

Draft Environmental Assessment

for Hunting on Flint Hills National Wildlife Refuge

March 2020

Submitted by

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Date: March 2020

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 Code of Federal Regulations [CFR] 1500-1509) and Department of the Interior (43 CFR 46; 516 DM 8) and U.S. Fish and Wildlife Service (Service) (550 FW 3) regulations and policies. NEPA requires examination of the effects of proposed actions on the natural and human environment.

1.0 Introduction

1.1 Proposed Action

The Service is proposing to open hunting for badger, bobcat, mink, muskrat, fox, opossum, raccoon, striped skunk, weasel, and coyote on the 8,295-acre South Neosho unit on the Flint Hills National Wildlife Refuge (NWR) in accordance with the refuge's Flint Hills National Wildlife Refuge Hunting Plan. Methods of take would include shotgun, muzzleloader, archery, and rimfire rifle. In addition, the Service proposes allowing the extended firearm white-tail antlerless-only season (WAO), in compliance with state regulations. The refuge is in southeast Kansas, in parts of Coffey and Lyon Counties (Figure 1).

The hunting plan proposes to continue existing hunting opportunities and provide new hunting opportunities on the refuge. The hunting program generally would follow State of Kansas regulations with respect to the target species, seasons, bag limits, and method of take. In certain instances, we, the Service, may deviate from those regulations to meet refuge wildlife population, public use, and public safety goals. This plan also proposes to use members of the general public to participate in hunts at specific times and locations that are designed to provide unique hunter opportunities. These special hunts would be conducted in cooperation with the Kansas Department of Wildlife, Parks, and Tourism (KDWPT).

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 Service cannot open a refuge to hunting and fishing until a final rule has been published in the Federal Register formally opening the refuge to hunting and fishing.

The final decision on the proposed action will be made at the conclusion of the public comment period for the draft EA and hunting plan.

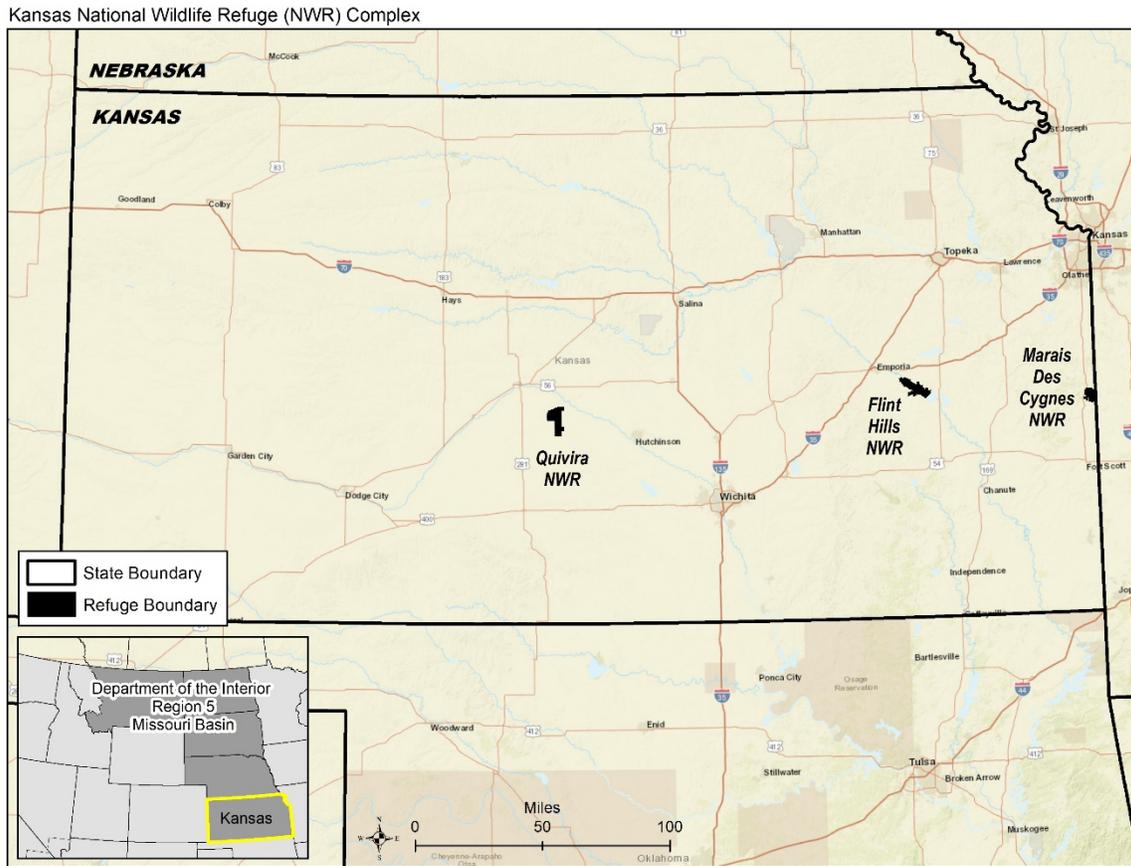


Figure 1. Area Map of Kansas National Wildlife Refuge Complex.

1.2 Background

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

Specifically, Flint Hills NWR was established pursuant to the Fish and Wildlife Coordination Act (1958): “Flint Hills NWR was established in 1966 and ‘. . . shall be administered by the Secretary of the Interior directly or in accordance with cooperative agreements . . . and in accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon, . . .’” 16 U.S. Code § 644. (Comprehensive Conservation Plan [CCP], p. 6).

In addition, the Refuge Recreation Act (16 U.S. Code § 460-1) states that each refuge is “. . . suitable for incidental fish and wildlife oriented recreational development, the protection of natural resources, and the conservation of endangered or threatened species . . .” (CCP, p. 6).

Refuge Purpose

The primary purpose of the refuge is to “Restore and maintain the hydrological system for the Neosho River drainage by managing for wetlands, control of exotic species, and management of trust responsibilities for the maintenance of plant and animal communities” (CCP, p. 1).

The mission of the Refuge System, as outlined by the NWRSA, as amended by the Improvement Act (16 U.S. Code 668dd et seq.), is:

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

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

- provide for the conservation of fish, wildlife, and plants, and their habitats within the Refuge System;
- Ensure that the biological integrity, diversity, and environmental health of the Refuge System are maintained for the benefit of present and future generations of Americans;
- ensure that the mission of the Refuge System described at 16 U.S. Code 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 Refuge System are located;
- assist in the maintenance of adequate water quantity and water quality to fulfill the mission of the Refuge System and the purposes of each refuge;
- recognize compatible wildlife-dependent recreational uses as the priority general public uses of the Refuge System through which the American public can develop an appreciation for fish and wildlife;
- ensure that opportunities are provided within the Refuge System for compatible wildlife-dependent recreational uses;
- 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 Refuge System.

The refuge maintains a 60 percent closure to migratory waterfowl hunting, in compliance with Migratory Bird Treaty Act recommendations for national wildlife refuges. The Neosho River divides the refuge, with the area south of the Neosho River (comprising approximately 40 percent of total refuge acreage) being open to waterfowl hunting.

1.3 Purpose and Need for the Proposed Action

The purpose of this proposed action is to provide compatible wildlife-dependent recreational opportunities on the refuge. 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 NWRS” and “ensure that opportunities are provided within the NWRS for compatible wildlife-dependent recreational uses.” (16 U.S. Code 668dd[a][4]). The need of the proposed action also meets the Service’s implementation of Secretarial Order 3347, “Conservation Stewardship and Outdoor Recreation,” and Secretarial Order 3356, “Hunting, Fishing, Recreational Shooting, and Wildlife Conservation Opportunities and Coordination with States, Tribes, and Territories,” by expanding hunting opportunities and aligning Service regulations with state regulations.

A purpose of this hunting plan is to bring the refuge into alignment with KDWPT regulations, and other national wildlife refuges in Kansas. Furthermore, the coyote hunting proposal would provide consistency of regulations with the adjacent Otter Creek State Wildlife Area and the U.S. Army Corps of Engineers John Redmond Reservoir. Simplifying regulations could assist with reducing the downward trend in hunters and anglers by providing for the recruitment, retention, and reactivation of sportsmen and sportswomen.

2.0 Alternatives

2.1 Alternatives Considered

Alternative A – Expand Hunting to Include Furbearer and Coyote and Extend White-tail Antlerless-Only Season – Proposed Action Alternative

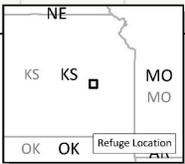
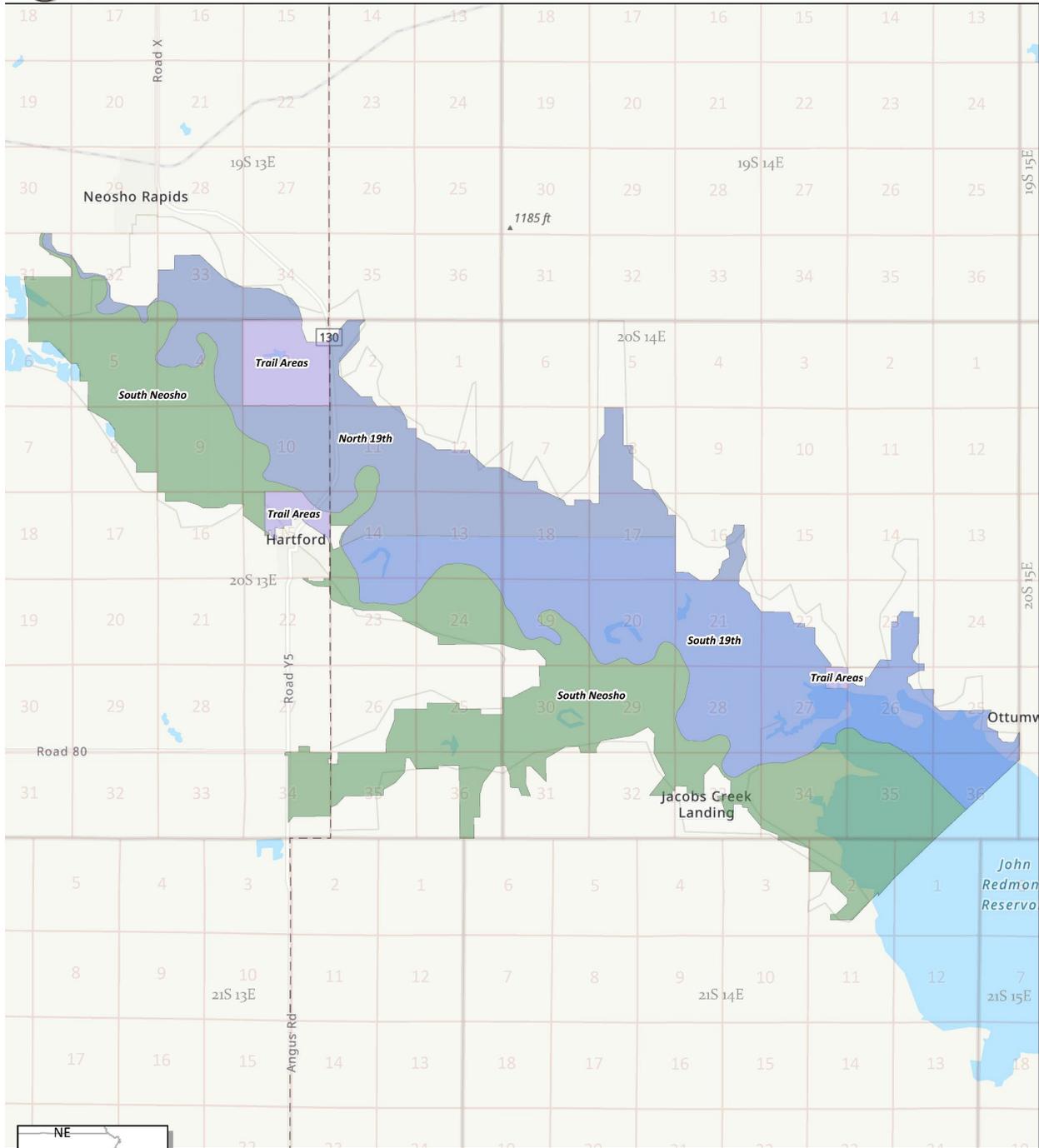
The refuge has prepared a hunting plan, which is presented in this document as the Proposed Action Alternative. The proposed alternative would not open additional acres for hunting, but rather new species (furbearers and coyote), and additional days for deer hunting (Figure 2). The Trail Areas and South 10th unit (9,108 acres combined), historically closed to hunting, would remain as such.

Furbearer and Coyote

Under the Proposed Action Alternative, the Service would open hunting for badger, bobcat, fox, mink, muskrat, opossum, raccoon, striped skunk, weasel, and coyote on the 8,295-acre South Neosho Unit on the refuge in accordance with the refuge’s hunting plan. No trapping or running is being proposed. Hunting for beaver and otter is not permitted by state regulations and is not proposed in this alternative. Method of take for furbearers would include shotgun, muzzleloader, archery, and rimfire rifle. Dogs, vehicles, or bait may not be used to hunt furbearers or coyotes. Coyotes may not be hunted from a vehicle or a road. Electronic calls would be permitted for coyote and furbearer. Hunting would be permitted during daylight hours (one-half hour before legal sunrise until one-half hour past legal sunset). Hunting seasons would be consistent with state regulations.

Deer

In addition, the Service proposes allowing the extended white-tail antlerless-only (WAO) season, on the 8,295-acre South Neosho Unit on the refuge in accordance with state regulations. Methods of take would include archery, muzzleloader, and shotgun (slugs only). Centerfire rifles and pistols would be prohibited.



Produced in the Natural Resource Program Center
 Fort Collins, Colorado
 Land Status Current To: 7/31/18
 Map Date: 12/6/2018
 Basemap: ESRI Vector Base v2, FWS, USGS DEM
 Web Mercator Projection
 NAD 83

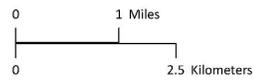


Figure 2. Vicinity Map, Showing Open (Blue) Areas and Closed (Green) Areas of the Refuge.

Mitigating measures would include prohibiting the use of centerfire rifles to provide for public safety of the surrounding private landowners. In addition, the Townsite Trail Area, north of Hartford, would be closed to hunting activities year round. This would reduce conflict with hikers, birdwatchers, and photographers. Under this alternative, the refuge law enforcement officer and KDWP wardens would monitor the hunts. They also would conduct license, bag limit, and access compliance checks.

This alternative offers increased opportunities for public hunting and fulfills the Service's mandate under the Improvement Act. The Service has determined that the hunting plan is compatible with the purposes of the refuge and the mission of the Refuge System.

Alternative B – Continue Current Hunting Program – No Action Alternative

Under the No Action Alternative, the refuge would continue to prohibit furbearer and coyote hunting, as well as deer hunting under the extended WAO. Other hunting seasons would remain in place, as outlined in the refuge hunting regulations.

3.0 Affected Environment and Environmental Consequences

3.1 Affected Environment

The refuge consists of 18,463 acres of wetlands, riparian forests, restored grasslands, and agricultural lands. Prior to refuge establishment, significant alterations occurred to vegetation and hydrology. Although much of the native tallgrass prairie was cleared for agriculture, native habitats still occur within wetlands, riparian forests, and remnant grasslands. Former agricultural fields provide sites for wetland management.

The hydrology of the Neosho River remained intact until the construction of the John Redmond Reservoir in 1965. Many federal reservoirs were constructed for flood control, following the record floods of 1951 in eastern Kansas. Despite the name "Flint Hills," the refuge is within a floodplain of the Neosho River. Flood frequency and duration increased after construction of the reservoir, limiting the success of tallgrass restoration efforts. Although the refuge is managed primarily for migratory waterfowl, significant habitat occurs for furbearer, deer, and other wildlife.

The refuge provides significant wetland habitat in an area dominated by pasture and cultivated crops. Land cover data show a dearth of emergent herbaceous wetlands within the 3,015-square-mile watershed. Most of the watershed is dominated by grassland or pasture (68 percent of acreage) and cultivated crops (21 percent of acres). Therefore, moist soil impoundments and shrub and scrub wetlands provide important migratory waterfowl habitat along the Neosho River. Mensik and Paveglio (2004) present management concepts that apply well to refuge habitats.

"Because many refuges are located in areas that have fragmented habitats as well as dramatically altered hydrology and vegetation, they are often islands of habitat surrounded by large urban areas or intensive agricultural development. Many of the refuges located along the Continent's four major flyways were established to conserve and intensively manage nesting, migration, and wintering areas for migratory waterfowl and waterbirds. A large number of the System's Migratory Bird Conservation Act-authorized waterfowl refuges were established in conjunction with other federal projects,

such as reservoirs and irrigation drainage projects. Because these NWRs are often the only remaining habitat in a highly altered landscape, they are intensively and consistently managed to provide habitat for migratory birds that utilize migration flyways spanning the Northern and Southern hemispheres.”

For more information regarding the affected environment, please see the refuge’s CCP (<https://www.fws.gov/mountain-prairie/refuges/flh.php>).

Tables 1 through 6 provide additional, brief descriptions of each resource affected by the proposed action.

3.2 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 would not be more than negligibly affected by the action have been dismissed from further analyses.

Tables 1 through 5 provide:

- a brief description of the affected resources in the proposed action area;
- impacts of the proposed action and any alternatives on those resources, including direct and indirect effects.

Table 6 provides a brief description of the cumulative impacts of the proposed action and any alternatives.

Impact Types:

- *Direct effects* are those that are caused by the action and occur at the same time and place.
- *Indirect effects* are those that 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.

Table 1. Affected Natural Resources and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives.

<p>Affected Resources</p>	<p><u>Alternative A (Proposed Action)</u> <i>Flint Hills NWR would allow hunting for additional species (furbearers and coyote) and additional days for deer hunting. No additional acres would be opened for hunting and areas historically closed to hunting would remain as such.</i></p>	<p><u>Alternative B (No Action)</u> <i>Hunting seasons and species would remain as outlined in the current refuge hunting regulations. .</i></p>
<p>Furbearers and Coyote</p>		
<p>In the roadside index conducted by KDWPT employees since 1980, raccoon observations have nearly tripled. Similarly, coyote observations have nearly quadrupled.</p> <p>Refuge staff members report abundant coyotes and raccoons as well. The coyote population is dense enough that an unattended harvested deer is quickly shredded and devoured by coyotes. Raccoons are commonly seen during nighttime spotlight deer surveys.</p> <p>Other furbearers (opossum, striped skunk, badger, and fox) do not seem to be increasing as rapidly, either on the refuge, or throughout the state. Frequent flooding of the refuge likely reduces the populations of some species.</p> <p>Neotropical migrant birds have declined continentally over several decades and mid-sized predators are suspected as part of this problem. Raccoons are known nest predators (Staller et al. 2005). The refuge represents some of the western extent of prothonotary warblers. Within the refuge’s floodplain forests, raccoons are a likely nest predator of this species.</p>	<p>At the statewide level in Kansas, these furbearer species have increasing population trends, according to summer roadside surveys by the KDWPT (KDWPT 2018). A cooperative mark-resight trail camera study with KDWPT in 2016–2017 estimated a density of 56.184 (+/- 2.0132) raccoons per square kilometer, indicating a raccoon population of approximately 2,675 likely inhabits the refuge. The definition of relatively high densities of raccoons is considered more than 30 per square kilometer (Gehrt 2003; Riley et al. 1998). Coyotes appeared ubiquitous across the refuge and observed individuals looked relatively healthy.</p> <p>The survey trend from 1967–2011 for these species is shown in Figure 3 and Figure 4.</p> <p>Hunters report seeing furbearers particularly coyotes when they are turkey hunting. These public users regularly inquire if coyote and raccoon hunting is a possibility on the refuge.</p> <p>Furbearer hunting on the refuge would add to the opportunity and quality of outdoor recreation experience offered on the refuge. The refuge would likely see some “dedicated” raccoon hunters willing to hunt or call furbearers during the day. However, harvest would likely be dominated by incidental take. Deer hunters and squirrel hunters may encounter and harvest furbearers. Refuge law enforcement officers estimate that 20 dedicated raccoon hunters might take approximately 25–30 animals throughout the year. Estimated take of the other furbearer species would be even fewer than that of raccoon.</p>	<p>Furbearer and coyote hunting would continue to be prohibited on the refuge. Populations would likely continue increasing, because they exist throughout the state. Nest predation from these species would continue unabated.</p>

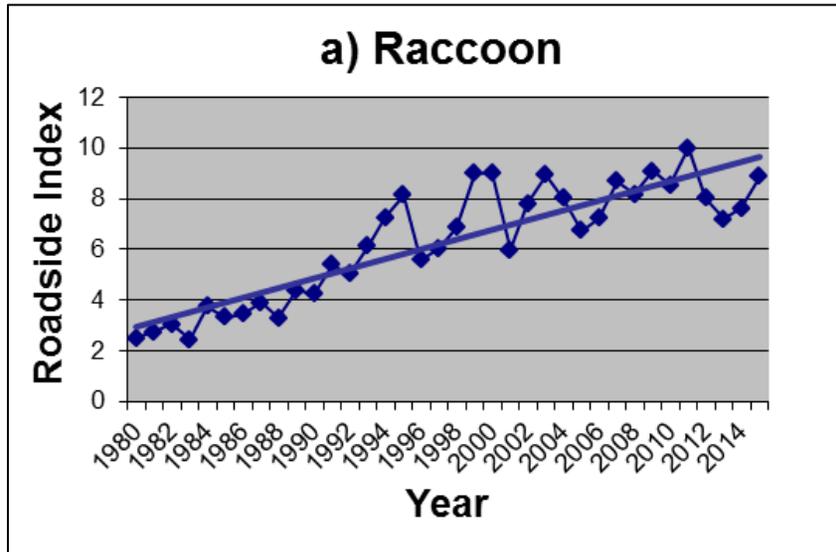
Affected Resources	<u>Alternative A (Proposed Action)</u> <i>Flint Hills NWR would allow hunting for additional species (furbearers and coyote) and additional days for deer hunting. No additional acres would be opened for hunting and areas historically closed to hunting would remain as such.</i>	<u>Alternative B (No Action)</u> <i>Hunting seasons and species would remain as outlined in the current refuge hunting regulations. .</i>
White-Tailed Deer		
<p>White-tailed deer are the only cervids on the refuge. Since 2010, refuge staff has conducted distance sampling with the assistance of Dr. Lloyd Fox, big game program coordinator for KDWPT. Refuge staff would need several years of surveys to identify population trends, yet the initial data yield interesting information. The distance sampling indicates a refuge-wide deer density of 23 per square mile. A lower density of 16 per square mile occurs in areas south of the river which are open to deer hunting for the full season. The portion of the refuge north of the river, closed for most of the deer season, shows more than double the density, 34 per square mile. Other public lands within deer management unit 14 show densities of approximately 15 per square mile. However, the surrounding private land in DMU 14 has densities ranging from 5–10 per square mile. Therefore, the refuge supports a markedly higher deer density than the surrounding private land, and even a higher density than the public land within DMU 14. The closed areas of the refuge should provide a greater density and quality of hunting for the public.</p>	<p>Although the refuge has deer densities that are more than double that of the surrounding private land, refuge staff does not observe excessive damage to vegetation or a “browse line.” However, the deer density estimates indicate that the refuge herd could support additional hunting opportunities. The WAO season typically is less than one week long (five days in 2019). Service law enforcement officers estimate that 25–30 hunters would take advantage of this expanded hunting opportunity. The success rate would be somewhere around 50 percent. These impacts are considered to be negligible due to the small number of hunters and the limited number of days per year on which these impacts occur.</p>	<p>The WAO season would continue to be closed on the refuge. Although deer numbers on the refuge are higher than those on the surrounding private land, the refuge is not showing habitat degradation.</p>

Affected Resources	<u>Alternative A (Proposed Action)</u> <i>Flint Hills NWR would allow hunting for additional species (furbearers and coyote) and additional days for deer hunting. No additional acres would be opened for hunting and areas historically closed to hunting would remain as such.</i>	<u>Alternative B (No Action)</u> <i>Hunting seasons and species would remain as outlined in the current refuge hunting regulations. .</i>
Other Wildlife and Aquatic Species		
<p>The refuge supports a diversity of wildlife species of eastern Kansas, including game and nongame species, reptiles, amphibians, and invertebrates, which are important contributors to the overall biodiversity on the refuge. Songbirds breed at the refuge, whereas waterfowl, rails, and raptors primarily use the refuge as wintering and migratory habitat. Wintering waterfowl concentrations on the refuge are highest from late November thru February. The refuge maintains a 9,445-acre waterfowl sanctuary that excludes access to the public, including small-game and migratory bird hunters. This area provides sanctuary and roosting areas for migratory birds and helps to offset potential disturbance effects.</p>	<p>Increased hunting may result in little disturbance to wildlife, because no additional units would be open to hunting. The South Neosho is already open to general hunting during the proposed furbearer and coyote hunting season. Similarly, during the WAO season, small game and waterfowl seasons are open in the South Neosho hunting unit.</p> <p>Hunting would not occur during the active breeding season for most birds; therefore, no disturbance is expected. However, coyotes are known to depredate white-tailed deer fawns and ground nesting birds such as northern bobwhite quail and turkeys (Cooper et al. 2015, Rollins and Carroll 2001, Staller et al. 2005). Raccoons are documented egg predators and opportunistically take other smaller species (Rollins and Carroll 2001, Staller et al. 2005). Furthermore, high densities of coyotes and raccoons can be reservoirs for distemper, rabies, West Nile Virus, round worm, mange, and likely other understudied diseases (Chronert et al. 2006, Fischer 1995). Some of these diseases are zoonotic, transmittable to humans. Visitors at the refuge enjoy seeing wildlife but do not want to contract diseases from those species. In 2017, a hunter reported being attacked by a seemingly rabid raccoon. Incidents like that are a risk to public health and well-being. This situation demonstrates the need for active furbearer management at the refuge.</p>	<p>Furbearer and coyote hunting would continue to be prohibited on the refuge. Populations would likely continue increasing, because they exist throughout the state. Nest predation from these species would continue unabated.</p>
Threatened and Endangered Species and Other Special Status Species		
<p>There are no threatened and endangered species or species of special management concern in the area of the proposed hunting expansion.</p>	<p>The proposed action and alternatives would not affect any species of special management concern.</p>	<p>No impact on threatened and endangered species are anticipated.</p>

Affected Resources	<u>Alternative A (Proposed Action)</u>	<u>Alternative B (No Action)</u>
Vegetation		
Forest vegetation may include silver maple, American sycamore, elm, pecan, green ash, hackberry, eastern cottonwood, willow, and oak species. Wetland species are mixed, but include shrubs such as coralberry, sedge, millet, and smartweed.	The proposed action would not affect any vegetation of special management concern. Although the refuge has deer densities more than double that of the surrounding private land, refuge staff does not observe excessive damage to vegetation or a “browse line.”	If no changes are made to the hunting regulations, there would be no changes to vegetation species or structure.

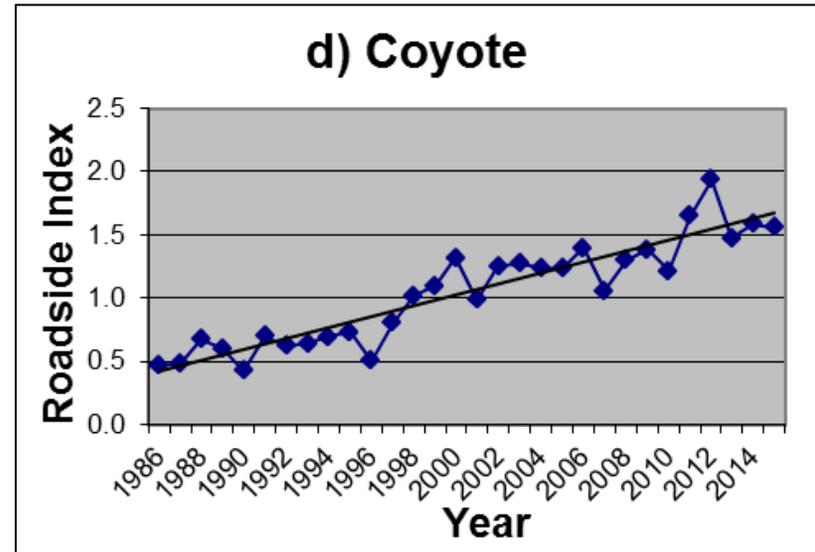
Key: KDWPT = Kansas Department of Wildlife, Parks, and Tourism; WAO = white-tail antlerless only

Note: The impacts on refuge soils, geology, air quality, water resources, and floodplains are all considered to be nonexistent to negligible and have not been analyzed further.



Source: KDWPT, Summer Roadside Survey (2015)

Figure 3. Kansas Survey Trend for Raccoon (1967–2011).



Source: KDWPT, Summer Roadside Survey (2015)

Figure 4. Kansas Survey Trend for Coyote (1967–2011).

Table 2. Affected Visitor Use and Experience and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives.

<p>Affected Resources</p>	<p><u>Alternative A (Proposed Action)</u> <i>Flint Hills NWR would allow hunting for additional species (furbearers and coyote) and additional days for deer hunting. No additional acres would be opened for hunting and areas historically closed to hunting would remain as such.</i></p>	<p><u>Alternative B (No Action)</u> <i>Hunting seasons and species would remain as outlined in the current refuge hunting regulations. .</i></p>
<p>Hunters are the primary constituency on the refuge, accounting for more than half of the total visits. The refuge averages about 27,033 visitors per year.</p>	<p>Hunters are the primary constituency on the refuge, accounting for more than half of the total visits. Hunting furbearers, coyotes, and deer during the WAO season would be unlikely to disturb refuge visitors engaged in other priority public uses. In addition, the WAO season usually lasts less than one week. Furbearer hunting season typically opens from mid-November through mid-February. This is a segment of the year with fewer birders and hikers. The proposed hunt would not conflict with other refuge wildlife-dependent recreational programs such as wildlife observation, wildlife photography, wildlife interpretation, environmental education, or fishing.</p> <p>Hunter numbers, particularly deer hunting, have been declining for the past six years. An additional hunt, such as the extended WAO season, would not only provide an additional opportunity, but also a chance to fill unused tags from earlier seasons. Furthermore, expanded hunting opportunity could slow the downward trend in hunting at the refuge by providing for the recruitment, retention, and reactivation of sportsmen and women.</p>	<p>The visiting public would continue to be frustrated by a lack of furbearer and coyote hunting options at the refuge. Deer hunters likely would continue to express concern over the abundance of coyotes and predators they see while hunting from a deer stand.</p>

Key: WAO = white-tail antlerless only

Table 3. Affected Cultural Resources and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives.

<p>Affected Resources</p>	<p><u>Alternative A (Proposed Action)</u></p>	<p><u>Alternative B (No Action)</u></p>
<p>Archaeological survey investigations conducted on the refuge have identified numerous archaeological sites. Most of these sites represent Middle Ceramic occupation presumed to date from 1,000 to 1,500 A.D. According to Thies (1981), the archaeological sites thus far discovered represent occupations ranging from the Paleo-Indians era up to and including the Historic era, or from approximately 12,000 B.C. to the earliest days of Euro-American settlement. Thies goes on to say it is probably that more sites exist in the areas that could not be adequately investigated during the 1979 and earlier surveys. One archaeological site of note, the Williamson Site, is listed in the National Register of Historic Places. Human remains have been discovered at the site. A number of the identified sites have been recommended for further study.</p>	<p><i>Flint Hills NWR would allow hunting for additional species (furbearers and coyote) and additional days for deer hunting. No additional acres would be opened for hunting and areas historically closed to hunting would remain as such.</i></p> <p>Because of the temporary and superficial use of refuge habitats during hunting and fishing activities, there should be no direct or indirect impacts on cultural resources under this alternative from visitors engaged in hunting and fishing activities, as delineated in the hunting plan. The Service has determined that, in accordance with the implementing regulations for section 106 of the National Historic Preservation Act (36 CFR 800), “. . . the undertaking is a type of activity that does not have the potential to cause effects on historic properties, assuming such historic properties were present, [and] the agency official has no further obligations under section 106 or 36 CFR 800.3(a)(1).”</p>	<p><i>Hunting seasons and species would remain as outlined in the current refuge hunting regulations. .</i></p> <p>Under this alternative, hunting would not be expanded to include new species or to areas that are currently closed. There would be no change to existing environmental conditions; subsequently, no direct or indirect impacts on cultural resources are anticipated under this alternative.</p>

Key: CFR = Code of Federal Regulations

Table 4. Affected Refuge Management and Operations and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives.

<p>Affected Resources</p>	<p><u>Alternative A (Proposed Action)</u> <i>Flint Hills NWR would allow hunting for additional species (furbearers and coyote) and additional days for deer hunting. No additional acres would be opened for hunting and areas historically closed to hunting would remain as such.</i></p>	<p><u>Alternative B (No Action)</u> <i>Hunting seasons and species would remain as outlined in the current refuge hunting regulations. .</i></p>
<p>Land Use</p>		
<p>The refuge has ongoing projects of habitat management and restoration of wetlands, forests, shrublands, and grasslands. Some of these activities (prescribed fire, tree plantings, water management, and wetland management) coincide with hunting seasons. The staff continues with this habitat work during hunting season, using the opportunity to engage and educate the public in land management.</p>	<p>There would be no conflicts with the cooperative farming program. The expanded hunting opportunities would not adversely affect land use. The refuge would continue to engage in habitat management and cooperative agriculture use during the hunting season to ensure that the refuge meets its other refuge management objectives.</p>	<p>Under the current hunting plan, there would be no change in the refuge management and operations.</p>
<p>Administration</p>		
<p>Current hunting program expenses include staff resources, signage, and law enforcement staffing. The refuge currently has law enforcement coverage from a federal officer and a federal zone officer, with additional coverage from KDWPT officers.</p>	<p>The proposed alternative (expanded hunting opportunities) would not require any additional cost for law enforcement. The proposed hunting seasons occur during months of the year when officers would be making other hunter contacts anyway. The hunts would occur in existing hunting units, and thus would require no new signage. The only local administrative change would be reprinting the refuge hunting brochure with the updated regulations. This occurs on an annual basis and would not require additional expense.</p>	<p>Under the current hunting plan, there would be no change in the refuge management and operations.</p>

Key: KDWPT = Kansas Department of Wildlife, Parks and Tourism

Table 5. Affected Socioeconomics and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives.

Affected Resources	<u>Alternative A (Proposed Action)</u> <i>Flint Hills NWR would allow hunting for additional species (furbearers and coyote) and additional days for deer hunting. No additional acres would be opened for hunting and areas historically closed to hunting would remain as such.</i>	<u>Alternative B (No Action)</u> <i>Hunting seasons and species would remain as outlined in the current refuge hunting regulations. .</i>
Local and Regional Economics		
<p>The refuge is approximately 20 miles from the city of Emporia, Kansas, with a population of 33,400. The city of Harford, Kansas, where the refuge is located, has a stable population of 400+ people. The predominant land uses in the vicinity of the refuge are grazing and non-irrigated farming. The refuge averages about 27,033 visitors per year.</p>	<p>Expenditures by hunters in Kansas averaged \$1,240 per year in 2011 (USDOI 2011). Expenditures in Kansas by wildlife watchers in 2011 averaged \$371 (USDOI, 2011).</p> <p>The proposed alternative would likely increase hunting on the refuge not only by providing additional hunts, but also by simplifying regulations, bringing them more into alignment with state hunting regulations.</p>	<p>Under Alternative B, there would be no change to the existing refuge hunting program. There would be no additional effects on local and regional economies.</p>
Environmental Justice		
<p>Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities.</p> <p>According to the Kansas Health Institute (Hunt and Panas 2018), population growth in Kansas from 2000 to 2016 was among minority populations, an increase of 52.5 percent. Projected growth of minority populations, barring any unexpected impacts on current population patterns, is expected to increase even more.</p>	<p>Within the spirit and intent of Executive Order 12898 – Federal Action to Address Environmental Justice in Minority Populations, and Low Income Populations, no actions being considered in the EA would disproportionately place any adverse environmental, economic, social, or health effects on minority or low-income populations when compared with the public.</p> <p>The Service is committed to ensuring that all members of the public have equal access to the nation’s fish and wildlife resources, and equal access to information that would enable them to take part meaningfully in activities and policy shaping.</p>	<p>Under the No Action Alternative, there would be no change to the existing refuge hunting program. Continuing the existing program would have no effects on minority or low-income communities.</p>

Key: EA = Environmental Assessment

3.3 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).

Table 6. Anticipated Cumulative Impacts of the Proposed Action and Any Alternatives.

Other Past, Present, and Reasonably Foreseeable Activity Impacting Affected Environment	Descriptions of Anticipated Cumulative Impacts
Hunting and Fishing	
<p>Both deer hunting and furbearer harvest have changed in the past decades. Although deer scarcely existed in the area surrounding the refuge during the 1950s, Kansas deer hunting now enjoys national acclaim.</p> <p>Though deer hunting has increased, the opposite is true of furbearer harvest. One factor may be the significant decline in fur prices over the past 40+ years. Furbearer populations have risen dramatically, in part because of decreased harvest.</p> <p>Between 1955 and 2015, hunter participation among Kansas residents declined by half, from 10 percent down to 5 percent. During that same timeframe, Kansas experienced an increase in hunters from other states.</p> <p>The survey trend from 2017–2018 for the harvest, participation, and activity levels for hunters in Kansas during the 2017–2018 is shown in Table 7.</p> <p>From the 2017 Furbearer Harvest Survey (KDWPT 2018c):</p> <p>Chronic wasting disease (CWD) does occur in Kansas, but has not been confirmed in the counties surrounding the refuge. Deer density estimates remain stable, even in the northwestern portion of the state, where CWD seems most prevalent. However, long-term deer populations could decline as they have in other states where CWD has existed for decades. Over the past 10 years, deer densities on the refuge have been consistent.</p>	<p>The refuge conducts its hunting program in coordination with state regulations and in consultation with state wildlife professionals. In many cases, refuge regulations are more restrictive than the state regulations.</p> <p>Under the proposed action, the Service would allow an additional few days of deer hunting, and furbearer and coyote hunting during daylight hours. In the case of each hunt, the proposed action is more restrictive than state regulations. For this reason, and the 8,295-acre no hunting zone (South 19th Unit), the proposed hunts would have a negligible cumulative effect on local or statewide wildlife populations.</p> <p>Deer</p> <p>State estimates are provided below (KDWPT 2018b, 2019c).</p> <p>Total permits issued = 182,632</p> <p>Success rate = 49.6 percent</p> <p>Total state harvest = 79,567</p> <p>Initially, the estimated take would likely be fewer than 20 deer annually. Over the long-term (decades), there likely would be no more than 100 annually, considering potential population increases and uncertain needs of herd health management. Relative to state and regional harvest numbers, refuge impacts on harvest numbers would be negligible.</p> <p>Furbearers</p> <p>Considering low numbers of occurrence of many furbearer species and Refuge hunt limitations (for example, area and hours), the potential take would likely be negligible in proportion to regional or state numbers.</p>

Other Past, Present, and Reasonably Foreseeable Activity Impacting Affected Environment	Descriptions of Anticipated Cumulative Impacts
	<p>Coyote</p> <p>Based on an estimated average of 0.47 per bag/day over a 181-day refuge season, potential harvest would be about 85 coyotes. In reality, it is not expected that coyote hunting would or could occur every day of the season. Also, considering the refuge hunt limitations (for example, no use of vehicles or lights, no dogs, and the hours), it is expected that the actual take would be much less.</p>
Other Wildlife-Dependent Recreation	
<p>There are roads and trails on and around the refuge that contribute to cumulative impacts. As mentioned elsewhere in the EA, interior roads fragment the refuge and any increase in use may contribute to wildlife disturbance due to more frequent traffic and human activity.</p> <p>Hunters comprise a majority of the public use on the refuge. The refuge does maintain trails for hiking, nature observation, photography, or nature interpretation. Hunting is prohibited in the trail areas and the 8,295-acre South 19th Unit. Therefore, significant acreage exists for other wildlife-dependent recreation.</p>	<p>Roads and trails on the refuge contribute to cumulative impacts on the environment. Roads and trails fragment habitat and increase the potential for the spread of invasive species and human-wildlife interaction (thereby disturbance). No newly developed roads or trails would be planned under the proposed alternative.</p> <p>The proposed alternative would not interfere with other wildlife-dependent recreation. Similarly, other wildlife-dependent recreation would not preclude the proposed action. For example, hunting and birding currently coexist in the same areas of the refuge. Yet, if nonhunters want to recreate in areas without hunting, there are many acres for those activities.</p>
Development and Population Increase	
<p>Land use has remained relatively stable since the refuge was established. The human population has not increased enough to promote development and habitat conversion.</p> <p>Since 1980, the population of Lyon County, Kansas, has decreased by approximately 1,700 people (from 35,100 to 33,400). The city of Harford, Kansas, where the refuge is located, has a stable population of 400+ people. Over the past 20 years, development has been minimal. In the last 10 years, a 90-turbine wind energy project was completed 20 miles east of the refuge. Refuge staff has not observed changes to wildlife populations as a result.</p>	<p>It is uncertain how projected population and development trends in Kansas would influence species and hunting and fishing impacts. Because most growth is expected to occur in urban areas, it is unlikely that local development would affect areas around the refuge in the near future. The refuge is in a rural landscape dominated by agricultural activities. However, urban expansion may adversely affect natural resources surrounding cities through additional decreases in the availability of habitat and increasing demands on water resources.</p> <p>Increases in the number of visitors likely would be experienced with increasing populations. Impacts would in part be influenced by changing societal interests and other developments (for example, transportation and equipment).</p> <p>The use of an adaptive management approach would allow the refuge to periodically review and adjust the hunting and fishing program to ensure that it does not contribute to the cumulative impacts of population growth and development on species.</p>

Other Past, Present, and Reasonably Foreseeable Activity Impacting Affected Environment	Descriptions of Anticipated Cumulative Impacts
Agricultural Land Uses	
<p>Tillable agriculture and pastures for cattle dominate the land use in the area surrounding the refuge. Over the past two decades, there has been a slight increase in tillable acres as Conservation Reserve Program acres decrease, and some private land pasture are converted to row crops.</p>	<p>Over the same time period, on refuge land, the Service has restored habitats, thus reducing cropland acreage from 3,900 acres to approximately 2,300 acres. The refuge staff has not noticed a decrease in deer densities over these past two decades. Furbearers and coyotes have increased, but reasons for that extend beyond land conversion. Refuge staff anticipates relative stability in agricultural land use. Therefore, cumulative impacts would be minor.</p>
Agricultural Land Uses	
<p>The Service prohibits the use of lead shot on the refuge. Lead would be allowed in rimfire rifles, muzzleloaders (single projectile), and shotguns (as slugs only) under the proposed alternative.</p>	<p>Research has indicated that lead can be present in gut piles left by deer hunters after field dressing. Bald eagles and other raptors feed on the gut piles and may ingest the lead, leading to poisoning.</p> <p>Under the proposed alternative, the refuge represents only a fraction of hunting for white-tail deer in the local area. We also expect that extending the WAO hunting season would not substantially increase harvest or hunter numbers but would be more likely to provide additional opportunities for current hunters and anglers. Therefore, the proposed action likely would introduce only small amounts of lead statewide, which would have a minor negative impact.</p>
Climate Change	
<p>Climate change refers to the increasing changes in the measures of climate over a long period of time—including precipitation, temperature, and wind patterns (USGS 2019). Although climate change is a naturally occurring phenomenon and temperature and precipitation changes are anticipated, there are many unknowns. Consequently, we do not fully understand the potential impacts that climate change may have on terrestrial and aquatic habitats and the associated wildlife species.</p> <p>Based on the National Oceanic and Atmospheric Administration’s summary of potential climate change effects on Kansas (Frankson et al. 2017; https://statesummaries.ncics.org/chapter/ks/), the prediction is that Kansas may experience warmer winter and spring temperatures. The number of cold (minimum temperature below 0 degrees F) nights may decrease. Annual precipitation, although uncertain, is predicted to be less in summer and more in winter. The intensity of droughts is expected to increase; however, deluge events may also become more frequent.</p>	<p>It has been reported that temporal shifts are occurring in species migration patterns in response to climate change and available food resources at higher latitudes. Over the last 20 years, there have been changes to farming practices and crop rotations, some of those attributable to weather patterns. Although Kansas still leads the nation in hard red winter wheat production, local farmers have significantly reduced their acreage of this crop. Some cite the increased rain and disease problems with winter wheat. This leaves corn and soybeans as the primary crops. Deer often graze in wheat during the winter, and thus large-scale agricultural changes could affect their populations over time. Data from local deer surveys do not show changes yet.</p> <p>Using available and emerging science, the Service would continue to assess predictions of these complex effects and use an adaptive management approach to implement this action to ensure that it does not add to the effects of climate change on the environment.</p>

Other Past, Present, and Reasonably Foreseeable Activity Impacting Affected Environment	Descriptions of Anticipated Cumulative Impacts
	Hunting programs and mitigation measures would adapt with changing conditions to continue to conserve natural resources and balance compatible recreational uses.

Key: CWD = chronic wasting disease; EA = Environmental Assessment; WAO = white-tail antlerless only

Table 7. Harvest, Participation, and Activity Levels for Hunters in Kansas during the 2017–2018 Furbearer Harvest Survey.

Species	Survey Respondents Who Pursued (n)	Estimated Harvest	% of Hunters Who Pursued	Harvest/100 Days	Maximum Harvest	Ave Harvest/Hunter
Badger	35	91	5	13.8	2	0.66
Bobcat	310	728	42	10.1	7	0.6
Coyote	637	17,537	86	48.7	100	6.99
Red Fox	44	122	6	10.3	20	0.7
Gray Fox	19	4	3	0.2	1	0.05
Swift Fox	11	4	1	1.5	1	0.09
Opossum	55	980	7	32.4	40	4.49
Raccoon	218	10,378	29	109.8	100	12.09
Skunk	22	153	3	60.6	6	1.77

Source: KDWPT 2018c

3.4 Mitigation Measures to Prevent Conflicts

Mitigating measures include prohibiting the use of centerfire rifles and pistols to provide for public safety of the surrounding private landowners. In addition, the Townsite Trail Area, north of Hartford, is closed to hunting activities year round. This reduces conflict with hikers, birdwatchers, and photographers. Refuge law enforcement officer and KDWPT wardens monitor the hunts. They would conduct license, bag limit, and access compliance checks.

To mitigate potential conflicts between raccoon hunters’ dogs and the surrounding private landowners, the Service would prohibit the use of dogs and night hunting for furbearers. On national wildlife refuges, no unconfined domestic animals (dogs, hogs, cats, horses, sheep, or cattle) shall be permitted to enter or roam at large (CFR S26.21[b]). Therefore, furbearer hunting would be limited to daylight hours, without dogs.

3.5 Monitoring

The State of Kansas conducts and uses surveys that are used to facilitate decision-making related to hunting and fishing activities (<https://ksoutdoors.com/Services/Research-Publications/Wildlife-Research-Surveys>). The refuge would heavily rely on the same information, such as what was used in this proposed EA and Hunting Plan. Local or refuge-specific information would be used to supplement statewide surveys or reports. Service law enforcement officers would offer the best source of monitoring for both the wildlife populations and also the hunting impact.

3.6 Summary of Analysis

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

Alternative A – Proposed Action Alternative

This alternative helps meet the purpose and needs of the Service as described above, because it provides additional wildlife-dependent recreation opportunities on the refuge. This hunting plan brings the refuge into alignment with KDWPT regulations, and with other national wildlife refuges in Kansas. Furthermore, the coyote hunting proposal would provide some consistency of regulations with the adjacent Otter Creek State Wildlife Area and the U.S. Army Corps of Engineers John Redmond Reservoir. Simplifying regulations could assist with reducing the downward trend in hunters and anglers by providing for the recruitment, retention, and re-activation of sportsmen and sportswomen.

The proposed alternative would create hunting opportunity, yet not likely enough take to adversely affect populations of the hunted species. Vegetation change would be minimal. There would be no impact on threatened and endangered species. Cultural resources would not be affected. The proposed hunts would require minimal additional administration and law enforcement. Visitor use would increase, thus positively affecting the local economy.

The Service has determined that the proposed action is compatible with the purposes of the refuge and the mission of the Refuge System.

Alternative B – No Action Alternative

The visiting public would continue to be frustrated by a lack of furbearer and coyote hunting options at the refuge. Deer hunters would likely continue to express concern over the abundance of coyotes and predators they see while hunting from a deer stand.

3.7 List of Sources, Agencies and Persons Consulted

The following agencies and organizations were consulted during the development of this EA.

- Kansas Department of Wildlife, Parks, and Tourism; Pratt, Kansas
- Barbara Boyle, Refuge Supervisor, USFWS DOI Region 5
- Aaron Mize, Hunt and Fish Coordinator, USFWS DOI Regions 5 and 7
- Bernardo Garza, Hunt and Fish Coordinator, USFWS DOI Regions 5 and 7
- Craig Mowry, Project Leader, USFWS Kansas NWR Complex

3.8 List of Preparers

Name	Position	Work Unit
Tim Menard	Wildlife Biologist	Flint Hills NWR

3.9 State Coordination

Representatives of the Kansas National Wildlife Refuge Complex (Flint Hills, Marais des Cygnes, and Quivira NWRs) met with the Secretary of KDWPT and a KDWPT wildlife research supervisor migratory bird specialist about potential future hunting opportunities on the refuges on October 30, 2019, in Hartford, Kansas. The state shared organization and public interests and responded to proposed hunting opportunities at the meeting and in follow-up verbal and written communications. These discussions helped adjust our plan to align, where possible, with State management goals. Overall, the state was supportive of the Service's proposals of expanded hunting opportunities and both agencies confirmed the continuance of a strong partnership. The refuge received a letter of concurrence from the State Director on November 18, 2019.

Flint Hills NWR and KDWPT will continue to work together to ensure safe and enjoyable recreational hunting opportunities. Law enforcement officers from both USFWS and KDWPT work together to patrol Flint Hills NWR, safeguarding hunters, visitors, and both game and nongame species.

3.10 Tribal Consultation

The Service mailed an invitation for comments to all Tribes potentially impacted by initiating an Environmental Assessment to expand hunting opportunities at Flint Hills NWR. The Service extended an invitation to engage in government-to-government consultation in accordance with Executive Order 13175.

3.11 Public Outreach

The KDWPT participated as part of the planning team. Comments throughout the planning process were considered in development of the hunting plan. The refuge will advertise the proposed hunting plan at the local post office and grain elevator. Special announcements and articles may be released in conjunction with hunting seasons.

The public will have a period of 30 days for review of the Draft Flint Hills National Wildlife Refuge Hunting Plan and associated Environmental Assessment. The hunting plan and Environmental Assessment will be available at <https://www.fws.gov/mountain-prairie/huntfish.php#>. Hard copies will be available upon request.

3.12 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.

3.13 References

- Chronert, J.M.; Jenks, J.A.; Roddy, D.E.; Wild, M.A.; Powers, J.G. 2006. Effects of Sarcoptic Mange on Coyotes at Wind Cave National Park. *The Journal of Wildlife Management* 71(6), 1987-1992.
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- Mensik, J.G.; Paveglio, F. L. 2004. Biological Integrity, Diversity, and Environmental Health Policy and the Attainment of Refuge Purposes: A Sacramento National Wildlife Refuge Case Study. *Natural Resources Journal* 44:1162-83.
- Riley, S.P.D.; Hadidian, J.; Manski, D.A. 1998. Population density, survival, and rabies in raccoons in an urban national park. *Canadian Journal of Zoology* 76, 1153–1164.
- Rollins, D.; Carroll, J.P. 2001. Impacts of Predation on Quail. ., & Sisson, D. C. 2005. Identifying Predators at Northern Bobwhite Nests. *The Journal of Wildlife Management*, 69(1), 124-132. Retrieved from <<http://www.jstor.org/stable/3803591>>
- [USDOI] U.S. Department of the Interior, U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.
- [USFWS] U.S. Fish and Wildlife Service. 2000. Flint Hills National Wildlife Refuge Comprehensive Conservation Plan. Department of the Interior, U.S. Fish and Wildlife Service, Region 6. Hartford, KS.

APPENDIX A OTHER APPLICABLE STATUTES, EXECUTIVE ORDERS, AND REGULATIONS

Statutes, Executive Orders, and Regulations
Cultural Resources
<p>American Indian Religious Freedom Act, as amended, 42 U.S.C. 1996 – 1996a; 43 CFR Part 7</p> <p>Antiquities Act of 1906, 16 U.S.C. 431-433; 43 CFR Part 3</p> <p>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</p> <p>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</p> <p>Paleontological Resources Protection Act, 16 U.S.C. 470aaa – 470aaa-11</p> <p>Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001–3013; 43 CFR Part 10</p> <p>Executive Order 11593 – Protection and Enhancement of the Cultural Environment, 36 Fed. Reg. 8921 (1971)</p> <p>Executive Order 13007 – Indian Sacred Sites, 61 Fed. Reg. 26771 (1996)</p>
Fish and Wildlife
<p>Bald and Golden Eagle Protection Act, as amended, 16 U.S.C. 668-668c, 50 CFR 22</p> <p>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</p> <p>Fish and Wildlife Act of 1956, 16 U.S.C. 742 a–m</p> <p>Lacey Act, as amended, 16 U.S.C. 3371 et seq.; 15 CFR Parts 10, 11, 12, 14, 300, and 904</p> <p>Migratory Bird Treaty Act, as amended, 16 U.S.C. 703–712; 50 CFR Parts 10, 12, 20, and 21</p> <p>Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds, 66 Fed. Reg. 3853 (2001)</p>
Natural Resources
<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</p> <p>Wilderness Act, 16 U.S.C. 1131 et seq.</p> <p>Wild and Scenic Rivers Act, 16 U.S.C. 1271 et seq.</p> <p>Executive Order 13112 – Invasive Species, 64 Fed. Reg. 6183 (1999)</p>
Water Resources
<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>

Key: CFR = Code of Federal Regulations; U.S.C. = U.S. Code