

UNITED STATES FISH AND WILDLIFE SERVICE

ENVIRONMENTAL ACTION STATEMENT

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA), and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and determined that the proposed Sport Hunting Plan for Clarks River National Wildlife Refuge in Graves, McCracken, and Marshall Counties, Kentucky:

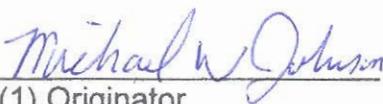
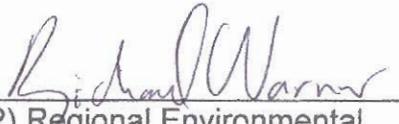
Check One:

- is a categorical exclusion as provided by 516 DM 2, Appendix 1 and 516 DM 6, Appendix 1, Section 1.4 A (4). No further NEPA documentation will therefore be made.
- is found not to have significant environmental effects as determined by the attached Environmental Assessment and Finding of No Significant Impact.
- is found to have significant effects and, therefore, further consideration of this action will require a notice of intent to be published in the Federal Register announcing the decision to prepare an EIS.
- is not approved because of unacceptable environmental damage, or violation of Fish and Wildlife Service mandates, policy, regulations, or procedures.
- is an emergency action within the context of 40 CFR 1 506.1 1. Only those actions necessary to control the immediate impacts of the emergency will be taken. Other related actions remain subject to NEPA review.

Other Supporting Documents:

Endangered Species Act, Section 7 Consultation, 2007
Compatibility Determination, 2007

Signature Approval:

 (1) Originator	<u>4-6-07</u> Date	 (2) Regional Environmental Coordinator	<u>04/19/07</u> Date
 (3) Regional Chief, NWRS, Southeast Region	<u>4/19/2007</u> Date	 (4) Regional Director, Southeast Region	<u>4/20/07</u> Date

Sport Hunting
Decision Document Package
for
CLARKS RIVER NWR

Alternative D

Contents

2. Environmental Assessment

Environmental Assessment

2007 Sport Hunt Plan

on

CLARKS RIVER NATIONAL WILDLIFE REFUGE
Graves, Marshall, and McCracken Counties, Kentucky

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Benton, Kentucky
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U.S. Fish & Wildlife Service

Hunting Brochure Map

Clarks River National Wildlife Refuge

Groves, Marshall and McCracken Counties, Kentucky

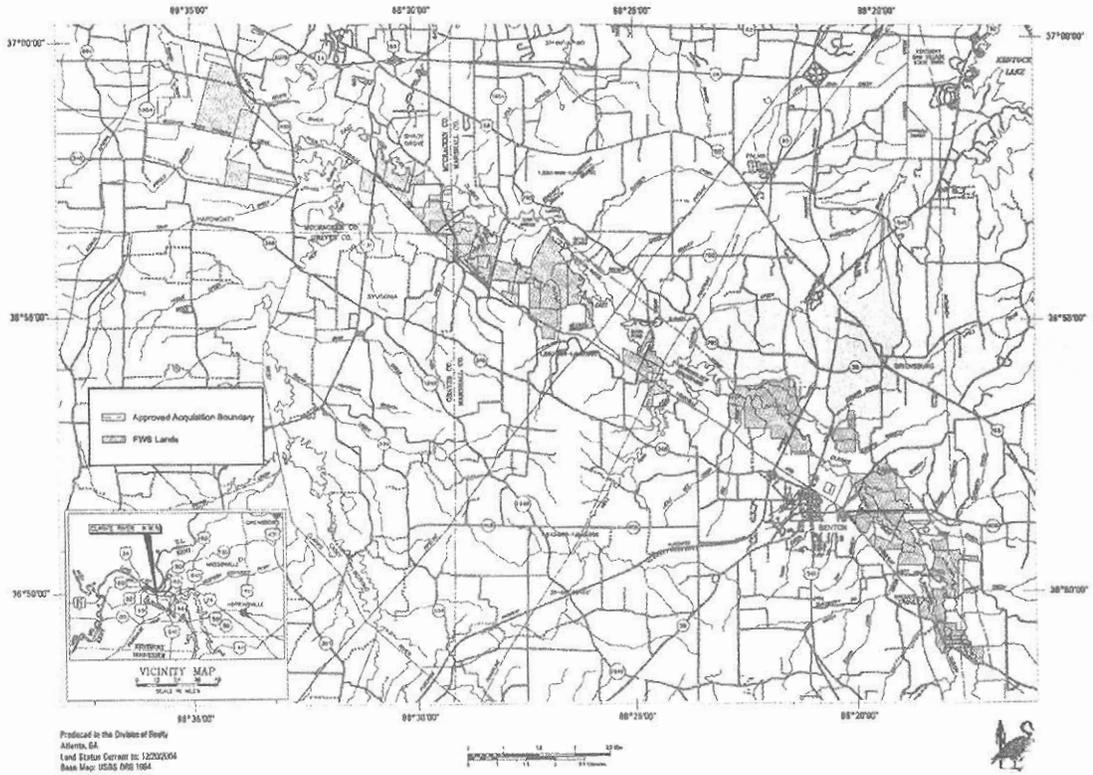


Figure 1. Location of Clarks River National Wildlife Refuge

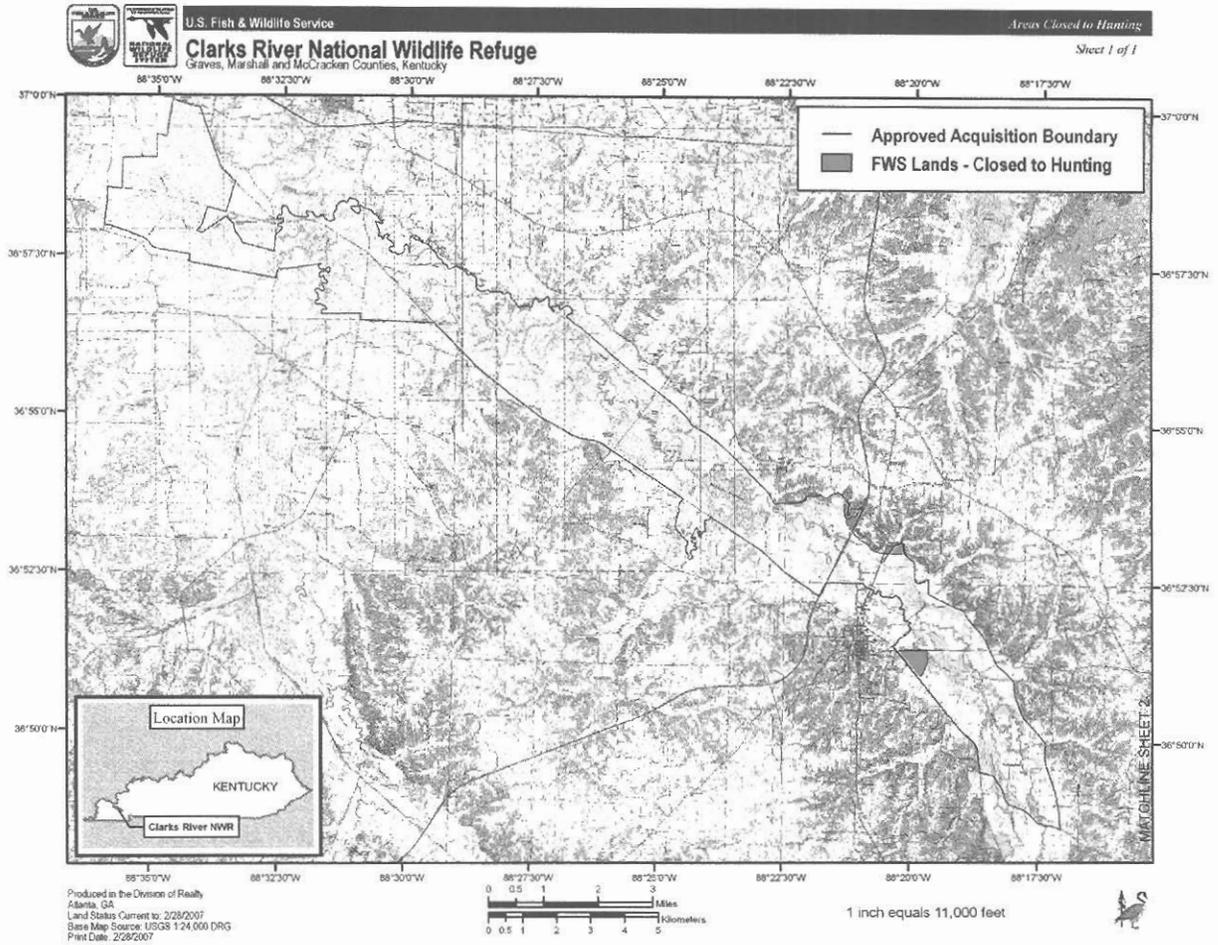


Figure 2. Areas open and closed to hunting on Clarks River National Wildlife Refuge

Chapter 1 Purpose and Need for Action

Clarks River National Wildlife Refuge (NWR) was established by authority of the Emergency Wetland Resources Act [16 U.S.C. 3901 (b)] for "...the conservation of the wetlands of the nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions..."

The National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd et seq.) provides authority for the Service to manage the refuge and its wildlife populations. In addition it declares that compatible wildlife-dependent public uses are legitimate and appropriate uses of the Refuge System that are to receive priority consideration in planning and management. There are six wildlife-dependent public uses: hunting, fishing, wildlife observation, wildlife photography, environmental education and interpretation. It directs managers to increase recreational opportunities including hunting on National Wildlife Refuges when compatible with the purposes for which the refuge was established and the mission of the National Wildlife Refuge System.

In response to a 2003 lawsuit filed by the Fund for Animals, the U.S. Fish and Wildlife Service (Service) will amend or rewrite environmental assessments that describe hunting programs at twenty-three national wildlife refuges located in the Southeast Region. The new environmental assessments will address the cumulative impacts of hunting at all refuges which were named in or otherwise affected by the lawsuit. This document addresses the hunting programs at Clarks River National Wildlife Refuge in Kentucky.

The purpose of this updated Environmental Assessment is to evaluate the effects of sport hunting at Clarks River National Wildlife Refuge. The alternatives evaluated in this updated Environmental Assessment are the same as those evaluated when the refuge was first proposed opened for hunting in 1999, namely; A) the no action alternative, B) the quota hunt alternative, C) the limited quota hunt alternative, and D) the action as proposed in the Refuge Hunt Plan.

The proposed action, Alternative D, would implement a hunt program consistent with the current refuge hunt program and as published in the most current publication of the Federal Register. The existing hunt program has been developed through annual biological and management assessments conducted since the program's inception. The hunting program as conducted, and proposed, is discussed in detail in the 2007 Sport Hunting Plan for Clarks River National Wildlife Refuge. The hunt program as proposed will provide the public with a high quality recreational experience and provide the refuge with a wildlife management tool to promote the biological integrity of the refuge.

Chapter 2 Alternatives Including the Proposed Action

This chapter discusses the alternatives considered for hunting on Clarks River National Wildlife Refuge. The alternatives evaluated in this Environmental Assessment are the same as those evaluated when the refuge was first proposed open for hunting in 1999, namely the; A) no action alternative, B) quota hunt alternative, C) limited quota hunt alternative, and D) the action as proposed in the Refuge Hunt Plan.

2.1 Alternative A: No Action

This action would result in the loss of a public and traditional outdoor recreation opportunity, *i.e.* no public hunting.

2.2 Alternative B: Quota Hunts

Hunting of all species would be conducted through quotas on a first come, first serve basis, with seasons coinciding with statewide regulations, and refuge special regulations.

2.3 Alternative C: Limited Quota Hunts

Quota hunts would be limited to deer and turkey on a first come, first serve basis, while other game species would be open according to statewide regulations, and refuge special regulations.

2.4 Alternative D: Action as Proposed in the Refuge Hunt Plan

Adherence to the proposal in the hunt plan should result in an annual sustained harvest of migratory birds, resident big and upland games species. The proposed action is not likely to adversely affect the Federal threatened and endangered species present on the refuge.

Alternatives B, C, and D would be implemented throughout the refuge except for those areas specifically closed to hunting for public safety, to provide wildlife sanctuary, or for administrative reasons. Alternatives B, C, and D, would be implemented consistent with statewide and/or refuge special regulations.

Chapter 3 Affected Environment

The Clarks River National Wildlife Refuge (NWR) was established on June 19, 1997. It is located in Graves, Marshall and McCracken Counties in the Jackson Purchase Region of western Kentucky. Congress authorized the acquisition of approximately 18,000 acres located within the floodplain and lower reaches of the East Fork of the Clarks River. The refuge averages about two to three miles wide and extends about 20 miles from near Paducah, Kentucky to just south of Benton, Kentucky.

Elbert and Judy Flatt started the refuge acquisition process by donating a 185-acre tract of land in 1998. The nucleus of the refuge was formed with the purchase of approximately 1,200 acres of land from the Minter family in 1998 and another 2,897 acres of land from MeadWestvaco in 1999. To date approximately 7,950 acres have been acquired from willing sellers at a cost of \$7.7 million.

Clarks River National Wildlife Refuge was established under the authority of the Emergency Wetland Resources Act of November 10, 1986 (100 Stat. 3582). Funding for the acquisition of refuge lands has been provided through the Land and Water Conservation Fund Act of September 3, 1964 (78 Stat. 897).

3.1 Physical Environment

The East Fork of the Clarks River rises in Henry County, Tennessee and runs northward for approximately 38 miles before joining with the West Fork of the Clarks River in McCracken County, Kentucky. The main stem meanders north for an additional six miles before emptying into the Tennessee River just east of Paducah. The river system drains a total of 546 square miles in Graves, Calloway, Marshall, and McCracken Counties and has a total stream length of 297 miles. Approximately 80 percent of the refuge lies within the floodplain of the East Fork of the Clarks River.

The East Fork of the Clarks River is one of few in the area that has not been dammed or channelized. Moderate amounts of rainfall will cause the river to leave its banks and localized flooding for short periods is the norm. Historically, it was comparatively slow-moving. The loss of wetlands, and associated water storage capacity, and land alterations within the watershed has significantly increased runoff and flow rates.

The topography in the Clarks River floodplain is flat and bordered by rolling, sometimes steep hills. The river falls approximately 85 feet over 20 miles. Elevations range from 310 feet mean sea level (MSL) at river's edge to over 400 feet MSL in the hills along the northern border. The highest point on the refuge is about 480 feet MSL. Wetland habitat types comprise approximately 95 percent of the refuge and upland habitat types comprise approximately 5 percent. Approximately 75 percent of the refuge is forested, the remainder, 25 percent, is openland.

The soils information for the refuge is based on surveys conducted by the Soil Conservation Service and the Kentucky Agricultural Experiment Station in the mid-1960s. The Falaya-Collins-Waverly soil association covers the upper two-thirds of the refuge and the Forestdale-Waverly soil association covers the lower third of the refuge. The change in soil associations coincides with the observed change in tail-water and headwater conditions on the refuge which occurs in the vicinity of the Sharpe-Elva Road.

The Falaya-Collins-Waverly association consists of nearly level, silty soils in the wide floodplains along the East and West Forks of the Clarks River. The dominant soils formed in silty alluvium. The somewhat poorly drained Falaya soils comprise 26 percent of the association, the moderately well drained Collins soils 25 percent, and the poorly drained Waverly soils 21 percent. All are subject to flooding in winter and early spring and summer crops may be lost to flooding. Agricultural land and timberland are mixed throughout the floodplain, but agricultural land predominates in the upper reaches while timberland predominates in the lower reaches. The suitability of this soil association for residential and industrial uses is limited because of the frequency of stream overflow.

The Forestdale-Waverly association consists of nearly level soils in an area believed to be an ancient lakebed bordering the East Fork of the Clarks River. The high clay variant of Forestdale silt loam formed at higher elevations in a thin layer of loess and underlying clayey sediments. The Waverly soils formed in silty alluvium. Forestdale soils form 37 percent of this association and Waverly soils 20 percent. Both are poorly drained, timberland predominates, and agricultural uses are limited due to flooding.

Clarks River NWR lies within the East Gulf Coastal Plain at the edge of the Central Hardwoods Region and is a part of the Lower Tennessee - Cumberland River Ecosystem.

3.2 Vegetation

The estimated acreage by habitat type within the acquisition boundary is as follows: 13,400 acres of bottomland hardwood forest, 4,380 acres of openland, 64 acres of upland pine forest, 60 acres of moist soils units, 60 acres of native warm-season grass fields, and 36 acres of upland hardwood forest. These figures are subject to change pending further analysis and are expected to be minimal.

The vegetation is primarily a riverine bottomland hardwood forest with overcup oak and cypress on wetter sites and willow oak, pin oak, red oak, ash, elm, and sycamore on the higher and better drained soils. Stands of giant cane or river cane (*Arundinaria gigantea*) are common along the riverbank and in canopy gaps. The forests have been repeatedly cut over the past century by small logging operations or otherwise neglected. An inventory is currently underway that will determine the quantity and quality of timber resources on the refuge. The pine forests are comprised of experimental plantations established by MeadWestvaco in 1978, in 1985, and in 1997. The upland hardwoods are found primarily on the bluffs in the vicinity of Happy Hollow

and Idlewild. Soybeans and corn are the primary crops on the agricultural land, some of which has been converted to moist soils units and native warm-season grass fields to benefit wildlife.

3.3 Wildlife Resources

Wildlife species found on the refuge are typical of bottomland hardwood forests, upland forests, agricultural lands, moist soils, and warm season grasses. The refuge provides habitat for wintering ducks and geese and year-round habitat for nesting wood ducks. Resident game species include gray and fox squirrels, swamp rabbits, eastern cottontail rabbits, quail, turkey, and white-tailed deer. Furbearers present include opossum, raccoon, red and gray foxes, bobcat, river otter, and beaver. No wading bird rookeries have been located on the refuge, but great blue herons are present throughout the year. Adults and juveniles of other heron species have been observed on the refuge during the breeding season indicating there are rookeries nearby.

The refuge is located in the North American Bird Conservation Initiative (NABCI), Central Hardwoods Bird Conservation Region and serves as breeding, wintering, and transient habitat for numerous species of migratory birds of concern including 36 of 135 species (27 percent) on the NABCI national list and 27 of 30 (90 percent) on the central hardwood regional list. The refuge bird list includes over 200 species.

3.4 Threatened and Endangered Species

Clarks River National Wildlife Refuge is located within the historic ranges of the endangered American burying beetle (*Nicrophorus americanus*), the threatened American bald eagle (*Haliaeetus leucocephalus*), the endangered Indiana bat (*Myotis sodalis*), and the endangered gray bat (*Myotis grisescens*). Detailed information on the ecology of each species can be found in the respective recovery plans (USFWS 1982, 1989, 1991, and 1999). A brief discussion of each species follows.

3.4.1 American Burying Beetle

The American burying beetle was once found throughout much of eastern North America and its historic range appears to have coincided with the eastern deciduous forest. It has not been observed in Kentucky since 1974 when it was last collected from nearby Trigg County and is considered possibly extirpated from Kentucky; however, habitat for the species is assumed present on the refuge. The adults are nocturnal and generally most active from April through September. No refuge specific surveys for the beetle have been conducted, but a survey is being planned.

3.4.2 American Bald Eagle

The bald eagle may be found in the refuge vicinity throughout the year. The dams and reservoirs at Land Between the Lakes National Recreation Area, approximately five to ten miles east of the refuge, attract wintering bald eagles and provide foraging habitat for nesting bald eagles.

Reintroduction efforts by the States of Tennessee and Indiana have produced a surplus of young that are beginning to colonize suitable habitats in western Kentucky along the Mississippi and Ohio Rivers west and north of the refuge. There are no known bald eagle nests in Graves County or McCracken County. The nearest known bald eagle nest, MRS-02a, is located one mile east of the refuge in Marshall County. The Kentucky Division of Fish and Wildlife Resources (KDFWR) monitors nesting bald eagles between January and July.

3.4.3 Indiana Bat

The Indiana bat is generally found in and near roost caves, which are used for winter hibernation, from mid-August through mid-May. Female Indiana bats may emerge from hibernation in the roost caves during late-March and early-April, and disperse to habitat with suitable maternal colony sites characterized by mature live trees with loose, shaggy bark and dead trees with loose, sloughing bark. The females and dependent young may be found roosting and foraging in the vicinity of the maternal colony from May through July. Indiana bats forage primarily in wetland and upland forests but may also forage over or along the edge of open lands. Recent mist net surveys on the refuge were not sufficient in scope or duration to document the presence or absence of the Indiana bat. However, Indiana bat maternal colonies have been reported from adjacent counties. Survey efforts will continue as time and funding allow.

3.4.4 Gray Bat

The gray bat dwells in caves all year round, and uses different caves for winter hibernation and summer maternal colonies. It is most likely to be encountered at the caves and when it forages near the caves. It is less likely to be encountered when it migrates between the summer and winter caves. The caves favored by the gray bat are closely associated with limestone karst areas in the southeastern United States. There are no caves or cave-like habitat located on or adjacent to the refuge. The likelihood of encountering a foraging or migrating gray bat is low.

3.5 Fishery Resources

The Clarks River and its tributaries provide habitat for many species of freshwater fish. A refuge-specific fish survey conducted in 2000 and 2002 identified a total of 54 species primarily darters, mad toms and minnows. Important game species such as bass, catfish, crappie, drum, gar, redhorse, and sunfish are present but access to the river is poor and boating on the river is restricted by logjams. Shovelnose sturgeon may use the mouth of the Clarks River during periods when water levels are running above normal. A baseline survey for freshwater mollusks in 2005 recorded 25 species including two listed by the Commonwealth of Kentucky as endangered.

3.6 Cultural Resources

The body of federal historic preservation laws has grown dramatically since the enactment of the Antiquities Act of 1906. Several themes recur in these laws, their promulgating regulations, and

more recent Executive Orders. They include: 1) each agency is to systematically inventory the “historic properties” on their holdings and to scientifically assess each property’s eligibility for the National Register of Historic Places; 2) federal agencies are to consider the impacts to cultural resources during the agencies’ management activities and seek to avoid or mitigate adverse impacts; 3) the protection of cultural resources from looting and vandalism are to be accomplished through a mix of informed management, law enforcement efforts, and public education; and 4) the increasing role of consultation with groups, such as Native American tribes, in addressing how a project or management activity may impact specific archaeological sites and landscapes deemed important to those groups. The U.S. Fish and Wildlife Service, like other federal agencies, is legally mandated to inventory, assess, and protect cultural resources located on those lands that the agency owns, manages, or controls. The Service’s cultural resource policy is delineated in 614 FW 1-5 and 126 FW 1-3. In the Service’s Southeast Region, the cultural resource review and compliance process is initiated by contacting the Regional Historic Preservation Officer/Regional Archaeologist (RHPO/RA). The RHPO/RA will determine whether the proposed undertaking has the potential to impact cultural resources, identify the “area of potential effect,” determine the appropriate level of scientific investigation necessary to ensure legal compliance, and initiates consultation with the pertinent State Historic Preservation Office and federally recognized Tribes.

According to Lori Stahlgren, staff archaeologist at the State Historic Preservation Office, Kentucky Heritage Council, there are no recorded archaeological sites located on the refuge, although there are sites nearby. She also indicated that there were no buildings or other structures eligible to be listed on the National Register of Historic Places.

3.7 Socio Economic

Graves, McCracken and Marshall Counties are primarily rural in character with an economy based on agriculture, livestock, forest products, light and heavy industry. Agriculture is dominated by corn, soybeans, and to a lesser extent by tobacco, winter wheat and hay. The agricultural economy is diversified by beef cattle, dairy cattle, and a wide variety of small livestock operations. An increase in concentrated animal (chicken and hog) feeding operations and rapid growth in ethanol production is anticipated. Population estimates, total households, families, housing units, and median annual household incomes for Graves, McCracken, and Marshall Counties and the Commonwealth of Kentucky are provided in the table below (U.S. Census Bureau 2000).

Table 1. Demographics of Graves, McCracken and Marshall Counties, Kentucky.

<i>County</i>	<i>Population</i>	<i>Households</i>	<i>Families</i>	<i>Housing Units</i>	<i>Median Annual Household Income (\$)</i>
Graves	37,028	14,841	10,562	16,340	30,874
McCracken	65,514	27,736	18,457	30,361	33,865
Marshall	30,125	12,412	8,993	14,730	35,573
Kentucky	4,041,769	3,926,965	1,104,398	1,750,927	33,672

Hunting is a traditional form of outdoor recreation for many people in Graves, McCracken, and Marshall Counties and throughout the Commonwealth of Kentucky. For some households, hunting may provide food at a much cheaper cost and may help meet subsistence requirements for some families. According to the Kentucky Department of Fish and Wildlife Resources End of Year License Sales Report for 2005, the numbers of hunting licenses sold to hunters in Graves County, McCracken County, and Marshall County during the 2005 - 2006 hunting season were 7,044 and 15,365 and 9,396 respectively.

Chapter 4 Environmental Consequences

This chapter describes the direct effects, indirect effects and the reasonably foreseeable environmental consequences of implementing the four management alternatives in Chapter 2. When detailed information is available, a scientific and analytic comparison between alternatives and their anticipated consequences is presented, which is described as “impacts” or “effects.” When detailed information is not available, those comparisons are based on the professional judgment and experience of refuge staff, Service and State biologists, and others.

4.1 Effects Common to all Alternatives

4.1.1 Environmental Justice

Executive Order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” was signed by President Bill Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income community access to public information and participation in matters relating to human health or the environment. This assessment has not identified any adverse or beneficial effects for any of the alternatives unique to minority or low-income populations in the affected area. No alternative will disproportionately place any adverse environmental, economic, social, nor health impacts on minority or low-income populations.

4.1.2 Public Health and Safety

All alternatives would have similar effects or minimal to negligible effects on human health and safety.

4.1.3 Refuge Physical Environment

Impacts of each alternative on the refuge physical environment would have similar minimal to negligible effects. Some disturbance to surface soils, topography, and vegetation would occur in areas selected for hunting; however effects would be minimal. Hunting would benefit vegetation as it is used to keep certain resident wildlife populations in balance with the habitat’s carrying capacity. The refuge would also control access to minimize habitat degradation.

Impacts to the natural hydrology would have negligible effects. The refuge expects impacts to air and water quality to be minimal and only due to refuge visitors’ automobile emissions. The

effect of these refuge-related activities on overall air and water quality in the region are anticipated to be relatively negligible. Existing State water quality criteria and use classifications are adequate to achieve desired on-refuge conditions.

Negative impacts to solitude among and within user groups are expected to be minimal given time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users). Positive impacts will result under the proposed alternative for the hunting public who seek solitude through hunting as an outdoor recreation.

4.1.4. Cultural Resources

None of the alternatives pose any threat to archaeological sites or historic properties on and/or near the refuge.

4.2 Summary of Effects

4.2.1 Impacts to Habitat

Alternative A: No Action

Coyote, opossum, raccoon, and white-tailed deer populations could increase above the carrying capacity of refuge habitat. As a result of overpopulation, the likelihood of starvation and diseases, such as bluetongue and epizootic hemorrhagic disease (EHD) in deer would likely increase as would vehicle-deer collisions, and crop depredation. Coyote, raccoon and opossum, may contract and spread distemper or rabies at above normal rates.

When white-tailed deer are overpopulated, they overbrowse their habitat, which can change the structure and composition of vegetative communities, and significantly reduce plant diversity. This will have a negative effect on refuge habitats and all associated wildlife species. The refuge recently began reforesting farmed wetlands with bottomland hardwood trees and may reforest up to 4,000 acres over the next several years. Young tree seedlings (1-9 years old) can be killed by overbrowsing. In the long-term overbrowsing would inhibit natural reproduction and replacement of a mature forest. Bottomland hardwood forests are a threatened ecosystem (Noss *et al.* 1995). Under this alternative, a reduction in habitat diversity and uncontrollable impacts to wetland conservation efforts would compromise the biological integrity of refuge habitats preventing refuge goals and objectives from being met.

Although hunters would not be traversing the refuge, which could cause damage to individual plants by trampling vegetation, or create narrow trails devoid of vegetation, other uses would still occur, with similar impacts. In either case the impacts incurred would be negligible.

Alternative B: Quota Hunts

Under this alternative, the hunting of all game species listed in the Refuge Hunt Plan would be regulated by a quota system. The numbers of white-tailed deer would be regulated to minimize damage to refuge habitat. The regulation of all other game species would likely have a neutral effect on refuge habitat.

Annually harvesting the white-tailed deer population would prevent overbrowsing. Damage to refuge habitat, including newly planted bottomland hardwood forest would be avoided providing a natural range of vegetation types and age classes. Plant diversity and refuge biological integrity would be maintained under this alternative; however, increased administrative costs associated with the processes required by quota hunts could negatively impact ongoing and proposed habitat management initiatives (*i.e.* available funding and/or staff resources redirected from planning and implementing wetland restoration, grassland restoration, control of exotic plants, mowing, and disking, etc. to process applications, maintain data, ensure compliance, maintain check in points, and establish quota boundaries, etc.).

Hunters, and others, traversing the refuge could cause damage to individual plants by trampling vegetation, or create narrow trails devoid of vegetation. The effects to refuge habitat would be negligible.

Alternative C: Limited Quota Hunts

Under this alternative, the hunting of turkey and white-tailed deer would be regulated by a quota system. The numbers of white-tailed deer would be regulated to minimize damage to refuge habitat. The regulation of turkey, and all other game species, would likely have a neutral effect on refuge habitat. All effects to refuge habitat, including that induced by hunters and other users, and redirection of staff/funding resources to address quota hunt processes is the same as Alternative B, with slightly lower impacts due to the volume of applicants to be considered.

Hunters, and others, traversing the refuge could cause damage to individual plants by trampling vegetation, or create narrow trails devoid of vegetation. The effects to refuge habitat would be negligible.

Alternative D: Action as Proposed in the Refuge Hunt Plan

The biological integrity of the refuge would be maintained and enhanced under this alternative, and the refuge purpose of conserving wetland habitat for wildlife would be achieved. The hunting of white-tailed deer would positively impact wildlife habitat by promoting plant health and diversity.

Hunters, and others, traversing the refuge could cause damage to individual plants by trampling vegetation, or create narrow trails devoid of vegetation. The effects to refuge habitat would be negligible.

4.2.2 Impacts to Hunted Wildlife

Alternative A: No Action

Disturbance and mortality to individuals of all game species due to hunting would not occur under this alternative. Disturbance to all game species from other uses, such as wildlife observation and photography, would still occur with negligible impacts.

Coyote, opossum, raccoon, and white-tailed deer populations could increase above the carrying capacity of refuge habitat. As a result of overpopulation, the likelihood of starvation and diseases, such as bluetongue and EHD in deer would likely increase as would vehicle-deer collisions, and crop depredation. Coyote, raccoon and opossum, may contract and spread distemper or rabies at above normal rates.

When white-tailed deer are overpopulated, they overbrowse their habitat, which can change the structure and composition of vegetative communities and result in decreased game species diversity. A reduction in cover and the amount and type of foods available to other game species will increase competition between and among game species, resulting in higher stress levels, reduced health, and higher predation rates. Game species diversity and refuge biological integrity would not be maintained under this alternative.

Alternative B: Quota Hunts

Disturbance and mortality to individuals of all game species due to hunting would occur under this alternative. Disturbance to all game species from other uses, such as wildlife observation and photography, would also occur but is considered to be negligible. Regulating the hunting of all game species would be possible under this alternative and would minimize the likelihood of starvation and disease due to overpopulation. Health and vigor could be maintained by managing populations at or below carrying capacity. A reduction in cover, the amount and type of foods available, etc. would be adequate due to population regulation, and prevent competition between and among game species. Automobile collisions with individual white-tailed deer could be minimized if white-tailed deer are not allowed to overpopulate. Increased administrative costs associated with quota hunt processes could negatively impact ongoing and proposed habitat management initiatives that benefit hunted species if redirection of available management resources results. Game species diversity and refuge biological integrity would be maintained under this alternative.

Alternative C: Limited Quota Hunts

The impacts to hunted wildlife under Alternative C would likely be the same as Alternative B. However, depending on the type of quota system used the impacts to white-tailed deer and turkey may vary. In addition, negative impacts associated with any redirection of management resources should be reduced due to a lower volume of applicants. There would be fewer applications to process and less administrative staff time and money spent processing them.

Alternative D: Action as Proposed in the Refuge Hunt Plan

Disturbance and mortality to individuals of all game species due to hunting would occur under this alternative. Disturbance to all game species from other uses, such as wildlife observation and photography, would also occur but is considered to be negligible. Flexibility in regulating the hunting of all game species would be allowed, and would minimize the likelihood of starvation and disease due to overpopulation. Health and vigor would be maintained by managing the population at or below carrying capacity. Cover, the amount and diversity of foods available, etc. would be better maintained through time due to population regulation, and reduce competition between and among game species. Game species diversity and refuge biological integrity would be maintained under this alternative. Automobile collisions with individual white-tailed deer could be minimized if white-tailed deer are not allowed to overpopulate.

Hunting can cause some disturbance to target and non-target game species. However, time and space zoning (e.g., establishment of separate use areas, use periods, and restrictions on the number of users) established by refuge regulations would minimize incidental disturbance. The disturbances to hunted wildlife would be confined primarily to the hunting season.

4.2.3 Impacts to Non-hunted Wildlife

Alternative A: No Action

Ground and shrub nesting birds and turtles are subject to high egg depredation rates if raccoon, coyotes, and opossum populations are not kept in check through harvest. When white-tailed deer are overpopulated, they overbrowse their habitat, which can change the structure and composition of vegetative communities. A forest with reduced plant diversity devoid of an herbaceous layer, shrubs and a mid-story canopy would not support a full complement of amphibians, reptiles, birds or small mammals; there would be less food and cover for these non-game species resulting in lower populations and increased predation rates. Non-game predator populations would eventually decline as well, due to lack of available prey. Non-hunted wildlife species diversity and refuge biological integrity would not be maintained under this alternative. Disturbances to non-hunted wildlife would not occur, although disturbances to non-hunted wildlife by other users would remain constant.

Alternative B: Quota Hunts

The types of disturbance to non-hunted wildlife by hunters, and timing, would be the same as that described in Alternative D below, the proposed action, but the amount and frequency of disturbance would likely be reduced by the use of a quota system for all game species. Non-game species diversity and refuge biological integrity would be maintained under this alternative.

Alternative C: Limited Quota Hunts

The types of disturbance to non-hunted wildlife by hunters, and timing, would be the same as that described in Alternative D below, the proposed action, but the amount and frequency of disturbance would likely be reduced by the use of a quota system for turkey and white-tailed deer. Non-game species diversity and refuge biological integrity would be maintained under this alternative.

Alternative D: Action as Proposed in the Refuge Hunt Plan

Seasonal disturbance to non-hunted wildlife may increase. Species active at dawn or dusk would be affected more than nocturnal species. However, significant disturbance would be unlikely because many bird species migrate south at the beginning of the hunting season and return after the hunting season has closed; and most reptiles, amphibians, and small mammals hibernate or become less active during the hunting season. Most of the hunting occurs between October and December when non-game species are least active and present in fewer numbers.

Disturbances to non-hunted wildlife may occur at dawn or dusk, particularly at the beginning of the hunting season, in the fall, before all of the Neotropical migratory birds have left, and before the reptiles, amphibians and small mammals go into hibernation. The amount and frequency of disturbance would decline as temperatures decrease. Disturbance to the daily wintering activities, such as feeding and resting, of Nearctic migratory birds might occur, but would be transitory. The extent of disturbance is limited to non-hunted wildlife in the immediate vicinity of the hunter, which is considered to be negligible.

Populations of coyotes, opossum, and raccoons would be held in check through hunting under this alternative. Depredation rates of quail, turkey, turtles, songbirds, snakes and their nests would stabilize at or near optimal rates. The quantity and quality of habitat needed to maintain healthy and diverse populations of non-hunted wildlife would be assured if habitat impacts associated with white-tailed deer overpopulation are prevented by population regulation to prevent the overbrowsing of available habitat. Non-game species diversity and refuge biological integrity would be maintained under this alternative.

4.2.4 Impacts to Endangered and Threatened Species

Clarks River National Wildlife Refuge is located within the historic ranges of the endangered American burying beetle, the threatened American bald eagle, the endangered Indiana bat, and the endangered gray bat. Hunting has not been implicated as a cause of decline for any of these species. Potential impacts to each species are discussed below under Alternative D.

Alternative A: No Action

If the refuge were not opened to hunting there would be no change in the present status or future management of threatened and endangered species present or potentially present on the refuge.

Alternative B: Quota Hunts

The impacts to endangered and threatened species and their habitats would likely be the same as those described below under Alternative D.

Alternative C: Limited Quota Hunts

The impacts to endangered and threatened species and their habitats would likely be the same as those described below under Alternative D.

Alternative D: Action as Proposed in the Refuge Hunt Plan

The endangered American burying beetle is most active from April through September so there would be some overlap with hunter activity in the early fall. However, the species is nocturnal and would not be affected by hunter activities. Furthermore, the species has not been observed in Kentucky since 1974. Should a relict population of the American burying beetle be found on the refuge, or should it be reintroduced, disturbance to the species or its habitat would be insignificant.

The presence of the endangered Indiana bat and the endangered gray bat on the refuge has not been confirmed but is assumed. Both species are migratory and hibernate in caves during the winter. There are no such caves or cave-like habitats on or adjacent to the refuge. The life cycle of these species is such that they would be assumed absent from the area between October 15 and March 31. Generally, hunting seasons extend from early August through the end of January (with a few exceptions), with the majority of hunting related activity occurring during the months of October through December, at which time these species are assumed absent. Disturbance to the Indiana bat and gray bat, should they linger in the fall, arrive early in the spring, or otherwise be present, would be insignificant. Impacts to the maternal or foraging habitat of these species would also be insignificant.

The threatened American bald eagle does not currently nest on the refuge and sightings in the vicinity of the refuge are infrequent. There is a potential that bald eagles could nest on the refuge in the future. If so, the nesting zone would be managed consistent with the Service's bald eagle management guidelines to minimize disturbance to the nesting pair(s) and their young. Disturbance to the bald eagle and its nesting or foraging habitat would be insignificant.

4.2.5 Impacts to Refuge Facilities (roads, trails, parking lots, levees)

Alternative A: No Action

Additional damage to roads, trails, parking lots and levees due to hunter use during wet weather periods would not occur; however, others would still be using the refuge facilities, thereby necessitating periodic maintenance. Additionally, costs associated with a hunting program in the

form of road, trail and levee maintenance, instructional sign needs, and law enforcement would not be applicable.

Alternative B: Quota Hunts

Some damage to roads, trails, parking lots and levees due to hunter use during wet weather periods may occur. Several years of operations indicate these impacts would be minimal. There would be some costs associated with a hunting program in the form of road and trail maintenance, instructional sign needs, and law enforcement. These costs should be minimal relative to total refuge operations and maintenance costs and would not diminish resources dedicated to other refuge management programs.

Alternative C: Limited Quota Hunts

The impacts to refuge facilities would be the same as those described in Alternative B above.

Alternative D: Action as Proposed in the Refuge Hunt Plan

The impacts to refuge facilities would be the same as those described in Alternative B above.

4.2.6 Impacts to Wildlife-Dependant Recreation

Alternative A: No Action

The refuge would not provide a traditional wildlife-oriented recreational opportunity compatible with the purpose for which it was established. The public would not harvest a renewable resource and public demand for hunting would not be addressed. Hunting is an important part of the local culture, and this alternative would not allow citizens to enjoy hunting at little or no cost on public land, in a region where private land is leased for hunting and lease fees are becoming increasingly more expensive as demand for quality hunting increases. Under this alternative, providing compatible wildlife-dependent recreation goals and objectives are not met.

Alternative B: Quota Hunts

The impacts to wildlife dependent recreation would be the same as Alternative D except that user conflicts and hunter opportunity may be further reduced, and a recreational hunter fee may be charged to address administrative costs associated with the processes of the quota hunt operation, potentially reducing hunter participation (higher fees than Alternative C could be incurred due to volume). The complexity of a quota system for all game species may negatively influence hunter interest. Under this alternative, providing compatible wildlife-dependent recreation goals and objectives are met.

Alternative C: Limited Quota Hunts

The impacts to wildlife dependent recreation would be the same as Alternative D except that user conflicts and hunter opportunity may be further reduced by a quota system for turkey and white-tailed deer, two of the most popular species hunted on the refuge. Hunters may be assessed a fee to address administrative costs associated with the processes of the quota hunt operation, potentially reducing hunter participation. The complexity of a quota system for the two most popular game species, deer and turkey, may negatively influence hunter interest. Lower fees than Alternative B may be incurred due to lower volume. Under this alternative, providing compatible wildlife-dependent recreation goals and objectives are met.

Alternative D: Action as Proposed in the Refuge Hunt Plan

The refuge would provide a traditional wildlife-oriented recreational opportunity compatible with the purpose for which it was established. The public would harvest a renewable resource and public demand for hunting would be addressed. Hunting is an important part of local culture and this alternative would allow citizens to enjoy hunting at little or no cost on public land in a region where private land is leased for hunting and lease fees are becoming increasingly more expensive as demand for quality hunting increases.

As public use levels increase over time, conflicts among and within user groups may occur. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) is an effective tool in reducing or eliminating such conflicts.

The Refuge Hunt Plan for the proposed action prohibits raccoon and opossum hunting during daylight hours when other users are typically present. Squirrel rabbit and quail seasons are closed during any modern gun or muzzleloader deer seasons. Separate seasons are established for crossbow, muzzleloader, and modern guns but archery is permitted throughout the hunting season for turkey and white-tailed deer and has not caused any known conflicts. Certain weekends are designated for youth-only hunts so that they do not have to compete with adults, and so that they may receive proper training by an experienced adult hunter who must be present. These are just some of the ways by which competition within the hunting user group would be managed.

If additional conflicts among and within user groups occur they would be mitigated by time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users). Other uses could occur throughout the year, but the majority typically occurs from spring through fall when trees have leafed out, flowers are in bloom, and when many species of wildlife are most active. The refuge would also focus other use (mainly birdwatching and other wildlife viewing) in specific areas that would be closed to hunting.

The hunting public would acquire an increased awareness of Clarks River National Wildlife Refuge and the National Wildlife Refuge System. Refuge staff would instill an appreciation for

and understanding of wildlife, the natural world and the environment and promote a land ethic and environmental awareness. Under this alternative, providing compatible wildlife-dependent recreation goals and objectives are met.

Refer to Table 2 below for a summary of the environmental consequences for each of the four alternatives.

Table 2. Summary of the Environmental Consequences of the Alternatives

Impact Topic	Alternative A (No Action)	Alternative B (Quota Hunts)	Alternative C (Limited Quota Hunt)	Alternative D (Proposed Action)
Environmental Justice	No impacts	No impacts	No impacts	No impacts
Public Health and Safety	Negligible effects	Negligible effects	Negligible effects	Negligible effects
Refuge Physical Environment	Negligible effects	Negligible effects	Negligible effects	Negligible effects
Cultural Resources	No impacts	No impacts	No impacts	No impacts
Habitat	User impacts to vegetation; impacts to vegetation - overbrowsing by of white-tailed deer	User impacts to vegetation; impacts to vegetation by deer less than Alternative A	User impacts to vegetation; impacts to vegetation by deer less than Alternative A	User impacts to vegetation; impacts to vegetation by deer less than Alternative A
Hunted Wildlife	Negligible disturbance impacts; increased disease and starvation; reduced cover and food for all wildlife; increased deer-car collisions; no staff resources necessary; reduced mgmt. costs	Negligible user impacts to vegetation; disease and starvation minimized; cover and food provided for all wildlife; deer-car collisions minimized; increased refuge resources to manage hunt; negative effect to hunters from complex quota system and user fee	Negligible user impacts to vegetation; disease and starvation minimized; cover and food provided for all wildlife; deer-car collisions minimized; refuge resources to manage hunt lower than Alternative B but higher than Alternative D; quota hunt less complex than Alternative B; negative effect to hunters from user fee	Negligible user impacts to vegetation; disease and starvation minimized; cover and food provided for all wildlife; deer-car collisions minimized; refuge resources to manage hunt lower than Alternatives B and C; hunt program less complex than Alternatives B and C

Table 2 (continued). Summary of the Environmental Consequences of the Alternatives

Impact Topic	Alternative A (No Action)	Alternative B (Quota Hunts)	Alternative C (Limited Quota Hunt)	Alternative D (Proposed Action)
Non-hunted Wildlife	Negligible disturbances from non-hunters; loss of food and cover due to deer overpopulation; increased rates of predation; biological integrity of refuge not maintained	Amount and frequency of disturbance lower than Alternatives C and D; food and cover optimized; predation reduced; biological integrity of refuge maintained	Amount and frequency of disturbance lower than Alternative D but higher than Alternative B; food and cover optimized; predation reduced; biological integrity of refuge maintained	Amount and frequency of disturbance higher than Alternative A, B, C; food and cover optimized; predation reduced; biological integrity of refuge maintained
Endangered and Threatened Species	American burying beetle (no effect); bald eagle, Indiana bat, and gray bat (not likely to adversely affect)	American burying beetle (no effect); bald eagle, Indiana bat, and gray bat (not likely to adversely affect)	American burying beetle (no effect); bald eagle, Indiana bat, and gray bat (not likely to adversely affect)	American burying beetle (no effect); bald eagle, Indiana bat, and gray bat (not likely to adversely affect)
Refuge Facilities	Negligible effects	Negligible effects	Negligible effects	Negligible effects
Wildlife-Dependent Recreation	All wildlife-dependent forms of recreation except hunting provided; user group conflicts managed by time and space zoning	All wildlife-dependent forms of recreation including hunting provided; user group conflicts managed by time and space zoning; increased time and money to manage hunt; negative effect to hunters from complex quota system and user fee	All wildlife-dependent forms of recreation including hunting provided; user group conflicts managed by time and space zoning; time and money to manage hunt lower than Alternative B but higher than Alternative D; quota hunt less complex than Alternative B; negative effect to hunters from user fee	All wildlife-dependent forms of recreation including hunting provided; user group conflicts managed by time and space zoning; time and money to manage hunt lower than Alternatives B and C; hunt program less complex than Alternatives B and C

4.3 Cumulative Impacts Analysis

The following section provides an analysis of the anticipated direct and indirect impacts, accumulated through time, of the proposed action on wildlife species listed in the Sport Hunting Plan for Clarks River National Wildlife Refuge, namely; migratory birds (ducks, geese, coots, woodcock, snipe, dove, crow); resident big game (white-tailed deer and eastern wild turkey), and upland game (squirrel, rabbit, raccoon, opossum, coyote, and quail).

As stated in Chapter One of this Environmental Assessment (EA), this amended EA is being developed in response to a 2003 lawsuit filed by the Fund for Animals. This amended EA reflects the intent of the original EA, whereby the same alternatives are cited and analyzed; however, this amended EA more thoroughly defines and analyzes the cumulative effects of the proposed action (*i.e.* Alternative D). Specifically, the proposed action would implement a Hunt Program on the refuge that adheres to the current hunting structure as being conducted and published in the most current publication of the Federal Register.

The National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 *et seq.*) defined cumulative effects 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”

Based on the fact that this cumulative effects analysis reflects the original EA, the methodology defining the past, present, proposed, and foreseeable future effects, in an effort to more thoroughly evaluate cumulative effects, are as follows:

- Past Actions refer to the effects associated with no hunting that was incurred after the refuge was established, and prior to the opening of the refuge to hunting as initially published in the Federal Register.
- Present/Proposed Actions are combined, due to the fact that the refuge has implemented the original Hunt Plan, and this assessment serves as an amendment to the original EA associated with that Hunt Plan. Alternative D, as analyzed here, is in fact, the Present and Proposed Action for this assessment. The Present/Proposed Actions analyze effects associated with refuge hunting from its inception to the present.
- Future Actions describe the anticipated future effects of implementing Alternative D on the resources described.

(Refer to Tables 6 and 7, for a summary of the Cumulative Effects analysis)

4.3.1 Past, Present, Proposed and Reasonably Foreseeable Future Impacts of Proposed Action on Wildlife Species.

4.3.1.1 Migratory Birds (Ducks, Geese, Coots, Woodcock, Snipe, Dove, Crow)

The U.S. Fish and Wildlife Service, working with partners, annually prescribe frameworks, or outer limits, for dates and times when hunting may occur, and the number of birds that may be taken and possessed. These frameworks are necessary to allow State selections of season and limits for recreation and sustenance; aid Federal, State, and tribal governments in the management of migratory game birds; and permit harvests at levels compatible with population status and habitat conditions. Because the Migratory Bird Treaty Act (16 U.S.C. 703-712) stipulates that all hunting seasons for migratory game birds are closed unless specifically opened by the Secretary of the Interior, the Service annually promulgates regulations (50 CFR Part 20) establishing the frameworks from which States may select season dates, bag limits, shooting hours, and other options for each migratory bird hunting season. The frameworks are essentially permissive in that hunting of migratory birds would not be permitted without them. Thus, in effect, Federal annual regulations both allow and limit the hunting of migratory birds.

Migratory game birds are those bird species so designated in conventions between the United States and several foreign nations for the protection and management of these birds. Under the Migratory Bird Treaty Act (16 U.S.C. 703-712), the Secretary of the Interior is authorized to determine when “hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any ... bird, or any part, nest, or egg” of migratory game birds can take place, and to adopt regulations for this purpose. These regulations are written after giving due regard to “the zones of temperature and to the distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds”, and are updated annually (16 U.S.C. 704(a)). This responsibility has been delegated to the U.S. Fish and Wildlife Service as the lead federal agency for managing and conserving migratory birds in the United States. Acknowledging regional differences in hunting conditions, the Service has administratively divided the nation into four Flyways for the primary purpose of managing migratory game birds. Each Flyway (Atlantic, Mississippi, Central, and Pacific) has a Flyway Council, a formal organization generally composed of one member from each State and Province in that Flyway. Clarks River National Wildlife Refuge is located within the Mississippi Flyway.

The process for adopting migratory game bird hunting regulations, located in 50 CFR part 20, is constrained by three primary factors. Legal and administrative considerations dictate how long the rule making process will last. Most importantly, however, the biological cycle of migratory game birds controls the timing of data-gathering activities and thus the dates on which these results are available for consideration and deliberation. The process of adopting migratory game bird hunting regulations includes two separate regulations-development schedules, based on “early” and “late” hunting season regulations. Early hunting seasons pertain to all migratory game bird species in Alaska, Hawaii, Puerto Rico, and the Virgin Islands; migratory game birds other than waterfowl (*e.g.* dove, woodcock, etc.); and special early waterfowl seasons, such as teal or resident Canada geese. Early hunting seasons generally begin prior to October 1. Late

hunting seasons generally start on or after October 1 and include most waterfowl seasons not already established. There are basically no differences in the processes for establishing either early or late hunting seasons. For each cycle, Service biologists and others gather, analyze, and interpret biological survey data and provide this information to all those involved in the process through a series of published status reports and presentations to Flyway Councils and other interested parties (USFWS 2006).

Because the Service is required to take abundance of migratory birds and other factors into consideration, the Service conducts a number of surveys throughout the year in conjunction with the Canadian Wildlife Service, State and Provincial wildlife-management agencies, and others. To determine the appropriate frameworks for each species, the Service considers factors such as population size and trend, geographical distribution, annual breeding effort, the condition of breeding and wintering habitat, the number of hunters, and the anticipated harvest. This Adaptive Management approach to managing migratory birds is used to ensure that mortality associated with hunting is compensatory (Nichols *et al.* 1995, Johnson 2001); however, mortality associated with hunting is debated (Poysa *et al.* 2004). After frameworks are established for season lengths, bag limits, and areas for migratory game bird hunting, migratory game bird management becomes a cooperative effort of State and Federal Governments. After Service establishment of final frameworks for hunting seasons, the States may select season dates, bag limits, and other regulatory options for the hunting seasons. States may always be more conservative in their selections than the Federal frameworks but never more liberal. Season dates and bag limits for National Wildlife Refuges open to hunting are never longer or larger than the State regulations. In fact, based upon the findings of an environmental assessment developed when a National Wildlife Refuge opens a new hunting activity, season dates and bag limits may be more restrictive than the State allows.

National Environmental Policy Act (NEPA) considerations by the Service for hunted migratory game bird species are addressed by the programmatic document, "Final Supplemental Environmental Impact Statement: Issuance of Annual Regulations Permitting the Sport Hunting of Migratory Birds (FSES 88- 14)," filed with the Environmental Protection Agency on June 9, 1988. The Service published Notice of Availability in the Federal Register on June 16, 1988 (53 FR 22582), and the Record of Decision on August 18, 1988 (53 FR 31341). Annual NEPA considerations for waterfowl hunting frameworks are covered under a separate Environmental Assessment, "Duck Hunting Regulations for 2006-07," and an August 24, 2006, Finding of No Significant Impact. Further, in a notice published in the September 8, 2005, Federal Register (70 FR 53376), the Service announced its intent to develop a new Supplemental Environmental Impact Statement for the migratory bird hunting program. Public scoping meetings were held in the spring of 2006, as announced in a March 9, 2006, Federal Register notice (71 FR 12216). More information may be obtained from: Chief, Division of Migratory Bird Management, U.S. Fish and Wildlife Service, Department of the Interior, MS MBSP-4107-ARLSQ, 1849 C Street, NWR, Washington, DC 20240.

4.3.1.1.1 Migratory Birds (Ducks and Geese)

Past Actions

Hunting on the refuge was not allowed; however, hunting on private lands adjacent to, and in close proximity of the refuge persisted. Ducks and geese are migratory, and as a result, are seldom affected by activities associated within small geographic areas. The Clarks River NWR acquisition boundary consists of approximately 18,000 acres located in the Mississippi Flyway. Available open water habitat conducive for waterfowl refuge and feeding in the form of sloughs, oxbows, moist-soil units, etc. is scattered across the refuge, and provides habitat to both migratory and resident waterfowl species. It is assumed that waterfowl species used the non-hunted refuge during this time; however, a determination of use was not documented. Based on refuge waterfowl surveys conducted in 2005-06 (A. Eller. 2005-06 Clarks River National Wildlife Refuge, U.S. Fish and Wildlife Service, Benton, Kentucky, USA), refuge size, and hunting activities surrounding the refuge, Clarks River NWR does not significantly contribute to the overall population status for migratory waterfowl while closed to hunting, and past actions have not had significant cumulative effects to the local or Mississippi Flyway population of ducks or geese.

Present / Proposed Actions

The bird check-list for Clarks River National Wildlife Refuge includes 16 species of waterfowl and four species of goose. The refuge began bi-weekly waterfowl surveys during the winter of 2005 -2006. The species most frequently encountered, and thus those most likely to be harvested, include wood duck (*Aix sponsa*), mallard (*Anas platyrhynchos*), gadwall (*Anas strepera*), green-winged teal (*Anas crecca*), northern pintail (*Anas acuta*), northern shoveler (*Anas clypeata*), blue-winged teal (*Anas discors*), scaup (*Aythya* spp.), hooded merganser (*Lophodytes cucullatus*), and Canada goose (*Branta canadensis*). The American black duck (*Anas rubripes*), canvasback (*Aythya valisneria*), and redhead (*Aythya americana*) are present in small numbers. Relevant population and harvest data are presented in the table below.

Table 3. A summary of waterfowl harvest in Kentucky, the Mississippi Flyway and the United States 1999 – 2005.

Harvest	All Ducks			Canada Goose	
	Kentucky	MS Flyway	US	Kentucky	MS Flyway
1999	388,457	7,414,047	15,358,365	35,339	731,969
2000	271,013	7,702,146	15,109,074	113,272	12,220,726
2001	182,235	6,309,436	13,377,684	25,151	858,422
2002	124,306	5,825,124	12,480,825	21,722	906,351
2003	198,287	6,408,714	12,850,732	38,504	1,103,880
2004	183,420	5,353,315	12,041,400	45,031	952,120
2005	187,000	5,270,000	12,510,800	35,035	928,457
Average	219,245	6,326,112	13,389,840	44,865	2,528,846

Waterfowl hunting on the refuge would be more restrictive than that allowed by State regulations. The refuge estimates that a maximum additional 1,800 ducks and 200 Canada geese would be harvested each year as a result of the present/proposed action. The anticipated refuge duck harvest represents approximately 0.8 percent of Kentucky's seven-year average harvest of 219,245 ducks and 0.03 percent of the Mississippi Flyway harvest (USFWS 2005, 2006). The anticipated refuge Canada goose harvest represents 1.8 percent of Kentucky's seven-year average harvest of 44,865 Canada geese and 0.03 percent of the Mississippi Flyway harvest (USFWS 2005, 2006). The present/proposed action of hunting ducks and geese should have no significant cumulative effects on the local wintering population or the Mississippi Flyway population.

Future Actions

Based on the observed effects of the present/proposed action, the future action should have no significant cumulative effects on the local or Mississippi Flyway population of ducks and geese.

Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). As public use levels expand across time, unanticipated effects associated with hunting activities may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize each negative effect to all wildlife species. Hunting season dates and regulations would be set and regulated to reduce any unforeseen negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all wildlife species. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) can be an effective tool in reducing negative effects to all wildlife species.

4.3.1.1.2 Migratory Birds (American Coot)

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. Positive effects to the American coot (*Fulica americana*) as a direct result of the past action would primarily consist of no harvest of the species and fewer disturbances to the species. The past action had no significant cumulative effect to the local or Mississippi Flyway population of coot.

Present/Proposed Action

The American coot is not frequently encountered on the refuge. In 2004, hunters harvested approximately 181,300 coots nationwide, 125,600 in the Mississippi Flyway, and 5,600 in Kentucky. In 2005, hunters harvested approximately 181,300 coots nationwide, 110,600 in the

Mississippi Flyway, and 2,700 in Kentucky. The refuge draws few if any coot hunters. The present/proposed action should have no significant cumulative effects to the local or Mississippi Flyway population of coot.

Future Action

Based on the observed impacts of the present/proposed action, the future action should have no significant cumulative effects to the local or Mississippi Flyway population of coot.

Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). As public use levels expand across time, unanticipated effects associated with hunting activities may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize each negative effect to all wildlife species. Hunting season dates and regulations would be set and regulated to reduce negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all wildlife species. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) can be an effective tool in reducing negative effects to all wildlife species.

4.3.1.1.3 Migratory Birds (American Woodcock)

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. Positive effects to American woodcock (*Scolopax minor*) as a direct result of the past action would primarily consist of no harvest of the species and fewer disturbances to the species. The past action has had no significant cumulative effect to the local or Eastern Unit population of woodcock.

Present/Proposed Action

Although the American woodcock is showing declines in numbers on their breeding grounds, habitat loss is considered to be the culprit, not hunting (Kelly and Rau 2006). This assertion was tested in a study conducted by the U.S. Geological Survey Patuxent Wildlife Research Center in 2005 (McAuley *et al.* 2005). Results showed no significant differences in woodcock survival between hunted and non-hunted areas. Furthermore, the authors concluded that hunting was not having a considerable impact on woodcock numbers in the Northeast (McAuley *et al.* 2005).

An estimated 800 woodcock were harvested in Kentucky during the 2005 – 2006 hunting season. This represents about three-tenths of one percent of the woodcock harvested during the season and less than two-one hundredths of one percent of the estimated 4.6 million North American

woodcock population (Kelly and Rau 2006). The refuge draws few if any woodcock hunters. The present/proposed actions should have no significant cumulative effects on the local Eastern Unit population of woodcock.

Future Action

Based on the observed impacts of the present/proposed action, the future action should have no significant cumulative effects to the local wintering population or the national breeding population woodcock.

Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). As public use levels expand across time, unanticipated effects associated with hunting activities may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize each negative effect to all wildlife species. Hunting season dates and regulations would be set and regulated to reduce negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all wildlife species. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) can be an effective tool in reducing negative effects to all wildlife species.

4.3.1.1.4 Migratory Birds (Common Snipe)

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. Positive effects to the common snipe (*Gallinago gallinago*) as a direct result of the past action would primarily consist of no harvest of the species and fewer disturbances to the species. The past actions have had no significant cumulative effects on the wintering population or the national breeding population of snipe.

Present/Proposed Action

The common snipe is one of only two shorebirds still legally hunted in the United States. It breeds in northern North America and winters from the southern United States into South America. There are no population numbers available. In 2004, hunters harvested approximately 103,300 snipe nationwide, 32,900 in the Mississippi Flyway, and 500 in Kentucky (USFWS 2006). In 2005, hunters harvested approximately 120,700 snipe nationwide, 39,500 in the Mississippi Flyway, and 1,700 in Kentucky (USFWS 2006). County-specific and refuge-specific harvest data are not available. Suitable wintering habitat for snipe may be found on the refuge however, based on staff observations hunter interest in this species is low. The present/proposed

actions should have no significant cumulative effects on the local wintering population or the national breeding population of snipe.

Future Action

Based on the observed impacts of the present/proposed action, the future action should have no significant cumulative effects to the local wintering population or the national breeding population snipe.

Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). As public use levels expand across time, unanticipated effects associated with hunting activities may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize each negative effect to all wildlife species. Hunting season dates and regulations would be set and regulated to reduce negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all wildlife species. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) can be an effective tool in reducing negative effects to all wildlife species.

4.3.1.1.5 Migratory Birds (Mourning Dove)

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. Positive effects to the mourning dove (*Zenaida macroura*) as a direct result of the past action would primarily consist of no harvest of the species and fewer disturbances to the species. However, the negative effects associated with global inter- and intra-species competition would potentially occur. Combined, past actions have had no significant cumulative effects to the local, eastern management unit, or national dove populations.

Present/Proposed Action

Under the present/proposed action dove may be hunted. The mourning dove is one of the most widely distributed and abundant birds in North America. Based on two banding studies done in the 1960s and 1970s, the fall population for the United States in the 1970s was estimated at 475 million birds (Dolton and Rau 2006). Current population figures are not available. However, call-count surveys have been used since 1966 to provide an index of the mourning dove population level (Dolton and Rau 2006). These surveys suggest that the mourning dove population has declined since 1966, but has been stable over the last decade (Dolton and Rau 2006).

The United States has been divided into three management zones (eastern, central, and western) based on mourning dove breeding, migration and wintering data (Dolton and Rau 2006). The eastern management unit includes 27 states comprising 30 percent of the land area of the contiguous United States. Dove hunting is permitted in 19 states, including Kentucky, representing 80 percent of the land area of the eastern management unit (Dolton and Rau 2006).

According to the U.S. Fish and Wildlife Service (2005), in 1999, hunters harvested approximately 26.3 million doves nationwide, 10.8 million in the eastern management unit, and 0.8 million in Kentucky. In 2005, hunters harvested approximately 22.1 million doves nationwide, 9.8 million doves in the eastern management unit, and 0.7 million in Kentucky. County-specific and refuge-specific harvest data are not available. The refuge has very little habitat suitable for dove hunting and hunter interest, based on staff observations is low. The present/proposed action should have no significant cumulative effects on local, eastern management unit, or national populations of dove.

Future Action

Based on the observed impacts of the present/proposed action, the future action should have no significant cumulative effects to the local, eastern management unit, or national dove populations. The dove population is anticipated to remain stable, or increase on the refuge due to habitat management practices implemented on the refuge that benefit dove, such as row-crop farming.

Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). As public use levels expand across time, unanticipated effects associated with hunting activities may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize any negative effect to all wildlife species. Hunting season dates and regulations would be set and regulated to reduce negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all wildlife species. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) can be an effective tool in reducing negative effects to all wildlife species.

4.3.1.1.6 Migratory Birds (Crow)

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. Positive effects to crow as a direct result of the past action would primarily consist of no harvest of the species and fewer disturbances to the species. However, the negative

effects associated with inter- and intra-species competition would potentially occur. Combined, the past action has had no significant cumulative effect on refuge crow populations.

Present/Proposed Action

Under the present/proposed action the American crow may be hunted. Based on refuge staff observation and contact with hunters, the refuge receives minimal, if any, crow specific hunting pressure. Historically, crow populations have benefited from agricultural development because of grains available as a food supply. Crows are considered migratory birds, and hunting regulations are implemented in accordance of 50 CFR part 20.133 and state regulation (National Archives and Records Administration 2004a). As stated in CFR (b) (2): the hunting season or seasons on crows shall not exceed a total of 124 days during a calendar year; and (b)(3) hunting shall not be permitted during the peak crow nesting period within a State. Crow populations are considered stable, and the present/proposed action should have no significant cumulative effects on refuge crow population.

Future Action

Based on the observed impacts of the present/proposed action, the future action should have no significant cumulative effects on crow populations. The crow population is anticipated to remain stable, or increase on the refuge due to habit management practices implemented on the refuge that benefit crow, such as row-crop farming.

Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). As public use levels expand across time, unanticipated effects associated with hunting activities may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize any negative effect to all wildlife species. Hunting season dates and regulations would be set and regulated to reduce negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all wildlife species. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) can be an effective tool in reducing negative effects to all wildlife species.

4.3.1.2 Resident Big Game (White-tailed Deer and Eastern Wild Turkey)

4.3.1.2.1 Resident Big Game (White-tailed Deer)

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. Positive effects to the white-tailed deer (*Odocoileus virginianus*) as a

direct result of the past action would primarily consist of no harvest of the species and fewer disturbances to the species. However, the negative effects associated with inter- and intra-species competition would potentially occur leading to diminished herd and habitat health. Combined, the past action had no significant cumulative effect to the refuge deer population.

Present/Proposed Action

Under the present/proposed action white-tailed deer may be hunted. The white-tailed deer has experienced significant changes in population numbers throughout history. The following history of the decline of the white-tailed deer is based on information provided in Halls (1984) and Thompson (2004). The white-tailed deer population declined from historic levels between 1500 and the early 1800s due to a rise in the number of European settlers and an increase in the hunting proficiency of Native Americans who acquired superior weapons from the colonists. The population may have increased slightly during the early 1800s as the number of Native Americans decreased and some colonists abandoned eastern lands to migrate west. However, extensive logging, overgrazing of domestic livestock, and annual burning led to a dramatic decline in the late 1800s and early 1900s. Combined with market hunting the white-tailed deer was nearly extirpated throughout its range by 1900.

During the 1930s and 1940s many state wildlife agencies began stocking deer to rebuild the white-tailed deer population. The deer came primarily from the states of Michigan, Wisconsin, Pennsylvania and North Carolina but they also came from public and private refuges. Closed seasons, strict law enforcement and stocking are credited with bringing the population back. Modern hunting regulations focus on maintaining the white-tailed deer population within the carrying capacity of remaining habitat. White-tailed deer numbers have steadily increased in counties surrounding the refuge since the early 1990s with peaks in 2003 and 2004 (D. Yancy. 2006 White-tailed Deer Population Status Report, Kentucky Department of Fish and Wildlife Resources, Frankfort, Kentucky, USA). Physical data obtained by the KDFWR indicates that the local deer herd is healthy and at or above desired population levels.

Deer herd health checks are conducted every five years on Clarks River National Wildlife Refuge by the Southeast Cooperative Wildlife Disease Study at the University of Georgia. The final report indicated that the herd is in good health, within the nutritional carrying capacity of refuge habitat, and does not appear to currently have any significant density-dependent diseases. However, it was determined that the herd has little or no immunity to hemorrhagic disease viruses and it is therefore susceptible to a future outbreak. There are no management options available to prevent such an outbreak.

The Commonwealth of Kentucky maintains an automated record-keeping system for the harvest of white-tailed deer. The refuge was included in the system beginning in 2004. The harvest data are summarized in the table below.

Table 4. Number of white-tailed deer harvested from Clarks River NWR 2004 – 2006.

White-tailed Deer Harvest Data					
Year	Male	Male (%)	Female	Female (%)	Total
2004	43	38.1	70	61.9	113
2005	57	50.9	55	49.1	112
2006	63	48.5	67	51.5	130

Harvest and survey data confirm that decades of deer hunting on surrounding private lands (using bait and a longer season) have not had a local negative effect on the deer population. The KDFWR estimated that, on average, 3,032 deer were harvested in Graves, Marshall, and McCracken Counties from 2000 through 2006 and that, on average, 114,381 deer were harvested statewide each year from 2000 through 2006. The average annual harvest of 118 deer from Clarks River National Wildlife Refuge from 2004 through 2006 represents approximately four percent of the annual three-county harvest and one-tenth of one percent of the annual statewide harvest. The effects of the present/proposed action will have no significant cumulative effect to the refuge deer population.

Future Action

Based on the observed impacts of the present/proposed action, the future action should have no significant cumulative effect on the refuge deer population. The deer population is anticipated to remain stable, or increase on the refuge due to habitat management practices implemented on the refuge that benefit early successional stage species. Habitat management practices include, but are not limited to, establishing native warm season grasses, allowing some agriculture fields to go fallow and/or planted to trees, row-crop agriculture, and controlled prescribed burning.

Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). As public use levels expand across time, unanticipated effects associated with hunting activities may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize any negative effect to all wildlife species. Hunting season dates and regulations would be set and regulated to reduce negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all wildlife species. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) can be an effective tool in reducing negative effects to all wildlife species.

4.3.1.2.2 Resident Big Game (Eastern Wild Turkey)

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. Positive effects to Eastern wild turkey (*Meleagris gallopavo silvestris*) populations as a direct result of the past action would primarily consist of no harvest of the species and fewer disturbances to the species. However, the negative effects associated with inter- and intra-species competition would potentially occur. Combined, the past action has had no significant cumulative effect on the refuge turkey population.

Present/Proposed Action

Under the present/proposed action turkey may be hunted. The decline and restoration of the eastern wild turkey generally parallels that of the white-tailed deer but with two differences. Remnant turkey populations in the southeast tended to persist longer than deer in areas that were unfavorable for settlement and large-scale turkey restoration efforts began two to three decades later than deer restoration efforts. Since the late 1970s the KDFWR has released approximately 7,600 turkeys (Thompson 2004). Eastern wild turkeys in the Commonwealth of Kentucky have rebounded from an estimated 2,000 birds in 1978 to about 230,000 in 2005 (J. Lane. 2005 Spring Turkey Season Update, Kentucky Department of Fish and Wildlife Resources, Frankfort, Kentucky, USA).

The Commonwealth of Kentucky maintains an automated record-keeping system for the harvest of eastern wild turkey. The refuge was included in the system beginning in 2004. The data for 2004 include only the fall harvest numbers. All others are for the spring and fall seasons. The harvest data are summarized in the table below.

Table 5. Number of wild turkey harvested from Clarks River NWR 2004 – 2006.

Eastern Wild Turkey Harvest Data					
Year	Male	Male (%)	Female	Female (%)	Total
2004	1	14.3	6	85.7	7
2005	23	85.2	4	14.8	27
2006	31	91.2	3	8.8	34

The KDFWR estimated that, on average, 623 turkeys were harvested in Graves, Marshall, and McCracken Counties from 2000 through 2006 and that, on average, 28,715 turkeys were harvested statewide each year from 2000 through 2006. The average annual harvest of 31 turkeys from Clarks River National Wildlife Refuge from 2005 through 2006 represents approximately five percent of the annual three-county harvest and one-tenth of one percent of the annual statewide harvest. The present/proposed action should have no significant cumulative effect on the refuge turkey population.

Future Action

Based on the observed impacts of the present/proposed action, the future action should have no significant cumulative effects on the refuge turkey population. The turkey population is anticipated to remain stable, or increase on the refuge due to habitat management practices implemented on the refuge that benefit early successional stage species. Habitat management practices include, but are not limited to, establishing native warm season grasses, allowing some agriculture fields to go fallow and/or planted to trees, row-crop agriculture, and controlled prescribed burning.

Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). As public use levels expand across time, unanticipated effects associated with hunting activities may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize any negative effect to all wildlife species. Hunting season dates and regulations would be set and regulated to reduce negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all wildlife species. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) can be an effective tool in reducing negative effects to all wildlife species.

4.3.1.3 Upland Game (Squirrel, Rabbit, Raccoon, Opossum, Coyote, Quail)

Squirrels, rabbit, raccoon, and opossum cannot be affected regionally by refuge hunting because of their limited home ranges. Only local effects will be discussed.

4.3.1.3.1 Upland Game (Gray and Fox Squirrels)

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. Positive effects to gray and fox squirrel (squirrel) populations as a direct result of the past action would primarily consist of no harvest of the species and fewer disturbances to the species. However, the negative effects associated inter- and intra-species competition would potentially occur. Combined, the effects of the past action had no significant cumulative effects on the refuge squirrel population.

Present/Proposed Action

Under the present/proposed action eastern gray squirrel (*Sciurus carolinensis*) and fox squirrel (*Sciurus niger*) may be hunted. Kentucky initiated an annual statewide mast survey beginning in 1953. Squirrel population levels are closely correlated to fall mast production indices. More

mast means lower rates of winter mortality and higher reproductive potential the following spring. Less mast means higher rates of winter mortality and lower reproductive potential the following spring. Studies have shown that three tree groups (hickories, red oaks, and white oaks) and three individual species (black walnut, American beech, and flowering dogwood) are important in Kentucky (B. Grossman. 2004-05 Squirrel Hunting Cooperator Survey Report, Kentucky Department of Fish and Wildlife Resources, Frankfort, Kentucky, USA).

Since the 2000 – 2001 hunting season the number of squirrels seen and harvested has mirrored the previous year's mast production index. Hunters have harvested an average of 49 percent of the squirrels seen and wounded an average of four percent over the past six years. In the 2005 – 2006 season hunters harvested 53 percent of the squirrels seen and wounded two percent. Gray squirrels were harvested four to one compared to fox squirrels statewide. In western Kentucky gray squirrels made up 82 percent of the harvest and fox squirrels made up 18 percent of the harvest (B. Grossman. 2004-05 Squirrel Hunting Cooperator Survey Report, Kentucky Department of Fish and Wildlife Resources, Frankfort, Kentucky, USA). Squirrel mortality associated with hunting is considered compensatory.

The land within the refuge acquisition boundary contains approximately 13,500 acres (75 percent of total refuge acres) of potential squirrel habitat (*i.e.* upland and bottomland forest). Based on observations made by refuge staff, and personal communication with local hunting clubs (K. Murphy, LBL Sportsmen Club, personal communication), squirrel hunting participation on the refuge remains popular to a relatively small group of participants. Reasons for continued interest in squirrel hunting, specifically using dogs, may be a result of sporting dog owners/hunters reduced interest in hunting upland birds, rabbit, raccoon, and opossum; and/or the fact that squirrel season normally comes in earlier than other seasons. The present/proposed action should have no significant cumulative effects on the refuge squirrel population.

Future Action

Based on the observed effects of the present/proposed action, the future action should have no significant cumulative effects on the refuge squirrel population. The squirrel population is anticipated to remain stable, and fluctuate with a direct correlation to mast production (B. Grossman. 2004-05 Squirrel Hunting Cooperator Survey Report, Kentucky Department of Fish and Wildlife Resources, Frankfort, Kentucky, USA).

Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). As public use levels expand across time, unanticipated effects associated with hunting activities may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize any negative effect to all wildlife species. Hunting season dates and regulations would be set and regulated to reduce negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all wildlife species. Experience has

proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) can be an effective tool in reducing negative effects to all wildlife species.

4.3.1.3.2 Upland Game (Eastern Cottontail and Swamp Rabbits)

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. Positive effects to the Eastern cottontail (*Sylvilagus floridanus*) and the swamp rabbit (*Sylvilagus aquaticus*) populations as a direct result of the past action would primarily consist of no harvest of the species and fewer disturbances to the species. However, the negative effects associated with inter- and intra-species competition would potentially occur. Combined, the effects of the past action had no significant cumulative effects on the refuge rabbit population.

Present/Proposed Action

Under the present/proposed action Eastern cottontail and swamp rabbit (rabbit) may be hunted. The KDFWR has monitored rabbit population levels since 1961 (B. Grossman. 2004-05 Rabbit Hunting Cooperator Survey Report, Kentucky Department of Fish and Wildlife Resources, Frankfort, Kentucky, USA). A one percent per year decline in the rabbit population over the survey period is generally attributed to habitat loss due to land use changes and cleaner agricultural practices. The population has never recovered from a severe drop in numbers following the winters of 1977 and 1978 but the statewide rabbit population has stabilized over the past decade and survey indices are showing oscillations characteristic of population stability. Over the past four hunting seasons, hunting mortality (harvested and wounded individuals) remained less than 50 percent of the rabbits encountered. Wound rates have remained constant at two percent.

Eastern cottontail rabbits account for almost 99 percent of the annual harvest. Swamp rabbits account for less than one percent of the annual harvest. Rabbits have small home ranges and should respond quickly to changes in local management practices associated with state and federal landowner incentive programs. Large-scale changes in the eastern cottontail population in Kentucky will require widespread changes in agricultural practices. The swamp rabbit suffers primarily from habitat loss and is declining rangewide. Swamp rabbit requirements are much more difficult to attain because habitat loss is often irreversible, and this species must be watched closely.

The land within the refuge acquisition boundary contains approximately 13,500 acres (75 percent of total refuge acres) of potential rabbit habitat (*i.e.* combination of suitable openland and forested habitat). Based on observations made by refuge staff, and personal communication with hunters, rabbit hunting participation on the refuge remains popular to a relatively small group of

participants. The present/proposed action should have no significant cumulative effects on the refuge rabbit population.

Future Action

Based on the observed impacts of the present/proposed action, the future action should have no significant cumulative effects on the refuge rabbit population. The rabbit population is anticipated to remain stable, or increase on the refuge due to habit management practices implemented on the refuge that benefit early successional stage species. Habitat management practices include, but are not limited to, establishing native warm season grasses, allowing some agriculture fields to go fallow and/or planted to trees, and controlled prescribed burning.

Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). As public use levels expand across time, unanticipated effects associated with hunting activities may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize any negative effect to all wildlife species. Hunting season dates and regulations would be set and regulated to reduce negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all wildlife species. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) can be an effective tool in reducing negative effects to all wildlife species.

4.3.1.3.3 Upland Game (Raccoon and Opossum)

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. Positive effects to raccoon (*Procyon lotor*) and opossum (*Didelphis virginiana*) populations as a direct result of the past action would primarily consist of no harvest of the species and fewer disturbances to the species. However, the negative effects associated with inter- and intra-species competition would potentially occur. Combined, the effects of the past action had no significant cumulative effects on the refuge raccoon and opossum population.

Present/Proposed Action

Under the present/proposed action raccoon and opossum may be hunted. Raccoon population data is monitored annually by the KDFWR through annual Trapping Logs, Roadkill data, and Animal Nuisance Complaint data (L. Patton. 1983-03 Trapping Success For Raccoon and Opossum Report; 1996-05 KY Raccoon Roadkills Observed Report; and 2002-06 Animal Nuisance Complaint Report, Kentucky Department of Fish and Wildlife Resources, Frankfort, Kentucky, USA). Opossum population data is monitored annually by the KDFWR through

annual Trapping Logs and Animal Nuisance Complaint data (L. Patton. 2002-06 Animal Nuisance Complaint Report and 1983-03 Trapping Success For Raccoon and Opossum Report, Kentucky Department of Fish and Wildlife Resources, Frankfort, Kentucky, USA). Raccoon and opossum populations on the refuge are considered stable. Based on observations made by refuge staff, and personal communication with hunters, raccoon hunting participation on the refuge remains popular to a relatively small group of participants. However, the refuge receives very minimal, if any, opossum specific hunting pressure. The land within the refuge acquisition boundary contains approximately 13,500 acres (75 percent of total refuge acres) of potential raccoon and opossum habitat (*i.e.* upland and bottomland forest).

When these species become overabundant, diseases such as distemper and rabies reduce the populations. However, waiting for disease outbreak to regulate their numbers can be a human health hazard. Raccoon and opossum reproduce quickly, are difficult to hunt due to their nocturnal habits, and are not as popular for hunting as other game species. Raccoon and opossum mortality associated with hunting is considered compensatory. The present/proposed action should have no significant cumulative effects on the refuge raccoon and opossum population.

Future Action

Based on the observed impacts of the present/proposed action, the future action should have no significant cumulative effects on the refuge raccoon and opossum population. The raccoon and opossum population is anticipated to remain stable, regardless of hunting pressure.

Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). As public use levels expand across time, unanticipated effects associated with hunting activities may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize any negative effect to all wildlife species. Hunting season dates and regulations would be set and regulated to reduce negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all wildlife species. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) can be an effective tool in reducing negative effects to all wildlife species.

4.3.1.3.4 Upland Game (Coyote)

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. Positive effects to coyote (*Canis latrans*) as a direct result of the past action would primarily consist of no harvest of the species and fewer disturbances to the species.

However, the negative impacts associated with inter- and intra-species competition would potentially occur. Combined, the effects of the past action had no significant cumulative effects on the coyote population.

Present/Proposed Action

Under the present/proposed action coyotes may be hunted. Based on observations made by refuge staff and personal communication with hunters, hunter effort specifically targeting coyotes is minimal. Based on personal contact with hunters, most coyotes are harvested incidentally while hunting other game species; primarily white-tailed deer. Coyotes reproduce rapidly, are experiencing population growth, and can have negative effects on their habitats (Bolen and Robinson 1998). Coyotes depredate small mammals, songbirds and their nests, turkey and quail nests, and any other animal they opportunistically encounter. When coyote numbers are high, local wildlife populations can be negatively affected. Coyotes are probably the most resilient species in North America and mortality associated with hunting is considered compensatory (Bolen and Robinson 1998).

Coyote population data is monitored annually by the KDFWR through annual Trapping Logs, Roadkill data, and Animal Nuisance Complaint data which suggest coyote populations are increasing (L. Patton. 1983-03 Trapping Success For Beaver and Coyote Report; 1996-05 KY Coyote Roadkills Observed Report; and 2002-06 Animal Nuisance Complaint Report, Kentucky Department of Fish and Wildlife Resources, Frankfort, Kentucky, USA). The present/proposed action should have no significant cumulative effects on the refuge coyote population.

Future Action

Based on the observed impacts of the present/proposed action, the future action should have no significant cumulative effects on the refuge coyote population. The coyote population is anticipated to increase, and at a minimum stabilize, regardless of hunting pressure.

Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). As public use levels expand across time, unanticipated effects associated with hunting activities may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize any negative effect to all wildlife species. Hunting season dates and regulations would be set and regulated to reduce negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all wildlife species. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) can be an effective tool in reducing negative effects to all wildlife species.

4.3.1.3.5 Upland Game (Northern Bobwhite Quail)

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. Positive effects to northern bobwhite quail (*Colinus virginianus*) as a result of the past action would primarily consist of no harvest of the species and fewer disturbances to the species. However, the negative impacts associated with habitat degradation and predation due to non-hunted, overpopulated game species would potentially occur. Quail populations on the refuge are influenced by activities and land-use practice surrounding the refuge. During the time of the past action, Farm Bill programs, primarily through the Conservation Reserve Program (CRP) being implemented on lands surrounding the refuge greatly improved habitat for quail; however, based on observations made by refuge staff and personal communication with hunters, quail populations did not significantly increase during this time both on- and off-refuge lands. Combined, the past actions have had no significant cumulative effects to non-hunted wildlife.

Present/Proposed Action

Under the present/proposed action northern bobwhite quail may be hunted. The northern bobwhite quail endured a severe decline in population for at least three decades (Dimmick *et al.* 2002). The Breeding Bird Survey showed a decline in bobwhite breeding numbers averaging 3.8 percent per year from 1982 to 1999 (Dimmick *et al.* 2002). The decline is attributed primarily to urban development of agricultural lands and cleaner agricultural practices. The Northern Bobwhite Conservation Initiative (Dimmick *et al.* 2002) has proposed a series of measures to increase the number of breeding bobwhite quail that include land conservation, and changes in agricultural and forestry land management practices. The early successional habitat that quail favor is not abundant on the refuge; therefore, quail hunting is limited. County-specific and refuge-specific harvest data are not available.

Northern bobwhite quail population data is monitored annually by the KDFWR through annual Hunting Logs submitted by hunters, CRP CP-33 monitoring, Mail Carrier Survey, and Breeding Bird Survey data. This information is used to set state-wide season structures and bag limits. Quail hunting on the refuge will coincide with KDFWR seasons and bag limits, with the exception that quail season is closed during all modern gun and muzzleloader deer seasons. The land within the refuge acquisition boundary contains approximately 4,500 acres (25 percent of total refuge acres) of potential quail habitat (*i.e.* openland habitat). Based on observations made by refuge staff, and personal communication with hunters, quail hunting participation on the refuge is very low. Refuge staff observed two quail hunting parties during the 2005 - 2006 season, and one quail hunting party during the 2006 - 2007 season. The low interest in quail hunting on the refuge is attributed to an overall (local, statewide, and nationwide) decline in the species.

Quail populations on the refuge are influenced by activities and land-use practice surrounding the refuge. Farm Bill programs, primarily through the Conservation Reserve Program (CRP) being implemented on lands surrounding the refuge have greatly improved habitat for quail. Acres of CRP in the surrounding counties of Marshall, McCracken and Graves are 12,091; 4,173; and 51,122.7, respectively (Marshall, McCracken, and Graves Counties, Farm Service Agency, personal communication). Management practices being implemented on the refuge in an effort to improve quail habitat include, establishing native warm season grasses where practical, and establishing early successional stage buffers around agriculture fields. Combined, the present/proposed actions should have no significant cumulative effects to northern bobwhite quail.

Future Action

Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). Based on the effects of the present/proposed action, hunter interest for quail is not expected to increase on the refuge; however, habitat improvement practices on- and off-refuge lands are expected to improve.

As public use levels expand across time, unanticipated impacts associated with hunting activities may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize any negative effect to all wildlife species. Hunting season dates and regulations would be set and regulated to reduce negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all wildlife species. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) is an effective tool in reducing negative effects to all wildlife species. Negative impacts to quail as a result of hunting activities will be insignificant over time. Collectively, these impacts should result in no significant cumulative effects to northern bobwhite quail.

4.3.1.4 Non-hunted Wildlife

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. Positive effects to non-hunted wildlife as a result of the past action would primarily consist of fewer disturbances to wildlife. However, the negative impacts associated with habitat degradation due to non-hunted, overpopulated game species would potentially occur. Combined, the effects of the past action have had no significant cumulative effects to non-hunted wildlife.

Present/Proposed Action

Non-hunted wildlife would include non-hunted migratory birds such as songbirds, wading birds, raptors, and woodpeckers; small mammals such as voles, moles, mice, shrews, and bats; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. Except for migratory birds and some species of migratory bats, butterflies and moths, these species have very limited home ranges and hunting could not affect their populations regionally; thus, only local effects will be discussed.

Disturbance to non-hunted migratory birds could have regional, local, and flyway effects. Regional and flyway effects would not be applicable to species that do not migrate such as most woodpeckers, and some songbirds including cardinals, titmice, wrens, chickadees, etc. The impacts of disturbance to non-hunted migratory birds under the present/proposed action are expected to be negligible for the following reasons. The hunting season, except for Spring turkey season, would not coincide with the nesting season. Long-term future impacts that could occur if reproduction was reduced by hunting are not relevant for this reason. Disturbance to the daily wintering activities, such as feeding and resting, of birds might occur.

Small mammals, including bats, are inactive during winter when hunting season occurs. These species are also nocturnal. Both of these qualities make hunter interactions with small mammals very rare. Hibernation or torpor by cold-blood reptiles and amphibians also limits their activity during the hunting season when temperatures are low. Hunters would rarely encounter reptiles and amphibians during most of the hunting season. Encounters with reptiles and amphibians in early fall are few and should not have negative effects on reptile and/or amphibian populations. Invertebrates are also not active during cold weather and would have few interactions with hunters during the hunting season. Refuge regulations further mitigate possible disturbance by hunters to non-hunted wildlife. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

Although ingestion of lead-shot by non-hunted wildlife could be a negative impact, it is not relevant to Clarks River National Wildlife Refuge because the use of lead shot would not be permitted on the refuge for upland game hunting (exception coyote).

Some species of bats, butterflies and moths are migratory. Negative effects to these species at the "flyway" level should be negligible. These species are in torpor or have completely passed through western Kentucky by peak hunting season which occurs in October - January. Some hunting occurs during September and October when these species are migrating; however, hunter interaction may be commensurate with that of other users.

These effects, combined with the addition of increased hunting opportunity, could have a negative effect on nesting bird populations. Generally, the hunting season (except for the spring turkey hunt) is during the winter and not during most birds' nesting period.

The opportunities for hunting may expand under the proposed action. High deer numbers are recognized as a problem causing crop damage, reducing some forest understory species, and reducing reforestation seedling survival. Hunting would be used to keep the deer herd and other resident wildlife in balance with the habitat's carrying capacity, resulting in long-term positive impacts on wildlife habitat. Combined, the present/proposed action should have no significant cumulative effects to non-hunted wildlife populations.

Future Action

Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). As public use levels expand across time, unanticipated impacts associated with hunting activities may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize any negative effect to all wildlife species. Hunting season dates and regulations would be set and regulated to reduce negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all wildlife species. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) is an effective tool in reducing negative effects to all wildlife species. Negative impacts to non-hunted wildlife as a result of hunting activities will be insignificant over time.

Hunted wildlife species would be managed at, or near carrying capacity to minimize any intra- and inter-species competition for habitat. Any negative cumulative impacts realized in the future action to non-hunted wildlife species would be further reduced by appropriate regulation(s). Collectively, these impacts should result in no significant cumulative effects on all non-hunted wildlife species.

4.3.1.5 Endangered Species

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. The past action had no significant cumulative effects to endangered species.

Present/Proposed Action

Activities associated with hunting have not been implicated as a cause of decline for any of the endangered or threatened species present or potentially present on the refuge. The taking of any federally listed endangered or threatened species on the refuge is already prohibited by the Endangered Species Act. As defined in Section 3 of the Endangered Species Act, the term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to

attempt to engage in any such conduct. In addition, none of these species is typically considered a “hunnable” species, and none could reasonably be misidentified for one or more of the species occurring on the refuge that are hunted.

Endangered and threatened species that utilize the refuge include the endangered American burying beetle, the threatened American bald eagle, the endangered Indiana bat, and the endangered gray bat. A Section 7 Evaluation was conducted in association with this Environmental Assessment for sport hunting at Clarks River National Wildlife Refuge. It was determined that the proposed alternative would not likely adversely affect these threatened and endangered species.

The endangered American burying beetle is most active from April through September so there would be some overlap with hunter activity in the early fall. However, the species is nocturnal and would likely not be affected by hunter activities. Furthermore, the species has not been observed in Kentucky since 1974. Should a relict population of the American burying beetle be found on the refuge, or should it be reintroduced, disturbance would be negligible.

The presence of the endangered Indiana bat and the endangered gray bat on the refuge has not been confirmed but is assumed. Both species are migratory and hibernate in caves during the winter. There are no such caves or cave-like habitat on or adjacent to the refuge. The life cycle of these species is such that they would be assumed absent from the area between October 15 and March 31. Generally, hunting seasons extend from early August through the end of January (with a few exceptions), with the majority of hunting related activity occurring during the months of October through December, at which time these species are assumed absent. Disturbance to the Indiana bat and gray bat, should they linger in the fall, arrive early in the spring, or otherwise be present, would be negligible.

The threatened bald eagle does not currently nest on the refuge and sightings in the vicinity of the refuge are infrequent. There is a potential that bald eagles could nest on the refuge in the future. If so, the nesting zone would be managed consistent with the Service’s bald eagle management guidelines to minimize disturbance to the nesting pair(s) and their young. The present/proposed action should have no significant cumulative effects on federally listed endangered species.

Future Action

Activities associated with hunting have not been implicated as a cause of decline for any of the endangered or threatened species present or potentially present on the refuge. The taking of any federally listed endangered or threatened species on the refuge is already prohibited by the Endangered Species Act. As defined in Section 3 of the Endangered Species Act, the term “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. In addition, none of these species is typically considered a “hunnable” species, and none could reasonably be misidentified for one or more of the species occurring on the refuge that are hunted.

Mitigation measures taken to reduce potential negative effects to the future action will be implemented. The Service will conduct periodic surveys for bald eagle nests, and management guidelines established by the U.S. Fish and Wildlife Service will be implemented in the event that nests are identified on, or within close proximity of refuge lands. In an effort to reduce the toxic effects associated with lead to all species, including the bald eagle, only non-toxic shot may be used while hunting any migratory bird game species or any upland game species, with the exception of rim-fire rifle cartridges used for hunting coyote, when applicable. The Service will conduct periodic surveys to determine if the Indiana bat and gray bat are present or absent on the refuge. In the event that an Indiana bat maternity colony is located, human activity within the area will be monitored for the potential taking of the species and/or habitat (*i.e.* tree, etc). Future actions should have no significant cumulative effects on federally listed endangered species.

Refer to the Section 7 Evaluation for the 2007 Sport Hunting Plan for Clarks River National Wildlife Refuge for more information.

4.3.2 Past, Present, Proposed and Reasonably Foreseeable Future Impacts of Proposed Action on Refuge Programs, Facilities, and Cultural Resources.

4.3.2.1 Wildlife-Dependant Recreation

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. The past action had negative cumulative effects to wildlife-dependant recreation due to the refuge having no established hunt program. The public suggested that hunting was an important issue during the planning stage of refuge establishment (Humphrey Reporting. 1997. Public Meeting On Proposed Clarks River National Wildlife Refuge, U.S. Fish and Wildlife Service, Benton, Kentucky, USA). Traditionally, many local sportsmen and sportswomen utilized lands now in the refuge for hunting. Furthermore, by not developing a hunt program, the refuge was not implementing actions addressed in the establishing Environmental Assessment for Clarks River NWR which determined that public hunting on the refuge is an appropriate form of wildlife-oriented public recreation which is compatible with the purpose for which the refuge was established (U.S. Fish and Wildlife Service. 1997. Final Environmental Assessment and Land Protection Plan-Proposed Establishment of Clarks River National Wildlife Refuge, U.S. Fish and Wildlife Service, Atlanta, Georgia, USA).

Present/Proposed Action

A hunting program would be developed, and hunting would provide for a wildlife-dependent recreation opportunity. The public suggested that hunting was an important issue during the planning stage of refuge establishment (Humphrey Reporting. 1997. Public Meeting On Proposed Clarks River National Wildlife Refuge, U.S. Fish and Wildlife Service, Benton, Kentucky, USA). Traditionally, many local sportsmen and sportswomen utilized lands now in

the refuge for hunting. The refuge will implement actions addressed in the establishing Environmental Assessment for Clarks River NWR which determined that public hunting on Clarks River NWR is an appropriate form of wildlife-oriented public recreation which is compatible with the purpose for which the refuge was established (U.S. Fish and Wildlife Service. 1997. Final Environmental Assessment and Land Protection Plan-Proposed Establishment of Clarks River National Wildlife Refuge, U.S. Fish and Wildlife Service, Atlanta, Georgia, USA). Hunting, being a viable management tool when used wisely, often inhibits the overpopulation of species within a given habitat community, and can provide for greater wildlife diversity which benefits all wildlife-dependant recreation user groups. The refuge also will implement one of the stated objectives (5. Provide opportunities for wildlife-dependent recreation and interpretation) necessary to fulfill purposes for which the refuge was established.

The refuge would control access under this action to minimize wildlife disturbance and habitat degradation, while allowing current and proposed compatible wildlife-dependent recreation. The present/proposed action should have no significant cumulative effects on wildlife-dependant recreation.

Future Action

The refuge would continue to meet the demands of the public by maintaining a hunt program, as well as, meeting the goals for which the refuge was established. Hunters account for the majority of wildlife-dependant recreational use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). As public use levels expand across time, unanticipated conflicts among and within user groups may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize each problem and provide quality wildlife-dependent recreational opportunities. Hunting season dates and regulations would be set and regulated to allow all user groups to experience solitude while on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the needs of all wildlife-dependent recreational users groups. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) is an effective tool in eliminating conflicts among and within user groups. Negative impacts to other wildlife-dependant recreational users groups on the refuge associated with hunting activities will be insignificant over time. Any negative cumulative impacts realized in the future action to wildlife-dependant recreational users groups on the refuge would be further reduced by appropriate regulation(s).

Currently, the refuge has acquired approximately 8,000 acres, of the potential 18,000 acres within the refuge acquisition boundary. The future action would have a positive effect on the wildlife-dependant recreation user-groups due to the potential of doubling acquired acres, whereby the majority of these acres would be opened for hunting, and the public would gain from a net increase in public use. Collectively, these impacts should result in no significant cumulative effects for all user groups.

4.3.2.2 Refuge Facilities (*i.e.* buildings, roads, utilities, water control structures, raceways, etc.)

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. The lack of hunters as a user group reduced negative effects to refuge facilities; however, the positive effects associated with the past action were insignificant due to the refuge being opened to other user groups. Collectively, the past action had no significant cumulative effects to refuge facilities.

Present/Proposed Action

Under the present/proposed action those facilities most utilized by hunters are: roads, parking lots, trails and levees. Hunters account for the majority of public use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). Maintenance or improvement of existing facilities (*i.e.* parking areas, roads, trails, and levees) will cause minimal short term impacts to localized soils and waters and may cause some wildlife disturbances and damage to vegetation. The facility maintenance and improvement activities described are periodically conducted to accommodate daily refuge management operations and general public use. These activities will be conducted at times (seasonal and/or daily) to cause the least amount of disturbance to wildlife. All disturbed sites will be restored to as natural a condition as possible. During times when roads are impassible due to flood events or other natural causes those roads, parking lots, trails and levees impacted by the event will be closed to vehicular use. Any negative impacts to refuge facilities would be further reduced by regulating vehicle, ATV, and equine use on the refuge. Collectively, these impacts would result in insignificant impacts to refuge facilities. The present/proposed action should have no significant cumulative effects on refuge facilities.

Future Action

Hunters account for the majority of public use on the refuge, and the demand for public land for hunting has increased over time; however, hunters as a group are declining. Kentucky state resident hunter numbers declined 20 percent from 1991-01, and 24 percent from 1996-01 (U.S. Department of Interior 2001). Negative impacts to refuge facilities associated with hunter use will be insignificant over time. Any negative cumulative impacts realized to refuge facilities would be further reduced by appropriate regulation(s). Collectively, these impacts should result in no significant cumulative effects to refuge facilities.

4.3.2.3 Cultural Resources

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public use. The past action had no significant cumulative effects on cultural resources.

Present/Proposed Action

The refuge prohibits searching for or removal of any object of antiquity including arrowheads, pottery or other historical or pre-historical artifacts. Hunting, regardless of method or species targeted, is a consumptive activity that does not pose any threat to historic properties on and/or near the refuge. In fact, hunting meets only one of the two criteria used to identify an “undertaking” that triggers a federal agency’s need to comply with Section 106 of the National Historic Preservation Act. These criteria, which are contained in 36 CFR Part 800, state:

- 1- an undertaking is any project, activity, or program that can alter the character or use of an archaeological or historic site located within the “area of potential effect;” and
- 2 - the project, activity, or program must also be either funded, sponsored, performed, licensed, or have received assistance from the agency.

Consultation with the pertinent State Historic Preservation Office and federally recognized Tribes are, therefore, not required. The present/proposed action should have no significant cumulative effects on cultural resources.

Future Action

Based on the observed impacts of the present/proposed action, the future action should have no significant cumulative effects to cultural resources on the refuge. The refuge prohibits searching for or removal of any object of antiquity including arrowheads, pottery or other historical or pre-historical artifacts, and will monitor for the potential occurrence of cultural resource sites.

4.3.2.4 Refuge Environment (*soils, vegetation, air quality, water quality and solitude*)

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public use. Impacts to soils, vegetation, air and water due to increased use associated with hunting activities would not occur; however, an overpopulated white-tailed deer population would potentially negatively impact local vegetation, soils, and water. Other user groups would benefit from the solitude associated with a non-hunted refuge; however, hunters would not benefit from the extra hunt rewards (*i.e.* solitude, companionship, etc.) associated with hunting. Collectively, the past action had no significant cumulative effects on the refuge environment.

Present/Proposed Action

The refuge expects no significant cumulative effects associated with the present/proposed action on the refuge environment. Some disturbance to surface soils and vegetation would occur in areas selected for hunting; however impacts would be minimal. Hunting would benefit vegetation as it is used to keep certain resident wildlife populations in balance with the habitat's carrying capacity. The refuge would also control access to minimize habitat degradation.

The refuge expects impacts to air and water quality to be minimal and only due to refuge visitors' automobile emissions. The effect of these refuge-related activities, as well as other management activities, on overall air and water quality in the region are anticipated to be relatively negligible, compared to the contributions of industrial centers, power plants, and non-refuge vehicle traffic. Existing State water quality criteria and use classifications are adequate to achieve desired on-refuge conditions.

Impacts associated with solitude to non-hunting user groups are expected to be insignificant given time and space zone management techniques, such as seasonal access and area closures, used to avoid conflicts among and within user groups.

Future Action

Hunting would be allowed, and most user groups to the refuge are hunters that enjoy solitude while hunting. Hunting season dates and regulations would be set and regulated to allow all user groups to experience solitude while on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the needs of the refuge environment. Negative impacts to vegetation would be reduced by managing game populations at, or near carrying capacity and through other appropriate regulation(s). Collectively, these actions are anticipated to result in no significant cumulative effects to the refuge environment.

4.3.2.5 Refuge Community

Past Action

A Sport Hunting Plan was not developed, and hunting as a recreational opportunity was not an approved public-use. The public suggested that hunting was an important issue during planning stage of refuge establishment (Humphrey Reporting. 1997. Public Meeting On Proposed Clarks River National Wildlife Refuge, U.S. Fish and Wildlife Service, Benton, Kentucky, USA). Traditionally, many local sportsmen and sportswomen utilized lands now in the refuge for hunting. The refuge community did not gain from an increase in tourism or revenue.

Present/Proposed Action

The refuge would work closely with State agencies, Federal agencies, local government, and private partners to minimize impacts to adjacent lands and its associated natural resources; however, no indirect or direct impacts are anticipated. The newly opened hunts would result in a net gain of public hunting opportunities positively impacting the general public, nearby residents, and refuge visitors. The refuge expects increased visitation and tourism to bring additional revenues to local communities, but not a significant increase in overall revenue to any area. The present/proposed action should have no significant cumulative effect on the refuge community.

Future Action

Currently, the refuge has acquired approximately 8,000 acres, of the potential 18,000 acres within the refuge acquisition boundary. The future action has the potential of doubling acquired acres, whereby the majority of these acres would be opened for hunting. The public would gain from a net increase in public use, and as a result, the community should benefit from increased tourism and revenue.

4.3.2.6. Summary of Cumulative Effects

Cumulative effects on the environment result from incremental effects of a proposed action when these are added to other past, present, and reasonably foreseeable future actions. While cumulative effects may result from individually minor actions, they may, viewed as a whole, become substantial over time. The proposed hunt plan has been designed so as to be sustainable through time given relatively stable conditions. Changes in refuge conditions, such as sizeable increases in refuge acreage or public use, are likely to change the anticipated impacts of the current plan and would trigger a new hunt planning and assessment process.

The implementation of any of the proposed actions described in this assessment includes actions relating to the refuge hunt program (see 2007 Sport Hunting Plan for Clarks River National Wildlife Refuge). These actions would have both direct and indirect effects (*e.g.*, new site inclusion would result in increased public use, thus increasing vehicular traffic, disturbance, etc); however, there are no significant cumulative effects from the proposed action (Tables 6 and 7).

The past refuge hunting program has been very similar to the proposed action in season lengths, species hunted, and bag limits. Changes to the hunt program in the past decade have been made to open hunting on more land within the refuge. These lands were usually those that had been recently acquired. The refuge does not foresee any changes to the proposed action in the way of increasing the intensity of hunting in the future.

National Wildlife Refuges, including Clarks River National Wildlife Refuge, conduct hunting programs within the framework of State and Federal regulations. By maintaining hunting regulations that are as, or more, restrictive than the State, individual refuges ensure that they are

maintaining seasons which are supportive of management on a regional basis. Additionally, the Clarks River refuge management staff coordinates with KDFWR annually to maintain regulations and programs that are consistent with the State management program.

Table 6. Summary of Cumulative Effects Associated With Hunting to Hunted, Non-Hunted, and Federally Listed T & E Species.

Species	Past Actions	Present/ Proposed Actions	Future Actions	Cumulative Effect
Migratory Birds (<i>Waterfowl, Dove, Woodcock, Snipe, Crow</i>)	No significant cumulative effect; mortality associated with hunting is assumed compensatory.	No significant cumulative effect; mortality associated with hunting is assumed compensatory.	No significant cumulative effect; mortality associated with hunting is assumed compensatory.	No significant cumulative effect.
White-tailed deer	No significant cumulative effect; hunting not allowed, herd health and habitat negatively impacted.	No significant cumulative effect; hunting allowed and deer herd managed to ensure herd and habitat health; mortality associated with hunting is considered compensatory.	No significant cumulative effect; hunting allowed and deer herd managed to ensure herd and habitat health; mortality associated with hunting is considered compensatory.	No significant cumulative effect.
Turkey	No significant cumulative effect; hunting not allowed and mortality associated with hunting is considered compensatory; insignificant negative effect due to intra- and inter-species competition.	No significant cumulative effect; hunting allowed and mortality associated with hunting is considered compensatory; insignificant positive effect due to less intra- and inter-species competition.	No significant cumulative effect; hunting allowed and mortality associated with hunting is considered compensatory; insignificant positive effect due to less intra- and inter-species competition.	No significant cumulative effect.
Upland Game (<i>Squirrel, Rabbit, Quail, Raccoon, Opossum, and coyote</i>)	No significant cumulative effect; hunting not allowed and mortality associated with hunting is considered compensatory; insignificant negative effect due to intra- and inter-species competition.	No significant cumulative effect; hunting allowed and mortality associated with hunting is considered compensatory; insignificant positive effect due to less intra- and inter-species competition.	No significant cumulative effect; hunting allowed and mortality associated with hunting is considered compensatory; insignificant positive effect due to less intra- and inter-species competition.	No significant cumulative effect.
Non-Hunted Species	No significant cumulative effect; negative effects associated with habitat degradation due to non-hunted overpopulated game species would be off-set by positive effects of less disturbance.	No significant cumulative effect; positive effects associated with less habitat degradation due to managing game populations with hunting would be off-set by negative effects of increased disturbance.	No significant cumulative effect; positive effects associated with less habitat degradation due to managing game populations with hunting would be off-set by negative effects of increased disturbance.	No significant cumulative effect.
Federally Listed Species	No significant cumulative effect.	No significant cumulative effect.	No significant cumulative effect.	No sig. cumulative effect.

Table 7. Summary of Cumulative Effects Associated With Hunting Activities on Refuge Programs, Facilities, and Cultural Resources.

Resource	Past Actions	Present/ Proposed Actions	Future Actions	Cumulative Effect
Wildlife-Dependant Recreation	No significant cumulative effect; hunt plan not developed, and hunting as a recreational opportunity, and not allowed.	No significant cumulative effect; hunting as described in Alt. D implemented and offered as a recreational opportunity.	No significant cumulative effect; attributed to a net gain of public-use opportunity, and the flexibility to implement refuge specific regulations.	No significant cumulative effect.
Refuge Facilities (<i>buildings, roads, utilities, water control structures, etc.</i>)	No significant cumulative effect; the lack of hunters as a user group potentially reduces insignificant negative effects.	No sig. cumulative effect; Potential insignificant negative effect associated with increased public use as a result of allowing hunting as a public use.	No sig. cumulative effect; Potential insignificant negative effect (off-set with mitigation measures); with major increase in public use.	No significant cumulative effect.
Cultural Resources	No significant cumulative effect	No sig. cumulative effect; hunting, as a recreational activity, does not require SHPO consultation.	No sig. cumulative effect; hunting, as a recreational activity, does not require SHPO consultation.	No significant cumulative effect.
Refuge Environment (soils, vegetation, air, water, solitude)	No significant cumulative effect; positive effects to some user groups relative to solitude by not having a hunt program would be offset by the negative effects incurred to vegetation attributed to over populated white-tailed deer.	No significant cumulative effect; solitude provided for hunting users; time and space zone would be managed to ensure solitude for all users; vegetation would benefit by keeping certain game populations at, or near carrying capacity.	No significant cumulative effect; solitude provided for hunting users; time and space zone would be managed to ensure solitude for all users; vegetation would benefit by keeping certain game populations at, or near carrying capacity.	No significant cumulative effect.
Refuge Community	No significant cumulative effect; hunt plan not developed, and hunting, as a sought after recreational opportunity, not allowed.	No significant cumulative effect; the public desired a hunt program on the refuge; increased revenue from tourism.	No significant cumulative effect; public land for hunting desired due to increased demand for expensive private land hunt leases; increased revenue from tourism.	No significant cumulative effect.

4.3.3. Mitigation Measures

No Significant cumulative effects and/or conflicts associated with hunting on Clarks River NWR are anticipated. The Sport Hunting Program as proposed in Alternative D, and described in the refuge hunt plan, is designed to achieve refuge goals and objectives, and minimize potential degrading effects to environmental, biological, social, cultural, facility, or other wildlife-dependent refuge programs.

Mitigation for potential negative impacts/conflicts will primarily be addressed through hunt season and regulation development. Annual review of any positive or negative aspects of the program will continually safeguard against any unforeseen negative impacts/conflicts that potentially arise as a result of the proposed activities, and build upon those evaluated as positive.

Uses associated with refuge non-hunting programs occur throughout the year, but the majority typically occur spring through fall when trees have leafed out, flowers are in bloom, and when most species of wildlife are most active. As public use levels expand across time, unanticipated effects associated with hunting activities may occur. The refuge's Visitor use programs would be adjusted as needed to eliminate or minimize any negative effect to all wildlife species. Hunting season dates and regulations would be set and monitored to reduce negative effects to all species on the refuge, and the refuge would have the flexibility to modify the hunt program in order to meet the requirements of all refuge user groups. Experience has proven that time and space zoning (*e.g.*, establishment of separate use areas, use periods, and restrictions on the number of users) is an effective tool in reducing negative effects to all wildlife species.

Most of the hunting activity occurs during the months of October through December. Wildlife species have completed the rearing of young and are typically in excellent condition. Most non-game species have migrated out of the area, or are inactive due to cold weather conditions. Migratory waterfowl would be subject to morning hunting only, which would provide 18 hours per day without direct disturbance. Federally listed endangered or threatened species are not likely to be negatively affected due to the time of year the proposed activity would occur, which is outside the primary activity period (*i.e.* bats). The taking of any federally listed endangered or threatened species on the refuge is already prohibited by the Endangered Species Act. As defined in Section 3 of the Endangered Species Act, the term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. In addition, none of these species is typically considered a "hunnable" species, and none could reasonably be misidentified for one or more of the species occurring on the refuge that are hunted. Significant impacts to other species groups not specifically addressed are not expected to occur.

Public use areas open, and activities permitted, will be printed in an annual hunt brochure available via the internet, at the refuge administrative office, and other designated locations to provide easy access to the public. The refuge boundary and designated areas with more

restrictive use regulations will be prominently marked with signs and/or paint. These areas will be clearly defined on the refuge hunting brochure.

Hunting is a traditional activity locally, and throughout the region. Social conflicts are not anticipated. Hunting under the proposed alternative has no known negative financial impacts, as recreational users fees are not planned. The activity as proposed provides ample opportunity to individuals who hunt for recreation or who may hunt to offset costs of purchasing processed foods for subsistence. Additional activities that reduce the potential for social conflicts result from staff participation in environmental education activities within the local community. This is accomplished through presentations, on and off, the refuge and its programs to various groups and through personnel contact which occurs throughout the year. These types of activities will continue to be conducted to mitigate any potential conflicts, and intensified if necessary. Public education is an important component in the progression of all refuge programs, and will continue to be given priority by refuge staff and volunteers.

The proposed activity of hunting poses no known impacts to the cultural resources. If unanticipated impacts are realized, mitigation will be addressed through hunting season, regulation or special area designations alternatives.

Chapter 5 Consultation and Coordination with Others

The U.S. Fish and Wildlife Service requested Kentucky Department of Fish and Wildlife Resources, and other appropriate parties, review the Refuge Hunt Plan and Environmental Assessment. U.S. Fish and Wildlife Service personnel in the Frankfort, Kentucky; Atlanta, Georgia; and Washington, D.C. offices will also be reviewing the Refuge Hunt Plan and Environmental Assessment. These documents were also made available for public review and comment as required by the National Environmental Policy Act. A summation of comments received and considered can be found in Appendix A of this document.

The views of Kentucky Department of Fish and Wildlife Resources Agency are provided below:

Hunting Plan

The following comments represent the views of the Kentucky Department of Fish and Wildlife Resources regarding the Draft Sport Hunting Decision Document for Clarks River NWR. Comments address the merits of the proposal when actions are considered individually, collectively, and in conjunction with refuge objectives, refuge purpose, and the National Wildlife Refuge System Improvement Act of 1997.

KDFWR supports the Draft Hunting Plan for Clarks River NWR. Hunting would provide a wildlife-dependent recreational opportunity compatible with the purpose for which the refuge was established. Implementation of this plan would contribute to accomplishing Clarks River NWR Objective 5—Provide opportunities for wildlife-dependent recreation and interpretation. This objective is consistent with provisions of the National Wildlife Refuge System Improvement Act of 1997. Sec. 2 (2) of the National Wildlife Refuge System Improvement Act of 1997 states that Congress finds “The System was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation.” Sec. 2(6) states Congress finds “When managed in accordance with principles of sound fish and wildlife management and administration, fishing, hunting, wildlife observation, and environmental education in national wildlife refuges have been and are expected to continue to be generally compatible uses.” Sec. 5(a) (3) (C) states: “compatible wildlife-dependent recreational uses are the priority general public uses of the System and shall receive priority consideration in refuge planning and management.” Sec. 3 defines ‘compatible use’ as “a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Director, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the refuge. It defines ‘wildlife-dependent recreation’ and ‘wildlife-dependent recreational use’” as “a use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation.” The hunting program would not interfere with or detract from the fulfillment of the purposes for the Refuge or mission of the National Wildlife Refuge System.

Implementation of the Draft Hunting Plan would sustain coyote, opossum, raccoon, and deer populations at ecologically sound levels. This would help accomplish the purpose for which the refuge was established, to provide habitat for the natural diversity of wetland-dependent wildlife. Hunting the white-tailed deer population would prevent over browsing. By foraging selectively, deer affect the growth and survival of many herb, shrub, and tree species, modifying patterns of relative abundance and vegetation dynamics. Cascading effects on other species extend to insects, birds, and other mammals. In forests, sustained over browsing reduces plant cover and diversity, alters nutrient and carbon cycling, and redirects succession to shift future over story composition. Many of these simplified alternative states appear to be stable and difficult to reverse.

Implementation of hunt plan would increase wildlife-associated recreation opportunities which would contribute to the economic and social stability of communities in the area and would increase understanding and support for conservation and the refuge. It would not negatively impact those groups covered by E.O. 12898 but would likely provide opportunities to hunt for low income individuals who may not be able to afford to lease land to hunt.

Implementation of the plan is not likely to have any significant negative impacts.

Environmental Assessment

The following comments represent the views of the Kentucky Department of Fish and Wildlife Resources (KDFWR) regarding the Environmental Assessment: 2007 Sport Hunt Plan on Clarks River National Wildlife Refuge. Comments address the merits and adequacy of the proposal when actions are considered individually, collectively, and in conjunction with refuge objectives, refuge purpose, and the National Wildlife Refuge System Improvement Act of 1997.

Merits of Alternatives

Alternative D

KDFWR supports Alternative D. This alternative would implement actions as Proposed in the Refuge Hunt Plan. Implementing the Refuge Hunt Plan would result in an annual sustained harvest of migratory birds, resident big game and upland game species. It would provide a wildlife-dependent recreational opportunity which is compatible with the purpose for which the refuge was established. This would contribute to accomplishing Clarks River NWR Objective 5—Provide opportunities for wildlife-dependent recreation and interpretation. This objective is consistent with provisions of the National Wildlife Refuge System Improvement Act of 1997. Sec. 2 (2) of the National Wildlife Refuge System Improvement Act of 1997 states that Congress finds “The System was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation.” Sec. 2(6) states: Congress finds “When managed in accordance with principles of sound fish and wildlife

management and administration, fishing, hunting, wildlife observation, and environmental education in national wildlife refuges have been and are expected to continue to be generally compatible uses.” Sec. 5(a) (3) (C) states: “compatible wildlife-dependent recreational uses are the priority general public uses of the System and shall receive priority consideration in refuge planning and management.” Sec. 3 defines ‘compatible use’ as “a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Director, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the refuge. It defines ‘wildlife-dependent recreation’ and ‘wildlife-dependent recreational use’ as “a use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation.” The hunting program would not interfere with or detract from the fulfillment of the purposes for the Refuge or mission of the National Wildlife Refuge System.

Implementation of Alternative D would likely sustain coyote, opossum, raccoon, and deer populations at ecologically sound and socially responsible levels. This would help accomplish the purpose for which the refuge was established, to provide habitat for the natural diversity of wetland-dependent wildlife. Hunting the white-tailed deer population would prevent over browsing. By foraging selectively, deer affect the growth and survival of many herb, shrub, and tree species, modifying patterns of relative abundance and vegetation dynamics. Cascading effects on other species extend to insects, birds, and other mammals. In forests, sustained over browsing reduces plant cover and diversity, alters nutrient and carbon cycling, and redirects succession to shift future over story composition. Many of these simplified alternative states appear to be stable and difficult to reverse.

Implementation of the Hunt Plan would help sustain the ecological integrity of the refuge and ultimately to accomplishing the refuge purpose of conserving wetland habitat for wildlife.

Implementation of hunt plan would increase wildlife-associated recreation opportunities which would contribute to the economic and social stability of communities in the area and would enhance public understanding and support for conservation and the refuge. It would not negatively impact those groups covered by E.O. 12898 but would likely provide opportunities to hunt for low income individuals who may not be able to afford to lease land to hunt.

Implementation of the plan is not likely to have a significant negative impact.

Alternative A

KDFWR cannot support Alternative A, the no action alternative which is essentially a no hunt alternative. This would result in the loss of a priority recreation opportunity which is traditional for the area. Hunting is the biggest recreational use of the refuge. Coyote, opossum, raccoon, and white-tailed deer populations could likely increase above ecologically sound and socially responsible levels. An over population of deer would over selectively browse the vegetation which would change the composition, structure and function of vegetative communities and significantly reduce plant diversity making it more difficult to achieve the refuge purpose. It would also make it difficult to restore areas by planting native trees. A forest devoid of an

herbaceous layer, shrubs and mid-story would not support a full complement of amphibians, reptiles, birds and small animals that naturally occur in the area. The likelihood of starvation and diseases, such as bluetongue and EHD would increase. Vehicle collisions with deer and crop depredation would likely increase. An over population of coyotes, raccoons, and opossums could depredate the nests of quail, turkey, turtles, songbirds and snakes at levels beyond “natural range of variability.” Likewise, elevated rates of disease transmission would likely occur for distemper, mange and rabies among coyotes, raccoons and opossums.

Alternative B and Alternative C

Alternative B: Quota Hunts and Alternative C: Limited Quota Hunts would have most of the positive impacts of Alternative D but would be more expensive to administer. This could negatively impact ongoing and proposed habitat management initiatives by redirecting available funding from planning and implementing wetland restoration, grassland restoration, control of exotic plants, mowing and disking to process applications, maintain data, ensure compliance, maintain check in points, and establish quota boundaries. At this time hunting pressure would not justify the implementation of quotas. If hunting pressure were to increase at a subsequent date to the point that quotas would become necessary the refuge annual review would identify this and appropriate amendments could be made.

Adequacy of Environmental Assessment

KDFWR believes that the Draft Environmental Assessment: 2007 Sport Hunt Plan on Clarks River National Wildlife Refuge meets National Environmental Protection Act (NEPA) requirements. It included discussions of the need for the proposal, of alternatives, of the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted as per 40 CFR 1508.9.

The Environmental Assessment for this project adequately addressed the impacts and considered the context and intensity of the expected impacts of the selected alternative as per 40 CFR 1508.27. The significance of the action was analyzed in the contexts of society as a whole, the affected region, the affected interests, and the locality. It addressed affected environments and environmental consequences in the context of environmental justice (E.O. 12898), public health and safety, refuge physical environment, cultural resources, habitats, biological environments, refuge facilities, wildlife dependent recreation, and cumulative impacts for each alternative.

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Appendix A Response to Public Comments

The Service solicited public comment for the 2007 Sport Hunt Plan and associated Environmental Assessment. The 30-day review period began March 2, 2007 and ended on April 1, 2007. A refuge hunting compatibility determination was also updated, re-evaluated and made available for public review beginning March 8, 2007 and ending April 1, 2007. Copies of all documents were obtainable at the refuge administrative office. Plan availability for comment announcements were made through information releases to four local newspapers and a local radio station (WCBL). Availability was also disclosed through the USFWS Southeast Region Website announcing 2007 press releases.

Fifty-nine public comments were received during the 30-day review period. Fifty-eight of the Fifty-nine comments received during the open comment period were in favor of hunting on National Wildlife Refuges or public lands. Thirty-two of the comments were specific to Clarks River National Wildlife Refuge and either supported hunting on Clarks River in general or specifically noted the Proposed Action as defined in the 2007 Sport Hunt Plan for Clarks River National Wildlife Refuge as being the alternative of choice. One comment (comment # 59) referenced implementation of a hunt program that restricted hunter numbers within designated areas of the refuge. This approach would most resemble Alternatives B and C, but not as proposed. One comment, by the Humane Society of the United States (HSUS), contained comments related to hunting on National Wildlife Refuges as a whole, however these comments were not specific to Clarks River NWR (comment # 53).

The single comment (#59) in support of a quota hunting approach similar to that proposed in alternatives B and C could be achieved through the implementation of Alternative D if supported and warranted by information available during annual program evaluation. This approach would require a significant increase in funding to administer, but could be considered as a potential tool to neutralize any future density-dependent negative impacts to wildlife resources or overall quality of public use associated with refuge programs.

The refuge received a letter from the Humane Society of the United States (comment #53) that contained comments related to hunting on the National Wildlife Refuge System as a whole and containing elements related to litigation filed in 2003 by the Fund for Animals against the U.S. Fish and Wildlife Service. These comments were not specific to the Clarks River NWR draft EA. However, the comments were considered but not responded to here.

Sport Hunting
Decision Document Package
for
CLARKS RIVER NWR

Contents

3. FONSI

FINDING OF NO SIGNIFICANT IMPACT

2007 Sport Hunting Plan for Clarks River National Wildlife Refuge

The U.S. Fish and Wildlife Service proposes to proposes to develop and implement a Sport Hunting Program at Clarks River National Wildlife Refuge consistent with Service policy and guidance, the mission of the National Wildlife Refuge System, the biological goals and objectives of the refuge, and commensurate with public demand.

The hunt program would be implemented throughout the refuge except for those areas specifically closed to hunting for public safety, to provide wildlife sanctuary, or for administrative reasons. The hunt program would be based on best available science, subjected to an annual evaluation, and implemented consistent with Commonwealth of Kentucky and refuge special regulations to provide the public with a high quality recreational experience and provide the Service with a wildlife management tool to promote the biological integrity of the refuge.

The Service evaluated four alternatives for implementation of the hunt program: Alternative A, No Action (No Hunt Program); Alternative B, Implementation of a Quota Hunt (All Species); Alternative C, Implementation of a Limited Quota Hunt (Deer and Turkey Only); and Alternative D, Implementation of the Proposed Refuge Hunt Plan.

The Service has analyzed the following alternatives to the proposal in an Environmental Assessment (copy attached):

Alternative A, the “No Action” alternative, *i.e.* no public hunting, would result in the loss of a desirable public and traditional outdoor recreation opportunity.

Alternative B, the “Quota Hunt” alternative, would allow the hunting of all game species present on the refuge but subject to a first-come, first-serve quota system, Commonwealth of Kentucky regulations, and refuge special regulations.

Alternative C, the “Limited Quota Hunt” alternative, would allow the hunting of deer and turkey on the refuge subject to a first-come, first-serve quota system. The hunting of all other game species present on the refuge would be subject to Commonwealth of Kentucky regulations and refuge special regulations.

Alternative D, the “Preferred” alternative, would implement the 2007 Sport Hunting Plan for Clarks River National Wildlife Refuge subject to Commonwealth of Kentucky regulations and refuge special regulations.

The preferred alternative was selected over the other alternatives because:

1. The preferred alternative would allow the refuge to manage wildlife populations, allow the public to harvest a renewable resource, promote a wildlife-oriented recreational opportunity, increase awareness of Clarks River National Wildlife Refuge and the National Wildlife Refuge System, and meet public demand.
2. The preferred alternative is compatible with Service policy regarding the establishment of hunting on National Wildlife Refuges.
3. The preferred alternative is compatible with the purpose for which Clarks River National Wildlife Refuge was established.
4. This proposal does not initiate widespread controversy or litigation.
5. There are no conflicts with local, state, regional, or federal plans or policies.

Implementation of the agency's decision would be expected to result in the following environmental, social, and economic effects:

1. The refuge could better manage wildlife populations.
2. This would allow the public to harvest a renewable resource.
3. The public would have increased opportunity for wildlife-oriented recreation.
4. Local businesses would benefit from hunters visiting from surrounding counties.
5. The Service will be perceived as a good steward of the land by continuing traditional uses of land in Kentucky.

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

1. Baiting will be prohibited.
2. Some areas closed to hunting.
3. Some waterfowl areas subject to quota system.
4. Waterfowl hunting will cease at 12:00 pm each day.
5. Squirrel season closed during the deer firearm season.
6. Rabbit and quail seasons closed during deer firearm and muzzleloader seasons.
7. Non-toxic shot required for migratory birds and small game except for rim-fire weapons used to hunt small game.
8. The refuge law enforcement program and closely regulated hunting season will ensure hunt regulation compliance and will protect refuge resources.

The proposal is not expected to have any significant adverse effects on wetlands and flood plains, pursuant to Executive Orders 11990 and 11988 because this area has historically had a high use of recreational hunting with no detrimental long-term effect on wetlands.

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

- U.S. Fish and Wildlife Service, Division of Refuges; Atlanta, Georgia; Washington, D.C.
- U.S. Fish and Wildlife Service, Division of Ecological Services; Frankfort, Kentucky
- Kentucky Department of Fish and Wildlife Resources; Frankfort, Kentucky
- Citizens of Graves, Marshall and McCracken Counties

Copies of the Environmental Assessment are available by writing:

Clarks River National Wildlife Refuge
91 U.S. Highway 641 North
Benton, Kentucky 42025

Therefore, it is my determination that the proposal does not constitute a major Federal action significantly affecting the quality of the human environment under the meaning of section 102(2)(c) of the National Environment Policy Act of 1969 (as amended). As such, an environmental impact statement is not required. This determination is based on the following factors (40 CFR 1508.27):
(for each factor list the page numbers of the EA where the factor was discussed.)

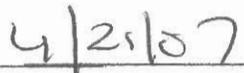
- 1. Both beneficial and adverse effects have been considered and this action will not have a significant effect on the human environment (EA, pages 9-54).**
- 2. The actions will not have a significant effect on public health and safety (EA, page 9).**
- 3. The project will not significantly effect any unique characteristics of the geographic area such as proximity to historical or cultural resources, wild and scenic rivers, or ecologically critical areas (EA, page 10, 48).**
- 4. The effects on the quality of the human environment are not likely to be highly controversial (EA, pages 9-54).**
- 5. The actions do not involve highly uncertain, unique, or unknown environmental risks to the human environment (EA, page 9-54).**
- 6. The actions will not establish a precedent for future actions with significant effects nor does it represent a decision in principle about a future consideration (EA, pages 9-54).**
- 7. There will be no cumulative significant impacts on the environment. Cumulative impacts have been analyzed with consideration of other similar activities on adjacent lands, in past action, and in foreseeable future actions (EA, pages 21-54).**

8. **The actions will not significantly affect any site listed in, or eligible for listing in, the National Register of Historic Places, nor will they cause loss or destruction of significant scientific, cultural, or historic resources (EA, pages 10, 48).**
9. **The actions are not likely to adversely affect endangered or threatened species, or their habitats (Intra-Service Section 7 Biological Evaluation Form attached to EA).**
10. **The actions will not lead to a violation of federal, state, or local laws imposed for the protection of the environment (EA, pages 9-54).**

References: Environmental Assessment of 2007 Sport Hunting Plan for Clarks River National Wildlife Refuge, Hunting Plan, Compatibility Determination, Letters of Concurrence, Refuge-specific Regulations, Intra-Service Section 7 Evaluation



Regional Director



Date