

**U.S. Department of the Interior
U.S. Fish and Wildlife Service**

**South Arkansas Refuge Complex
Trapping Plan**

Environmental Assessment

for

*Felsenthal National Wildlife Refuge
Overflow National Wildlife Refuge
Pond Creek National Wildlife Refuge*

March 7, 2016

Abstract: The U.S. Fish and Wildlife Service (Service) proposes to implement a Trapping Plan for the South Arkansas Refuge Complex (SARC) which covers Felsenthal National Wildlife Refuge (NWR), Overflow NWR and Pond Creek NWR and is compatible with the purposes of the refuges. This Environmental Assessment (EA) evaluates three alternatives for trapping furbearers on the refuges.

This EA presents three possible alternatives: (A) Maintain the existing trapping program by allowing recreational trapping within the State trapping regulations and season dates framework and that follows refuge regulations and season dates (Preferred Alternative). (B) Open the refuges to trapping of select species within the State trapping regulations and season dates framework and that follows refuge regulations and season dates, for nuisance wildlife management purposes only. (C) No recreational trapping on the refuges would be allowed. Refuge staff, partnering State and federal agencies, universities and/or contractors under the direction of refuge management, would be solely responsible for managing nuisance wildlife species.

Alternative A is the preferred alternative based on known furbearer populations, and refuge management needs required to meet wildlife management and facility maintenance goals on the refuges. Alternative A would result in maintaining target species' populations at lower levels through a furbearer management program which will help to minimize damage to refuge habitat and decrease flooding related issues. Alternative A would also assist refuge staff in managing exotic invasive wildlife species (e.g. nutria) populations and in turn, offset negative impacts to native flora and fauna.

The National Wildlife Refuge System Improvement Act and the Fish and Wildlife Service's policy recognize trapping as a legitimate, traditional use of renewable natural resources; and permit trapping on a national wildlife refuge when it is compatible with the purposes for which the refuge was established. The general broad objectives of the trapping program are:

- Manage furbearer populations, especially beaver and nutria, to limit damage to refuge habitat and adjoining private property.
- Safeguard refuge infrastructure (levees, roads, water control structures) critical to managing habitat for fish and wildlife.
- Provide a traditional recreational use of refuge resources while meeting the purposes of the refuge and mission of the Refuge System.
- Provide quality trapping opportunities that minimize conflict with other public use activities.

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1.1 PURPOSE

This Environmental Assessment (EA) for a Trapping Plan for the South Arkansas Refuge Complex (SARC), which comprises Felsenthal National Wildlife Refuge (NWR), Overflow NWR and Pond Creek NWR, evaluates three possible alternatives for opening and administering a trapping program on the refuge. This EA will assist in the development of an updated SARC Trapping Plan that will guide the management of furbearer populations and trapping regulations for the next fifteen years on the SARC.

1.2 NEED

Recreational furbearer trapping within the general framework of Arkansas Game and Fish Commission (AGFC) regulations and season dates has been allowed on the SARC and addressed to some extent in each refuge's Comprehensive Conservation Plan, as well as, in dated Trapping Plans for Felsenthal and Overflow NWRs. However, refuge management has deemed it necessary to reevaluate the current furbearer management program across the SARC and update the SARC Trapping Plan.

1.3 DECISIONS THAT NEED TO BE MADE

This Environmental Assessment is prepared to evaluate the environmental consequences of administering a trapping program on the South Arkansas Refuge Complex. Three alternatives are presented in this document:

Alternative A: Maintain the existing trapping program by allowing recreational trapping within the State trapping regulations and season dates framework and that follows refuge regulations and season dates (Preferred Alternative).

Alternative B: Open the refuges to recreational trapping of select species within the State trapping regulations and season dates framework and that follows refuge regulations and season dates, for nuisance wildlife management purposes only.

Alternative C: No recreational trapping on the refuges would be allowed. Refuge staff, partnering State and federal agencies, universities and/or contractors under the direction of refuge management would be solely responsible for managing nuisance wildlife species.

The Service's Regional Director is the official responsible for determining the action to be taken in the proposal by choosing an alternative. The Regional Director will also determine whether this EA is adequate to support a Finding of No Significant Impact decision, or whether the preparation of an Environmental Impact Statement is needed.

1.4 BACKGROUND

Conformance with Statutory Authority

The refuges within the SARC are managed and administered as part of the National Wildlife Refuge System, by the U.S. Fish and Wildlife Service (Service) and the Department of Interior.

The refuge system operates under a variety of legal authorities, regulations and policies. The following federal legislative and administrative authorities and Service policies apply to trapping on refuge lands:

- The National Wildlife Refuge System Improvement Act of 1997 recognizes that wildlife-dependent recreational uses involving hunting, fishing, wildlife observation, wildlife photography, environmental education and interpretation, when determined to be compatible, are legitimate and appropriate uses of land within the National Wildlife Refuge System. Other uses not listed as priority public uses may be allowed if they are determined to be appropriate and compatible with the purposes for which the refuge was established.
- The Refuge Recreation Act (P.L. 87-714; 16 U.S.C. 460K-460k-4; 76 Stat. 653), as amended; which authorizes the Secretary of the Interior to administer refuges, hatcheries and other conservation areas for recreational use, when such uses do not interfere with the area's primary purposes.
- The Fish and Wildlife Act (16 U.S.C. 742a-742j; 70 Stat. 1119), as amended establishes a comprehensive national fish, shellfish, and wildlife resources policy with emphasis on the commercial fishing industry but also with a direction to administer the Act with regard to the inherent right of every citizen and resident to fish for pleasure, enjoyment, and betterment and to maintain and increase public opportunities for recreational use of fish and wildlife.
- Title 50 CFR 29.1 which provides for public or private economic use of the natural resources of any wildlife refuge.
- Title 50 CFR 31.14 which authorizes the taking of animal species that are surplus or detrimental to the management program of a wildlife refuge.
- Title 50 CFR 31.2 which authorizes trapping as a method of surplus wildlife population control and disposal.
- Presidential Executive Order 13112 and the resulting *The National Strategy for Management of Invasive Species for The National Wildlife Refuge System* which sets forth a comprehensive strategy for dealing with the critical problem of invasive species in the United States.

As practiced on refuges, trapping has been shown to have no adverse effect and may have beneficial effects (i.e. protection of habitat infrastructure or predator control for migratory bird protection) on the long-term stability and health of wildlife populations and their habitats (USFWS 1997). The harvesting of wildlife on refuges is carefully regulated to ensure equilibrium between population levels and wildlife habitat. In addition to providing wildlife-dependent recreation opportunities, trapping will promote a better understanding and appreciation of refuge habitats and their associated wildlife resources. Implementation of a furbearer management program is also supported by each refuge's Comprehensive Conservation Plan.

Established in 1975, Felsenthal National Wildlife Refuge (NWR) is located in southeast Arkansas, about five miles west of Crossett, Arkansas in Ashley County. Named for a small community located at its southwest corner, this 65,000 acre refuge contains an abundance of water resources dominated by the Ouachita and Saline Rivers, and the Felsenthal Pool.

Felsenthal National Wildlife Refuge was established as mitigation for the creation of the Corps of Engineers (COE) Ouachita and Black Rivers Navigation Project and Felsenthal Lock and Dam. On average, only about four barges per month use the navigation channel. The Ouachita-Black Rivers Navigation Project began in 1902 and is a 337-mile long waterway. The project stretches from central Arkansas to Jonesville, Louisiana where it converges with the Tensas and Little Rivers to form the Black River. The project also provides for a multitude of recreational opportunities with facilities spread along the entire length of the river.

Geographically, the 65,000-acre refuge is located in what is known as the Felsenthal Basin, an extensive natural depression that is laced with a vast complex of sloughs, bayous and lakes. The region's two major rivers, the Saline and Ouachita, flow through the refuge. These wetland areas in combination with the refuge's diverse forest ecosystem of bottomland hardwoods, pine forests and uplands support a wide variety of wildlife and provide excellent fishing, hunting, boating, wildlife observation and environmental education opportunities.

This low lying area is 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. Historically, periodic flooding of the "bottoms" during winter and spring provided excellent wintering waterfowl habitat. These wetlands, in combination with the pine and upland hardwood forest on the higher ridges, support a wide diversity of native plants and animals.

About 63% of Felsenthal NWR is bottomland hardwoods (~40,000 acres), about 15% is the permanent 65 foot pool (~15,000 acres), with the remaining in upland pine-hardwoods (~10,000 acres).

Felsenthal NWR's goal is to promote the environmental health of the Ouachita and Saline River and enhance the biological diversity of associated habitats within the river basin. Through active management, the refuge contributes significantly to the conservation of bottomland hardwood and species in the Felsenthal Basin. Management actions that support the recovery for the endangered red-cockaded woodpecker are a priority. Open water at Felsenthal NWR (e.g. Felsenthal Pool) consists of 15,000-acres that can more than double to 36,000 acres during winter and spring flooding. Local communities realize economic and social benefits as visitors enjoy the refuge's natural beauty and biological diversity. Visitors engage in a wide variety of wildlife-dependent activities including hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Through the educational and interpretive programs, people come to value the ecological significance of the refuge and its importance as a link with other natural areas within the Felsenthal Basin. In turn, refuge visitors become better stewards of their own local environments.

Felsenthal NWR provides hunting, fishing (recreational, tournaments, and commercial), wildlife observation, photography, environmental education, and interpretative activities for the public.

Wildlife observation can be done through several different means of travel. The refuge has two walking trails open for public use; one is located behind the office, and the Sand Prairie Trail is located off of the Pine Island Road. The refuge also has an extensive system of ATV/UTV trails comprising approximately 40-miles. The ATV/UTV trails are broken down into blue and yellow trails, blue trails are open year round for fishing access, while the yellow trails are only open during the regular hunting season from September until January. The ATV/UTV trails can be utilized by hikers, horseback riding, and bicycles. Felsenthal also has seven undeveloped campsites available for use. Campsites can be utilized all year long with no special use permits required for camping.

There are eleven fishing and watercraft launches located around the refuge to include the Lock and Dam launch, Grand Marais Launch, Shallow Lake Launch, Jones Lake Launch, Deep Slough Launch, Old Beer Joint (Hogan Track) Launch, Crossett Harbor Launch, Pine Island Launch, Prairie Island Launch, Eagle Lake Launch, and Pereogeethe Lake Launch. Fishing opportunities include recreational (bream, bass, and crappie), bow-fishing, bass tournaments, and commercial fishing. Fishing can be done during the day or at night since the refuge is open 24 hours a day. Fishing can be done on any waters on the refuge except during waterfowl season inside of the waterfowl sanctuary and year around at the Eagle Lake Pond and Refuge Headquarters Pond.

Hunting opportunities at Felsenthal NWR include hunting for rabbit, squirrel, coyote, quail, deer, turkey, raccoon, and waterfowl. Felsenthal also offers two quota deer hunts with the use of modern firearm and muzzleloader, and one quota turkey hunt with modern firearm. Waterfowl hunting is the biggest draw for hunters to the refuge. Waterfowl hunters are not allowed to enter into a hunting area until 4:00 A.M.; this means hunters must stay at their vehicle if entering by foot or ATV/UTV, and if by boat, they must remain in the main river channel or at the boat launch until the legal entry time. Waterfowl hunting ends at 12:00 noon, and waterfowl hunters must leave the refuge by 1:30 each day.

Felsenthal NWR was established in 1975 for the following 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)
- “...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-1 (Refuge Recreation 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)

Overflow NWR

Overflow National Wildlife Refuge, established in 1980, encompasses 13,973 fee-title acres in the southeast corner of Ashley County, Arkansas, about five miles west of Parkdale. Overflow NWR was established to protect one of the last remaining bottomland hardwood forests considered vital for maintaining mallard, wood duck, and other waterfowl populations in the Mississippi Flyway. The bottomland hardwood forest consists primarily of willow oak and overcup oak. The willow oaks produce small acorns that are an excellent source of food for the mallards and wood ducks in the winter. Bald cypress and tupelo gum occur along streams, channels and sloughs throughout the refuge. This ~13,000 acre wetland complex consists of seasonally flooded bottomland hardwood forests, impoundments, and open fields.

About 60% of Overflow NWR is bottomland hardwoods (~8,650 acres), about 15% reforested (~2,020 acres), about 15% open-water wetlands and beaver ponds (~1,500 acres), with the remaining acreage in agriculture (~800 acres) and upland pine-hardwoods (200-300 acres). During the winter, a 4,000-acre greentree reservoir is created when the bottomland hardwood forests are allowed to flood.

Overflow NWR provides hunting, wildlife observation, photography, environmental education, and interpretative activities for the public. Wildlife observation can be done through several different means of travel. The refuge has a walking trail open for public use, and is located by the office and goes by an observation blind that can be utilized to observe wildlife. The refuge also has an extensive system of ATV/UTV trails. The ATV/UTV trails are marked yellow trails and they are only open during the regular hunting season that lasts from September until January. The ATV/UTV trails can be utilized by hikers, horseback riders, and bicycles. Overflow NWR does not have any campsites available on the refuge, and fishing is not allowed on the refuge due to the high contamination of the water (USFWS 2010).

Hunting opportunities on the refuge include hunting for rabbit, squirrel, coyote, deer, turkey, raccoon, and waterfowl. Waterfowl hunting is the biggest draw for hunters to the refuge. Waterfowl hunters are not allowed to enter into a hunting area until 4:00 A.M.; this means hunters must stay at their vehicle if entering by foot or ATV/UTV and if by boat, hunters must remain at the boat launch until the legal entry time. Waterfowl hunters are limited to using a 25 H.P. boat motor (mud motors are allowed), waterfowl hunting ends at 12:00 noon, and waterfowl hunters must leave the refuge by 1:30 each day. No boats are allowed on the refuge from 1:30 P.M till 4:00 A.M. each day to lessen the disturbance of resting waterfowl.

Overflow NWR was established in 1980 for the following purposes:

- “...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. 715d (Migratory Bird Conservation Act)
- “...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-1 (Refuge Recreation 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)

- “...conservation, management, and ...restoration of the fish, wildlife, and plant resources and their habitats...for the benefit of present and future generations of Americans.” 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)

Pond Creek NWR

Pond Creek NWR, established in 1994, is located in Sevier County, Arkansas, approximately 55 miles north of the city of Texarkana and 142 miles southwest of Little Rock. The refuge protects the largest remaining tract of bottomland hardwoods along the Little River, and extends west from U.S. Highway 71 almost to the Oklahoma state line. Pond Creek bisects the refuge and flows from the northwest to the southeast where it intersects the Cossatot River just upstream from the confluence of the Cossatot/Little Rivers.

Pond Creek NWR consists of 26,292 acres of fee title ownership and public use activities are also managed on various easements. The refuge is located on the floodplain and overflow bottoms formed at the junction of the Little and Cossatot Rivers upstream from Millwood Lake. Generally, the Little River forms the southern boundary of the refuge and the Cossatot River forms the eastern boundary.

The refuge’s northern boundary follows the Woodbine escarpment, a relatively low rise that separates the bottoms from the uplands. Pond Creek runs through the middle of the refuge, with approximately half of its watershed within the refuge and many of its south-flowing tributaries reaching into the uplands directly north. Open water covers about 2 percent of the refuge. Virtually all of the refuge (elevation below 290 feet) is part of the Millwood Lake flood-pool, with the flowage easement held by the U.S. Army Corps of Engineers.

Goals of Pond Creek NWR include, restoring and managing diverse habitats designed to achieve the refuge purpose and wildlife population objectives, maintain viable, diverse populations of native flora and fauna consistent with sound biological principles, protect the area’s wetlands and resource values through protection strategies, and develop and implement a quality wildlife-dependent recreation and environmental education program that leads to enjoyable recreational experiences and a greater understanding and appreciation of fish and wildlife resources.

Hunting, trapping, fishing, wildlife observation, photography, environmental education, and interpretative activities are also provided for the public. Wildlife observation can be done through several different means of travel. The refuge has 3 walking trails open for public use, 45 miles of gravel roads, and 15-miles of ATV/UTV trails. The ATV/UTV trails marked with yellow trails are only open during the regular hunting season from September until January. Those trails marked with blue are open year-round to gain fishing access. The ATV/UTV trails and gravel roads can be utilized by hikers, horseback riders, and bicycles. Seven camping areas are located throughout the refuge and are open year-round unless flooded. Hunting opportunities on Pond Creek NWR include hunting for rabbit, squirrel, coyote, deer, turkey, raccoon, and waterfowl.

Pond Creek NWR was established in 1980 for the following purposes:

- “...the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international treaty obligations contained in various migratory bird treaties and conventions.” 16 U.S.C. 3901(b) Stat.3582-91(Emergency Wetlands Resources Act of 1986)
- “...recognize the important public purposes served by non-consumptive activities, other recreational activities, and wildlife-related public use, including hunting, fishing and trapping.” Furthermore, this plan “...shall permit, to the maximum extent practicable, compatible uses to the extent that they are consistent with sound wildlife management, and in accordance with the National Wildlife Refuge System, Administration Act of 1997 (16 USC668dd-668ee) and other applicable laws.” (Omnibus Parks and Public Lands Act of 1996)

CHAPTER 2: PROPOSED ACTION AND ALTERNATIVES

The Service evaluated three possible alternatives:

Alternative A: Maintain the existing trapping program by allowing recreational trapping within the State trapping regulations and season dates framework and that follows refuge regulations and season dates (No Action and Preferred Alternative).

Alternative B: Open the refuges to recreational trapping of select species within the State trapping regulations and season dates framework and that follows refuge regulations and season dates, for nuisance wildlife management purposes only.

Alternative C: No recreational trapping on the refuges would be allowed. Refuge staff, partnering State and federal agencies, universities and/or contractors under the direction of refuge management would be solely responsible for managing nuisance wildlife species.

2.1 ALTERNATIVE DEVELOPED FOR DETAILED ANALYSIS

Three alternatives were carried forward for detailed analysis.

2.1.1 Alternative A - Open the refuge to recreational trapping that follows State and refuge regulations and season dates (No Action and Preferred Alternative).

Alternative A satisfies the National Environmental Policy Act (NEPA) requirements for a No Action Alternative. This preferred alternative would allow trapping of all furbearing mammals permitted under State trapping regulations found within the refuge boundary. Service policy permits trapping of furbearing animals on refuges where it contributes to, or is compatible with, the management objectives of the refuge (7 RM 15.13). A Special Use Permit with associated fee would be required of all trappers.

2.1.2 Alternative B - Open the refuge to recreational trapping of select species only.

This alternative would allow trapping of primarily beaver and nutria by recreational trappers for resource management purposes. Non-targeted species trapped must be documented on a Trapping Report and relinquished to the refuge. Trapping season dates, methods, and other regulations on the refuge would generally follow regulations established for the State. A Special Use Permit with associated fee would be required of all trappers.

2.1.3 Alternative C – Prohibit recreational trapping on all refuges within the SARC.

No recreational trapping on the refuges would be allowed. Refuge staff, partnering State and federal agencies, universities and/or contractors under the direction of refuge management, would be solely responsible for managing nuisance wildlife species.

2.2 ALTERNATIVE ACTION TABLE

Table 1 summarizes the actions that are anticipated under each alternative. Detailed discussion of the environmental impacts of each alternative can be found in Section 4.

TABLE 1: Alternatives Action Table

Action	Alternative A (No Action and Preferred Alternative) Open the refuge to recreational trapping that follows State and refuge regulations and season dates.	Alternative B Open the refuge to recreational trapping of select species only.	Alternative C Prohibit recreational trapping on all refuges within the SARC.
Species that will be trapped	badger, beaver, bobcat, coyote, gray fox, red fox, mink, muskrat, nutria, opossum, raccoon, river otter, spotted skunk, striped skunk and weasel	beaver, nutria and possibly raccoon	None
Compatible with refuge goals and purpose	Yes. Provides a broader scope of furbearer management to safeguard refuge resources. Additionally, it provides a recreational opportunity for the public.	Yes. Provides limited furbearer management on a nuisance basis and provides a recreational opportunity for the public.	No. Trapping has been determined as “Compatible” on all refuges in the SARC. As such, trapping serves as a tool for managing wildlife resources and provides a recreational opportunity to the public.
Will trapping be in conflict with other wildlife dependent recreational activities?	No. Conflicts are possible, but deemed minimal. If conflicts exist, Refuge Manager	No. Conflicts are possible, but deemed minimal. If conflicts exist, Refuge Manager	None

	would be able to mitigate trapping activities to alleviate public safety concerns.	would be able to mitigate trapping activities to alleviate public safety concerns.	
Meeting needs identified by public	Yes. Provides trapping opportunities that will address public needs by enabling a broader scope of furbearer management to safeguard the refuge resources while providing a recreational opportunity to the public.	No. Limiting the harvest to selected species does not meet the needs identified by the public for recreational interests.	No. Eliminating recreational trapping does not meet the needs identified by the public for recreational interests.

CHAPTER 3: AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter describes the physical, biological, cultural, and socioeconomic resources most likely affected by recreational trapping on the South Arkansas Refuge Complex.

3.2 PHYSICAL and BIOLOGICAL CHARACTERISTICS

Felsenthal NWR

Established in 1975, Felsenthal National Wildlife Refuge (NWR) is located in southeast Arkansas, about five miles west of Crossett, Arkansas in Ashley County. Named for a small community located at its southwest corner, this 65,000 acre refuge contains an abundance of water resources dominated by the Ouachita and Saline Rivers, and the Felsenthal Pool.

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Geographically, the 65,000-acre refuge is located in what is known as the Felsenthal Basin, an extensive natural depression that is laced with a vast complex of sloughs, bayous and lakes. The region's two major rivers, the Saline and Ouachita, flow through the refuge. These wetland areas in combination with the refuge's diverse forest ecosystem of bottomland hardwoods, pine forests and uplands support a wide variety of wildlife and provide excellent fishing, hunting, boating, wildlife observation, and environmental education opportunities.

This low lying area is 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. Historically, periodic flooding of the “bottoms” during winter and spring provided excellent wintering waterfowl habitat. These wetlands, in combination with the pine and upland hardwood forest on the higher ridges, support a wide diversity of native plants and animals.

About 63% of Felsenthal NWR is bottomland hardwoods (~40,000 acres), about 15% is the permanent 65 foot pool (~15,000 acres), with the remaining in upland pine-hardwoods (~10,000 acres).

Overflow NWR

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About 60% of Overflow NWR is bottomland hardwoods (~8,650 acres), about 15% reforested (~2,020 acres), about 15% open-water wetlands and beaver ponds (~1,500 acres), with the remaining acreage in agriculture (~800 acres) and upland pine-hardwoods (200-300 acres). During the winter, a 4,000-acre greentree reservoir is created when the bottomland hardwood forests are allowed to flood.

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Pond Creek NWR consists of 26,292 acres of fee title ownership and public use activities are also managed on various easements. The refuge is located on the floodplain and overflow bottoms formed at the junction of the Little and Cossatot Rivers upstream from Millwood Lake. Generally, the Little River forms the southern boundary of the refuge and the Cossatot River forms the eastern boundary.

The refuge’s northern boundary follows the Woodbine escarpment, a relatively low rise that separates the bottoms from the uplands. Pond Creek runs through the middle of the refuge, with approximately half of its watershed within the refuge and many of its south-flowing tributaries reaching into the uplands directly north. Open water covers about 2 percent of the refuge. Virtually all of the refuge (elevation below 290 feet) is part of the Millwood Lake flood-pool, with the flowage easement held by the U.S. Army Corps of Engineers.

3.3 BIOLOGICAL ENVIRONMENT

3.3.1 Threatened and Endangered Species

The refuge follows recovery plan guidelines for the management of the following federally threatened and endangered species. The following species may be present in the vicinity of the SARC refuges.

Pondberry (*Lindera melissifolia*)

Pondberry is a deciduous shrub that can grow up to 6 feet tall. It generally is associated with wetland habitats such as bottomland hardwoods in the interior areas, and the margins of sinks, ponds and other depressions in the more coastal sites. The plants generally grow in shaded areas but also may be found in full sun. Small yellow flowers bloom in very early spring, followed by production of the red berries in the fall. Habitat loss is the main reason for listing.

Status: Endangered

Pink Mucket (*Lampsilis abrupta*)

The pink mucket is found in medium to large rivers in gravel with sand substrate. It uses a variety of sunfish species as its host fish. In Arkansas, this species inhabits the Ouachita, Saline, White, Black, and Spring rivers.

Status: Endangered

Red-cockaded Woodpecker (*Picoides borealis*)

Red-cockaded woodpecker requires open pine woodlands and savannahs with large old pines (generally 60 to 80 years) for cavity trees because the cavities are excavated completely within inactive heartwood, so the cavity interior remains free from resin that can entrap the birds. Cavity excavation typically takes many years. In Arkansas, woodpeckers use loblolly and shortleaf pine tree as cavity trees year-round. Suitable habitat consists of mature pines with an open canopy, low densities of small pines, little or no hardwood or pine midstory, few or no overstory hardwoods, and abundant native bunchgrass and forb groundcovers. Their diet consists primarily of ants, roaches, beetles, spiders, centipedes, true bugs, crickets, and moths; however, they also eat fruits and seeds. Fire suppression which allows encroachment of hardwoods, lack of cavity trees, loss of mature pine trees, and habitat fragmentation is the limiting factor and directly affects the number of potential breeding groups. Several silvicultural practices have been detrimental and include short rotations, clearcutting, and conversion to sub-optimal pine species.

Status: Endangered

Winged Mapleleaf (*Quadrula fragosa*)

Winged mapleleaf are found in medium to large rivers with clean gravel, sand, or cobble bottoms. In Arkansas, they are only found in the Ouachita and Saline Rivers. Channel and blue catfish are the only fish species that are suitable hosts to complete its life cycle. Females mimic a dying or dead mussel to attract their fish host. They can grow up to 4 inches long.

Status: Endangered

Geocarpon (*Geocarpon minimum*)

Geocarpon prefers the edges of saline (salt) barrens in grasslands called “slicks” or “slickspots.” Geocarpon is a tiny inconspicuous plant, ranging in size from 0.4 – 1.6 inches. Vegetation encroachment, cattle grazing, and landscape alteration are the main threats.

Status: Threatened

Ouachita Rock-Pocketbook (*Arcidens wheeleri*)

The Ouachita rock-pocketbook inhabits pools, backwaters, and side channels in the Little River and its larger tributaries in southeast Oklahoma and southwest Arkansas and the Ouachita River in Arkansas. The only confirmed reproducing population left occurs in the Little River in Arkansas, although the species is extremely rare. The species occupies stable substrates containing gravel, sand, and other materials. It generally occurs within large mussel beds containing a diversity of mussel species.

Status: Endangered

Leopard Darter (*Percina pantherina*)

The leopard darter inhabits pools that have water depths of 10-40 inches, substrates of rubble and boulders, and no detectable current velocity in southwestern Arkansas and southeastern Oklahoma. They only spawn on riffles between mid-March and mid-April. After hatching, larvae drift downstream into pools. Darters feed mainly on microcrustaceans as juveniles and on immature aquatic insects as adults such as mayfly nymphs, blackfly larvae, and midge larvae. They have keen vision and are likely to feed during the day. Impounded streams in the Little River basin have eliminated crucial spawning and rearing habitat and significantly reduced their distribution. Reservoir construction and improper construction of low water crossings fragments darter habitat and creates formidable barriers to dispersal. Intensive commercial harvest (clear-cutting) of forest products, impacts from road construction, removal of streamside vegetation increase turbidity, sediment yields, and storm flow into the streams. Environmental contaminants (e.g. pesticides, fertilizers, acid rain, and untreated wastes) pose a significant threat particularly as water levels decrease during summer months, concentrating these pollutants. Nutrient laden runoff from improper disposal techniques of poultry and swine farming are considered a potential threat to the darter.

Status: Threatened

Scaleshell (*Leptodea leptodon*)

Scaleshell is a relatively small mussel that lives in medium-sized and large rivers with stable channels and good water quality. Freshwater drum have been identified as a host fish for the scaleshell but there may be other species. Relatively little is known about the life history of the scaleshell.

Status: Endangered

Northern Long-eared bat (*Myotis septentrionalis*)

Northern long-eared bats arrive at the hibernacula in August or September, enter hibernation in October and November, and leave the hibernacula in March or April. During the summer, bats typically roost singly or in colonies underneath bark or in cavities or crevices of both live trees and snags or in caves and mines switching roosts every 2-3 days. They are not likely dependent on a certain roost tree but may select trees that retain bark and form suitable cavities such as black oak, northern red oak, silver maple, black locust, American beech, sugar maple, sourwood, and shortleaf pine. Bats have also been observed roosting in man-made structures, such as

buildings, barns, a park pavilion, sheds, cabins, under eaves of buildings, behind window shutters, and in bat houses. Bats roost more often on upper and middle slopes. They migrate between 35 to 55 miles between summer roosts and winter hibernaculum. They commonly overwinter in hibernacula that include caves and abandoned mines, which have large passages and entrances, relatively constant, cooler temperatures, high humidity, and no air currents. They have been found hibernating in abandoned railroad tunnels, storm sewer entrances, hydro-electric dam facilities, old aqueducts, and dry wells. Bats may often use the same hibernaculum site for multiple years. The bat has a diverse diet including moths, flies, leafhoppers, caddisflies, and beetles. Bats emerge to forage at dusk in mature forests 3 to 10 feet above the ground catching insects from the air and plucking them from the ground and foliage on forested hillsides and ridges.

Status: Threatened

Rabbitsfoot mussel (*Quadrula cylindrica*)

Rabbitsfoot can reach up to 6 inches in length. It is primarily an inhabitant of medium to large streams and rivers. It is widely distributed occurring in 13 of 15 states within its historical range. The majority of stable and reproducing populations left within its historical range occur in Arkansas. It usually occurs in shallow areas along the bank and adjacent shoals. Specimens may also occupy deep water runs. Bottom substrates generally include gravel with sand. This species seldom burrows but lies on its side instead. It uses shiners, or minnow species, as its host fish.

Status: Threatened

3.3.2 Other Wildlife Species

The SARC supports a diversity of wildlife common to the West Gulf Coastal Plain of Arkansas. Most of the wildlife that live on the refuge 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, Overflow NWR and Pond Creek NWR contains approximately 200 species of birds, 40 species of mammals, 70 species of reptiles and amphibians, and 90 fish species. Each of these individual species 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.

Birds

Felsenthal and Overflow NWRs lie within the Mississippi Flyway—the “highway in the sky” from nesting grounds in the north, to wintering areas in south-central North America used by vast numbers of migrating waterfowl, shorebirds, neotropical songbirds, and birds of prey. Almost 100 species of birds are known to nest in the area, and over 200 species have been sighted on the refuges. Waterfowl begin arriving in September, with blue-winged teal (*Anas discors*), mallards (*Anas platyrhynchos*), black ducks (*Anas rubripes*), gadwall (*Anas strepera*), and ring-necked ducks (*Aythya collaris*) among the 20 (or more) species that winter on the refuges. The wood duck (*Aix sponsa*), a year-round resident at all SARC refuges, nests in tree cavities and in nest boxes placed throughout the hardwood forests. Duck populations (in general order of abundance) include mallards, green-winged teal (*Anas crecca*), northern shovelers (*Anas*

clypeata), pintails (*Anas acuta*), gadwalls, blue-winged teal, wood ducks, and hooded mergansers (*Lophodytes cucullatus*).

During the spring, summer and through early fall, the SARC is a haven for a variety of other migrant birds. A myriad of songbirds and shorebirds stop briefly in the fall and spring to replenish energy reserves for the long journey to and from wintering areas in Central and South America, while other birds, such as northern parula (*Parula americana*), prothonotary warbler (*Protonotaria citrea*) and American redstart (*Setophaga ruticilla*) utilize the refuges for nesting. The SARC remains a mecca for great blue herons (*Ardea herodias*), green herons (*Butorides virescens*), little blue herons (*Egretta caerulea*), black-crowned night herons (*Nycticorax nycticorax*), great egrets (*Ardea alba*), white ibis (*Eudocimus albus*), wood storks (*Mycteria americana*), anhinga (*Anhinga anhinga*), double-crested cormorants (*Phalacrocorax auritus*) and American bitterns (*Botaurus lentiginosus*).

The SARC hosts migrant American bald eagles (*Haliaeetus leucocephalus*) during the winter months that follow migrating waterfowl down the flyway, and is home to bald eagles that breed and nest on the refuge. Other raptors commonly observed on the refuge include red-shouldered (*Buteo lineatus*) and red-tailed hawks (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), black vulture (*Coragyps atratus*), barred owl (*Strix varia*), great-horned owl (*Bubo virginianus*), eastern screech owl (*Otus asio*), American kestrel (*Flaco sparverius*), northern harrier (*Circus cyaneus*), broad-winged hawk (*Buteo platypterus*), Cooper's hawk (*Accipiter cooperii*), osprey (*Pandion haliaetus*), and sharp-shinned hawk (*Accipiter striatus*).

Mammals

Habitat diversity within the SARC lends itself to a diversity of wildlife. Temporarily flooded bottomland forests, pine-dominated uplands, upland hardwoods, and various types of riparian and open-land areas provide ideal habitat for many species of mammals. More than 40 species of mammals are likely to be found on the SARC. In addition to the black bear, which is a consummate generalist that inhabits all refuge habitats, other forest wetland inhabitants are the white-tailed deer, bobcat, coyote, river otter, raccoon, gray fox, red fox, beaver, mink, swamp rabbit, cottontail rabbit, eastern gray squirrel, fox squirrel, nutria, opossum, muskrat, and skunk. No accurate inventories have been conducted on small mammals, such as mice, voles, or moles.

Beavers (*Castor canadensis*) have the potential to significantly adversely affect bottomland hardwood forests by damming sloughs and brakes. Forests inundated into the growing season quickly show signs of stress and trees eventually die. Beavers also kill trees by girdling and felling. One study in Mississippi showed that beavers, on average, damaged \$164/acre (1985 values) of timber by girdling and felling (Bullock and Arner 1985). Historically, beaver numbers were controlled by trapping for the demanding fur trade. In the 1980s, annual harvests exceeded 1 million beaver pelts across the nation (Hill 1982). Recently, due to cultural and societal changes, furs have not been in demand; therefore, little trapping is conducted, causing beaver numbers to be high (Hill 1982).

Methods to control beavers include trapping and shooting by Service employees, through interagency agreements with USDA-APHIS, and trapping by the public. To minimize habitat loss, removing beaver dams manually, with heavy equipment or by explosives is done by Service employees. Dams that are small enough to remove by hand or are located in a culvert or water

control structure will be removed manually. If a dam is so large it cannot be removed manually, it can either be removed by machinery or explosives. Explosives are used only by certified employees of the Service or APHIS and all state and local laws are followed.

Raccoons have been implicated as a nest predator and nest predation by raccoons is a primary cause of reproductive failure in birds (Hoover, 2006). Raccoons are distributed statewide and have been harvested in greater numbers than any other furbearer for 50 years. 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. Raccoons are frequent urban and rural pests. Damages often occur from their nuisance activity. They also 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. While many Arkansans believe that the number of raccoons is exploding, objective data from the bowhunter and field trial surveys indicate that their populations have been relatively stable (AGFC 2015).

In many parts of the country, densities of raccoons have increased in recent decades as a result of habitat fragmentation, the conversion of natural habitats to agriculture, and the suppression of top predators (Heske et al 1999). As a result of increasing densities, affinity to aquatic environments and continent-wide distribution, raccoons have negative consequences for populations of many different organisms over a large geographic area (Engleman et al. 2003). This includes bird communities within marsh, forest-field edge, grassland, bottomland and upland and prairie habitats throughout the United States (Hoffman and Heske 2003).

The nutria (*Myocastor coypus*) is a semiaquatic rodent native to southern South America. Nutria were intentionally released into the U.S. in support of the fur farming trade during the 1930's and nutria were later introduced to many areas to control aquatic vegetation. Nutria populations are now well established in the U.S. including the SARC. Nutria do not represent a valuable fur resource and their value for vegetation control is at best overrated because they more often feed on desirable vegetation, especially waterfowl foods, and avoid nuisance aquatic vegetation (Lowery 1974, Linscombe and Kinler 1997). In fact, at high population densities, foraging by nutria can significantly impact natural plant communities and can negatively impact a host of native wildlife including waterfowl, wading birds, and muskrats. Digging and rooting by nutria in aquatic systems can contribute to severe erosion. Nutria can serve as hosts for several pathogens that can infect people, pets, and livestock such as tuberculosis and septicemia. Also, nutria can carry parasites such as blood flukes, tapeworms, liver flukes, giardia, and harmful nematodes. Nutria have a high reproductive potential and few, if any, natural predators; therefore, population control is challenging (Lowery 1974, Sealander and Heidt 1990). The most practical control measures include recreational trapping by the public and shooting by refuge staff.

During the 2014-15 fur-taking season, 25,092 pelts valued at over \$203,132 were purchased by licensed fur dealers in Arkansas. This represents a 40% decrease in pelt purchases and a 61% decrease in total value when compared to 2013-14. The 2014-15 bowhunter survey included 9,595 hours of observations and indicates populations of terrestrial furbearers are stable with the exception of an increase in coyotes and a possible increase in raccoons. The perception of

Arkansas trappers is that populations of muskrat may be decreasing; bobcat, gray fox, otter and red fox are probably stable; and that coyote, raccoon, and striped skunk are increasing (AGFC 2015).

Amphibians and Reptiles

Amphibian management and conservation are of great interest due to apparent global amphibian declines. Habitat loss, fragmentation, and degradation appear to be the primary factors in these declines. This group of animals require quality wetland habitat for their survival and they also serve as important indicators of environmental health. Numerous species of frogs, snakes, turtles, lizards, skinks, and salamanders utilize the refuges. Amphibians, particularly frogs, have been intensively studied by refuge staff and staff from the Conway Ecological Services Office as part of a broad-scale effort to document malformed amphibians. Four species of venomous snakes inhabit the SARC and alligators are seen frequently.

Scientists consider amphibians to be indicators of environmental health, and many amphibian populations are declining at rapid rates likely due to changes in their habitat, diseases, and environmental pollution. Abnormalities in amphibians can be attributed to these aforementioned environmental factors. The most common abnormalities involve missing or shortened toes or legs, surficial abnormalities such as cysts, eye abnormalities and extra limbs. The U.S. Fish and Wildlife Service completed a nationwide 10-year study (2000 – 2009) of abnormalities in frogs and toads, and collected a total of 68,359 frogs and toads from 152 National Wildlife Refuges and analyzed a subset of 48,081 individuals to estimate average abnormality frequency (Reeves et al. 2013). This “core dataset” represented 32 amphibian species from 462 wetland sites. On average, only 2 percent of the amphibians were classified as abnormal. One-third of the 675 collection events yielded no abnormal amphibians at all, and one-half of the collections had fewer than 2 percent abnormal individuals. Most scientists believe that frog abnormalities result from one or more of the following factors (or interactions between them): contaminants, parasites, predators and ultraviolet-B radiation. It is likely abnormalities are caused by different factors in different places.

Alligator snapping turtles are the largest freshwater turtles in the United States. They are protected from commercial harvest in every state. Commercial harvest of these turtles threatens their population because alligator snapping turtles do not breed until they are approximately 15 years old, and the harvest typically targets adults. Nest depredation by raccoons, skunks, opossums, and fire ants also harm the population significantly. The SARC has no good estimate of the alligator snapping turtle population, though individual turtles have been seen.

Fish

The SARC provides habitat for more than 90 species of freshwater fish. Seasonal flooding of wooded areas provides spawning and feeding habitat for numerous sport, commercial, and forage fishes. Important game species found in refuge waters include bluegill (*Lepomis macrochirus*), redear sunfish (*Lepomis microlophus*), longear sunfish (*Lepomis megalotis*), white crappie (*Pomoxis annularis*), black crappie (*Pomoxis nigromaculatus*), largemouth bass (*Micropterus salmoides*), yellow bass (*Morone mississippiensis*), white bass (*Morone chrysops*), blue catfish (*Ictalurus furcatus*), flathead catfish (*Pylodictis olivaris*), and channel catfish (*Ictalurus punctatus*). Other species include smallmouth bass (*Micropterus dolomieu*), bigmouth buffalo (*Ictiobus cyprinellus*), black buffalo (*Ictiobus niger*), freshwater drum (*Aplodinotus grunniens*),

longnose gar (*Lepisosteus osseus*), shortnose gar (*Lepisosteus platostomus*), alligator gar (*Atractosteus spatula*), spotted gar (*Lepisosteus oculatus*), bowfin (*Amia calva*), grass carp (*Ctenopharyngodon idella*), big head carp (*Hypophthalmichthys nobilis*), and common carp (*Cyprinus carpio*).

Invertebrates

Arkansas is home to approximately 85 mussel species. Of these, 14 are federally protected under the Endangered Species Act and 6 are being evaluated for protection. Mussels in Arkansas are primarily threatened from changes to their habitat including the construction and operation of dams and reservoirs on Arkansas Rivers. Pollution and sedimentation, especially polluted rainwater runoff from roads and fields is an ongoing threat to native mussels. The presence of diverse and reproducing populations of mussels indicates a healthy aquatic system. Posey (1996) documented mussel beds and species composition within the 33.4-mile portion of the Ouachita River between Felsenthal NWR and the Arkansas-Louisiana line. Posey's findings consisted of 20 major beds, 4 minor beds, and 27 mussel species. Davidson (2015) documented mussel beds and species composition within the 10.8-mile section of the Saline River that flows through Felsenthal NWR. Davidson recorded 31 mussel species, including the endangered Winged Mapleleaf (*Quadrula fragosa*) and Pink Mucket (*Lampsilis abrupta*). These 31 species were found in 11 major and 2 minor beds.

3.4 CULTURAL RESOURCES

The area in which the South Arkansas Refuge Complex now occupies is rich in history. Archaeological investigations indicate that the earliest use by man may have occurred about 5,000 years ago when the Caddo Indians occupied the area and hunted, fished and trapped in places that are still popular for these activities today. The area contains farming settlements dating back to the Mississippian Period (AD 900-1600). The archaeological site at Lake Enterprise, near Wilmot, is approximately 3,500 years old. The land was originally settled by the Tunica and Caddo Indians and became part of the Quapaw holdings. Felsenthal NWR is home to some of the most significant and well-preserved archeological resources in the region. Remains of seasonal fishing camps, temple mounds with ceremonial plazas and villages with as many as 200 structures are evidence of once thriving Indian communities. Hernando de Soto and his men are thought to be the first Europeans to explore the area. In 1541 they encountered the fierce Caddo Indians and subsequently accepted the hospitality of the Quapaws during the fierce winter of 1541-1542, in which 250 of the de Soto party died.

In 1803, the land that is now known as the Louisiana Purchase was acquired from France, and divided into territories. European visitors to the area in the early 1800s reported Native Americans were engaged in limited farming, as well as hunting and gathering. It is believed that the Caddo Tribe augmented the natural fire process in the area to clear areas, enhance crops, and flush game. The advent of European settlers into south Arkansas decimated the Native Americans through diseases brought by the newcomers. The Indians were moved first into other Caddo territory in northwest Louisiana and finally to the Oklahoma Territory in what is now Ottawa County. It is doubtful that any of these tribes were still living in the area when these Indian holdings were ceded to the U.S. in 1818, marking the real beginning of European settlement.

Two hundred years ago, the Lower Mississippi River Valley contained over 24 million acres of bottomland hardwood and swamp forests. Today, only about 4 million acres of wetland forest remain, most as islands in a sea of agriculture. Agriculture was the primary land use in the years before the Civil War. By the mid-1800s, many farms were producing cotton, corn, wheat, potatoes, and livestock on the fertile land. The Civil War curbed the large-scale agricultural development and after the war large plantations were sold off in smaller tracts. Timber abounded, especially hardwood, and as hardwood was cleared for cultivation, pine took over. Timber was rafted down the Saline River and Ouachita River to other settlements. Arkansas's wood products industry saw its beginnings in the 1890s concurrent with the first railroads. Cotton farming grew as more lands were cleared for timber harvesting. By 1925, almost all of the virgin pine had been cut over. Many of the smaller farms were abandoned during the Great Depression of the 1920s and 1930s, and later purchased by the timber industry and the federal government, becoming timber plantations, national forests, wildlife refuges, etc.

Following the decrease in timber production, the 1920s saw the advent of a mini “oil boom,” but production declined rapidly in later years due to poor recovery practices and widespread industrial pollution from the oil drilling (saltwater and brine discharges to surface streams and wetlands). As of 1997, about 200 oil and 80 gas fields were in production in Arkansas, producing about 23,500 barrels of oil per day and 586,000 MCF of gas per day.

Greater detail concerning cultural resources for Pond Creek NWR (USFWS 1999) and Felsenthal NWR and Overflow NWR (USFWS 2010) can be found in each refuge’s Comprehensive Conservation Plan.

3.4.1. Cultural Resources Protection

Cultural resources include historic properties as defined in the National Historic Preservation Act (NHPA); cultural items as defined in the Native American Graves Protection and Repatriation Act (NAGPRA); archaeological resources as defined in the Archaeological Resources Protection Act (ARPA); sacred sites as defined in Executive Order 13007, Protection and Accommodation of Access To “Indian Sacred Sites,” to which access is provided under the American Indian Religious Freedom Act (AIRFA), and collections. As defined by the NHPA, a historic property or historic resource is any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). These include any artifacts, records, and remains that are related to and located in such properties. The term also includes properties of traditional religious and cultural importance (traditional cultural properties), which are eligible for inclusion in the NRHP as a result of their association with the cultural practices or beliefs of an American Indian tribe. Archaeological resources include any material of human life or activities that is at least 100 years old, and that is of archaeological interest.

The South Arkansas Refuge Complex abides by these Acts and Executive Orders to protect any cultural or historic legacy that may potentially occur on the refuge. The refuge consults with the U.S. Fish and Wildlife Service’s-Regional Historic Preservation Officer prior to any new construction work that is undertaken on the refuge that involves excavation with heavy earth-moving equipment like tractors, graders, and bulldozers. The Regional Historic Preservation Officer investigates the proposed area of impact and consults with the Arkansas Historic Preservation Program (AHPP) and all relevant Native American Tribes. The AHPP and Native

American Tribes review the proposals and determine whether cultural or historical resources will be impacted, that is, whether any properties listed in or eligible for listing in the NRHP will be affected.

In the event that cultural resources have been determined to be impacted by an action, the refuge will change the proposed action in order to avoid impacts to cultural and historical resources. If cultural resources are actually encountered during construction activities, the refuge is to notify the Regional Historic Preservation Officer and AHPP immediately. Approximately 212 sites have been identified to be of archaeological significance on the SARC. To date, three archaeological surveys have been conducted on the refuges. Given the region's settlement during both the prehistoric and historic periods, the likelihood of cultural resources is considered relatively high.

3.5 LOCAL SOCIOECONOMIC CONDITIONS

Felsenthal and Overflow NWRs are located in southeastern Arkansas and in close proximity to the Arkansas-Louisiana border. Felsenthal NWR is located in Union, Bradley and Ashley Counties and Overflow NWR is located in Ashley County. This three-county area had an estimated population of approximately 73,226 in 2013. The State of Arkansas has only one city with a population greater than 100,000: its capital, Little Rock, with a population of about 197,357. Populations have been declining in the region, with a decrease of about 2.30 percent since 2010. This compares with a 1.5 percent increase for the State of Arkansas, and a 2.4 percent increase for the U.S (Table 2). Per capita income for the three-county area is just below the average for the state, \$22,170.

Union County is the state's largest county geographically. Ninety percent of the county is forested. Forage and hay are raised for livestock, but few row crops are cultivated. Nearly 25% of the workforce is employed in manufacturing, primarily in petro-chemical, poultry processing, and wood products operations. The soils of Ashley County are fertile, allowing the cultivation of the great cash crops of the state: corn, cotton, rice, and soybeans. The western part of the county is largely forested, home to what is billed as "The Forestry Capital of the South." Today, forest products account for 57% of the value of all shipments from Ashley County and are responsible for 26% of the employment. The Great Lakes Chemical Corporation (now Chemture) is the world's largest producer of bromine. With facilities in Union (and Columbia) counties, it contributes significantly to the local economy and employs more than 1,000 people.

Pond Creek NWR is located in the southwestern portion of the state, Sevier County, Arkansas and remains a rural county. Roughly 70 percent of the land in Sevier County is forested, 26 percent is in farms, and 4 percent is under crop cultivation. Sevier County is roughly 70 percent forested by primarily mixed stands of pine and hardwood. The forest industry is the largest forest landowner and leases or owns roughly 49 percent of the county's forest land. In terms of number of employees and annual payroll, the forest products manufacturing industry is third in economic importance to Sevier County. The percentage of the county's direct earnings from the timber industry was less than 10 percent in 1990 (USFWS 1999). However, Sevier County lies within the procurement zone of a large sawmill, plywood mill, and chipper mill operating in neighboring Howard County, as well as a paper mill operating in Little River County. Thus, there is a high demand for timber in the county. Manufacturing non-durable goods, primarily

poultry products, is the leading industry in the county and employs more than 1,000 people. Pilgrim’s Pride, the largest industry in the county, has expanded several times since its establishment in 1954. Other significant employers are industrial machinery manufacturing and the forest products industries. Three sawmills, a plywood mill, and a large timber treatment plant operates in the county (USFWS 1999). The retail trade sector is also growing and employs more than 900 people in about 77 small businesses.

There will be minimal economic effects expected on the local economy as a result of opening the SARC to trapping.

Table 2. Socioeconomic Conditions

Characteristic	Union County	Bradley County	Ashley County	Sevier County	State of Arkansas	United States
Demographic						
Population (2013 estimate)	40,694	11,249	21,283	17,426	2,959,373	316,128,839
Percent Change 4/1/2010-7/1/2013	-2.30%	-2.30%	-2.60%	2.20%	1.50%	2.40%
Total Land Area (sq. miles)	1,039.21	649.23	925.35	565.13	52,035.48	3,531,905.43
Population Density (pop./sq. mile)	40.1	17.7	23.6	30.2	56	87.4
Race/Ethnicity						
White	64.60%	68.40%	71.9%	58.6%	79.9%	77.70%
Black/African American	32.60%	27.40%	25.80%	4.50%	15.60%	13.20%
Hispanic/Latino (of any race)	3.60%	14.40%	5.20%	32.7%	6.90%	17.10%
Asian	0.80%	0.40%	0.20%	0.50%	1.50%	5.30%
Education (% of population over 25)						
High School Degree	82.40%	76%	84.20%	66.30%	83.70%	86.00%
College Degree	16.10%	10.80%	12.20%	8.60%	20.10%	28.80%
Economic						
Median Household Income	\$37,435	\$30,409	\$35,683	\$35,153	\$40,768	\$53,046
Per-captita Income	\$20,718	\$19,386	\$19,761	\$16,021	\$22,170	\$28,155
Individuals Below the Poverty Level	21.50%	31.3%	18.90%	24.4%	19.20%	15.40%

Chapter 4: ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter assesses the environmental impacts expected to occur from the implementation of Alternatives A, B or C as described in Chapter 2. A detailed comparison between alternatives and their anticipated consequences is presented, describing “impacts” or “effects.” When detailed information is not available, those comparisons are based on the professional judgment and experience of refuge staff.

Alternative A - Open the refuge to recreational trapping that follows State and refuge regulations and season dates (No Action and Preferred Alternative).

Alternative A satisfies the National Environmental Policy Act (NEPA) requirements for a No Action Alternative. This preferred alternative would allow trapping of all furbearing mammals permitted under State trapping regulations found within the refuge boundary. Service policy permits trapping of furbearing animals on refuges where it contributes to, or is compatible with the management objectives of the refuge (7 RM 15.13). A Special Use Permit with associated fee will be required of all trappers.

Alternative B - Open the refuge to recreational trapping of select species only.

This alternative would allow trapping of primarily beaver and nutria by recreational trappers for resource management purposes. Non-targeted species trapped must be documented on a Trapping Report and relinquished to the refuge. Trapping season dates, methods, and other regulations on the refuge would generally follow regulations established for the State. A Special Use Permit with associated fee will be required of all trappers.

Alternative C – Prohibit recreational trapping on all refuges within the SARC.

No recreational trapping on the refuges would be allowed. Refuge staff, partnering State and federal agencies, universities and/or contractors under the direction of refuge management, would be solely responsible for managing nuisance wildlife species.

4.1.1 SUMMARY OF EFFECTS BY ALTERNATIVE

The following section describes the environmental consequences of adopting each refuge management alternative.

Impacts Of Refuge Management On The Socioeconomic Environment

Impacts of Refuge Management on Socioeconomic Environment in Alternative A

The sociological aspects of wildlife management programs are complex, and vary widely across geographic boundaries. These activities, particularly trapping, while appreciated and promoted in rural America, are less likely to be viewed the same way by people in urban settings and backgrounds. In many cases, urban America sees and hears only the negative aspects of trapping and associates trapping programs on refuges with wildlife destruction and commercialization of the resource rather than with the objectives of wildlife habitat improvement, nuisance and exotic

invasive animal control, and other benefits to the environment. In spite of managing for a diverse public and equally diverse populations of wildlife, it is impossible to please all interest groups and individuals. Some would object to management in any form, and it would be difficult to argue against the pursuit of natural values.

Realistically, there are few remaining areas where protection of the habitat alone is the only necessary management option. This is especially true in cases where humans have already caused significant impacts on the landscape, as at the SARC. The majority of habitats are degraded, are far from natural, and have the growing inability to support the historical abundance and diversity of fauna that is necessary and expected. These concerns and issues would be addressed in environmental education and interpretation programs about the refuges' wildlife management program.

From an economic standpoint, revenue associated with trapping statewide is significant (AGFC 2015); however, due to a decline in trapping effort on the SARC for the past several years and reduced prices paid for furs, none of the alternatives would have significant impact on the socioeconomic environment.

- Estimated Value of Arkansas Fur Purchases 2012-2013 - \$662,911.30 (AGFC 2013*b*)
- Estimated Value of Arkansas Fur Purchases 2014-2015 - \$203,131.88 (AGFC 2015)
- Trapping SUPs Issued Per Year Based on a 5-year Average For:
 - Felsenthal NWR – 7.2 Trappers/year.
 - Overflow NWR – 0.4 Trappers/year.
 - Pond Creek NWR – 4.8 Trappers/year.

Impacts of Refuge Management on Socioeconomic Environment in Alternative B
Same as Impacts of Refuge Management on Socioeconomic Environment in Alternative A.

Impacts of Refuge Management on Socioeconomic Environment in Alternative C
Same as Impacts of Refuge Management on Socioeconomic Environment in Alternative A.

Impacts On The Cultural Resources

Impacts on the Cultural Resources in Alternative A

Refuge lands are protected from development or destructive land uses that may result in substantial impacts on cultural and historic resources. Regardless of which alternative we select, we would protect known cultural and historic resources. For compliance with section 106 of the National Historic Preservation Act, the refuge staff will, during the early planning stages of proposed new actions, provide the regional historic preservation officer with a description and location of all projects, activities, routine maintenance, and operations that affect ground and structures, details on requests for compatible uses, and the range of alternatives considered. That office will analyze those undertakings for their potential to affect historic and prehistoric sites, and consult with the State historic preservation officer and other parties as appropriate. We will notify the State and local government officials to identify concerns about the impacts of those

undertakings. If previously unknown historical or cultural resources are detected during habitat management operations, the Regional Historic Preservation Officer will be notified immediately.

We expect all of the alternatives to have local long-term minor beneficial impacts through education and awareness and no adverse impacts on cultural and historical resources on the refuge.

Alternative A is expected to have no impacts to cultural resources. Additionally, no buildings or structures exist on-site that are listed on the National Register of Historic Places. ATV/UTV use in association with trapping will be permitted; however, ATV/UTV use is restricted to authorized roads and trails. Any ground disturbance caused by trappers will be negligible.

Impacts on the Cultural Resources in Alternative B

Same as Impacts of Refuge Management on Cultural Resources in Alternative A.

Impacts on the Cultural Resources in Alternative C

No impacts.

Impacts On Air Quality

Impacts on Air Quality in Alternative A

ATV/UTV use in association with trapping will be permitted; however, emissions associated with ATV/UTV use are insignificant due to the very low participation rates of trappers that use the SARC.

Impacts on Air Quality in Alternative B

Same as Impacts on Air Quality in Alternative A.

Impacts on Air Quality in Alternative C

No impacts.

Impacts On Soils

Impacts on Soils in Alternative A

ATV/UTV use in association with trapping will be permitted; however, ATV/UTV use is restricted to authorized roads and trails. Any ground disturbance caused by trappers will be negligible.

Indirectly, beaver are one of the most targeted species trapped across the SARC. The primary instream habitat value of beaver dams is that they impound water to form large pools and ponds. These impoundments trap sediment, help to create productive and diverse wetland environments on adjacent floodplains, improve water quality, and facilitate groundwater recharge. As a result of impoundments caused by beaver dams, soils are inundated with water. This can result in positive or negative impacts to soils; however, these impacts would primarily be based on the soils influence on desired vegetation.

Impacts on Soils in Alternative B

Same as Impacts on Soils in Alternative A.

Impacts on Soils in Alternative C

No direct impacts. Indirectly, prohibiting trapping, specifically beaver trapping, will have an impact on soils. These impacts, albeit minimal based on historical trapping effort, can be positive and negative. Impoundments resulting from beaver dams trap sediment, help to create productive and diverse wetland environments on adjacent floodplains, improve water quality, and facilitate groundwater recharge. Altered hydrology also has the potential to, and does, negatively affect forest resources and infrastructure both on and off the refuge due to prolonged soil saturation.

Impacts On Hydrology And Water Quality

Impacts on Hydrology and Water Quality in Alternative A

Properly managed refuge lands tend to improve water quality within the refuge and downstream as vegetated areas reduce runoff and sedimentation, while also absorbing some nitrogen, phosphorous and other pollutants. Soil and water disturbance, and siltation directly associated with trapping activities are expected to be nominal.

Indirectly, beaver are one of the most targeted species trapped across the SARC. The primary instream habitat value of beaver dams is that they impound water to form large pools and ponds. These impoundments trap sediment, help to create productive and diverse wetland environments on adjacent floodplains, improve water quality, and facilitate groundwater recharge. All these functions are ultimately the result of the dams reducing stream velocities and altering hydrology by spreading water over a large surface area (Pollock et. al. 20013). However, beaver have few natural predators and when left unmanaged, especially in manipulated environments, beaver have the potential to, and do negatively affect forest resources and infrastructure both on and off the refuge. Beaver dam removal in association with trapping would have a more significant impact on hydrology and water quality; however, trapping alone will reduce beaver numbers and assist in keeping beaver populations in check. Based on historical use, the taking of beaver as a result of trapping will reduce impacts on hydrology and have a minimum impact on water quality.

Impacts on Hydrology and Water Quality in Alternative B

Same as Impacts on Hydrology and Water Quality in Alternative A.

Impacts on Hydrology and Water Quality in Alternative C

There will be no direct impacts on hydrology and water quality associated with trapping. Indirectly, prohibiting trapping, specifically beaver trapping, will have an impact on hydrology and water quality. These impacts, albeit minimal based on historical trapping effort, can be positive and negative. Impoundments resulting from beaver dams trap sediment, help to create productive and diverse wetland environments on adjacent floodplains, improve water quality, and facilitate groundwater recharge. Altered hydrology also has the potential to, and does negatively affect forest resources and infrastructure both on and off the refuge.

Impacts On Vegetation

Impacts on Vegetation in Alternative A

Some disturbance to vegetation as a result of trapping activities may occur; however, this disturbance would be minimal and temporary. Motorized access will be limited to designated roads and ATV/UTV trails, and parking areas.

Indirectly, the taking of beaver and nutria will have positive impacts on vegetation. Beaver have the potential to significantly alter a vegetative community by killing trees as a result of feeding on the cambium layer of trees and other woody and herbaceous plants, cutting trees down for lodge and dam construction, and by altering hydrology, thereby killing desirable timber in forested communities. Nutria, and exotic invasive species, burrows and tunnels can damage the integrity of flood control levees, man-made canals and ditches, and streambanks resulting in significant erosion and instability. Nutria are known for feeding heavily on plant roots, which changes soil structure and transforms wetlands into open water habitat and can consume up to 25% of their weight daily. Loss of marsh habitat impacts native wildlife species and often leads to colonization of non-native, invasive plants such as reed canarygrass. It is anticipated that trapping, specifically the taking of beaver and nutria, will have an overall positive impact on vegetation.

Impacts on Vegetation in Alternative B

Potentially less direct, negative impacts than Alternative A. Same indirect Impacts on Vegetation in Alternative A.

Impacts on Vegetation in Alternative C

Prohibiting trapping, specifically the taking of beaver and nutria, will have an overall negative impact on vegetation based on the impacts described in the Impacts on Vegetation in Alternative A.

Impacts On Federal And State Endangered Species

Impacts on Threatened (T) and Endangered (E) Species in Alternative A

Federally Threatened and Endangered Species on the SARC include: Plants - Pondberry *Lindera mellisifolia* (E), Geocarpon *Geocarpon minimum* (T); Freshwater Mussels - Pink Mucket (pearly mussel) *Lampsilis abrupta* (E), Winged Mapleleaf Mussel *Quadrula fragosa* (E), Ouachita Rock-Pocketbook *Arcidens wheeleri* (E), Scaleshell *Leptodea leptodon* (E), Rabbitsfoot Mussel *Quadrula cylindrical cylindrical* (T); Birds - Red-cockaded Woodpecker *Picoides borealis* (E); Fish - Leopard Darter *Percina pantherina* (T); and Mammals - Northern Long-Eared Bat *Myotis septentrionalis* (T).

There is no designated critical habitat for federally listed species on the refuge. No effect is expected for this alternative since listed species are either nocturnal or their life habits do not coincide with the trapping seasons. A Section 7 Biological Evaluation of the Endangered Species Act has been completed as part of this EA and the associated Trapping Plan. A finding of “No Effects” was determined (Appendix A).

Impacts on Federal and State Endangered Species in Alternative B

Same as Impacts on Threatened and Endangered Species in Alternative A.

Impacts on Federal and State Endangered Species in Alternative C

Same as Impacts on Threatened and Endangered Species in Alternative A.

Impacts On Birds

Impacts on Birds in Alternative A

This alternative will provide resource staff the capability to actively manage furbearer populations, specifically, raccoon populations on the refuge which potentially could decrease impacts caused to refuge migratory and resident bird populations.

Multiple studies have shown raccoons to be an important nest predator of migratory birds (Chalfoun et al. 2002, Schmidt 2003), with one study finding raccoons to be the second most frequently recorded nest predator, only surpassed by the brown-headed cowbird (Friesen et al. 2013). Nest predation is a limiting factor for many migratory birds, playing directly into the population viability of these species (Chalfoun et al. 2002). Results from a study in Illinois (Schmidt 2003) suggests that high raccoon densities, if left unchecked, have the potential to contribute to declines in not only the abundance but also the diversity of the State's songbird populations.

Under this alternative, it is expected that shorebirds and wading birds would not be negatively impacted by trapping since, in most cases, they are not generally occupying the same areas ideal for trap sets. The exception could be some species of wading birds, such as great blue herons which often feed around beaver dam and huts; however, based on professional experience and trapper's experience capturing such a non-targeted species is a rare exception. Migratory birds of prey (eagles, hawks, etc.) and waterfowl are on the refuge during trapping seasons; however, disturbance is expected to be minimal. Disturbance to the daily wintering activities, such as feeding and resting, of residential birds might occur but are insignificant because such interactions are infrequent and of short duration when they do occur.

Impacts on Birds in Alternative B

Same as Impacts on Birds in Alternative A. Raccoons would be allowed to be taken if population densities become a concern.

Impacts on Birds in Alternative C

There will be no direct impacts to birds with this alternative; however, prohibiting trapping, specifically the taking of raccoon, may have an overall negative impact on avian fauna based on the impacts described in the Impacts on Birds in Alternative A.

Impacts On Mammals

Impacts on Mammals in Alternative A

Disturbance to mammals is an unavoidable consequence associated with trapping activities. However, the known and anticipated levels of disturbance from these activities are minimal. Activities associated with trapping are limited to concentrated areas of the refuge and relatively short in duration. Escape cover and adjacent suitable habitat is available. Individual mammals may be negatively impacted by direct trapping activities and indirect results of trapping;

however, in the long term, mammal populations will thrive from active habitat management that promotes wildlife diversity, healthy wildlife populations, and fully-functioning systems.

Under this alternative, the trapping program has been designed to encourage trapping techniques which are as selective, humane, and effective as is reasonable and practical, considering the target species and habitat conditions of the refuge (7 RM 15.13). Permit provisions require the use of State approved traps and trap-sets for selected species; and as specified in the general trapping conditions, will require trap inspection every 24 hours. These trapping conditions include several trapping requirements intended to reduce animal suffering and reduce the taking of non-target species. Individual animals will be harvested and removed, in accordance with state regulations. AGFC carefully reviews population trends when determining annual harvest needs to keep populations healthy (AGFC 2013a). Harvest and observation data from AGFC suggests populations of mink are decreasing, bobcat, gray fox, and otter are stable, and that beaver, coyote, opossum, nutria, and raccoon are increasing (AGFC 2015).

Species that are targeted for trapping or may be incidentally taken while trapping on the SARC are included below (AGFC 2013b):

Beaver (*Castor canadensis*)

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. 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. Castoreum, which is a secretion from the castor gland, is relatively valuable, being used in perfume and trapping industries. Beaver meat also is eaten by some people and is used for dog food.

Bobcat (*Lynx rufus*)

Bobcats are found throughout the state and, primarily in wooded habitats. Their diet consists mostly of rabbits, though they also eat rodents and birds as the opportunity arises. Breeding generally occurs from December to February with litters of one to six kittens being born from March through early May. Despite popular perception of an increasing number of bobcats, objective data from the bowhunter observation survey indicates that their populations have been stable over the last six years.

Coyote (*Canis latrans*)

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 SARC.

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. 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.

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. However, 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.

Gray Fox (*Urocyon cinereoargenteus*)

The gray fox is found statewide and is common in thickly wooded habitats; however, they are rare on the SARC and seldom captured as a result of trapping. Gray fox are primarily nocturnal and are adept climbers. They have few predators besides man, dogs and possibly coyotes.

Mink (*Mustela vison*)

This species is found statewide and across the SARC, but is most plentiful in the Delta region, including Overflow NWR where irrigation canals and reservoirs are common.

Muskrat (*Ondatra zibethicus*)

Changing land use patterns have contributed to increases in muskrat populations during the last few decades. Practices such as larger acreages devoted to rice and fish farming with accompanying irrigation water, borrow pits, canals and ponds provide more suitable habitat for muskrats. However, in recent years there appears to have been a decline in muskrat populations in the eastern United States, though the reasons for this are unknown. High prices seen in the last few years should have brought about a larger increase in pelt purchases than has been observed in Arkansas, providing some support for the idea that they are not as abundant as they have been in the past.

Nutria (*Myocastor coypus*)

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. This species does not represent a very valuable fur resource in Arkansas, since less than 500 are trapped annually and the demand for their fur (and thus price) is low. Most nutria are seen in the West Gulf Coastal Plain, the Mississippi Delta and up the Arkansas River Valley. Most nutria are trapped within these regions, often incidental to trap sets for other species.

Opossum (*Didelphis virginiana*)

The opossum is common throughout the state and its fur is currently of low economic value, although many are caught annually in the pursuit of other, more valuable species. 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. There is some limited interest in opossum hunting and a limited market for opossum meat for eating.

Otter (*Lutra canadensis*)

River otter occur in all counties of the state, but are most common in the southern and eastern parts of Arkansas, and are abundant across the SARC. However, otter are common in most river drainages in the Ozark and Ouachita regions. Nuisance complaints have increased in some areas, generally involving eating fish out of ponds and causing damage to boat dock flotation materials.

Raccoon (*Procyon lotor*)

Raccoons are distributed statewide and have been harvested in greater numbers than any other furbearer for 50 years. 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.

Raccoons are frequent urban and rural pests. Damages often occur from their nuisance activity. They also 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. 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.

Red Fox (*Vulpes vulpes*)

When the state was heavily forested, the red fox was uncommon. The clearing of land for agriculture provided habitat and the red fox extended its range across the state. Increasingly open habitat also enhanced the migration and proliferation of the more dominant coyote. Evidence suggests that where the two species occur together, the coyote will displace the red fox. The red fox occurs in all regions of the state, but it reaches its highest densities in the Delta, where extensive open lands predominate. Red fox are seldom captured as a result of trapping on the SARC.

Spotted Skunk (*Spilogale putorius*)

The spotted skunk is also known to some as civet cat. Like the striped skunk, the spotted skunk has little economic value to trappers or hunters because of the low demand and low pelt value, although spotted skunk pelts sell for a higher price, in spite of their smaller size. These little animals are excellent mousers and unlike the striped skunk, climb trees with ease. Spotted skunks are thought to occur statewide, with the possible exception of the easternmost portion of the State. They are most common in the upland areas of the Ozarks and Ouachitas, where they prefer rocky outcrops and ledges. Spotted skunks are rarely observed on the SARC and are seldom captured as a result of trapping.

Striped Skunk (*Mephitis mephitis*)

Striped skunks occur in all counties of the state and are most common in cleared agricultural lands and pasture land. Skunks are a common nuisance animal, usually causing problems such as digging under houses and emitting their telltale odor when alarmed by domestic dogs. Skunks are the major vector of wildlife rabies in the United States and Arkansas, averaging 40-50 percent of all reported cases.

Weasel (*Mustela frenata*)

Weasels are rare within the state and most common where pocket gopher populations are found. Very little is known about this mammal in Arkansas due to its scarcity. They are beneficial, since they feed on rats, mice and pocket gophers. In the northern and western United States, weasels turn white in the winter, except for the black tip on the tail. In Arkansas, weasels do not change color, but the winter coat may be lighter than in summer. Weasels are rarely observed on the SARC and are seldom captured as a result of trapping.

Impacts on Mammals in Alternative B

This alternative would allow trapping of primarily beaver and nutria; however, raccoon may also be taken based on monitored population densities. The same Impacts on Mammals in Alternative A for these species are predicted based on historical trapping effort on the SARC.

Impacts on Mammals in Alternative C

No significant impacts expected; however, negative impacts could occur to mammal species affected by nutria and overpopulated raccoon populations as described in Impacts on Mammals in Alternative A for these species.

Impacts On Reptiles And Amphibians

Impacts on Reptiles and Amphibians in Alternative A

To a minimal extent, disturbance to reptiles and amphibians is an unavoidable consequence of trapping activities. However, the known and anticipated levels of disturbance from this activity is inconsequential, primarily due to the fact that trapping season is in the wintertime when most reptile and amphibian species are hibernating. Activities associated with trapping are limited to concentrated areas of the refuge and relatively short in duration. Escape cover and adjacent suitable habitat is available. Periodically turtles are captured in traps; however, these captures are rare and seldom result in injury. Indirect impacts could be similar to the Impacts on Hydrology and Water Quality in Alternative A.

Impacts on Reptiles and Amphibians in Alternative B

Same as Impacts on Reptiles and Amphibians in Alternative A.

Impacts on Reptiles and Amphibians in Alternative C

No direct impacts. Indirect impacts could be similar to the Impacts on Hydrology and Water Quality in Alternative C.

Impacts On Fisheries

Impacts on Fisheries in Alternative A

Same as Impacts on Hydrology and Water Quality in Alternative A.

Impacts on Fisheries in Alternative B

Same as Impacts on Hydrology and Water Quality in Alternative A.

Impacts on Fisheries in Alternative C

Same as Impacts on Hydrology and Water Quality in Alternative C.

Impacts On Invertebrates

Impacts on Invertebrates in Alternative A

Same as Impacts on Hydrology and Water Quality in Alternative A.

Impacts on Invertebrates in Alternative B

Same as Impacts on Hydrology and Water Quality in Alternative A.

Impacts on Invertebrates in Alternative C

Same as Impacts on Hydrology and Water Quality in Alternative C.

Impacts On Public Use And Access

Impacts on Public Use and Access in Alternative A

Due to a decline in trapping effort on the SARC for the past several years and reduced prices paid for furs, this alternative would not have a significant impact on the SARC public uses and accesses. The average number of trapper's per year based on a 5-year average for Felsenthal NWR is 7.2 trappers/year, Overflow NWR is 0.4 trappers/year, and Pond Creek NWR is 4.8 trappers/year.

In areas being trapped, most visitations occur from November through January for hunting; however, there have been very few conflicts between uses (including hunting, fishing, wildlife observation, school programs or special events). This alternative will provide an additional opportunity to enjoy the refuge.

Impact to refuge facilities (roads, parking lots, boat ramps, and trails) will be minimal with this alternative. Motorized vehicles must remain on approved roads and trails, which are maintained for all public uses; these facilities will receive a slight increase in use with the addition of trapper use but impacts will be minimal and short-term due to the limited number of SUPs issued.

Portions of the refuge may be temporarily closed to public access for a variety of reasons due to forest management activities or environmental conditions. Advance notice may be provided in the form of posted signs or public notification; however, closures may also be abrupt and unannounced. Management activities which may limit public access include but are not limited to timber harvest, prescribed burning, wildfire management, vegetation management, maintenance or improvement to infrastructure. Environmental conditions which may limit public access can include flooding, storm damage, threat of inclement weather, high fire danger, and pest or disease outbreak. Closure to public access will generally be temporary and short in duration. The primary purposes for closure are to protect life, safety, or limit potential resource damage.

Impacts on Public Use and Access in Alternative B

Same as Impacts on Public Use and Access in Alternative A

Impacts on Public Use and Access in Alternative C

No Impacts.

CUMULATIVE IMPACTS

Managing And Protecting Habitat

All of the alternatives would have positive and/or negative impacts to the native biological resources on the SARC. The combination of our management actions with those of other conservation partners, organizations, and landowners should result in beneficial cumulative impacts on the biological environment by:

- Improving the protection and management of Federal trust species, State listed endangered species, and migratory birds
- Using structured decision-making and enhancing monitoring to improve wildlife management and conservation actions
- Protecting and improving upland and wetland habitats that are declining at the state and regional levels or threatened by development
- Controlling invasive plants and animals
- Controlling nuisance or destructive animals
- Enhancing and restoring biological integrity, diversity, and environmental health of refuge lands
- Providing and promoting public uses on the SARC that are compatible with refuge purposes

Based on past, present and foreseeable future refuge management actions, Alternatives A and B will better ensure beneficial cumulative impacts on the biological environment by managing furbearer populations.

Certain biological resources that we would manage to control, prevent, or eliminate (e.g., nutria) are not natural components of our managed wildland areas. We do not consider the loss of these biotic elements to be an adverse impact. However, not controlling invasive and nuisance species would create adverse cumulative impacts to the biological environment.

In general, native habitat management will have considerable cumulative impacts on the biological environment as we expect to increase population numbers of many more, migrating and wintering waterfowl, bald eagles, forest interior dwelling bird species, and breeding and migrating early successional landbird and waterbird species. Native plant management cumulatively benefits the biological environment by increasing and enhancing healthy soil biota, restoring and enhancing native plant resources, increasing resident wildlife populations of mammals, fish, reptiles, and amphibians, and enhancing invertebrate production to sustain and perpetuate migratory bird resources.

The majority of the land acquired by the refuge was previously used for various recreational opportunities, with trapping being one. If public use levels expand in the future, unanticipated impacts associated with trapping may occur. Service experience has proven that time and space zoning and regulation changes can be an effective tool to mitigate unanticipated impacts. The Project Leader will determine if such a tool is necessary to mitigate these unanticipated impacts on a case by case basis.

Managing Exotic Or Nuisance Species

The refuge will have a zero tolerance policy for exotic species. Preventing establishment of viable populations of invasive animals on the refuge will preserve existing biological integrity, diversity, and environmental health (BIDEH) as required in U.S. Fish and Wildlife Service Policy (601 FW 3).

Beaver are native aquatic rodents that are a natural component of the refuge ecosystem. However, on occasion individual animals or small family groups will damage valuable refuge infrastructure, burrow into dikes/roads or cause flooding conditions on neighboring private land. Beaver damming and flooding of refuge managed habitats may impact the refuge's ability to achieve an optimal management regime for Federal trust resources, particularly migratory birds. Under these circumstances, the refuge may employ lethal removal of specific individuals to lessen damage. Individual animals will be impacted, but the population as a whole will experience no long-term impacts.

Nutria, an exotic invasive species, burrows and tunnels can damage the integrity of flood control levees, man-made canals and ditches, and streambanks resulting in significant erosion and instability. Nutria are known for feeding heavily on plant roots, which changes soil structure and transforms wetlands into open water habitat and can consume up to 25% of their weight daily. Loss of marsh habitat impacts native wildlife species and often leads to colonization of non-native, invasive plants such as reed canarygrass.

Cultural Resources

The activities in Alternative A and B have the potential to impact cultural resources, by direct disturbance associated with trapping activities. For compliance with section 106 of the National Historic Preservation Act, the refuge staff will, during the early planning stages of proposed new actions, provide the regional historic preservation officer with a description and location of all projects, activities, routine maintenance and operations that affect ground and structures, details on requests for compatible uses, and the range of alternatives considered. That office will analyze those undertakings for their potential to affect historic and prehistoric sites, and consult with the State historic preservation officer and other parties as appropriate. We will notify the State and local government officials to identify concerns about the impacts of those undertakings.

We expect none of the alternatives to have significant adverse cumulative impacts on cultural resources on the refuge.

Relationship Between Short-Term Uses Of The Human Environment And The Enhancement Of Long-Term Productivity

Under all alternatives, our primary aim is to maintain or enhance the long-term productivity and sustainability of natural resources on the SARC, in the State of Arkansas, and in the West Gulf Coastal Plain ecosystem, along with migratory birds, inter-jurisdictional fish, and other far-ranging wildlife species, across their whole range. Wildlife management, habitat protection and restoration actions across all alternatives may entail short-term negative impacts to ensure the long-term productivity of the refuge. Many of the benefits associated with trapping namely, controlling invasive animals, proactively managing wildlife species, and restoring native plant communities can have dramatic short-term impacts. These include direct mortality of some plants and animals, displacement of species, or cessation of certain types of public use.

However, the long-term benefits of those actions generally offset their short-term impacts. Habitat and wildlife management practices that mimic ecological and sustainable processes optimize the maintenance and enhancement of the biological diversity, integrity, and environmental health of those habitats and wildlife species for the long term. Long-term productivity is especially enhanced when the ecological and sustainable management actions that are proposed in the preferred alternative would best support and improve links between public use and ecosystem function. In summary, we predict that Alternative A would contribute positively to maintaining and enhancing the long-term productivity of the refuge's natural resources, with sustainable beneficial cumulative and long-term benefits to the environment surrounding the refuge with minimal inconvenience or loss of opportunity for the American public.

Unavoidable Adverse Effects

Unavoidable adverse effects are the effects of those actions that could cause harm to the human environment and cannot be avoided, even with mitigation measures. All the alternatives would result in some minor, localized, unavoidable adverse effects. For example, trapping to control invasive species would produce minor, short-term, localized adverse effects to vegetation and possibly non-target species. However, none of those effects would rise to a significant level. Furthermore, all of those impacts would be mitigated with best management practices, so none of the alternatives would cause significant, unavoidable cumulative impacts.

As we noted previously, many of the activities associated with trapping in the alternatives have a certain level of unavoidable adverse effects. Those effects are mitigated to some degree by the use of practices and precautions that safeguard wildlife populations, avoid sensitive or irreplaceable habitats, or time of the actions or include features to avoid or minimize impacts on fish and wildlife. The adverse effects generally are short-term and more than offset by the long-term gains in habitat quality and fish, wildlife, and plant productivity.

Biological Integrity, Diversity, and Environmental Health

Trapping 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

beaver and raccoon, 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. Trapping is a closely monitored tool that effectively regulates wildlife populations.

Chapter 5: REGULATORY COMPLIANCE

The following acts authorize the U.S. Fish and Wildlife Service to administer trapping on National Wildlife Refuges. The Refuge Recreation Act of 1962 (16U.S.C 460K) authorizes the Secretary of the Interior to administer National Wildlife Refuges for public recreation as an appropriate incidental or secondary use; 1) to the extent that is practicable and consistent with the primary objectives of the refuge, and; 2) Provided that funds are available for the development, operation, and maintenance of permitted recreation.

The National Wildlife Refuge System Administration Act of 1966 (16U.S. 688dd-ee) authorizes the use of any area within the NWR System for any purpose, including but not limited to hunting, fishing, and public recreation whenever those uses are determined to be compatible with the purpose for which the area was established. The Refuge Improvement Act of 1997 is the latest amendment to the NWRS Administration Act which outlines that the first consideration in any decision making would be wildlife including plants, animals, and their habitats. The second consideration would be effect of the activity on the six top priority public uses established by the Act that included hunting, fishing, wildlife observation, wildlife photography, environmental education, and environmental interpretation. The third consideration is impact on all other compatible uses.

The Service determined that trapping is compatible with the purpose of the SARC refuges and the mission of the National Wildlife Refuge System. Carefully controlled trapping is considered a management tool, and contributes to the habitat and wildlife management goals of the refuge. The activity will be carefully regulated through the use of Special Use Permits.

Chapter 6: LIST OF PREPARERS

The following individuals cooperated in the preparation of this document:

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Chapter 7: CONSULTATION AND COORDINATION WITH OTHERS

The South Arkansas Refuge Complex Trapping Plan was coordinated with the Arkansas Game and Fish Commission (AGFC) and reviewed by Blake Sasse, Furbearer Program Leader, AGFC, Little Rock, AR.

Following the adoption of the Trapping Plan, the refuge will consult and coordinate with AGFC to address annual implementation of trapping activities. Trapping opportunities on the refuge are primarily developed to be consistent with AGFC state seasons and regulations with the exception of more restrictive special conditions and season dates for the furbearer management program.

Chapter 8: REFERENCES CITED

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APPENDIX A:

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: Alan Whited
Telephone Number: (870) 364-3167
Date: 12/04/15

E-Mail: William_Whited@fws.gov

PROJECT NAME (Grant Title/Number): South Arkansas Refuge Complex-Trapping Plan

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/U.S. Fish and Wildlife Service

III. Station Name: Felsenthal NWR, Overflow NWR, Pond Creek NWR

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

Implement management actions identified in the South Arkansas Refuge Complex Trapping Plan.

V. Pertinent Species and Habitat:

A. Include species/habitat occurrence map:

Complete the following table:

SPECIES/CRITICAL HABITAT	STATUS¹
Pondberry <i>Lindera mellisifolia</i>	E
Pink Mucket (pearly mussel) <i>Lampsilis abrupta</i>	E

Red-cockaded Woodpecker <i>Picoides borealis</i>	E
Winged Mapleleaf Mussel <i>Quadrula fragosa</i>	E
Geocarpon <i>Geocarpon minimum</i>	T
Ouachita Rock-Pocketbook <i>Arcidens wheeleri</i>	E
Leopard Darter <i>Percina pantherina</i>	T
Scaleshell <i>Leptodea leptodon</i>	E
Northern Long-Eared Bat <i>Myotis septentrionalis</i>	T
Rabbitsfoot Mussel <i>Quadrula cylindrical cylindrical</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 29, Lower Mississippi River (Felsenthal & Overflow); Number 15, Arkansas/Red (Pond Creek)
- B. County and State:** Ashley, Bradley, Union and Sevier Counties, Arkansas
- C. Section, township, and range (or latitude and longitude):**
 N 33.14808 / W 092.05760 (Felsenthal); N 33.149531 / W 091.595455 (Overflow); N 33.885158 / W 094.198781 (Pond Creek)

Distance (miles) and direction to nearest town:

Felsenthal NWR is located in southeast Arkansas, and approximately 8-miles west of Crossett, Arkansas; Overflow NWR is located at 3858 Highway 8 E, Parkdale, AR 71661; approximately 15 miles east of Hamburg, AR on State Highway 8; Pond Creek NWR is located in southwest Arkansas, approximately 10-miles east of Horatio on Hwy. 2 (Central Road).

E. Species/habitat occurrence:

Pondberry (*Lindera mellisifolia*): Recent surveys failed to find pondberry within Felsenthal NWR, however, the plant does occur within Arkansas Natural Heritage Commission's Coffee Prairie Natural Area. Coffee Prairie is just south of the Felsenthal NWR boundary and is within the refuge's acquisition boundary. Pondberry is not known to occur on any refuge within the SARC.

Pink Mucket (pearly mussel) (*Lampsilis abrupta*): The pink mucket is found in medium to large rivers in gravel with sand substrate. It uses a variety of sunfish species as its host fish. In Arkansas, this species inhabits the Ouachita, Saline, White, Black, and Spring rivers. Pink mucket is known to occur on Felsenthal NWR in the Saline River.

Red-cockaded Woodpecker (RCW) (*Picoides borealis*): 13 known colonies are known to occur on Felsenthal NWR and occur in suitable habitat across the refuge. RCWs prefer the open, park-like timber stands where it drills nesting

cavities in mature pine trees. RCWs are only known to occur on Felsenthal NWR.

Winged Mapleleaf Mussel (*Quadrula fragosa*): Winged mapleleaf are found in medium to large rivers with clean gravel, sand, or cobble bottoms and. In Arkansas, they are only found in the Ouachita and Saline Rivers. Winged mapleleaf is only known to occur on Felsenthal NWR in the Saline River.

Geocarpon (*Geocarpon minimum*): Geocarpon prefers the edges of saline (salt) barrens in grasslands called “slicks” or “slickspots.” Geocarpon is a tiny inconspicuous plant, ranging in size from 0.4 – 1.6 inches. Vegetation encroachment, cattle grazing, and landscape alteration are the main threats. Potential to occur at Felsenthal NWR.

Ouachita Rock-Pocketbook (*Arcidens wheeleri*): The Ouachita rock-pocketbook inhabits pools, backwaters, and side channels in the Little River and its larger tributaries in southeast Oklahoma and southwest Arkansas and Ouachita River in Arkansas. The only confirmed reproducing population left occurs in the Little River in Arkansas. The species occupies stable substrates containing gravel, sand, and other materials. It generally occurs within large mussel beds containing a diversity of mussel species. Potential to occur at Pond Creek NWR.

Leopard Darter (*Percina pantherina*): The leopard darter inhabits pools that have water depths of 10-40 inches, substrates of rubble and boulders, and no detectable current velocity in southwestern Arkansas and southeastern Oklahoma. Potential to occur at Pond Creek NWR.

Scaleshell (*Leptodea leptodon*): Scaleshell is a relatively small mussel that lives in medium-sized and large rivers with stable channels and good water quality. Freshwater drum have been identified as a host fish for the scaleshell but there may be other species. Relatively little is known about the life history of the scaleshell. Potential to occur at Pond Creek NWR.

Northern Long-Eared Bat (*Myotis septentrionalis*): Suitable summer habitat (e.g. trees with a DBH of > 4” with exfoliating bark, hollow, etc.) for the northern long-eared bat does occur on the refuge; however, this bat species is not known to occur in any of the counties within Felsenthal NWR (USFW Arkansas Ecological Services-Revised Endangered Species Inventory 6/12/15).

Rabbitsfoot Mussel (*Quadrula cylindrical cylindrical*): Rabbitsfoot mussel is primarily an inhabitant of medium to large streams and rivers. It is widely distributed occurring in 13 of 15 states within its historical range. The majority of stable and reproducing populations left within its historical range occur in Arkansas. It usually occurs in shallow areas along the bank and adjacent shoals. Specimens may also occupy deep water runs. Bottom substrates generally include gravel with sand. This species seldom burrows but lies on its side instead. It uses shiners, or minnow species, as its host fish. Rabbitsfoot mussel is known to occur on Felsenthal NWR in the Saline River.

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
Pondberry <i>Lindera mellisifolia</i>	No impacts expected. No critical habitat designated.
Pink Mucket (pearly mussel) <i>Lampsilis abrupta</i>	No impacts expected. No critical habitat designated.
Red-cockaded Woodpecker <i>Picoides borealis</i>	No impacts expected. No critical habitat designated.
Winged Mapleleaf Mussel <i>Quadrula fragosa</i>	No impacts expected. No critical habitat designated.
Geocarpon <i>Geocarpon minimum</i>	No impacts expected. No critical habitat designated.
Ouachita Rock-Pocketbook <i>Arcidens wheeleri</i>	No impacts expected. No critical habitat designated.
Leopard Darter <i>Percina pantherina</i>	No impacts expected. No critical habitat designated.
Scaleshell <i>Leptodea leptodon</i>	No impacts expected. No critical habitat designated.
Northern Long-Eared Bat <i>Myotis septentrionalis</i>	No impacts expected. No critical habitat designated.
Rabbitsfoot Mussel <i>Quadrula cylindrical cylindrical</i>	No impacts expected. No critical habitat designated.

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

SPECIES/CRITICAL HABITAT	ACTIONS TO MITIGATE/MINIMIZE IMPACTS
Pondberry <i>Lindera mellisifolia</i>	Conduct periodic surveys in suitable habitat; document and notify refuge staff and partnering agencies and NGO's; and avoid if found to occur.
Pink Mucket (pearly mussel) <i>Lampsilis abrupta</i>	No mitigation actions required.
Red-cockaded Woodpecker <i>Picoides borealis</i>	No mitigation actions required.
Winged Mapleleaf Mussel <i>Quadrula fragosa</i>	No mitigation actions required.
Geocarpon	Conduct periodic surveys in suitable habitat; document and

<i>Geocarpon minimum</i>	notify refuge staff and partnering agencies and NGO's; and avoid if found to occur.
Ouachita Rock-Pocketbook <i>Arcidens wheeleri</i>	No mitigation actions required.
Leopard Darter <i>Percina pantherina</i>	No mitigation actions required.
Scaleshell <i>Leptodea leptodon</i>	No mitigation actions required.
Northern Long-Eared Bat <i>Myotis septentrionalis</i>	No mitigation actions required.
Rabbitsfoot Mussel <i>Quadrula cylindrical cylindrical</i>	No mitigation actions required.

VIII. Effect Determination and Response Requested:

SPECIES/ CRITICAL HABITAT	DETERMINATION ¹			RESPONSE ¹ REQUESTED
	NE	NA	AA	
Pondberry <i>Lindera mellisifolia</i>	X			Concurrence
Pink Mucket (pearly mussel) <i>Lampsilis abrupta</i>	X			Concurrence
Red-cockaded Woodpecker <i>Picoides borealis</i>	X			Concurrence
Winged Mapleleaf Mussel <i>Quadrula fragosa</i>	X			Concurrence
Geocarpon <i>Geocarpon minimum</i>	X			Concurrence
Ouachita Rock-Pocketbook <i>Arcidens wheeleri</i>	X			Concurrence
Leopard Darter <i>Percina pantherina</i>	X			Concurrence
Scaleshell <i>Leptodea leptodon</i>	X			Concurrence
Northern Long-Eared Bat <i>Myotis septentrionalis</i>	X			Concurrence
Rabbitsfoot Mussel <i>Quadrula cylindrical cylindrical</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 "Formal Consultation". Response Requested for proposed or candidate species is "Conference".

Signature (originating station)

Date

Project Leader

Title

IX. Reviewing Ecological Services Office Evaluation:

A. Concurrence X Nonconcurrence _____

B. Formal consultation required _____

C. Conference required _____

D. Informal conference required _____

B. Remarks (attach additional pages as needed):

Signature

Date

Title

Office