



U.S. Fish and Wildlife Service

Felsenthal National Wildlife Refuge
Big Game, Upland Game, Waterfowl and
Migratory Bird Hunting Plan and
Environmental Assessment
August 2021



View of Felsenthal Pool – Charles Harrelson, USFWS

Section I. HUNT PLAN

Felsenthal National Wildlife Refuge

Big Game, Upland Game, Waterfowl and Migratory Bird Hunt Plan

August, 2021

U.S. Fish and Wildlife Service

Felsenthal National Wildlife Refuge
5531 Highway 82 West
Crossett, AR 71635

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Chapter I. Introduction

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 National Wildlife Refuge System Administration Act of 1966 (NWRSA), as amended by the National Wildlife Refuge System Improvement Act of 1997 (NWRSA, Improvement Act), Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations and Fish and Wildlife Service Manual.

Felsenthal National Wildlife Refuge (NWR or refuge) was established by the Federal Property and Administrative Service Act of 1949 (40 U.S.C. 471-535), as amended; Fish and Wildlife Coordination Act of 1934 (16 U.S.C. 661-666c) as amended; Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j Stat. 1119) as amended; the Act of May 19, 1948, Public Law 80-537 (16 U.S.C. 667b-667d; 62 Stat. 240) as amended; and The National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended.

In order to meet specific Refuge and other broader U.S. Fish and Wildlife Service (Service) directives, the following purposes were established for Felsenthal NWR:

The Refuge's official purpose statement is:

- [Fish and Wildlife Coordination Act 16 U.S.C. § 664](#) "... shall be administered by him [Secretary of the Interior] directly or in accordance with cooperative agreements ... and in accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon ..."
- [Acquisition of Lands for Recreational Development 16 U.S.C. § 460k-1](#) "... suitable for incidental fish and wildlife-oriented recreational development; the protection of natural resources; and the conservation of endangered species or threatened species ..."
- [Refuge Recreation Act \(16 U.S.C. § 460k-460k-4\), as amended 16 U.S.C. § 460k-2](#) "... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..."

Felsenthal NWR is located in Ashley, Bradley, and Union Counties, Arkansas, about 5 miles west of Crossett, Arkansas on U.S. Highway 82 (Figure 1). Felsenthal NWR is one of four refuges forming an administrative complex, which also includes Pond Creek NWR to the northwest, and Overflow NWR to the east. Upper Ouachita NWR in Louisiana makes up the southern boundary

of Felsenthal NWR. Figure 2 shows the conservation areas surrounding the refuge.

Felsenthal NWR was officially opened to hunting of resident wildlife species and waterfowl in September 1978. In 1988, the refuge hunt plan and associated environmental documents (environmental assessment and section 7) were updated (USFWS 1988). Also the Felsenthal NWR Comprehensive Conservation Plan (CCP) identified hunting as an important priority for the refuge (USFWS 2010a). General hunt map (Figure 3) is located below.

The mission of the NWRS, as outlined by the NWRSAA, as amended by the NWRSIA (16 U.S.C. 668dd et seq.), 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 NWRSAA mandates the Secretary of the Interior in administering the System to (16 U.S.C. 668dd(a)(4):

- 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.

Figure 1. Location of Felsenthal National Wildlife Refuge, Crossett, Arkansas.

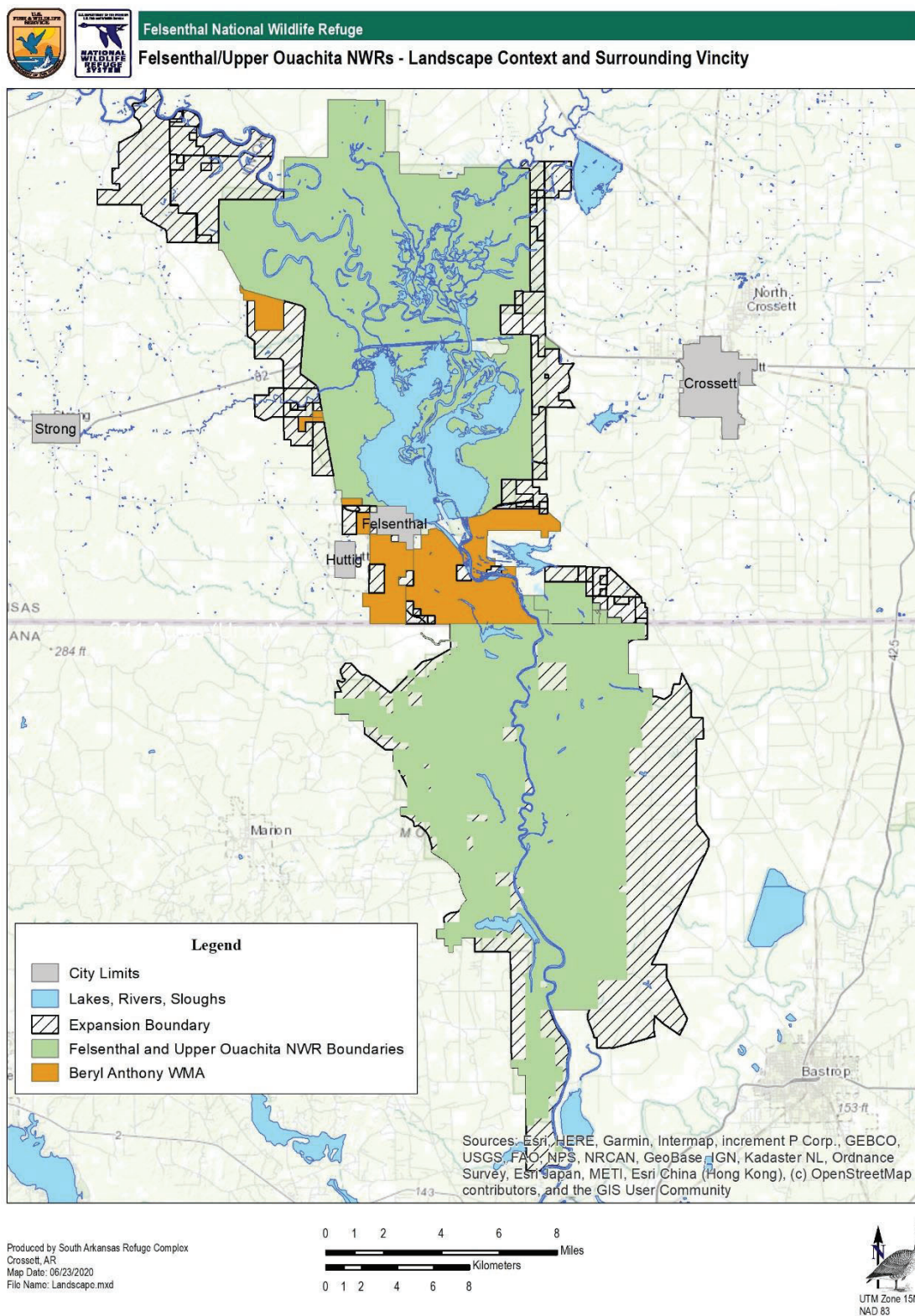


Figure 2. Conservation Lands Adjacent to or Near Felsenthal National Wildlife Refuge, Arkansas.

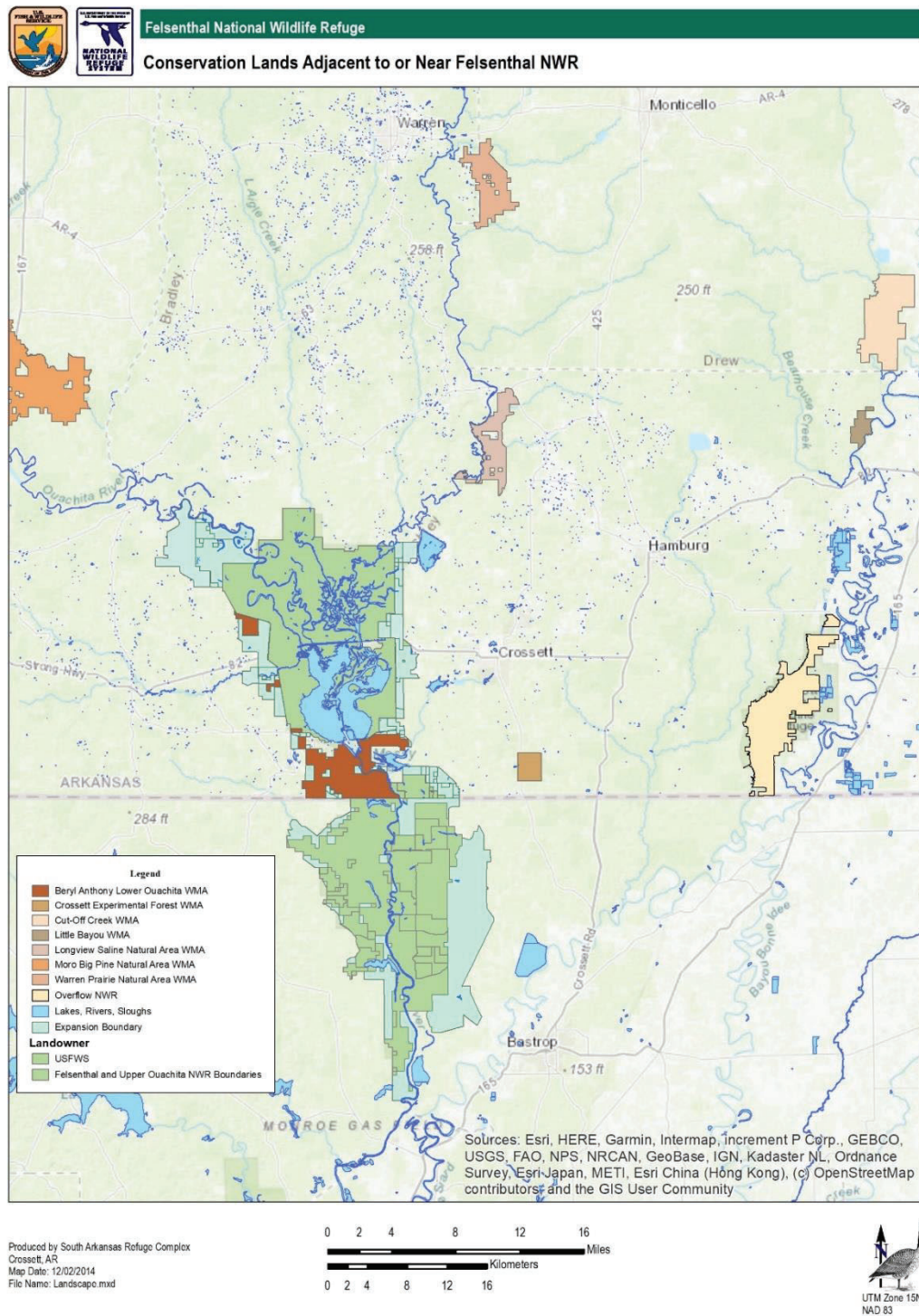


Figure 3. General Hunt Map of Felsenthal National Wildlife Refuge, Arkansas.

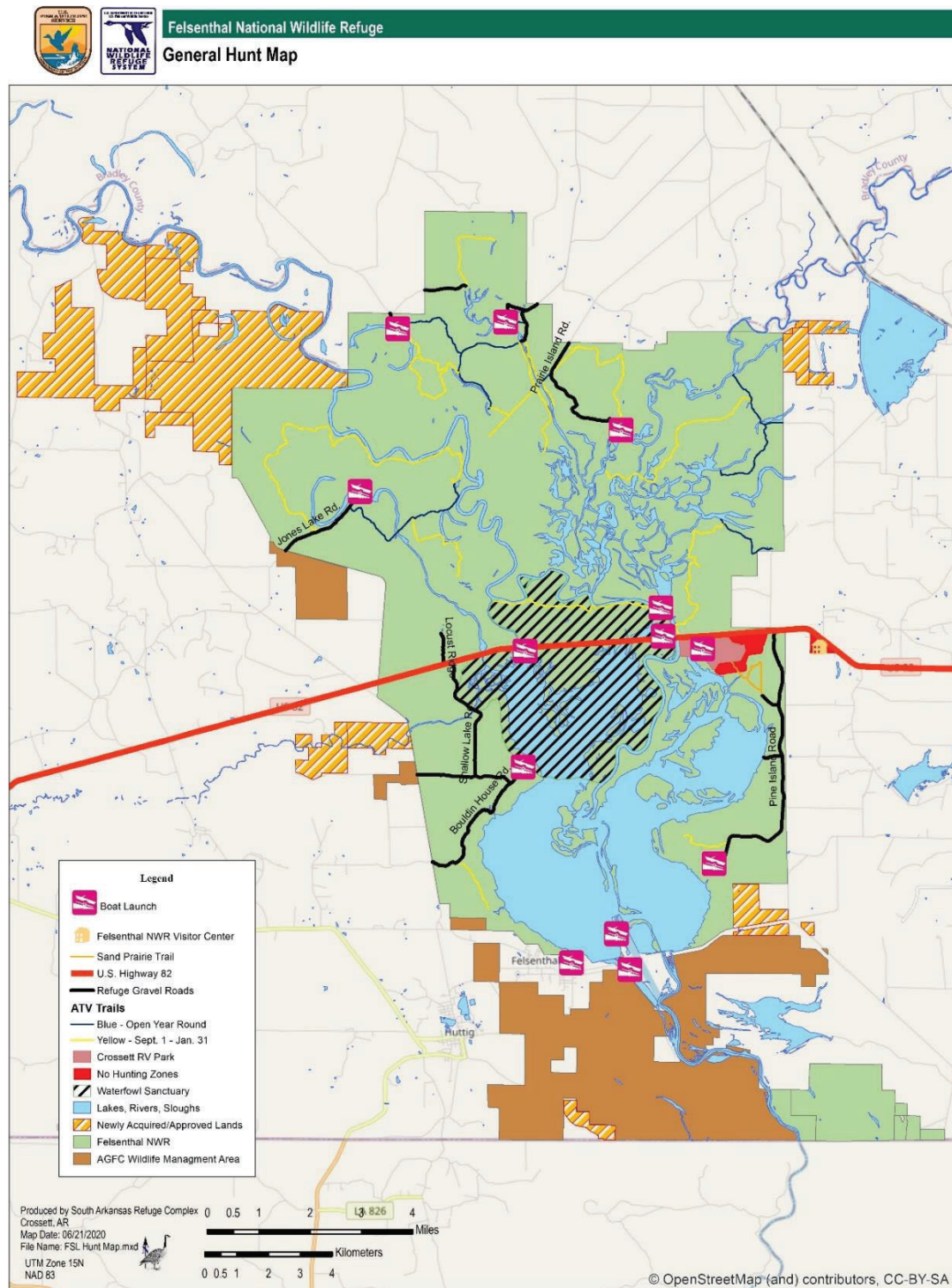
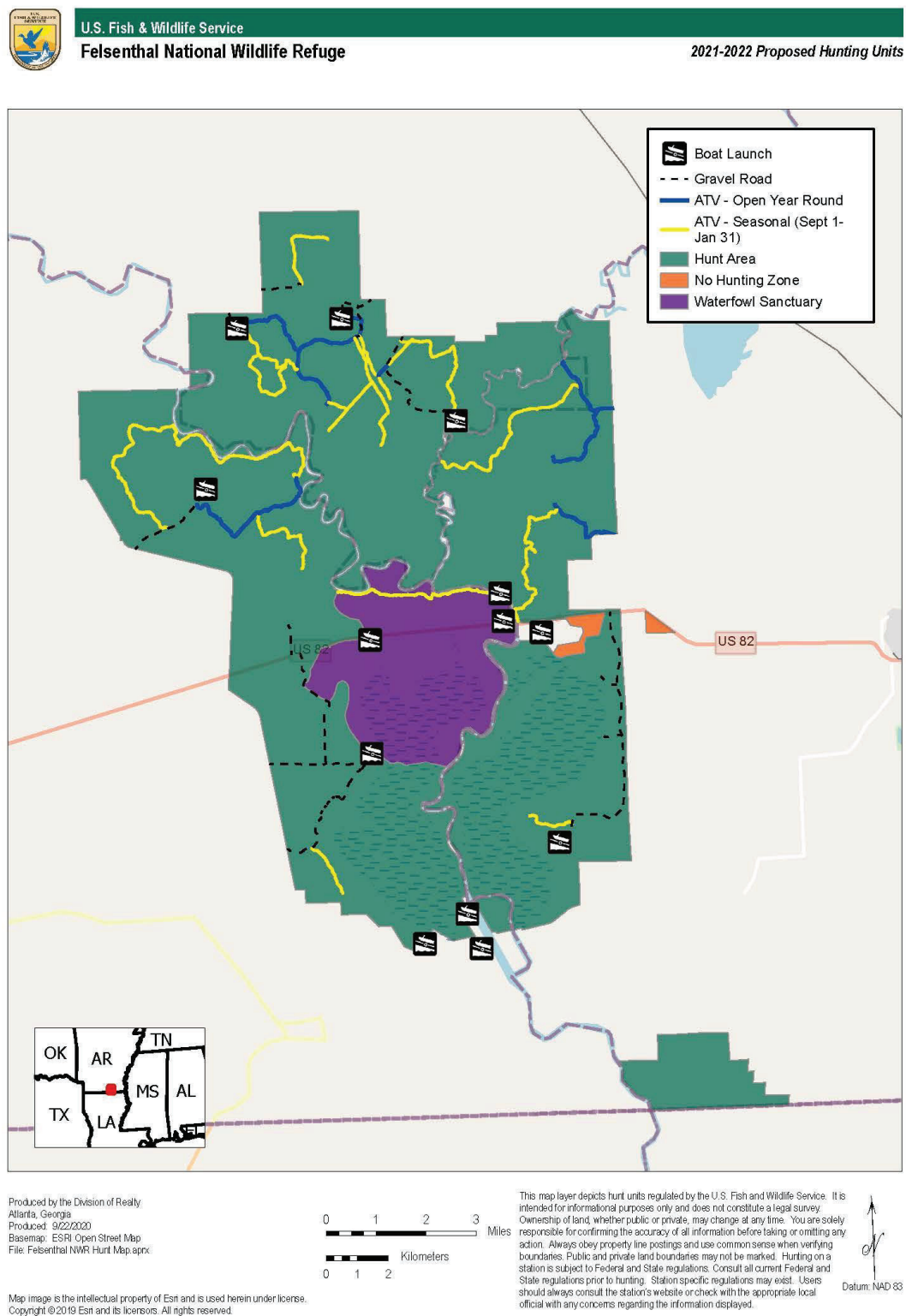


Figure 4. Felsenthal NWR Hunt Units.



Chapter II. Statement of Objectives

Biologically sound, compatible hunting is a priority public use of the Refuge, when compatible, as outlined by the Improvement Act. However, there are times/periods when hunting on some sites will need to be curtailed due to lack of refuge personnel, safety reasons, need for sanctuary sites for certain wildlife, and lack of sufficient land acres.

Conducting a well-managed hunt on Felsenthal NWR will assist the refuge in meeting primary objectives that includes providing the public with quality wildlife-oriented recreational programs that are compatible with the purposes for which the refuge was established.

The refuge provides numerous hunting opportunities for the public for both migratory and resident wildlife species. Hunters have the opportunity to hunt squirrel, rabbit, quail, woodcock, waterfowl (duck including merganser, light and dark geese, coot), deer, raccoon, opossum, and turkey. The refuge offers a wide range of deer hunting opportunities for those using archery, muzzleloader, and modern gun, as well as special opportunities for youth hunters with access available to most portions of the refuge.

Strategies include:

1. Utilize quotas, permits, period limitations, etc., as needed to improve the quality and safety of hunting activities.
2. Provide hunting as priority public use as part of a compatible wildlife-dependent recreation program.
3. Provide the public with an opportunity to use a valuable renewable resource by legitimate and traditional methods.
4. Maintain wildlife populations at levels compatible with habitat carrying capacities.

Goals describe the desired future condition of the refuge and provide a framework for what the refuge is trying to accomplish in adopting a Habitat Management Plan (HMP). The visitor services goal were developed earlier in the comprehensive conservation planning process, which helped, focus our thinking about management actions. The goal outlined in the CCP is described below (USFWS 2010a).

Visitor Services

CCP Goal 3. *Provide wildlife-dependent public use opportunities consistent with the Refuge System mission that leads to greater understanding and enjoyment of fish, wildlife, and their habitats on the Complex.*

The Improvement Act states that compatible wildlife-dependent recreational uses are the priority public uses of the Refuge System (e.g., hunting, fishing, wildlife observation, wildlife

photography, and environmental education and interpretation) and will receive enhanced consideration over the other general public uses. The Service will permit other uses only when they have been proven to be both appropriate and compatible (see 605 FW 1, General Guidance, and 603 FW 1, Appropriate Refuge Uses).

A variety of public use opportunities are available on the Felsenthal NWR. The refuge annually averages approximately 380,000 visitors.

CCP Objective 3.2: Hunting - Over the 15-year life of this CCP, continue to provide appropriate hunting opportunities that allow for quality public recreation and are compatible with refuge purposes.

Chapter III. Description of Hunting Program

The refuge hunt plan to be implemented, is consistent with sound biological principles of wildlife management, and achieves the desired outcome of providing quality recreational opportunities for the public, while adhering to current and future agency and statutory guidance such as maintaining naturally occurring diversity, population levels, and age/sex structure within refuge wildlife populations. Strict adherence to these standards is of the highest priority and essential in order to maintain a compatible refuge hunting program. It is the expressed intent of this document that the Felsenthal NWR hunting program contributes to the Service mission, NWRS mission, refuge purposes, and refuge goals and objectives.

Important game species to be considered by the Felsenthal NWR hunt program are listed below and can be found throughout various habitats of the refuge. These include big game (white-tailed deer, eastern wild turkey), small game (gray and fox squirrels, eastern cottontail and swamp rabbits, raccoon, opossum, quail), and migratory birds (ducks, coots, geese, woodcock, mergansers). To achieve the objectives set forth by this plan, on occasion, it may be necessary to deviate from state season structures, adjust bag limits or implement other restrictions. Determinations will be based on decisions formulated from annual evaluations of public use levels, wildlife population levels, and time/space zoning. Adjustments will be made to ensure achievement of the primary goal of the NWRS.

Annual consultation with Arkansas Game and Fish Commission (AGFC) will occur to ensure that any proposed changes in the hunting season structure or related regulations are properly coordinated. Several AGFC commission meetings are held throughout the year to conduct commission business, and establish various hunt seasons and regulations. Coordination of proposed changes will occur prior to the appropriate AGFC commission meeting.

Establishment of a refuge hunt program will authorize public hunting of all game species identified within the plan, and include all lands currently owned by the refuge except areas specifically noted as closed. Those lands congressionally authorized for purchase will also be subject to hunting seasons and structure proposed by this document once they have been incorporated into the refuge. As annual evaluations are conducted and changes occur across time (i.e. increased public use, completion of public use infrastructure or intense management of units for specific species), closure of additional areas may be deemed necessary and will remain an option to ensure that all refuge program goals and objectives are met.

A. Areas to be Opened to Hunting

Under state and refuge specific seasons, 76,114 acres will be open to hunting. Included in the above acreage is the newly acquired and approved for acquisition lands (9,277 acres) (Figure 3) which is primarily bottomland hardwood forest and subject to periodic flooding. These lands will be open to hunting beginning in the 2021-22 hunt season. In addition, the approved acquisition boundary has approximately 28,202 acres remaining to be acquired. As these lands are acquired, they would be open to hunting as outlined in this plan.

The refuge has two hunt units (Figure 4). The Refuge Hunt Area is open to all listed in this plan and the refuge public use regulations brochure. The Waterfowl Sanctuary closes annually to all public entry from November 15 thru February 15. The Waterfowl Sanctuary is open to public hunting outside those dates including fall teal season.

Only two areas within refuge boundary are closed to hunting, RV Park No Hunt Zone (235 acres) and Visitor Center No Hunt Zone (89 acres) for a total of 324 acres (Figure 3 & 4). These two areas are closed for safety reasons. The Crossett RV Park has year round campers. The visitor center is the administrative facility for the refuge and it serves as meeting and learning center for school groups, civic organizations, etc.

B. Species to be taken, hunting periods, hunting access

This section describes the species to be hunted, hunting seasons for each and hunter access to refuge hunt units.

1. Migratory Game Birds

Migratory bird hunting includes ducks, geese, coots, mergansers and woodcock. The hunting period for migratory birds will be consistent with AGFC season framework and regulations with any exceptions noted below. The use of non-toxic shot is required while hunting migratory birds on refuge lands. The use of dogs is permissible for the purpose of retrieving migratory birds, and for the pursuit of woodcock.

a. Ducks, Geese, Coot, and Mergansers

The refuge is open to waterfowl hunting during the State Duck and Teal Seasons (including the state Youth Hunts). Geese and Coots can be taken during the state duck season when state seasons for those species are open. Waterfowl hunting occurs on 15,150 acres of open water (Felsenthal pool, backwater sloughs, cypress brakes, and oxbow lakes) and when flooded, nearly 51,000 acres of bottomland hardwoods. It should be noted even the refuge's upland areas are subject to periodic flooding and may be accessible to waterfowl hunters. Hunters may not enter the hunting areas before 4 am. Hunting ends at noon daily. September teal season shooting hours are from sunrise until noon.

The waterfowl sanctuary (6,910 acres) is closed November 15 thru February 15 to all public access (Figure 3). The sanctuary is open to authorized users during the September teal season.

b. Woodcock

The refuge is open to woodcock hunting during the State season and State bag limits apply. Woodcock hunting is closed during the quota deer muzzleloader and gun hunts. Woodcock hunting can take place anywhere within the 76,114 acres open to hunting.

2. Big Game

Big game hunting includes white-tailed deer and wild turkey. The hunting period for big game relating to white-tailed deer and wild turkey will be consistent with AGFC season framework, bag limits, and regulations with the following exceptions noted below. Possession, placement or hunting over bait, salt, minerals or other ingestible attractants and deer drives are not permitted.

Modification of big game hunting may occur over time, as warranted by biological and/or excessive hunter participation, which is determined through the annual evaluation process.

a. White-tailed Deer

The archery/crossbow season is open at the beginning of the state season thru January 31 and closed during the quota muzzleloader and modern gun seasons. Either sex can be harvested; however, a doe must be harvested on the refuge and checked before harvesting a buck. Currently the bag limit for deer is 2 does or 1 buck and 1 doe, regardless of method. Archery/crossbow hunting can take place on any of the 76,114 acres open to hunting except on the 6,910-acre waterfowl sanctuary when it closes on November 15.

Muzzleloader season is open for five days, generally the first five days of the State

season. Either sex can be harvested; however, a doe must be harvested on the refuge and checked before harvesting a buck. Currently the bag limit for deer is 2 does or 1 buck and 1 doe, regardless of method. The entire 76,114 acres of the refuge open to hunting is open to muzzleloader hunting. The maximum number of muzzleloader hunters is currently 500. As land is acquired the number of hunters in the quota system will increase. The refuge may operate check stations to collect data on harvested deer. Harvested deer must be checked with AGFC.

Modern gun season occurs on the 76,114 acres open to hunting, and consists of four days within the State season. Either sex can be harvested; however, a doe must be harvested on the refuge and checked before harvesting a buck. Currently the bag limit for deer is 2 does or 1 buck and 1 doe, regardless of method. Currently 550 modern gun hunters are selected through the lottery system. As land is acquired, the quota hunt numbers will increase. The refuge may operate check stations to collect data on harvested deer. Harvested deer must be checked with AGFC.

Youth modern gun hunt is an open hunt (no quota permit required). Youth hunt is restricted to youth 15 years of age and younger (age at opening of statewide youth deer season) accompanied by one adult 21 years or older. Archery, crossbow, and muzzleloader are permitted. The total deer harvested refuge wide is 2 deer (2 does or 1 buck and 1 doe). Youth hunting is available on all 76,114 acres of the refuge open to hunting.

b. Eastern Wild Turkey

The turkey archery/crossbow season is open during the State's spring season in Zone 9. Archery turkey hunting is closed during the quota turkey gun season on the refuge. State bag limits apply. Turkey hunting occurs primarily in the upland areas of the refuge but can occur in bottomland hardwood forest depending of floodwaters.

The turkey modern gun season can occur on the 76,114 acres of the refuge open to hunting but is primarily concentrated in the upland areas of the refuge because of spring flooding. Modern turkey hunt consists of the first three days of the state season (zone 9). A quota permit is required and is limited to 50 hunters. As land is acquired; the number of quota permits will also increase. Harvested turkeys must be checked in accordance with state turkey hunt regulations. Currently, the bag limit is one bearded turkey, no jakes.

The modern gun youth turkey quota hunt is the first two days of the State youth season and a quota permit is required with a limit of 50 hunters. Hunting is refuge-wide (76,114 acres). Youth hunts are restricted to individuals 15 years of age and younger (age at opening of state-wide youth turkey season) accompanied by one adult 21 years or older. Bag limit is one bearded turkey. Harvested turkeys must be checked in

accordance with state turkey hunt regulations.

3. Small Game

Small game hunting includes squirrel, rabbit, raccoon, opossum, and quail. The use of dogs is permitted in the pursuit of small game. The hunting period for small game will be consistent with AGFC season framework and regulations with the following exceptions listed below. Squirrel, rabbit, raccoon, opossum, and quail hunting will be closed during all refuge modern gun and muzzleloader deer hunts. Small game hunting requires the use of non-toxic shot (exception, rim-fire ammunition) and may not be hunted with center-fire weapons. The use of electronic calls is not permitted.

a. Rabbit and Squirrel

Hunting of rabbit and squirrel is permitted on 76,114 acres of the refuge from September 1 to January 31. The spring squirrel season is closed. The use of dogs is allowed from December 1 to January 31. Rabbit and squirrel hunting is closed in the waterfowl sanctuary (November 15 thru January 31).

b. Raccoon and opossum

Hunting of raccoon and opossum is permitted on 76,114 acres of the refuge from midnight of the last of the modern gun hunt thru January 31. The use of dogs is required during hours of darkness. Waterfowl Sanctuary is closed to raccoon and opossum hunting.

c. Quail

Quail hunting occurs primarily in the refuge's upland habitats. The season runs from November 1 to January 31.

4. Incidental Take Species

a. Beaver, nutria, and coyote

Beaver, nutria and coyote may be taken incidental to any daytime refuge hunt without the use of dogs. Hunters may use legal hunting equipment and ammunition allowed for that hunt only and there is no bag limit. Incidental take is allowed on all 76,114 acres.

b. Feral Swine

In accordance with Arkansas Game and Fish Commission regulations concerning the taking of feral swine on WMAs, feral hogs may be taken incidental to any daytime refuge hunt (without the use of dogs) with legal hunting equipment and ammunition allowed for that hunt. No bag limit. Live hogs may not be transported or possessed.

There are over 100 access points across the refuge from public and private sources. Our

analysis demonstrates that 62% of the refuge is located within 1/2 mile of a public road and 91% within 1 mile of refuge public roads. This analysis did not include ATV/UTV trails, hiking trails, or maintenance/logging roads. The refuge currently has 53.3 miles of ATV/UTV trails (See the 2016 ATV/UTV compatibility determination for additional information). In addition, the refuge has seven primitive camping areas and nine boat ramps and associated parking areas. Three additional boat ramps with parking reside adjacent to the refuge providing additional access points to the refuge.

C. Hunt Permit Requirements

Hunting will be subject to federal, state, and refuge-specific regulations and occur within the State season framework, unless otherwise approved by AGFC. Refer to the annual Felsenthal NWR Public Use Brochure for regulations on hunting within the refuge.

When hunting on Felsenthal NWR, users will be required to have in their possession a copy of the current Felsenthal NWR Public Use Regulations brochure which they have signed, and if applicable, an additional quota hunt permit. The leaflet will serve as a refuge access permit and will be updated each year. It will inform hunters of current refuge regulations, safety zones, and other pertinent information for the current year's hunt. It will be available in the information boxes at the refuge entrance, from the refuge office, or on the refuge's Web site.

Except for the quota hunts, permits will be free and not limited in number. For the quota deer and turkey hunts, permit, application, and processing fees will be charged and the number of permits will be limited to reduce potential hunter conflict, ensure a high-quality hunt, and/or achieve a management objective.

In addition to the Refuge Access permit, special hunts such as those that are a quota require an additional permit. Individuals seeking to apply for a Quota Hunt Permit may do so on-line by visiting the website. Fees apply for applications and permits. A drawing is held prior to the hunting seasons. Out of the total number of hunt applications received; only a certain number (predetermined quota) are drawn.

Deer and Turkey Quota Hunt Permits are issued via a lottery system where participants must apply before a deadline to be eligible for the hunt. The process is facilitated by a third-party vendor allowing accessibility and transparency to users. All applicants are subject to a \$5.00 non-refundable application fee for quota hunts. Successful applicants will be charged an additional \$15.00 per permit fee.

D. Consultation and Coordination with the State.

Felsenthal NWR staff work cooperatively and regularly on various projects with staff from the AGFC. Hunting opportunities on the refuge are generally designed to comply with seasons, limits, and legal weapons in Arkansas. Refuge management and biological staff meet annually with AGFC representatives to discuss current issues, status of hunts, and any proposed changes to regulations.

The AGFC provided input and received concurrence on 2017 hunt plan updates. AGFC is notified of proposed changes to the refuge hunt program including the additional acreage and invited to review draft changes and provide input. Felsenthal NWR and AGFC will continue to work together to ensure safe and enjoyable recreational hunting opportunities.

E. Law Enforcement

Enforcement of refuge violations normally associated with management of a NWR is the responsibility of commissioned Refuge Law Enforcement Officers. Other refuge officers, Special Agents, State game wardens, and the local Sheriff's Department often assist the Felsenthal NWR's full time law enforcement officer.

The following methods are used to control and enforce hunting regulations:

- Refuge and hunt area boundaries will be clearly posted;
- The refuge will provide a brochure that shows hunt areas;
- Felsenthal NWR law enforcement staff will randomly check hunters for compliance with Federal and State Laws, as well as refuge-specific regulations pertinent to hunting, including compatibility stipulations;
- Service Officers and/or Felsenthal NWR law enforcement staff will coordinate with AGFC and other law enforcement agencies; and
- Information will be made available at the Felsenthal NWR Visitor Center and website ([Felsenthal NWR Web Site https://www.fws.gov/refuge/felsenthal/](https://www.fws.gov/refuge/felsenthal/)).

Procedures for obtaining law enforcement assistance are based on legal jurisdiction, pending where an incident occurred. The Felsenthal NWR law enforcement officer has met with local law enforcement agencies in the three counties in which the refuge resides to develop good working relationships and coordinate appropriate strategies.

F. Funding and Staffing Requirements

Annual hunt administration costs include salaries, brochure printing, equipment, boundary maintenance, signs, paint, access maintenance (roads, parking areas, trails. etc.), fuel, costs associated with mobility impaired hunter access, etc. Total estimated cost for the refuge hunt program is \$77,818. The majority of these costs are salary-related and considered administrative in nature. These costs are equivalent to approximately 1.0 full time staff.

Hunting is a priority refuge use and an important component of meeting refuge objectives and goals. Current staffing and funding are available to meet the requirements of a quality-hunting program. It is anticipated that adequate funding would continue to be sufficient to maintain these standards set in future years.

The Refuge Recreation Act requires that funds are available for the development, operation, and maintenance of the permitted forms of recreation. The permit fee (\$15 for deer & turkey), and preseason application fee (\$5/hunter) are the minimal amounts needed to offset the cost of facilitating the preseason application, drawings, and permitting of the quota hunts. Preseason drawings are administered by a contracted company that collect information and required fees, conduct the drawing, and issue the permits. Refuge staff will work with the contractor to provide the highest level of customer support.

Refuge staff will prepare and edit the refuge public use regulations brochure annually, make changes to the hunt plan and regulations as needed, prepare annual output reports, and respond to public inquiries about the hunt program.

Law enforcement staffing is essential. Currently, the refuge has one law enforcement officer. AGFC also regularly assists with our law enforcement needs.

In Tables 1 and 2 below are the cost analysis and breakdown of the funding required to administer and manage each hunting program.

Table 1. Hunter Participation Estimates

Permits	Deer - Muzzle Loader	Deer - Gun	Waterfowl	Turkey	Small Game
# Preseason Applicants*	425	761	n/a	229	n/a
Total Permits	430	550	n/a	78	n/a

*Annual applicants and permit numbers may vary.

Table 2. Hunting Program Cost Summary

<u>Program</u>	<u>Non LE Staff Days</u>	<u>Cost (GS-12 Step 1 (\$36.76/hr)</u>	<u>Incidental Costs*</u>	<u>Recovery (100%)</u>
Big Game - Deer	18	\$5,293	\$4,000	\$19,880
Big Game – Turkey (includes youth hunts)	3	\$882	\$1,200	\$2,315

Small Game	2	\$588	\$1,000	\$0
Waterfowl	15	\$4,411	\$2,500	\$0
Other	5	\$1470	\$550	\$0
Total	43	\$12,644	\$9,300	\$22,195

*Incidental Costs include brochures, third party vendor, fuel, signs, etc.

The refuge hunting program has additional costs to consider. Refuge law enforcement adds another \$54,000 to the refuge hunt program costs.

In addition, the refuge also relies on volunteers to assist with management activities such as the hunt program. They contribute through working at check stations and facility maintenance. These contributions for all hunting programs combined can provide an estimated benefit (\$16.73/hour /GS-5) of 112 hours = \$1,874 or greater depending on the year.

The total cost of the refuge hunting program combined: Staff Time (\$68,518) & Actual Expenditures (\$9,300) = \$77,818

Recovery is the revenue generated by permit and application fees from hunters participating in refuge hunting activities. Regulations for the fee program allow the refuge to retain 100 percent of the total fees collected. Special permitting for hunts on Felsenthal NWR date back to 1983 when for the first time, a limited number of antlerless deer permits were offered. In 1985, both the modern gun and muzzleloader hunts followed suit offering a limited number of permits where hunters applied and were randomly drawn to receive a permit. In 1991, the first fee was set at \$10/permit as the refuge tried a new computerized software method of selecting applicants for permits. Shortly after, the fee was increased to \$12.50 per permit for all quota permits, deer and turkey. It was not until 2015 that the refuge had to increase fees to offset the administrative cost of the hunts. Today, applicants are subject to a \$5.00 non-refundable application fee for quota hunts and successful applicants are charged an additional \$15.00 per permit fee.

Description of Facilities and Infrastructure

Felsenthal NWR currently has minimal infrastructure, which includes the enhancement of existing boat ramps, parking areas, and placement of informational signs to support hunting on the refuge. There would be some costs associated with a hunting program in the form of road maintenance and boat ramp maintenance. These costs should be minimal relative to total

refuge operations and maintenance costs and would not diminish resources dedicated to other refuge management programs. Maintenance of facilities used by hunters (roads, parking lots, trails, and boat launching ramps) will be addressed with the refuge's deferred maintenance budget.

Chapter IV. Conduct of the Hunting Program

A. Hunter Permit Application, Selection, and/or Registration Procedures

When hunting on Felsenthal NWR, hunters will be required to have in their possession a copy of the current Felsenthal NWR Public Use Regulations brochure which they have signed, and if applicable, a quota hunt permit. The brochure will serve as a refuge hunting permit and will be updated annually. It will inform hunters of current refuge regulations, safety zones, and other pertinent information for the current year's hunt. It will be available at the refuge office, refuge website, and in the information boxes at various refuge entrances.

Except for the quota hunts, permits will be free and not limited in number. For the quota deer and turkey hunts, permit, application, and processing fees will be charged and the number of permits will be limited to reduce potential hunter conflict, ensure a high-quality hunt, and/or achieve management objectives.

As part of our Special Uses' policy, users with mobility limitations may be granted privileged access on Felsenthal NWR with a Mobility Impaired Access Permit. On average, 15-20 permits are issued each year by the refuge for the mobility impaired. To obtain a special use permit, users must already possess the AGFC Mobility Impaired Permit. The permit comes with a sticker to be placed on the ATV/UTV. Such permits authorize access on the Refuge with the following Special Conditions.

1. Hunt from a stationary ATV/UTV on designated trails.
2. Retrieve game in the most direct and most forthright manner.
3. Disturbance to vegetation, wildlife, and other refuge visitors must be kept to a minimum.
4. The maximum distance from a designated ATV/UTV trail, road, or campground is 100 yards.
5. There is a one person limit for assistance and may only use/ride the permittee's ATV/UTV.
6. While traversing the refuge, you must possess a signed copy of the permit. Also, the included sticker must be visible and permanently affixed to the ATV/UTV that belongs to the permittee.

B. Hunter Application and Registration Procedures (if applicable)

Hunter application and registration is required for all quota hunts on refuge in addition to the Refuge Access permit. Individuals seeking to apply for a Quota Hunt Permit may do so on-line. Fees apply for quota hunt applications and permits only. A drawing for quota hunts is held prior to the hunting seasons and a predetermined number of applicants will be selected from the total number of received hunt applications.

1. **Waterfowl, woodcock, archery deer and turkey, youth deer, rabbit, squirrel, raccoon, opossum, quail, and incidental take species (feral hogs, coyote, beaver, and nutria):** These hunts are open to all eligible hunters, with proper state licenses, who have obtained a Refuge Public Use Regulations Brochure. There is no check-in/check-out required.
2. **Quota Deer Modern Gun:** Quota hunt procedures can be located in the refuge public use regulations brochure or online at [Felsenthal National Wildlife Refuge Public Use Regulations Brochure https://www.fws.gov/refuge/felsenthal/](https://www.fws.gov/refuge/felsenthal/). This is a quota hunt that requires hunters to submit a FWS Form (3-2355) online by the deadline outlined in the refuge public regulation brochure. An application fee is required. In addition selected hunters must have proper state licenses and have obtained a Refuge Public Use Regulations Brochure. There is no check-in/check-out required.
3. **Quota Deer Muzzleloader:** Quota hunt procedures can be located in the refuge public use regulations brochure or online at [Felsenthal National Wildlife Refuge Public Use Regulations Brochure https://www.fws.gov/refuge/felsenthal/](https://www.fws.gov/refuge/felsenthal/). This is a quota hunt that requires hunters to submit a FWS Form (3-2355) online by the deadline outlined in the refuge public regulation brochure. An application fee is required. In addition selected hunters must have proper state licenses and have obtained a Refuge Public Use Regulations Brochure. There is no check-in/check-out required.
4. **Quota Adult and Youth Turkey Gun:** Quota hunt procedures can be located in the refuge public use regulations brochure or online at [Felsenthal National Wildlife Refuge Public Use Regulations Brochure https://www.fws.gov/refuge/felsenthal/](https://www.fws.gov/refuge/felsenthal/). This is a quota hunt that requires hunters to submit a FWS Form (3-2355) online by the deadline outlined in the refuge public regulation brochure. An application fee is required. In addition selected hunters must have the proper state licenses and have obtained a Refuge Public Use Regulations Brochure. There is no check-in/check-out required.

C. Refuge Specific Hunting Regulations

Listed below are refuge-specific regulations that pertain to Felsenthal NWR as of the date of this plan. These regulations may be modified as conditions change or if refuge expansion continues/occurs.

(1) *Migratory game bird hunting.* We allow hunting of American woodcock, duck, light and dark goose, merganser, and coot on designated areas of the refuge subject to the following conditions:

(i) Hunters and anglers must possess and carry a signed refuge public use brochure while hunting or fishing.

(ii) Waterfowl hunters may enter the refuge beginning at 4 a.m. We allow waterfowl hunting until 12 p.m. (noon).

(iii) Hunters must remove decoys, blinds, boats, and all other equipment by 1 p.m. each day (see §27.93 of this chapter).

(iv) We close areas of the refuge posted with “Area Closed” signs and identify them on the refuge public use brochure map as a waterfowl sanctuary. We close waterfowl sanctuaries to all public entry and public use from November 15 to February 15.

(v) We allow hunting of duck, light and dark goose, merganser, and coot during the State waterfowl season except during scheduled refuge quota gun deer hunts.

(vi) We allow American woodcock hunting during the State season except during scheduled refuge quota hunts. Woodcock hunters may enter the refuge beginning at 4 a.m. and must exit by 1 hour after legal sunset.

(vii) All youth hunters age 15 and younger must remain within sight and normal voice contact of an adult age 21 or older who possesses a valid State hunting license. One adult may supervise no more than two youth hunters.

(viii) We allow only all-terrain vehicles/utility-type vehicles (ATVs/UTVs) for hunting and fishing activities according to regulations provided in the refuge public use brochure.

(ix) You may use bikes, horses, and mules on roads and ATV/UTV trails (when open to motor vehicle and ATV/UTV traffic, respectively) as a mode of transportation for hunting and fishing activities on the refuge except during the quota deer hunts.

(x) We prohibit hunting within 150 feet (45 meters) of roads, pipelines, and trails open to motor vehicle use (including ATV/UTV trails).

(xi) We allow the incidental take of beaver, nutria, and coyote during any daytime refuge hunt with weapons and ammunition allowed for that hunt. There is no bag limit.

(xii) We allow the use of dogs when hunting.

(2) *Upland game hunting.* We allow hunting of quail, squirrel, rabbit, raccoon, and opossum (as governed by State law), and incidental take of beaver, nutria, and coyote, on designated areas of the refuge subject to the following conditions:

(i) The conditions set forth at paragraphs (e)(1)(i), (iv), and (vii) through (xi) of this section apply.

(ii) We allow hunting for quail, squirrel, rabbit, raccoon, and opossum on the refuge during State seasons through January 31. We close upland game hunting during refuge quota gun deer hunts.

(iii) We do not open for the spring squirrel hunting season, or for the summer/early fall raccoon hunting season.

(iv) We allow the use of dogs for squirrel and rabbit hunting from December 1 through

January 31, and for quail and raccoon/opossum hunting during the open season on the refuge for these species.

(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 (e)(1)(i), (iv), and (vii) through (xi) of this section apply.

(ii) We allow archery deer hunting on the refuge from the opening of the State season through January 31, except during refuge deer quota hunts.

(iii) We allow muzzleloader and modern gun deer hunting during designated times and seasons, within specified State seasons as listed in the refuge public use brochure.

(iv) Total deer harvested refuge-wide is two deer (two does, or one buck and one doe, as governed by State law) regardless of method. A doe must be harvested before a buck.

(v) We prohibit buckshot for modern gun deer hunting.

(vi) You may only use portable deer stands erected no earlier than the opening day of archery season, and you must remove them no later than January 31 each year (see §27.93 of this chapter).

(vii) We prohibit the use of deer decoy(s).

(viii) Turkey hunting (Archery, Youth, and Quota) will be conducted during designated times and seasons, within specified State seasons as listed in the refuge public use brochure.

(ix) We restrict quota hunt participants to those selected for a quota permit (FWS Form 3-2439), except that one nonhunting adult age 21 or older possessing a valid hunting license must accompany the youth hunter age 15 and younger.

(x) An adult age 21 or older possessing a valid hunting license must accompany and be within sight and normal voice contact of hunters age 15 and younger. One adult may supervise no more than one youth hunter.

(xi) We allow the use of one tree stand or ground blind, and one game camera, on the refuge if the owner's State hunting license number is clearly written on them in a conspicuous location.

(xii) We restrict hunt participants for quota hunts to those drawn for a quota permit (FWS Form 3-2439). These permits are nontransferable, and the permit fees are nonrefundable.

(xiii) The incidental taking of feral hogs will be governed by Arkansas Game and Fish Commission regulations concerning the taking of feral hogs on State Wildlife Management Areas (WMAs). Subject to State regulations, we allow incidental take of feral hogs during daytime refuge deer quota hunts (without the use of dogs) and during a specified period during archery deer hunting with legal hunting equipment and ammunition allowed for those hunts according to the season dates provided in the refuge public use brochure. There is no bag limit.

The refuge strives to meet the guiding principles for a quality refuge hunting program identified in Service policy 605 FW 2 and support the Presidential Executive Order #13443: Facilitation of Hunting Heritage and Wildlife Conservation by annually evaluating the hunt program. This evaluation is in close collaboration with our State partners in the AGFC incorporating any new science and information reflecting the diversity of hunting preferences and opportunities.

D. Relevant State Regulations

The refuge conducts its hunting program within the framework of State and Federal regulations and in some cases more restrictive. Additionally, the refuge coordinates with the State as needed to maintain regulations and programs that are consistent with the State's management programs. All relevant refuge-specific regulations are listed above in Section IV, subsection B.

E. Other Refuge Rules and Regulations for Hunting

Hunter Requirements

1. Hunters participating in activities associated with the Felsenthal NWR hunt program will be required to have the appropriate state hunting license, state and federal stamps, a signed general refuge hunting permit, and if born on or after January 1st, 1968, a hunter education course completion card. If participating in a refuge quota hunt, the hunter must also possess a permit issued by the refuge appropriate for that hunt. Hunters who are mobility-impaired and utilizing all-terrain-vehicles to access designated hunting areas (authorized by special use permit) must have in their possession a copy of the issued special use permit and sticker on their ATV/UTV.
2. Allowable equipment: Boats, blinds, decoys and other personal property must be removed at the end of each day's hunt. Deer stands may be placed on the refuge starting on the opening day of Archery Season and must be removed by January 31. Limit is one deer stand and one game camera per person. Stands and cameras must be marked with owner's name and address on the outside.
3. Vehicles are restricted to designated public roads.
4. Dogs are prohibited except for hunting quail, woodcock, waterfowl, rabbit, squirrel, raccoon and opossum during refuge seasons and in accordance with refuge-specific regulations. Use of dogs outside the refuge hunting season is limited to sanctioned events under the Professional Kennel Club, United Kennel Club or other professional

organization and by special use permit.

5. Weapons are allowed during an open hunting season and are limited to those allowed by the State. Additional weapon and ammunition regulations include: use of non-toxic shot only for hunting migratory birds or small game (exception Quota turkey hunts);
 - a. Only rimfire rifles .22 caliber and under, and shotguns are permitted except during muzzleloader and modern gun deer hunts when hunting equipment legal for these hunts is permitted.
 - b. The use or possession of buckshot is prohibited refuge-wide.
 - c. The use of center-fire weapons to take rabbit, squirrel or quail is prohibited.
 - d. Shotguns larger than 10 gauge are prohibited.
6. All hunters and persons accompanying hunters must wear hunter orange, chartreuse or blaze camouflage, which must total at least 400 square inches above the waist. In addition, a hunter orange or chartreuse head garment must be worn while hunting for any species during modern gun, muzzleloading and youth firearm deer seasons.
7. Camping on the refuge is permitted in designated primitive areas only. Campers may stay no more than fourteen days during any thirty consecutive-day period in any campground. Camps must be occupied daily. All disturbances, including the use of generators, are prohibited after 10 p.m. Camping on the refuge while hunting off the refuge is not permitted. Campfires are permitted only in camping areas and must be attended. Only downed wood may be used for fires. Importation/exportation of firewood is prohibited. During period of high fire danger, all open fires will be prohibited.
8. Tagging of big game (deer and turkey) and reporting harvest will be in accordance with AGFC regulations.
9. Consult Refuge Public Use Regulations for additional requirements.

Chapter V. Public Engagement

A. Outreach for Announcing and Publicizing the Hunting Program

The refuge maintains a mailing list of local newspapers, radio and websites for news release purposes. Special announcements and articles may be released in conjunction with hunting

seasons. In addition, information about the hunt will be available at Felsenthal NWR headquarters, on the Felsenthal NWR website, or South AR Refuge Complex Facebook page.

The refuge has been open to hunting under a Hunt Plan prior to the development of the current plan. No significant changes to the program have been implemented with the exception of opening an additional 9,277 acres to hunting. However, a news release notifying the public of the newly updated plan will be issued. Opportunities for public review and comment on this plan and the associated Environmental Assessment were made through National Environmental Policy Act processes.

General refuge hunting brochures are annually revised and printed in brochures that are subsequently mailed to requesting parties and available at the refuge administrative office and placed in boxes scattered around the refuge. Additionally, refuge regulations are published annually in the AGFC Hunting Guidebook.

B. Anticipated Public Reaction to the Hunting Program

The hunt program on Felsenthal NWR has not been an issue of concern with the local public. In contrast, the absence of a hunting program would stimulate serious public concerns. Public hunting as a refuge use was positively expressed during public meetings held prior to the establishment of the refuge, during CCP public meetings and other public meetings, and identified as being important to the community as a whole. The area that now comprises Felsenthal NWR has traditionally been an area popular for hunting, and aids in meeting a variety of recreational and economic components important to the local community. Hunting is socially accepted in the area and surrounding region. Public hunting has been conducted on the refuge since its establishment in 1975. News releases, hunt dates, etc. have been announced through local media sources to keep the public informed about activities associated with the refuge hunt program. In addition, a refuge hunt brochure was developed and made available to provide all necessary information relative to the refuge's hunting program.

Although minimal local opposition to hunting on the refuge exists, nationally, there have been some anti-hunting sentiments expressed by organizations that are opposed to hunting on National Wildlife Refuges. Generally, the local public desires more hunting, not less, on the refuge. The opening of additional hunt areas will be received very favorably.

C. How Hunters Will Be Informed of Relevant Rules and Regulations

General information regarding hunting and other wildlife-dependent public uses can be obtained at Felsenthal NWR headquarters at 5531 Highway 82 West, Crossett, AR 71635 or by calling 870-364-3167. Dates, forms, hunting unit directions, maps, applications, and

permit requirements about the hunt will be available on the station website at: [Felsenthal National Wildlife Refuge Public Use Regulations Brochure](https://www.fws.gov/refuge/felsenthal/) <https://www.fws.gov/refuge/felsenthal/> and at the Refuge Visitor Center.

Information on AGFC regulations can be obtained at [Arkansas Game and Fish Commission](http://www.agfc.com) <http://www.agfc.com> or by calling 1-800-364-4263.

Chapter VI. Compatibility Determination

Hunting and all associated program activities proposed in this plan were found compatible with purposes of the refuge. See the compatibility determination for additional details (Appendix D).

Chapter VII. References

- Anderson, J.E. (Ed) 2006. Arkansas Wildlife Action Plan. Arkansas Game and Fish Commission, <http://www.wildlifearkansas.com/strategy.html> Little Rock, AR. 2028 pp.
- Arkansas Department of Parks and Tourism (ADPT), 2013 Arkansas Statewide Comprehensive Outdoor Recreation Plan 2014-2018. 44pp.
- Arkansas Game and Fish Commission, 2016. Strategic Quail Management Plan, <https://www.agfc.com/en/hunting/small-game/quail/arkansas-bobwhite-quail-resources/> 16pp.
- Arkansas Game and Fish Commission 2016. White-tailed Deer Harvest Reports. <https://ar-web.s3licensing.com/SurveyReport>
- Arkansas Game and Fish Commission 2015. Wild Turkey Harvest and Scientific Reports. <https://www.agfc.com/en/hunting/turkey/turkey-scientific-reports/>
- Arkansas Game and Fish Commission 2013. 2013 Strategic Deer Management Plan, Little Rock, AR 50pp.
- Austin, J.E. 1987. Activities of post breeding lesser scaup in southwestern Manitoba. Wilson Bull. 99:448-456.
- 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.
- Baydack, R.K. 1986. Sharp-tailed grouse response to disturbance in the Carberry Sand Hills of Manitoba. Colorado State University. Fort Collins, Colorado.
- Beach, R. 1993. Depredation problems involving feral hogs. Pages 67-93 in C.W. Hanselka and J.F. Cadenhead, eds. Feral Swine: A compendium for resource managers. Texas Agric. Ext. Service, College Station, TX.
- Becker, H. N., R. C. Belden, T. Brevault, M. J. Burrige, W. B. Frankenberger, and P. Nicoletti. 1978. Brucellosis in feral swine in Florida. Journal of the American Veterinary Medical Association 173: 1181-1182.
- Behrend, D. F., G. F. Mattfield, W. C. Tierson and J. E. Wiley. 1970. Deer density control for comprehensive forest management. J. Forestry. 68:695-700.
- Belanger, L. and L. Bedard. 1995. Hunting and waterfowl. Pages 243-256 in *Wildlife and*

Recreationists: coexistence through management and research (Knight and Gutzwiller eds). Island Press, Washington, D. C. 372 pp.

Bellrose, F. C. 1954. The value of waterfowl refuges in Illinois. *Journal of Wildlife Management* 18(2) 160-169.

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.

Boomer, G. S., F. A. Johnson, and G. S. Zimmerman. 2015. Adaptive harvest management: adjustments for SEIS 2013. U. S. Department of Interior, Washington, D. C. 21 pp. Available online at <http://www.fws.gov/birds/management/adaptive-harvest-management/publications-and-reports.php>

Bouffard S.H. 1982. Wildlife values versus human recreation: Ruby Lake National Wildlife Refuge. *Trans. North American Wildlife and Natural Resources Conference* 47:553-558.

Bowles, A.E. 1996. Responses of wildlife to noise. Pages 109-156 in R.L. Knight and K.J. Gutzwiller, eds. *Wildlife and recreationists: coexistence through management and research*. Island Press, Washington, D.C.

Boyle, S.A., F.B. Samson. 1985. Effects of non-consumptive recreation on wildlife: A review. *Wildlife Society Bulletin* 13:110.

Bratton, S.P. 1979. Impacts of white-tailed deer on the vegetation of Cades Cove, Great Smokey Mountains National Park. *Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies*. 33:305-312.

Bullock, J.F. and Arner, D.H., 1985. Beaver damage to non-impounded timber in Mississippi. *Southern Journal of Applied Forestry*, 9(3), pp.137-140.

Burger, J. 1981. The effect of human activity on birds at a coastal bay. *Biological Conservation* 21:231-241.

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

Clark, R.G., H. Greenwood, and L.G. Sugden. 1986. Preliminary estimates of rate of grain passage through the digestive tract of mallards. *Can. Wildl. Serv. Prog. Note* 160. 2pp.

Combs, D.L. 1987. Ecology of male mallards during winter in the Upper Mississippi Alluvial Valley. Ph.D. thesis. University of Missouri-Columbia. 223pp.

- Dahlgren, R. B. 1988. Human disturbances to migrating and wintering waterfowl: an annotated bibliography, USFWS, La Crosse, Wisconsin, 112 pp.
- 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.
- Dietsch, A.M., Sexton, N.R., Koontz, L.M., and Conk, S.J., 2013, National wildlife refuge visitor survey 2012—Individual refuge results: U.S. Geological Survey Data Series 754, <https://pubs.usgs.gov/ds/754/>.
- Dickson, J.G., Mayer, J., and Dickson, J.D. 2001. Wild Hogs. In J.G. Dickson, editor. Wildlife of Southern Forests: Habitat and Management. Hancock House Publishers, Blaine, WA, USA, pp. 191-208.
- Dooley, J.L., T.A. Chandler, and P.F. Doherty. 2010. Mallard Response to Experimental Walk-In and Shooting Disturbance. J. Wildlife Management. 74 (8): 1815-1824.
- Drake, D., J. B. Paulin, P. D. Curtis, D. J. Decker, and G. J. San Julian. 2005. Assessment of negative economic impacts from deer in the northeastern United States. Journal of Extension 43(1), Article Number 1RIB5.
- Ellingwood, M. R., and S. L. Caturano. 1988. An evaluation of deer management options. New England Chapter of The Wildlife Society and Northeast Deer Technical Committee
- Erwin, R.M. 1980. Breeding habitat by colonially nesting water birds in 2 mid-Atlantic U.S. regions under different regimes of human disturbance. Biological Conservation. 18:39-51.
- 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.
- Fredrickson, L.H., and F.A. Reid. 1988. Waterfowl use of wetland complexes. Managing waterfowl habitats: breeding, migrating, wintering. U.S. Fish and Wildlife Service, Leaflet 13. 6pp.
- Fredrickson, L.H. and T.S. Taylor. 1982. Management of seasonally flooded impoundments for wildlife. U.S. Fish and Wildl. Serv. Resour. Publ. 148. 29pp.
- Frid, A. and L. M. Dill. 2002. Human-caused disturbance stimuli as a form of predation risk. *Conservation Ecology* 6(1): 11.
- Gabrielson, G.W. and E.N. Smith. 1995. Physiological responses of wildlife to disturbance. Pages 95-107 in R. L. Knight and K.J. Gutzwiller, ed. *Wildlife Recreationist: coexistence through management and research*. Island Press, Washington, D.C. 372pp.
- George, J.L., C.E. Braun, R.A. Ryder and E. Decker. 1991. Response of waterbirds to experimental disturbances. *Proceedings Issues and Technology in the Management of Impacted Western Wildlife*. Thoren Ecological Institute 5: 52-59.
- Guillemain, M, Romain Blanc, C. Lucas, 2007, Ecotourism disturbance to wildfowl in protected areas: historical, empirical and experimental approaches in the Camargue, Southern France. *Biodiversity and Conservation*, Volume 16, Number 12, Page 3633.
- Gutzwiller, K.J., S.H. Anderson. 1999. Spatial extent of human-intrusion effects on subalpine bird distributions. *The Condor*. 101: 378-389.
- 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.
- Healy, W. M., and S. M. Powell. 1999. Wild turkey harvest management: biology, strategies, and techniques. U.S. Fish and Wildlife Service, Federal Aid in Wildlife Restoration, Project BTP-R5001-1999.
- Hedenstrom, A. and Alerstam, T. 1998. How fast can birds migrate? – *J. Avian Biol.* 29:424-432.
- Heitmeyer, M.E. 1985. Wintering strategies of female mallards related to dynamics of lowland hardwood wetlands in the upper Mississippi Delta. Ph.D. thesis, University of Missouri-Columbia. 376 pp.
- Heitmeyer, M.E. and Raveling, D.G. 1988. Winter resource use by three species of dabbling ducks in California. Final Report to the Delta Waterfowl and Wetlands Research Station, University of California, Davis.

- Hill, E.P., 1982. Beaver. *Wild mammals of North America*, pp.256-281.
- Hunter, M.L., Jr. (1990) *Wildlife forests and forestry. Principles of managing forests for biological diversity*. Prentice Hall. Englewood Cliffs, NJ.
- Kahl, R. 1991. Boating disturbance of canvasbacks during migration at Lake Poygan, Wisconsin. *Wildlife Society Bulletin*. 19:242-248.
- Kaiser, M.S., and E.K. Fritzell 1984. Effects of river recreationists on green-backed heron behavior. *J. Wildlife Management* 48:561-567.
- King, J.R. 1974. Seasonal allocation of time and energy resources in birds. Pages 4-70 in R.A. Paynter, Jr., ed. *Avian energetics*. Nuttall Ornithol. Club, Cambridge, MA. 334pp.
- Kelley, J.R., Jr., and R. D. Rau. 2006. American woodcock population status, 2006. U.S. Fish and Wildlife Service, Laurel, Maryland. 15pp.
- Klein, M. L. 1989. Effects of high levels of human visitation on foraging waterbirds at J. N. "Ding" Darling National Wildlife Refuge. Final research report. Florida Coop. Fish Wildl. Res. Unit, Univ. Florida, Gainesville. FCFWRU Work Order No. 42. vii + 103pp.
- Klein, M.L. 1993. Waterbird behavioral responses to human disturbances. *Wildlife Society Bulletin*. 21:31-39.
- Knight, R.L. 1984. Responses of wintering bald eagles to boating activity. *J. Wildlife Management*. 48:999-1004.
- 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.
- Korschgen, C. E. and R. B. Dahlgren. 1992. Human disturbances of waterfowl: causes, effects, and management. *Fish and Wildlife Leaflet* 13.2.15, 7pp.
- Korschgen, C.E., L.S. George, and W.L. Green. 1985. Disturbance of diving ducks by boaters on Comprehensive Conservation Plan - 215 - Appendix G: Final Compatibility Determinations a migrational staging area. *Wildlife Society Bulletin*. 13:290-296.
- Krausman, P.R., L.K. Sows, and B.D. Leopold. 1992. Revisiting overpopulated deer ranges in the United States. *California Fish & Game Journal*. 78:1-10.
- Lacki, M. J., and R. A. Lancia. 1986. Effects of wild pigs on beech growth in Great Smoky Mountains National Park. *Journal of Wildlife Management* 50(4): 655-659.

- Lacki, M.J. and Lancia, R.A. 1983. Changes in soil properties of forest rooted by wild boar. *Proceedings of the Southeastern Association of Fish and Wildlife Agencies*. 37:228-236.
- Laskowski, H., T. Leger, J. Gallegos, and F. James. 1993. Behavior response of greater yellowlegs, snowy egrets, and mallards to human disturbance at Back Bay National Wildlife Refuge, Virginia. Unpublished Final Report RMS 51570-01-92. 29 pp.
- 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.
- Lipscomb, D. 1989. Impacts of feral hogs on longleaf pine regeneration. *Southern Journal of Applied Forestry* 13: 177-181.
- Linscombe, G. and Kinler, N., 1997. A survey of vegetative damage caused by nutria herbivory in the Barataria and Terrebonne Basins (Vol. 31). Barataria-Terrebonne National Estuary Program.
- Magee, P.A. 1996. Influence of microclimate on waterfowl energetics in a willow roost complex in northeastern Missouri. Ph.D. thesis, University of Missouri-Columbia, 129pp.
- 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.
- McNeil, Raymond; Pierre Drapeau; John D. Goss-Custard. 1992. The occurrence and adaptive significance of nocturnal habitats in waterfowl. *Biological Review*. 67: 381-419.
- McWilliams, S.R., Guglielmo, C., Pierce, B. and Klaassen, M. 2004. Flying, fasting, and feeding in birds during migration: a nutritional and physiological ecology perspective. – *J. Avian Biol.* 35: 377-393.
- Mott, S.E., R.L. Tucker, D.C. Guynn, H.A. Jacobson. 1985. Use of Mississippi bottomland hardwoods by white-tailed deer. *Proceedings of the Southeast Association of Fish and Wildlife Agencies* 39: 403-411.
- Morton, J.M., A.C. Fowler, and R.L. Kirkpatrick. 1989. Time and energy budgets of American black ducks in winter. *Journal of Wildlife Management* 53 (2):401-410.

- Mosby, H.S. 1969. The influence of hunting on the population of a woodlot grey squirrel population. *J. Wildlife Management*. 33 (1): 59-73.
- Nudds, T. D. 1980. Forage preference: theoretical considerations of diet selection by deer. *Journal Wildlife Management* 44(3): 735-740.
- Owen, M. 1973. The management of grassland areas for wintering geese. *Wildfowl*. 24:123-130.
- Paulus, S.L. 1984b. Activity budgets of nonbreeding gadwalls in Louisiana. *J. Wildl. Manage.* 48:483-489.
- Pease, M.L., R.K. Rose, and M.J. Butler. 2005. Effects of human disturbances on the behavior of wintering ducks. *Wildlife Society Bulletin*. 33(1):103-112.
- Raasch, J.D. 1996. Experimental disturbance of waterbirds on seasonally flooded impoundments in Missouri. M.S. thesis, University of Missouri-Columbia. 164 pp.
- 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, Maryland, USA.
- Rapport, D. J. 1980. Optimal foraging for complementary resources. *Am. Nat.* 116:324-346.
- Reinecke, K.L., R.M. Kaminski, D.J., Moorhead, J.D. Hodges, and J.R. Nassar. 1989. Mississippi Alluvial Valley. Pages 203-247 in L.M. Smith, R.L. Penderson, and R.M. Kaminski, editors. *Habitat management for migrating and wintering waterfowl in North America*. Texas Tech University Press, Lubbock, Texas, USA.
- Rooney, T. P. and D. M. Waller. 2003. Direct and indirect effects of white-tailed deer in forest ecosystems. *Forest Ecology and Management*. 181: 165-176.
- Rose, G.B. 1984. Mortality rates of tagged adult cottontail rabbits. *J. Wildlife Management* 41(3): 511-514.
- Sealand, J.A. and Heidt, G.A., 1990. *Arkansas mammals: their natural history, classification, and distribution*. University of Arkansas Press.
- Seward, Nathan W.; VerCauteren, Kurt C.; Witmer, Gary W./ and Engeman, Richard M., 2004. Feral Swine Impacts on Agriculture and the Environment. *Sheep & Goat Research Journal*. 12: 7pp.
- Southeastern Association of Fish and Wildlife Agencies (SAFWA), 2015. Annual State Summary

Report – Wild Hog Working Group. 52pp.

Southwick Associates, 2011. The Economics Associated with Outdoor Recreation, Natural Resources Conservation and Historic Preservation in the United States, National Wildlife Foundation, Washington, D.C.

Stevens, L. 2010. The feral hog in Oklahoma. 2nd Edition. Samuel Roberts Noble Foundation. Ardmore, OK.

Strole T. A., and R. C. Anderson. 1992. White-tailed deer browsing: species preferences and implications for central Illinois forests. *Natural Areas Journal* 12:139-144.

Tate, J. 1984. Techniques in controlling wild hogs in Great Smokey Mountains National Park; Proceedings of a workshop National Park Service Research/Resources Manage. Report SER-72, Nov. 1984.

Taylor, Rick. 2003. The feral hog in Texas. Texas Parks and Wildlife Department. 20pp U.S. Census Bureau. 2014. Accessed April, 1, 2014/ at <http://quickfacts.census.gov/qfd/states/48/48291.html>

Thomas, V.G. 1976. Habitat usage of wintering ducks at the Ouse Washes, England. *Wildfowl* 27:19-32.

Thompson, Frank R., III, ed. 2004. Publication: Gen. Tech. Rep. **NC-244**. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 267 p.

Tilghman. N. G. 1989. Impacts of white-tailed deer on forest regeneration in northwestern Pennsylvania. *Journal Wildlife Management* 53(3): 524-532.

University of Georgia, Southeastern Cooperative Wildlife Disease Study 2012. Deer Health Evaluations –Felsenthal NWR 2011, Athens, GA 5pp.

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. 2021. Felsenthal NWR Hunt Plan Environmental Assessment. Atlanta, GA.

- U.S. Fish and Wildlife Service. 2021. Felsenthal NWR Draft Hunting Compatibility Determination. Atlanta, GA.
- U.S. Fish and Wildlife Service. 2018. Felsenthal NWR Hunt Plan. Atlanta, GA. 39pp.
- 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, and U.S. Department of Commerce, U.S. Census Bureau. 2016 Deer Hunting in the United States: Demographics and Trends, Addendum to the 2011 National Survey of Fishing, Hunting, and Wildlife–Associated Recreation. 21pp.
- U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2015 Economic Impact of Waterfowl Hunting in the United States, Addendum to the 2011 National Survey of Fishing, Hunting, and Wildlife–Associated Recreation. 13pp.
- U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2015 The Relationship Between Wildlife Watchers, Hunters, and Anglers, Addendum to the 2011 National Survey of Fishing, Hunting, and Wildlife–Associated Recreation. 64pp.
- U.S. Fish and Wildlife Service. 2019. Environmental Assessment Duck Hunting Regulations for 2019-2020. U.S. Department of the Interior, Washington, D.C. <https://www.regulations.gov/document?D=FWS-HQ-MB-2018-0030-0096>
- U.S. Fish and Wildlife Service, 2015. Felsenthal Habitat Management Plan and Environmental Assessment. Crossett, AR. 254pp.
- U.S. Fish and Wildlife Service, 2015. Compatibility Determination – ATV/UTV Use on Designated Trails on Felsenthal NWR. Crossett, AR. 16pp.
- U.S. Fish and Wildlife Service. 2013. Final Land Protection Plan and Final “Environmental Assessment for the Expansion of Upper Ouachita and Felsenthal National Wildlife Refuges. Atlanta, GA. 498pp.
- U.S. Fish and Wildlife Service (USFWS). 2012. Northern American Waterfowl Plan. <https://www.fws.gov/migratorybirds/pdf/management/NAWMP/2012NAWMP.pdf>.
- U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2011 National Survey of Fishing, Hunting, and Wildlife–Associated Recreation. 161pp.
- U.S. Fish and Wildlife Service. 2010 Felsenthal and Overflow National Wildlife Refuge

- Comprehensive Conservation Plan. Crossett, AR. 326pp
- U.S. Fish and Wildlife Service. 2010 Felsenthal and Overflow National Wildlife Refuge Comprehensive Conservation Plan and Environmental Assessment. Crossett, AR. 447pp
- U.S. Fish and Wildlife Service. 2007. National bald eagle management guidelines.
- U.S. Fish and Wildlife Service. 2006. Waterfowl population status, 2006. Division of Migratory Bird Management, Laurel, Maryland, 60 pp.
- U.S. Fish and Wildlife Service. 2005. Waterfowl harvest and population survey data: Estimates of U.S. harvest, hunting activity, and success derived from the state-federal cooperative harvest information program. Division of Migratory Bird Management, Columbia, Missouri, 92 pp.
- U.S. Fish and Wildlife Service. 2003. Recovery plan for the red-cockaded woodpecker (*Picoides borealis*): second revision. Atlanta, GA. 296 pp.
- U.S. Fish and Wildlife Service. Service Manual, <http://fws.gov/policy/manuals/>, Washington, D.C.
- U.S. Fish and Wildlife Service. 1988 Felsenthal National Wildlife Refuge Hunt Plan. Crossett, AR. 30pp.
- U.S. Fish and Wildlife Service. 1978 Felsenthal National Wildlife Refuge Hunt Plan. Crossett, AR. 30pp.
- Vangilder, L.D. 1992. Population dynamics. Pages 144-164 in J.G. Dickson, *ed.* The wild turkey: biology and management. Stackpole Books, Harrisburg.
- Vinson, M. 1998. Effects of recreational activities on declining anuran species in the John Muir Wilderness, CA. Missoula, MT: University of Montana. 83 p. Thesis.
- Waller, D.M., and W.S. Alverson. 1997. The white-tailed deer: a keystone herbivore. Wildlife Society Bulletin 25:217-226.
- Walsberg, G.E. 1983. Avian ecological energetics. Pages 161-220 in D.S. Farner, J.R. King, and K. C. Parkes (eds.) Avian Biology VII. Academic Press, New York.
- Ward, D.H., and R.A. Stehn. 1989. Response of Brant and other geese to aircraft disturbance at Izembek Lagoon, Alaska. U.S. Fish and Wildlife Service, Alaska Fish and Wildlife Research Center. Final report to the Minerals Management Service. Anchorage, Alaska. 193 pp.

Warren, R. J. 1991. Ecological justification for controlling deer populations in eastern national parks. *Trans. North Am. Wildl. Nat. Resour. Conf.* 56:56-66.

Williams, S. C. and J. S. Ward. 2006. Exotic seed dispersal by white-tailed deer in southern Connecticut. *Natural Areas Journal* 26(4): 383-390.

Williams, G.J., and E. Forbes. 1980. The habitat and dietary preferences of dark-bellied Brant geese and widgeon in relation to agricultural management. *Wildfowl* 31:151-157.

Wood, G.W. and D.N. Roark. 1980. Food habits of feral hogs in Coastal South Carolina. *J. Wildl. Manage.* 44(2):506-511.

Yarrow, G. K., and J. C. Kroll. 1989. Coexistence of white-tailed deer and feral hogs: management implications. *Southeast Deer Study Group* 12: 13-14.

SECTION II: ENVIRONMENTAL ASSESSMENT

Environmental Assessment

*Big Game, Upland Game,
Waterfowl and Migratory Game Bird
Hunting Plan*

on

FELSENTHAL NATIONAL WILDLIFE REFUGE

Ashley, Bradley, and Union Counties, Arkansas

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U. S. Department of Interior
Crossett, Arkansas
August 2021



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Environmental Assessment for Big Game, Upland Game, Waterfowl and Migratory Game Bird Hunting Plan

Date: August 2, 2021

This Environmental Assessment is being prepared to evaluate the effects associated with the proposed action and complies with the National Environmental Policy Act in accordance with Council on Environmental Quality regulations (40 CFR 1500-1509) and Department of the Interior (43 CFR 46; 516 DM 8) and U.S. Fish and Wildlife Service (550 FW 3) regulations and policies. The National Environmental Policy Act requires examination of the effects of proposed actions on the natural and human environment.

This EA evaluates the foreseeable consequences of implementing each of the management alternatives.

Proposed Action

The U.S. Fish and Wildlife Service (Service) is proposing to expand the hunting program on Felsenthal NWR to newly acquired lands. In addition to the areas currently open to hunting the refuge will provide hunting opportunities for big game, upland game, waterfowl, migratory birds and incidental take of beaver, coyote, nutria, and feral hogs on an additional 9,277 acres acquired in fee-title in 2020. In addition, the approved acquisition boundary has approximately 28,202 acres remaining to be acquired. As these lands are acquired, they would be open to hunting as evaluated in this analysis.

A proposed action may evolve during the NEPA process as the agency refines its proposal and gathers feedback from the public, tribes, and other agencies. Therefore, the final proposed action may be different from the original. The proposed action will be finalized at the conclusion of the public comment period for the EA.

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 National Wildlife Refuge System Administration Act of 1966 (NWRSA), as amended by the National Wildlife Refuge System Improvement Act of 1997 (NWRSA) (16 U.S.C. 668dd et seq.), Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations and Fish and Wildlife Service Manual.

The refuge was established pursuant to Federal Property and Administrative Service Act of 1949 (40 U.S.C. 471-535), as amended. Established in 1975 as mitigation for the creation of the U.S. Corps of Engineers' (USACE) Ouachita and Black Rivers Navigation Project and Felsenthal Lock and Dam, Felsenthal NWR is located in southeast Arkansas, approximately eight miles west of the town of Crossett (Figure 1). This refuge is named for the small Felsenthal community located at its southwest corner, and contains an abundance of water resources dominated by the Ouachita and Saline rivers and the

Felsenthal Pool.

The Refuge's official purposes are:

- [16 U.S.C. § 664](#) (Fish and Wildlife Coordination Act)"... shall be administered by him [Secretary of the Interior] directly or in accordance with cooperative agreements ... and in accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon ..."
- [16 U.S.C. § 460k-1](#)"... suitable for incidental fish and wildlife-oriented recreational development; the protection of natural resources; and the conservation of endangered species or threatened species ..."
- [16 U.S.C. § 460k-2](#) (Refuge Recreation Act (16 U.S.C. § 460k-460k-4), as amended)"... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..."

The mission of the NWRS, as outlined by the NWRSAA, as amended by the NWRSIA, is;

"... 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"

Additionally, the NWRSAA mandates the Secretary of the Interior in administering the NWRS (16 U.S.C. 668dd(a)(4)) 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.

Felsenthal NWR was officially opened to hunting of resident wildlife species and waterfowl in September 1978. In 1988, the refuge hunt plan and associated environmental documents (environmental assessment and section 7) were updated (USFWS 1988). Also the Felsenthal NWR Comprehensive Conservation Plan (CCP) identified hunting as an important priority for the refuge (USFWS 2010a) under Objective 3.2: Hunting - Over the 15-year life of this CCP, continue to provide appropriate hunting opportunities that allow for quality public recreation and are compatible with refuge purposes. The recent acquisition of new land by the Service allows for the expansion of the hunt program increasing opportunities for the public.

Purpose and Need for the Proposed Action

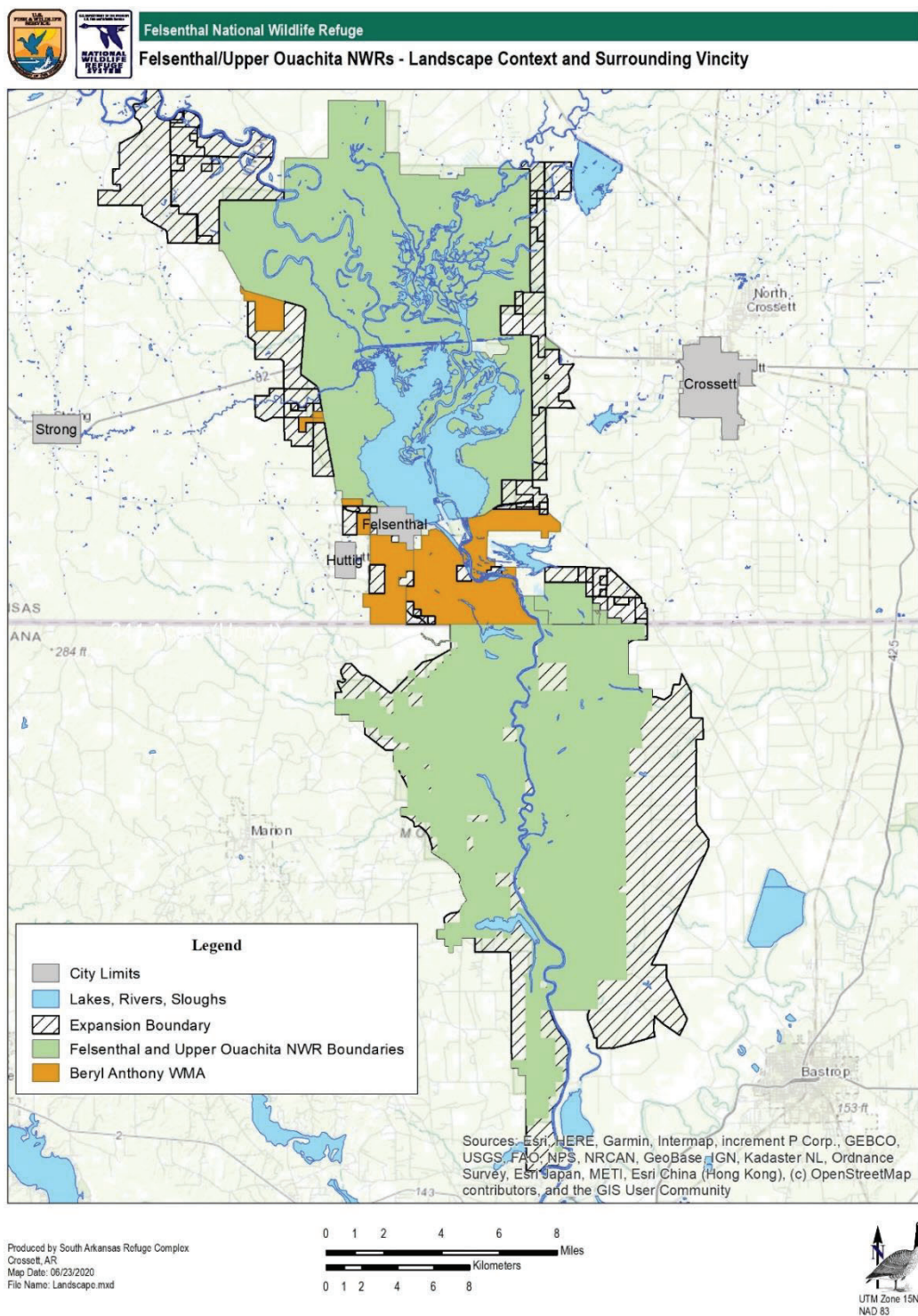
The purpose of the proposed action is to provide wildlife dependent recreation opportunities on Felsenthal NWR. Conducting a well-managed hunt on Felsenthal National Wildlife Refuge will assist the refuge in meeting primary objectives that includes providing the public with quality wildlife-oriented recreational programs that are compatible with the purposes for which the refuge was established.

The need is to meet the requirements of the NWRSIA, evaluate compatibility of proposed uses; protect biological integrity, diversity, and environmental health; and implement the CCP and step-down management plans of the refuge. The need is also to align as much as possible with state hunting regulations where compatible with refuge purposes and management through effective coordination with state fish and wildlife agencies, Native American Tribes, adjacent landowners, and the general public, while ensuring the biological integrity, diversity, and environmental health of the NWRS are maintained [16 U.S. Code §668dd(a)(4)]. Further, the need is also to meet the Service's priorities and mandates; implement the Service's Secretarial Order (SO) 3347 *Conservation Stewardship and Outdoor Recreation* and SO 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. In addition, the proposed action must meet the Service's priorities and mandates as outlined by the NWRSAA:

- “to recognize compatible wildlife-dependent recreational uses as the priority general public uses of the System through which the American public can develop an appreciation for fish and wildlife;
- ensure that opportunities are provided within the System for compatible wildlife-dependent recreational uses;
- ensure that priority general public uses of the System receive enhanced consideration over other general public uses in planning and management within the System;
- provide increased opportunities for families to experience compatible wildlife-dependent recreation, particularly opportunities for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting” (16 U.S.C. 668dd(a)(4)).

With the acquisition of additional land to the refuge, the Service will expand opportunities for hunting as defined in the Felsenthal NWR Hunt Plan (USFWS 2021).

Figure 1. Location of Felsenthal National Wildlife Refuge, Crossett, Arkansas.



Alternatives

Alternative A - (Current Management - No Action)

Under this alternative, hunting would be limited to the lands currently open to hunting and to species that are currently listed as legal game. There would be no change to current public use and wildlife management programs.

The refuge hunting season framework on lands currently open to hunting would generally fall within Arkansas Game and Fish Commission (AGFC) guidelines, but in various instances may be more conservative than state seasons and regulations. Refuge management goals and objectives may require occasional modifications to the hunting program based on harvest data, public use demands, and other refuge programs. Use of quota hunts for special management purposes may be necessary to meet refuge specific objectives. All or part of the refuge may be closed to hunting by the Refuge Manager at any time, if necessary, for public safety, to provide wildlife sanctuary for trust species, or for essential management actions.

Alternative B - (Proposed Action – 2021 Hunt Plan Implementation)

The proposed action would authorize implementation of the Final 2021 Hunt Plan, which would: 1) manage hunting on current and future refuge parcels within the current acquisition boundary, and 2) open 9,277 newly acquired/approved lands to big game (white-tailed deer and turkey), upland game (gray and fox squirrels, rabbits, raccoon, opossum and bobwhite quail), waterfowl (ducks including merganser, light and dark geese, coots), other migratory game birds (woodcock) and incidental take species (beaver, nutria, coyote, and feral hogs) for hunting. Alternative B would fully meet the intended purpose and management needs identified in the 2010 CCP, 2014 Land Protection Plan (LPP), 2017 Hunt Plan, and 2020 Hunt Plan. Hunt Units for the refuge are depicted in Figure 2.

The refuge hunting season framework on lands currently open to hunting and newly acquired lands, would generally fall within AGFC guidelines, but in various instances may be more conservative than state seasons and regulations. Refuge management goals and objectives may require occasional modifications to the hunting program based on harvest data, public use demands, and other refuge programs. Use of quota hunts for special management purposes may be necessary to meet refuge specific objectives. All or part of the refuge may be closed to hunting by the Refuge Manager at any time, if necessary, for public safety, to provide wildlife sanctuary for trust species, or for essential management actions. Specific actions are outlined below.

This alternative offers increased opportunities for public hunting and fulfills the Service's mandate under the NWRSA. The Service has determined that the hunt plan is compatible with the purposes of Felsenthal NWR and the mission of the NWR (Appendix D).

Figure 2. Felsenthal NWR Hunt Units.

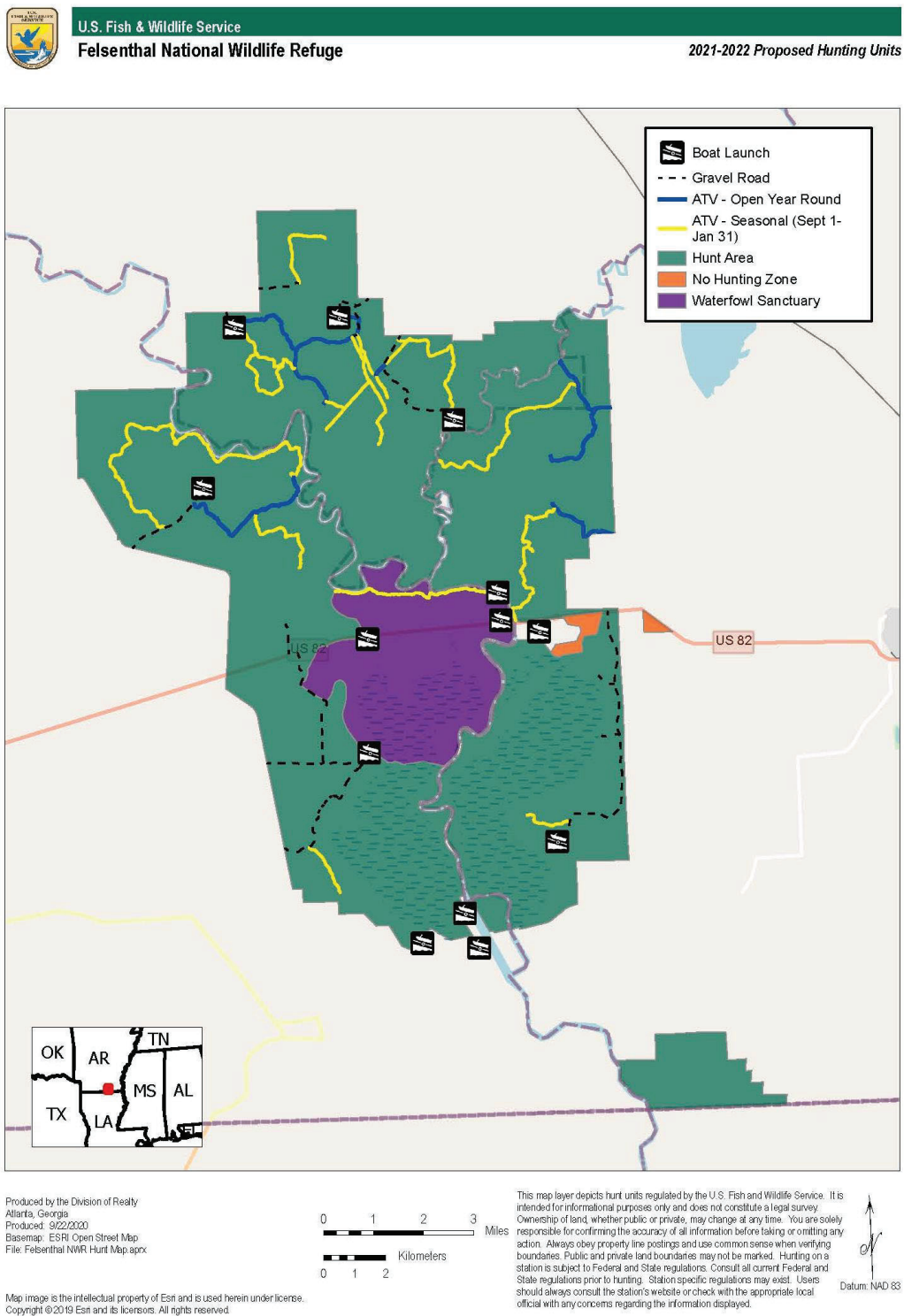


Table 1. Alternative B Hunt Description

TYPE	HABITAT	SEASON DATES/ BAG LIMITS/CLOSURES	REFUGE SPECIFIC REGULATIONS
Waterfowl (Duck including Merganser, light and dark Geese, Coot)	-15,150 acres of open water - when flooded, nearly 51,000 acres of bottomland hardwoods - waterfowl sanctuary (6,910 acres) is closed November 15 thru February 15 to all public access	-Same as State Waterfowl and Teal Seasons including Youth Duck Hunts and Bag Limits. - Waterfowl sanctuary is open to authorized users during the September teal season	-Hunting will cease at noon each day. - Hunters may not enter the hunting areas before 4 am. -The use of dogs for retrieving purposes or in the pursuit of migratory game birds is permitted. -Only nontoxic shot permitted - September teal season shooting hours are from sunrise until noon
Woodcock	-76,114 acres open to hunting	-Same as State Seasons and Bag Limits. -Closed during all refuge quota deer muzzleloader and gun hunts	-Only nontoxic shot permitted -Access to the refuge is two hours before sunrise to two hours after sunset. -The use of dogs for retrieving purposes or in the pursuit of migratory game birds is permitted. are not permitted - Possession, placement or hunting over bait, salt, minerals or other ingestible attractants and deer drives -Total deer harvested refuge-wide is 2 deer (2 does or 1 buck and 1 doe) regardless of method - Either sex can be harvested; however, a doe must be harvested on the refuge and checked before harvesting a buck - Youth hunt is restricted to youth 15 years of age and younger (age at opening of state-wide youth deer season) accompanied by one adult 21 years or older
White-tail Deer	-76,114 acres open to hunting except the 6,910 acre waterfowl sanctuary (November 15 thru February 15)	-Harvested deer must be checked in accordance with state deer hunt regulations - Muzzleloader season is open for five days, generally the first five days of the State season for Zone 12 - Modern gun season consists of four days within the State season of Zone 12 - Youth modern gun hunt is an open hunt (no quota permit required)	- Youth hunts are restricted to individuals 15 years of age and younger (age at opening of state-wide youth turkey season) accompanied by one adult 21 years or older
Turkey	-76,114 acres open to hunting	-Same as State Seasons and Bag Limits for Zone 2 (Harvested turkeys must be checked in accordance with state turkey hunt regulations) - Archery turkey hunting is closed during the quota turkey gun season on the refuge - Modern gun quota turkey hunt consists of the first three days of the state season (zone 9) - Modern gun youth turkey quota hunt is the first two days of the State youth season	
Squirrel Rabbit	-76,114 acres open to hunting	-Same as State Season and Bag Limits. -Closed during all refuge modern gun and muzzleloader deer seasons. - Spring squirrel season is closed.	-Only nontoxic shot permitted (exception, rim-fire ammunition) and may not be hunted with center-fire weapons - Use of dogs is permitted allowed from December 1 to January 31 - Use of electronic calls is not permitted
Quail	-76,114 acres open to hunting	- Same as State Season and Bag Limits.	-Only nontoxic shot permitted (exception, rim-fire ammunition) and may not be hunted with center-fire weapons - Use of dogs is permitted - Use of electronic calls is not permitted
Raccoon Opossum	-76,114 acres open to hunting	-Same as State Season and Bag Limits.	-Only nontoxic shot permitted (exception, rim-fire ammunition) and may not be hunted with center-fire weapons - Use of dogs is required during hours of darkness - Use of electronic calls is not permitted
Incidental Take - Feral Hogs	76,114 acres open to hunting	- No Bag limit - The incidental taking of feral hogs will be governed by Arkansas Game and Fish Commission regulations concerning the taking of feral hogs on State Wildlife Management Areas (WMAs). Subject to State regulations, we allow incidental take of feral hogs during daytime refuge deer quota hunts (without the use of dogs) and during specified period during archery deer hunting with legal hunting equipment and ammunition allowed for those hunt according to season dates provided in the public use regulations brochure.	- use of dogs is prohibited - Live hogs may not be transported or possessed. - May only be taken during daylight hours - Hunters may use legal hunting equipment and ammunition allowed for that hunt only
Incidental Take - Coyote Beaver Nutria	-76,114 acres open to hunting	-No bag limit	-Hunters may use legal hunting equipment and ammunition allowed for that hunt only -Use of dogs is not permitted. - May only be taken during daylight hours

Measures to Avoid Conflicts:

The refuge strives to meet the guiding principles for a quality refuge hunting program identified in Service policy 605 FW 2 and support the Presidential Executive Order #13443: Facilitation of Hunting Heritage and Wildlife Conservation by annually evaluating the hunt program. This evaluation is in close collaboration with our State partners in the AGFC incorporating any new science and information reflecting the diversity of hunting preferences and opportunities.

- Specific refuge regulations are listed in 50 Code of Federal Regulations (CFR) Part 32, Migratory Bird Hunting is listed 50 CFR 20, Public Entry and Using is listed in 50 CFR 26, Prohibited Acts is listed in 50 CFR 27, and in the refuge's hunt and fish brochure
- The limited, quota hunts are designed to avoid conflict with threatened and endangered species, resident wildlife, and other recreational uses.
- Expansion of hunting on an additional 9,277 acres will disperse hunters over a larger area, thereby reducing level of disturbance associated with hunting such as loud noises produced by guns and the rapid movement of both hunters and hunting dogs
- To further minimize wildlife disturbance, Felsenthal NWR established no hunting zones and areas which are closed to all public entry.

Alternative B, Proposed Action, would offer increased opportunities for public hunting, would implement and achieve a number of objectives in the CCP, and would help fulfill the Service's mandate under the NWRSA of 1997. The Service has previously determined that the 2017 Hunt Plan and 2021 Hunt Plan including their associated compatibility determination are compatible with the purposes of Felsenthal NWR and the mission of the NWRSA. Under Alternative B, expanded hunting opportunities would be opened on newly acquired 9,277 acres of Felsenthal NWR. The estimated cost to administer the proposed hunt would be approximately \$77,818 annually. The associated costs would primarily involve issuing refuge-specific hunt permits, brochures, law enforcement, and staff activities. This alternative offers increased opportunities for public hunting and fulfills the Service's mandate under the NWRSA.

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.

Felsenthal NWR is located in Ashley, Bradley, and Union Counties, Arkansas, about 5 miles west of Crossett, Arkansas on U.S. Highway 82. Felsenthal NWR is one of four refuges forming an administrative

complex, which also includes Pond Creek NWR to the northwest, and Overflow NWR to the east. Upper Ouachita NWR in Louisiana makes up the southern boundary of Felsenthal NWR.

The refuge, established in 1975, historically consisted of bottomland hardwood and upland forests. The landscape was dominated by forest industry lands, which continues today. The Crossett, Arkansas area has the reputation of being the forestry capital of the South.

Natural habitats are dominated by bottomland hardwoods, backwater sloughs, and open water in the wetlands and upland pine and hardwood representative of the West Gulf Coastal Plain. The refuge's wetlands are influenced by the Ouachita and Saline River watersheds as well as the Felsenthal lock and dam. For more information regarding the affected environment, please see section II Refuge Overview of the Refuges CCP (USFWS 2010) which can be found here: [Felsenthal and Overflow National Wildlife Refuges Comprehensive Conservation Plan](#).

Table 1 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 or no negligible impacts exist 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	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Non-Target Wildlife and Aquatic Species	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Threatened and Endangered Species and Other Special Status Species	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat and Vegetation (including vegetation of special management concern)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Geology and Soils	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Air Quality	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water Quality	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Floodplains	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Wilderness	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visitor Use and Experience	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cultural Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Refuge Management and Operations	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Socioeconomics	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Tables 2-5 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. Affected Natural Resources and Anticipated Impacts of the Proposed Action and Any Alternatives

Waterfowl (Ducks including teal (<i>Anas carolinensis</i>), Merganser (<i>Mergus merganser</i>), Light (<i>Chen caerulescens</i>) and Dark Geese (<i>Branta</i> spp.), and Coot (<i>Fulica americana</i>)	
Affected Environment Description	<p>Migratory game birds are those bird species so designated in conventions between the United States and several foreign nations for the protection and management of these birds. Under the Migratory Bird Treaty Act (16 U.S.C. 703-712), the Secretary of the Interior is authorized to determine when "hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any ... bird, or any part, nest, or egg" of migratory game birds can take place, and to adopt regulations for this purpose. These regulations are written after giving due regard to "the zones of temperature and to the distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds and are updated annually (16 U.S.C. 704(a)). This responsibility has been delegated to the Service as the lead federal agency for managing and conserving migratory birds in the United States. For each species, frameworks, seasons and regulations are developed 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. Acknowledging regional differences in hunting conditions, the Service has administratively divided the nation into four Flyways for the primary purpose of managing migratory game birds. The Service, working with partners, annually prescribe frameworks, or outer limits, for dates and times when hunting may occur and the number of birds that may be taken and possessed. These frameworks are necessary to allow state selections of season and limits for recreation and sustenance; aid federal, state, and tribal governments in the management of migratory game birds; and permit harvests at levels compatible with population status and habitat conditions. Each Flyway (Atlantic, Mississippi, Central, and Pacific) has a Flyway Council, a formal organization generally composed of one member from each state and province in that Flyway.</p> <p>The programmatic document, "Second Final Supplemental Environmental Impact Statement: Issuance of Annual Regulations Permitting the Sport Hunting of Migratory Birds (EIS 20130139)," filed with the Environmental Protection Agency on May 24, 2013, addresses NEPA compliance by the Service for issuance of the annual framework regulations for hunting of migratory game bird species. A notice of availability was published in the <i>Federal Register</i> on May 31, 2013 (78 FR 32686), and the Record of Decision was published on July 26, 2013 (78 FR 45376). NEPA compliance for waterfowl hunting frameworks is addressed through the annual preparation of separate environmental assessments, the most recent being "Duck Hunting Regulations for 2018–19," with its corresponding May 2018, finding of no significant impact.</p>
Environmental Trends and Planned Actions Description	<p>The refuge is 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</p>

<p>(Raftovich 2020). During the 2017 season, 345 hunters harvested 425 ducks on the refuge, whereas 223 hunters harvested 356 ducks in 2018. Midwinter aerial waterfowl surveys conducted by AGFC estimated 1,054,553 ducks in 2019 and 1,472,083 in 2020 within the Arkansas Mississippi Alluvial Valley and its tributaries (AGFC 2020).</p> <p>The Mississippi Flyway’s 418,100 waterfowl hunters 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.</p> <p>Refuges conduct hunting programs within the framework of state and federal regulations. Waterfowl hunting is restricted to half days. The refuge has a 6,910 acre sanctuary that is closed to all public use from November 15-February 15 to provide a disturbance free zone for migrating waterfowl. Available open water habitat conducive for waterfowl refuge and feeding in the form of sloughs, oxbows, etc. is scattered across the refuge, and provides habitat to both migratory and resident waterfowl species. Experience has proven that time and space zoning (<i>e.g.</i>, establishment of separate use areas, use periods, and restrictions on the number of users) can be an effective tool in reducing negative effects to all wildlife species.</p>	<p>Anticipated Impacts</p> <p>Since the refuge consists of 85 percent wetlands, all recreational activity has the potential of impacting waterfowl, marsh birds, and other migratory bird populations feeding and/or resting near the hunting area(s). Conflicts arise when migratory birds and humans are present in the same areas (Boyle and Samson 1985). Response of wildlife to human activities includes departure from site (Owen 1973, Burger 1981, Korschgen et al 1985, Henson and Grant 1991, Kahl 1991, Klein 1993), use of suboptimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior (Burger 1981, Korschgen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993), and increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). McNeil et al. (1992) found that many waterfowl species avoid disturbance by feeding at night instead of during the day. Our principal concern is repeated disruption of nesting, resting, or foraging birds, and public safety concerns related to firearms use when hunting.</p> <p>Hunting is a priority, wildlife-dependent, consumptive activity with additional effects on waterfowl. General adverse impacts of waterfowl hunting are mortality, crippling and disturbance. Belanger and Bedard (1995) concluded that disturbance caused by waterfowl hunting to waterfowl resources can modify the distribution and use of habitats by waterfowl, affect their activity budget and decrease their foraging time, and disrupt pair and family bonds and contribute to increased hunting mortality.</p> <p>Migratory bird hunters may also disturb migratory birds and other wildlife as they travel to and from their hunting sites or when retrieving downed birds. Depending on the location and the number/species of migratory birds in the area, a disturbance can be temporary with displaced birds moving to nearby backwaters. For some species like bald eagles and other predators, migratory bird hunting creates a readily available food source due to birds lost or wounded.</p>
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<p>Disturbance to waterfowl occurs during white-tailed deer hunting seasons, as hunters flush deer through wetlands, creeks, and open water habitats. Dogs running at large during small game hunting seasons will also flush wintering waterfowl resting and feeding in both wetland and upland areas. The ingestion of lead sinkers or lead shot is another concern; however the impacts are lessened from refuge regulations requiring the use of non-toxic shot for upland and waterfowl hunting.</p> <p>To minimize waterfowl disturbance, the refuge has designated approximately 6,910 acres as a waterfowl sanctuary that will be closed to hunting and other recreational uses on a seasonal or annual basis. Literature reviews of visitor use and its relationship to disturbance to waterbirds support the time restriction and are reflected in the hunting regulations of other refuges, particularly in the Southeast Region of the FWS (Delong 2002). Havera et al (1992) and Dahlgren (1988) in comprehensive literature reviews of human disturbances to migrating and wintering waterfowl have noted that the use of sanctuaries (non-hunted areas) was the most common and effective solution to mitigating adverse disturbance impacts. Bellrose (1954) wrote of the early 1900's when owners of duck lands found that providing non-hunted areas on their properties was of value in building and holding concentrations of waterfowl. A distinctive degree of sense of security constituted the principal factor governing duck use of areas that were all hunted, half hunted/half unhunted, or no hunting. Waterfowl numbers averaged 16 times more abundant per acre on half hunted/half unhunted areas than on areas that were completely hunted. Other hunting measures that serve to mitigate adverse impacts to waterfowl are to provide adequate buffer areas and large enough sanctuaries to ensure full use by waterfowl, provide "temporal respite" for ducks by limiting hunts to half days and/or use an intermittent hunt program (3-4 hunts/week), and regulate hunter access limiting boat access and traffic to specific areas.</p> <p>The use of retrieving dogs during migratory bird hunts should result in fewer lost birds with negligible added disturbance. All retrieving dogs would be under control of the hunter at all times.</p> <p>Alternative A - Continue Current Management – No Action Estimated Hunter Numbers: Gun Hunt (160) Estimated Take: Gun Hunt (1,500) Under this alternative, legal harvest of individual animals would still occur on areas of the refuge that are currently open to hunting according to the 1988 Hunt Plan. Hunting would not be opened on any parcels acquired since approval of the 1988 Plan or any future acquired refuge parcels.</p> <p>Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative Estimated Hunter Numbers: Gun Hunt (200) Estimated Take: Gun Hunt (2,250) Hunters will be able to hunt more areas of the refuge potentially allowing for more harvest opportunities. The proposed action of expanding acreage for hunting of ducks, coot, and geese should have no significant effects on the local wintering population or the Mississippi Flyway population or nationally.</p>	<p>Woodcock (<i>Scolopax minor</i>)</p>
<p>Affected Environment Description</p>	

<p>Frameworks for season lengths, bag limits, and areas for woodcock hunting are established by the Service. Seasons and regulations are developed 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. At Felsenthal NWR, season lengths are more restrictive than the state allows.</p> <p>According to the 2018-19 Harvest Information Program (Raftovich et al. 2019), amongst 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.</p>
<p>Environmental Trends and Planned Actions Description</p> <p>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).</p> <p>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.</p>
<p>Anticipated Impacts</p> <p>The refuge draws few if any woodcock hunters. Based on the observed impacts of the current hunting of this species, expanding the acreage available to be hunted on Felsenthal NWR should have no significant effects on the local population of woodcock.</p> <p>Alternative A - Continue Current Management – No Action Estimated Hunter Numbers: Gun Hunt (5) Estimated Take: Gun Hunt (2)</p> <p>Under this alternative, legal harvest of individual animals would still occur on areas of the refuge that are currently open to hunting according to the 1988 Hunt Plan. Hunting would not be opened on any parcels acquired since approval of the 1988 Plan or any future acquired refuge parcels.</p> <p>Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative Estimated Hunter Numbers: Gun Hunt (5) Estimated Take: Gun Hunt (2)</p>

<p>Hunters will be able to hunt more areas of the refuge potentially allowing for more harvest opportunities. As these lands were hunted under the previous landowner, we expect the impacts to be minimal. The proposed action of expanding acreage for hunting of woodcock should have no significant effects on the local or regional population.</p>	<p>White-tailed deer (<i>Odocoileus virginianus</i>)</p>	<p>Affected Environment Description</p> <p>Harvest regulation is an essential part of sound management for white-tailed deer. Regulating the harvest is necessary to keep deer populations at or below habitat carrying capacity and in relative balance with their food supply on refuge lands. Over-population leads to increased car-deer collisions, damage to habitat, impacts on neighboring landowner crops, and poor overall herd health (Casey and Hein 1983, Tilghman 1989, Nudds 1980, Hunter 1990), .</p> <p>Deer herd health checks were conducted most recently by the Southeast Cooperative Wildlife Disease Study in 2011 (SCWDS, 2012). The report concluded that the Felsenthal herd was at or near nutritional carrying capacity. Deer density on any given area of Felsenthal NWR varies with season, river height, outside hunting pressure, and other factors. Overpopulation of deer can be devastating to the understory component of forested habitat. Excessive browsing has the potential to impact understory dependent species, specifically breeding, migrant, and resident songbirds. Species that could experience negative impacts from deer overpopulation and associated habitat degradation include breeding birds, such as painted bunting, common yellowthroat, and wood thrush, and migrant birds, including black-throated blue warblers, yellow warbler, worm-eating warbler, hooded warbler, and ovenbird (Casey and Hein 1983, McShea and Rappole, 2000). Habitat quality for resident species, such as gray catbird, brown thrasher, and white-eyed vireo, can also decline in the presence of too many deer.</p>	<p>Environmental Trends and Planned Actions Description</p> <p>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.</p> <p>An active deer hunting program on all areas open to hunting is necessary at Felsenthal NWR 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.</p>
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<p>Population estimates of hunted species are developed at multiple spatial scales and used to determine take limits, hunting seasons, and methods of take. The proposed refuge hunting program rules will be more restrictive than hunting regulations throughout the State of Arkansas. Felsenthal NWR will regularly coordinate with the state and maintain hunting regulations that are designed for the protection of natural resources and the public. The proportion of harvest on the refuge would be a very small portion of the total annual state harvest. Since 2007, deer harvest at the refuge has never come close to a half percentage of Arkansas' total deer harvest each year. The refuge contributes minimally to the State's total harvest for white tailed deer. High deer numbers are recognized as a problem causing crop damage, reducing some forest understory species, and reducing reforestation seedling survival. The only viable solution to mitigate the adverse impacts that deer have on refuge forest and landbird resources is to trim the herd by enhancing and improving the effectiveness of deer hunting on the refuge.</p> <p>Deer – For 2019-2020 season:</p> <ul style="list-style-type: none">• Total state harvest = 188,151• Total harvest in Ashley County = 3,114• Total harvest in Bradley County = 4,796• Total harvest in Union County = 6,245• Total harvest on Felsenthal NWR = 354 (0.00188% of statewide harvest)	<p>Anticipated Impacts</p> <p>Due to the relatively small home range size for deer (500-1500 acres), deer hunting does not have regional population impacts. Only local impacts are likely to occur from deer hunting on the refuge and those impacts are generally considered beneficial. Deer harvest on the refuge is estimated at 200-300 per season.</p> <p>Alternative A - Continue Current Management – No Action</p> <p>Estimated Hunter Numbers: Archery Hunt (300), Muzzleloader (450), Gun Hunt (500)/ season</p> <p>Estimated Take: Archery Hunt (140), Muzzleloader (80), Gun Hunt (190)</p> <p>Under this alternative, legal harvest of individual animals would still occur on areas of the refuge that are currently open to hunting according to the 1988 Hunt Plan. Hunting would not be opened on any parcels acquired since approval of the 1988 Plan or any future acquired refuge parcels.</p> <p>Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative</p> <p>Estimated Hunter Numbers: Archery Hunt (325), Muzzleloader (450), Gun Hunt (550) /season</p> <p>Estimated Take: Archery Hunt (145), Muzzleloader (80), Gun Hunt (200) /season</p> <p>The AGFC maintains records for the harvest of white-tailed deer. The refuge has harvest totals back to 1978. Harvest and survey data confirm that decades of deer hunting on surrounding private lands (using bait and a longer season) have not had a local negative effect on the deer population. The average annual harvest represents less than a five hundreds of a percent of the annual statewide harvest. As these lands were hunted under the previous landowner, we expect the impacts to be minimal. Due to the highly restricted, short duration of deer quota hunts, expanding the number of acres available for hunting will have no significant effect to the refuge deer population.</p>
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<p>Turkey (<i>Meleagris gallopavo</i>)</p>	<p>Affected Environment Description</p> <p>Turkeys are non-migratory and maintain relatively small home ranges, generally no more 1,500 acres in this region. Once a species that was almost extinct in the U.S in the early 1900's, the AGFC, established in 1915, shortened hunting seasons 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.</p> <p>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.</p> <p>The wild turkey is now numerous and widely distributed due to reintroduction programs, active management, and regulated hunting. Turkey numbers appear to be stable but fluctuate greatly depending on water levels of the Ouachita River. During prolonged events of flooding in the wetlands along the river, turkey numbers generally decline but will recover over time. Gobbler only, spring hunting ensures the survival of hens, allows those hens to be bred, and continues providing this renewable resource.</p>	<p>Environmental Trends and Planned Actions Description</p> <p>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. State-wide harvest of wild turkeys from 2007 to 2019 was 130,224 with a yearly average of 10,017. During this same period, turkeys harvested on Felsenthal NWR contributed less than 110 individual turkeys to the state total or less than 0.01% of the yearly average.</p>	<p>Anticipated Impacts</p> <p>The quota turkey hunting, which occurs in April, only allows very small number of hunters to be permitted to hunt on the refuge. Impacts to regional and statewide populations of these species would be minimal, and effects on local populations would be at a level low enough to sustain those populations. Harvest</p>
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<p>during limited turkey hunting at Felsenthal NWR is expected to be no more than 20-25 male turkeys. The limited public hunting of turkeys on the refuge should have no noticeable impacts on sustaining this renewable resource.</p> <p>Alternative A - Continue Current Management – No Action Estimated Hunter Numbers: Archery Hunt (5), Gun Hunt (50) Estimated Take: Archery Hunt (2), Gun Hunt (10)</p> <p>Under this alternative, legal harvest of individual animals would still occur on areas of the refuge that are currently open to hunting according to the 1988 Hunt Plan. Hunting would not be opened on any parcels acquired since approval of the 1988 Plan or any future acquired refuge parcels.</p> <p>Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative Estimated Hunter Numbers: Archery Hunt (5), Gun Hunt (50) Estimated Take: Archery Hunt (2), Gun Hunt (12)</p> <p>The AGFC maintains records for the harvest of wild turkey. The data confirms turkey hunting on surrounding private lands (a longer season) have not had a local negative effect on the turkey population. From 2007 to 2019, the annual harvest of less than 110 turkey of the yearly average from Felsenthal NWR represents less than a small percentage of the annual statewide harvest. As these lands were hunted under the previous landowner, we expect the impacts to be minimal. Due to the highly restricted, short duration of turkey quota hunts, expanding the number of acres available for hunting will have no significant effect to the refuge turkey population.</p>	<p>Squirrel (<i>Sciurus carolinensis</i>, <i>Sciurus niger</i>) and Rabbit (<i>Sylvilagus floridanus</i>)</p>
<p>Affected Environment Description</p> <p>The land within the refuge acquisition boundary contains over an additional 25,000 acres of potential squirrel habitat (<i>i.e.</i> upland and bottomland forest). The reproductive potential of these species is very high with multiple litters produced each year. However, squirrel population levels are closely correlated to fall mast production indices. More mast means lower rates of winter mortality and higher reproductive potential the following spring. Less mast means higher rates of winter mortality and lower reproductive potential the following spring. Squirrel mortality associated with hunting is considered compensatory. 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 squirrels, are not affected by hunting but rather are limited by food resources (USFWS 2014). 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. Based on observations made by refuge staff, and personal communications with hunters, squirrel hunting participation on the refuge remains popular to a relatively small group of participants.</p>	

The land within the refuge acquisition boundary contains approximately 6,500 acres of potential rabbit habitat (*i.e.* combination of suitable open land and forested habitat). The reproductive potential of these species is very high with multiple litters produced each year. However, rabbits thrive where adequate food and cover are available to sustain their populations. Rabbits can be found in a variety of habitats, but are primarily associated with the edges of upland openings and dense regeneration areas in woodlands. The rabbit population is anticipated to remain stable, or increase on the refuge due to habitat management practices implemented on the refuge that benefit early successional stage species. Habitat management practices include, but are not limited to, forest management activities, open field management, and controlled prescribed burning. Based on observations made by refuge staff, and personal communication with hunters, rabbit hunting participation on the refuge remains popular to a relatively small group of participants. The present/proposed action should have no significant effects on the refuge rabbit population.

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 (Dickson2001). 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 versus 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.

Anticipated Impacts

Research shows that there are only small differences in density and/or mortality rates in gray squirrels on hunted versus non-hunted populations (Mosby 1969, Rose 1977). Based on the observed impacts of the current hunting of this species, expanding the acreage available to be hunted on Felsenthal NWR should have no significant effects on the local population of gray and fox squirrels.

Based on the observed impacts of the current hunting of this species, expanding the acreage available to be hunted on Felsenthal NWR should have no significant effects on the local population of rabbits.

Alternative A - Continue Current Management – No Action

Estimated Hunter Numbers: Gun Hunt (50)
Estimated Take: Gun Hunt (850)

Under this alternative, legal harvest of individual animals would still occur on areas of the refuge that are currently open to hunting according to the 1988 Hunt Plan. Hunting would not be opened on any parcels acquired since approval of the 1988 Plan or any future acquired refuge parcels.

Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative

Estimated Hunter Numbers: Gun Hunt (60)
Estimated Take: Gun Hunt (900)

Hunters will be able to hunt more areas of the refuge potentially allowing for more harvest opportunities. As these lands were hunted under the previous landowner, we expect the impacts to be minimal. The proposed action of expanding acreages for hunting of squirrels should have no significant effects on the local or regional population. The local squirrel population is anticipated to remain stable.

The proposed action of expanding acreage for hunting of rabbits should have no significant effects on the local or regional population. The local rabbit population is anticipated to remain stable or increase on the refuge due to habit management practices implemented on the refuge.

Raccoon (*Procyon lotor*) and Opossum (*Didelphus virginiana*)

Affected Environment Description

The land within the refuge acquisition boundary contains approximately 29,000 acres of potential raccoon habitat and opossum (*i.e.* upland and bottomland forest). Raccoon reproduce quickly, are difficult to hunt due to their nocturnal habits, and are not as popular for hunting as other game species. They prey upon waterfowl, wild turkey and other ground-nesting birds and their nests. Distemper often affects localized populations, and while rabies is a potential problem, no rabid raccoons have been found in Arkansas in more than 15 years (Arkansas Department of Health 2020).

Raccoons are frequent urban and rural pests. Damage often occurs to neighboring landowners from their nuisance activity.

The opossum is not considered a significant nuisance species, although they do get into people’s garbage and chicken houses occasionally. The species may serve as a host for organisms causing tularemia, relapsing fever, leptospirosis and usually carry a large burden of internal parasites, such as flukes, tapeworms and roundworms (Dickson 2001).

Environmental Trends and Planned Actions Description

<p>Raccoons are distributed statewide and have been harvested in greater numbers than any other furbearer for 50 years (Dickson 2001). Reasons for the high harvest include the ubiquitous nature of raccoons, their high population levels and their high reproductive potential. Also, they are easily caught, there is demand for the fur and they are pursued by both trappers and sportsmen. There is a limited market for raccoon meat for eating.</p> <p>According to the AGFC's 2018-19 Furbearing Animal Report (AGFC 2019), the perception of Arkansas trappers is that raccoon populations are increasing. While many Arkansans believe that the number of raccoons is exploding, objective data from the bow hunter and field trial surveys indicate that their populations have been stable over the last six years. Recognizing the expansion of some of these populations, 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.</p> <p>The opossum is common throughout the state. According to the AGFC's 2018-19 Furbearing Animal Report (AGFC 2019), the perception of Arkansas trappers is that opossum populations are increasing. Recognizing the expansion of some of these populations, 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.</p> <p>While raccoon and opossum 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 raccoons.</p>	<p>Anticipated Impacts</p> <p>Based on observations made by refuge staff, and personal communication with hunters, raccoon hunting participation on the refuge remains popular to a relatively small group of participants. Raccoon associated with hunting is considered compensatory.</p> <p>Based on observations made by refuge staff, and personal communication with hunters, the refuge receives very minimal, if any, opossum specific hunting pressure.</p> <p>Alternative A - Continue Current Management – No Action Estimated Hunter Numbers: Gun Hunt (50) Estimated Take: Gun Hunt (50)</p> <p>Under this alternative, legal harvest of individual animals would still occur on areas of the refuge that are currently open to hunting according to the 1988 Hunt Plan. Hunting would not be opened on any parcels acquired since approval of the 1988 Plan or any future acquired refuge parcels.</p> <p>Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative Estimated Hunter Numbers: Gun Hunt (50) Estimated Take: Gun Hunt (50)</p>
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<p>Hunters will be able to hunt more areas of the refuge potentially allowing for more harvest opportunities. As these lands were hunted under the previous landowner, we expect the impacts to be minimal. The proposed action of expanding acreage for hunting of raccoon should have no significant effects on the local or regional population. The local raccoon population is anticipated to remain stable, regardless of hunting pressure.</p> <p>Opossum reproduce quickly, are difficult to hunt due to their nocturnal habits, and are not as popular for hunting as other game species. Opossum mortality associated with hunting is considered compensatory. The proposed action of expanding acres for hunting of opossum should have no significant effects on the local or regional population. The local opossum population is anticipated to remain stable, regardless of hunting pressure.</p>	<p>Quail (<i>Colinus virginianus</i>)</p>	<p>Affected Environment Description</p> <p>Quail populations on the refuge are influenced by refuge management activities and land-use practice surrounding the refuge. The land within the refuge acquisition boundary contains approximately 6,500 acres of potential quail habitat (<i>i.e.</i> open pine savannah habitat). Management practices being implemented on the refuge in an effort to improve quail habitat include, establishing forest management activities, open field management, and prescribed fire. Combined, the present/proposed actions should have no significant effects to northern bobwhite quail.</p>	<p>Environmental Trends and Planned Actions Description</p> <p>The northern bobwhite quail endured a severe decline in population. Bobwhites have suffered a 62% decrease in their population cross the Southeast from 1963 to 1996 (Capel 1996). This trend is consistent in Arkansas as well (AGFC 2016). The decline is attributed primarily to land use practices and lack of prescribed fire. The AGFC Strategic Quail Management Plan (2016) has proposed a series of measures to increase the number of breeding bobwhite quail that include land conservation, and changes in agricultural and forestry land management practices. The early successional habitat that quail favor is increasing on the refuge with our open pine savannah management and the use of prescribed fire as a management tool. County-specific and refuge-specific harvest data are not available. Quail hunting on the refuge will coincide with AGFC seasons and bag limits, with the exception that quail season is closed during all modern gun and muzzleloader deer seasons.</p> <p>While quail 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 quail.</p>	<p>Anticipated Impacts</p>
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<p>Based on observations made by refuge staff, quail hunting participation on the refuge is very low. The low interest in quail hunting on the refuge is attributed to an overall (local, statewide, and nationwide) decline in the species. Based on the effects of the present, proposed action, hunter interest for quail is not expected to increase on the refuge; however, habitat improvement practices on and off-refuge lands are expected to improve quail populations.</p> <p>Alternative A - Continue Current Management – No Action Estimated Hunter Numbers: Hunt (5) Estimated Take: (5)</p> <p>Under this alternative, legal harvest of individual animals would still occur on areas of the refuge that are currently open to hunting according to the 1988 Hunt Plan. Hunting would not be opened on any parcels acquired since approval of the 1988 Plan or any future acquired refuge parcels.</p> <p>Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative Estimated Hunter Numbers: Same as Gun Hunt (5) Estimated Take: Same as A</p> <p>Hunters will be able to hunt more areas of the refuge potentially allowing for more harvest opportunities. As these lands were hunted under the previous landowner, we expect the impacts to be minimal. The proposed action of expanding acres for hunting of quail should have no significant effects on the local or regional population. The local quail population is anticipated to remain stable or increase on the refuge due to habit management practices implemented on the refuge.</p>	<p>Feral Hog (<i>Sus scrofa</i>) – Incidental Take</p> <p>Affected Environment Description</p> <p>It is neither the goal nor the intent of the Service to manage feral hogs as a huntable game species. Hogs are an invasive, exotic species that damage native habitats and prey on native wildlife. Feral hogs can have an impact on abundance and richness of plant and animal species, initiate crop damage, prey on livestock, cause vehicle collisions, and transmit diseases. (Massei et. al. 2011). By rooting and wallowing, feral hogs destroy wildlife habitat. Impacts include severe damage to impoundment dikes, increased erosion along waterways and wetlands, loss of native plants, and soil disturbance that favors the introduction of invasive plants, such as Chinese tallow and Japanese climbing fern. Additionally, feral hogs compete directly for food with native species such as deer, turkeys, squirrels, raccoons, and many other birds and mammals. They are predators of reptiles, small mammals, and ground nesting birds. They also harbor several infectious diseases, some of which can be fatal to native wildlife and humans (Dickson 2001). The objective of feral hog control programs is to reduce numbers to levels that minimize impacts to acceptable levels, and where possible, completely eradicate them. Because the ultimate goal is to eliminate feral hogs, the Service sees no management value in promoting recreational hunting of feral hogs on any public lands.</p> <p>The Service does believe that hunter effort can remove a portion of feral hogs from its refuges, but does not fully support the overall goal that hunting alone can control feral hog populations. Hunting has been shown to reduce hog populations by as little as 8 percent to as much as 50 percent. However, studies show that at</p>
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<p>least 66-75 percent of a hog population must be removed each year to impact or offset reproduction (McPeake 2015). Additionally, hunters often selectively harvest hogs, bypassing females or small piglets. Public hunting is also often density dependent. Thus, when control measures successfully remove a significant percentage of the feral hog population, hunters are often unwilling to put forth the time and effort required to harvest remaining hogs. Public hunting pressure then is reduced and feral hog populations rebound to previous levels.</p> <p>History, observations, and research across many states suggest that allowing take of feral hogs creates a value and commodity among users and that reducing or eliminating the opportunity to take feral hogs will reduce the releasing of feral pigs on public and private lands. Historically, unscrupulous hunters have been caught and prosecuted for illegally releasing live hogs onto public lands. For example, the Tennessee Wildlife Resources Agency (TWRA) attempted to control the feral hog populations by opening a state-wide hunting season in 1999. This resulted in disjointed populations of feral hogs appearing throughout the state. Individuals illegally stocked feral hogs in an effort to establish local hunting populations. Once a state-wide hunting season was implemented, the feral hog populations expanded the most (TWRA 2020). In 2015, studies estimated the damage by feral hogs topped \$26 million. In order to remove the incentive to relocate feral hogs, Tennessee changed regulations to consider feral hog destructive species and to be controlled by methods other than sport hunting. (TWRA 2020). Therefore, the live transport of hogs is not permitted, and it is illegal to capture and purposefully release a hog into the wild on public or private land in Arkansas (A.C. A. 2-38-504). Many areas experiencing new inundations of hogs are the result of illegal releases of live hogs onto public lands for populations of hogs to hunt. Supporting AGFC in this effort will increase the effectiveness of this feral swine management strategy across all lands within Arkansas.</p> <p>The Service's feral hog management strategies include a multifaceted approach utilizing various removal methods on both small and large scales by staff and partners. This approach ensures that each strategy supports the same goal. Allowing hunters to remove hogs can be variable and may often times not share the same goal. As data and literature become available, the Service is constantly adapting its strategy to make the most effective impact on the feral hog population on its refuges. We believe that the biggest impact can be made in an effort to combat feral hogs by supporting AGFC and working with partners in a unified approach.</p>	<p>Environmental Trends and Planned Actions Description</p> <p>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.</p> <p>Feral hogs are a problem both on refuge lands and adjoining privately owned lands. They occur throughout Felsenthal NWR and their numbers appear to be stable but fluctuate greatly depending on water levels of the Ouachita River. 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.</p> <p>The incidental taking of feral hogs will be governed by Arkansas Game and Fish Commission regulations concerning the taking of feral hogs on State Wildlife Management Areas (WMAs). Subject to State regulations, we allow incidental take of feral hogs during daytime refuge deer quota hunts (without the use of dogs) and during specified period during archery deer hunting with legal hunting equipment and ammunition allowed for those hunt according to season dates provided in the public use regulations brochure. No bag limit. Live hogs may not be transported or possessed.</p>
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<p>Anticipated Impacts</p> <p>Hunters actively pursuing hogs can negatively impact removal efforts by Service staff and personnel. Hunter activity around baited trap sites may disperse the hogs into other areas and can decrease the success of refuge removal efforts. Furthermore, hunters using dogs to pursue hogs often results in dispersing hogs temporarily onto adjacent properties and hogs then return when hunting pressure is low. However, hunting is another management tool, which assists in the control of this extremely invasive species. Removal of feral hogs reduces not only the damage to wildlife habitat and food resources, but crop damage to neighboring landowners as well.</p> <p>Alternative A - Continue Current Management – No Action Estimated Hunter Numbers: Archery Hunt (15), Gun Hunt (25) Estimated Take: Archery Hunt (10), Gun Hunt (30)</p> <p>Under this alternative, legal harvest of individual animals would still occur on areas of the refuge that are currently open to hunting according to the 1988 Hunt Plan. Hunting would not be opened on any parcels acquired since approval of the 1988 Plan or any future acquired refuge parcels.</p> <p>Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative Estimated Hunter Numbers: Archery Hunt (25), Gun Hunt (40) Estimated Take: Archery Hunt (15), Gun Hunt (35)</p> <p>Hunters will be able to hunt more areas of the refuge potentially allowing for more harvest opportunities. As these lands were hunted under the previous landowner, we expect the impacts to be minimal. The proposed action of expanding acres for incidental take of feral hogs should have no significant effects on the local or regional population, since studies show that at least 66-75 percent of a hog population must be removed each year to impact or offset reproduction (McPeake 2015). The local feral hog population is anticipated to remain stable or increase on the refuge if hunting is the only management action used to control this invasive species.</p>	<p>Coyote (<i>Canis latrans</i>) – Incidental Take</p>	<p>Affected Environment Description</p> <p>Coyotes have vastly expanded throughout the eastern United States, believed to potentially be filling the niche of the Red wolf as the apex predator in urban and forested areas. The coyote mating system is such that only the dominate pair reproduce and suppress the mating activities in subordinate individuals. When the dominate pair of coyotes is killed, the packs disbands, and the subordinate members find mates and reproduce. Because of such reproductive system, efforts throughout history to eradicate coyote populations because of damage to livestock, property, and other commodities has failed. It has been deemed nearly impossible to permanently reduce coyote populations (Crabtree and Sheldon 1999).</p>
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<p>Coyotes are an opportunistic predator, consuming small mammals, birds and their nests and most any other susceptible animal they encounter. They also consume carrion, fruit, and vegetative matter (Whitaker and Hamilton 1998). Coyotes can be beneficial, since they consume large numbers of rodents, scavenge for dead animals and remove crippled and diseased deer from the deer herd. However, when these species numbers are high, local wildlife populations can be negatively affected. Research has shown that control of coyote populations can increase the abundance of species such as rodents, rabbits, badgers, bobcats, and fox (Henke and Bryant, 1999). Coyotes are controversial, since they sometimes prey upon game animals and domestic animals, such as cats, dogs and occasionally upon poultry and other livestock. However, proper animal husbandry measures can control most depredation problems.</p>	<p><i>Environmental Trends and Planned Actions Description</i></p> <p>In Arkansas, the coyote originally was found in the more open areas of western Arkansas. But with changing agricultural practices, such as clearing of timberlands and creation of more open lands, the coyote extended its range to the central part of the state by the early 1950s and over the entire state by the early 1960s. Presently, coyotes are common in every Arkansas County, and abundant on the South Arkansas Refuge Complex (SARC).</p> <p>Bowhunter observation data provides some modest support for the popular perception that coyote populations are increasing in the state; however, the large amount of annual variation in observation rates make such determinations difficult. Nevertheless, it is clear that recreational harvest, aided by very liberal hunting, trapping and nuisance wildlife control regulations, is not reducing coyote populations on a statewide level. Coyote control can only realistically be achieved on a local scale, and only then if a significant effort is made on a sustained basis.</p> <p>While coyote 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 coyote.</p>
<p>Anticipated Impacts</p> <p>Population impacts of hunting coyotes on the refuge cannot be reasonably measured and are most likely not detectable due to the minimal estimated harvest and transient nature of the species.</p> <p>Alternative A - Continue Current Management – No Action Estimated Hunter Numbers: Archery Hunt (10), Gun Hunt (10) Estimated Take: Archery Hunt (2), Gun Hunt (5)</p> <p>Under this alternative, legal harvest of individual animals would still occur on areas of the refuge that are currently open to hunting according to the 1988 Hunt Plan. Hunting would not be opened on any parcels acquired since approval of the 1988 Plan or any future acquired refuge parcels.</p> <p>Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative</p>	

<p>Estimated Hunter Numbers: Archery Hunt (10), Gun Hunt (10) Estimated Take: Archery Hunt (2), Gun Hunt (5)</p> <p>Hunters will be able to hunt more areas of the refuge potentially allowing for more harvest opportunities. As these lands were hunted under the previous landowner, we expect the impacts to be minimal. The proposed action of expanding acres for incidental take of coyote should have no significant effects on the local or regional population. The local coyote population is anticipated to remain stable or increase on the refuge.</p> <p>Under the proposed action, coyotes could be incidentally taken during all refuge hunts in those areas open to hunting and using any designated legal firearm or bow for that particular hunt. Although no research projects have been conducted concerning coyote densities and impacts on wildlife populations at Felsenthal NWR, anecdotal evidence by staff observations suggest that the number of coyotes continues to increase. The coyote is considered a nuisance species by the AGFC.</p>	
<p>Beaver (<i>Castor canadensis</i>) – Incidental Take</p>	
<p>Affected Environment Description</p> <p>Beavers move into suitable areas and by creating an environment appropriate for their own needs, unwittingly create wetland habitats for many other species including waterfowl (Beard 1953; Nummi 1992). Felsenthal NWR acknowledges that beaver ponds contribute to landscape diversity. However, beaver also damage forest resources used by many other species. Research has shown that browsing by beaver can reverse the progress of succession and decrease diversity of woody species (Rosell et. al. 2005).</p> <p>Perhaps no other mammal in Arkansas is as valuable as the beaver and at the same time, creates more problems and economic loss. Its activities often conflict with man's vested interest, and damage to agricultural and timber lands present difficult problems for the SARC and the AGFC (Dickson 2001). Across the SARC, beavers cause flooding of agricultural land by damming canals, drainages and pipes. They also fell trees or kill trees by girdling or submerging the roots behind dams for prolonged periods. On the other hand, the beaver provides several important services to humans. Because of their construction of ponds, beavers provide water storage for a variety of uses, retard soil erosion, enhance conditions for warm water fish and create plant diversity.</p>	
<p>Environmental Trends and Planned Actions Description</p> <p>Once nearly extirpated, the beaver is now again abundant through much of the United States where forested habitat occurs near suitable water sources that can be dammed (Whitaker and Hamilton 1998). Prior to European settlement, the beaver population in North America was estimated at more than 100 million animals (Dickson 2001). Beaver pelts became economically important and were exported from North America during the Fur Trade era of the 18th and 19th centuries. Today, the continental population has rebounded to levels nearing 100 million (Lander 2016).</p>	

While beaver 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 beaver.	
<p>Anticipated Impacts</p> <p>Population impacts of hunting beaver on the refuge cannot be reasonably measured and are most likely not detectable due the nocturnal nature of this species. Since beaver are considered most active at night, a temporal protection will be created during hours of darkness which will further reducing the hunter harvest.</p> <p>Alternative A - Continue Current Management – No Action Estimated Hunter Numbers: Archery Hunt (0), Gun Hunt (2) Estimated Take: Archery Hunt (1), Gun Hunt (1)</p> <p>Under this alternative, legal harvest of individual animals would still occur on areas of the refuge that are currently open to hunting according to the 1988 Hunt Plan. Hunting would not be opened on any parcels acquired since approval of the 1988 Plan or any future acquired refuge parcels.</p> <p>Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative Estimated Hunter Numbers: Archery Hunt (0), Gun Hunt (3) Estimated Take: Archery Hunt (2), Gun Hunt (2)</p> <p>Hunters will be able to hunt more areas of the refuge potentially allowing for more harvest opportunities. As these lands were hunted under the previous landowner, we expect the impacts to be minimal. The proposed action of expanding acres for incidental take of beaver should have no significant effects on the local or regional population. The local beaver population is anticipated to remain stable.</p>	
Nutria (<i>Myocastor coypus</i>) – Incidental Take	
<p>Affected Environment Description</p> <p>Native to South America, nutria is an introduced and invasive semi-aquatic rodent which can cause significant damages to wetlands as they are known to destroy vegetation and burrow into levees and other infrastructure. Nutria reproduce at rapid rates with a female nutria producing on average 5, but as many as 13, young per litter (Dickson 2001). A female can breed again within two days after giving birth, meaning one nutria can have up to three litters per year. Nutria can be difficult to control because they prefer marshy habitats where they can easily hide in vegetation and burrows.</p>	
Environmental Trends and Planned Actions Description	

<p>The nutria was first successfully introduced in Louisiana in 1938 as a new fur resource. Since then, nutria have become well established through natural dispersal and by trans-locations along the Gulf Coast and inland to Oklahoma, Arkansas, Tennessee, northern Mississippi and Alabama. Nutria were introduced in many areas to control aquatic vegetation, such as water hyacinth, bladderwort, algae and other unwanted vegetation that choked ponds and waterways. But, the nutria's value for this purpose is greatly overrated, since it more often feeds on desirable vegetation, especially in waterfowl habitat. Its burrowing activities also cause serious damage to drainage canals, irrigation ditches and levees in rice growing areas and on fish farms. Nutria have few natural enemies, and except for trapping, control measures do not appear to be very effective (Dickson 2001).</p> <p>While nutria 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 nutria.</p>	<p>Anticipated Impacts</p> <p>Population impacts of hunting nutria on the refuge cannot be reasonably measured and are most likely not detectable due the nocturnal nature of this species. Since nutria are considered most active at night, a temporal protection will be created during hours of darkness which will further reduce the hunter harvest.</p> <p>Alternative A - Continue Current Management – No Action Estimated Hunter Numbers: Archery Hunt (0), Gun Hunt (1) Estimated Take: Archery Hunt (0), Gun Hunt (1)</p> <p>Under this alternative, legal harvest of individual animals would still occur on areas of the refuge that are currently open to hunting according to the 1988 Hunt Plan. Hunting would not be opened on any parcels acquired since approval of the 1988 Plan or any future acquired refuge parcels.</p> <p>Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative Estimated Hunter Numbers: Archery Hunt (0), Gun Hunt (1) Estimated Take: Archery Hunt (0), Gun Hunt (2)</p> <p>Hunters will be able to hunt more areas of the refuge potentially allowing for more harvest opportunities. As these lands were hunted under the previous landowner, we expect the impacts to be minimal. The proposed action of expanding acres for incidental take of nutria should have no significant effects on the local or regional population. The local nutria population is anticipated to remain stable.</p>
<p>Non-Target Wildlife and Aquatic Species</p>	
<p>Affected Environment Description</p>	

<p>Felsenthal NWR support a diversity of wildlife common to the Coastal Plain and Mississippi Alluvial Plain of Arkansas. Most of the wildlife that live on the refuges is found typically in bottomland hardwood forests. Few species surveys have been conducted on the refuge, however. Although actual numbers are hard to accurately quantify, the current wildlife list for Felsenthal NWR would contain at least 200 species of birds, 40 species of mammals, 70 species of reptiles and amphibians, and 90 fish species (USFWS 2010). Each of these individual species would have the same general requirements in that they require food, water, and cover to survive. However, the particular food and cover requirements of a given species are often very specialized. The specific habitat needs of each species vary in some degree from those of every other kind of animal, although many different animals may occupy the same general area. A diversity of habitats tends to encourage and support a diversity of wildlife species.</p> <p>Felsenthal NWR is managed for the purpose of providing habitat for the benefit of migratory waterfowl and other bird species, for habitat and protection of endangered species, provide recreation and environmental education for the public, and protect cultural resources. The refuge is also managed to sustain a healthy population of resident wildlife and plants.</p>	<p>Environmental Trends and Planned Actions Description</p> <p>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.</p> <p>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 western Kentucky 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.</p> <p>Overall, hunting 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.</p>	<p>Anticipated Impacts</p> <p>Hunted wildlife species would be managed at, or near carrying capacity to minimize any intra- and inter-species competition for habitat. Any negative impacts realized in the future to non-hunted wildlife species would be further reduced by appropriate regulation(s). Collectively, these impacts should result in no significant effects on all non-hunted wildlife species.</p> <p>Alternative A - Continue Current Management – No Action</p>
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Through this alternative, public hunting would not be opened on any parcels acquired since approval of the 1988 Hunt Plan or any future acquired refuge parcels, no additional limited hunts would be opened, and no new species would be added to the hunt program. Increased disturbance to non-hunted wildlife would not occur as a result of increased hunting opportunities. However, all refuge parcels would be open to other wildlife-dependent recreation which would cause disturbance to non-hunted wildlife. Hunting is an important management tool for natural resource managers and a Service priority form of wildlife-dependent recreation. Not allowing hunting on recently acquired and future acquired parcels could have negative impacts on non-hunted wildlife. Over-abundance of deer and feral hogs can have devastating effects on a multitude of migrant and resident songbird species through habitat destruction while also directly impacting ground nesting birds, such as Chuck-Will's-widow and turkey.

Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative

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, Felsenthal NWR established 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). Felsenthal NWR continued used of quota hunts helps to manage wildlife disturbance.

Hunter 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. Usage of non-toxic shot reduces the potential of lead poisoning to waterfowl as well as up the food chain.

Felsenthal NWR excludes waterfowl hunting activities on certain areas of the refuge specifically to provide areas of sanctuary. The Refuge also restricts the number of waterfowl hunters and hunt dates/times in some areas with no public entry outside of those days. By restricting entry on these manage impoundments, waterfowl can use the areas as sanctuary for the majority of the winter. Outside of managed impoundment, in order to minimize additional disturbance to both waterfowl and resident wildlife, the Refuge requires all waterfowl hunters to be out of the field prior to noon each day of the season.

<p>Small mammals, including bats, are inactive during winter when hunting season occurs. These species are also nocturnal. Both of these qualities make hunter interactions with small mammals very rare. Hibernation or torpor by cold-blood reptiles and amphibians also limits their activity during the hunting season when temperatures are low. Hunters would rarely 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 and summer 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 period 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.</p> <p>Fish are not expected to be negatively impacted by the increased hunting 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.</p> <p>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.</p> <p>As these lands were hunted under the previous landowner, we expect the impacts to be minimal. Implementing Alternative B would result in minimal disturbance to non-hunted species. There would be fewer impacts on non-hunted wildlife by controlling the density of deer, coyote, and feral hog populations through the implementation of this alternative.</p>	<p>Threatened and Endangered Species and Other Special Status Species</p>
<p>Affected Environment Description</p> <p>There are 30 federally listed threatened and endangered animal and plant species in the state of Arkansas, many of which are aquatic species (24 species), however, only 7 species are found on Felsenthal NWR. The red-cockaded woodpecker is the most recognized and well-known endangered species that occur on Felsenthal NWR. In addition, there are numerous species of special concern.</p> <p>The potential for pondberry, an endangered plant, to occur on the refuge exists; however, it has not been documented to occur here. It is thought the combination of frequent fire and flooding may reduce the likelihood of this species on the refuge.</p> <p>The northern long-eared bat has recently been federally listed as “threatened,” and is assumed to occur at Felsenthal NWR. Annual surveys have detected the species in very low numbers. Northern long-eared bats occupy wood areas and forage near forests and tree lined corridors.</p>	

Davidson (2015) found Winged Mapleleaf and Pink Mucket mussels in the Saline River on Felsenthal NWR just above the Prairie Island Access. Rabbitsfoot mussels have not been found on the refuge but the refuge is within its range and habitat. Ouachita Rock-Pocketbook mussels are rarer and are not likely found on the refuge USFWS AR ES Field Office, 2015.

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 including red-cockaded woodpecker, pondberry, Northern long-eared bat, and 3 mussel species.

With hunting being limited in most areas and more restrictive than 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 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. Nontoxic ammunition must be used by hunters hunting in Green Tree Reservoirs, and nontoxic ammunition is recommended specifically in wetland areas throughout the refuge. Refuge staff provide information on websites, signage and through

<p>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 slugs for deer hunting and rim fire weapons for small game hunting are permitted.</p>	<p>Anticipated Impacts</p> <p>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. Intra-Service Section 7 Evaluation Consultations were completed for the Felsenthal NWR: 2021 Hunt Plan; 2017 Hunt Plan; 2010 CCP; and 1978 and 1988 Hunt Plans. Findings of “no effect” were determined for all species except red-cockaded woodpecker. A finding of “not likely to adversely affect” was determined for RCWs (Appendix E).</p> <p>Alternative A - Continue Current Management – No Action</p> <p>Through this alternative, no changes would be made to the current hunt program. Increased impacts on threatened, endangered, and species of concern would not occur as a result of hunting.</p> <p>Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative</p> <p>As these lands were hunted under the previous landowner, we expect the impacts to be minimal. Additional impacts to threatened species, endangered species, and species of concern would be negligible under implementation of the 2020 Hunt Plan. It is the policy of the Service to protect and preserve all native species of fish, amphibians, reptiles, birds, mammals, invertebrates, and plants, including their habitats, which are designated threatened or endangered. Disturbance factors resulting from public use are always considered for all listed species. The red-cockaded woodpecker, pondberry, several mussel species, and northern long-eared bat are listed as endangered by the U.S. Fish and Wildlife Service. Of these, the mussels and northern long-eared bat will not be impacted by hunting because they would be unlikely to use the refuge’s forested habitats and/or their occurrence on the refuge is outside of the hunting season for deer, small game, and waterfowl. Red-cockaded woodpeckers are a resident species. Hunting has been allowed since 1978 and no impacts have been noted to red-cockaded woodpeckers. No known occurrences of pondberry currently exist on the refuge. There are no known records of pondberry or RCWs on the new lands</p>
<p>Habitat and Vegetation (including vegetation of special management concern)</p>	
<p>Affected Environment Description</p> <p>Felsenthal NWR is located in an extensive natural depression and low-lying area dissected by an intricate system of rivers, creeks, sloughs, buttonbush swamps, and lakes throughout a vast bottomland hardwood forest that gradually rises to an upland forest community. The region’s two major rivers, the Saline and Ouachita, flow through the refuge. Historically, periodic flooding of the “bottoms” (bottomland hardwoods) during winter and spring provided excellent wintering waterfowl habitat. These wetlands, in combination with the pine and upland hardwood forests on the higher ridges, support a wide diversity of native plants and animals. The habitat types represented on Felsenthal NWR are shown below.</p>	

Felsenthal NWR habitat types and their acreages. Permanent Water, 11,000 acres Pine, 11,050 acres Pine-Hardwood Habitat, 765 acres Bottomland Hardwood, 52,789 acres Upland Hardwood, 217 acres Open Fields, Prairies and Nonproductive Areas, 617 acres TOTAL Acres of Habitat, 76,438 acres	Environmental Trends and Planned Actions Description Traditional uses, such as hunting, 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 hunts, and adding new lands to the hunt program would continue these traditional uses and would have a positive economic impact on local communities.
Anticipated Impacts There are no expected noticeable adverse impacts of the proposed action on the refuge environment, consisting of soils, vegetation, air quality, water quality, and solitude. In some instances, hunting would benefit vegetation and neighboring crop lands as it is used to maintain deer and feral hog populations at reasonable densities. The refuge would also control access to minimize habitat degradation. Impacts associated with solitude are expected to be minimal given temporal and spatial management techniques, such as infrequent day closures, used to avoid conflicts among user groups. No impacts are anticipated on neighboring public or private lands. Approval of Alternative B would result in a net gain of public hunting opportunities positively impacting the general public, nearby residents, and refuge visitors. The refuge expects increased visitation and tourism to bring additional revenues to local communities. Through these economic impacts, community support would likely increase for refuge land acquisition, habitat management, and public use funding.	Alternative A - Continue Current Management – No Action Under this alternative, the 1988 Hunt Plan would remain in effect with no changes and hunting would not be opened to the public on any lands acquired since approval of the plan or on any future acquired parcels within the current refuge acquisition boundary. Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative 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.

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 overbrowsing 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, initiate crop damage, predate on livestock, cause vehicle collisions, and transmit diseases. (Massei et. al. 2011).

As these lands were hunted under the previous landowner, we expect the impacts to be minimal. Similar to Alternative A, this alternative provides reasonable means for helping control deer and feral hog densities, which can impact overall habitat quality. In the absence of public hunting for deer, higher densities would likely have severe, negative effects on habitat quality for a variety of trust species. Hunting and other priority public uses should cause fewer impacts on native wildlife, vegetation, soils, and aesthetics on recently acquired and future acquired parcels when compared to these impacts during prior ownership. Newly acquired lands would have clearly defined access points, restricting use to approved trails and parking areas. These restrictions should minimize negative impacts to habitat.

Table 4. Affected Visitor Use and Experience

Visitor Use and Experiences	
Affected Environment Description	<p>Outdoor recreation has been a strong economic engine for Arkansas. Over \$10 billion in consumer spending and 126 in direct job creation. Hunting is a popular nature-based recreational activity that contributes greatly to local, State, and national economies. Total expenditures for all hunting activities (big game, small game, migratory birds, and others) totaled \$33.7 billion in 2011 nationally (USFWS 2011). A more detailed analysis was conducted for waterfowl hunting, which generated over \$3 billion in total output, and \$436 million in State and federal tax revenues, impacting local, State, and national economies (USFWS 2015). In Arkansas alone in 2011, total expenditures for hunting was \$1 billion (USFWS 2011. ADPT 2013). A more detailed analysis was conducted for waterfowl hunting in Arkansas, which generated over \$384,567 million in total industry output, and \$58.1 million in State and federal tax revenues (USFWS 2011).</p> <p>The United States Geologic Survey (USGS)-Fort Collins Science Center estimated the impacts associated with visitor spending to the local community for the current management program when they completed the Visitor and Community Survey for Felsenthal NWR (Dietsch, et. al 2013). The economic impact analysis provides detailed information on the current economic setting. The economic impacts were estimated using the “Impacts Analysis for Planning” (IMPLAN) regional input-output modeling system. Accounting for both the direct and secondary effects, visitor recreation expenditures generates total annual economic impacts of \$19.6 million total output, 198 jobs and \$5.2 million tax revenue (Dietsch, et. al 2013). These impacts are expected to increase with expanding public use opportunities such as hunting.</p>
Environmental Trends and Planned Actions Description	<p>Traditional uses, such as hunting, 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 hunts, and adding new lands to the hunt program would continue these traditional uses and would have a positive economic impact on local communities.</p>

Anticipated Impacts

The refuge is open to all six priority, wildlife-dependent public uses – hunting, fishing, wildlife observation, photography, environmental education, and interpretation. The refuge has more than 400,000 visits annually.

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 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.

By maintaining hunting regulations that are often times more restrictive than State standards, the refuge can promote a better diversity of management options across the landscape, including those that may favor wildlife observation, outreach, and education.

Alternative A - Continue Current Management – No Action

Through this alternative, no impacts would be incurred on non-hunting related wildlife –dependent recreation. However, adopting this alternative would not allow for increased hunting opportunities on the refuge, as recommended in the 2010 CCP, 2014 LPP, Improvement Act, and Conserving the Future Implementation Plan.

Alternative A would not fully meet the intended purpose and need of the 2020 Hunt Plan as it would: 1) not provide additional public hunting opportunities on the newly acquired lands, and 2) not ensure compliance with Service policy on hunting (605 FW2).

This action would require that the refuge post all parcels acquired since 2020 and all future acquired refuge parcels that lie within the current Refuge acquisition boundary as Closed to Hunting. This would involve an increase in law enforcement patrols, at least temporarily, to enforce closure regulations and provide adequate public information to ensure regulatory compliance.

Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative

Levels of compatible wildlife-dependent recreation would be similar under the scenario of each alternative. Any decline in wildlife viewing and wildlife photography opportunities would likely not be realized with the limited nature of the proposed hunts, hunt areas, closed areas, and time of season identified in Alternative B. As future refuge parcels are acquired, these areas would be opened to compatible public-use activities, resulting in an increase in all priority public uses.

As public use levels likely increase through time, unanticipated conflicts between user groups may occur. These conflicts can be mitigated or resolved by providing competing interest groups with alternative access opportunities. Much like during scheduled prescribed burns, this impact is minor and short in duration as to not cause long term conflicts among user groups.

Table 5. Refuge Management and Operations

Administration	Affected Environment Description
	<p>Annual hunt administration costs include salaries, brochure printing, equipment, boundary maintenance, signs, paint, access maintenance (roads, parking areas, trails, etc.), fuel, costs associated with mobility impaired hunter access, etc. Total estimated cost for the refuge hunt program is \$77,818 including staff time and actual expenditures. The majority of these costs are salary-related and considered administrative in nature totaling \$22,195. These costs are equivalent to approximately 1.0 full time staff. The refuge hunting program has additional costs to consider. Refuge law enforcement adds another \$54,000 to the refuge hunt program costs. In addition, the refuge also relies on volunteers to assist with management activities such as the hunt program. They contribute through working at check stations and facility maintenance. These contributions for all hunting programs combined can provide an estimated benefit (\$16.73/hour /GS-5) of 112 hours = \$1,874 or greater depending on the year.</p> <p>The Refuge Recreation Act requires that funds are available for the development, operation, and maintenance of the permitted forms of recreation. The permit fee (\$15 for deer & turkey), and preseason application fee (\$5/hunter) are the minimal amounts needed to offset the cost of facilitating the preseason application, drawings, and permitting of the quota hunts. Preseason drawings are administered by a contracted company which collect information and required fees, conduct the drawing, and issue the permits. Refuge staff will work with the contractor to provide the highest level of customer support.</p> <p>Law enforcement staffing is essential. Currently, the refuge has one law enforcement officer. AGFC also regularly assists with our law enforcement needs.</p> <p>Hunting is a priority refuge use and an important component of meeting refuge objectives and goals. Current staffing and funding are available to meet the requirements of a quality hunting program. It is anticipated that adequate funding would continue to be sufficient to maintain these standards set in future years.</p> <p>Environmental Trends and Planned Actions Description</p> <p>The refuge would continue to meet the demands of the public by maintaining a hunt program, as well as, meeting the goals for which the refuge was established. As public use levels expand across time, unanticipated conflicts among and within user groups may occur. The refuge's visitor use programs would be adjusted as needed to eliminate or minimize each problem and provide quality wildlife-dependent recreational opportunities. Hunting season dates and regulations would be set and regulated to allow all user groups to experience solitude while on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the needs of all wildlife-dependent recreational users groups. Experience has proven that time and space zoning (e.g., establishment of separate use areas, use periods, and restrictions on the number of users) is an effective tool in eliminating conflicts among and within user groups. Negative impacts to other wildlife-dependent recreational users groups on the refuge associated with hunting activities will be insignificant over time. Any negative impacts realized in the future action to wildlife-dependent recreational users groups on the refuge would be further reduced by appropriate regulation(s).</p> <p>Currently, the refuge has acquired approximately 76,438 acres, of the potential 104,516 acres within the refuge acquisition boundary. The future action would have a positive effect on the wildlife-dependent recreation user-groups due to the potential of acquiring additional acres, whereby these acres would be opened for hunting, and the public would gain from a net increase in public use. Collectively, these impacts should result in no significant effects for all user groups.</p> <p>Under the proposed action, acres open to migratory bird hunting would be reduced while acres open to other types of hunting would be increased, additional hunting opportunities would be made available, and species would be added to the list of those that can be legally hunted. Other forms of compatible wildlife-dependent recreation, such as wildlife observation, wildlife photography, environmental education, and interpretation, would be minimally impacted by the limited additional hunting opportunities. When future refuge parcels are acquired, these areas will be opened to all compatible public-use activities. Opening refuge parcels acquired since</p>

approval of the 2014 LPP to hunting would create additional hunting opportunities, as recommended by the 2010 CCP and the Improvement Act. Under this alternative, a careful balance of hunting seasons has been fully examined to ensure that hunting and other wildlife-dependent recreation do not conflict. This alternative would also allow the public to enjoy additional high quality hunting opportunities with little added cost to the refuge, a primary factor for consideration in an era of reduced refuge staffing and operating budgets.

The Service defines facilities as, “Real property that serves a particular function such as buildings, roads, utilities, water control structures, raceways, etc.” Under the proposed action those facilities most utilized by hunters would be parking areas, roads and trails. Under the present/proposed action those facilities most utilized by hunters are: roads, parking lots, trails and levees. Maintenance or improvement of existing facilities (*i.e.* parking areas, roads, trails, and levees) will cause minimal short term impacts to localized soils and waters and may cause some wildlife disturbances and damage to vegetation. The facility maintenance and improvement activities described are periodically conducted to accommodate daily refuge management operations and general public use. These activities will be conducted at times (seasonal and/or daily) to cause the least amount of disturbance to wildlife. All disturbed sites will be restored to as natural a condition as possible. During times when roads are impassible due to flood events or other natural causes those roads, parking lots, trails and levees impacted by the event will be closed to vehicular use. Any negative impacts to refuge facilities would be further reduced by regulating vehicle, ATV, and equine use on the refuge. Collectively, these impacts would result in insignificant impacts to refuge facilities. The present/proposed action should have no significant effects on refuge facilities.

Negative impacts to refuge facilities associated with hunter use will be insignificant over time. Any negative impacts realized to refuge facilities would be further reduced by appropriate regulation(s). Collectively, these impacts should result in no significant effects to refuge facilities.

Anticipated Impacts

Alternative A - Continue Current Management – No Action

Under this alternative, all annual impacts related to facilities would remain the same as the current time.

Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative

Annual maintenance or improvements of existing facilities (parking areas, roads, trails, buildings, etc.) may cause minimal short term impacts to localized soil, water, and wildlife habitat. Facility maintenance and improvement activities are periodically conducted to accommodate daily activities. When these activities are necessary, they would be scheduled to cause the least amount of disturbance to wildlife and other users of the refuge. Siltation barriers would be used to minimize soil erosion and all disturbed sites would be restored to a natural condition as much as possible. As parcels are acquired, new facilities may need to be developed and/or maintained. Existing facilities on new parcels may have short-term impacts to a localized area. The development of new facilities would require a compatibility determination to evaluate any impacts of that use.

Table 6. Socioeconomics

Local and Regional Economies	
Affected Environment Description	<p>Felsenthal NWR is located in Union, Bradley and Ashley counties. This three-county area (Union, Bradley, Ashley) had an estimated population of approximately 71,819 in 2015. The State of Arkansas has only one city with a population greater than 100,000: its capital, Little Rock, with a population of about 197,992. Populations have been decreasing in the region on an average of -4.13 %, with a statewide increase of about 2.10 percent since 2010 through 2015. Per capita income for the three-county area is just below the average for the state, \$22,798. Union County demographic makeup is 64.1% white, 32.9% black/African American, 4.1% Hispanic/Latino, and 0.7% Asian. Bradley County demographic makeup is 68.7% white, 27.7% black/African American, 15.7% Hispanic/Latino, and 0.5% Asian. Ashley County demographic makeup is 72.6% white, 15.7% black/African American, 5.5% Hispanic/Latino, and 0.3% Asian.</p> <p>The refuge typically averages about 400,000 visitors a year. In 2017, Felsenthal NWR had 424,550 visitors. The vast majority of the recreation visits, over 250,000, were for freshwater fishing with about 70 percent of recreation visits by area residents. In 2017, Felsenthal NWR experienced 46,190 recreational hunt visits comprised of 20,387 residents and 25,803 non-residents (Caudill and Carver 2019).</p> <p>Total expenditure by visitors to Felsenthal NWR in 2017 was \$11,528,800. Nonresident expenditures accounted for 68% of the total. Expenditures on non-consumptive activities accounted for 49% of the total, with hunting accounting for 29% and fishing 22%. The local economic contributions associated with refuge recreation visits was \$13,558,900.00 of economic input creating 133 jobs, and \$ 1,067,400,.00 total state and local tax revenue (Caudill and Carver 2019).</p>
Environmental Trends and Planned Actions Description	<p>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 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). Visitation to Felsenthal NWR dropped in 2019 to just over 380,000. Hunting accounted for 45,500 visits (USFWS 2019). 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.</p>
Anticipated Impacts	<p>Alternative A - Continue Current Management – No Action We do not expect that continuing with current management will have any significant adverse short-term, long-term impacts on the economy of the towns or county in which the refuge lies. We would not expect this activity to significantly alter the demographic of economic characteristics of the local community.</p> <p>Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative Expanding hunting on new acres of the refuge, could result in several minor beneficial impacts on the social communities near the refuge and in the State and region as a whole. We expect public use of the refuge to increase, thereby increasing the number of days visitors spend in the area and correspondingly, the level of visitor spending in the local communities.</p>

<p>White-tailed deer hunting is the single most important public use that would affect forest-dependent wildlife and the local economy. It serves as both a wildlife-dependent recreational use and a method to reduce and stabilize deer densities. Reducing deer densities to within the carrying capacity and allowing incidental take of feral hogs not only benefits the habitat but reduces crop damage to neighboring landowners. The refuge hunt program is most practically means to reduce deer densities and has a minor contribution to reducing hog densities.</p>	<p>Environmental Justice</p>
<p>Affected Environment Description</p> <p>President Clinton signed 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.</p>	<p>Environmental Trends and Planned Actions Description</p> <p>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.</p>
<p>Anticipated Impacts</p> <p>Before we make any decisions to make major changes in habitat management or the environment, we always inform all of our publics, equally, and our programs and facilities are open to all who are willing to adhere to the established refuge rules and regulations. We do not discriminate in our responses for technical or practical information on conservation issues or when providing technical assistance in managing private lands.</p> <p>Alternative A - Continue Current Management – No Action / Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative</p> <p>These alternatives are not expected to place disproportionately high, adverse environmental, economic, social, or health effects on minority or low-income persons.</p>	

Monitoring

The Service will maintain compliance with hunting regulations by dispatching Service and law enforcement officers to perform field checks. Hunters must possess an Annual Public Use Permit that can be acquired online. Refuge brochures are available online and at kiosks at most refuge access points. The AGFC will continue to monitor wildlife populations in the state to determine the response of these wildlife species to hunting management actions. The refuge will continue its cooperation with the AGFC.

Summary of Analysis

The purpose of this EA is to briefly provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement or a Finding of No Significant Impact.

Alternative A - Continue Current Management – No Action

As described above, hunting on the refuge would be maintained at current levels with no significant changes. Conflicts between hunters and other refuge 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 will likely continue to increase slightly or at least remain at current levels. Impacts to habitat and non-hunted wildlife caused by overabundant and exotic species will continue and potentially worsen.

This alternative 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 opportunities. Habitat damage by feral hogs would likely continue to increase and affect refuge habitat and adjacent landowners' agricultural crops. Also, the refuge would not come into greater alignment with state regulations.

Alternative B: 2021 Hunt Plan Implementation - Proposed Action Alternative

Implementing this alternative would manage hunting on current and future refuge parcels within the current acquisition boundary, and open an additional 9,277 newly acquired/approved lands to big game (white-tailed deer and turkey), upland game (gray and fox squirrels, rabbits, raccoon, opossum and bobwhite quail), waterfowl (ducks, geese, coots), other migratory game birds (woodcock) and incidental take species (beaver, nutria, coyote, and feral hogs) for hunting. These additional opportunities are likely to attract slightly more hunters, potentially increasing conflicts with other users; however, this impact should be minor. We believe that any conflicts can be easily mitigated by the continued use of time and space zoning measures to separate user groups that reduce the likelihood and impacts of the conflict. There is not likely to be an adverse effect on endangered or threatened species. Effects on wildlife and habitat at a local level would be positive overall, but these effects would be negligible on a larger scale. 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.

This alternative helps meet the purpose and needs of the Service as described above because it provides additional wildlife-dependent recreation opportunities on the refuge. Refuge habitat objectives will be more easily achieved with the reduction of habitat damage caused by feral hogs. This alternative also helps align Service regulations with state regulations in an effort to making hunting more accessible by the American public. The NWRSA of 1997 identified hunting as a compatible use for refuges. The draft Compatibility Determination will be used to determine if the Draft Hunting Plan is compatible with the purposes of the Tensas River NWR and the mission of the NWR.

List of Sources, Agencies and Persons Consulted

National wildlife refuges, including Felsenthal NWR, conduct hunting programs within the framework of state and Federal regulations. All authorized hunts are at least as restrictive as the state of Arkansas. By maintaining hunting regulations that are as, or more, restrictive than the state, individual refuges ensure that they are maintaining seasons which are supportive of management on a local and regional basis. The Service sent letters regarding the opportunity for input to the state of Arkansas on October 1, 2020. The proposed Hunt Plan, compatibility determination, regulations and EA Refuge were provided for review on April 29, 2021. Refuge staff will continue to coordinate with the AGFC to address annual implementation of hunting activities.

List of Preparers

Michael Stroeh, Project Leader
Nick Wirwa, Wildlife Biologist
Amanda Wilkinson, Park Ranger

State Coordination

National wildlife refuges, including Felsenthal NWR, conduct hunting programs within the framework of state and Federal regulations. Felsenthal NWR closely follows the AGFC hunting season dates, hours, limits and methods of take, with few exceptions based on refuge purposes. Refuge staff reviewed regulations for the neighboring State Wildlife Management Area to establish consistency where possible.

The Service consulted with AGFC through letter in October 2020 and provided the 2021 Felsenthal NWR Hunt Plan and EA to the agency in April 2021 for review. On May 28, 2021, AGFC provided comments to the Service in support of the proposed alternative. Felsenthal NWR will continue to work with the AGFC to ensure safe and enjoyable recreational hunting opportunities. Established hunter training education helps ensure hunters continue to use good judgment related to humaneness and animal welfare.

The Service also provided an in depth review by the Regional Office personnel and staff biologists. Numerous contacts were made throughout the area of the refuge soliciting comments, views, and ideas

into the development of the accompanying hunting plan

Chronic wasting disease (CWD; Williams and Young 1980), is considered by many North American wildlife managers and administrators as the most important disease threatening North American cervids. A fatal, transmissible, and degenerative disease of deer, elk, moose, and other species of the family Cervidae, CWD affects all native North American cervids. The Service recognizes that the AGFC will have the lead on any disease which affects resident wildlife, and Felsenthal NWR will support the state in its prevention and surveillance efforts, as appropriate. The proposed hunt plan has been reviewed and is supported by the AGFC. Additionally, the refuge coordinates with the AGFC annually and notifies the AGFC of changes in the hunt program, providing the state an opportunity to review and comment on proposed changes.

Tribal Consultation

The Service sent scoping letters making notification and seeking input on October 1, 2020 and follow up emails in April 14, 2021 to:

- Quapaw Tribal Business;
- Caddo Nation;
- Coushatta Tribe of Louisiana;
- Choctaw Nation;
- Jena Band of Choctaw;
- Mississippi Band of Choctaw Indians;
- Tunica-Biloxi Indian Tribe of Louisiana

Public Outreach

The EA, draft hunt plan, draft CD, and draft regulations for the refuge were made available for public review and comment in the spring of 2021 nationally through the Federal Register and locally from April 14, 2021 through July 6, 2021 at the Refuge Complex office, on refuge and national websites (<https://www.fws.gov/refuge/>), and in the local newspapers. National public notice was provided through the Federal Register ([Volume 86, Number 84; 86 FR 23794; Docket No. FWS-HQ-NWRS-2021-0027, FXRS12610900000-212-FF09R20000; pages 23794-23842](#)) which was published on May 4, 2021.

The Service received 5 responses from interested citizens with 4 distinct comments. The comments and Service responses are provided in Appendix C. A letter was received from the Humane Society of the United States that was also received to the Federal Register. A response to that letter is provided in the Final Rule.

Determination

This section will be filled out upon completion of the public comment period and at the time of finalization of the Environmental Assessment.

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

APPENDIX A. REFERENCES

- Anderson, J.E. (Ed) 2006. [Arkansas Wildlife Action Plan](#). Arkansas Game and Fish Commission. Little Rock, AR. 208 pp.
- Arkansas Department of Health. 2020. [Diseases and Conditions: Rabies](#). Retrieved January 5, 2021.
- Arkansas Department of Parks and Tourism (ADPT), 2013 Arkansas Statewide Comprehensive Outdoor Recreation Plan 2014-2018. 44pp.
- Arkansas Game and Fish Commission, 2016. [Strategic Quail Management Plan](#). 16pp.
- Arkansas Game and Fish Commission 2016. [White-tailed Deer Harvest Reports](#).
- Arkansas Game and Fish Commission 2015. [Wild Turkey Harvest and Scientific Reports](#).
- Arkansas Game and Fish Commission 2013. 2013 Strategic Deer Management Plan, Little Rock, AR 50pp.
- Arkansas Game and Fish Commission. 2019. 2018-2019 Furbearing Animal Report. Mayflower, AR. 33pp.
- Arrese, P. 1987. Age, intrusion pressure and defense against floaters by territorial male Song Sparrows. *Animal Behavior* 35:773-784.
- Austin, J.E. 1987. Activities of post breeding lesser scaup in southwestern Manitoba. *Wilson Bull.* 99:448-456.
- 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.
- Baydack, R.K. 1986. Sharp-tailed grouse response to disturbance in the Carberry Sand Hills of Manitoba. Colorado State University. Fort Collins, Colorado.
- Beach, R. 1993. Depredation problems involving feral hogs. Pages 67-93 in C.W. Hanselka and J.F. Cadenhead, eds. *Feral Swine: A compendium for resource managers*. Texas Agric. Ext. Service, College Station, TX.
- Beard, Elizabeth B. 1953. The Importance of Beaver in Waterfowl Management at the Seney National Wildlife Refuge. *The Journal of Wildlife Management*, 17(4): 398-436
- Becker, H. N., R. C. Belden, T. Brevault, M. J. Burrige, W. B. Frankenberger, and P. Nicoletti. 1978. Brucellosis in feral swine in Florida. *Journal of the American Veterinary Medical Association* 173: 1181-1182.
- Behrend, D. F., G. F. Mattfield, W. C. Tierson and J. E. Wiley. 1970. Deer density control for comprehensive forest management. *J. Forestry*. 68:695-700.
- Belanger, L. and L. Bedard. 1995. Hunting and waterfowl. Pages 243-256 in *Wildlife and Recreationists: coexistence through management and research* (Knight and Gutzwiller eds). Island Press, Washington, D. C. 372 pp.
- Bellrose, F. C. 1954. The value of waterfowl refuges in Illinois. *Journal of Wildlife Management* 18(2) 160-169.

- 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.
- Boomer, G. S., F. A. Johnson, and G. S. Zimmerman. 2015. [Adaptive harvest management: adjustments for SEIS 2013](#). U. S. Department of Interior, Washington, D. C. 21 pp.
- Bouffard S.H. 1982. Wildlife values versus human recreation: Ruby Lake National Wildlife Refuge. *Trans. North American Wildlife and Natural Resources Conference* 47:553-558.
- Bowles, A.E. 1996. Responses of wildlife to noise. Pages 109-156 in R.L. Knight and K.J. Gutzwiller, eds. *Wildlife and recreationists: coexistence through management and research*. Island Press, Washington, D.C.
- Boyle, S.A., F.B. Samson. 1985. Effects of non-consumptive recreation on wildlife: A review. *Wildlife Society Bulletin* 13:110.
- Bratton, S.P. 1979. Impacts of white-tailed deer on the vegetation of Cades Cove, Great Smokey Mountains National Park. *Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies*. 33:305-312.
- Bullock, J.F. and Arner, D.H., 1985. Beaver damage to non-impounded timber in Mississippi. *Southern Journal of Applied Forestry*, 9(3), pp.137-140.
- Burger, J. 1981. The effect of human activity on birds at a coastal bay. *Biological Conservation* 21:231-241.
- Capel, Stephen W., et al. 1996. Virginia Bobwhite Quail Management Plan. Virginia Department of Game and Inland Fisheries. Powhatan, Virginia. 21 pp.
- Caudill, J. and E. Carver. 2019. *Banking on Nature 2017: The Economic Contribution of National Wildlife Refuge Recreational Visitation to Local Communities*. U.S. Fish and Wildlife Service. Falls Church, Virginia. 36pp.
- Casey, D. and D. Hein. 1983. Effects of heavy browsing on a bird community in deciduous forest. *Journal Wildlife Management* 47(3): 829-836.
- Clark, R.G., H. Greenwood, and L.G. Sugden. 1986. Preliminary estimates of rate of grain passage through the digestive tract of mallards. *Can. Wildl. Serv. Prog. Note* 160. 2pp.
- Cole, D. N. and R. L. Knight. 1990. *Impacts of recreation on biodiversity in wilderness*. Utah State University.
- Combs, D.L. 1987. Ecology of male mallards during winter in the Upper Mississippi Alluvial Valley. Ph.D. thesis. University of Missouri-Columbia. 223pp.
- Crabtree, Robert L. and Jennifer W. Sheldon. 1999. The Ecological Role of Coyotes on Yellowstone's Northern Range. *Yellowstone Science*. Spring 1999 pp. 15-23
- Dahlgren, R. B. 1988. Human disturbances to migrating and wintering waterfowl: an annotated bibliography, USFWS, La Crosse, Wisconsin, 112 pp.
- 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.
- Davidson, L. Chris. 2015. Status and Distribution of Freshwater Mussels (Bivalvia: Unionoida) Inhabiting the Saline River within Felsenthal National Wildlife Refuge. USFWS. Conway, AR.
- 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.
- Dietsch, A.M., Sexton, N.R., Koontz, L.M., and Conk, S.J., 2013, [National wildlife refuge visitor survey 2012—Individual refuge results](#): U.S. Geological Survey Data Series 754
- Dickson, J.G., Mayer, J., and Dickson, J.D. 2001. Wild Hogs. In J.G. Dickson, editor. *Wildlife of Southern Forests: Habitat and Management*. Hancock House Publishers, Blaine, WA, USA, pp. 191-208.
- Dooley, J.L., T.A. Chandler, and P.F. Doherty. 2010. Mallard Response to Experimental Walk-In and Shooting Disturbance. *J. Wildlife Management*. 74 (8): 1815-1824.
- Drake, D., J. B. Paulin, P. D. Curtis, D. J. Decker, and G. J. San Julian. 2005. Assessment of negative economic impacts from deer in the northeastern United States. *Journal of Extension* 43(1), Article Number 1RIB5.
- Ellingwood, M. R., and S. L. Caturano. 1988. An evaluation of deer management options. New England Chapter of The Wildlife Society and Northeast Deer Technical Committee
- Erwin, R.M. 1980. Breeding habitat by colonially nesting water birds in 2 mid-Atlantic U.S. regions under different regimes of human disturbance. *Biological Conservation*. 18:39-51.
- 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.
- Fredrickson, L.H., and F.A. Reid. 1988. Waterfowl use of wetland complexes. Managing waterfowl habitats: breeding, migrating, wintering. U.S. Fish and Wildlife Service, Leaflet 13. 6pp.
- Fredrickson, L.H. and T.S. Taylor. 1982. Management of seasonally flooded impoundments for wildlife. U.S. Fish and Wildl. Serv. Resour. Publ. 148. 29pp.
- Frid, A. and L. M. Dill. 2002. Human-caused disturbance stimuli as a form of predation risk. *Conservation Ecology* 6(1): 11.

Gabrielson, G.W. and E.N. Smith. 1995. Physiological responses of wildlife to disturbance. Pages 95-107 in R. L. Knight and K.J. Gutziller, ed. *Wildlife Recreationist: coexistence through management and research*. Island Press, Washington, D.C. 372pp.

George, J.L., C.E. Braun, R.A. Ryder and E. Decker. 1991. Response of waterbirds to experimental disturbances. *Proceedings Issues and Technology in the Management of Impacted Western Wildlife*. Thoren Ecological Institute 5: 52-59.

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.

Guillemain, M, Romain Blanc, C. Lucas, 2007, Ecotourism disturbance to wildfowl in protected areas: historical, empirical and experimental approaches in the Camargue, Southern France. *Biodiversity and Conservation*, Volume 16, Number 12, Page 3633.

Gutzwiller, K.J., S.H. Anderson. 1999. Spatial extent of human-intrusion effects on subalpine bird distributions. *The Condor*. 101: 378-389.

Havens H., and Hardesty D. 2020a. Mississippi Department of Wildlife Fisheries and Parks. [Aerial Waterfowl Survey Report January 21 – 24, 2020](#). Retrieved September 10, 2020

Havens H., and Hardesty D. 2020b. Mississippi Department of Wildlife Fisheries and Parks. [Aerial Waterfowl Survey Report January 9 – 13, 2020](#). Retrieved September 10, 2020.

Havens H., and Hardesty D. 2020c. Mississippi Department of Wildlife Fisheries and Parks. [Aerial Waterfowl Survey Report December 18 - 20, 2020](#). Retrieved September 10, 2020

Havens H., and Hardesty D. 2020d. Mississippi Department of Wildlife Fisheries and Parks. [Aerial Waterfowl Survey Report November 13 - 18, 2020](#). Retrieved September 10, 2020.

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.

Healy, W. M., and S. M. Powell. 1999. Wild turkey harvest management: biology, strategies, and techniques. U.S. Fish and Wildlife Service, Federal Aid in Wildlife Restoration, Project BTP-R5001-1999.

Hedenstrom, A. and Alerstam, T. 1998. How fast can birds migrate? – *J. Avian Biol.* 29:424-432.

Heitmeyer, M.E. 1985. Wintering strategies of female mallards related to dynamics of lowland hardwood wetlands in the upper Mississippi Delta. Ph.D. thesis, University of Missouri-Columbia. 376 pp.

Heitmeyer, M.E. and Raveling, D.G. 1988. Winter resource use by three species of dabbling ducks in California. Final Report to the Delta Waterfowl and Wetlands Research Station, University of California, Davis.

- Henke, Scott E. and Fred C. Bryant. 1999. Effects of Coyote Removal on the Faunal Community in Western Texas. *The Journal of Wildlife Management* Vol. 63, No. 4 (Oct., 1999), pp. 1066-1081
- Hill, E.P., 1982. Beaver. *Wild mammals of North America*, pp.256-281.
- 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.
- Hunter, M.L., Jr. (1990) *Wildlife forests and forestry. Principles of managing forests for biological diversity*. Prentice Hall. Englewood Cliffs, NJ.
- Iqbal, S., W. blumenthal, C. Kennedy, F.Y. Yip, S. Pickard, W. Dana Flanders, K. Loring, 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.
- Kahl, R. 1991. Boating disturbance of canvasbacks during migration at Lake Poygan, Wisconsin. *Wildlife Society Bulletin*. 19:242-248.
- Kaiser, M.S., and E.K. Fritzell 1984. Effects of river recreationists on green-backed heron behavior. *J. Wildlife Management* 48:561-567.
- King, J.R. 1974. Seasonal allocation of time and energy resources in birds. Pages 4-70 in R.A. Paynter, Jr., ed. *Avian energetics*. Nuttall Ornithol. Club, Cambridge, MA. 334pp.
- Kelley, J.R., Jr., and R. D. Rau. 2006. American woodcock population status, 2006. U.S. Fish and Wildlife Service, Laurel, Maryland. 15pp.
- Kelly, T.R., P.H. Bloom, S.G. Torres, Y.Z. Hernandez, 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.
- Klein, M. L. 1989. Effects of high levels of human visitation on foraging waterbirds at J. N. "Ding" Darling National Wildlife Refuge. Final research report. Florida Coop. Fish Wildl. Res. Unit, Univ. Florida, Gainesville. FCFWRU Work Order No. 42. vii + 103pp.
- Klein, M.L. 1993. Waterbird behavioral responses to human disturbances. *Wildlife Society Bulletin*. 21:31-39.
- Knight, R.L. 1984. Responses of wintering bald eagles to boating activity. *J. Wildlife Management*. 48:999-1004.
- 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.
- Korschgen, C. E. and R. B. Dahlgren. 1992. Human disturbances of waterfowl: causes, effects, and management. *Fish and Wildlife Leaflet* 13.2.15, 7pp.
- Korschgen, C.E., L.S. George, and W.L. Green. 1985. Disturbance of diving ducks by boaters on Comprehensive Conservation Plan - 215 - Appendix G: Final Compatibility Determinations a migrational staging area. *Wildlife Society Bulletin*. 13:290-296.

- Kramer, J.L., and P.T. Redig. 1997. Sixteen year of lead poisoning in eagles, 180-95: an epizootologic 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.
- Lander, Art. 2016, October 19. [Art Lander's Outdoors: American mink, long-tailed weasel are small furbearers with big attitudes](#). Kentucky Forward, Retrieved September 10, 2020.
- Lacki, M. J., and R. A. Lancia. 1986. Effects of wild pigs on beech growth in Great Smoky Mountains National Park. *Journal of Wildlife Management* 50(4): 655-659.
- Lacki, M.J. and Lancia, R.A. 1983. Changes in soil properties of forest rooted by wild boar. *Proceedings of the Southeastern Association of Fish and Wildlife Agencies*. 37:228-236.
- Laskowski, H., T. Leger, J. Gallegos, and F. James. 1993. Behavior response of greater yellowlegs, snowy egrets, and mallards to human disturbance at Back Bay National Wildlife Refuge, Virginia. Unpublished Final Report RMS 51570-01-92. 29pp.
- 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.
- Lipscomb, D. 1989. Impacts of feral hogs on longleaf pine regeneration. *Southern Journal of Applied Forestry* 13: 177-181.
- Linscombe, G. and Kinler, N., 1997. A survey of vegetative damage caused by nutria herbivory in the Barataria and Terrebonne Basins (Vol. 31). Barataria-Terrebonne National Estuary Program.
- Madsen, J. 1995. Impacts of disturbance on migratory waterfowl. *Ibis* 137:S67-S74.
- Magee, P.A. 1996. Influence of microclimate on waterfowl energetics in a willow roost complex in northeastern Missouri. Ph.D. thesis, University of Missouri-Columbia, 129pp.
- Martina, Leila S. 2019. [Didelphis virginiana Virginia opossum](#). Animal Diversify Web, University of Michigan Museum of Zoology.
- 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, WI Halteman. 2005. Effects of hunting on survival of American woodcock in the northeast. *Journal of Wildlife Management* 69(4): 1565–1577.
- McNeil, Raymond; Pierre Drapeau; John D. Goss-Custard. 1992. The occurrence and adaptive significance of nocturnal habitats in waterfowl. *Biological Review*. 67: 381-419.
- McPeake, Rebecca, et al. 2015. Feral Hog Control in Arkansas. University of Arkansas-Division of Agriculture Research and Extension. MP534: 13pp.

- McWilliams, S.R., Guglielmo, C., Pierce, B. and Klaassen, M. 2004. Flying, fasting, and feeding in birds during migration: a nutritional and physiological ecology perspective. – *J. Avian Biol.* 35: 377-393.
- 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.
- Mott, S.E., R.L. Tucker, D.C. Guynn, H.A. Jacobson. 1985. Use of Mississippi bottomland hardwoods by white-tailed deer. *Proceedings of the Southeast Association of Fish and Wildlife Agencies* 39: 403-411.
- Morton, J.M., A.C. Fowler, and R.L. Kirkpatrick. 1989. Time and energy budgets of American black ducks in winter. *Journal of Wildlife Management* 53 (2):401-410.
- Mosby, H.S. 1969. The influence of hunting on the population of a woodlot grey squirrel population. *J. 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.
- Nudds, T. D. 1980. Forage preference: theoretical considerations of diet selection by deer. *Journal Wildlife Management* 44(3): 735-740.
- Nummi, Petri. 1992. [The importance of beaver ponds to waterfowl broods: an experiment and natural tests](#). *Annales Zoologici Fennici* Vol. 29, No. 1, pp. 47-55.
- 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.
- Paulus, S.L. 1984b. Activity budgets of nonbreeding gadwalls in Louisiana. *J. Wildl. Manage.* 48:483-489.
- Pease, M.L., R.K. Rose, and M.J. Butler. 2005. Effects of human disturbances on the behavior of wintering ducks. *Wildlife Society Bulletin*. 33(1):103-112.
- Pergams ORW, Zaradic PA (2008) Evidence for a fundamental and pervasive shift away from nature-based recreation. *Proceedings of the National Academy of Sciences USA* 105: 2295–2300.
- Raasch, J.D. 1996. Experimental disturbance of waterbirds on seasonally flooded impoundments in Missouri. M.S. thesis, University of Missouri-Columbia. 164 pp.
- 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, Maryland, USA.
- 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.
- Rapport, D. J. 1980. Optimal foraging for complementary resources. *Am. Nat.* 116:324-346.

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

Reinecke, K.L., R.M. Kaminski, D.J., Moorhead, J.D. Hodges, and J.R. Nassar. 1989. Mississippi Alluvial Valley. Pages 203-247 in L.M. Smith, R.L. Penderson, and R.M. Kaminski, editors. *Habitat management for migrating and wintering waterfowl in North America*. Texas Tech University Press, Lubbock, Texas, USA.

Rooney, T. P. and D. M. Waller. 2003. Direct and indirect effects of white-tailed deer in forest ecosystems. *Forest Ecology and Management*. 181: 165-176.

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

Rosell, F., O. Bozsér, P. Collen, and H. Parker. 2005. Ecological impact of beavers *Castor fiber* and *Castor canadensis* and their ability to modify ecosystems. *Mammal Review* 35:248–276.

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

Sealand, J.A. and Heidt, G.A., 1990. *Arkansas mammals: their natural history, classification, and distribution*. University of Arkansas Press.

Seward, Nathan W.; VerCauteren, Kurt C.; Witmer, Gary W./ and Engeman, Richard M., 2004. Feral Swine Impacts on Agriculture and the Environment. *Sheep & Goat Research Journal*. 12: 7pp.

Southeastern Association of Fish and Wildlife Agencies (SAFWA), 2015. Annual State Summary Report – Wild Hog Working Group. 52pp.

Southwick Associates, 2011. *The Economics Associated with Outdoor Recreation, Natural Resources Conservation and Historic Preservation in the United States*, National Wildlife Foundation, Washington, D.C.

[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, \(1 December 2010\).](#)

Stevens, L. 2010. *The feral hog in Oklahoma*. 2nd Edition. Samuel Roberts Noble Foundation. Ardmore, OK.

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

Strole T. A., and R. C. Anderson. 1992. White-tailed deer browsing: species preferences and implications for central Illinois forests. *Natural Areas Journal* 12:139-144.

Tate, J. 1984. Techniques in controlling wild hogs in Great Smokey Mountains National Park; Proceedings of a workshop National Park Service Research/Resources Manage. Report SER-72, Nov. 1984.

Taylor, Rick. 2003. [The feral hog in Texas](#). Texas Parks and Wildlife Department. 20pp U.S. Census

Bureau. 2014. Accessed April, 1, 2014.

Tennessee Wildlife Resources Agency. 2020. [Wild Hogs](#). Retrieved December 10, 2020.

Thomas, V.G. 1976. Habitat usage of wintering ducks at the Ouse Washes, England. *Wildfowl* 27:19-32.

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.

Thompson, Frank R., III, ed. 2004. Publication: Gen. Tech. Rep. **NC-244**. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 267 p.

Tilghman, N. G. 1989. Impacts of white-tailed deer on forest regeneration in northwestern Pennsylvania. *Journal Wildlife Management* 53(3): 524-532.

University of Georgia, Southeastern Cooperative Wildlife Disease Study 2012. *Deer Health Evaluations –Felsenthal NWR 2011*, Athens, GA 5pp.

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

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, and U.S. Department of Commerce, U.S. Census Bureau. 2016 *Deer Hunting in the United States: Demographics and Trends*, Addendum to the 2011 National Survey of Fishing, Hunting, and Wildlife–Associated Recreation. 21pp.

U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2015 *Economic Impact of Waterfowl Hunting in the United States*, Addendum to the 2011 National Survey of Fishing, Hunting, and Wildlife–Associated Recreation. 13pp.

U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2015 *The Relationship Between Wildlife Watchers, Hunters, and Anglers*, Addendum to the 2011 National Survey of Fishing, Hunting, and Wildlife–Associated Recreation. 64pp.

U.S. Fish and Wildlife Service. 2019. [Environmental Assessment Duck Hunting Regulations for 2019-2020](#). U.S. Department of the Interior, Washington, D.C.

U.S. Fish and Wildlife Service, 2015. *Felsenthal Habitat Management Plan and Environmental Assessment*. Crossett, AR. 254pp.

U.S. Fish and Wildlife Service, 2015. *Compatibility Determination – ATV/UTV Use on Designated Trails on Felsenthal NWR*. Crossett, AR. 16pp.

U.S. Fish and Wildlife Service, 2014. *Sam D. Hamilton Noxubee NWR Comprehensive Conservation Plan*. Atlanta, GA: U.S. Department of the Interior Fish and Wildlife Service, Southeast Region.

- U.S. Fish and Wildlife Service. 2013. Final Land Protection Plan and Final “Environmental Assessment for the Expansion of Upper Ouachita and Felsenthal National Wildlife Refuges. Atlanta, GA. 498pp.
- U.S. Fish and Wildlife Service (USFWS). 2012. [Northern American Waterfowl Plan](#). 70pp.
- U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2011 National Survey of Fishing, Hunting, and Wildlife—Associated Recreation. 161pp.
- U.S. Fish and Wildlife Service. 2010 Felsenthal and Overflow National Wildlife Refuge Comprehensive Conservation Plan. Crossett, AR. 326pp
- U.S. Fish and Wildlife Service. 2010 Felsenthal and Overflow National Wildlife Refuge Comprehensive Conservation Plan and Environmental Assessment. Crossett, AR. 447pp
- U.S. Fish and Wildlife Service. 2007. National bald eagle management guidelines.
- U.S. Fish and Wildlife Service. 2006. Waterfowl population status, 2006. Division of Migratory Bird Management, Laurel, Maryland, 60 pp.
- U.S. Fish and Wildlife Service. 2005. Waterfowl harvest and population survey data: Estimates of U.S. harvest, hunting activity, and success derived from the state-federal cooperative harvest information program. Division of Migratory Bird Management, Columbia, Missouri, 92 pp.
- U.S. Fish and Wildlife Service. 2003. Recovery plan for the red-cockaded woodpecker (*Picoides borealis*): second revision. Atlanta, GA. 296 pp.
- U.S. Fish and Wildlife Service. 2021. [Service Manual](#).
- U.S. Fish and Wildlife Service. 1988 Felsenthal National Wildlife Refuge Hunt Plan. Crossett, AR. 30pp.
- U.S. Fish and Wildlife Service. 1978 Felsenthal National Wildlife Refuge Hunt Plan. Crossett, AR. 30pp.
- Vangilder, L.D. 1992. Population dynamics. Pages 144-164 in J.G. Dickson, *ed.* The wild turkey: biology and management. Stackpole Books, Harrisburg.
- Vinson, M. 1998. Effects of recreational activities on declining anuran species in the John Muir Wilderness, CA. Missoula, MT: University of Montana. 83 p. Thesis.
- Waller, D.M., and W.S. Alverson. 1997. The white-tailed deer: a keystone herbivore. Wildlife Society Bulletin 25:217-226.
- Walsberg, G.E. 1983. Avian ecological energetics. Pages 161-220 in D.S. Farner, J.R. King, and K. C. Parkes (eds.) Avian Biology VII. Academic Press, New York.
- Ward, D.H., and R.A. Stehn. 1989. Response of Brant and other geese to aircraft disturbance at Izembek Lagoon, Alaska. U.S. Fish and Wildlife Service, Alaska Fish and Wildlife Research Center. Final report to the Minerals Management Service. Anchorage, Alaska. 193 pp.
- Warren, R. J. 1991. Ecological justification for controlling deer populations in eastern national parks. Trans. North Am. Wildl. Nat. Resour. Conf. 56:56-66.
- Whitaker, John O., and W.J. Hamilton. 1998. *Mammals of the eastern United States*. Cornell University Press, 1998.

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

Williams ES, Young S. Chronic wasting disease of captive mule deer: a spongiform encephalopathy. *J Wildl Dis.* 1980 Jan;16(1):89-98. doi: 10.7589/0090-3558-16.1.89. PMID: 7373730.

Williams, G.J., and E. Forbes. 1980. The habitat and dietary preferences of dark-bellied Brant geese and widgeon in relation to agricultural management. *Wildfowl* 31:151-157.

Williams, S. C. and J. S. Ward. 2006. Exotic seed dispersal by white-tailed deer in southern Connecticut. *Natural Areas Journal* 26(4): 383-390.

Wood, G.W. and D.N. Roark. 1980. Food habits of feral hogs in Coastal South Carolina. *J. Wildl. Manage.* 44(2):506-511.

Yarrow, G. K., and J. C. Kroll. 1989. Coexistence of white-tailed deer and feral hogs: management implications. *Southeast Deer Study Group* 12: 13-14.

APPENDIX B: OTHER APPLICABLE 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 C: 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 Hunt Plan, Environmental Assessment, and draft Hunting Compatibility Determination for Felsenthal National Wildlife Refuge (NWR, refuge) for public review and comment. Local public notice included a Public Information Bulletin and information and documents posted on the refuge's website. National public notice was provided through the Federal Register ([Volume 86, Number 84; 86 FR 23794; Docket No. FWS-HQ-NWRS-2021-0027, FXRS12610900000-212-FF09R20000; pages 23794-23842](#)) which was published on May 4, 2021. Public comments on the proposal were received by the Service during the public review and comment period (April 14, 2021 through July 7, 2021) from 4 members of the general public, 1 NGO, and the Arkansas Game and Fish Commission. 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: Four non-substantive comments were received regarding land acquisition and loss of hunt leases.

Service's Response: The expansion of the refuge's acquisition boundary was a necessary step to meet continual habitat needs for trust species such as migratory waterfowl, shorebirds, and neotropical migrants, and to contribute to the network of conservation lands and wildlife resources in the regional landscape. During the public planning process for the 2013 Land Protection Plan, we received input and settled on the current approved acquisition boundary. Approvals were obtained from the Arkansas Game and Fish Commission, Arkansas Governor, and the Service's Regional Director. We will continue to consider acquisitions from willing sellers within this approved boundary, if the lands are determined to be biologically important, or provide connections with other protected lands.

We purchased the land for the refuge for specific reasons, under certain authorities. The Refuge Improvement Act of 1997 not only defines priority public uses (hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation), but also establishes a process for determining whether these uses are appropriate and compatible with the purposes for which a refuge was established. All uses are considered closed until we open them through that process. We considered public input during the 2010 Felsenthal NWR Comprehensive Conservation planning process, 2013 Land Protection Planning process, and the 2017 and 2021 Felsenthal NWR hunt plan processes. We have considered uses identified during these planning processes and established compatibility determinations. These processes have recognized hunting as a priority use and 2021 Hunt Plan and environmental assessment opens newly acquired lands to hunting and to continue the use on existing lands, with some stipulations.

Currently through this process, the project areas will be open to hunting as defined in the hunt plan for Felsenthal NWR. Hunting regulations on the refuge are more restrictive than those on private land. Individuals who have memberships in private hunting clubs within the project areas will no longer have exclusive access to those lands that have been acquired by the Service, and they will have to abide by the more restricted hunting regulations. However, the project areas will be open to all members of the public at little to no cost, as opposed to private hunting clubs that charge annual membership dues.

We apologize for the confusion that these different planning processes have caused. The four comments received do not relate to opening hunting on Felsenthal NWR, therefore, are outside the scope of this document. These comments would have been more appropriately addressed during the 2013 Land Protection Planning process. No changes were made to the documents.

*APPENDIX D: FELSENTHAL NWR HUNTING COMPATIBILITY
DETERMINATION*



Compatibility Determination-Felsenthal National Wildlife Refuge- Hunting

USE: Hunting – Big Game, Upland Game, Waterfowl and Other Migratory Birds

REFUGE NAME: Felsenthal National Wildlife Refuge, Arkansas

DATE ESTABLISHED: 1975

ESTABLISHING AND ACQUISITION AUTHORITIES:

- 16 U.S.C. 664 (Fish and Wildlife Coordination Act)
- 16 U.S.C. 460k-1 (Refuge Recreation Act)
- 16 U.S.C. 460k-2 (Refuge Recreation Act (16 U.S.C. 460k-460k-4), as amended)

REFUGE PURPOSES:

- "shall be administered by him [Secretary of the Interior] directly or in accordance with cooperative agreements ... and in accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon" 16 U.S.C. 664 (Fish and Wildlife Coordination Act).
- "the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors" 16 U.S.C. 460k-2 (Refuge Recreation Act (16 U.S.C. 460k-460k-4), as amended).
- "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-1 (Refuge Recreation Act).

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 the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE:

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

The use is public hunting of waterfowl (ducks including merganser, light and dark geese, coots), woodcock (*Scolopax minor*), squirrel (*Sciurus carolinensis*), rabbit (*Oryctolagus cuniculus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), white-tailed deer (*Odocoileus virginianus*), and turkey (*Meleagris gallopavo*) on Felsenthal NWR as listed and in accordance with refuge-specific regulations, other federal regulations, and applicable state regulations. The use is an existing use on the refuge, which was previously approved with the refuge's Comprehensive Conservation Plan (CCP) (USFWS 2010). This re-evaluation of the use includes continuing existing hunting and expanding hunting on new acquired lands. Hunting is one of the six priority public uses of the National Wildlife Refuge System (NWRS), under the National Wildlife Refuge System Administration Act of 1966 (NWRSA) {16 U.S.C. 668dd-668ee}, as amended by the National Wildlife Refuge System Improvement Act of 1997 (NWRPIA). Hunting is an existing use on the refuge and is included in the Felsenthal National Wildlife Refuge Comprehensive Conservation Plan (CCP, USFWS 2010).

Felsenthal NWR allows the take of nuisance and/or invasive species [(beavers (*Castor canadensis*), coyotes (*Canis latrans*), nutria (*Myocastor coypus*), and feral hogs (*Sus scrofa*)] only incidental to other approved hunting. In particular, it is neither the goal nor the intent of the Service to manage feral hogs as a huntable game species. Hogs are an invasive, exotic species that damage native habitats and prey on native wildlife. The objective of feral hog control programs is to reduce numbers to levels that minimize impacts to acceptable levels, and where possible, completely eradicate them. On NWRs in Arkansas their take has only been permitted incidental to other approved hunts, we have not allowed approved "feral hog hunts" for the purpose of sport hunting. Because the ultimate goal is to eliminate feral hogs, the Service sees no management value in promoting recreational hunting of feral hog populations on any public lands.

(b) Where will the use be conducted?

Hunting will be allowed on the Hunt Area consisting of 76,144 acres. Furthermore, hunting will be allowed on any future land purchased or leased for the refuge if determined compatible. Areas excluded from hunting, such as the refuge office and maintenance compound (88 acres) and the Crossett RV Park (234 acres) will be marked with appropriate no hunting zone signs. The waterfowl sanctuary is closed to all public use November 15 to February 15. See the refuge Public Use regulations Brochure or the hunt unit map in the Refuge Hunt Plan (USFWS 2021).

(c) When will the use be conducted?

Hunting will be allowed in accordance with all applicable federal and state regulations. Hunting will occur within the hunting season framework established by the Arkansas Game and Fish Commission (AGFC). Federal regulations in 50 CFR pertaining to the NWRSA, as well as existing refuge-specific regulations (see hunt plan) will apply. However, the refuge manager may, upon annual review of the hunting program and in coordination with the AGFC, impose further restrictions on hunting, recommend that the refuge be closed to hunting, or further liberalize hunting regulations within the limits of state seasons and regulations, or as otherwise approved by AGFC. The refuge manager may restrict hunting if it conflicts with other, higher priority refuge programs or endangers refuge resources or public safety.

(d) How will the use be conducted?

Hunting will be subject to federal, state, and refuge-specific regulations and occur within the State season framework, unless otherwise approved by AGFC. Refer to the annual Felsenthal NWR Public Use Brochure for regulations on hunting within the refuge.

When hunting on Felsenthal National Wildlife Refuge, users will be required to have in their possession a copy of the current Felsenthal NWR Public Use Regulations brochure which they have signed, and if applicable, an additional quota hunt permit. The leaflet will serve as a refuge access permit and will be updated each year. It will inform hunters of current refuge regulations, safety zones, and other pertinent information for the current year's hunt. It will be available in the information boxes at the refuge entrance, from the refuge office, or on the refuge's Web site.

Except for the quota hunts, permits will be free and not limited in number. For the quota deer and turkey hunts, permit, application, and processing fees will be charged and the number of permits will be limited to reduce potential hunter conflict, ensure a high-quality hunt, and/or achieve a management objective.

In addition to the Refuge Access permit, special hunts such as those that are a quota require an additional permit. Individuals seeking to apply for a Quota Hunt Permit may do so on-line by visiting the website. Fees apply for applications and permits. A drawing is held prior to the hunting seasons. Out of the total number of hunt applications received; only a certain number (predetermined quota) are drawn.

Deer and Turkey Quota Hunt Permits are issued via a lottery system where participants must apply before a deadline to be eligible for the hunt. The process is facilitated by a third-party vendor allowing accessibility and transparency to users. All applicants are subject to a \$5.00 non-refundable application fee for quota hunts. Successful applicants will be charged an additional \$15.00 per permit fee.

(e) Why is this use being proposed?

Hunting is one of the priority public uses defined by Executive Order 12996 (March 25, 1996) and the NWRSA, as amended by the NWRSIA (Public Law 105-57). This legitimate and appropriate use of a NWR is generally considered compatible, as long as it does not materially interfere with or detract from the fulfillment of the NWRS mission or the purposes of the NWR.

Hunting is a tool managers use to maintain wildlife populations at an acceptable level. In Arkansas, the AGFC establishes hunting seasons and bag limits to meet population objectives and to offer the public an opportunity to experience a traditional outdoor recreational activity. A number of factors such as habitat limitations and landowner tolerances, and each year the seasons and bag limits are designed to remove the harvestable surplus without long-term negative impacts to the population determine game species population objectives. The ability to effectively manage game species populations depends in large part on the availability of land with quality habitat. Providing hunting opportunities on the refuge will aid the State in meeting its management objectives and preserve a wildlife-dependent priority public use long associated with this land.

The United States Fish and Wildlife Service (Service) intends to continue the tradition of wildlife-dependent recreation on the refuge by allowing hunting in compliance with State regulations. By allowing this use to continue, hunters can experience this traditional recreational activity, utilize a sustainable, renewable resource, aid the refuge and State in maintaining acceptable game species population levels, gain a better appreciation of the refuge's high quality wildlife habitats, observe wildlife, and become better informed about the refuge and the NWRS.

Felsenthal NWR was officially opened to hunting of resident wildlife species and waterfowl in September 1978. In 1988, the refuge hunt plan and associated environmental documents (environmental assessment and section 7) were updated (USFWS 1988). Also the Felsenthal NWR CCP identified hunting as an important priority for the refuge (USFWS 2010a).

A compatibility determination (CD) has been made for hunting on Felsenthal NWR and related activities. The determination was completed in 1994; finding hunting compatible. As part of the 2010 CCP and as a part of the Land Protection Plan and Environmental Assessment (EA) in 2014, CDS were completed also finding hunting compatible with refuge purposes. A CD was completed as part of the 2017 Hunt Plan and EA.

The purpose of the proposed action will further align the refuge with the Department of the Interior's Secretarial Order 3356, which directs the Service to enhance and expand public access to lands and waters on NWRs for hunting, fishing, recreational shooting, and other forms of outdoor recreation. The proposed action will promote one of the priority public uses of the NWRS. Hunting will also promote the stewardship of our natural resources and increase the public's appreciation and support for the refuge.

AVAILABILITY OF RESOURCES:

The total cost of the refuge hunting program combined: Staff Time (\$68,518) & Actual Expenditures (\$9,300) = \$77,818

Adequate refuge resources are available to implement the hunting program at the present level of hunting use. Future cost savings may be realized as refuge staff encourage the public to print refuge maps and brochures from the refuge website, thereby reducing publication costs.

Administration and Management

Costs for implementation of the use of hunting on Felsenthal NWR are itemized in Table 1. Refuge law enforcement is the primary method necessary to ensure proper and safe administration of hunts at Felsenthal NWR. Currently, there is one full-time Law Enforcement Officer (LEO). Furthermore, AGFC Wildlife Officers provide additional law enforcement support. Currently, check stations are run during the white-tailed deer firearm and muzzleloader seasons whereby hunters provide biological data from deer harvested on the refuge. Hunters also register harvested deer and turkeys with the State through a phone call, smartphone app, or computer based check system. Road maintenance, mowing, and campground maintenance is necessary for the support of the refuge hunting program. However, these activities are funded as part of routine refuge maintenance activities. Approximately, \$9,300 is required annually for the hunt program to print brochures, signs, and other supplies for the program. Currently, \$22,195 is returned to the refuge from refuge quota permit fees and is used to offset the cost of refuge hunts.

Table 1: Itemized Costs for Implementation of Use

<u>Program</u>	<u>Non-LE Staff Days</u>	<u>Cost (GS-12 Step 1 (\$36.76/hr)</u>	<u>Program Costs</u>	<u>Recovery (100%)</u>
Big Game - Deer	18	\$5,293	\$4,000	\$19,880
Big Game – Turkey (includes youth hunts)	3	\$882	\$1,300	\$2,315
Small Game	2	\$588	\$1,000	\$0
Waterfowl	15	\$4,411	\$2,500	\$0
Other	5	\$1,470	\$550	\$0
Total	43	\$12,644	\$9,300	\$22,195

*Incidental Costs include brochures, third party vendor, fuel, signs, etc.

The refuge hunting program has additional costs to consider. Refuge law enforcement adds

another \$54,000 to the refuge hunt program costs.

In addition, the refuge also relies on volunteers to assist with management activities such as the hunt program. They contribute through working at check stations and facility maintenance. These contributions for all hunting programs combined can provide an estimated benefit (\$16.73/hour /GS-5) of 112 hours = \$1,874 or greater depending on the year.

Maintenance

Maintenance of facilities used by hunters (roads, parking lots, trails, and boat launching ramps) will be covered by the refuge's deferred maintenance budget. Facilities most utilized by refuge visitors are roads, parking lots, trails, and boat launching ramps. The facility maintenance and improvement activities described are periodically conducted to accommodate daily refuge management operations and other general public uses. During times when roads are impassible due to flood events or other natural causes, those roads, parking lots, trails, and boat ramps impacted by the event will be closed to vehicular use.

Monitoring

Enforcement of refuge violations normally associated with management of a NWR is the responsibility of commissioned Federal Wildlife Officers. Other officers, Special Agents, State game wardens, and the local Sheriff's Department often assist Felsenthal NWR full time federal wildlife officer.

The following methods are used to control and enforce hunting and fishing regulations:

- Refuge and hunt area boundaries and fishing site locations will be clearly posted;
- The Refuge will provide a brochure that shows hunting and fishing areas; and
- Felsenthal NWR law enforcement staff will randomly check hunters and anglers for compliance with Federal and State Laws.

Hunter participation and harvest data are collected by the State and law enforcement officers from both Felsenthal NWR and AGFC working together. Felsenthal NWR has operated a deer check station for 42 years. The refuge uses this data to support hunting seasons and bag limits.

Special Equipment

N/A

Facilities

The refuge has numerous facilities (roads, parking lots, trails, boat ramps, kiosks) that are used by hunters and other visitors. Seasonal All-Terrain Vehicles (ATV) trails (yellow trails on refuge hunt map) are open from September 1 thru January 31 to facilitate hunting access on the refuge.

Offsetting Revenue

Recovery is the revenue generated by permit and application fees from hunters participating in refuge hunting activities. Regulations for the fee program allow the refuge to retain 100 percent of the total fees collected, \$22,195 in 2019. Special permitting for hunts on Felsenthal NWR date back to 1983 when for the first time, a limited number of antlerless deer permits were offered. In 1985, both the modern gun and muzzleloader hunts followed suit offering a limited number of permits where hunters applied and were randomly drawn to receive a permit. In 1991, the first fee was set at \$10/permit as the refuge tried a new computerized software method of selecting applicants for permits. Shortly after, the fee was increased to \$12.50 per permit for all quota permits, deer and turkey. It was not until 2015 that the refuge had to increase fees to offset the administrative cost of the hunts. Today, applicants are subject to a \$5.00 non-refundable application fee for quota hunts and successful applicants are charged an additional \$15.00 per permit fee.

ANTICIPATED IMPACTS OF THE USE:

Hunting, and its associated activities, can result in positive or negative impacts to wildlife and other refuge resources. In its current highly-regulated form, hunting is expected to cause only minor negative impacts to the refuge and may include: damage to vegetation, littering, conflicts among refuge visitors, and disturbance to wildlife. A positive effect of the refuge hunting program will be the provision of additional wildlife-dependent recreational opportunities and a better appreciation and more complete understanding of the wildlife and habitats associated with the refuge and an opportunity to utilize a sustainable, renewable resource. This can translate into more widespread and stronger support for the refuge, the NWRS, and the Service. The following is a discussion of refuge-specific impacts.

Felsenthal NWR was established to provide for the needs of migratory birds and other wildlife. Regulated hunting does not adversely affect the ability of the refuge to fulfill this purpose. NWRS are managed first and foremost for wildlife. The focus of refuge management is to benefit wildlife populations, and not necessarily, individual animals. Hunting does cause mortality (compensatory) and wounding of individual animals, but is regulated so as not to threaten the future of wildlife populations. In fact, hunting is necessary to maintain a balance between certain wildlife populations and the habitats in which all wildlife species depend. The effects of hunting on wildlife populations are monitored within the State and across the nation and are considered when establishing hunting regulations and annual bag limits. AGFC regulates hunting on statewide, regional, and local scales to ensure that hunting remains sustainable and does not cause a negative impact to game populations. Hunting is a priority

public use of the NWRS and allowing hunting on the refuge facilitates the fulfillment of refuge purposes and the NWRS mission.

General Impacts of Hunting

Direct impacts are those impacts immediately attributable to an action. Indirect impacts are those impacts that are farther in time and in space. 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 on the refuge could cumulatively result in detrimental consequences to wildlife and/or habitats. It will be important for refuge staff to monitor these impacts to ensure wildlife and other refuge resources are not impacted in a detrimental manner.

Feral hogs compete with many species of native wildlife for food, cover, water, and space. They are highly adaptable, have high reproductive capabilities, and can be found in a wide range of habitat types. Rooting and feeding activities negatively impact vegetative communities, soil properties and plant successional patterns, including predation on ground nesting birds, reptiles, and amphibians (SAFWA, 2015). There are no negative impacts to taking feral hogs thru incidental take because of the negative impact that hogs have on habitat. Incidental take assists in population reduction.

Migratory Birds (Ducks including merganser, light and dark Geese, Coot, and Woodcock)

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, waterfowl banding data, and hunter harvest data. Survey data is 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.

Since the refuge consists of over 80 percent wetlands, all recreational activity has the potential of impacting waterfowl, shorebirds, marsh birds, and other migratory bird populations feeding and/or resting near the hunting area(s). Conflicts arise when migratory birds and humans are present in the same areas (Boyle and Samson 1985). Response of wildlife to human activities

includes departure from site (Owen 1973, Burger 1981, Korschgen et al 1985, Henson and Grant 1991, Kahl 1991, Klein 1993), use of suboptimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior (Burger 1981, Korschgen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993), and increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). McNeil et al. (1992) found that many waterfowl species avoid disturbance by feeding at night instead of during the day.

Hunting is a priority, wildlife-dependent, consumptive activity with additional direct effects on waterfowl. General adverse impacts of waterfowl hunting are mortality, crippling and disturbance. Belanger and Bedard (1995) concluded that disturbance caused by waterfowl hunting to waterfowl resources can:

1. modify the distribution and use of habitats by waterfowl;
2. affect their activity budget and decrease their foraging time; and
disrupt pair and family bonds and contribute to increased hunting mortality.

Providing waterfowl sanctuaries will minimize some of these impacts to waterfowl. Havera et al (1992) and Dahlgren (1988) in comprehensive literature reviews of human disturbances to migrating and wintering waterfowl have noted that the use of sanctuaries (non-hunted areas) was the most common and effective solution to mitigating adverse disturbance impacts.

White-tailed Deer, Turkey, and other Game Species

AGFC annually reviews hunting seasons and bag limits and modifies them to avoid any long-term population declines. Hunting is not expected to adversely impact deer, turkey, or any other game species populations. In fact, the amount of wildlife harvested on Felsenthal NWR is thought to be quite conservative. For example, within the past five years, 200-300 deer are harvested annually on Felsenthal NWR and this level of harvest equates to a harvest density of 1 deer / 166 -250 acres. The additional acreage may yield 30-50 additional deer harvested. White-tailed deer is the most popular game animal on Felsenthal NWR. Ashley, Bradley, and Union Counties harvested 14,689 deer in 2019 (AGFC 2019). In recent years, the state of Arkansas has supported a statewide deer harvest of near or over 200,000 deer. Therefore, deer harvest on Felsenthal NWR is insignificant to the overall deer population, whether on a local, regional, or statewide scale.

Disturbance

Human disturbance can alter wildlife behavior (e.g. foraging time), population structure, and distribution patterns of wildlife. It is probable that hunting would cause some or all of these effects to some degree on refuge wildlife. A number of measures mitigate these effects. Hunting seasons largely occur outside the times when most wildlife species are raising offspring and are most sensitive to disturbance. Also, the most popular hunts (i.e. modern gun permit deer hunt; muzzleloader deer hunt; and turkey hunts) are controlled by a combination of a

restricted number of days allowed for the hunting activity and a restricted number of permitted hunters for the hunting activity.

Habitat

Hunting is not expected to adversely affect refuge habitat. 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).

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.

Biological Integrity, Diversity, and Environmental Health

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 refuge. Some species, such as white-tailed deer, today occur at levels well above those thought to occur under historic conditions. Left unchecked, high numbers of such species could adversely affect biological integrity, diversity, and environmental health. Hunting is a closely monitored tool that effectively regulates wildlife populations.

Other Uses and Public Safety

Camping is allowed on the refuge at six designated primitive campsites in support of the hunting program and other on-refuge wildlife-dependent activities (USFWS 2017). Camping can facilitate negative impacts to the refuge in the form of disturbance to vegetation, short-term displacement of certain wildlife species, littering, campfires, noise, public intoxication, and human waste. However, these potential negative consequences are mitigated by refuge regulations and the fact that the majority of on-refuge camping is conducted within a short time frame. The majority of on-refuge camping occurs during the 5-day muzzle loader deer hunt and the 4-day modern gun deer hunt. Also, camping is restricted to the six designated campsites to minimize impacts over the entire refuge. Camping is only permitted in conjunction with on-refuge wildlife dependent activities. All disturbances, including generators,

are prohibited after 10:00 pm. Campfires are allowed only in campgrounds and must be attended. Only downed wood may be used for campfires and campfires are prohibited during periods of high fire danger. Littering and destruction of vegetation is prohibited. An open alcohol container in plain view within campgrounds is prohibited. Current mitigation measures and regulations are adequate to minimize or eliminate negative impacts associated with camping.

Dogs are permitted for hunting waterfowl, raccoon, opossum, squirrels, and rabbits. At present levels of use, dogs used for this purpose are not expected to adversely impact non-target species or cause conflict with other uses. 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 that include promoting public safety. Overall, the cumulative impact of hunting on other wildlife-dependent recreation or public safety at Felsenthal NWR is expected to be minor.

Felsenthal NWR has 55 miles of ATV/UTV trails. Refer to Felsenthal ATV/UTV CD and Habitat Management Plan and environmental assessment (EA) (USFWS 2015) for a discussion of the impacts of ATV/UTVs on the refuge.

Cumulative Impacts

Cumulative impacts on the environment result from incremental impacts of a proposed action when these are added to other past, present, and reasonably foreseeable future actions. While cumulative impacts may result from individually minor actions, they may, viewed as a whole, become substantial over time. The refuge hunt program is designed to be sustainable through time, given relatively stable conditions, particularly because of close coordination with the AGFC.

The cumulative impacts of hunting on ducks including merganser, light and dark geese, coots, woodcock, squirrel, rabbit, raccoon, opossum, white-tailed deer, and turkey populations at the refuge are negligible. The proportion of the refuge's harvest of these species is negligible when compared to local, regional, and State-wide populations and harvest. As an example in 2019, approximately 14,692 deer were taken from the counties in which the refuge is located while only 354 deer were recorded as being harvested on Felsenthal NWR (0.00188% of statewide harvest). This accounted for nearly eight percent of the total hunting harvest for white-tailed deer in the State of Arkansas (AGFC, 2019). Experience has proven that time and space zoning (e/g., establishment of separate use area, use periods, and restriction on the number of users) is an effective tool in eliminating conflicts between user groups.

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, we anticipate no direct or indirect cumulative impacts on resident wildlife, migratory birds, and non-hunted wildlife of by use of hunting on the refuge.

Refer to the hunt plan and EA for additional impacts to the refuge's resources (USFWS 2021a, 2021b).

PUBLIC REVIEW AND COMMENT:

The proposal has been thoroughly coordinated with all interested and/or affected parties. Parties contacted include:

U.S. Fish and Wildlife Service, Arkansas Ecological Services Field Office.
Arkansas Game and Fish Commission, Wildlife Division.
Choctaw Nation of Oklahoma
Coushatta Tribe of Louisiana
Jena Band of Choctaw Indians
Mississippi Band of Choctaw Indians
Quapaw Tribal Business Committee
Tunica-Biloxi Indian Tribe of Louisiana

Arkansas Game and Fish Commission, Wildlife Division expressed support for the action on May 28, 2021.

The Service provided public notice of the availability of the draft Hunt Plan, Environmental Assessment, and draft Hunting Compatibility Determination for Felsenthal National Wildlife Refuge (NWR, refuge) for public review and comment through local and national public media. Local notice included a Public Information Bulletin and information and documents posted on the refuge's website. National public notice was provided through the Federal Register ([Volume 86, Number 84; 86 FR 23794; Docket No. FWS-HQ-NWRS-2021-0027, FXRS12610900000-212-FF09R20000; pages 23794-23842](#)) which was published on May 4, 2021. Public comments on the proposal were received by the Service during the public review and comment period (April 14, 2021 through July 7, 2021) from five members of the general public and The Humane Society of the United States. 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 in Appendix C of the environmental assessment associated with this determination.

DETERMINATION (CHECK ONE BELOW):

☐ **USE IS NOT COMPATIBLE**

X USE IS COMPATIBLE WITH FOLLOWING STIPULATIONS

NEPA Compliance for Refuge Use Decision: Place an X in appropriate space.

Categorical Exclusion and Environmental Action Statement

X Environmental Assessment and Finding of No Significant Impact

Environmental Impact Statement and Record of Decision

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

The refuge will permit ducks including merganser, light and dark geese, coots, American woodcock, squirrel, rabbit, raccoon, opossum, deer, and turkey hunting in accordance with AGFC and specific refuge regulations. Beaver, coyote, nutria, and feral hog can be taken incidental to other approved hunts in accordance with AGFC and specific refuge regulations. An EA is on file at the refuge headquarters as part of the Hunting Plan. Refuge specific regulations will be reconsidered annually and adjusted as new information becomes available. As outlined in the refuge CCP, this amended plan will serve as the required update for the Hunting Plan. The following stipulations will help ensure the refuge hunting program is compatible with refuge purposes.

- This use must be conducted in accordance with state and federal regulations, and special refuge regulations published in the annual refuge Public Use Regulations brochure. Season dates, hunt methods, species hunted, quota hunt application procedures and other hunt related information is located the refuge website and Public Use Regulation's brochure.
- This use is subject to modification if on-site monitoring by refuge personnel or other authorized personnel results in a determination that hunting is causing unanticipated negative impacts to natural communities, wildlife species, or their habitats.
- Hunting seasons may be more restrictive than state seasons and regulations to ensure compliance with visitor safety, reduce wildlife disturbance, and facilitate high-quality hunting.
- Law Enforcement Officer(s) will promote compliance with refuge regulations, monitor public use patterns and public safety, and document visitor interactions. Law

Enforcement personnel will monitor all areas and enforce all applicable state and federal Regulations.

- The refuge manager may, upon annual review of the hunting program and in coordination with the AGFC, impose further restrictions on hunting, recommend that the refuge be closed to hunting, or further liberalize hunting regulations within the limits of state seasons and regulations, or as otherwise approved by AGFC. Hunting restriction may be implemented if it conflicts with other, higher priority refuge programs or endangers refuge resources or public safety.
- The following refuge specific regulations are designed to make this use compatible:
 1. Migratory game bird hunting. We allow hunting of American woodcock, duck, light and dark geese, merganser, and coot on designated areas of the refuge subject to the following conditions:
 - a. We allow hunting of duck, light and dark geese, merganser, and coot during the State waterfowl season except during scheduled refuge quota gun deer hunts.
 - b. Waterfowl hunters may enter the refuge beginning at 4 a.m. Waterfowl hunting is allowed until 12 p.m. (noon)
 - c. Hunters must remove decoys, blinds, boats and all other equipment by 1 p.m. each day
 - d. We close areas of the refuge posted with “Area Closed” signs and identify them on the refuge hunt brochure map as a waterfowl sanctuary. We close waterfowl sanctuaries to all public entry and public use from November 15 to February 15.
 - e. Hunters must possess and carry a signed refuge public use brochure while hunting.
 - f. We allow American woodcock hunting during the State season except during scheduled refuge quota hunts. Woodcock hunters may enter the refuge beginning at 4 a.m. and must exit by 1 hour after legal sunset
 - g. All youth hunters age 15 and younger must remain within sight and normal voice contact of an adult age 21 or older, who possesses a valid state hunting license. One adult may supervise no more than two youth hunters.
 - h. We allow only all-terrain vehicles/utility-type vehicles (ATVs/UTVs) for hunting and fishing activities according to regulations provided in the public use brochure.
 - i. You may use bikes, horses and mules on roads and ATV/UTV trails (when open to motor vehicle and ATV/UTV traffic, respectively) as a mode of transportation for hunting and fishing activities on the refuge except during the quota deer hunts.
 - j. We prohibit hunting within 150 feet (45 meters) of roads, pipelines, and trails open to motor vehicle use (including ATV/UTV trails).
 - k. We allow the incidental take of beaver, nutria, and coyote during any daytime

refuge hunt with weapons and ammunition allowed for that hunt. There is no bag limit.

- I. We allow the use of dogs when hunting.
2. Upland game hunting. We allow hunting of quail, squirrel, rabbit, raccoon and opossum (as governed by State law), and incidental take of beaver, nutria, and coyote on designated areas of the refuge subject to the following conditions:
 - a. The conditions set forth at paragraphs (1)(d), (e), and (g) through (l) of this section apply.
 - b. We allow hunting for quail, squirrel, rabbit, raccoon and opossum on the refuge during State seasons through January 31. We close upland game hunting during refuge quota gun deer hunts.
 - c. We do not open for spring squirrel hunting season, or summer/early fall raccoon hunting season.
 - d. We allow the use of dogs for squirrel and rabbit hunting from December 1 through January 31 and for quail and raccoon/opossum hunting during the open season on the refuge for these species.
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:
 - a. The conditions set forth at paragraphs (1)(d), (e), and (h) through (k) of this section apply.
 - b. We allow archery deer hunting on the refuge from the opening of the State season through January 31 except during refuge deer quota hunts.
 - c. We allow muzzleloader and modern gun deer hunting during designated times and seasons, within specified state seasons as listed in refuge public use brochure.
 - d. Total deer harvested refuge-wide is two deer (two does, or one buck and one doe, as governed by State law) regardless of method. A doe must be harvested before a buck.
 - e. We prohibit buckshot for modern gun deer hunting.
 - f. You may only use portable deer stands erected no earlier than the opening day of archery season, and you must remove them no later than January 31 each year.
 - g. We prohibit the use of deer decoy(s).
 - h. Turkey hunting (Archery, Youth and Quota) will be conducted during designated times and seasons, within specified state seasons as listed in refuge public use brochure.
 - i. We restrict quota hunt participants to those selected for a quota permit (FWS Form 3-2439, Hunt Application—National Wildlife Refuge System), except that one nonhunting adult age 21 or older possessing a valid hunting license must accompany the youth hunter age 15 and younger.
 - j. An adult age 21 or older possessing a valid hunting license must accompany and be within sight and normal voice contact of hunters age 15 and younger. One adult may supervise no more than one youth hunter.
 - k. We authorize the use of one tree stand or ground blind, and one game camera

on the refuge if the owner's State hunting license number is clearly written on them in a conspicuous location.

- l. We restrict hunt participants for quota hunts to those drawn for a quota permit (FWS Form 3-2439, Hunt Application—National Wildlife Refuge System). These permits are nontransferable, and the permit fees are nonrefundable.
- m. The incidental taking of feral hogs will be governed by Arkansas Game and Fish Commission regulations concerning the taking of feral hogs on State Wildlife Management Areas (WMAs). Subject to State regulations, we allow incidental take of feral hogs during daytime refuge deer quota hunts (without the use of dogs) and during specified period during archery deer hunting with legal hunting equipment and ammunition allowed for those hunt according to the season dates provided in the public use brochure. There is no bag limit.

JUSTIFICATION:

Hunting is a priority wildlife-dependent use for the NWRS through which the public can develop an appreciation for fish and wildlife (Executive Order 12996, March 25, 1996 and The NWRSA, as amended by the NWRSA (Public Law 105-57)). The Service's 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.

Considering the information presented in this document and with the stipulations previously described, hunting will not materially interfere with or detract from the NWRS mission or purposes of the refuge. Hunting is a priority public use of the NWRS and providing a hunting program contributes to achieving one of the refuge goals. Hunting seasons and bag limits are established by the AGFC and adopted or amended by the refuge. These restrictions help ensure the continued well-being of game populations. Specific refuge regulations address equity and quality of opportunity for hunters, and help safeguard refuge habitat. Disturbance to other fish and wildlife does occur, but this disturbance is generally short-term and minor in nature. Hunting is not expected to adversely affect the biological integrity, diversity, and environmental health of the refuge or the NWRS.

The stipulations above will ensure proper control of the use and provide management flexibility should detrimental impacts develop. Allowing this use also furthers the mission of the NWRS by providing renewable resources for the benefit of the American public while conserving fish, wildlife, and plant resources on the refuge.

Hunting is supported by numerous refuge documents including hunt plans and their associated EAs, three CDs, Land Protection Plan, and the refuge CCP (USFWS 2017, USFWS 2013, USFWS 2010a, USFWS 1994, USFWS 1988, USFWS 1978).

LITERATURE CITED

Refer to the Literature Cited Section of the Hunt Plan and EA for additional information.

Arkansas Game and Fish Commission 2019. White-tailed Deer Harvest Reports. <https://ar-web.s3licensing.com/SurveyReport>

Arkansas Game and Fish Commission 2019. Wild Turkey Harvest and Scientific Reports. <https://www.agfc.com/en/hunting/turkey/turkey-scientific-reports/>

Arkansas Game and Fish Commission 2013. 2013 Strategic Deer Management Plan, Little Rock, AR 50pp.

Beach, R. 1993. Depredation problems involving feral hogs. Pages 67-93 in C.W. Hanselka and J.F. Cadenhead, eds. *Feral Swine: A compendium for resource managers*. Texas Agric. Ext. Service, College Station, TX.

Belanger, L. and L. Bedard. 1995. Hunting and waterfowl. Pages 243-256 in *Wildlife and Recreationists: coexistence through management and research* (Knight and Gutzwiller eds). Island Press, Washington, D. C. 372 pp.

Boyle, S.A., F.B. Samson. 1985. Effects of non-consumptive recreation on wildlife: A review. *Wildlife Society Bulletin* 13:110.

Burger, J. 1981. The effect of human activity on birds at a coastal bay. *Biological Conservation* 21:231-241.

Dahlgren, R. B. 1988. Human disturbances to migrating and wintering waterfowl: an annotated bibliography, USFWS, La Crosse, Wisconsin, 112 pp.

Erwin, R.M. 1980. Breeding habitat by colonially nesting water birds in 2 mid-Atlantic U.S. regions under different regimes of human disturbance. *Biological Conservation*. 18:39-51.

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.

Kahl, R. 1991. Boating disturbance of canvasbacks during migration at Lake Poygan, Wisconsin. *Wildlife Society Bulletin*. 19:242-248.

Klein, M.L. 1993. Waterbird behavioral responses to human disturbances. *Wildlife Society Bulletin*. 21:31-39.

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

McNeil, Raymond; Pierre Drapeau; John D. Goss-Custard. 1992. The occurrence and adaptive significance of nocturnal habitats in waterfowl. *Biological Review*. 67: 381-419.

- Morton, J.M., A.C. Fowler, and R.L. Kirkpatrick. 1989. Time and energy budgets of American black ducks in winter. *Journal of Wildlife Management* 53 (2):401-410.
- Owen, M. 1973. The management of grassland areas for wintering geese. *Wildfowl*. 24:123-130.
- Southeastern Association of Fish and Wildlife Agencies (SAFWA), 2015. Annual State Summary Report – Wild Hog Working Group. 52pp.
- U.S. Fish and Wildlife Service. 2021. Felsenthal NWR Hunt Plan Environmental Assessment. Atlanta, GA
- U.S. Fish and Wildlife Service. 2021. Felsenthal NWR Draft Hunting Compatibility Determination. Atlanta, GA.
- U.S. Fish and Wildlife Service. 2018. Felsenthal NWR Hunt Plan. Atlanta, GA. 39pp.
- U.S. Fish and Wildlife Service, 2017. Draft Felsenthal NWR Hunt Plan and Environmental Assessment. Crossett, AR. 123pp.
- U.S. Fish and Wildlife Service, 2015. Felsenthal Habitat Management Plan and Environmental Assessment. Crossett, AR. 254pp.
- U.S. Fish and Wildlife Service, 2015. Compatibility Determination – ATV/UTV Use on Designated Trails on Felsenthal NWR. Crossett, AR. 16pp.
- U.S. Fish and Wildlife Service. 2013. Final Land Protection Plan and Final “Environmental Assessment for the Expansion of Upper Ouachita and Felsenthal National Wildlife Refuges. Atlanta, GA. 498pp.
- U.S. Fish and Wildlife Service. 2010. Felsenthal and Overflow National Wildlife Refuge Comprehensive Conservation Plan. Crossett, AR. 326pp
- U.S. Fish and Wildlife Service. 2010a Felsenthal and Overflow National Wildlife Refuge Comprehensive Conservation Plan and Environmental Assessment. Crossett, AR. 447pp
- U.S. Fish and Wildlife Service. Service Manual, <http://fws.gov/policy/manuals/>, Washington, D.C.
- U.S. Fish and Wildlife Service. 1988 Felsenthal National Wildlife Refuge Hunt Plan. Crossett, AR. 30pp.
- U.S. Fish and Wildlife Service. 1978 Felsenthal National Wildlife Refuge Hunt Plan. Crossett, AR. 30pp.
- Ward, D.H., and R.A. Stehn. 1989. Response of Brant and other geese to aircraft disturbance at Izembek Lagoon, Alaska. U.S. Fish and Wildlife Service, Alaska Fish and Wildlife Research Center. Final report to the Minerals Management Service. Anchorage, Alaska. 193 pp.
- Williams, G.J., and E. Forbes. 1980. The habitat and dietary preferences of dark-bellied Brant geese and widgeon in relation to agricultural management. *Wildfowl* 31:151-157.

Approvals:

SIGNATURE: REFUGE MANAGER:

**NICHOLAS
WIRWA** Digitally signed by
NICHOLAS WIRWA
Date: 2021.08.06
15:50:27 -05'00'

(Acting)

(Signature and date)

REVIEW: REFUGE SUPERVISOR, SOUTH ATLANTIC-GULF REGION:

ANITRA FIRMENICH Digitally signed by ANITRA
FIRMENICH
Date: 2021.08.10 06:38:02 -06'00'

(Signature and date)

REVIEW: REGIONAL COMPATIBILITY COORDINATOR, SOUTH ATLANTIC-GULF REGION

 Digitally signed by Pamala J. Wingrove
Date: 2021.08.10 11:34:02 -04'00'

(Signature and date)

CONCURRENCE: REGIONAL REFUGE CHIEF SOUTH ATLANTIC-GULF REGION:

BRETT HUNTER Digitally signed by BRETT
HUNTER
Date: 2021.08.12 09:32:47 -04'00'

(Signature and date)

MANDATORY 15-YEAR REEVALUATION DATE: August 2031

APPENDIX E: INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION

REGION 4
INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

[Note: This form provides the outline of information needed for intra-Service consultation. If additional space is needed, attach additional sheets, or set up this form to accommodate your responses.]

Originating Person: Michael Stroeh
Telephone Number: 870-364-3167 **E-Mail:** michael_stroeh@fws.gov
Date: 2/16/2021

PROJECT NAME (Grant Title/Number): Hunting on Felsenthal NWR

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: Arkansas/US Fish & Wildlife Service

III. Station Name: Felsenthal National Wildlife Refuge

IV. Description of Proposed Action (attach additional pages as needed):

Felsenthal NWR proposes to continue a hunting program. Hunting would be in accordance with Arkansas Game and Fish Commission Regulations, Code of Federal Regulations, and special refuge regulations. The refuge will provide hunting opportunities for big game (white-tailed deer, and turkey), upland game (gray and fox squirrels, rabbits, raccoon, opossum and bobwhite quail), waterfowl (ducks, geese, coots, and mergansers), other migratory birds (woodcock) and incidental take species (beaver, nutria, coyote, and feral hogs) on an additional 9,277 acres acquired in fee-title in 2020. Hunting is an acceptable, traditional form of wildlife dependent recreation and is compatible with the major purposes for which the refuge was established. The existing and new lands will increase the core area size for forest blocks and provide valuable habitat and corridors for migratory birds, bears, and other wildlife. These lands are used by neotropical migratory birds following the Ouachita River during their spring and fall migrations, as well as nesting prothonotary, Swainson's, and worm-eating warblers, Mississippi kites, and wood ducks. This area is prone to winter and spring flooding which provides critical habitat for

wintering waterfowl. Hundreds of thousands of wintering waterfowl utilize these bottomland hardwoods forests annually.

Please see the attached hunt plan and environmental assessment for additional details.

V. Pertinent Species and Habitat:

A. Include species/habitat occurrence map: Maps included with hunt plan and EA.

B. Complete the following table: Species, Critical Habitat and Federal Status

SPECIES/CRITICAL HABITAT	STATUS ¹
Red-cockaded Woodpecker (<i>Leuconotopicus borealis</i>)	E
Pink mucket (pearly mussel) (<i>Lampsilis abrupta</i>)	E
Pondberry (<i>Lindera mellisifolia</i>)	E
Winged Mapleleaf Mussel (<i>Quadrula fragosa</i>)	E
Rabbitsfoot Mussel (<i>Quadrula cylindrical cylidrica</i>)	T
Ouachita Rock-Pocketbook Mussel (<i>Arkansia wheeleri</i>)	E
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	T
Monarch Butterfly (<i>Danaus plexippus</i>)	C
Piping Plover (<i>Charadrius melodus</i>)	T
Eastern Black Rail (<i>Laterallus jamaicensis</i>)	T
Red Knot (<i>Calidris canutus</i>)	T

SPECIES/CRITICAL HABITAT	STATUS ¹
Whooping Crane (<i>Grus americana</i>)	Experimental, non-essential
Geocarpon (<i>Geocarpon minimum</i>)	T

¹STATUS: E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species

VI. Location (attach map):

A. Ecoregion Number and Name:

Number 27, Lower Mississippi River

B. County and State:

Ashley, Bradley, and Union Counties, Arkansas

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

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

Approximately 5 miles west of Crossett, AR.

E. Species/habitat occurrence:

The subject property is predominately bottomland hardwood forest with scattered upland pine/upland hardwood communities.

Felsenthal NWR uses the IPAC database to identify threatened and endangered species for purposes of this Biological Evaluation. This is done because the IPAC database is the better of the Service's databases for the Refuge and may contain the best available information on species presence. Nevertheless, in order to ensure a thorough review, this Biological Evaluation considers all threatened and endangered species identified by both the IPAC and ECOS databases. These databases are updated regularly, 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.

Staff present on the Refuge and conducting this evaluation may have the best available information about the presence of fish and wildlife species. Thus, where species are identified by either database, but the refuge has information that the species is not

actually present within the “action area”, we have explained that as the basis for our determination that any hunting and fishing activities will have no effect on the species.

Red-cockaded Woodpecker - Felsenthal NWR harbors one of the highest-known concentrations (per acre of available habitat) of RCWs in Arkansas. Currently there are 24 active RCW groups on Felsenthal NWR. The red-cockaded woodpecker has high priority in refuge management. This woodpecker prefers open, park-like timber stands where it excavates nesting cavities in mature pine trees. The RCW prefers mature, older aged, open canopy pine stands with low ground cover of grasses and forbs. Its decline has been traced to the loss of older, open pine forests in the South, and a fire-dependent ecosystem to which the RCW has adapted.

Mussel species - Pink mucket, winged mapleleaf, rabbitsfoot, and Ouachita rock pocketbook mussels are primarily inhabitants of Ouachita and/or Saline Rivers. The rabbitsfoot mussel is typically found in small to medium sized rivers with clear, shallow water with a mixture of sand 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.

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. A very small population has been documented south of Felsenthal NWR on the Lower Ouachita-Beryl Anthony WMA.

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 range-wide 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.

Monarch Butterfly – The Monarch Butterfly travels through Arkansas on its way to central Mexico where they hibernate. While in Arkansas, they depend on flowering plants that are being lost due to the production of clean agricultural crops. The majority of the habitats on the refuge are forested bottomland hardwoods with little value to a butterfly. However, most habitats found on the Refuge that are actively managed, are managed in a way (i.e. selective timber thinning, early successional scrub-shrub and moist-soil habitats) that encourages flowering plants that would be used by Monarchs.

Piping Plover – The Piping Plover is a transient migrant that uses mud flats. Southward migration from the breeding grounds primarily occurs from July to September with

migration back to the breeding grounds occurring from mid-February to mid-May. Occurrences are likely to be infrequent and of short duration (1-2 days) during the summer months. Although no sightings have occurred on the refuge, they are occasionally seen on lands near the refuge according to eBird (ebird.org). Plover use of the refuge would likely occur on mud flats in July or August from fields that were flooded the previous year or on the edges of lakes during dry periods in which mudflats are exposed.

Black Rail – The Black Rail is a transient migrant that uses shallow emergent freshwater wetland habitat areas. Occurrences would be infrequent and of short duration during the spring and fall months. Although no observations have occurred on the refuge, there have been six observations in Arkansas according to eBird (ebird.org), one of which was made in a county in which the Refuge is located. Use on the refuge would most likely occur in areas managed for freshwater emergent plants for wintering waterfowl (i.e. moist-soil wetlands).

Red Knot – The Red Knot is a transient migrant that uses shorelines of lakes or freshwater marshes. Occurrences are likely to be infrequent and of short duration during the summer to early fall. Although no sightings have occurred on the refuge, they are occasionally made on lands near the refuge according to eBird (ebird.org). Red Knot use of the refuge would likely occur on mudflats that are created during Felsenthal pool drawdowns for waterfowl as the mudflats are exposed during late summer.

Whooping Crane – The Whooping Crane population that migrates through Arkansas is a small migratory population of individuals introduced beginning in 2001. Occurrences are likely to be infrequent on the refuge. Crane use would likely occur on fields managed for wintering waterfowl (moist-soil or agricultural habitats). Currently, the refuge has no agricultural management activities. Moist soil management is limited to every third year during the drawdown of the Felsenthal pool from July 1- Nov. 15.

Geocarpon - Geocarpon prefers eroded areas in grasslands called "slicks" or "slickspots." Bare soil over sandstone, slicks are high in salinity and may be the remains of ancient Pleistocene lake beds. At this time, Geocarpon is not known to occur on, or in close proximity to the refuge.

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
Red-cockaded woodpecker (<i>Picoides borealis</i>)	The activities associated with hunting will not alter the habitat in a way that will be negative for this species and disturbance from hunting should be minimal. The species being hunted in refuge's

SPECIES/CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
	<p>current hunt program are easily identifiable and a red-cockaded woodpecker should not be misidentified for any of these species. The refuge's hunting program is not likely to adversely affect this species. Newly open hunt areas currently contain no active RCWs clusters.</p> <p>However, it is possible that the use of portable, removable tree stands and climbing on trees, which are allowed on the refuge, could disturb and flush individuals of this species utilizing the same tree as hunters. Noise from gun use might also flush roosting birds from trees, although it is more likely the birds will remain in place when only disturbed by noise. In either case, when such disturbances do occur and flush birds from trees it does not result in mortality or rise</p> <p>Lead ammunition can be used during the deer hunting season. The proposed action opens an additional 4,000 plus acres to quota deer hunts that could potentially increase the number of gun hunters from 500 to 550 per season. Increased harvest is anticipated to be 10 deer per season. Lead bullets and fragments do not always completely leave the harvested animal and a small portion of the lead enters the environment, on average 2.6 or 3 grams of metal lost (Stokke, et al 2017). RCWs forage exclusively on insects, bioaccumulation of lead would not affect this species due to their position in the food chain. Insects such as moths, beetle larvae and mosquitos, common food items of RCWs, do not ingest lead shot directly and though some of these insects may consume vegetation as adults or in larval stages, plants do not typically take up heavy metals until the metals have reached critical levels in the soil (Sharma and Dubey 2005). Therefore, lead exposure to RCW due to hunting on the refuge is unlikely. In addition, the refuge restricts use of lead ammunition to upland game hunting and encourages the use of non-lead ammunition to minimize lead exposure on the refuge.</p>
Pink mucket (pearly mussel) (<i>Lampsilis abrupta</i>)	<p>The potential impacts to mussel species from the hunting program could be sedimentation from foot traffic near waterways and deposition of lead shot into water. It is possible that stream sediments and water flow could erode lead ammunition and release particles of lead compounds into the water. Mussels, including the Pink mucket, are filter feeders and therefore do not ingest larger pieces of lead. Spent lead ammunition does not dissolve readily in aquatic systems and can be stable, remaining intact for decades or centuries (Goodard et al. 2008). No direct</p>

SPECIES/CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
	<p>studies have looked at impacts of spent lead ammunition on mussels, however, a review of research by Goodard et al. (2008) noted that “for bioavailable lead from ammunition and fishing tackle to have significant effects on biota at the organism or population level, the quantity of shot or tackle would have to be substantial” Lead deposition through hunting on the refuge would be minimal due to non-toxic shot requirements for all hunters using a shotgun. The only lead ammunition used on the refuge is from rifles used to hunt deer, squirrel or raccoons. Only a small portion of this ammunition ever ends up making it into the soil or water because when hunting for these species it is likely that the lead projectile ends up in the animal or permanently lodged into a tree. The refuge’s hunting program is not likely to adversely affect this aquatic species.</p>
<p>Pondberry (<i>Lindera mellisifolia</i>)</p>	<p>Pondberry has been documented in Ashley County just south of the refuge on the State WMA. Some historical references to pondberry on the refuge have also been documented. However, existing refuge vegetative surveys were not designed to specifically detect this species; therefore, we cannot preclude its existence within any of the areas.</p> <p>Hunting related threats to Pondberry include trampling by foot traffic and destruction from off road vehicle use. With no known populations on the refuge or near the refuge, the refuge’s hunting program is not likely to affect this plant.</p> <p>Potential lead impacts to this species is very unlikely. As a plant species the only exposure to lead would be through absorption from the soil. Lead levels would have to be at critical levels to be absorbed (Sharma and Dubey 2005). The restriction on lead ammunition on the refuge along with the location of spent ammunition residing in target animals, trees or soil as larger fragments minimizes the likelihood that lead would have any impact on pondberry therefore the determination is not likely to adversely affect.</p>
<p>Winged Mapleleaf Mussel (<i>Quadrula fragosa</i>)</p>	<p>The potential impacts to mussel species from the hunting program could be sedimentation from foot traffic near waterways and deposition of lead shot into water. It is possible that stream sediments and water flow could erode lead ammunition and release particles of lead compounds into the water. Mussels, including the winged mapleleaf mussel, are filter feeders and therefore do not ingest larger pieces of lead. Spent lead</p>

SPECIES/CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
	<p>ammunition does not dissolve readily in aquatic systems and can be stable, remaining intact for decades or centuries (Goodard et al. 2008). No direct studies have looked at impacts of spent lead ammunition on mussels, however, a review of research by Goodard et al. (2008) noted that “for bioavailable lead from ammunition and fishing tackle to have significant effects on biota at the organism or population level, the quantity of shot or tackle would have to be substantial” Lead deposition through hunting on the refuge would be minimal due to non-toxic shot requirements for all hunters using a shotgun. The only lead ammunition used on the refuge is from rifles used to hunt deer, squirrel or raccoons. Only a small portion of this ammunition ever ends up making it into the soil or water because when hunting for these species it is likely that the lead projectile ends up in the animal or permanently lodged into a tree. The refuge’s hunting program is not likely to adversely affect this aquatic species.</p>
<p>Rabbitsfoot Mussel (<i>Quadrula cylindrical</i> <i>cylidrica</i>)</p>	<p>The potential impacts to mussel species from the hunting program could be sedimentation from foot traffic near waterways and deposition of lead shot into water. It is possible that stream sediments and water flow could erode lead ammunition and release particles of lead compounds into the water. Mussels, including the Rabbitsfoot mussel, are filter feeders and therefore do not ingest larger pieces of lead. Spent lead ammunition does not dissolve readily in aquatic systems and can be stable, remaining intact for decades or centuries (Goodard et al. 2008). No direct studies have looked at impacts of spent lead ammunition on mussels, however, a review of research by Goodard et al. (2008) noted that “for bioavailable lead from ammunition and fishing tackle to have significant effects on biota at the organism or population level, the quantity of shot or tackle would have to be substantial” Lead deposition through hunting on the refuge would be minimal due to non-toxic shot requirements for all hunters using a shotgun. The only lead ammunition used on the refuge is from rifles used to hunt deer, squirrel or raccoons. Only a small portion of this ammunition ever ends up making it into the soil or water because when hunting for these species it is likely that the lead projectile ends up in the animal or permanently lodged into a tree. The refuge’s hunting program is not likely to adversely affect this aquatic species. It is possible that stream sediments and water flow could erode lead ammunition and release particles of lead compounds into the water. However, lead deposition through hunting on the refuge would be minimal due to non-toxic shot requirements for all hunters using a shotgun. The only lead</p>

SPECIES/CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
	ammunition used on the refuge is from rifles used to hunt deer, squirrel or raccoons. Only a small portion of this ammunition ever ends up making it into the soil or water because when hunting for these species it is likely that the lead projectile ends up in the animal or permanently lodged into a tree. The refuge's hunting program is not likely to adversely affect this aquatic species.
Ouachita Rock-Pocketbook Mussel (<i>Arkansia wheeleri</i>)	The potential impacts to mussel species from the hunting program could be sedimentation from foot traffic near waterways and deposition of lead shot into water. It is possible that stream sediments and water flow could erode lead ammunition and release particles of lead compounds into the water. Mussels, including the Ouachita rock-pocketbook mussel, are filter feeders and therefore do not ingest larger pieces of lead. Spent lead ammunition does not dissolve readily in aquatic systems and can be stable, remaining intact for decades or centuries (Goodard et al. 2008). No direct studies have looked at impacts of spent lead ammunition on mussels, however, a review of research by Goodard et al. (2008) noted that "for bioavailable lead from ammunition and fishing tackle to have significant effects on biota at the organism or population level, the quantity of shot or tackle would have to be substantial" Lead deposition through hunting on the refuge would be minimal due to non-toxic shot requirements for all hunters using a shotgun. The only lead ammunition used on the refuge is from rifles used to hunt deer, squirrel or raccoons. Only a small portion of this ammunition ever ends up making it into the soil or water because when hunting for these species it is likely that the lead projectile ends up in the animal or permanently lodged into a tree. The refuge's hunting program is not likely to adversely affect this aquatic species.
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	Northern long-eared bats emerge at dusk to feed. They primarily fly through the understory of forested areas feeding on moths, flies, leafhoppers, caddisflies, and beetles. During the summer, these bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags (dead trees). In winter, they hibernate in caves and mines, called hibernacula. They use areas in various sized caves or mines with constant temperatures, high humidity, and no air currents. White-nose syndrome, a fungal disease known to affect bats, is currently the predominant threat to this bat. Human presence and related noise during hunting activities have not been included among the activities interfering or affecting this species, especially during the dusk and evening hours when the bat feeds and hunters are not allowed on the refuge. However, it is possible that the use of portable, removable

SPECIES/CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
	<p>tree stands and climbing on trees, which are allowed on the refuge, could disturb and flush individuals of this species utilizing the same tree as hunters. Noise from gun use might also flush roosting bats from trees, although it is more likely the bats will remain in place when only disturbed by noise. In either case, when such disturbances do occur and flush bats from trees it does not result in mortality or rise to the level of take. Upland game shot used throughout the refuge is lead-free. Ammunition used for big game hunting may contain lead. The amount of lead introduced to the environment as a result of big game hunting will be negligible because hunters utilizing centerfire lead ammunition for big game utilize very few bullets when hunting since every shot counts and big game quickly abandon a site after a shot is fired. The bioaccumulation of lead is a potential concern, but it does not present a significant issue on this refuge as some hunters will choose non-lead methods of take such as archery and non-lead ammunition. We encourage the use of non-toxic ammunition and educate hunters about lead. Moreover, this species does not scavenge, and therefore will not be impacted by lead fragments in gut piles (which are often buried) left on the refuge after hunting seasons. Instead, this species consumes insects and other food sources very unlikely to be impacted by lead in the environment. Current and proposed expansion of hunting areas, along with non-lead alternatives and education, would not result in lead levels toxic to this species. Thus, we believe that this activity might affect, but is not likely to adversely affect this species because individuals of this species would fly away temporarily from areas used by possible hunters.</p>
<p>Monarch Butterfly (<i>Danaus plexippus</i>)</p>	<p>Monarch butterflies spend spring and summer in areas of North America, preferring open field and grassland habitats. This species migrates to Central America beginning in early fall. Their primary food source is milkweed. No critical habitat has been designated.</p> <p>Due to most of the refuge being a forested bottomland hardwood system, the number of monarchs using the refuge is minimal. Factors attributing to their decline have been identified as habitat loss, mowing and pesticide applications. With the nature of the activities associated with hunting including expanding existing opportunities to new lands, butterflies are unlikely to be affected. Also, habitat quality for this species will likely not be altered. Only foot travel is allowed in any areas of grassland habitat suitable for Monarch butterflies, so it is unlikely that</p>

SPECIES/CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
	<p>individual milkweed plants that may be damaged or destroyed would affect habitat quality.</p> <p>An additional potential impact is vehicle strikes by hunters on the refuge traveling to their parking location. While this is a potential impact it should be noted that Monarch butterflies migrate to Central America in the fall and therefore their numbers are limited during the Fall hunt season. Potential vehicle strikes would not be significant to the population.</p> <p>Lead introduced on this refuge is not likely to adversely affect the Monarch butterfly because the species feeds exclusively on nectar and is therefore not exposed to lead or bioaccumulation of lead. The lead levels in the refuge soil would not be sufficient for plants to uptake lead so lead derived from hunting cannot be present in nectar.</p>
Piping Plover (<i>Charadrius melodus</i>)	<p>Piping plovers may be present on the refuge along shorelines of water bodies in the Spring and Summer. Piping plovers feed on insects, spiders, and crustaceans. These invertebrates are filter feeders and therefore do not ingest larger pieces of lead. Spent lead ammunition does not dissolve readily in aquatic systems and can be stable, remaining intact for decades or centuries (Goodard et al. 2008). No direct studies have looked at impacts of spent lead ammunition on mussels, however, a review of research by Goodard et al. (2008) noted that “for bioavailable lead from ammunition and fishing tackle to have significant effects on biota at the organism or population level, the quantity of shot or tackle would have to be substantial” Lead deposition through hunting on the refuge would be minimal due to non-toxic shot requirements for all hunters using a shotgun. The only lead ammunition used on the refuge is from rifles used to hunt deer, squirrel or raccoons. Only a small portion of this ammunition ever ends up making it into the soil or water because when hunting for these species it is likely that the lead projectile ends up in the animal or permanently lodged into a tree.</p> <p>Individuals of this bird species that could be present at the refuge may gather at staging areas with high invertebrate concentrations to rest and feed. If hunters were to venture onto areas transitorily occupied by piping plovers, this bird could fly away temporarily from approaching hunters and return as the hunters move on to other areas, causing them a disturbance but no direct harm or mortality The refuge’s hunting program is not likely to adversely affect this species. In addition, there is not likely to be any lead</p>

SPECIES/CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
	<p>ammunition should be minimized in the wetlands that these birds would be feeding in due to non-toxic shot requirements for shotgun hunters on the refuge.</p> <p>Lead ammunition can be used during the deer hunting season. The proposed action opens an additional 4,000 plus acres to quota deer hunts that could potentially increase the number of gun hunters from 500 to 550 per season. Increased harvest is anticipated to be 10 deer per season. Lead bullets and fragments do not always completely leave the harvested animal and a small portion of the lead enters the environment, on average 2.6 or 3 grams of metal lost (Stokke, et al 2017). Hunting on the refuge occurs in the Fall therefore the species is not present on the refuge during the time this activity is underway. Ammunition used for deer hunting may contain lead. The amount of lead introduced to the environment as a result of these hunting activities will be negligible, given the restrictive nature of the hunt opportunity including limited number of hunters through a quota hunt and that rifle projectiles are the only lead ammunition allowed. The bioaccumulation of lead is a potential concern, but it does not present a significant issue for this hunt on this refuge as some hunters will choose non-lead methods of take such as archery. We encourage the use of non-toxic ammunition and educate hunters about lead. Moreover, this species does not scavenge, and therefore will not be impacted by lead fragments in gut piles (which are usually buried) left on the refuge after hunting seasons. Current and proposed levels of hunting, along with non-lead alternatives and education, would not result in lead levels toxic to this species.</p>
Eastern black rail (<i>Laterallus jamaicensis</i>)	<p>This transient species would only be found in emergent freshwater habitats in the spring or fall. These types of habitats are mostly found on the refuge in areas that are managed for waterfowl sanctuary and that are closed to hunting during that time of the year. Human presence and related noise during hunting activities have not been included among the activities interfering or affecting this species. However, it is possible that hunting could disturb and flush individuals of this species. Noise from gun use might also flush resting birds, although it is more likely the rails will remain in place when only disturbed by noise. In either case, when such disturbances do occur and flush rails from trees it does not result in mortality or rise to the level of take.</p>

SPECIES/CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
	<p>There is not likely to be any lead ammunition present in the emergent wetlands that rails would be feeding in due to non-toxic shot requirements for shotgun hunters on the refuge. Additionally, the only lead ammunition allowed on the refuge (rifle projectiles) would likely be too large to be ingested by a small bird like a black rail.</p> <p>Lead ammunition can be used during the deer hunting season. The proposed action opens an additional 4,000 plus acres to quota deer hunts that could potentially increase the number of gun hunters from 400 to 450 per season. Increased harvest is anticipated to be 10 deer per season. Lead bullets and fragments do not always completely leave the harvested animal and a small portion of the lead enters the environment, on average 2.6 or 3 grams of metal lost (Stokke, et al 2017). Eastern black rail forage on insects, seeds, crustaceans, and mollusks, bioaccumulation of lead would not affect this species due to their position in the food chain. Insects such as beetle larvae and mosquitos, common food items of eastern black rails, do not ingest lead shot directly and though some of these insects may consume vegetation as adults or in larval stages, plants do not typically take up heavy metals until the metals have reached critical levels in the soil (Sharma and Dubey 2005). Therefore, lead exposure to Eastern black rails due to hunting on the refuge is unlikely. In addition, the refuge restricts use of lead ammunition to upland game hunting and encourages the use of non-lead ammunition to minimize lead exposure on the refuge.</p>
Red Knot (<i>Calidris canutus</i>)	<p>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 or units managed for wintering waterfowl. Potential impacts during hunting season include disturbance by vehicle traffic, noise from hunters, presence of dogs, and noise from gunfire. It is unlikely that hunting will disturb the species when present on the refuge as there are typically no hunting seasons open in the times in which they are most likely to be seen.</p> <p>Individuals of this bird species that could be present at the refuge may gather at staging areas with high invertebrate concentrations to rest and feed. If hunters were to venture onto areas transitorily occupied by red knots, this bird could fly away temporarily from approaching hunters and return as the hunters move on to other</p>

SPECIES/CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
	<p>areas, causing them a disturbance but no direct harm or mortality</p> <p>Lead ammunition can be used during the deer hunting season. The proposed action opens an additional 4,000 plus acres to quota deer hunts that could potentially increase the number of gun hunters from 500 to 550 per season. Increased harvest is anticipated to be 10 deer per season. Lead deposition through hunting on the refuge would be minimal due to non-toxic shot requirements for all hunters using a shotgun. The only lead ammunition used on the refuge is from rifles used to hunt deer, squirrel or raccoons. Only a small portion of this ammunition ever ends up making it into the soil or water because when hunting for these species it is likely that the lead projectile ends up in the animal or permanently lodged into a tree. Lead bullets and fragments do not always completely leave the harvested animal and a small portion of the lead enters the environment, on average 2.6 or 3 grams of metal lost (Stokke, et al 2017).</p> <p>Red knot feed on small invertebrates including mussels and clams. These prey species are filter feeders and therefore do not ingest larger pieces of lead. Spent lead ammunition does not dissolve readily in aquatic systems and can be stable, remaining intact for decades or centuries (Goodard et al. 2008). No direct studies have looked at impacts of spent lead ammunition on mussels, however, a review of research by Goodard et al. (2008) noted that “for bioavailable lead from ammunition and fishing tackle to have significant effects on biota at the organism or population level, the quantity of shot or tackle would have to be substantial”. Therefore, lead exposure to red knot due to hunting on the refuge is unlikely. In addition, the refuge restricts use of lead ammunition to upland game hunting and encourages the use of non-lead ammunition to minimize lead exposure on the refuge.</p> <p>The refuge’s hunting program is not likely to adversely affect this aquatic species. In addition, there is not likely to be any lead ammunition should be minimized in the wetlands that these birds would be feeding in due to non-toxic shot requirements for shotgun hunters on the refuge.</p>
Whooping Crane (<i>Grus americana</i>)	This transient species would likely only occur in wet, open-field habitats during the fall and winter. In a literature review, Lewis and Black (2008) found that whooping cranes do react to approach

SPECIES/CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
	<p>by boats and people approaching on foot which resulted in flushing the birds. Disturbance is minimized on the refuge by the management of whooping crane habitat as wintering waterfowl sanctuary in which no hunting is allowed during that time of the year.</p> <p>Those areas are seasonally open for upland and big game in which lead ammunition is allowed in rifles. Lead ammunition can be used during the deer hunting season. The proposed action opens an additional 4,000 plus acres to quota deer hunts that could potentially increase the number of gun hunters from 500 to 550 per season. Increased harvest is anticipated to be 10 deer per season. Lead bullets and fragments do not always completely leave the harvested animal and a small portion of the lead enters the environment, on average 2.6 or 3 grams of metal lost (Stokke, et al 2017). Eastern black rail forage on insects, seeds, crustaceans, and mollusks, bioaccumulation of lead would not affect this species due to their position in the food chain. However, because of the likelihood of harvesting a squirrel or raccoon in this habitat (open-field habitat) is minimal, it is unlikely that any of that lead rifle ammunition is deposited in areas that a Whooping Crane may be foraging.</p> <p>While accidental shooting during lawful hunting activities are possible and have occurred infrequently in past years the likelihood of take associated with regulated hunting remains extremely low. Death or injury associated with migratory bird hunting would be as infrequent as in any other form of hunting on the refuge. No known sightings of whooping cranes are known to exist on the refuge. The refuge's hunting program is not likely to adversely affect this bird.</p>
<p>Geocarpon (<i>Geocarpon minimum</i>)</p>	<p>Vegetational succession appears to be the major threat to this tiny (0.4" to 1.6"), inconspicuous plant. When grasses or shrubs encroach on a slick, the geocarpons fail. If slicks do indeed result from fire, then fire suppression would hasten encroachment of geocarpon habitat. Geocarpons also suffer from certain forestry practices such as the piling and burning of slash and the use of heavy equipment.</p> <p>Hunting related threats to Geocarpon include trampling by foot traffic and destruction from off road vehicle use. With no known populations on the refuge or near the refuge, the refuge's hunting</p>

SPECIES/CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
	<p>program is not likely to affect this plant.</p> <p>Potential lead impacts to this species is very unlikely. As a plant species the only exposure to lead would be through absorption from the soil. Lead levels would have to be at critical levels to be absorbed (Sharma and Dubey 2005). The restriction on lead ammunition on the refuge along with the location of spent ammunition residing in target animals, trees or soil as larger fragments minimizes the likelihood that lead would have any impact on Geocarpon therefore the determination is not likely to adversely affect.</p>

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

1. The refuge will halt (or alter) hunting activities when unusual concentrations of threatened and endangered species are known to be present and threatened by hunting activities.
2. The presence of law enforcement officers will provide a deterrent to the shooting of non-target species.
3. Hunter numbers are minimized during the popular deer quota hunts by a quota draw system. This should minimize the potential of temporarily displacing listed migratory species that may be present during that time of the year (i.e. monarch butterfly, piping plover, eastern black rail, red knot, or whooping crane).
4. The majority of the hunting on the refuge occurs with a shotgun, in which non-toxic shot is required. However, lead ammunition can be used by upland game hunters using a rimfire weapon or big game hunters pursuing deer and turkey on the refuge.
 - a. On approximately 70,000 acres, an average of 350-400 deer are harvested annually by means of rifle or muzzleloader in which lead ammunition may be used.
 - b. Many squirrel and raccoon hunters will choose to use shotguns in which non-toxic shot is required. However, sometimes they choose to use rimfire weapons with lead ammunition when pursuing these species. Because most squirrels and raccoons are often harvested in trees with single projectiles from a rimfire weapon, most lead projectiles never reach the ground where it can be broken down into the soil or water or incidentally consumed by a foraging bird.

VIII. Effect Determination and Response Requested:

SPECIES/ CRITICAL HABITAT	DETERMINATION ¹			RESPONSE ¹ REQUESTED
	NE	NA	AA	
Red-cockaded woodpecker (<i>Picoides borealis</i>)		X		Concurrence
Pink mucket (pearly mussel) (<i>Lampsilis abrupta</i>)		X		Concurrence
Pondberry (<i>Lindera mellisifolia</i>)		X		Concurrence
Winged Mapleleaf Mussel (<i>Quadrula fragosa</i>)		X		Concurrence
Rabbitsfoot Mussel) <i>Quadrula</i> <i>cylindrical cylidrica</i>)		X		Concurrence
Ouachita Rock-Pocketbook Mussel (<i>Arkansia wheeleri</i>)		X		Concurrence
Northern Long-eared Bat (<i>Myotis</i> <i>septentrionalis</i>)	X			Concurrence
Monarch Butterfly (<i>Danaus plexippus</i>)		X		Concurrence
Piping Plover (<i>Charadrius melodus</i>)		X		Concurrence
Eastern Black Rail (<i>Laterallus jamaicensis</i>)		X		Concurrence

SPECIES/ CRITICAL HABITAT	DETERMINATION ¹			RESPONSE ¹ REQUESTED
	NE	NA	AA	
Red Knot (<i>Calidris canutus</i>)		X		Concurrence
Whooping Crane (<i>Grus americana</i>)		X		Concurrence
Geocarpon (<i>Geocarpon minimum</i>)		X		Concurrence

¹DETERMINATION/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 A Formal Consultation@. Response Requested for proposed or candidate species is a concurrence@.

References:

Goddard, C.I., Leonard, N.J., Stang, D.L., Wingate, P.J., Rattner, B.A., Franson, J.C., and Sheffield, S.R. 2008. Fisheries 33(5). Available from:
<https://afspubs.onlinelibrary.wiley.com/doi/epdf/10.1577/1548-8446-33.5.228>

Lewis, T.E. and Slack, R.D. 2008. Whooping Cranes and Human Disturbance: An Historical Perspective and Literature Review. Proceedings of the North American Crane Workshop 10:3-6. Available from:
<https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1182&context=nacwgproc>

Sharma, P. and Dubey, R.S. March 2005. Lead toxicity in plants. Brazilian Journal of Plant Physiology 17 (1). Available from: <https://doi.org/10.1590/S1677-04202005000100004>

Stokke, S., Brainerd, S. and Arnemo, J.M. February 2017. Metal deposition of copper and lead bullets in moose harvested in Fennoscandia. Wildlife Society Bulletin. Available from: <https://doi.org/10.1002/wsb.731>

NICHOLAS WIRWA Digitally signed by
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Date: 2021.08.05
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Date

South Arkansas Refuges Complex Project Leader
Title

IX. Reviewing Ecological Services Office Evaluation:

- A. Concurrence X Nonconcurrence _____
- B. Formal consultation required _____
- C. Conference required _____
- D. Informal conference required _____

E. Remarks (attach additional pages as needed):

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Field Supervisor
Title

Date
Arkansas Ecological Services Field Office
Office

APPENDIX F: FINDING OF NO SIGNIFICANT IMPACT

Finding of No Significant Impact

For

Recreational Hunting on

Felsenthal National Wildlife Refuge

Ashley, Bradley, and Union Counties, Arkansas

The U.S. Fish and Wildlife Service (Service) will open recreational hunting on Felsenthal National Wildlife Refuge (NWR) (Ashley, Bradley, and Union Counties, Arkansas) for big game (white-tailed deer and eastern turkey), migratory birds (ducks, geese, coot, and woodcock), small game (rabbit, squirrel, raccoon, opossum, and quail) and the incidental take of feral hogs, coyote, beaver, and nutria. This action will help control overpopulation, protect valuable wildlife resources and provide quality wildlife dependent recreation as outlined in the attached hunt plan and environmental assessment.

These changes in the Felsenthal NWR hunt program offers the best opportunity for public hunting that will result in minimal impact on physical and biological resources, while meeting the Service's mandates under the National Wildlife Refuge System Administration Act (NWRSA) and Secretarial Order 3356, and aligning with the State of Arkansas's regulations and seasons.

Selected Action

Alternative B Proposed Action, Implement 2021 Hunt Plan

The proposed action will allow implementation of the 2021 Hunt Plan which will manage hunting on current and future Refuge parcels that lie within the current Refuge approved acquisition boundary. The Refuge hunting season framework will generally fall within Arkansas Game and fish Commission (AGFC) guidelines, but in various instances may be more conservative than state seasons and regulations. Refuge management goals and objectives may require occasional modifications to the hunting program based on harvest data, public use demands, and other Refuge programs. Use of quota hunts for special management purposes may be necessary to meet Refuge specific objectives.

The proposed alternative was selected over the other alternatives because:

1. The other alternative included no action and/or minimal action. This alternative did not provide for the most optimal public hunting opportunities, as recommended by the 2010 Comprehensive Conservation Plan, nor did it fully address environmental consequences from over-abundance of deer, coyote, and feral hog,
2. Public hunting, as outlined in the 2021 Hunt Plan, Alternative B, is the most cost effective, efficient, and logical way of controlling deer, coyote, and feral hog populations.

3. Hunting will be managed to minimize disturbance to non-hunted wildlife.
4. The addition of \parcels will result in negligible added wildlife disturbance while providing an increase in quality and diversity of the existing Refuge wildlife-dependent recreation program.
5. Engaging youth through various programs, in particular a high quality hunting experience is imperative to long-term support of the Refuge and greater Refuge System.

Other Alternative Considered and Analyzed

Alternative A, No Action, Current Management

Under this alternative hunting will be limited to the lands currently open to hunting and to species that are currently listed as legal game. There will be no change to current public use and wildlife management programs. This action will require that the Refuge post all new parcels acquired since the 1988 and 2017 Hunt plan and all future acquired refuge parcels as Closed to Hunting. This will also require an increase in law enforcement patrols to enforce closure regulations and provide adequate public safety to ensure regulatory compliance.

Compatible wildlife-dependent public recreational opportunities will be limited to existing levels. There will be no change in current refuge implementation of this priority, compatible wildlife-dependent public use that is allowed. Opportunities to create additional outdoor recreation experiences by adding additional species will be lost. In addition, the Refuge's ability to connect with certain segments of the public will potentially be diminished since hunting for some popular game species will not be permitted. Hunters will 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 the refuge did not as closely align with the State of Arkansas's hunting season structure as the selected alternative. Additionally, this alternative does not fully fulfill the Service's mandates under the NWRSA 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. The EA evaluated the effects associated with two alternatives. It is incorporated as part of this finding.

Implementation of the proposed alternative will be expected to result in the following environmental, social, and economic effects:

1. The Refuge will be better able to manage wildlife populations across all parcels.
2. Local businesses will benefit from additional hunters visiting from other areas.
3. The Service will be recognized as a good steward of the land by continuing traditional land use in Arkansas.

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

1. A requirement that all hunters obtain a Refuge hunt permit which can be used to measure hunter use and ensure hunters are educated on all rules and regulations aimed at minimizing effects.
2. Prohibition of all baiting.
3. A Refuge law enforcement program which will ensure hunt regulation compliance and protection of Refuge resources.
7. Hunting seasons that fall within the state seasons for Arkansas but are generally shorter and more restrictive.

The proposal is not expected to have any significant adverse effects on wetlands and flood plains, pursuant to Executive Orders 11990 and 11988 because:

This area has historically had high use for public hunting with no detrimental long-term effect on wetlands and none anticipated from this plan.

Public Review

The proposal has been thoroughly coordinated with all interested and/or affected parties. Parties contacted include:

U.S. Fish and Wildlife Service, Arkansas Ecological Services Field Office.
Arkansas Game and Fish Commission, Wildlife Division.
Choctaw Nation of Oklahoma
Coushatta Tribe of Louisiana
Jena Band of Choctaw Indians
Mississippi Band of Choctaw Indians
Quapaw Tribal Business Committee
Tunica-Biloxi Indian Tribe of Louisiana

Arkansas Game and Fish Commission, Wildlife Division expressed support for the selected alternative on May 28, 2021.

The Service provided public notice of the proposal through local and national public notice of the availability of the draft Hunt Plan, Environmental Assessment, and draft Hunting Compatibility Determination for Felsenthal National Wildlife Refuge (NWR, refuge) for public review and comment. Local public notice included a Public Information Bulletin and information and documents posted on the refuge's website. National public notice was provided through the Federal Register ([Volume 86, Number 84; 86 FR 23794; Docket No. FWS-HQ-NWRS-2021-0027, FXRS12610900000-212-FF09R20000; pages 23794-23842](#)) which was published on May 4, 2021. Public comments on the proposal were received by the Service during the public review and comment period (April 14, 2021 through July 7, 2021) from five members of the general public and The Humane Society of the United States. 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 in Appendix E of this plan.

Copies of the Environmental Assessment are available by contacting:
U.S. Fish and Wildlife Service, Felsenthal National Wildlife Refuge
5531 Highway 82 West
Crossett, AR 71635
<http://www.fws.gov/refuge/felsenthal>

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.

1. Both Beneficial and adverse effects have been considered and this action will not have a significant effect on the human environment ((EA, pages 37-38,41-42)
2. The project will not significantly affect any unique characteristics of the geographic area such as proximity to historical or cultural resources, wild and scenic rivers, or ecologically critical areas (throughout the EA).
3. The effects on the quality of the human environment are not likely to be highly controversial (EA, pages 37-38, 41-42).
4. The actions do not involve highly uncertain, unique, or unknown environmental risks to the human environment (EA, page 37-38, 41-42).
5. The actions will not establish a precedent for future actions with significant effects nor does it represent a decision in principle about a future consideration (throughout the EA).
6. The actions will not significantly affect any site listed in, or eligible for listing in, the National Register of Historic Places, nor will they cause loss or destruction of significant scientific, cultural or historic resources (EA, pages 9, 30).
7. Some actions are not likely to adversely affect while others will have no effect on the endangered or threatened species or their habitats (EA pages 32-34, and Appendix E).

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 Plan on the Felsenthal NWR 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.

Supporting References:

2021 Final Felsenthal National Wildlife Refuge Hunting Plan and Environmental Assessment
2017 Final Felsenthal National Wildlife Refuge Hunting Plan and Environmental Assessment
Compatibility Determination on Hunting for Felsenthal national Wildlife Refuge
2014 Land Protection Plan for Felsenthal and Upper Ouachita National Wildlife Refuges

2010 Comprehensive Conservation Plan for Felsenthal National Wildlife Refuge
1988 Final Felsenthal National Wildlife Refuge Hunting Plan
State Letter of Concurrence
Section 7 Evaluation
Draft Refuge Specific Regulations

Decision

The Service has decided to implement the 2021-22 Hunting Package for the Felsenthal NWR.

This action is compatible with the purposes of the refuges and the mission of the National Wildlife Refuge System. See the attached compatibility determination for Felsenthal NWR (Environmental Assessment Appendix D).

The action is consistent with applicable laws and policies.

BRETT HUNTER Digitally signed by BRETT
HUNTER
Date: 2021.08.18 12:53:06 -04'00'

David Viker, Regional Refuge Chief
South Atlantic-Gulf Region
U.S. Fish and Wildlife Service
Atlanta, Georgia

Date