population scale. In our sound professional judgment, we have determined that the incidental take of bobcats during refuge hunting seasons does not materially interfere with or detract from the purposes for which these refuges were established nor the mission of the NWRS. There will be neutral to minor environmental impacts associated with bobcat hunting, and the biological integrity, diversity, and environmental health of these refuges will not be negatively impacted. This action also contributes to implementing S.O. 3356 *Hunting, Fishing, Recreational Shooting, and Wildlife Conservation Opportunities and Coordination with States, Tribes, and Territories* by expanding hunting opportunities and better aligning Service regulations with State regulations. We did not make any changes based on this comment.

Comment (17): One commenter believes the Service should not allow black bear trophy hunting on national wildlife refuges, as it is inhumane and not biologically supported and if bear hunting is allowed, "black bear baiting, hounding, trapping, and spring hunting" should be prohibited.

Service Response: The Administration Act as amended by Improvement Act defines hunting as an appropriate and legitimate wildlife-dependent use of the NWRS when determined to be compatible. The Service relies on state fish and wildlife agencies as the experts on biological and population status of native wildlife and their sustainability including considering the impacts of hunting and trapping. In Arkansas, Arkansas Game and Fish Commission (AGFC) conducts black bear hunting seasons including in the Bear Management Zone in which Holla Bend NWR is situated. The AGFC supports the proposal to allow incidental take of black bears on Holla Bend NWR. Based on regular bear population monitoring, reproductive outputs, occupied habitats, harvest analysis, and damage/nuisance complaints, the AGFC consider bear populations in Arkansas over the long term to be stable to increasing, and geographically expanding their range (Black Bear Harvest Report, AGFC 2018). We disagree with the relevancy and applicability of the various assertions made by the commenter on the deleterious impact of incidental take of black bear on Holla Bend NWR. Bears are a sustainable, renewable wildlife resource and offer hunting opportunity for archery, muzzleloader, and modern gun hunters in Arkansas. Bears typically do not reside on Holla Bend NWR; sightings of bears on the refuge are of occasional, transient individuals. Allowing take of black bear incidental to archery deer hunting and the youth gun deer hunt on the refuge will be of no biological significance for regional or statewide populations. We expect that the take of a bear on the refuge will be extremely low. Likely, there will be many seasons in which no bears are killed, and it is doubtful that an annual take on the refuge would exceed one individual. The commenter stated that if black bear hunting was going to be allowed despite their opposition, that the use of "…baiting, hounding, trapping, and spring hunting…" must be prohibited. The Service is proposing allowing incidental take of black bears on Holla Bend NWR by "still hunting," and has not considered or proposed the use of the methods of concern cited by the commenter. In our sound professional judgment, we have determined that the incidental take of black bear does not materially interfere with or detract from the purposes for which Holla Bend NWR was established nor the mission of the NWRS. This use also contributes to implementing S.O. 3356 *Hunting, Fishing, Recreational Shooting, and Wildlife Conservation Opportunities and Coordination with States, Tribes, and Territories* by expanding

hunting opportunities and better aligning Service regulations with State regulations. We will make no changes based on this comment.

Comment (18): One commenter believes the Service should not allow hounding on Service lands, as it is inhumane and has broad implications. The proposed rule expands opportunities for hounding on national wildlife refuges, which is unsporting and detrimental to the environment, and for which the Service has failed to evaluate the environmental impacts.

Service Response: On Bald Knob, Cache River, and Wapanocca NWRs, dogs are permitted for rabbit hunting as permissible under AGFC regulations. Take of coyote, bobcat, and foxes is allowed only incidental to other refuge hunts with the devices and methods allowable for those hunts and according to applicable seasons and regulations. The "other refuge hunts" for which dogs are allowed are migratory bird (Bald Knob and Cache River NWRs only), quail, rabbits, squirrels, raccoons, and opossums. Dogs are not permitted for deer hunting on these refuges, so the species cited by the commenter cannot be taken with the aid of dogs during any deer hunts. The Service relies on state fish and wildlife agencies as the experts on biological and population status of native wildlife and their sustainability including considering the impacts of hunting on game species and other wildlife. Use of dogs for hunting coyote, bobcat, foxes, and rabbits is an established and accepted practice in Arkansas and is popular with hunters using these refuges. The bond between hunting dogs and their handlers enhances the quality of the experience for these hunters and the use of dogs aids in retrieval of downed game, thereby minimizing loss. The Administration Act as amended by Improvement Act defines hunting as an appropriate and legitimate wildlife-dependent use of the NWRS when determined to be compatible. The "environment impacts" of the use of dogs for hunting on these refuges are considered neutral to minor. The use of dogs for hunting certain species on these refuges does not violate our responsibility mandated in the law or Service policy to maintain biological integrity, diversity, and biological health. This use also contributes to implementing S.O. 3356 *Hunting, Fishing, Recreational Shooting, and Wildlife Conservation Opportunities and Coordination with States, Tribes, and Territories* by expanding hunting opportunities and better aligning Service regulations with State regulations. There is no "…Service's proposal to revoke hounding on Wapanocca National Wildlife Refuge…" as the commenter stated and no changes regarding use of dogs for hunting on these refuges will be made based on this comment.

Comment (19): One commenter believes that certain practices allowed by the proposed rule are incompatible with the National Wildlife Refuge System. The Service must not allow wildlife killing contests on national wildlife refuges, as it is incompatible with the Service's legal responsibilities for managing the National Wildlife Refuge System. The Proposed Rule currently maintains or proposes to newly allow hunting of species persecuted in wildlife killing contests on several national wildlife refuges in states that allow these cruel and environmentally destructive practices.

Service Response: There are no “wildlife killing contests” allowed or conducted on refuges in the Central Arkansas NWR Complex as defined and alleged by the commenter. Hunting is conducted according to federal and state regulations and frameworks. Arkansas Game and Fish Commission approves all hunting on these refuges. The Administration Act as amended by Improvement Act defines hunting as an appropriate and legitimate wildlife-dependent use of the NWRS when determined to be compatible. In our sound professional judgment, we have determined that the hunting seasons and practices on these refuges in the proposed rule do not materially interfere with or detract from the purposes for which these refuges were established nor the mission of the NWRS. We did not make any changes because of this comment.

Comment (20): One commenter believes that certain practices allowed by the proposed rule are incompatible with the National Wildlife Refuge System. The Service should not allow hunting of coyotes where predator control is utilized under state law.

Service Response: Hunting on Bald Knob, Big Lake, Cache River, Holla Bend, and Wapanocca NWRs, in our sound professional judgment, is a legitimate and appropriate wildlife-dependent recreational use of theses refuges as defined by the Administration Act as amended by the Improvement Act. We have determined that all the proposed changes to our hunting and fishing programs on these refuges do not materially interfere with or detract from the purposes for which these refuges were established nor the mission of the NWRS. All proposed or existing hunting, methods, or practices comply with state and federal laws, regulations, and policies. None of the existing or proposed hunts on these refuges conflict with or impede our compliance with our responsibility to maintain biological integrity, diversity, and biological health of these refuges. Environmental impacts are considered to be neutral to minor. Our actions also contribute to implementing S.O. 3356 *Hunting, Fishing, Recreational Shooting, and Wildlife Conservation Opportunities and Coordination with States, Tribes, and Territories* by expanding hunting opportunities and better aligning Service regulations with State regulations. We made no changes based on this comment.

APPENDIX E. INTRA-SERVICE ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

REGION 4
INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

Originating Person: Keith M. Weaver
Telephone Number: 870-919-6777 **E-Mail:** keith_weaver@fws.gov
Date: July 22,2021

PROJECT NAME:
Central Arkansas National Wildlife Refuge (NWR) Complex (Complex) Hunting and Fishing Plans and Compatibility Determinations

I. Service Program:
- **Ecological Services**
- **Federal Aid**
- **Clean Vessel Act**
- **Coastal Wetlands**
- **Endangered Species**
- **Section 6 Partners for**
- **Fish and Wildlife**
- **Sport Fish Restoration**
- **Wildlife Restoration**
- **Fisheries**
- **Refuges/Wildlife**

II. State/Agency:
n/a

III. Station Name:
Bald Knob NWR, Big Lake NWR, Cache River NWR, Holla Bend NWR, and Wapanocca NWR

IV. Description of Proposed Action:
The U.S. Fish and Wildlife Service (Service) is proposing to open new hunting and fishing opportunities in addition to current seasons on the Complex in accordance with the Central Arkansas NWR Complex's respective refuges 2021 Hunting and Sport Fishing Plans, refuge establishing legislation, and refuge purposes. In alignment with the existing Comprehensive Conservation Plans (CCPs) (USFWS 2009 and 2010), the Service is proposing to update and replace the existing hunt and sport fishing plans and existing compatibility determinations (CDs) for five of the six national wildlife refuges (NWRs) in the Central Arkansas NWR Complex (Logan Cave NWR is excluded from this analysis). This effort is also to better align with the State of Arkansas's regulations and seasons.

The Central Arkansas NWR Complex manages hunting and fishing on Bald Knob NWR (15,436 acres), Big Lake NWR (10,913 acres), Cache River NWR (73,546 acres), Holla Bend NWR (6,013 acres), and Wapanocca NWR (5,624 acres) (Figure 1-5). Cache River NWR currently has an active land acquisition program (See Figure 3); for this refuge, those anticipated acquisitions are included in this analysis and would be added to the Cache River NWR Hunt and Fish Plan upon acquisition without the development of an additional or amended hunt and fish plan, unless specific conditions or circumstances bar this action. The existing total of 73,346 acres open to hunting on Cache River NWR would increase over time from Alternative A by 213,338 acres up to approximately 286,684 acres, as also analyzed in the LPP (USFWS 2012).

The species open for take in current and proposed hunting/fishing seasons for refuges in the Complex are listed in Table 1 and explained in refuge specific hunt and fish plans and hunt and fish compatibility determinations (Section A for each Refuge and Appendix B and C).

Table 1. Current (X) and new species (X*) open for hunting and fishing on refuges within the Central Arkansas NWR Complex.

Species	**Bald Knob NWR**	**Big Lake NWR**	**Cache River NWR**	**Holla Bend NWR**	**Wapanocca NWR**
Migratory Birds					
Duck	X		X		
Light Geese	X		X		
Dark Geese	X		X		
Merganser	X		X		
Coot	X		X		
Rail (sora and Virginia)	X*		X*		
Gallinule (common and purple)	X*		X*		
Snipe	X		X		
Woodcock	X		X		
Dove (mourning, white-winged, Eurasian collared, rock	X		X		
Crow (American and fish)	X*		X*		
Upland Game					
Squirrel (gray and fox)	X	X	X	X	X
Rabbit (cottontail and swamp)	X	X	X	X	X
Northern bobwhite quail	X	X*	X	X*	X*

Species	Bald Knob NWR	Big Lake NWR	Cache River NWR	Holla Bend NWR	Wapanocca NWR
Raccoon	X	X	X	X	X
Opossum	X	X	X	X	X
Beaver	X	X	X	X	X
Muskrat	X	X*	X	X*	X*
Nutria	X	X	X	X*	X
River otter	X*	X*	X*	X*	X*
Mink	X*	X*	X*	X*	X*
Coyote	X	X	X	X	X
Fox (red and gray)	X*	X*	X*	X*	X*
Bobcat	X*	X*	X*	X	X*
Striped skunk	X*	X*	X*	X*	X*
Big Game					
Black bear				X*	
White-tailed deer	X	X	X	X	X
Eastern wild turkey	X	X*	X	X	X*
Feral hog	X	X*	X		X
Sport Fish					
Fish	X	X	X	X	X
Crawfish	X	X	X	X*	X
Frogs	X	X	X	X	X*

Proposed changes in method of take include adding hunting seasons for youth archery/gun turkey on Bald Knob NWR; modern gun deer, youth gun deer, archery/gun turkey and youth archery/gun turkey on Big Lake NWR; additional youth gun deer, and mentored youth gun squirrel and rabbit on Holla Bend NWR; and youth gun deer, archery/gun turkey, and youth archery/gun turkey on Wapanocca NWR. On Wapanocca NWR, the following new methods of fishing will be allowed – yo-yo's, drop lines, limb lines, trot lines, jugs, and other free-floating containers.

V. Pertinent Species and Habitat:

A. Include species/habitat occurrence maps:

Figure 1. Bald Knob National Wildlife Refuge Species Occurrence Map

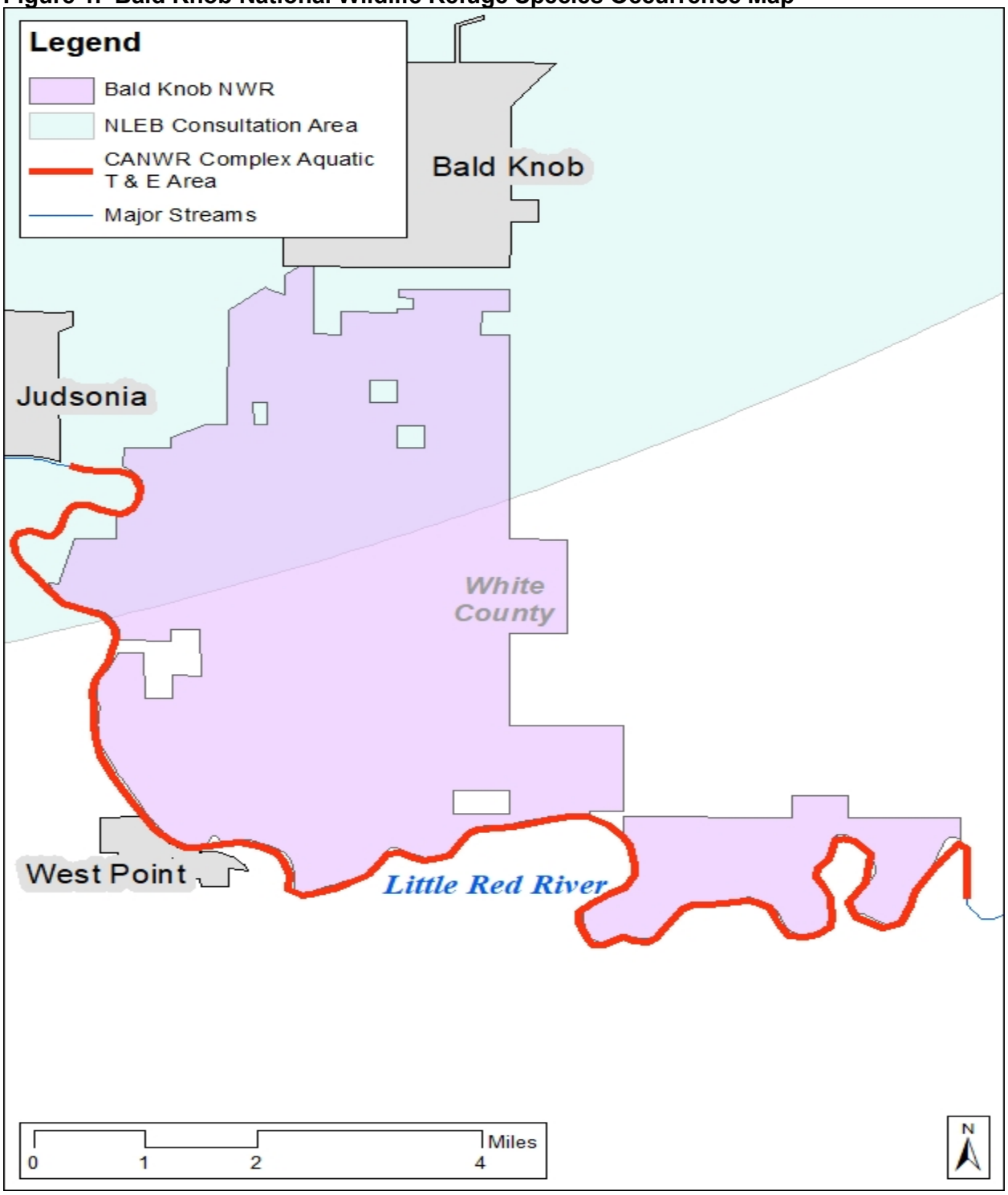


Figure 2. Big Lake National Wildlife Refuge Species Occurrence Map.

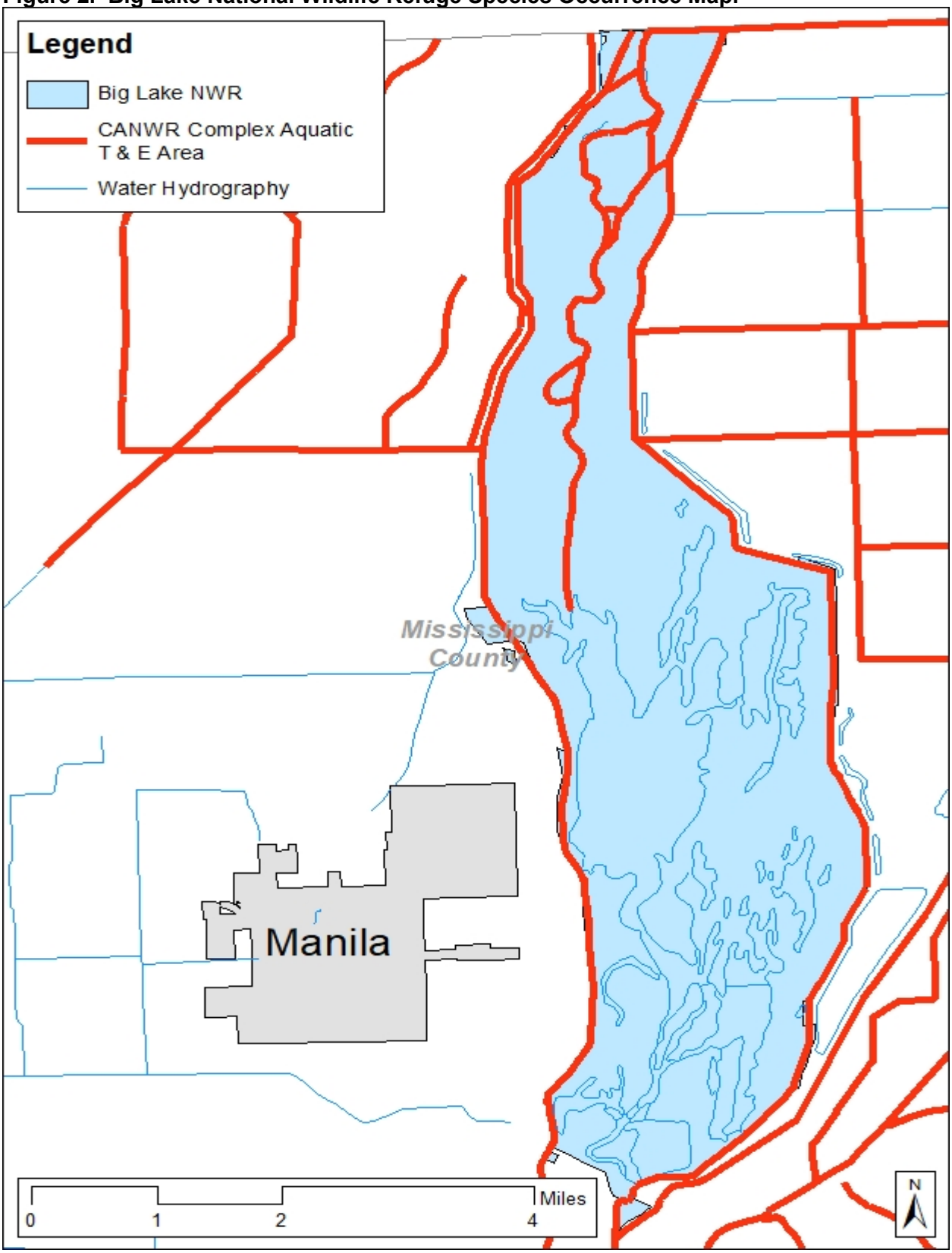


Figure 3. Cache River National Wildlife Refuge Species Occurrence Map.

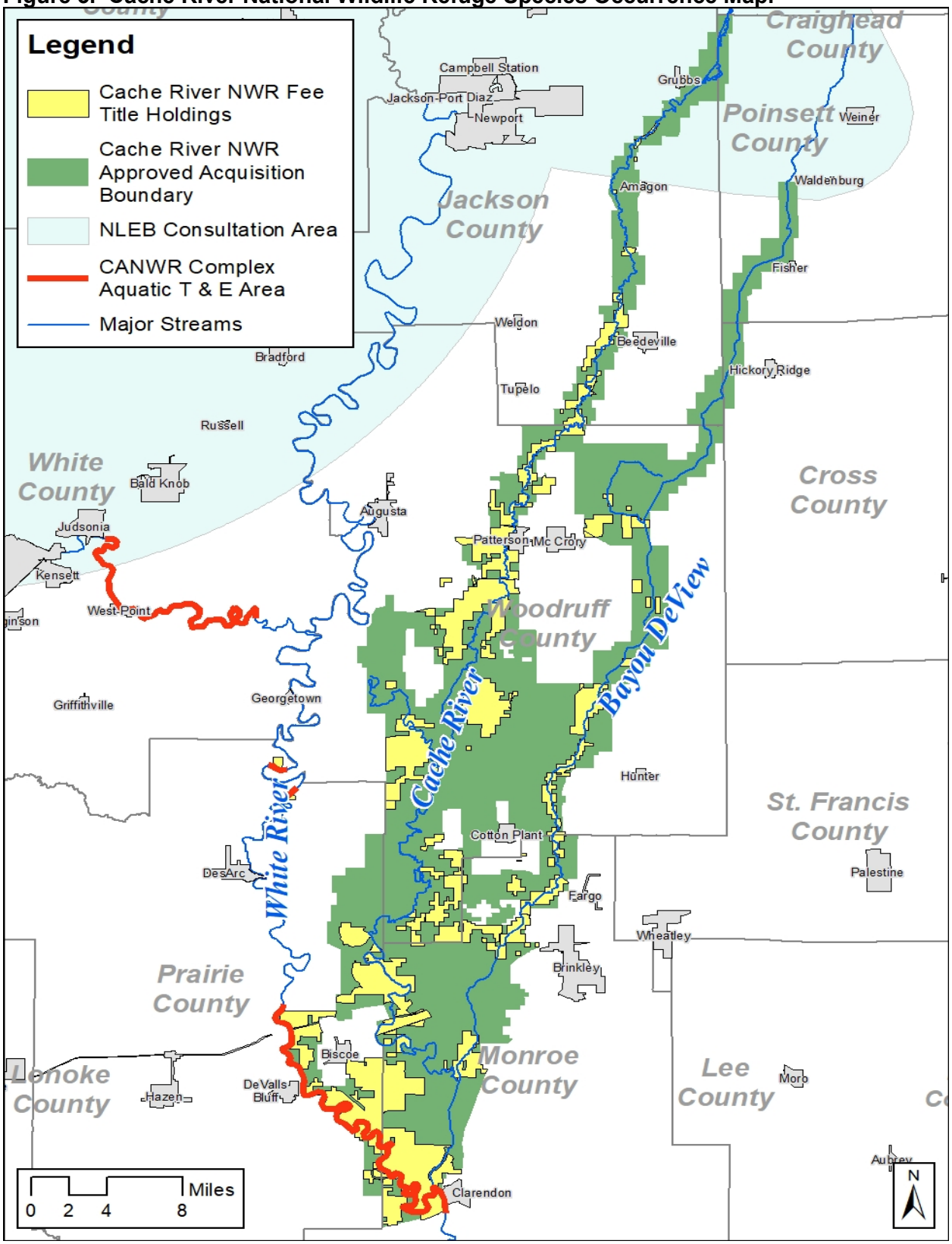


Figure 4. Holla Bend National Wildlife Refuge Species Occurrence Map.

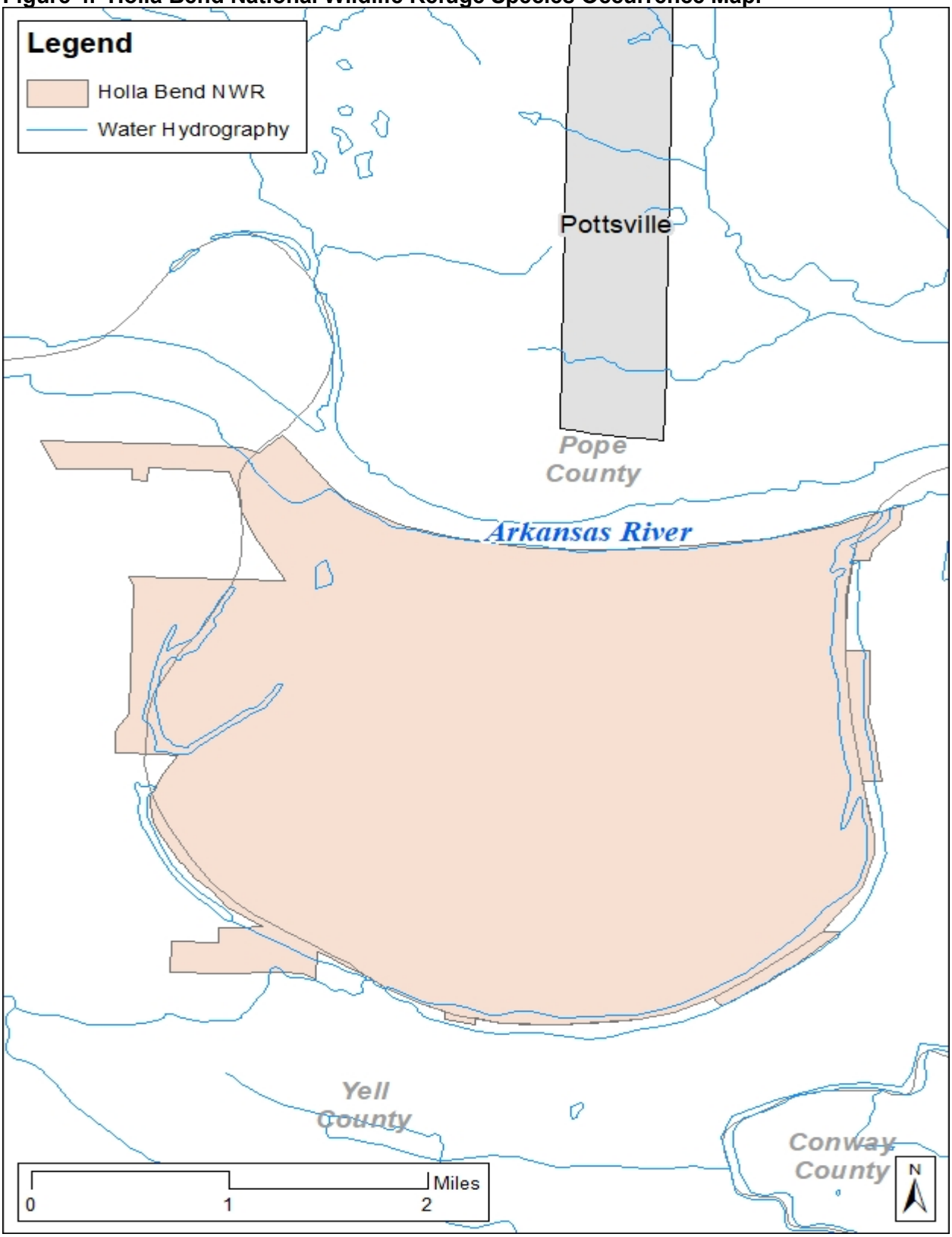
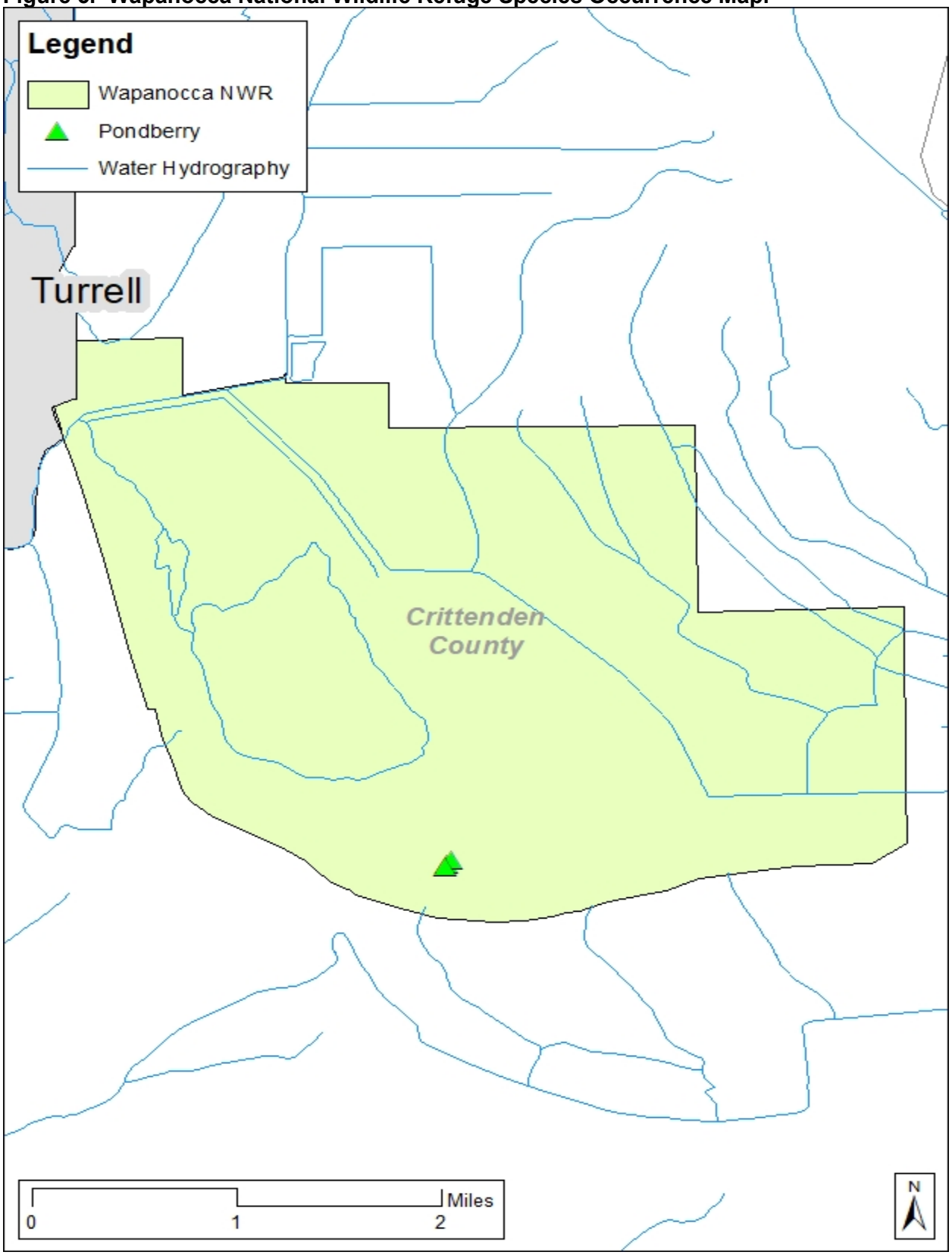


Figure 5. Wapanocca National Wildlife Refuge Species Occurrence Map.

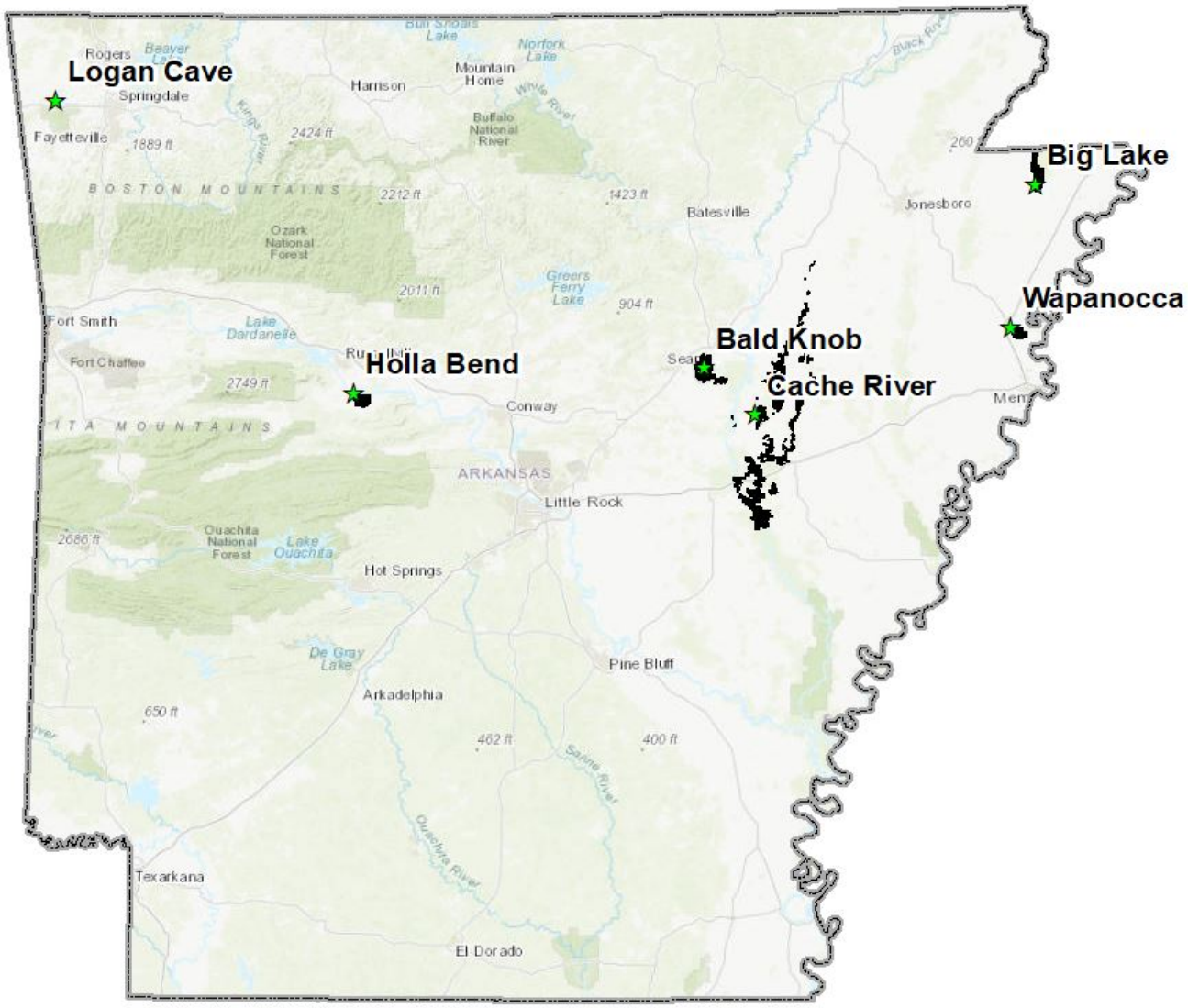


B. Consultation areas by species based on IPaC and conferral with Arkansas Ecological Services Field Office.

SPECIES/CRITICAL HABITAT	STATUS[1]	REFUGE[2]
Ivory-billed Woodpecker *(Campephilus principalis)*	E	CR
Pink Mucket *(Lampsilis abrupta)*	E	BK, CR
Fat Pocketbook *(Potamilus capax)*	E	BL,
Scaleshell *(Leptodea leptodon)*	E	BL, CR
Rabbitsfoot *(Theliderma cylindrica)*	T; CH (CR only)	BK, CR
Pondberry *(Lindera melissifolia)*	E	BL, CR, WA
Missouri Bladderpod (*Physaria liformis*)	T	HB
Indiana Bat *(Myotis sodalis)*	E	HB
Northern Long-eared Bat *(Myotis septentrionalis)*	T	BK, CR,HB
Gray bat (*Myotis grisescens*)	E	CR, HB
Piping plover (*Charadrius melodus*)	T	BK, BL, CR, HB, WA
Eastern black rail (*Laterallus jamaicensis*)	T	BK,BL,CR, HB,WA
Red Knot (*Calidris canutus*)	T	BK, BL, CR, HB, WA
Whooping Crane (*Grus americana*)	E, Experimental, Non-Essential	BK, BL, CR, HB, WA
Monarch Butterfly (*Danaus plexippus*)	C	BK, BL, CR, HB, WA

[1]STATUS: E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species
[2]REFUGE: BK=Bald Knob NWR, BL=Big Lake, CR=Cache River NWR, HB=Holla Bend NWR, WA=Wapanocca NWR

VI. Location (attach map):



A. Ecoregion Number and Name:
Big Lake NWR, Bald Knob NWR, Cache River NWR and Wapanocca NWR are in Ecosystem Area I, Ecosystem 27: Mississippi Alluvial Valley

Holla Bend NWR is in R2-Ark/Red Rivers Ecoregion

B. County and State:
Crittenden County, Arkansas (Wapanocca NWR)
Jackson County, Arkansas (Cache River NWR)
Mississippi County, Arkansas (Big Lake NWR)
Monroe County, Arkansas (Cache River NWR)
Prairie County, Arkansas (Cache River NWR)
Pope County, Arkansas (Holla Bend NWR)
White County, Arkansas (Bald Knob NWR)
Woodruff County, Arkansas (Cache River NWR)
Yell County, Arkansas (Holla Bend NWR)

C. Section, township, and range (or latitude and longitude):

Big Lake NWR - T14N & T15N R9E, one tract in T17N R3E, and, T18N R2E & R3E

Bald Knob NWR - Various holdings in T7N R5W, T8N R5W, T7N R6W, T8N R6W;

Cache River NWR- Various holdings in T1N R3W, T1N R4W, T2N R3W, T2N R4W, T3N R2W, T3N R3W, T3N R4W, T4N R2W, T4N R3W, T4N R4W, T5N R2W, T5N R3W, T5N R4W, T6N R1W, T6N R2W, T6N R3W, T7N R1W, T7N R2W, T7N R3W, T8N R1W, T8N R2W, T8N R3W, T9N R1W, T9N R2W, T10N R1W, T11N R1W;

Holla Bend NWR- parts of sections 25, 29 and 30; T6N Rl9W.

Wapanocca NWR - Sections 1, 2, 3, 4, 9, 10, 11, 12, T8N R8E; Sections 28, 33, 34, 35 T9N R8E; all of the 5th Principal Meridian.

D. Distance (miles) and direction to nearest town:

Big Lake NWR - 3 Miles west of Manila, Arkansas on Hwy 18. Bald Knob NWR - 3 miles south of Bald Knob, Arkansas.

Cache River NWR - Large holdings of Cache River NWR are 1 mile northwest of Clarendon, 2 miles southeast of Biscoe, 3 miles north of Brasfield, 7 miles southwest of Brinkley, 1 mile east of Dixie, and 4 miles southwest of McCrory, Arkansas.

Holla Bend NWR - Take State Hwy 155 to State Hwy 7 into the town of Dardanelle, Arkansas - 5 miles from the refuge entrance.

Wapanocca NWR – North boundary adjoins City of Turrell, Arkansas.

E. Species/habitat occurrence:

Listed species and habitat occurrence on the Central Arkansas NWR Complex are based on the expert opinion of Service biologists, supplemented with information from the Environmental Conservation Online System (ECOS, https://ecos.fws.gov/ecp/) and Information for Planning and Consultation (IPaC, https://ecos.fws.gov/ipac/) databases.

Since research activities are ongoing in this area and since the ECOS and IPaC databases are regularly updated, approximately every 90 days, it is possible that the specific threatened and endangered species identified as present on or near the refuge may change between the finalization of this Biological Evaluation and its publication. The IPaC database also identifies multiple species that are not present within the hunt or fish units; for these species our determination is that any hunting actions on these units will have no effect to species not occurring on these units. The approved acquisition boundaries for the refuges involved in this biological evaluation were used in IPaC and final determination of the species consultation list and refuges where consultation was warranted was based on conferring with Arkansas Ecological Services Field Office.

Ivory-billed Woodpecker (IBWO) - The IBWO was once an inhabitant of forested habitats throughout the southeastern United States and Cuba. Although little specific population data are available, it is likely that European settlement and the clearing of the forest caused the species to decline in the latter half of the 19th century. By the mid-20th century, the IBWO was reduced to a very small population. The most famous of these birds were those studied by Arthur Allen and James Tanner at the Tensas River in Louisiana in the late 1930s. The last widely accepted sightings were made in the Tensas area by Don Eckleberry in 1944. Since that time there have been numerous unconfirmed sightings throughout the historic range of the species. Many of these sightings seemed highly credible but lacked hard evidence.

In February of 2004, Cornell Laboratory of Ornithology biologists became aware of credible sight reports of the IBWO in a portion of Bayou DeView which is located on Cache River NWR. Subsequently, Cornell biologists and their partners documented the presence of at least one IBWO (Fitzpatrick et al. 2005) in that area. It was thought that that portion of the Bayou De View was providing some or all of the life cycle requirements for this species' persistence. The sixteen sightings of the IBWO were documented deep within the baldcypress-tupelo swamp of the Bayou De View. Thousands of hours of intensive searching using a variety of techniques during the search seasons from 2004 through 2009 produced only a few additional reported observations in Arkansas.

Pink Mucket- The pink mucket pearly mussel has a limited distribution within the main stem of the Lower White River, being more frequent upstream toward Newport, Arkansas, but extending downstream to near St. Charles, Arkansas. They are sedentary mussels that prefer silt-free substrates of sand, gravel, and cobble and often found in medium to large rivers (20 m wide or greater). Due to their sedentary nature and longevity, they are especially vulnerable to stream disturbances such as impoundments, siltation, and pollution. Mussels feed by filtering algae, bacteria, phytoplankton and other small particles out of the water column.

Fat Pocketbook - The fat pocketbook mussel inhabits the very lowest reaches of the White River below Cache River NWR, but also has been found in other streams in the vicinity of Big Lake NWR, but has not been found in the Cache River on any recent surveys. The fat pocketbook mussel has a limited distribution with only one specimen collected within the main stem of the Lower White River. Historical accounts indicate this species requires large rivers with flowing water and stable substrate and occurs in a full range of habitat types (i.e. shifting sand and flocculent mud to hard clay and gravel). Due to their sedentary nature and longevity, they are especially vulnerable to stream disturbances such as impoundments, siltation, and pollution. Mussels feed by filtering algae, bacteria, phytoplankton and other small particles out of the water column. No fat pocketbook mussels have been documented on any of the refuges in the Central Arkansas NWR Complex.

Scaleshell- Scaleshell inhabits medium-sized to large rivers with stable channels and good water quality. The abundance and distribution of scaleshell have decreased due to habitat loss and adverse effects associated with water quality degradation, reservoir construction, sedimentation, channelization, and dredging. These habitat changes have resulted in significant extirpations, restricted and fragmented distributions, and poor recruitment within the White River system this species is typically restricted to the upper tributaries and the mainstem downstream to near the confluence with the Black River. One specimen was documented from the White River in Jackson County near Newport in 1999. No scaleshell mussels have been documented on Big Lake NWR.

Rabbitsfoot- Rabbitsfoot is primarily an inhabitant of small to medium sized streams and some larger rivers. It usually occurs in shallow water areas along the bank and adjacent runs and shoals with reduced water velocity and a mixture of sand and gravel. The rabbitsfoot mussel is typically found in small to medium sized rivers with clear, shallow water with a mixture of sand and gravel. The rabbitsfoot population on the White River remains in two disjunct reaches separated by approximately 100 river miles. The upper reach extends downstream to the Little Red River confluence north of Georgetown, White and Woodruff Counties, and the lower reach extends from south of Cache River NWR downstream to near St. Chares, Arkansas. Portions of the White River adjacent to Cache River NWR are designated as Critical Habitat. No rabbitsfoot mussels have been documented on Bald Knob or Cache River NWR.

Pondberry - Pondberry occupies microhabitats of seasonally flooded depressions and sinks in wooded areas, where it characteristically grows in discrete colony patches of sparsely branched deciduous woody stems with aromatic leaves. In Arkansas, few scattered colonies are known. Pondberry is mapped and believed extant at about 99 sites, although some of these are in close proximity, so the number of extant populations may be somewhat less. A few extant populations appear quite large, but may contain few different genetic individuals; many sites are small and isolated. Believed extirpated from Louisiana and possibly Florida; extant populations are known from the coastal plain in North Carolina south to Georgia and Alabama and from the Mississippi Embayment in Mississippi, Arkansas, and Missouri. Extensive clearing and drainage of bottomland forests is probably the major factor affecting the species, both historically and currently. Also the species appears susceptible to the emerging Red Bay or Laural Wilt disease; one Georgia population is known to be infected, but the full potential range and impact of the disease is unknown at this time. Limited sexual reproduction, dispersal, and recruitment are also a concern for the species' persistence in its now highly-fragmented habitat.

In Arkansas, pondberry colonies are found in the upper reaches of the Village Creek bottoms and other tributaries to the Black River in Jackson, Lawrence, and Clay Counties; the St. Francis Sunken Lands WMA in Craighead County, and the most recently discovered colony at Wapanocca NWR, in Crittenden County. It has been documented on Cache River NWR.

Missouri Bladderpod - The Missouri bladderpod is a small annual plant, about 4 to 8 inches tall, with distinctive canary-yellow flowers cluster at the top of the stems and bloom from April to May. It grows strictly in southern Missouri and northern Arkansas (known from only two sites in two counties in Arkansas. Missouri bladderpods grow mostly in open limestone glades; but it has been found on one dolomite glade in Arkansas. Glades are naturally dry, treeless areas with shallow, loose soil and areas of exposed rock. Glades are described by the underlying rock (e.g., limestone or dolomite). Sometimes the bladderpod is found on highway rights-of-way and pastures where mowing and grazing have kept the area open. Occasionally it is found in open rocky woods. No specimens have been documented on Holla Bend NWR.

Indiana Bat- Indiana bats are found over most of the eastern half of the United States. Summer habitat includes small to medium river and stream corridors with well developed riparian woods; woodlots within 1 to 3 miles of small to medium rivers and streams; and upland forests. The bats usually roost under loose tree bark on dead or dying trees. During summer, males roost alone or in small groups, while females roost in larger groups of up to 100 bats or more. Indiana bats also forage in or along the edges of forested areas. During the winter, Indiana bats use caves and mines as hibernacula. They require cool, humid caves with stable temperatures, under 50° F but above freezing. Very few caves within the range of the species have these conditions. No Indiana bats have been documented on Holla Bend or Big Lake NWRs.

Northern Long-eared Bat- The Northern Long-eared Bat has a large range in the eastern and north-central United States and much of southern Canada; they are most abundant in the northern part of the range, but relatively rare elsewhere. Northern long-eared bats spend winter hibernating in caves and mines that exhibit constant temperatures, high humidity, and no air currents. Within hibernacula, they most often inhabit small crevices or cracks, often with only the nose and ears visible. During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live trees and dead snags. Males and non-reproductive females may also roost in cooler places, like caves and mines. Northern long-eared bats seem to be flexible in selecting roosts, choosing roost trees based on suitability to retain bark or provide cavities or crevices. This bat has also been found rarely roosting in structures, like barns and sheds. Significant recent declines associated with rapidly spreading white-nose syndrome have occurred in eastern North America, and some habitat has been lost, degraded, or fragmented, primarily through the disturbance of hibernacula and land development. Northern long-eared bats have not been detected in any of the refuges Bald Knob, Big Lake, Cache River, Holla Bend, or Wapanocca NWRs.

Gray Bat- The gray bat occupies a limited geographic range in limestone karst areas of the southeastern United States, including northern Arkansas. With rare exceptions, gray bats live in caves year-round. During the winter, gray bats hibernate in deep, vertical caves. In the summer, they roost in caves that are scattered along rivers. These caves are in limestone karst areas of the southeastern United States. They do not use houses or barns. Females give birth to a single young in late May or early June. Gray bats eat a variety of flying aquatic and terrestrial insects present along rivers or lakes. They are extremely vulnerable to disturbance in their caves. No gray bats have been detected in Cache River or Holla Bend NWRs.

Piping Plover- Piping plover is a transient migrant occurring infrequently and for short duration (1-2 days) during southward migration during July to September. For example, only one bird was recorded over a two-day period in August 2000 on Bald Knob NWR. Breeding occurs along the Atlantic coast from North Carolina to southern Canada and along rivers and wetlands of the northern Great Plains from Nebraska to the southern Prairie Provinces. Plover use on the refuges may occur on mud flats that are created in July and August from fields that were planted in crops and flooded the previous year. Shorebirds may also occur near areas of active soybean production. Northward migration occurs from mid-February to mid-May.

Eastern Black Rail- Eastern Black Rail is a transient migrant that uses shallow emergent freshwater wetland habitats areas. Eastern black rails typically occupy areas with overhead cover that permits little or no view of bare ground. Occurrences would be infrequent and of short duration during the spring and fall months, presumably from migration to and from the Texas Gulf Coast. Use on the Refuge Complex has not been documented but if present, would most likely occur in marsh or moist soil managed wetlands. Although no observations have occurred on the refuges, there have been observations near the lower Cache River NWR.

Red Knot- The Red Knot is a transient migrant that uses shorelines of lakes or freshwater marshes. The Red Knot is mostly a migrant and winter resident along the Atlantic and Gulf coasts. Occurrences are likely to be infrequent and of short duration during the summer to early fall. Sightings have occurred on lands near the Complex, specifically Bald Knob NWR. Red Knot use of the Complex would likely occur on mudflats that are created when fields flooded for waterfowl are de-watered or when lakes dry up during late summer.

Whooping Crane- The only fully wild population of whooping cranes nests in the Northwest Territories and adjacent areas of Alberta, Canada, primarily within the boundaries of Wood Buffalo National Park. Whooping cranes arrive at this breeding area in late April. The birds winter along the central Texas Gulf of Mexico coast at Aransas NWR and adjacent areas, typically arriving between late October and mid-November. Occasionally, stragglers may not arrive until late December. It would be rare for individuals from this population to occur on refuges within the Complex. A migratory non-essential experimental Eastern Population was designated in 2001 its designated range includes Arkansas. (66 FR 33903-33917). This population would summer and breed in central Wisconsin and winter in west-central Florida. Whooping cranes from this population may occur anywhere in the southeastern United States, including Arkansas.

Another attempt to establish a non-migratory, non-essential experimental population occurred in Louisiana in 2011 (76 FR 6066-6082). More than 60 birds were known to be alive as of October 2018. Occurrences are likely to be infrequent on the Complex. However, a female crane from this population has visited Holla Bend NWR in the fall of 2019 and 2020 before traveling to Wheeler NWR in Alabama to winter and then onto Louisiana. Whooping cranes have never been observed on the other refuges in the Complex.

Monarch Butterfly – The Monarch Butterfly travels through Arkansas on its way to central Mexico where they overwinter. While in Arkansas, they depend on flowering plants that are being lost due to habitat loss and degradation (from conversion of grasslands to agriculture, widespread use of herbicides, logging/thinning at overwintering sites in Mexico, urban development, and drought) (USFWS 2020). The diversity of the habitats on the refuge are managed in a way (i.e. selective timber thinning, and early successional scrub-shrub, grassland, and moist-soil habitat restoration and management) that actually encourages flowering plants that would be used by Monarchs; however, the majority of the habitats on the refuges are forested bottomland hardwoods with little value to a butterfly. However, there are actively managed habitats such as grassland units, cropland margins, forest management areas, reforestation sites, early successional scrub-shrub, and moist-soil units that contain flowering plants that could be used by Monarchs.

VII. Determination of Effects:

A. Explanation of effects of the action on species and critical habitats in item V. B (attach additional pages as needed):

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Ivory-billed Woodpecker	The activities associated with hunting and sport fishing on Cache River NWR will not alter habitat in any manner that will be negative for this species, if it even exists on the refuge. Any increase in hunting activity due to new species open for take will not cause disturbance to IBWO because those species do not occupy IBWO habitat. The species being hunted are easily identifiable and a woodpecker should not be misidentified for any of these species. Due to the dispersed temporal and spatial human activity associated with the refuge's hunting and sport fishing program, no negative effects are anticipated for IBWO including nesting, which does not occur during hunting seasons. This species will not be affected by use of lead ammunition or tackle due to the low occurrence of lead that could possibly bioaccumulate in insects they eat.
Pink Mucket	Due to the nature of this species' habitat location in riverbed areas under deep water, if it even exists on Bald Knob or Cache River NWRs, the hunting and sport fishing programs on these refuges, including addition of new species, should have no effect on this species because the mussel bed habitats will not be disturbed and the mussels are not subject to ingestion of lead shot because nontoxic shot is required for waterfowl hunting that may occur on the river. Being filter feeders, they would not ingest shot nor ingest any fishing tackle that are being used in rivers or that might be dropped into the river. Potential impacts to mussel species from the release of eroded lead ammunition or tackle into the water would be negligible as lead use is minimal and very little would ever make it into a river system in which this mussel species may be present.

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Fat Pocketbook	Due to the nature of their location in riverbed areas under deep water, the hunting and sport fishing programs on Big Lake NWR, including addition of new species/hunts, should have minimal effect on this aquatic species, if it even exists on the refuge. Any mussel bed habitat will not be disturbed by hunters or anglers and the mussels are not subject to ingestion of lead shot because Big Lake NWR is not open to migratory bird hunting and nontoxic shot is required for other hunting that might occur near the river. Being filter feeders, they would not ingest shot. Mussels will not ingest any fishing tackle that are being used in rivers or lakes that might be dropped into the water. Potential impacts to mussel species from the release of eroded lead ammunition or tackle into the water would be negligible as lead use is minimal and very little would ever make it into a river system in which this mussel species may be present.
Scaleshell	Due to the nature of their location in riverbed areas under deep water, the hunting and sport fishing programs including addition of new hunts on Big Lake and Cache River NWRs should have no effect on this aquatic species, if it even exists on these refuges. The mussel bed habitats will not be disturbed by hunters or anglers, Big Lake NWR is closed to migratory bird hunting so no hunting would occur in vicinity of potential scaleshell habitat, and being filter feeders, mussels will not ingest any fishing tackle that might be dropped into the water in rivers or lakes. Mussels are not subject to ingestion of lead shot on Cache River NWR because nontoxic shot is required for waterfowl hunting that may occur on the river, and being filter feeders, they would not ingest shot. Potential impacts to mussel species from the release of eroded lead ammunition or tackle into the water would be negligible as lead use is minimal and very little would ever make it into a river system in which this mussel species may be present.
Rabbitsfoot	Due to the nature of their location in riverbed areas under deep water, the hunting and sport fishing program on Bald Knob and Cache River NWRs, including addition of new species, should have no effect on this aquatic species or its Critical Habitat (Cache River NWR only). The mussel bed habitat will not be disturbed by hunters or anglers, and the mussels are not subject to ingestion of lead shot because nontoxic shot is required for waterfowl hunting that may occur on the river, and being filter feeders, the mussels would not ingest shot. Nor will mussels ingest any fishing tackle rivers that might be dropped into the water. Potential impacts to mussel species from the release of eroded lead ammunition or tackle into the water would be negligible as lead use is minimal and very little would ever make it into a river system in which this mussel species may be present.

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Pondberry	Pondberry has been documented only in one small area on Wapanocca NWR; however, vegetation surveys on other refuges were not designed to specifically detect this species; therefore, we cannot preclude its existence on these refuges. Regardless, activities associated with hunting and sport fishing, including addition of new species/hunts will not alter the habitat of this species and only foot travel is allowed in any areas of potential habitat for Pondberry, so it is unlikely that any individual plants would be damaged or destroyed. No fishing occurs near the pondberry patch on Wapanocca NWR, therefore there will be no effects by use of lead ammunition or tackle due to low occurrence overall leaching into the soils.
Missouri Bladderpod	This plant species has never been documented on Holla Bend NWR and suitable habitat is not believed to exist. As such, the hunting and sport fishing programs will have no effect on this species. This species will not be affected by use of lead ammunition or tackle due to the low occurrence of lead that could leach into the soil.
Indiana Bat	The activities associated with hunting and sport fishing will not alter the habitat in a way that will be negative for this species, if it even exists on Holla Bend NWRs. Acoustic bat monitoring has not documented this species on the refuge. During the winter the bats are hibernating in caves and would not come into contact with hunters or anglers. Potential disturbance to bats, such as hunters climbing trees, placing tree stands, noise of gun fire, or nighttime sport fishing is extremely low and will have minimal effects. The only species hunted at night when Indiana bats would be most active are raccoon and opossum and they cannot be mistaken for bats. These refuges are closed for migratory bird hunting so there is not any hunting for flying species, except wild turkey, which cannot be misidentified for a bat. Nighttime sport fishing occurs does not occur on Holla Bend NWR, so fishing will not disturb nocturnal activities of bats and will have minimal effects due to low number of anglers, and infrequent and insignificantly-disturbing encounters with this species. This species will not be affected by use of lead ammunition or tackle due to the low occurrence of lead that could possibly bioaccumulate in insects they eat.

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Northern Long-eared Bat	The activities associated with hunting and sport fishing will not alter the habitat in a way that will be negative for this species, if it even exists on Bald Knob, Cache River, and Holla Bend NWRs. The only species hunted at night when northern long-eared bats would be most active are raccoon and opossum and they cannot be mistaken for bats. The potential for hunting disturbances to roosting bats during the day from gun noise, climbing trees, or placing tree stands is extremely low and will have minimal effects. Only Bald Knob and Cache River NWR are open for migratory bird hunting and bats could not be misidentified for migratory birds. Wild turkey hunters could not misidentify a bat. During the winter, northern long-eared bats are hibernating in caves or mines and not exposed to hunters. Nighttime sport fishing occurs only on Cache River NWR and these activities will have minimal effects due to low number of anglers, infrequent and insignificantly-disturbing encounters with this species. This species will not be affected by use of lead ammunition or tackle due to the low occurrence of lead that could possibly bioaccumulate in insects they eat.
Gray Bat	Nighttime acoustic bat monitoring has not detected this species on Cache River or Holla Bend NWRs. This species inhabits caves year-round and no caves exist within the vicinity of these refuges. However, a summertime roosting colony has been documented in large underground culverts near Newport, Arkansas in the vicinity of the upper reaches of Cache River NWR. These refuges likely do not provide suitable habitat. Only Cache River NWR is open for migratory bird hunting and bats could not be misidentified for migratory birds. Wild turkey hunters could not misidentify a bat. The only species hunted at night when bats would be most active are raccoon and opossum and they cannot be mistaken for bats. The potential for hunting disturbances to roosting bats during the day from gun noise, climbing trees, or placing tree stands is extremely low and will have minimal effects. Nighttime sportfishing is allowed only on Cache River NWR, and will have minimal effects on nocturnal activities of bats on either refuge due to low number of anglers, and infrequent and insignificantly-disturbing encounters with this species, if at all. The hunting and sport fishing programs on these refuges would not likely have an adverse effect on this species. This species will not be affected by use of lead ammunition or tackle due to the low occurrence of lead that could possibly bioaccumulate in insects they eat.

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Piping Plover	The activities associated with hunting and sport fishing on the Central Arkansas NWR Complex are not habitat altering in any areas that this species might occur and disturbance due to gunfire or hunter movement should be minimal. The piping plover, if it even occurs on these refuges, would be a transient migrant with most potential for occurrence outside of hunting seasons. Due to the transient nature of this species, its occurrence on and use of mud flats, and physical characteristics, potential for encounters with hunters would be extremely low, and it would not be easily confused with any huntable species on the refuges (and only Bald Knob and Cache River NWRs have migratory bird hunting, which will not present any problem of misidentified species). It would not likely be exposed to most sport fishing activities, including new species being added due to timing of the fishing activities and potential occurrence of this species. This species will not be affected by use of lead ammunition or tackle due to the low occurrence of lead that could possibly bioaccumulate in insects or other food they eat. The Complex's hunting and sport fishing program is not likely to adversely affect this species.
Eastern Black Rail	This species has not yet been documented on any of the refuges on the Central Arkansas NWR Complex. The activities associated with hunting and sport fishing will not alter the habitat in a way that will be negative for this species - hunters and anglers are not permitted to alter habitat or remove vegetation. Only Bald Knob and Cache River NWRs are open to migratory bird hunting and although Sora and Virginia Rails are being added for hunting on Bald Knob and Cache River NWRs, due to Eastern Black Rails' highly transient and seclusive nature, timing of southward migration, limited habitat suitable for their use, the extremely low numbers of hunters expected to pursue rail, the difference in appearance between hunted and non-hunted species, the secretive habits of this species, which make flushing unlikely, and the extremely low potential for encounters to occur, and limited exposure to gunfire at a distance that could alarm this species. The above discussion suggests minimal exposure of rails to hunters, and similarly, there would be limited exposure of rails to anglers, since fishing on these refuges does not occur in the herbaceous wetland habitat that could be used by rails. Therefore, the Complex's hunting and sport fishing program is not likely to adversely affect this species. This species will not be affected by use of lead ammunition or tackle due to the low occurrence of lead that could possibly bioaccumulate in insects or other food they eat.

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Red Knot	The Red Knot is a migrant and winter resident along the Atlantic and Gulf coasts during hunting seasons for Rallidae and Scolopacidae species. Hunting and sport fishing activities on the Central Arkansas NWR Complex would not alter habitat in a way that would be detrimental to this species- hunters and anglers are not permitted to alter habitats and any temporary vegetation (trampling) or mudflat impacts (footprints) from hunters or anglers would be inconsequential. Inexperienced hunters could possibly mistake Red Knots for rails or snipe in coastal bays and marshes, but these habitats do not exist on the Complex. We have no reports of Red Knot being subjected to hunting mortality and we believe the probability is discountable, especially considering the brief overlap in timing when Red Knots could be present and migratory bird hunting is in effect on Bald Knob and Cache River NWRs. Big Lake, Holla Bend, and Wapanocca NWRs are closed to migratory bird hunting. This transient species would only be found on bare wetland habitats in the late summer. These types of habitats would exist on the fringes of lakes/ponds or units managed for wintering waterfowl. It is unlikely that hunting or sport fishing will disturb these specialized areas, as there are typically no hunting seasons open in the times in which they would be most likely to occur, (and if there were an overlap, any gunfire in the proximity of any red knots likely would be of such a distance, low repetition and duration, that it would not likely cause any flushing of birds, and sport fishing is generally not conducted in areas that may contain suitable habitat for Red Knots. This species will not be affected by use of lead ammunition or tackle due to the low occurrence of lead that could possibly bioaccumulate in insects or other food they eat. The Complex's hunting and sport fishing programs are not likely to adversely affect this bird.

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Whooping Crane	This transient species would likely only occur in wet, open-field habitats during the fall and winter. Hunting and sport fishing activities on the Central Arkansas NWR Complex would not result in any habitat alteration/disturbance that would be detrimental to this species – hunters and anglers are not permitted to alter habitat or collect or remove foods that a crane might eat and any vegetation trampling or soil imprints in an area that a crane may be using would be inconsequential. It is possible for individuals from the Louisiana experimental population to occasionally stray from normal migratory pathways. Foot traffic is unlikely to occur in places or during times where/when a crane might be present and even if it did the proximity of the traffic to the crane likely would not result in disturbance. Fishing mostly would not be conducted during times when a crane might be present. While accidental shooting of Whooping Cranes during lawful hunting activities are possible it is highly unlikely because of their notable difference in appearance compared to Snow Geese, which is the only remotely comparative legal game species on these refuges. The likelihood of Whooping Crane take associated with regulated hunting seasons remains extremely low as to be discountable. Death or injury of cranes in association with migratory game bird hunting (which is allowed only on Bald Knob and Cache River NWRs) would be as infrequent as in any other form of hunting on the Complex, and measures such as education on proper identification are in place to protect them. The crane that has visited Holla bend NWR the past few years used moist-soil units and croplands on the refuge that are managed for wintering waterfowl. Migratory bird hunting is not permitted on Holla Bend NWR, so there is no danger of this crane being mistakenly shot in mistake for waterfowl. This species will not be affected by use of lead ammunition or tackle due to the low occurrence of lead that could possibly bioaccumulate in insects and other items they eat. The Complex's hunting and sport fishing programs are not likely to adversely affect this species.

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Monarch Butterfly	Monarch butterflies do not resemble any hunted species and are not sought after by anglers. The timing of their occurrence on the refuges, behavior, and habitat occupied put them at little risk of being encountered by hunters and anglers. Accidental mortality due to vehicular collision or being trampled underfoot mortality is not controllable, but the level of mortality is expected to be insignificant. Hunting and sport fishing activities on the Complex would not alter habitat in a way that would be detrimental to this species. Hunters and anglers are not permitted to alter habitat or remove vegetation and most vegetation used by monarchs would largely be senescing by the time hunting season would occur in any suitable habitat for monarchs, so any vegetative trampling of desirable vegetation by foot traffic would be discountable. Suitable fishing sites are typically not in areas inhabited by monarchs and most fishing occurs from boats in open water or streams where monarchs likely would not be encountered with any frequency. Noise/sound vibrations from gunfire likely cannot be detected by monarchs. This species will not be affected by use of lead ammunition or tackle due to the low occurrence of lead that could possibly bioaccumulate in plants they eat. The Complex's hunting and sport fishing programs are not likely to affect this species.

B. Explanation of actions to be implemented to reduce adverse effects:

The refuge will modify hunting/fishing activities if unusual concentrations of threatened and endangered species are known to be present and would be threatened by hunting/fishing activities.

The presence of Federal and State wildlife law enforcement officers will provide a deterrent to the take of non-target species.

Hunter numbers are minimized during the popular deer gun hunts by a quota draw system. This will also minimize any potential disturbance to listed species.

Non-toxic shot is required for use in shotguns for hunting all species, except for wild turkey hunting.

Non-toxic shot is also required for migratory bird (Bald Knob and Cache River NWRs only) and upland game hunting on all refuges.

We also encourage the use of non-toxic ammunition and fishing tackle and educate hunters and anglers about the dangers of lead ingestion to wildlife.

<u>Lead Ammunition and Fishing Tackle</u>

Lead ammunition from rifles chambered for rimfire cartridges is allowed on all refuges for upland game hunting.

Shotguns with slugs (buckshot is prohibited), muzzleloaders shooting a single projectile, handguns, and large-bore air rifles using lead ammunition are legal for use on all refuges for deer and feral hog hunting (except Holla Bend NWR on which feral hog hunting is prohibited). Additionally, on Bald Knob, Cache River, and Holla Bend NWRs, centerfire rifles also are legal for deer and feral hog (except Holla Bend NWR) hunting.

On Holla Bend NWR, centerfire rifles, shotguns with slugs, muzzleloaders shooting a single projectile, and handguns using lead ammunition can be used for black bear (no other refuges are open for bear hunting).

On all refuges, turkey can be hunted with shotguns using lead shot.

However, Non-toxic rimfire, centerfire, and shotgun ammunition also is allowed on all refuges for all species/seasons for which these devices can be used.

Fishing tackle containing lead (e.g., sinkers, split shot, line weights, etc.) are allowed for use. However, non-lead products also are allowed.

VIII. Effect Determination and Response Requested:

SPECIES/CRITICAL HABITAT	DETERMINATION[1]			RESPONSE[1] REQUESTED
	NE	NA	AA	
Ivory-billed Woodpecker (*Campephilus principalis*)		X		Concurrence
Pink Mucket *(Lampsilus abrupta)*		X		Concurrence
Fat Pocketbook *(Potamilus capax)*		X		Concurrence
Scaleshell (*Leptodea leptodon*)		X		Concurrence
Rabbitsfoot Mussel (*Leptodea leptodon*)		X		Concurrence

Pondberry (*Lindera melissifolia*)		X		Concurrence
Missouri Bladderpod (*Physaria liformis*)	X			Concurrence
Indiana Bat (*Myotis sodalis*)		X		Concurrence
Northern Long-eared Bat (*Myotis septentrionalis)*		X		Concurrence
Gray Bat *(Myotis grisescens)*		X		Concurrence
Piping Plover (*Charadrius melodus*)		X		Concurrence
Eastern black rail (*Laterallus jamaicensis*)		X		Concurrence
Red Knot (*Calidris canutus*)		X		Concurrence
Whooping Crane (*Grus americana*)		X		Concurrence
Monarch Butterfly (*Danaus plexippus*)		X		Concurrence

[1]DETERMINATION/RESPONSE REQUESTED:
NE = no effect. This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested is optional but a "Concurrence" is recommended for a complete Administrative Record.

NA = not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response Requested is a "Concurrence".

AA = likely to adversely affect. This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested for listed species is "Formal Consultation". Response Requested for proposed or candidate species is "Conference".

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_____
Signature Date

Project Leader, Central Arkansas NWR Complex
Title

IX. Reviewing Ecological Services Office Evaluation:

A. Concurrence ___X__ Non-concurrence _____

B. Formal consultation required _____

C. Conference required _____

D. Informal conference required _____

E. Remarks (attach additional pages as needed):

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_____
Signature/Date

Field Supervisor/Arkansas Ecological Services Field Office
Title/Office

APPENDIX F. FINDING OF NO SIGNIFICANT IMPACT AND DECISION TO IMPLEMENT THE 2021 HUNTING AND FISHING PLANS AT CENTRAL ARKANSAS NATIONAL WILDLIFE REFUGE COMPLEX

The US Fish and Wildlife Service (Service) is to open new hunting and fishing opportunities for several new species on the Complex in accordance with the Central Arkansas NWR Complex 's respective refuges 2021 Hunting and Sport Fishing Plans and establishing legislation and refuge purposes (Table 1). In accordance with the existing Comprehensive Conservation Plans (CCPs) and the EAs and Findings of No Significant Impact (FONSIs) for the CCPs, the Service is updating and replacing the existing hunt and sport fishing plans and existing compatibility determinations (CDs) for five of the six national wildlife refuges (NWRs) in the Central Arkansas NWR Complex (Logan Cave NWR is excluded from this analysis) (USFWS 2009 and 2010).

These additional hunting and fishing seasons and species offer the best opportunity for public hunting that would result in a minimal impact on physical and biological resources, while meeting the Service's mandates under the National Wildlife Refuge System Administration Act (NWRSAA) and Secretarial Order 3356, and aligning with the State of Arkansas's regulations and seasons.

Selected Action

Alternative B—Proposed Action Alternative:

The Central Arkansas NWR Complex manages hunting and fishing on Bald Knob NWR (15,436 acres), Big Lake NWR (10,913 acres), Cache River NWR (73,346 acres), Holla Bend NWR (6,013 acres), and Wapanocca NWR (5,624 acres). Cache River NWR currently has an active land acquisition program, and those anticipated acquisitions are included in this analysis and would be added to the Cache River NWR Hunt and Fish Plan upon acquisition without the development of an additional or amended hunt and fish plan, unless specific conditions or circumstances bar this action. The existing total of 73,346 acres open to hunting on Cache River NWR would increase over time by 213,338 acres up to approximately 286,684 acres, as also analyzed in the LPP (USFWS 2012).

In addition to the current seasons of beaver, coot, coyote, crawfish, dark geese, dove, merganser, duck, feral hog, fish, frogs, light geese, muskrat, nutria, opossum, quail, rabbit, raccoon, snipe, squirrel, teal, turkey, white-tailed deer, and woodcock, Bald Knob and Cache River NWRs will add hunting seasons for sora and Virginia rail, purple and common gallinule, white-winged, Eurasian collared, and rock dove, American and fish crow, striped skunk, red and gray fox, bobcat, river otter, and mink (See Table 3). In addition to the current seasons of beaver, coyote, crawfish, fish, frogs, beaver, nutria, opossum, rabbit, raccoon, squirrel, and white-tailed deer on Big Lake, hunting seasons for modern gun deer, youth gun deer, quail, turkey, feral hog, striped skunk, red and gray fox, bobcat, river otter, mink, and muskrat will occur (See Table 3). On Holla Bend NWR, in addition to current seasons of beaver, bobcat, coyote, fish, frogs, opossum, rabbit, raccoon, squirrel, turkey, and white-tailed deer, additional youth gun deer, black bear, gun squirrel and rabbit, striped skunk, red and gray fox, river otter, mink, muskrat, nutria, quail, and crawfish seasons would be added. On Wapanocca NWR, in addition to current seasons of beaver, coyote, crawfish, feral hog, fish, beaver, nutria, opossum, rabbit, raccoon, squirrel, and white-tailed deer, additional youth gun deer, quail, turkey, striped skunk, red and gray fox, bobcat, river otter, mink, muskrat, and frog seasons will be added (See Table 3). Increased methods of take for fishing and frogging will be offered on Wapanocca NWR (See Table 3). Opportunities for wheelchair-bound hunters and anglers on the Complex would be enhanced by placement of wheelchair-accessible hunting blinds and fishing platforms where suitable.

This alternative was selected over the other alternatives because it offers the best opportunity for public hunting and fishing that would result in a minimal impact on physical and biological resources, while meeting the Service's mandates under the NWRSAA and Secretarial Order 3356, and aligns more fully with the State of Mississippi hunting regulations.

Other Alternatives Considered and Analyzed

Alternative A—[No Action Alternative]

Under Alternative A, hunting and fishing will continue as outlined in the existing respective refuges Sport Hunting and Fishing Plans and associated FONSIs:

- Bald Knob NWR Hunt (USFWS 1995) and Fish (USFWS 1996) Plans;
- Big Lake NWR Hunt (USFWS 1985) and Fish (USFWS 1987) Plans;
- Cache River NWR Hunt (USFWS 1995) and Fish (USFWS 1995) Plans;
- Holla Bend NWR Hunt (USFWS 1980) and Fish (USFWS 1990) Plans; and
- Wapanocca NWR Hunt (USFWS 2007) and Fish (USFWS 1989) Plans.

Opportunities to create additional outdoor recreation experiences by adding additional species would be lost. In addition, the Refuge's ability to connect with certain segments of the public would potentially be diminished since hunting for some popular game species would not be permitted. Hunters would pursue these species off-refuge and thus the Refuge's ability to reach those members of the public and promote natural resources conservation, environmental education and natural resources stewardship may be more limited.

This alternative was not selected, because the existing hunting program at Complex did not align with the State of Arkansas hunting and fishing season structure. Additionally, this alternative does not fully fulfill the Service's mandates under the NWRSAA and Secretarial Order 3356.

Summary of Effects of the Selected Action

An Environmental Assessment (EA) was prepared in compliance with the National Environmental Policy Act (NEPA) to provide decision-making framework that 1) explored a reasonable range of alternatives to meet project objectives, 2) evaluated potential issues and impacts to the refuge, resources and values, and 3) identified mitigation measures to lessen the degree or extent of these impacts. It provided more detailed analysis of the potentially affected natural resources (including hunted migratory game birds, hunted upland game species, hunted big game species, non-target wildlife and aquatic species, threatened and endangered species and other special status species, and habitat and vegetation) and visitor use and experience with no or negligible impacts anticipated for geology and soils, air quality, water quality, floodplains, Wilderness, cultural resources, refuge management and operations, and socioeconomics. The EA is incorporated as part of this finding.

Implementation of the agency's decision would be expected to result in the environmental, social, and economic effects summarized in the EA, particularly tables 4 through 8.

Minor beneficial impacts would be expected for visitor use and experience under Alternative B. The refuges would expect to experience neutral to minor decreases in the depredation rates of songbirds, plants, invertebrates, small mammals, deer fawn, turtles, and other reptiles and amphibians through potential decreases in invasive species and predators. While some habitat disturbance would be expected to continue, the refuges would expect to experience neutral to minor decreases in habitat disturbance and associated erosion concerns resulting from potentially fewer feral hogs and nutria. Despite refuge and partner control efforts and the proposed addition and expansion of hunting, feral hogs would be expected to continue to be present on the refuges. The proposed hunting and fishing activities would be expected to support healthy wildlife populations. Further, neutral impacts would be anticipated for Federally listed species; an Endangered Species Act Section 7 consultation (Appendix D in the 2021-22 Hunting and Fishing Package) was developed with the determination that the Proposed Action would not adversely affect the recovery and/or protection of these species or critical habitat. The refuges limit or exclude hunting activities where there are biological concerns. To meet the requirements of compatibility, the Service could limit or exclude hunting activities on additional portions of the refuges to avoid conflicts related to biological resources, such as threatened or endangered species, if necessary. Special hunts could also be used to manage hunting pressure, provide increased opportunities, and manage overall take at appropriate levels.

This alternative would allow new opportunities as described in the hunting and fishing plans within the Refuges by expanding open areas, seasons and species hunted. These new hunting and fishing opportunities will attract hunters currently not using the Refuge, thus affording an opportunity for the Refuges to engage new segments of the public to promote natural resources conservation, environmental education and natural resources stewardship. Opportunities to create additional outdoor recreation experiences would be consistent with goals and priority uses identified by the National Wildlife Refuge System Improvement Act of 1997 and Secretarial Orders 3347 and 3356. The Service has determined that these changes in the Hunting and Fishing Plans are compatible with the purposes of the Central Arkansas National Wildlife Refuge Complex and the mission of the NWRS.

The Refuge Manager may establish specific regulations for individual species or portions of the Refuges depending on conflicts with other wildlife dependent recreation priorities. Permanent or periodic hunting closures for specific species or closures of portions of the Refuges may be necessary if the Refuge Manager determines that there is specific habitat, wildlife protection and/or public safety requirements. The need to implement mitigation measures will be evaluated annually. All hunting and fishing would be conducted in accordance with all applicable State, Refuge and federal regulations. Coordination with the public and Refuge stakeholders including AGFC will promote continuity and understanding of Refuges and Service resource goals and objectives, and will help assure that the decision-making process takes into account all interests.

Measures to Mitigate and Minimize Adverse Effects

Measures to mitigate and/or minimize adverse effects have been incorporated into the selected action. These measures include:

BIOLOGICAL CONFLICTS

The Refuge minimizes conflict related to biological resources by adopting a “wildlife first” principle explicitly stated in the Refuge Improvement Act. Staff monitors species population trends to ensure that target species can be hunted on the Refuge without adversely affecting the species. These monitoring activities include direct observation of populations, consultation with State and Service species specialists, and review of current species survey information and research.

PUBLIC USE CONFLICTS

In an effort to minimize conflicts with priority non-hunting recreational uses outlined in the Refuge Improvement Act, and for public safety, the Refuge designates areas open to hunting and enforces Refuge-specific regulations. Areas administratively closed to hunting are clearly marked with “No Hunting Zone” or “Area beyond This Sign Closed” signs and/or illustrated in the Refuge hunting brochure map. Overall, hunting impacts to visitor services/recreation opportunities are considered short-term, minor and local. Past conflicts have been minimal and we anticipate future conflicts to be about the same.

Specific measures taken to avoid conflict with non-hunting Refuge visitors include the following. As public use levels on the refuge expand across time, unanticipated conflicts between user groups may occur. The Refuges' Visitor Services programs will be adjusted as needed to eliminate or minimize each problem and provide quality wildlife dependent recreational opportunities that include promoting public safety. Overall, the cumulative impact of hunting on other wildlife-dependent recreation or public safety at the Complex is expected to be minor.

ADMINISTRATIVE CONFLICTS

There is potential for conflict to occur between the hunting public and management activities on the Refuge. During heavy hunter presence periods, Refuge staff (other than law enforcement personnel) typically avoid working in locations where hunters are present. Another potential conflict associated with hunting on the Refuge is between adjacent landowners and the hunting public. Portions of the Refuges are closed to all hunting. These no hunting zones and are clearly illustrated on the Refuges hunting brochure map and marked with "No Hunting Zone" signs. In locations where hunting is allowed the boundaries are posted with refuge boundary signs. Law enforcement personnel work closely with Refuge neighbors on illegal trespass issues and violations of hunting within 100 yards of public dwellings to mitigate these conflicts.

Public Review

The proposal has been thoroughly coordinated with all interested and/or affected parties. The Service sent letters regarding the Draft Hunting and Fishing Plans, draft hunting and fishing compatibility determinations, regulations, and EA to the state of Arkansas in October 2020 and April 2021. Refuge staff will continue to coordinate with AGFC to address annual implementation of hunting activities. The Service also sent letters requesting comments and consultation in October 2020 and follow up emails in April 2021 to:

- Osage Nation;
- Quapaw Tribe;
- Shawnee Tribe;
- Choctaw Nation;
- Jena Band of Choctaw;
- Mississippi Band of Choctaw;
- Chickasaw Nation;
- United Keetoowah Band of Cherokee;
- Muscogee Creek Nation;
- Alabama-Quassarte Tribal Town;
- Kialegee Tribal Town;
- Thlopthlocco Tribal Town;
- Seminole Nation;
- Delaware Tribe;
- Delaware Nation;
- Shawnee Tribe; and
- Stockbridge Munsee Community

The Bald Knob, Big Lake, Cache River, Holla Bend, and Wapanocca NWRs Draft Hunting and Fishing Plans, Environmental Assessment, and Hunting and Fishing Draft Compatibility Determinations were made available for public review and comment from April 14 to July 6, 2021. Notice was posted at the Central Arkansas NWR Complex Headquarters, refuge websites and refuge Facebook pages. Further, an information bulletin announcing the availability of the documents for public review and comment was provided to *Woodruff County Monitor, Town Courier, Daily Citizen, Evening Times, Jonesboro Sun, Monroe County Herald, Prairie County Herald, Wynne Progress, Times Herald, Newport Independent, Log Cabin Democrat, Courier, Dardanelle Post Dispatch*, and *The Democrat Gazette*. Additionally, public comments were requested through the Federal Register process announced on May 4, 2021, and ended on July 6, 2021 (86 FR Number 23794). Eleven members of the general public, the Arkansas Game and Fish Commission, the Friends of Holla Bend National Wildlife Refuge, the Humane Society of the United States (via the Federal Register process), and the Shawnee Tribe of Oklahoma submitted comments and Service responses to these comments are addressed in Appendix D.

Finding of No Significant Impact

While refuges, by their nature, are unique areas protected for conservation of fish, wildlife and habitat, the proposed action will not have a significant impact on refuge resources and uses for several reasons, as listed.

- In the context of local/State/refuge hunting/fishing programs, the proposed action will only result in a harvest of less than 1% of additional species. The Service works closely with the State to ensure that additional species harvested on a refuge are within the limits set by the State to ensure healthy populations of the species for present and future generations of Americans.
- The action will result in beneficial impacts to the human environment, including the biodiversity and ecological integrity of the refuge, as well as the wildlife-dependent recreational opportunities and socioeconomics of the local economy, with only negligible adverse impacts to the human environment as discussed above.
- The adverse direct and indirect effects of the proposed action on air, water, soil, habitat, wildlife, aesthetic/visual resources, and wilderness values are expected to be minor and short-term. The benefits to long-term ecosystem health that these efforts will accomplish far outweigh any of the short-term adverse impacts discussed in this document.
- The NWRS uses an adaptive management approach to all wildlife management on refuges, monitoring and re-evaluating the hunting and fishing opportunities on the refuge on an annual basis. This ensures the hunting and fishing programs continue to contribute to the biodiversity and ecosystem health of the refuge and these opportunities do not contribute to any cumulative impacts to habitat or wildlife from climate change, population growth and development, or local, State, or regional wildlife management.
- The action, along with proposed mitigation measures, will ensure that there is low danger to the health and safety of refuge staff, visitors, and the hunters/fishers themselves.
- The action is not in an ecologically sensitive area;

- The action will not impact any candidate, threatened, or endangered species; or any Federally-designated critical habitat;
- The action will not impact any cultural or historical resources;
- The action will not impact any wilderness areas;
- There is no scientific controversy over the impacts of this action and the impacts of the proposed action are relatively certain.
- The proposal is not expected to have any significant adverse effects on wetlands and floodplains, pursuant to Executive Orders 11990 and 11988.

Based upon a review and evaluation of the information contained in the EA as well as other documents and actions of record affiliated with this proposal, the Service has determined that the proposals to implement the 2021-22 Hunting and Sport Fishing Plans and Hunting and Fishing Compatibility Determinations for the Bald Knob, Big Lake, Cache River, Holla Bend, and Wapanocca NWRs do not constitute major Federal actions significantly affecting the quality of the human environment under the meaning of section 102 (2) (c) of the National Environmental Policy Act of 1969 (as amended). As such, an environmental impact statement is not required.

Decision

The Service has decided to implement the 2021-22 Hunting and Fishing Package for the Central Arkansas National Wildlife Refuge Complex, including Bald Knob, Big Lake, Cache River, Holla Bend, and Wapanocca NWRs.

This action is compatible with the purposes of the refuges and the mission of the National Wildlife Refuge System. See the attached compatibility determinations for Central Arkansas NWR Complex (Appendix B and C in the 2021-22 Hunting and Fishing Package).

The action is consistent with applicable laws and policies.

BRETT HUNTER Digitally signed by BRETT HUNTER
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Signature, Title Date