

# **Environmental Assessment**

## **Wichita Mountains Wildlife Refuge Hunt Plan**

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# **Environmental Assessment for Wichita Mountains Wildlife Refuge Hunt Plan**

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

## **1.0 Purpose and Need**

### **Proposed Action**

The U.S. Fish and Wildlife Service (Service) is proposing to open hunting opportunities for waterfowl (ducks, geese, coots), wild turkey, and the incidental take of coyote, and feral hogs while maintaining existing opportunities for white-tailed deer and elk on the Wichita Mountains Wildlife Refuge (WR or refuge) in accordance with the refuge's 2018 Hunt Plan and Comprehensive Conservation Plan (2013). The refuge developed a new 2018 hunt plan, replacing the refuge's current 1984 Hunt Plan, and proposes to open approximately 20,922 acres to duck, coot, geese, and wild turkey hunting and allow the harvest of feral hogs and coyotes during refuge controlled hunts. The refuge seeks the addition of these species to provide additional opportunities for sportsmen, and to more closely align the hunting program with Oklahoma Department of Wildlife Conservation (ODWC) regulations.

This proposed action is often iterative and evolves over time during the process as the agency refines its proposal and learns more from the public, tribes, and other agencies. Therefore, the final proposed action may be different from the original. The final decision on the proposed action will be made at the conclusion of the public comment period for the EA and the Draft 2019–2020 Wichita Mountains Wildlife Refuge Hunting Regulations.

### **Background**

National wildlife refuges are guided by the mission and goals of the National Wildlife Refuge System (NWRS), the purposes of an individual refuge, Service policy, and laws and international treaties. Relevant guidance includes the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations and Fish and Wildlife Service Manual.

The refuge was established pursuant to Presidential Proclamation 563, on June 2, 1905. The primary purpose of the refuge is “...for the protection of game animals and birds and shall be recognized as a breeding place thereof.”

The Wichita Mountains WR is a tract of 59,020 acres embracing a major portion of the ancient Wichita Mountains in southwestern Oklahoma. Protection of this area dates back to 1901 when it was established as a Forest Reserve by President McKinley and 1905 when President Roosevelt redesignated the area as the Wichita Forest and Game Preserve. The long history of preservation of the Wichita Mountains WR has protected this unique vast land as a reminder of southwestern Oklahoma's natural conditions prior to European settlement.

On October 23, 1970, the Wichita Mountains Wilderness Area was established by Public Law 91-504. It consists of two units totaling 8,570 acres: the popular Charons Garden Unit (5,723 acres) is located in the southwestern portion of the refuge, within the Public Use Area and the North Mountain Unit (2,847 acres) located in the north-central part of the refuge within the refuge's Special Use Area. The Special Use Area of the refuge was an administrative designation for an area with restricted public access intended to benefit natural conditions and allow for natural processes. The Special Use Area covers 34,932 acres of the northwest part of the refuge. The Public Use Area of the refuge was an administrative designation as an area for public access, intended to benefit public use opportunities, including hunting and fishing, and promote awareness of the refuge's wildlife and habitats. The Public Use Area covers 24,088 acres of the south and southeastern portions of the refuge.

The Wilderness Act of 1964 (Public Law 88-577, September 3, 1964) provides the following purposes for designated wilderness areas:

1. To secure an enduring resource of wilderness;
2. To protect and preserve the wilderness character of areas within the National Wilderness Preservation System; and
3. To administer (the area) for the use and enjoyment of the American people in a way that will leave them unimpaired for future use and enjoyment as wilderness.

Public hunts have been offered on the refuge since 1969 with the introduction of rifle hunting for Rocky Mountain elk and expanded to rifle hunting for white-tailed deer in 1984. Elk and deer hunting occurs throughout the refuge (10 hunt units; Attachment 1) with the exception of areas outside the boundary fence (974 acres), interior working pastures (1,764 acres), and areas with high public use, primarily around buildings, roads, public use facilities, and administrative facilities (2,831 acres). These public hunts have provided visitors with additional recreation opportunities on the refuge. All hunts are administered in cooperation with ODWC.

Additional management goals were established by the Wichita Mountains WR Comprehensive Conservation Plan (USFWS 2013). They include:

1. Improve ecoregion conservation through comprehensive and strategic refuge management and participation with landscape management partnerships;
2. Preserve the biological integrity of southern mixed-grass prairie and Cross Timbers habitats to enhance long-term resiliency of these habitats;
3. Manage to preserve the natural character of those refuge lands designated as Research Natural Areas;
4. Provide visitors a chance to enjoy a world-class, wildlife-focused experience through public use opportunities that educate and increase the quality of life for current and future generations and promote the long-term health of the refuge;

5. Manage to preserve the wilderness character of those refuge lands designated by Congress as part of the National Wilderness Preservation System;
6. Administer safe, well-maintained, and energy-efficient facilities that allow the public and staff to enjoy and support the purpose of the refuge and the mission of the NWRS; and
7. Identify and protect the archaeological, historical, and cultural resources on the refuge for the benefit of present and future generations.

The mission of the NWRS, as outlined by the National Wildlife Refuge System Administration Act (NWRSA), as amended by the National Wildlife Refuge System Improvement Act (16 U.S.C. 668dd et seq.), is to:

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

The NWRSA mandates the Secretary of the Interior in administering the System to (16 U.S.C. 668dd (a)(4):

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

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

A draft compatibility determination has been completed in conjunction with this hunt plan and the EA. Hunting and all associated program activities proposed in this plan are expected to be found compatible with the purposes of the refuge.

## **Purpose and Need for the Proposed Action**

The purpose of this proposed action is to increase hunting opportunities on Wichita Mountains WR. The need of the proposed action is to meet the Service's priorities and mandates as outlined by the NWRSA to "recognize compatible wildlife-dependent recreational uses as the priority general uses of the NWR" and "ensure that opportunities are provided within the NWR for compatible wildlife-dependent recreational uses" 16 U.S.C. 668dd(a)(4)). The Hunt Plan for the refuge was completed in January 1984 and requires updating. This action is also needed to effectively implement Secretarial Order 3356, which directs bureaus and offices within the Department of Interior (DOI), in collaboration with states, tribes, and territorial partners, to implement programs to enhance hunting, fishing, and recreational shooting opportunities on DOI-managed lands and waters, while also promoting conservation activities.

## **2.0 Alternatives**

### **Alternatives Considered**

This chapter discusses the alternatives considered for expanding hunting opportunities on the refuge.

#### Alternative A – Current Management [No Action Alternative]

Under the no action alternative, current refuge hunting opportunities for big game (elk and deer only) would continue and remain the same across the refuge. Big game hunting occurs in 10 units totaling 53,290 acres and will continue to be permitted through the ODWC controlled hunts program. Controlled deer and elk hunts would be a cooperative effort between ODWC and the refuge. ODWC would administer the random draw and issue permits to successful applicants. A \$20 (deer) and \$30 (elk) recreation fee would be paid to the Service. The refuge would determine the number of permits available based upon habitat conditions and results of annual deer and elk population surveys. Number of permits available would vary from year to year. Permits issued have ranged from 50–112 for deer and from 80–440 for elk, dependent upon annual production, herd sex ratios, and the success of previous hunts. Supported hunts would continue and deer and elk hunters would be required to attend a mandatory hunter orientation the day prior to the hunt and transportation to and from the field would be provided by group leaders who are ODWC or refuge employees or volunteers. Deer and elk hunts would be 2 ½ days in length with one deer hunt and up to 4 possible elk hunts per year. Hunters would be required to check harvested deer and elk through the refuge check station to attach a metal transportation tag before removal from the refuge. Deer and elk hunters would have to be at least 18 years of age by the date of the hunt to qualify.

Under the no action alternative, public use areas on the refuge may be closed during controlled deer and elk hunts. Public use areas hunted would be closed for 2 ½ days to other public use activities. Public use areas may be closed up to 12 ½ days each year for big game hunting. Other public use activities including environmental education (1,328 visits) and interpretive programming (11,951 visits) would not be impacted by the closure as those events would be scheduled around the hunting closure dates or held in areas of the refuge not closed for the controlled hunts. Popular public uses that may be affected by closures include wildlife observation (2,166,450 visits), photography (1,940,191 visits), fishing (11,700 visits), bicycling (9,750 visits), boating (11,700 visits), and recreational uses, including commercial interpretive tours,

commercial photography, jogging and strenuous walking, picnicking, rock sports, commercial rock sports, and hiking (45,200 visits).

Alternative B – Open Waterfowl, Wild Turkey, Feral Hog, and Coyote Hunting with Minor Changes to Big Game Hunting – [Proposed Action Alternative]

Under the Proposed Action Alternative, the hunting of elk and deer would remain similar to Alternative A with the following changes. The refuge would phase out hunter orientation prior to hunts and rely on providing information through web or app-based systems. To reduce administrative costs and to simplify the process for hunters, we would work with ODWC to study and implement other hunt access options, including walk-in hunting and limited use of personal vehicles off paved roads. Supported hunts would be phased out over a 5-year period and unsupported hunts, whereby hunters would access hunt units on their own and not via government vehicles or assistance, would begin. Minimum age requirements for controlled deer hunts would be changed from 18 to 16 years of age. Although no previous maximum number of hunters had been identified for deer and elk hunts, for logistical capacity reasons, no more than 100 permits would be issued for those hunts.

Wild turkey hunting would be opened on the refuge through controlled hunts in hunt Units A, B, C, D, E, G, and J, which would not all be hunted concurrently. Youth and spring turkey hunts would be conducted through the ODWC Controlled Hunts Program similarly to deer and elk hunts. Access to hunt units would be by walk-in only from established parking areas. Up to 12 permits would be issued based upon annual surveys and habitat conditions. Both controlled turkey hunts would be three days in length and held in May or April. Turkey hunting would be managed in accordance with state law except the only approved methods of take would be shotgun, muzzleloader, and bow; only lead free non-toxic shot would be allowed; and age requirements would differ.

Feral hog and coyote hunting would be opened during any refuge controlled hunt with no limit on the number taken. Hunters would have to have a permit for the controlled hunt and use the weapons allowed for that controlled hunt.

Waterfowl hunting would be opened on all refuge waters (e.g., lakes, pond, creeks), except Quanah Parker Lake, within hunt Units A, B, and J, on a first-come first-served basis. Approximately 540 water acres would be open to hunting for geese, ducks, mergansers, and coots. Season dates and general hunting regulations would follow those established by ODWC for Duck Zone 2 and statewide goose seasons, except they would be closed during elk/deer controlled hunts. Hunting hours would be from morning legal shooting hours until 1:00 pm, from the bank or by boat; jump shooting would not allowed. Waterfowl hunters would have to keep a signed refuge hunt tearsheet on their person in addition to all other state and federal requirements.

**Mitigation Measures to Avoid Conflicts**

In light of the heavy outdoor public use on the refuge, conflicts are expected between hunters and outdoor recreational users. Areas administratively closed during controlled hunts are clearly marked with “Area Beyond This Sign Closed” and “Controlled Hunt In Progress” signs.

Additionally, the refuge releases hunt announcements several weeks in advance of hunts, posts on social media, and posts on the refuge website.

Elk, white-tailed deer, coyote, and feral hog hunting would be regulated as controlled hunts with a majority of the hunting occurring in the Special Use Area (hunt Units C, D, E, F, G, H, I). Controlled deer and elk hunts generally occur in November, December, and January and account for less than 14 days total. These hunts occur during weekdays (Tuesday–Thursday), which are low use periods during the week.

Limited areas would be opened to youth and spring turkey and hunter numbers would be limited (12/hunt) through lottery draws administered by ODWC. Not all turkey hunt units would be utilized concurrently. Lead shot would not be allowed for turkey. Limited spring and youth turkey hunter numbers, spatial distribution of hunters (turkey hunt units spread over an estimated 40,208 acres), and sedentary nature of turkey hunting allows opportunities for hunters to avoid encountering non-hunters or other hunters.

Waterfowl hunting would be limited to hunt Units A, B, and J with limited shooting hours and closed during refuge controlled deer and elk hunts. Quannah Parker Lake, a popular photography, wildlife observation, fishing, and boating lake will not be open to waterfowl hunting. Closure of public use areas will not occur for waterfowl hunting. Jump shooting would also not be allowed, further reducing conflict. This alternative provides a recreational experience for the public while minimizing conflicts with controlled hunts and other visitors.

### **3.0 Affected Environment and Environmental Consequences**

#### **Affected Environment**

The refuge consists of a diverse ecosystem of Cross Timbers and the largest remaining stretch of native southern mixed-grass, which supports a diversity of wildlife species in southwestern Oklahoma. These species, including both game and non-game, are important contributors to the overall biodiversity of the Wichita Mountain WR. Wildlife species that occur on the refuge include 57 mammal species, 292 bird species, 19 amphibian species, 55 reptile species, and 33 fish species. The refuge serves a vital role in the management of the recently delisted black-capped vireo and supports the largest breeding population in Oklahoma. The refuge was established “*for the protection of game animals and birds and shall be recognized as a breeding place thereof.*”

The refuge is divided into three distinct terrestrial habitats: rocklands (2,474 acres), central mixed-grass prairie (30,941 acres), and Cross Timbers oak forest and woodland (24,702 acres). The central mixed-grass prairie contains elements from both shortgrass and tallgrass prairies with species densities and distributions controlled primarily by soil moisture and topography. The Cross Timbers habitat is characterized by a mosaic of forest, woodland, and savanna. The rockland habitats occur primarily on open and exposed mountaintops, southern slopes, and boulder slides and are characterized by shallow soils, sparse vegetation, and gabbro and granite rock formations. The refuge is at a higher elevation than the surrounding areas and is thereby situated at the top of the watershed. Natural aquatic classes on the refuge, such as creeks and streams, are intermittent and seasonal. Man-made reservoirs and ponds account for the largest

waterbodies on the refuge. Current and proposed hunting areas are located across all habitat types within the refuge. The resources described below are those that could be impacted directly or indirectly by the alternatives discussed in this document.

The refuge consists of approximately 92.22 square miles in Comanche county, Oklahoma (see map at Attachment 1).

For more information regarding the affected environment, please see section 3.3 of the refuge's 2013 Comprehensive Conservation Plan, which can be found here: [http://www.fws.gov/refuge/wichita\\_mountains](http://www.fws.gov/refuge/wichita_mountains).

### **Environmental Consequences of the Action**

This section analyzes the environmental consequences of the action on each affected resource, including direct and indirect effects. This EA only includes the written analyses of the environmental consequences on a resource when the impacts on that resource could be more than negligible and therefore considered an "affected resource." Any resources that will not be more than negligibly impacted by the action have been dismissed from further analyses.

#### **Impact Types:**

- *Direct effects* are those which are caused by the action and occur at the same time and place.
- *Indirect effects* are those which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.
- *Cumulative impacts* result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions.

The environmental consequences associated with each affected resource are listed in sections 3.1 through 3.5.

### **Cumulative Impact Analysis**

Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7).

Refuges, including Wichita Mountains Wildlife Refuge, conduct hunting programs within the framework of state and federal regulations. Population estimates of huntable species are developed at a regional, state, flyway, and continental scale. Hunting frameworks and take limits are set based upon these estimates. The proposed refuge hunting program rules would be the same as, or more restrictive than, hunting regulations throughout the State of Oklahoma. By maintaining hunting regulations that are the same as or more restrictive than the state, individual refuges ensure that they are maintaining seasons which are supportive of management on a more regional basis. Such an approach also provides consistency with large-scale population status and objectives.

State hunting areas near the refuge include Fort Cobb Wildlife Management Area (WMA), Walnut Slough Wetland Development Unit (WDU), Hackberry Flat WMA and WDU, Mountain Park WDU, Waurika WMA and WDU, and Walker Creek WDU. These areas offer numerous hunting opportunities including small game, waterfowl, turkey, and big game. Although the Proposed Action Alternative would increase hunting opportunities compared to the No Action Alternative, the slight increase in hunter activity would not have a significant cumulative effect locally, regionally, or nationally.

For more information on the national cumulative impacts of the Service’s hunting and fishing program on the National Wildlife Refuge System, see “Cumulative Impacts Report 2018–19 National Wildlife Refuge Proposed Hunting and Sport Fishing Openings.”

Listed below are brief descriptions of each resource affected by the alternatives considered and anticipated impacts.

**Affected Natural Resources and Anticipated Impacts of the No Action and Proposed Action Alternatives**

<b>Hunted Species – Rocky Mountain Elk</b>
<p><i>Regional Analysis</i></p> <p>Prior to European settlement, an estimated 10 million elk roamed throughout much of the United States (Rocky Mountain Elk Foundation 2018). Unregulated commercial and subsistence hunting threatened to eliminate the elk from its range. However, thanks in large part to the conservation movement of the early 1900s, many species, including elk, were provided some protections from over-hunting. At the same time, sanctuaries such as the Wichita Mountains were established to protect these species from near extinction. Elk populations have been restored throughout much of their range due to careful management and many successful reintroduction efforts. Today the Rocky Mountain Elk Foundation (RMEF) reports approximately one million elk in North America. During the 2017–2018 season, Oklahoma Department of Wildlife Conservation (ODWC) reports 407 elk were harvested throughout the state (Barber and Clark 2018).</p> <p><i>Local Analysis</i></p> <p>Reintroduction of elk on the refuge started in 1911 with one bull and four cows from Jackson Hole, Wyoming. In 1912, an additional 15 were introduced. The refuge elk herd has flourished and elk from the refuge have been used to reintroduce elk to eastern Oklahoma. In addition, many elk have emigrated from the refuge and have repopulated much of southwestern Oklahoma. During the 2017–2018 hunting season, elk were harvested in 16 counties in Oklahoma (Barber and Clark 2018). An aerial survey conducted by refuge staff in 2018 estimated the elk herd to be approximately 1,200 animals (McDonald 2018). The last five years of elk harvest data on the refuge indicate the annual average number of elk harvested was 63 individuals and an average success rate of 75 percent. In addition, the refuge accounts for 34 percent of the total elk harvest in Oklahoma. Because of the big game high fence surrounding the refuge and the limited egress/ingress of elk, appropriate harvest recommendations are necessary to manage this herd to ensure the hunting experience remains of the highest quality and to ensure population levels are appropriate for the habitat conditions. The recent rates of harvest have had minor impacts on the refuge elk population. The refuge</p>

will continue to support one of the premier controlled hunts in Oklahoma and will manage elk in a manner that contributes to the biological integrity and environmental health of the resources to be sustained.

### **Direct and Indirect Impacts**

#### Alternative A (No Action Alternative)

Annually, 50–200 elk are harvested depending upon the number of hunts each year. The average harvest for the last 20 years is 54 animals, with 63 animals in the 5-year average. An aerial survey conducted by refuge staff in 2018 estimated the elk herd to be approximately 1,200 animals (McDonald 2018). Annual harvest of elk is necessary to maintain the biological integrity of habitat and reduce the negative consequences of over-population (i.e., disease, starvation, habitat degradation), as the refuge is surrounded by a high big game fence that limits the movement of elk in and out of the refuge. The modern rates of harvest have maintained a steady and stable refuge elk population, though slightly rising annually over the last 5 years based upon primarily observational data. Hunting causes direct mortality of elk resulting in a short-term negative impact to individuals, but the hunt programs provides long-term beneficial impacts to elk, other species, and habitats by maintaining the elk population at the carrying capacity of the refuge.

#### Alternative B (Proposed Action Alternative)

Impacts would be the same as described in Alternative A.

### **Hunted Species – White-tailed Deer**

#### *Regional Analysis*

In 1917, the statewide deer population in Oklahoma was estimated at 500 animals and by 1922, all deer hunting was prohibited (ODWC 2018). Very limited deer seasons were authorized through the 1930s and 1940s. In the early 1940s, active restoration efforts began and from 1947 to 1972, nearly 9,000 deer were trapped and relocated within the state, most of which originated from the refuge and McAlester Army Ammunition Plant (Masters et al. 1995). By 1954, due to successes in restoration efforts, the first statewide gun deer season was held, resulting in 1,487 harvested bucks (ODWC 2018). Harvest reports from the 2017–2018 season indicated a total harvest of over 107,000 deer statewide; of that, 593 were reported for Comanche County (Barber and Clark 2018).

#### *Local Analysis*

The refuge hosts one of the more popular controlled deer hunts in the state and permit availability is based on annual population estimates. Annual surveys conducted by refuge staff estimate the current deer population to be approximately 500 animals with a 5-year average of approximately 700 animals. Carrying capacity for white-tailed deer in Oklahoma ranges from 43 deer per square mile on highly productive sites with deep rich soils to 5 deer per square mile on low productivity sites with shallow droughty soils and average across the state of 18 deer per square mile (Masters et al. 1995). While the refuge is 59,020 acres, only 24,188 acres are representative of quality deer habitat and the refuge currently supports 13 deer per square mile. During the 2017 refuge deer hunt, 47 hunters harvested 21 deer (12 bucks and 9 does) and an average of 29 deer over the last 5 years. While harvest rates are low and a limited number of permits are available each year, the hunting experience is of the highest quality, not

only in terms of overall experience, but potential quality of bucks harvested. Because of the big game high fence surrounding the refuge and the limited egress/ingress of deer, appropriate harvest recommendations are necessary to ensure the hunting experience remains of the highest quality and to ensure population levels are appropriate for the habitat conditions.

**Direct and Indirect Impacts**

Alternative A (No Action Alternative)

Annual surveys conducted by refuge staff estimate the current deer population to be approximately 500 animals with a 5-year average of approximately 700 animals. Annually, 20–65 deer are harvested depending upon the number of permits issued and hunter participation. The 20-year average harvest is 42 deer and the 5-year average is 29 deer. Annual harvest of deer is necessary to maintain the biological integrity of habitats and reduce the negative consequences of over-population (i.e., disease, starvation, habitat degradation), as the refuge is surrounded by a high big game fence that limits the movement of deer in and out of the refuge. Currently, the refuge supports 13 deer per square mile on 24,188 acres of quality deer habitat. Hunting results in the direct mortality of deer resulting in a short-term negative impact to individuals, but the hunt programs provides long-term beneficial impacts to deer, other species, and habitats by maintaining the deer population at the carrying capacity of the refuge. The impact of harvest from the refuge is negligible within the context of deer harvest within Oklahoma as harvest rates are low and a limited number of permits are available each year.

Alternative B (Proposed Action Alternative)

Impacts would be the same as described in Alternative A.

**Hunted Species – Feral Hog**

Studies of habitat competition between feral hogs and other wildlife have not been directly studied on the refuge. However, as a predator, feral hogs eat salamanders, frogs, snakes, turtles, rodents, eggs and chicks of ground-nesting birds, and white-tailed deer fawns (Hellgren 1993). Tolleson et al. (1993) concluded that feral hogs could have detrimental effects on bobwhite quail populations depending upon density of quail and feral hogs, quail nesting cover, and quantity and diversity of other hog food sources. White-tailed deer will avoid natural foraging areas that are utilized by feral hogs (Tolleson et al. 1995). Yarrow and Kroll (1989) reported that competition for mast and forage resources occurs seasonally between deer and hogs. High fecundity and omnivorous feeding habits allow for quick assimilation into most habitats followed by rapid population growth and, consequently, adverse effects on ecosystem. Feral hogs also cause shifts in dominant plant species, reductions of forest regeneration, and the possible extirpation of many species of concern. They degrade ecosystems through predation/competition with native fauna, grazing on native plants, and physically altering habitats by “rooting.” Rooting creates large, disturbed areas that can lead to extensive erosion, destruction of native species, facilitation of invasion by non-native, noxious weeds (Sweitzer and Van Vuran 2002), and harming both water and mineral cycles. Because of the prolific nature of feral hogs, hunting alone is not a viable option to control the population. As such, the refuge will continue with aggressive control techniques (e.g., aerial gunning, trapping, shooting) in addition to allowing the incidental take of feral

hogs in conjunction with hunting opportunities on the refuge. Current population management of feral hogs is expected to reduce interspecies competition within available habitat.

### **Direct and Indirect Impacts**

#### Alternative A (No Action Alternative)

Under this alternative, the refuge would remain closed to recreational feral hog hunting. Current refuge feral hog management activities (aerial gunning, trapping, opportunistic shooting) remove between 150–350 hogs annually and these activities would continue. This alternative would result in fewer feral hogs being removed from the refuge, which would result in continued negative impacts associated with habitat degradation and the predation of native species including turkeys. The negative impacts of not hunting feral hogs are anticipated to be negligible due to other control activities the refuge undertakes.

#### Alternative B (Proposed Action Alternative)

Under this alternative, the refuge would be opened to the incidental take of feral hogs during controlled hunts for elk, deer, and turkey. The refuge predicts approximately 2–10 feral hogs would be harvested annually. Current refuge feral hog management activities (aerial gunning, trapping, and opportunistic shooting) remove 150–350 hogs annually and these activities will continue. Hunting feral hogs would have a minor positive impact on reducing the overall population of hogs on the refuge, which would improve conditions for other wildlife through reduced habitat quality degradation.

### **Hunted Species – Coyote**

#### *Regional Analysis*

The coyote was historically found on the Great Plains of North America, but is now found throughout North America due to range expansion and translocation by hounds' men (Butfiloski and Baker 2004). Coyote populations throughout North America have continued to expand, despite man's attempt to control them. The coyote occurs statewide in Oklahoma and thrives in a variety of habitat types (Caire et al. 1989). The coyote is often viewed as a nuisance predator in Oklahoma, but they are highly intelligent and play an important role in the natural ecosystem. They are remarkably adaptable, and therefore management of the species through hunting and trapping is beneficial. In Oklahoma, coyotes are open to hunting year-round with no daily limit or season limit. There is no available population data available for coyote in Oklahoma, only harvest numbers from 2003–2016 (Jager 2017).

#### *Local Analysis*

Studies of resource competition and predation between coyotes and other wildlife species have been well documented on the refuge (Halloran and Glass 1959; Holle 1977; Litvaitis and Shaw 1980; Litvaitis 1981). Coyotes are the primary large carnivore on the refuge and allow for natural processes to occur within the refuge ecosystem. Throughout much of the local area, coyotes are considered to be in direct conflict with livestock production, and shooting and trapping are commonly used to control the population. On the refuge, population indices are tracked annually during deer surveys. Trends fluctuate widely from year to year, presumably following trends in prey abundance. Refuge research has shown that coyotes prey upon rodents, birds, elk, deer, and cattle (Holle 1977; Litvaitis 1981) and change seasonally based upon prey availability. Coyote trend data, including observational, on the refuge suggests

sufficient numbers to support limited hunting opportunities while still allowing for natural processes within the refuge.

### **Direct and Indirect Impacts**

#### Alternative A (No Action Alternative)

Under this alternative, the refuge would remain closed to coyote hunting. Coyotes prey upon a wide array of wildlife on the refuge (Holle 1977; Litvaitis and Shaw 1980; Litvaitis 1981), directly compete with the bobcat for prey resources (Litvaitis 1981), and seasonally prey heavily upon deer fawns (Garner 1976). Coyotes are not overly abundant on the refuge and population indices fluctuate widely, presumably following trends in prey abundance. At the current population levels, competition/predation between coyotes and other wildlife species are not thought to be limiting factors. No impacts are expected.

#### Alternative B (Proposed Action Alternative)

Under this alternative, the refuge would be opened to the incidental take of coyote during controlled hunts for elk, deer, and turkey. The refuge predicts approximately 10 individuals would be harvested annually. Hunting would not have a significant impact on the local, regional, or national populations of coyote because the percentage taken is expected to be low. Natural reproduction will likely be higher than the hunting harvest rate; therefore, only negligible short-term negative impacts to the coyote or prey population are expected.

### **Hunted Species – Waterfowl**

#### *Regional Analysis*

Waterfowl populations throughout the continental United States are managed through an administrative process known as flyways, of which there are four (Atlantic, Mississippi, Central, and Pacific). Ducks follow these ancient pathways from their breeding grounds to wintering areas. The Central Flyway is composed of the states of Montana, Wyoming, Colorado, New Mexico, Texas, Oklahoma, Kansas, Nebraska, South Dakota, and North Dakota, and the Canadian provinces of Alberta, Saskatchewan, and the Northwest Territories. The total duck population for 2018 was estimated at 41.2 million breeding ducks in the traditional survey area, which is 13 percent lower than last year's estimate of 47.3 million, but still 17 percent above the long-term average. The Migratory Bird Hunting Activity and Harvest Report shows that 11.6 million ducks were harvested in the United States in the 2016–2017 hunting season, increasing to 12.1 million ducks harvested in the 2017–18 season (Raftovich et al. 2018). The estimated average annual duck harvest for the Central Flyway was 2.4 million birds in 2017, which represent approximately 20 percent of the estimated average annual U.S. harvest of 12.1 million ducks (Raftovich et al. 2017). In Oklahoma, there were an estimated 197,400 ducks harvested in 2017, which represents approximately 8 percent of the estimated annual harvest of 2.4 million birds in the Central Flyway, and 2 percent of the average annual harvest of 12.1 million ducks in the United States.

#### *Local Analysis*

The refuge is not considered a waterfowl mecca, but numerous species of waterfowl begin arriving in September, some remaining through winter. While most birds use the refuge for only a short time, they are dependent upon the area and food resources. Waterfowl species commonly observed on the refuge include gadwall, American widgeon, ring-necked duck,

Canada geese, mallard, northern pintail, green-winged teal, and bufflehead. On average, the refuge attracts 1,740 total waterfowl during the peak of fall migration (mid-November). ODWC sets harvest regulations within the limits set by the Service.

**Direct and Indirect Impacts**

Alternative A (No Action Alternative)

Under this alternative, the refuge would remain closed to waterfowl hunting. Temporary and negligible disturbance is possible from elk and deer hunters passing near water bodies holding birds. However, these disturbances are not during nesting seasons. There are no expected significant impacts to waterfowl species.

Alternative B (Proposed Action Alternative)

Because of the limited amount of quality wetland habitat for waterfowl and the low numbers of hunters anticipated, it is estimated that the waterfowl harvest on the refuge would be minimal. This level of harvest would not have a significant impact on the local, regional, or national populations because the percentage taken would be low. Temporary and minor disturbance is possible from hunters passing near or using water bodies holding birds. Turkey hunter disturbance to nesting birds that result in mortality is unlikely as turkey hunters primarily and typically use dryland habitat and only a maximum of 12 turkey tags would be issued. Only minor short-term adverse impacts are expected to waterfowl species.

**Hunted Species – Wild Turkey**

*Regional Analysis*

Wild turkeys are found throughout much of North America (Figure 2). Oklahoma hosts three sub-species of wild turkey: the Eastern, Rio Grande, and Merriam's (Figure 3). The sub-species found on the refuge is the Rio Grande wild turkey, which has an estimated population of 112,000 birds statewide in Oklahoma (ODWC communication – Rod Smith, Southwest Region Supervisor, 2014). Historically, Rio Grande wild turkeys were found throughout western Oklahoma. Habitat loss and uncontrolled hunting resulted in a turkey population that was assumed extirpated from Oklahoma by the late 1930s (Rakowski and Elmore 2017). The ODWC worked with landowners and conducted restocking activities, successfully restoring the Rio Grande wild turkey in Oklahoma more than a decade ago. By the 1960s and 1970s, restoration efforts were successful using wild trapped birds from Arkansas and Missouri (Bidwell 1985).

*Local Analysis*

Currently, turkey populations are stable to growing both locally and throughout much of the State. Observational data suggests the turkey population is of sufficient numbers to sustain optimum population levels for priority refuge objectives other than hunting. Several winter roosts flocks of 80–100 can be found on the refuge.

**Direct and Indirect Impacts**

Alternative A (No Action Alternative)

Under this alternative, the refuge would remain closed to wild turkey hunting and there would be no impacts to the turkey population from hunting. Population dynamics and fluctuations

will continue to occur. If the turkey population increases, competition with other wildlife species and their habitats could occur, negatively impacting the turkey population.

Alternative B (Proposed Action Alternative)

Under this alternative, the refuge would be newly opened to turkey hunting. Turkeys are not overly abundant on the refuge even though excellent habitat is present. Recruitment of young birds is likely hampered by predation from coyotes and feral hogs. Observational data suggests several winter roost flocks of 80–100 and indicate a stable to slightly increasing resident population. The refuge predicts approximately 12 individuals would be harvested annually. Hunting would have an insignificant negative impact on the local, regional, or national populations of wild turkey because the percentage taken is expected to be low.

**Other Wildlife and Aquatic Species**

In a region and transition zone where the distributions of eastern and western wildlife species overlap, the refuge supports habitats high in biodiversity. From the prairie habitats to oak savannas and rugged granite peaks, the refuge offers a diversity of animal and plant communities. Vertebrate wildlife species that occur on the refuge include game and nongame species, 57 mammal species, 292 bird species, 19 amphibian species, 55 reptile species, and 33 fish species.

**Direct and Indirect Impacts**

Alternative A (No Action Alternative)

This alternative results in some short-term negative impacts on small mammals, birds, and other wildlife due to minor disturbance in areas where human access for hunting occurs. While there is typically an impact to the majority of wildlife species whenever human presence is noted, many animals have developed a tolerance to humans and vehicles. Many animals remain motionless until the perceived threat from visitors has dissipated. As a result, the wildlife found near the roads has grown somewhat accustomed to the daily activities that occur at those locations throughout the day, and there would be no anticipated change in diversity or abundance of wildlife that currently use the area. Deer and elk hunting would not occur April–May during the active breeding season for most birds on the refuge, which limits impacts to those species.

Feral hogs have an extremely high reproduction rate, compete with native wildlife for resources, and cause direct wildlife mortality through nest predation and opportunistic consumption of birds, reptiles, and amphibians. Feral hog are a vector of many diseases that can be contracted by other animals. Physical damage as well as the establishment of invasive plant species would significantly degrade habitat quality. Degraded habitat indirectly affects wildlife populations, decreasing availability of forage and nest sites and/or alteration of important habitat structural components required by certain species. Any increase in population would lead to further adverse impacts on other wildlife species. Feral hog impacts on soil resources can have an adverse effect on aquatic wildlife species where erosion occurs from feral hog rooting and wallowing activities.

Alternative B (Proposed Action Alternative)

There would be an expected increase in overall disturbance to wildlife with additional hunting opportunities. Some resident mammals and birds would be displaced from certain hunt units, but could find refuge in adjacent areas or areas closed to hunting. Increased hunting may result in additional short-term disturbance to wildlife over a larger area, since additional units would be open to hunting beyond elk and deer. These impacts are expected to be minimal and substantially less than the impacts from other current public uses. This includes temporary displacement of turkey, waterfowl, and other resident wildlife from foot traffic moving through the area. Increased hunting may result in additional short-term disturbance over a longer period of time, since additional species would be open to hunting. However, the Proposed Action would keep some hunt units closed to waterfowl and spring turkey, which may minimize overall disturbance. Spring and youth turkey season is late-March through early May. To offset this impact, 32 percent of the refuge would remain closed to turkey hunting to provide breeding and nesting habitat for migratory birds with minimal disturbance. Youth and spring turkey hunting seasons will be short (two 3-day hunts), and hunter numbers would be limited. There may be a negligible improvement to habitat quality and quantity for native species from increased removal of feral hogs from the refuge.

**Threatened and Endangered Species and other Special Status Species**

No threatened or endangered species reside or are likely to be present on the refuge during any of the hunting seasons. There has been no documented direct or indirect conflict between the species hunted on the refuge and any threatened or endangered species either present or potentially present. The recently delisted black-capped vireo begins arriving to the refuge in early April, which would coincide with spring turkey hunting.

**Direct and Indirect Impacts**

No threatened or endangered species are likely to be present at the refuge during any of the hunting seasons. The recently delisted black-capped vireo begins arriving on the refuge in early April, which would coincide with spring turkey hunting. However, these activities are unlikely to impact them because the primary nesting habitat is generally in areas not likely to be occupied by turkey hunters. No negative impacts are expected.

**Vegetation**

The refuge owes its character to the range of mountains from where it gets its name. These topographic features and the climate of the region have created habitats of mixed-grass prairies, Cross Timbers, and rocklands that define the refuge and the biota that live there. The habitats of the Wichita Mountains are so unusual and distinct that it was once designated as its own biotic district (Blair and Hubbell 1938). The refuge lies at a vegetational crossroads or transition along the eastern edge of the southern Great Plains region. The mixed-grass prairies are dominated by little bluestem (*Schizachyrium scoparium*), Indiangrass (*Sorghastrum nutans*), big bluestem (*Andropogon gerardii*), switchgrass (*Panicum virgatum*), sideoats grama (*Bouteloua curtipendula*), hairy grama (*Bouteloua hirsute*), blue grama (*Bouteloua gracilis*), silver bluestem (*Bothriochloa laguroides*), buffalograss (*Bouteloua dactyloides*), and Canada wildrye (*Elymus canadensis*). The Cross Timber forests are dominated by post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), and eastern red cedar (*Juniperus virginiana*).

While the mixed-grass prairie areas in the refuge are primarily herbaceous, oaks and other trees occur in some areas protected from fire due to topographic position. Additionally, the mixed-grass prairie is dotted by thickets of plum and sumac. Riparian areas in the central mixed-grass prairie contain species such as cottonwood (*Populus deltoides*), ash (*Fraxinus* spp.), American elm (*Ulmus americana*), and buttonbush (*Cephalanthus occidentalis*). The Cross Timbers are one of the largest ecosystem types in the State of Oklahoma, with the majority of this ecotype located in the central and eastern parts of the state. The Cross Timbers habitat is defined by a varying mixture and densities of oaks and red cedar. On the refuge, post oak is the most common species, followed by blackjack oak and red cedar (Buck 1964). The central mixed-grass prairie habitat encompasses 30,941 acres of refuge lands and Cross Timbers habitat encompasses 24,702 acres.

The Wichita Mountains Wildlife Refuge staff treats non-native invasive species annually to prevent the degradation of natural communities. Invasive species can have a negative effect on the habitat and modify both the appearance and the utility of the landscape. The refuge has demonstrated a correlation between the density and distribution of invasive plants and their occurrence relative to roads and trails. If left unmanaged, these threats could contribute to diminished quality and quantity of the outdoor recreational experience.

### **Direct and Indirect Impacts**

#### Alternative A (No Action Alternative)

Minor long-term adverse impacts are expected under this alternative. Because hunter numbers are limited and hunt duration is short, impacts due to trampling are expected to be minimal. The spread of invasive species through hunter access is a minor adverse impact because access to hunt units is controlled by the refuge and no personal vehicle access is allowed. Beneficial impacts to vegetation are expected with the reduction of elk and deer populations, which can cause habitat degradation and over-grazing if left unmanaged.

#### Alternative B (Proposed Action Alternative)

Under this alternative, minor long-term impacts are expected to be similar to Alternative A. There is potential for localized damage and increased invasive species spread due to increased foot traffic by hunters with additional hunting opportunities. These impacts would be minimized due to the limited number of turkey hunters, the expected low number of waterfowl hunters, and new vehicle cleaning requirements for big game hunters during unsupported hunts. In addition, the increase in hunter visits compared to overall public use on the refuge is considered insignificant.

### **Geology and Soils**

The geology of this region represents some of the oldest geologic strata outcroppings in Oklahoma and are primarily of igneous rocks such as granite and rhyolite. The maximum elevation is approximately 2,479 feet at the summit of Mt. Pinchot and the minimum elevation is approximately 1,280 feet at the base of Lake Elmer Thomas Dam. Rocky outcroppings are common. Soils in the area of potential effect are largely in the Foard, Tillman, Vernon, and Hollister soil series, each with extensive distribution in the region. The Foard series are very deep and well-drained soils occurring on nearly level to gently sloping broad summits and shoulder slopes of terrace pediments. The Tillman series are very deep and well-drained soils

found on alluvial plains and alluvial plain remnants. Vernon soils are well-drained, moderately deep soils over claystone bedrock on broad, gently sloping to steep plains and escarpments. Hollister soils are very deep and well-drained, occurring on broad, flat, plain terraces.

**Direct and Indirect Impacts**

Alternative A (No Action Alternative)

Impacts associated with this alternative are expected to be short-term and negligible. Hunter densities are low across the refuge and vehicle traffic associated with hunts is confined to established roads.

Alternative B (Proposed Action Alternative)

Impacts associated with this alternative would result in a minimal increase in the disturbance to soils. Although hunter traffic may increase, vehicles would continue to be confined to public access roads. In addition, the increase in hunter visits compared to overall public use on the refuge is considered insignificant.

**Air Quality**

The refuge Wilderness Areas (Charons Garden and North Mountain) are designated as a Class I Clean Air Areas, by the Clean Air Act. The refuge coordinates with the Service's Air Quality Branch to ensure appropriate and consistent air quality monitoring at, but not limited to, the Interagency Monitoring of Protected Visual Environments (IMPROVE) station to ensure protection of the refuge's Class I status. Air quality on the refuge is primarily influenced by off-site sources, carried by prevailing southeast transport winds. All paved roads are heavily used by the public throughout the year. Most dirt roads are used sporadically by refuge staff and during controlled hunts, resulting in negligible amounts of dust and vehicle emissions.

**Direct and Indirect Impacts**

Under both alternatives, negligible negative impacts to air quality exist due to vehicle emissions from hunter visits. In 2018, 529 hunt visits took place on the refuge, and the addition of turkey and waterfowl hunts is not expected to significantly increase hunt visits in the future. Any potential increase in hunter visits compared to overall public use on the refuge is considered insignificant.

**Water Resources**

The Wichita Mountains Wildlife Refuge is at a higher elevation than the surrounding areas and is thereby situated at the top of the watershed. Natural aquatic classes on the refuge such as creeks and streams are intermittent and seasonal. Man-made reservoirs, ponds, and associated wetlands account for the largest water bodies on the refuge and are the only year-round water sources. Since the refuge is under a fenced system, large herbivores would not have access to water during dry seasons or drought without these reservoirs.

**Direct and Indirect Impacts**

Alternative A (No Action Alternative)

Current hunting activities are not known to have any direct effects on water quality. However, there may indirect beneficial effects as a result of maintaining elk and deer herds at sustainable levels. The rooting and digging behavior of feral hogs increases the potential for soil erosion, which could lead to decreased water quality due to sediment deposition. Impacts associated with this alternative are expected to be short-term and negligible as hunter densities are low across the refuge.

Alternative B (Proposed Action Alternative)

Impacts to water resources are expected to be similar to Alterative A. A decrease in the feral hog population as a result of increased removal may lead to a negligible decrease in turbidity and disturbed sites on which invasive plant species thrive. Introduction of waterfowl hunting on the refuge may potentially decrease water quality in the units newly opened to waterfowl hunting from boat use. The adverse impacts associated from potential increased boat use would be negligible when compared the approximately 11,700 boating visits received in 2018. Increases in hunter visits compared to overall public use on the refuge are considered insignificant.

**Wilderness and Special Designation Areas**

On October 23, 1970, the Wichita Mountains Wilderness Area was established by Public Law 91-504. It consists of two units totaling 8,570 acres. The popular Charons Garden Unit (5,723 acres) is located in the southwestern portion of the refuge within the Public Use Area; the North Mountain Unit (2,847 acres) is located in the north-central part of the refuge within the refuge’s Special Use Area. The Special Use Area of the refuge was an administrative designation for an area with restricted public access intended to benefit natural conditions and allow for natural processes. The Special Use Area covers 34,932 acres of the northwest part of the refuge. The Public Use Area of the refuge was an administrative designation as an area for public access, intended to benefit public use opportunities, including hunting and fishing, and promote awareness of the refuge’s wildlife and habitats. The Public Use Area covers 24,088 acres of the south and southeastern portions of the refuge.

**Direct and Indirect Impacts**

Alternative A (No Action Alternative)

Elk and white-tailed deer hunting currently occurs within the Wichita Mountains Wilderness Area boundaries; however, access is generally limited to 10 or fewer hunters per hunt. Hunting within the Wichita Mountains Wilderness Area will be in accordance with the provisions, requirements and spirit of the Wilderness Act. Adverse impacts to wilderness characteristics, if any, are considered insignificant. Hunting would continue to occur in Wilderness, Public Use, and Special Use land designations.

Alternative B (Proposed Action Alternative)

It is not expected that Alternative B would lead to higher hunter use of the Wichita Mountains Wilderness Area due to terrain and habitat limitations for turkey and waterfowl hunting within the Wilderness boundary. Impacts would be similar under either alternative.

## Affected Visitor Use and Experience Resources and Anticipated Impacts of the No Action and Proposed Action Alternatives

### Visitor Use and Experience

The refuge hosts approximately 2 million visitors per year, with 171,945 visits at the visitor center in 2018. These visitors (annual approximate visits in parenthesis) engage in a variety of recreational activities including but not limited to hunting (529), hiking (195,000), rock climbing (4,000), scuba diving (100), fishing (11,700), wildlife observation (2,166,450), and wildlife photography (1,365,000). In an effort to minimize conflicts with priority non-hunting recreational uses outlined in the National Wildlife Refuge Improvement Act, and for public safety, the refuge designates areas open to hunting. The Public Use Area normally open to visitors is comprised of approximately 24,088 acres of the south and southeastern portions of the refuge. The highest use areas (approximately 2,831 acres) have been identified and closed to all hunting in order to provide outdoor recreation opportunities to the non-hunting public. At least one other hunt unit area within the Public Use Areas remains open for other public use activities. The refuge releases hunt announcements several weeks in advance of hunts, posts on social media, and posts on the refuge website. In addition, closure signs are posted in numerous locations, including within the visitor center.

### Direct and Indirect Impacts

#### Alternative A (No Action Alternative)

During refuge controlled hunts (elk and deer), hunt units within the Public Use Area are closed to other refuge activities while the hunts are in progress. These closures are 2 1/2 days long during the middle of the week for a total of 14 days annually. Overall, hunting impacts of Alternative A to visitor services or other recreation opportunities are considered negative, short-term and localized since other parts of the refuge are available for use by non-hunters (other wildlife-dependent recreation users). Conflicts between hunters and non-hunters are anticipated to be similar to the conflicts between other user groups (i.e., between hikers and photographers) which are minor, adverse and short-term.

#### Alternative B (Proposed Action Alternative)

The entire refuge would be open to some form of hunting with the exception of refuge lands outside the refuge boundary fence, office areas, and areas with high public use, primarily around buildings, roads, and public use facilities. All refuge hunt units would be open for controlled elk and deer hunting (ODWC controlled hunt permit required); waterfowl hunting would be open on all refuge waters (e.g., lakes, pond, creeks), except Quannah Parker Lake, within hunt Units A, B, and J (refuge hunt permit required); and youth / spring turkey hunt will be open in hunt Units A, B, C, D, E, G, and J (ODWC controlled hunt permit required).

Visitation to the refuge is expected to approach or slightly exceed 2 million visitors in 2018–2019. Visitation occurs throughout the year. The average monthly visitation is 160,000 people, with May being the highest month with over 164,000 visitors. In light of the heavy outdoor public use on the refuge, conflicts are expected between hunters and other outdoor recreational users. During the waterfowl season and the spring turkey season, the refuge would remain open to other public use activities. Turkey hunters would be assigned specific units, but not all hunt units may be used concurrently, providing areas for other recreational users to recreate apart from hunters. However, short-term adverse impacts are most likely to

be experienced during the spring turkey season (e.g., April/May), which are the highest public use periods at the refuge. Based on comments received during the CCP (2013), hunting has previously been allowed on Wichita Mountains WR for many years and little negative reaction is expected regarding the continuation or expansion of controlled elk and deer hunts. However, we expect some negative public response to the turkey and waterfowl hunts. Some individuals may have concerns with spring turkey hunting in the public use area as this season is during some of the highest public use periods on the refuge.

Additional concerns for conflict exist in the opening of the Special Use Area to a new hunting opportunity. Typically closed to the public, expanding hunter access to this area may create the potential for pushback from the public. The Special Use Area is otherwise only open to the public for deer and elk controlled hunts and refuge-led wildlife tours.

### **Affected Cultural Resources and Anticipated Impacts of the No Action and Proposed Action Alternatives**

#### **Cultural Resources**

Periods of human occupation throughout Oklahoma have been heavily documented and extend from the widely accepted Clovis complex (possibly even pre-Clovis) forward. Consistent with much of its surroundings, assessments of the cultural resources at Wichita Mountains reveals a rich collection of archaeological and historical sites. While the refuge has never been fully surveyed, there have been a number of studies that have identified potential sites and documented existing sites spanning from prehistory, through Western contact and expansion, and into modern day. The largest of these surveys (Bastain 1966) did not evaluate many of these sites for inclusion into the National Register of Historic Places (NRHP). Since that time, few sites have been professionally revisited over the last 50 years denoting their eligibility for addition to the NRHP as undetermined or unknown.

Currently, five properties have been nominated to the NRHP: Boulder Cabin, Buffalo Lodge, Cedar Creek Arrastra, Ferguson House, and Ingram House. Each of these sites is a product of historic Euroamerican development. The built structures reflect architecture consistent with settlement and Euroamerican occupation of the Wichita Mountains in the early twentieth century. These historic structures are, for the most part, well known and well preserved. While not included in the NRHP, additional historic properties exist from the 1930s CCC/WPA programs. To date, no recommendation has been made to include these resources on the NRHP, but they do exist as part of a wider historic landscape and may need further long-term consideration.

Prehistoric, archaeological sites across the refuge have received minimal monitoring and management. Beyond their initial survey, the majority of documented locations have not been revisited. Site conditions are largely unknown; as such, adverse impacts are unknown. Based upon available information, however, the majority of the approximately 45 sites are believed to be late Archaic (c. 5,000 BC–1,000 BC) and/or Plains Woodland (c. 1000 BC–1400 AD) in nature. These locations were documented in varying conditions from “excellent, subsurface

deposits demonstrated” to “disturbed” as a result of erosion. Several sites offered up small collections of materials that can be found at the Sam Noble Museum in Norman, OK.

**Direct and Indirect Impacts**

Alternative A (No Action Alternative)

Under Current Management, no adverse impacts have been reported in the past and no significant change is expected. The current hunting program produces little ground disturbance.

Alternative B (Proposed Action Alternative)

Under the Proposed Alternative, there would be a potential increases in adverse impacts to cultural resources from expanded hunt opportunities on the refuge. This would likely be offset by reductions in other uses due to temporary closures during hunts as the majority of visitation the refuge receives is from non-hunting activities. Any impacts are expected to be negligible.

**Affected Refuge Management and Operations Resources and Anticipated Impacts of the No Action and Proposed Action Alternatives**

**Refuge Management and Operations**

**Administration**

The refuge receives funding and staffing for operations, infrastructure, and maintenance. Annual hunt administration costs for Wichita Mountains WR, including salary, equipment, law enforcement, brochures, collection of hunt data, and analysis of biological information, come directly from refuge funds. Funding specifically for hunts has not been allocated, although funds are available through hunter fees.

For many years, the refuge has planned and provided for elk and deer hunting opportunities, and the hunts are scheduled well in advance to minimize administrative conflicts. Refuge management sets priorities, allowing refuge staff sufficient time to administer and coordinate the hunting program. Additional assistance, if needed, is sought from ODWC and other refuges.

The enforcement of refuge and state hunting regulations, trespass, and other public use violations normally associated with management of a national wildlife refuge is the responsibility of commissioned federal wildlife officers. Federal wildlife officers cooperate with, and are assisted by, local, county, state and federal law enforcement agencies, including state game wardens. Wichita Mountains WR has proprietary jurisdiction; state and county law enforcement agencies have jurisdiction on refuge lands. Medicine Park and Cache are neighboring cities that have authority and jurisdiction to enforce refuge regulations through an MOU. The refuge staff regularly meets with various federal, state, county, and local law enforcement agencies to share information, assist with investigating unlawful activities, and coordinate patrols.

Potential for conflict with refuge management and operations activities occurs in areas where habitat management treatments are conducted (prescribed fire, invasive plant management).

Occasionally, an area open to hunting is proposed for a management activity that must have specific timing and weather conditions and cannot be rescheduled, such as prescribed fire. Typically, a notice of this activity is posted on the refuge website and posted in the visitor center. Signs of the closure of a unit are posted around the area to ensure visitor do not enter the unit. The unit is also scouted by refuge staff to ensure the unit is “clear” prior to implementing the treatment.

Refuge visitor services staff manages the refuge’s outreach program and routinely interact with and assist refuge users during hunting seasons. A hunting map and information will be developed for information dissemination.

**Direct and Indirect Impacts**

Alternative A (No Action Alternative)

Under Alternative A, annual operations for refuge hunts would cost the refuge approximately \$35,000 for law enforcement operation, refuge management and administration, biological monitoring and data collection, and annual maintenance. It is anticipated that funding and hunt fees would be sufficient to continue the hunting program at the refuge. Hunts would not significantly impact refuge management and operations, as hunts are planned well in advance. Prescribed fires would continue to be implemented during optimal conditions regardless of impacts to the hunt program.

Alternative B (Proposed Action Alternative)

Impacts under Alternative B would be similar to Alternative A, except annual operations budget needs for refuge hunts would increase to approximately \$37,000. The additional hunts are not expected to exceed current staffing capacity. Changes in management of controlled hunts to improve efficiencies including reduced staff time needs related to phasing out mandatory orientation meetings and driving hunters to their hunt units would provide a long-term positive impact to refuge operations.

**Affected Socioeconomic Resources and Anticipated Impacts of the No Action and Proposed Action Alternatives**

**Socioeconomics**

**Local and Regional Economies**

Wichita Mountains sits just outside the Lawton, OK metro area and has a population of approximately 124,000 people. The Lawton/Ft. Sill Chamber of Commerce prominently lists the refuge as a major local attraction. According to the Service’s 2013 *Banking on Nature* report, recreational visitation to Wichita Mountains WR, which was operating on a budget of \$3.9 million, produced \$174 million in economic effects while supporting some 1,050 jobs. That is about \$44 generated for every \$1 in budget expenditures.

Visitors coming from outside the local area, do so specifically to experience some aspect of the refuge and its resources. Visitors that live within the local 50-mile radius of a refuge typically have different spending patterns than those that travel from longer distances. A 2010 study showed that 34 percent of surveyed visitors to Wichita Mountains WR indicated that

they live within the local area (Sexton, Dietsch, Carlos, Koontz, Solomon, and Miller). Nonlocal visitors (66 percent) stayed in the local area, on average, for 2 days. Expenditures by these travelers support locally owned businesses including hotels, coffee shops, restaurants, boutiques, and art galleries. Furthermore, the refuge operates 61 commercial permits, which allow photographers, videographers, and climbing guides to conduct commercial operations within the refuge.

**Direct and Indirect Impacts**

Alternative A (No Action Alternative)

Hunters comprise less than 1 percent of recreational visitors to the refuge. Under Alternative A, hunts are conducted mid-week and only for 4 days at a time. While it does not create a significant positive impact, it likely does eliminate or equalize the negative impacts a closure has on the local and regional economies.

Alternative B (Proposed Action Alternative)

While not expected to be significant in nature, proposed expansion of hunt programs may have real and tangible negative impacts for local communities dependent upon visitation. Additional hunter use increases the potential for conflict resulting from diverse recreational use. This may impact the overall visitor experience potentially reducing visitation, and, thereby, revenue circulated within the local economy and negatively impact commercial operations within the refuge. Increasing the potential for removal of feral hogs may have negligible positive impacts to the local economy by reducing agricultural losses in the vicinity of the refuge.

**Climate Change**

The impacts of climate change on wildlife species is of great concern. The increase in global temperatures and change in weather patterns can have catastrophic effects on wildlife distribution and ecosystems processes. Such climate-induced changes have the capacity to make dramatic alterations in floral and faunal composition, species dominance, and distribution of ecosystems. Another impact of climate change is the spread of invasive plants. The prevalence and vigor of invasive plants and the competitive advantage they have over native plants may be linked to changes in climate.

**Direct and Indirect Impacts**

Current hunting activities or the expansion of hunting on the refuge are not likely to result in any direct or indirect impacts on climate change.

**Environmental Justice**

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires all Federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities.

**Direct and Indirect Impacts**

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

**Indian Trust Resources**

There are no Indian trust resources on the refuge.

**Direct and Indirect Impacts**

Neither Alternative A nor B would impact any Indian trust resources.

**Humaneness and Animal Welfare Concerns****Direct and Indirect Impacts**Alternative A

Under current management, there would be mortality of Rocky Mountain elk and white-tailed deer. All hunters must comply with ODWC’s regulations regarding the possession of Hunters Education certification. During this course, established hunter ethics and responsibilities to help ensure hunters are using good judgment related to humaneness and animal welfare are addressed. Accurate, clean shots are expected. The target should be within the effective range of the firearm, ammunition, bow and arrow, and the skills of the hunter; a humane kill is likely.

Alternative B

This alternative would be the same as Alternative A with the additional mortality of waterfowl, wild turkey, feral hog, and coyote.

**Anticipated Cumulative Impacts of the No Action and Proposed Action Alternatives****Natural Resources**

Total elk harvest in the State of Oklahoma in 2017–2018 was 407 elk; 288 (137 from the refuge) of those elk were harvested in Comanche County. The refuge accounts for a significant portion of the total elk harvest in Oklahoma, but the refuge also contributes significantly to the overall elk population within Oklahoma. White-tailed deer harvest during the same period was 107,914 individuals, the highest harvest in five years. During the 2017 refuge deer hunt, hunters harvested 21 deer (12 bucks and 9 does), and an average of 29 deer over the last 5 years. The impact of harvest at this rate from the refuge is negligible within the context of deer harvest within Oklahoma. While harvest rates for white-tailed deer are low and a limited number of permits are available each year, the hunting experience is of the highest quality; not only in terms of overall experience, but potential quality of bucks harvested.

Feral hogs occur throughout much of Oklahoma and cause substantial damage to agriculture and native rangelands. Levels of predation by feral hogs on other wildlife species at the refuge have not been directly studied. However, research suggests feral hogs can negatively impact a

number of different wildlife species (West et al. 2009; Stevens 2010). In addition, feral swine threaten wildlife health by their preponderance to harbor infectious agents such as pseudorabies virus and *Brucella abortus*, which can cause devastating disease in wild ungulates (Rhyan et al. 2001). Oklahoma offers liberal harvest regulations and may be taken year-round on private lands and on public lands during established hunting seasons. In 2017, Oklahoma hunters reported harvesting 623,132 feral hogs. On the refuge, management activities to control feral hogs remove on average 200 individuals. Removal of feral hogs during refuge hunts is expected to be low, but any additional remove of feral hogs would provide beneficial impacts to the wildlife and habitats on the refuge.

Studies of resource competition and predation between coyotes and other wildlife species have been well documented on the refuge (Halloran and Glass 1959; Holle 1977; Litvaitis and Shaw 1980; Litvaitis 1981). Coyotes are the primary large carnivore on the refuge and allow for natural processes to occur within the refuge ecosystem. Throughout much of the local area, coyotes are considered to be in direct conflict with livestock production and shooting and trapping are commonly used to control the population. Research has documented that coyotes prey upon a vast variety of species (Holle 1977; Litvaitis 1981) and shifts seasonally based on prey availability. Coyote population indices are tracked annually during deer surveys and trends fluctuate widely from year to year, presumably following trends in prey abundance. Harvest of coyotes during refuge hunts is expected to be low and not likely to affect the population regionally or locally.

Waterfowl populations throughout the United States are managed through an administrative process known as flyways. In North America, the process for establishing waterfowl hunting regulations is conducted annually. Annual waterfowl assessments are based upon the distribution, abundance, and flight corridors of migratory birds.

The Service believes that hunting on the Wichita Mountains Wildlife Refuge would not add significantly to the cumulative impacts of migratory waterfowl management on local, regional, or Central Flyway waterfowl populations because the percentage likely to be taken on the refuge, would be a tiny fraction of the estimated populations. In addition, overall populations would continue to be monitored and future harvests would be adjusted as needed under the existing flyway and state regulatory processes. Several points support this conclusion: 1) the proportion of the national waterfowl harvest that occurs on national wildlife refuges is only 6 percent (US DOI 2009); 2) there are no waterfowl populations that exist wholly and exclusively on national wildlife refuges; 3) annual hunting regulations within the United States are established at levels consistent with the current population status; 4) refuges cannot permit more liberal seasons than provided for in Federal frameworks; and 5) refuges purchased with funds derived from the Federal Duck Stamp must limit hunting to 40 percent of the available area.

In Oklahoma, waterfowl hunters harvested an estimated 306,800 ducks and geese (USFWS 2017). This is approximately 9.2 percent of the Central Flyway's (3.3 million) harvest and 2.1 percent of the estimated U.S. waterfowl harvest (14.9 million). Anticipated harvest of waterfowl on the refuge is expected to be low with negligible adverse impacts locally, regionally, and nationally.

The wild turkey population (Eastern and Rio Grande subspecies) is stable to increasing throughout much of the state. Oklahoma hunters harvested nearly 27,000 turkeys in 2017. Anticipated harvest on the refuge is expected to be low (5–10 birds) with a negligible cumulative impact locally and regionally.

No additional cumulative impacts are anticipated from elk and deer hunting on other wildlife or aquatic species from Alternative B. The hunting of feral hog and coyote would not have any cumulative impacts on other wildlife because the anticipated harvest of both species will be low and both have reproductive abilities and life strategies that would likely result in no long-term changes in their population levels. The hunting of wild turkeys has the potential to cause short-term decreases in human-caused disturbance to other wildlife, as areas of the refuge would receive lower visitation during the short hunts. Over the 15-year life of the Hunt Plan, no cumulative impacts are anticipated to other wildlife from this hunt because of the hunts short duration and low number of participants.

Waterfowl hunts under Alternative B are likely to have negligible cumulative impacts on other wildlife in the waterbodies opened to hunting especially along banks. Hunters who prefer to hunt from the bank or tether boats to a shoreline may concentrate in areas they consider favorable and revisit these same sites annually during the 15-year life of the Hunt Plan. This may lead to concentrated increases in litter, vegetation alteration and disturbance, wildlife disturbance, and soil compaction, which may negatively affect wildlife in the immediate vicinity. These impacts should remain negligible because waterfowl hunting occurs during times when many wildlife species are dormant due to colder temperatures, and sufficient areas should remain free from disturbance for wildlife to avoid areas that may become degraded. Management of the hunt would likely include impact assessments by refuge staff to assure continued compatibility of the hunt by mitigating for any adverse impacts.

No cumulative impacts are anticipated for threatened and endangered species and other special status species.

No increased cumulative impacts on vegetation are anticipated from current levels. The limited number of hunters, hunt days, and hunt areas should allow for the continued health of existing plant communities. Refuge staff would continue to address invasive plant species that originate on Fort Sill, but this is not expected to have cumulative adverse effects.

No additional cumulative impacts on geology and soils are anticipated on the refuge under either alternative. Prior gold mining on lands before the refuge was established has left some impacts to the soil, such as open pits and shafts, mine tailings, and traces of mercury and other contaminants. However, those affected areas are a small portion of the refuge and therefore are expected to have minor localized cumulative impacts. Prescribed fire and fire suppression activities may affect larger areas of soil, but would unlikely cause damage. These fire activities have the potential to be beneficial to soils by increasing availability of certain nutrients and thus stimulating healthy vegetation growth. These impacts are expected to be beneficial and minor in the long-term.

Negligible cumulative impacts are anticipated to air quality for either alternative. Hunt visits have stayed relatively consistent over the last 10 years and hunter numbers are unlikely to increase by a significant amount. Over the last ten years, all visitation to the refuge has fluctuated annually, potentially due to weather, wildfires, and socioeconomic factors. Hunter visits are insignificant in comparison to the total annual visitation to the refuge and the addition of their impact to air quality have insignificant effects on air quality. Air pollution from nearby off-refuge sources, including industry, power plants, and automobiles impacts the refuge and its wilderness area. Haze from pollution sometimes reduces visibility. Fires from explosives and other military activities at the adjacent Fort Sill generate smoke that can temporarily impact air quality of the refuge. The smoke from these activities could add to smoke from prescribed fires occurring on the refuge, further impacting the refuge's air quality. These impacts to the refuge's air quality are relatively short-term, widespread, and minor.

No cumulative impacts are expected to water quality or availability and wetlands, from Alternatives A or B. There are outside sources that may cumulatively effect water resources on the refuge, including several drainages that enter the refuge from Fort Sill, the septic systems at the Job Corps and Holy City Sites, and mercury loadings from precipitation. These impacts are expected to be negligible.

No additional cumulative impacts are anticipated on the refuge under either alternative. Increases in hunter use of wilderness areas will be negligible and all regulations ensuring protections of wilderness character will remain in effect. Overall use of wilderness areas by the visiting public is unlikely to increase as a result of hunting because the wilderness areas receive more visitation from non-consumptive users.

### **Visitor Use and Experience**

ODWC manages several Wildlife Management Areas in the counties surrounding the refuge. Most of these offer similar public use opportunities as the refuge, including hunting, fishing, wildlife observation, and photography. Great Plains State Park, located on Tom Steed Reservoir about 10 miles west of the refuge, offers camping, fishing, and hiking opportunities. Almost the entire state of Oklahoma is privately owned and rural, providing limited recreational opportunities. These outside opportunities for recreation are unlikely to have significant cumulative impacts to visitor use and experience on the refuge due to their limited offerings. Expanding recreational opportunities such as hunting on the refuge is expected to result in beneficial, long-term impacts on public outdoor recreation.

#### Hunting/Fishing

Based on comments received during the CCP, hunting has been allowed on Wichita Mountains WR for many years and little negative reaction is expected regarding the continuation or expansion of controlled elk and deer hunts. However, we expect some negative public response to the turkey and waterfowl hunts. Some individuals may have concern with spring turkey hunting in the public use area as this season is during some of the highest public use periods on the refuge, which may result in incrementally minor adverse impacts to the visitor experience of non-hunting visitors.

Other Wildlife-Dependent Recreation (i.e., road and trail development and use)

Because the refuge experiences a high volume of visitation throughout the year, conflicts should be expected. Non-hunting recreational visitors comprise a much larger population of visitors. We expect some negative public response to the turkey and waterfowl hunts. Some individuals may have concern with spring turkey hunting in the public use area as this season is during some of the highest public use periods on the refuge. New hunting opportunities would not result in the creation or expansion of any other public uses or their associated infrastructure or facilities so no cumulative impacts are expected.

Use of Lead Ammunition/Tackle

The presence of lead in soil can pose a hazard to wildlife. Movement of lead into groundwater also is a concern. Rainwater acts as a carrier for solubilized lead. The more easily the lead moves through the soil, the more of an impact it will have. Non-toxic shot is required by federal regulations for hunting ducks, geese, and coots among other species. Currently the state of Oklahoma requires non-toxic shot for ducks, geese, mergansers, coots, gallinules, and sandhill cranes. Wichita Mountains WR is encouraging, not mandating, hunters to switch to non-toxic ammunition use for elk and white-tailed deer hunting. Non-toxic ammunition would be required for hunting turkey. Under this alternative, the refuge only represents 0.0002 percent of the statewide harvest for elk and white-tailed deer combined. Therefore, the continued allowance of toxic shot for hunting elk and deer has a negligible adverse impact on the environment. No increases in lead ammunition use are expected from the Proposed Alternative.

**Cultural Resources**

Impacts to the cultural/historical resources and properties as a result of the hunt program are unlikely for both Alternatives A and B. The hunt programs do not include ground disturbance. Should the plan expand in such a way as to cause an effect, further examination would be needed under section 106 of the National Historic Preservation Act.

**Refuge Management and Operations**

Under the proposed alternative, there would be minimal impacts to refuge management and operations. Additional coordination would be necessary to reduce the potential impacts to the prescribed burn program; however, the refuge has administered prescribed burning around hunting for many years. As such, with the addition of hunting days and species, minimal negative impacts are expected.

**Socioeconomics**

Under the proposed action alternative and in light of the heavy outdoor public use on the refuge, conflicts are expected between hunters and other outdoor recreational users. Added to the reduction of accessible acreage (however short in duration) to 99.99 percent of recreational visitors and the potential hampering of commercial permittee(s) operation, cumulative impacts are slightly negative at the local level.

The U.S. Census Bureau projects about a ten percent growth rate of Comanche County (U.S. Census Bureau 2005), which will likely drive an increase in demand for public recreational opportunities. This will have a long-term, beneficial cumulative impact on the refuge.

Increased population and refuge visitation will also contribute to the local economy from visitor spending, further resulting in beneficial, long-term, and localized to widespread impacts.

#### Climate Change

While the impacts from climate change on the refuge are not certain, nor well understood, the expansion of hunting on the refuge will not add to the cumulative impacts of climate change. The refuge hunt program will adjust as necessary to ensure that it does not contribute to the cumulative impacts of climate change on resident wildlife and migratory birds.

#### Environmental Justice

There are no anticipated cumulative impacts under either alternative.

#### Indian Trust Resources

No cumulative impacts are expected.

#### Humaneness and Animal Welfare Concerns

The refuge anticipates that cumulative impacts will be negligible under either alternative.

### **Summary of Analysis**

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

#### Alternative A – No Action Alternative

There would be no additional costs to the refuge under this alternative. The refuge would not provide new hunting and access opportunities. Although this alternative would have fewer impacts to other public uses, it would minimize our mandates under Secretarial Order 3356. As described above, under the no action alternative, no long-term adverse impacts are expected to occur to big game, upland game, and waterfowl under current management. There would be no additional impacts on natural resources including air quality, soils, vegetation, and water quality.

No additional impacts would occur to the visitor experience through potential conflicts between hunters and other user groups exist. However, minor conflicts would continue due to limited number of hunt days and the areas closed to hunting for other public uses. The refuge would remain open to other public uses during these hunts. Minor beneficial impacts to the local economy would continue to occur through capital expenditures in the local economy by hunters.

No additional impacts to cultural resources are expected to occur to the known and suspected cultural resources occurring under the ground surface.

Minor adverse impacts would continue to occur to refuge administration and facilities. Under the no action alternative, current hunts would require significant staff time to conduct hunt briefings, and assist hunters. Costs are expected to remain the same because the refuge would use resources already available for current hunts. The no action alternative meets the purpose

and needs of the Service as described in the EA, because it provides wildlife-dependent recreation opportunities. However, it limits the opportunity to help control the coyote population.

Negligible impacts to cultural resources are expected to occur due to the majority of cultural resources occurring under the ground surface.

#### Alternative B – Preferred Alternative

Refuges, including Wichita Mountains WR, conduct hunting programs within the framework of state and federal regulations. Population estimates of huntable species are developed at a regional, state, flyway, and continental scale. Hunting frameworks and take limits are set based upon these estimates. The proposed refuge hunting program rules would be the same as, or more restrictive than, hunting regulations throughout the State of Oklahoma.

The refuge would continue to account for a significant portion of the total elk harvest in Oklahoma, but the refuge also contributes significantly to the overall elk population within Oklahoma. During the 2017 refuge deer hunt, hunters harvested 21 deer (12 bucks and 9 does), and an average of 29 deer over the last 5 years. The impact of harvest at this rate from the refuge would continue to be minimal within the context of deer harvest within Oklahoma.

The wild turkey population is stable to increasing throughout much of the state. Oklahoma hunters harvested nearly 27,000 turkeys in 2017. Anticipated harvest on the refuge is expected to be low (5–10 birds) with a negligible adverse impact locally and regionally.

The Service believes that hunting on the Wichita Mountains WR would not add significantly to the impacts of migratory waterfowl management on local, regional, or Central Flyway waterfowl populations because the percentage likely to be taken on the refuge, would be a tiny fraction of the estimated populations. In addition, overall populations will continue to be monitored and future harvests will be adjusted as needed under the existing flyway and state regulatory processes.

Feral hogs occur throughout much of Oklahoma and cause substantial damage to agriculture and native rangelands. However, research suggests feral hogs can negatively impact a number of different wildlife species (West et al. 2009; Stevens 2010). On the refuge, management activities to control feral hogs remove on average 200 individuals. Removal of feral hogs during refuge hunts is expected to be low, but any additional removal of feral hogs would provide negligible beneficial impacts to the wildlife and habitats on the refuge.

Studies of resource competition and predation between coyotes and other wildlife species have been well documented on the refuge (Halloran and Glass 1959; Holle 1977; Litvaitis and Shaw 1980; Litvaitis 1981). Coyote population indices are tracked annually during deer surveys and trends fluctuate widely from year to year. Harvest of coyotes during refuge hunts is expected to be low and not likely to impact the population regionally or locally.

The Service has the resources necessary to carry out this alternative, and has determined that the proposed action described in this alternative is compatible with the purposes of the Wichita

Mountains WR and the mission of the NWRS. As described in the EA, hunting would have negligible impacts on natural resources including air quality, soils, vegetation, and water quality. There would be minor adverse impacts to other wildlife through disturbance, which would be mitigated through limited hunt days, hunter numbers, and closed areas. There would be minor beneficial impacts to native wildlife from the take of feral hogs.

Some minor adverse impacts would occur to the visitor experience through potential conflicts between hunters and other user groups. However, conflicts would be minor due to limited number of hunt days and the no hunt zones open to public use. The refuge would remain open to other public uses during these hunts. Negligible beneficial impacts to the local economy would occur through capital expenditures in the local economy by additional hunters. Impacts to cultural impacts would be similar to Alternative A.

### **Monitoring**

*Rocky Mountain Elk* – On an annual to biennial basis, refuge staff conduct aerial elk surveys and habitat monitoring to provide biologists and managers vital information necessary for managing the population. Because the refuge is surrounded by a high-fence, limited egress/ingress occurs, and appropriate management of the population parameters is necessary to reduce the potential for detrimental impacts to habitats caused by over-grazing. Refuge wildlife biologists and managers use the data collected from surveys, in addition to habitat monitoring data, to determine harvest recommendations necessary for management of the population.

*White-tailed deer* – Each year refuge staff conducts white-tailed deer surveys and habitat monitoring to provide biologists and managers vital information necessary for managing the population. Because the refuge is surrounded with a high-fence and limited egress/ingress occurs, appropriate management of population parameters is necessary to reduce the potential for detrimental impacts to habitats caused by over-grazing. Refuge wildlife biologists and managers use the data collected from surveys, in addition to habitat monitoring data, to determine harvest recommendations necessary for management of the population.

*Waterfowl* – Each year, monitoring activities provide information on harvest levels, population size, and habitat conditions for migratory birds in the United States. The Service's Division of Migratory Bird Management is responsible for conducting migratory bird surveys for all of the flyways, collecting and compiling much of the relevant biological data, and coordinating the regulatory effort with states and the public. Data collected from these activities are analyzed each year, and proposals for duck hunting regulations are developed by the Flyway Councils, states, and the Service. The refuge works with the state to ensure that all of its proposed hunting activities are in alignment with the results of these monitoring efforts and regulatory frameworks, using an adaptive management process to adjust hunting activities as necessary to ensure no adverse impacts to migratory bird populations.

*Wild Turkey* – The refuge does not currently have established survey protocols to estimate turkey abundance on the refuge. However, observation data throughout the refuge provides a basic understanding of population parameters. Current turkey populations appear to be stable to increasing both locally and throughout much of the state. Best available data on turkey

abundance suggests sufficient numbers to sustain limited harvest. Refuge staff will continue to utilize observational data to track population parameters of wild turkeys

*Coyote* – Indices to coyote abundance are collected each year in conjunction with white-tailed deer surveys. Presence of coyotes is documented along each transect and data provides an index (coyote/km) for the refuge. Trends fluctuate widely from year to year, presumably following trends in prey abundance.

*Feral hogs* – Reliable monitoring protocols for feral hogs have not been established and therefore abundance on the refuge is currently unknown. However, current refuge research with USDA-Wildlife Services suggests approximately 300 individuals. The refuge intends to continue control of this invasive species with the ultimate goal of reducing the population by 99 percent.

### **List of Sources, Agencies, and Persons Consulted**

Refuge staff met with ODWC representatives on January 31, 2018, to discuss the current hunting program and recommendations for the future. Refuge staff subsequently utilized their comments and suggestions in the development of the 2019 Hunt Plan and this EA.

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### **List of Preparers**

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### **State Coordination**

Refuge staff met with ODWC representatives on January 31, 2018, to discuss the current hunting program and recommendations for the future. Refuge staff subsequently utilized comments and suggestions in the development of the 2019 Hunt Plan and this EA.

### **Tribal Consultation**

On January 17, 2019, the Service sent out a letter to all 38 recognized tribes in Oklahoma inviting them to consult on the proposed hunting opportunities on eight Oklahoma refuges.

### **Public Outreach**

The EA, Hunt Plan and Compatibility Determination was distributed to the public for comment via the refuge's website, social media accounts, and press releases. The public commenting period began on Wednesday June 5, 2019 and concluded 11:59PM Sunday July 7, 2019.

**Determination**

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

- The Service’s action will not result in a significant impact on the quality of the human environment. See the attached “**Finding of No Significant Impact**”.
  
- The Service’s action **may significantly affect** the quality of the human environment and the Service will prepare an Environmental Impact Statement.

Preparer Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name/Title/Organization: \_\_\_\_\_

\_\_\_\_\_

Reviewer Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name/Title: \_\_\_\_\_

## Appendix 1

### OTHER APPLICABLE STATUTES, EXECUTIVE ORDERS & REGULATIONS

<b>STATUTES, EXECUTIVE ORDERS, AND REGULATIONS</b>	
<p><b>Cultural Resources</b></p> <p>American Indian Religious Freedom Act, as amended, 42 U.S.C. 1996 – 1996a; 43 CFR Part 7            Antiquities Act of 1906, 16 U.S.C. 431-433; 43 CFR Part 3            Archaeological Resources Protection Act of 1979, 16 U.S.C. 470aa – 470mm; 18 CFR Part 1312; 32 CFR Part 229; 36 CFR Part 296; 43 CFR Part 7            National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470-470x-6; 36 CFR Parts 60, 63, 78, 79, 800, 801, and 810            Paleontological Resources Protection Act, 16 U.S.C. 470aaa – 470aaa-11            Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001-3013; 43 CFR Part 10            Executive Order 11593 – Protection and Enhancement of the Cultural Environment, 36 Fed. Reg. 8921 (1971)            Executive Order 13007 – Indian Sacred Sites, 61 Fed. Reg. 26771 (1996)</p>	<p>The proposed action includes no ground-disturbing activities, or other activities that might disturb undocumented paleontological, archaeological, or historic sites.</p>
<p><b>Fish &amp; Wildlife</b></p> <p>Bald and Golden Eagle Protection Act, as amended, 16 U.S.C. 668-668c, 50 CFR 22            Endangered Species Act of 1973, as amended, 16 U.S.C. 1531-1544; 36 CFR Part 13; 50 CFR Parts 10, 17, 23, 81, 217, 222, 225, 402, and 450            Fish and Wildlife Act of 1956, 16 U.S.C. 742 a-m            Lacey Act, as amended, 16 U.S.C. 3371 et seq.; 15 CFR Parts 10, 11, 12, 14, 300, and 904            Migratory Bird Treaty Act, as amended, 16 U.S.C. 703-712; 50 CFR Parts 10, 12, 20, and 21            Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds, 66 Fed. Reg. 3853 (2001)</p>	<p>There are no known federal threatened or endangered species on the refuge during the hunting season (See ESA Section 7 Consultation).</p> <p>The proposed action is consistent with Executive Order 13186 because the Environmental Assessment for Hunting on Wichita Mountains WR evaluates the effects of agency actions on migratory birds.</p>
<p><b>Natural Resources</b></p> <p>Clean Air Act, as amended, 42 U.S.C. 7401-7671q; 40 CFR Parts 23, 50, 51, 52, 58, 60, 61, 82, and 93; 48 CFR Part 23            Wilderness Act, 16 U.S.C. 1131 et seq.            Wild and Scenic Rivers Act, 16 U.S.C. 1271 et seq.            Executive Order 13112 – Invasive Species, 64 Fed. Reg. 6183 (1999)</p>	<p>The Service has evaluated the suitability of the Wichita Mountains WR for wilderness designation and found that the Wichita Mountains Wilderness Area, consisting of two units totaling 8,570 acres, meets the criteria.</p> <p>The Service has evaluated the eligibility of streams on Wichita Mountains WR for wild and scenic river designation and concluded no streams meet the basic criteria for inclusion into the National Wild and Scenic Rivers System.</p>

	<p>The proposed action would have negligible effects to air quality.</p> <p>The proposed action is consistent with Executive Order 13112 because stipulations in permits would be designed to prevent the introduction of invasive species.</p>
<p><b>Water Resources</b></p> <p>Coastal Zone Management Act of 1972, 16 U.S.C. 1451 et seq.; 15 CFR Parts 923, 930, 933</p> <p>Federal Water Pollution Control Act of 1972 (commonly referred to as Clean Water Act), 33 U.S.C. 1251 et seq.; 33 CFR Parts 320-330; 40 CFR Parts 110, 112, 116, 117, 230-232, 323, and 328</p> <p>Rivers and Harbors Act of 1899, as amended, 33 U.S.C. 401 et seq.; 33 CFR Parts 114, 115, 116, 321, 322, and 333</p> <p>Safe Drinking Water Act of 1974, 42 U.S.C. 300f et seq.; 40 CFR Parts 141-148</p> <p>Executive Order 11988 – Floodplain Management, 42 Fed. Reg. 26951 (1977)</p> <p>Executive Order 11990 – Protection of Wetlands, 42 Fed. Reg. 26961 (1977)</p>	<p>The refuge does not lie in a coastal zone, and contains no rivers, harbors, or navigable waters.</p> <p>There would be negligible impacts of the proposed action on water quality or water resources.</p> <p>The refuge contains no drinking water sources and does not supply drinking water to any community.</p> <p>The proposed action is consistent with Executive Order 11990 because implementation of the Hunt Plan would protect existing wetlands.</p> <p>The proposed action is consistent with Executive Order 11988, because implementation of the Hunt Plan would not result in the modification or destruction of floodplains.</p>

# Attachment 1 – Refuge Hunt Map

## Wichita Mountains Wildlife Refuge

