

Environmental Assessment

Deer Hunting at Boyer Chute National Wildlife Refuge

March 2007

Proposed Action: Allow managed deer hunting on Boyer Chute National Wildlife Refuge

Type of Statement: Environmental Assessment

Lead Agency: U.S. Fish & Wildlife Service

Responsible Official: Robyn Thorson, Regional Director
Region 3
U.S. Fish & Wildlife Service

Contact: Larry Klimek, Project Leader
U.S.FWS, Boyer Chute/Desoto National Wildlife Refuges
3720 Rivers Way
Fort Calhoun, NE 68023
(712) 642-5401

Acronyms used in this document:

CFR - *Code of Federal Regulations*

EA - *Environmental Assessment*

EMU - *MFWP Elk Management Unit*

ESA - *Endangered Species Act*

COE - *U.S. Army Corp of Engineers*

FWS - *U.S. Fish and Wildlife Service*

NGPC - *Nebraska Game and Parks Commission*

NEPA - *National Environmental Policy Act*

NRCS - *U.S. Department of Agriculture, Natural Resources Conservation Service*

NRD - *Papio-Missouri Valley Natural Resource District*

NWR - *National Wildlife Refuge*

Refuge - *Boyer Chute National Wildlife Refuge*

Project Summary

Boyer Chute National Wildlife Refuge is located approximately 3 miles east of Fort Calhoun, NE. The primary purposes of the refuge are to preserve, restore, enhance and maintain Missouri River floodplain terrestrial and aquatic habitats as well as provide public use opportunities for environmental education, interpretation, photography, wildlife observation, fishing, and hunting.

In response to a 2003 lawsuit filed by the Fund for Animals, the U. S. Fish and Wildlife Service will amend or re-write environmental assessments that describe hunting programs at twenty-three national wildlife refuges. 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 deer hunting programs at Boyer Chute National Wildlife Refuge in Nebraska.

The alternatives being considered in detail are:

- (A) No deer hunting at the refuge(no action alternative)
- (B) Managed deer hunting
- (C) General public deer hunting

These alternatives were selected because they best promoted increased visitation and public enjoyment of the refuge while remaining consistent with the other primary purposes of Boyer Chute. The impacts of each alternative are examined in detail per NEPA guidelines. A decision will be made regarding which alternative is to be implemented.

Alternative (B) is the preferred alternative. Alternative (B) would allow managed deer hunting opportunities at Boyer Chute. This alternative would provide quality hunting in a time when traditional hunting is declining. This alternative will allow controlled deer hunts in management specified locations of the refuge. This will aid in minimizing conflicts with other visitors to the refuge as well as minimize any impacts to the flora and fauna by hunters.

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1. Purpose and Need for Action

1.1 Introduction and Background

This document describes a proposal by the U.S. Fish and Wildlife Service (USFWS) to allow managed hunting of deer at Boyer Chute National Wildlife Refuge. In response to a 2003 lawsuit filed by the Fund for Animals, the U. S. Fish and Wildlife Service will amend or re-write environmental assessments that describe hunting programs at many national wildlife refuges. 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 Boyer Chute National Wildlife Refuge in Nebraska.

Boyer Chute National Wildlife Refuge is located three miles east of the farming community of Fort Calhoun, Nebraska. The current refuge boundary is situated west and alongside the Missouri River in Washington County, 10 miles north of Omaha, Nebraska. The authorized acquisition boundary is astride the Missouri River in Pottawattamie County, Iowa and Washington County, Nebraska.



The U.S. Fish and Wildlife Service established the refuge in 1992 to preserve and restore Missouri River habitats commonly found before the river was channelized in 1958. The Fish and Wildlife Act of 1956 and Emergency Wetland Resource Act of 1986 authorized acquisition. It serves as a seasonal resting area for waterfowl, nesting area for a variety of migratory grassland, wet meadow and wetland dependent birds, and is year round home for many resident wildlife species. There are approximately 25,000 visitors to the refuge each year participating in such activities as biking, hiking, fishing, wildlife observation, and limited deer and waterfowl hunting are currently supported.

1.2 Purpose

Refuge managed deer hunting will allow management of the deer population and assist the refuge in realizing the fulfillment of its obligations to the public. Expanding hunting opportunities at Boyer Chute will help to encourage partnerships with other wildlife agencies such as the Nebraska Game and Parks Commission. On the same note, by encouraging hunting, it is hoped that strong ties to the environment and Boyer Chute would be forged. Heightened public awareness and concern about the refuge will facilitate increased public input and re-establish the general public as a stakeholder in environmental restoration and wildlife conservation projects at Boyer Chute and elsewhere.

1.3 Need for Action

In the National Wildlife Refuge System Improvement Act of 1997, Congress outlined six primary public uses of national wildlife refuges: fishing, hunting, wildlife observation, wildlife photography, environmental education and interpretation. Policy of the U.S. Fish and Wildlife Service (FWS) Refuge Manual (605 FW2-Hunting) stipulates that hunting is considered a priority general public use of the Refuge System and should receive enhanced consideration over non-priority uses. Refuges are encouraged to set aside areas or times to promote an appreciation for wildlife and the environment, while providing quality recreation and teaching proper hunting methods in a safe environment. A hunting program must be compatible, and should instill positive values and high ethical standards, such as fair chase and sportsmanship, while providing a quality hunt.

1.4 Decisions Needed

The Regional Director, Region 3, Minneapolis, Minnesota, will use this document to make a decision regarding the allowance of deer hunting at Boyer Chute. If it should be decided to allow deer hunting at the refuge, a determination of which alternative is to be implemented will also be made.

1.5 Scoping

Scoping is the early process of identifying the range and impacts of the project proposal. It is a process that defines any issue related to the proposal so the appropriate people or organizations are consulted and the major issues are addressed. The Refuge Improvement Act designated six wildlife dependent recreational uses to be given priority on National Wildlife Refuges if they are determined to be compatible with Refuge purposes and the Refuge system mission. The wildlife dependent recreational uses are wildlife observation, wildlife photography, environmental education, environmental interpretation, hunting and fishing. During the acquisition process and in the Acquisition Environmental Assessment, the FWS stated that hunting would be evaluated and potentially allowed. The approved alternative will serve as the guideline for the development of the refuge. After the issues were analyzed, a managed deer hunting option was chosen as the most feasible and became the proposed project.

1.5.1 Proposed Project and Alternatives

Here is the proposed project and alternatives:

- (A) No deer hunting
 - no action alternative

- (B) Managed deer hunting
 - limited hunters, limited time, limited area
 - species would include white-tailed deer

- (C) General deer hunting
 - hunting opportunity for the general public
 - unlimited hunters, season length to coincide with state of Nebraska
 - species would include white-tailed deer

2. Alternatives

2.1 Introduction

This chapter describes three alternatives: a "No Deer Hunting" alternative, a "Managed deer hunting" alternative, and a "General Deer Hunting" alternative.

Description of Alternatives

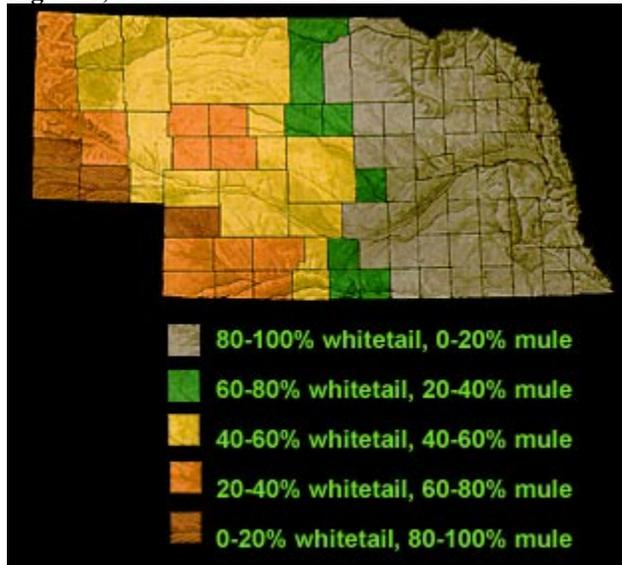
2.2.1. Alternative A: No Deer Hunting(no action alternative)

In this situation, the Service would not open the Refuge to any type of deer hunting. This action would not provide for additional educational and recreational activities, and the hunting public would be denied an opportunity to have quality hunting in a public area given the fact that the amount of available public hunting grounds is limited in the area. In general, this alternative would not have any direct adverse affects on species diversity and the environment. This alternative does not provide the opportunity to manage the deer herd to prevent overcrowding and habitat degradation.

2.2.2. Alternative B: Managed Deer Hunting

Under this alternative, the refuge would allow managed deer hunting for a limited time period at specified areas of the refuge. The refuge will control the number of hunters, and conduct approximately 1 to 4 deer hunts, annually. This action will primarily affect the population of white-tailed deer (Figure 1),

Figure 1, Distribution of Whitetail and Mule Deer in NE



a species with a steadily increasing population. This alternative will provide quality hunting in a time when traditional hunting is declining. The Refuge would continue to base its management hunts on the deer population trends and harvest data. This alternative is desirable because it provides the greatest benefits with the least adverse environmental

effects, due to the limited time scope and controlled nature of the hunt.

2.2.3. Alternative C: General Deer Hunting

This action would allow deer hunting by the general public according to State of Nebraska regulations and seasons. This alternative would create a great deal of hunter interest. There is a very limited amount of public hunting ground near the Omaha metropolitan area, and Boyer Chute NWR is located less than ten miles away. Based on the high levels of hunting activity taking place on public areas within a much greater distance of Omaha, it is expected that extremely heavy deer hunting pressure would take place at Boyer Chute. The Refuge currently has no full time law enforcement personnel, and it would not be possible for refuge staff to supervise the anticipated high number of hunters and ensure proper hunting practices. Harvest data would be difficult to obtain, and would hinder effective management of the Refuge's deer management program. Alternative C is considered but rejected because while it would provide hunting opportunities for all deer hunters, the anticipated increase in use would not be compatible with the mission of the refuge.

3. Affected Environment

Boyer Chute NWR is located on the floodplain of the Missouri River between Omaha, NE, and Blair, NE. In this section, we give an overview of the environment of the area(s) to be affected by the proposed action or the alternatives.

3.1 Ecology

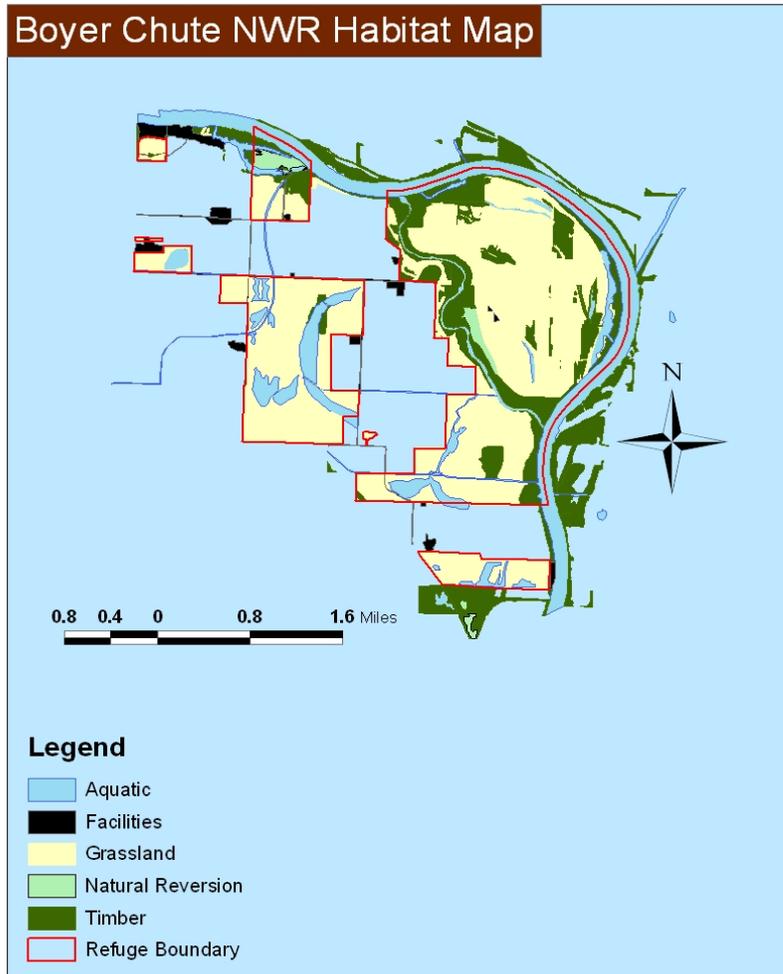
Historically, the Missouri River was dynamic and meandering, providing diverse riverine and floodplain habitats, including chutes, oxbow lakes, sandbars, marshes, deep pools and wet prairies (Boyer Chute Expansion, 1997). Seasonal flooding was usual and a vital part to the health of the ecosystem, providing rich nutrients and essential habitat conditions. Today, upstream reservoirs have changed the hydrology of the area and the quality of the river. Colder temperature and nutrient depleted water have resulted in severe losses in fish populations. Changes in the nature of the river have reduced habitat for all wildlife, including invertebrates, birds, and mammals. On April 15, 1997, American Rivers designated the Missouri River as the most endangered river system in the country (Boyer Chute Expansion, 1997).

Agricultural development has resulted in drainage of wetlands and decrease of riparian woodland, bottomland hardwoods, and floodplain prairies. Urban and industrial development has also contributed to the reduction of habitat. Based on the Environmental Assessment for the Boyer Chute Expansion prepared by the US Fish and Wildlife Service, agriculture, urban, and industrial development combined have resulted in a 95 percent loss of floodplain habitat (13).

Boyer Chute, historically, was an island of sediment and sand deposited in the Missouri River by Iowa's Boyer River (US Fish and Wildlife Service, 2003). Its nature was changed by modern engineering and modifications along the Missouri River. Today, areas along the

channel have been planted with trees and shrubs native to the area to recreate riverine habitat, and the remaining areas not already in native vegetation, have been seeded with a mix of native grasses and forbs (Figure 2).

Figure 2, Boyer Chute NWR Habitat Map



Approximately 612 acres are managed as timber, 2743 acres as tallgrass prairie, 406 acres as restored wetlands and riverine habitats, 206 as administrative acres (roads, buildings, parking areas), and 73 acres set aside as natural revegetation/succession.

3.2 Wildlife

The area and adjacent Missouri River provide potential habitat for four Federally-listed threatened and endangered species: pallid sturgeon, bald eagle, interior least tern, and piping plover (Boyer Chute Expansion, 1997). Two candidate fish species, the sicklefin chub and sturgeon chub could be present at times in the area. Wetlands and sandbars in the area provide habitat for waterfowl and other small birds.

The Missouri River valley provides habitat for many migratory birds, such as the snow goose and numerous duck species. It also provides habitat for many shorebirds, neotropical migrants, short distance migrants, resident songbirds, hawks and owls. Bald eagles, a federally-listed Threatened species, can be also found in the area, especially during winter. Several game species, such as pheasant, quail, and wild turkey are present too. Many grassland species are present in the area. Examples of those include grasshopper sparrow, upland sandpipers, dickcissel, field sparrow, and western meadowlark (Effects, 2003).

More than 30 species of mammals can be found along the Missouri River, such as deer, beaver, muskrat, mink, coyotes, fox, and raccoons (Boyer Chute Expansion, 1997). In particular, beavers are present in Nathan's Lake and Boyer Chute. Several species of reptiles and amphibians are present in the area too; specifically, 26 species of reptiles and 15 species of amphibians can be found along the river. Common reptile species include soft-shell turtles, false map turtles, snapping turtles, water snakes and garter snakes. Some amphibian species found in the area are leopard frogs, spadefoot toads, and salamanders.

3.3 Fishery Resources

More than 80 species of fish can be found in the Missouri River, but in reduced numbers compared to the past and only in particular areas. This decrease in fish populations is the result of major changes in the nature of the Missouri River, including channelization and flood control. The river basin supports 156 native fish species, and 33 of them are listed as rare, endangered, or threatened (Boyer Chute Expansion, 1997).

Several game fish are present in the area, such as flathead and channel catfish, walleye, sauger, drum, and panfish. Forage fish, such as chubs, shiners, shad, and minnows, are also present.

3.4 Public Use

The refuge is open from ½ hour before sunrise to ½ hour after sunset each day. Specific parts of Boyer Chute are open to the public for wildlife-dependant recreational uses, such as hiking, fishing, hunting, and wildlife observation/photography. Environmental education and interpretation are also provided.

Most wildlife observations are conducted while people drive the access road, bike, or hike the trails. During weekdays, 50-200 people can visit the refuge each day, while this number can double in the weekends (Boyer Chute Expansion, 1997). Visitation depends on the season. Use is much lower during the winter period.

Environmental education opportunities are primarily offered to students from the surrounding area schools. Students normally have specific activities, such as finding plankton, insect collection, and vegetation typing.

Additional trail facilities are expected. The Back to the River hike-bike trail will follow the alignment of the river road from Omaha to Fort Calhoun. The refuge has supplied

right-of-way for this trail (Boyer Chute Expansion, 1997). Observation points along the river road could be constructed to help wildlife observation.

Recreational fishing is available on the Boyer Chute and the Missouri River banks. Two accessible piers have been installed on the chute.

3.5 Hydrology and Soils

The area has two streams that flow eastward from the bluffs to the Missouri River. Turkey Creek is the northern stream, and Deer Creek is the southern stream. Both streams have been modified with several water control structures along them. The Fort Calhoun Drainage District maintains water control structures and ditches.

Soils of the Missouri River floodplain vary from light sandy to dense clays. Land use classifications are based upon soil type and floodplain location range. For example, Class I soils have the highest productivity, while Class V soils have the least productivity (Boyer Chute Expansion, 1997). The most abundant soils are Class II wet and Class III wet, in other words hydric soils (Boyer Chute Expansion, 1997).

The area is subject to periodic flooding. Usually, flooding has two major effects. The first is caused by the river backing up into drainage ditches. This causes flooding of farmed wetlands and prevents rainfall from running off into ditches. The second is caused by the duration of high river flows. If the river is high for several weeks, hydraulic pressure of the river raises groundwater causing ground water seepage to occur into farmed wetlands.

3.6 Socio-economic Environment

Boyer Chute is in the southern portion of Washington County, Nebraska. It is located 3 miles east of the town of Fort Calhoun, Nebraska (pop.856), the closest city, and around 8 miles southeast of Blair, NE (pop. 7,512) (US Census, 2003). Crescent, Iowa (pop.537), is the closest town in Iowa. Omaha, NE (pop. 716,998), which is 10 miles away, is rapidly expanding northward toward the area.

The floodplain is primarily farmland. The area combines some rural, recreational, and urban characteristics. The Missouri River and its recreational activities is a major resource base for the area attracting numerous cabins and trailers. Specifically, trailers and homesteads cover less than two percent of the area within the refuge expansion zone (Boyer Chute Expansion, 1997). In addition, the city of Omaha is expanding to the north from Douglas County into Washington County.

Land use patterns and lifestyles of those who visit Boyer Chute may be slightly affected by hunting on the refuge. The status quo pattern of non-consumptive refuge use may change as users shy away from hunting areas. No displacement of business can be foreseen with the introduction of hunting. Businesses may actually expand in surrounding areas with the increased visitation of hunters. A decrease in employment opportunities is unlikely, a small increase may occur.

Changes in aesthetics are probable. Many believe a wildlife refuge's goal is to provide sanctuary for wildlife. If individuals are hunting wildlife, a safe refuge does not exist for pursued animals; therefore, public perception of the Refuge may decline as more hunting opportunities are introduced. The general public, not associated with hunting, might fear guns being fired in their vicinity, thus giving recreational users an excuse to not visit the refuge.

Public pedestrian access would only be affected if certain areas of the refuge were closed during days that hunting were allowed. Recreational use would remain the same except on days designated for hunting, which may facilitate a decline in non-consumptive users of the refuge.

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 communities 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 unique to minority or low-income populations in the affected area. The Proposed Action will not disproportionately place any adverse environmental, economic, social, nor health impacts on minority or low-income populations.

3.7 Cultural Resources

To date, no Native American trust or other cultural resources have been located at Boyer Chute Wildlife Refuge. Based on information provided by the Nebraska State Historical Preservation Officer, there are two historic sites in adjacent areas. One site is Neal Woods, which has historic lime kilns. The other site was used by aboriginals in the Nebraska Period. The exact location is SW1/4, Section 20, T17N, S13E. Fort Atkinson Historical Park, the first fort west of the Missouri, and the sole accomplishment of the Yellowstone Expedition of 1819, is located in Fort Calhoun and it's directly adjacent to the planned future Refuge boundary (Fort Atkinson, 2003). The Refuge deer hunts would not impact these sites located off of the Refuge.

3.8 Radiological Environment

Fort Calhoun does have a nuclear power plant. It is located approximately 5 miles to the north of the refuge. No radiological contamination is known to exist on refuge property

3.9 Air Quality

The air quality in the area is relatively good. From the 14 EPA regulated facilities in the area, four report their air releases (EPA, 2003). The closest to Boyer Chute is the Fort Calhoun Stone Company.

3.10 Water Quality

The water quality of the area complies with EPA regulations. From the 14 EPA regulated facilities in the area, eight are permitted to discharge water in the river (EPA, 2003). The closest to Boyer Chute are the Fort Calhoun Stone Company and the Fort Calhoun Wastewater Treatment Plant.

3.11 Noise

Noise pollution already exists on the wildlife refuge. A rock quarry is located adjacent to refuge property. Loud booms, associated with rock blasting, can be heard intermittently throughout the day. Eppley Airfield is located just south of the refuge and the rumble of northbound jets can be heard from refuge property.

3.12 Important Transportation Corridors

Only one important transportation corridor surrounds Boyer Chute, US highway 75. US highway 75 is an important northbound road that leads out of Omaha and through Fort Calhoun and Blair.

3.13 Aesthetic Environment

Boyer Chute is a typical grassland restoration refuge. As farmland is acquired, restoration to original condition is initiated. The Missouri River borders the refuge on the north and east. Boyer Chute runs north to south through the refuge parallel to the Missouri.

3.14 Solid Wastes

Solid wastes contribute little to the affected environment. From the 14 EPA regulated facilities, five report hazardous wastes treatment (EPA, 2003), but none of them are close to Boyer Chute.

4. Cumulative Impacts Analysis

Cumulative effects are caused by the combination of past, present, and reasonably foreseeable future actions. This chapter evaluates the potential social, economic or environmental impacts as well as the project benefits. Positive and negative impacts are both presented here, along with proposed mitigation for the impacts.

Alternative A: No Deer Hunting (no action)

A. Anticipated Direct and Indirect Impacts of Proposed Action on Wildlife Species

1. Resident Wildlife

Populations of white-tailed deer could continue to grow. Prior to the implementation of the Refuge's deer hunting program in 2003, aerial deer surveys showed the following deer populations:

Table 1. Pre-Refuge deer hunting population surveys:

Year	# Deer	Refuge Acreage surveyed	Deer/ mi²
1997	50	1953	16
1999	95	1953	31
2001	136	1953	45
2002	100	1953	33

Table 2. Post-Refuge deer hunting population surveys:

Year	# Deer	Refuge Acreage surveyed	Deer/ mi²
2004	414	3013	88
2005	230	3013	49
2006	212	4040	34
2007	322	4040	51

The Refuge deer population has increased overall during the 1997-2007 monitoring time-frame, and without managed deer hunts beginning in 2003, would have very likely exceeding the habitat carrying capacity. Deer herds will increase 30 to 40 percent per year when protected and under good habitat conditions. Most of the deer herd recruitment must be removed annually to maintain the population at its

current levels (West Virginia Cooperative Extension Bulletin No. 806). A non-hunted deer population would very likely increase to levels that result in damage to agricultural croplands, increased deer-vehicle collisions, as well as damage to native vegetation. Depredation complaints from local landowners and farmers would continue to grow. This alternative would not have a direct impact upon other resident wildlife species, but would have a potential indirect impact upon them. White-tailed deer could continue to grow to levels which can do serious damage to native prairie wildflowers and the understory component of adjacent forest habitats through over-browsing. Fish populations would not be affected under this alternative.

2. Migratory Species

This alternative would not have a direct impact upon migratory wildlife species, but would have a potential indirect impact upon them. White-tailed deer could continue to grow to levels which can do serious damage to native prairie wildflowers and the understory component of adjacent forest habitats through over-browsing. This degradation of habitat would negatively affect migratory species dependant upon it, in particular neo-tropical migrant birds which are dependant upon woodland lower canopy vegetation.

3. Endangered Species

This alternative would not have a direct or indirect impact upon endangered species.

B. Anticipated Direct and Indirect Impacts of Proposed Action on Refuge Programs, Facilities, and Cultural Resources

1. Other Refuge Wildlife Dependent Recreation

This action would not provide for additional recreational activities. Under this alternative, other recreational uses of the refuge, such as hiking, fishing, cycling, wildlife observation, wildlife photography would not be affected.

2. Refuge Facilities

Refuge facilities, trails, and roads are not going to be affected under this alternative.

3. Cultural Resources

Cultural resources are not going to be affected under this alternative.

C. Anticipated Direct and Indirect Impacts of Proposed Action on Refuge Environment and Community

1. Hydrology and Soils

Streams and soil structure and composition would not be affected under this alternative.

2. Air Quality

This alternative would not affect air quality, as no form of pollution would be generated.

3. Water Quality

This alternative would not affect water quality, as no pollutants would be discharged in any water bodies.

4. Noise

Noise pollution would remain at the current level under this alternative including a rock quarry blasting with dynamite located less than two miles away from the Refuge.

5. Important Transportation Corridors

Only one important transportation corridor surrounds Boyer Chute, US highway 75. This road would be unaffected under this alternative.

6. Socio-economics

Under this alternative, the State would not gain any additional income from hunting licenses, tags, stamps, and taxes on hunting equipment and ammunition. Local economy would be unaffected. Non-consumptive recreational visitors would remain at the same level.

7. Aesthetic Environment

Under this alternative the environment would remain the same as pre-Refuge hunting programs.

8. Radiological Environment

Under this alternative the environment would remain the same. There are no known sources of radiological contamination at Boyer Chute.

9. Solid Waste

Solid wastes contribute little to the environment of the area, and therefore, the “no hunting” alternative would not change this factor.

D. Other Past, Present, Proposed, and Reasonably Foreseeable Hunts and Anticipated Impacts

Waterfowl hunting is currently permitted at Boyer Chute NWR. Waterfowl hunting activity has been extremely low to date with an average of 20 hunters annually during the course of the waterfowl hunting season. Due to the low waterfowl hunter numbers, no impacts are expected from concurrent hunting programs (waterfowl and whitetailed deer). Deer or waterfowl hunting zones could be moved away from each other to avoid conflicts between waterfowl and whitetailed deer hunters if problems arise in the future.

E. Anticipated Impacts if Individual Hunts are Allowed to Accumulate

There are no significant additional impacts anticipated with the accumulation of deer and waterfowl hunting. The extremely low numbers of waterfowl hunters (20 hunters annually) over the course of a several month long hunting season, do not appreciably contribute to the impact of deer hunting at Boyer Chute NWR.

Alternative B: Managed Deer Hunting (preferred alternative)

A. Anticipated Direct and Indirect Impacts of Proposed Action on Wildlife Species

1. Resident Wildlife

Prior to the implementation of the Refuge's deer hunting program in 2003, aerial deer surveys showed the following deer populations:

Table 1. Pre-Refuge deer hunting population surveys:

Year	# Deer	Refuge Acreage surveyed	Deer/ mi²
1997	50	1953	16
1999	95	1953	31
2001	136	1953	45
2002	100	1953	33

Table 2. Post-Refuge deer hunting population surveys:

Year	# Deer	Refuge Acreage surveyed	Deer/ mi²
2004	414	3013	88
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2006	212	4040	34
2007	322	4040	51

The Refuge deer population has increased overall during the 1997-2007 monitoring time-frame, and without managed deer hunts beginning in 2003, would have very likely exceeding the habitat carrying capacity. This alternative would allow the refuge to continue to manage the white-tailed deer populations. Refuge managed hunts would allow the most accurate management of the deer population, and allow the collection of harvest data. When population levels exceed carrying capacity, deer are highly susceptible to disease (e.g., hemorrhagic disease, chronic wasting disease, etc.) outbreaks that result in high mortality. This often results in an abrupt decline in the deer population, which can adversely affect the genetic structure of the herd. Managing for healthy wildlife populations through harvesting animals supports the Refuges goal of providing for the viability of wildlife populations associated with tallgrass prairie. The carrying capacity will vary from year to year based on habitat conditions, but an average of 35 deer/mi² is typical for this part of

the country. The habitat on the Refuge can maintain higher deer densities, and this is desired to allow the public a greater opportunity to view deer on the Refuge. A Refuge deer population of 35 to 60 deer/mi² will allow maximum public viewing of deer, while still maintaining healthy habitat.

Table 3. Refuge Deer Hunts Harvest Data

Year	# of Hunters	# Deer Harvested	Success Rate	Post Deer Hunts Spring Deer/ mi²
November 2003	10 mentors 17 youth hunters	15 deer	56%	88 deer/mi ² (spring 2004)
October 2004 early	25 hunters	31 deer	124%	
October 2004 late	25 hunters	26 deer	104%	
December 2004	8 youth hunters	5 deer	63%	
January 2005	49 hunters	43 deer	88%	49 deer/mi ² (spring 2005)
October 2005 early	38 hunters	36 deer	95%	
October 2005 late	38 hunters	23 deer	61%	
December 2005	21 hunters	11 deer	52%	
January 2006	69 hunters	52 deer	75%	34 deer/mi ² (spring 2006)
October 2006 early	37 hunters	28 deer	76%	
October 2006 late	37 hunters	10 deer	27%	51 deer/mi ² (spring 2007)

As the above table shows, the Refuge management deer hunts have maintained a healthy deer population levels. Deer herds will increase 30 to 40 percent per year when protected and under good habitat conditions. Most of the deer herd recruitment must be removed annually to maintain the population at its current levels (West Virginia Cooperative Extension Bulletin No. 806).

Figure3. Boyer Chute NWR falls within the State of Nebraska's *Wahoo* Deer Management Unit:

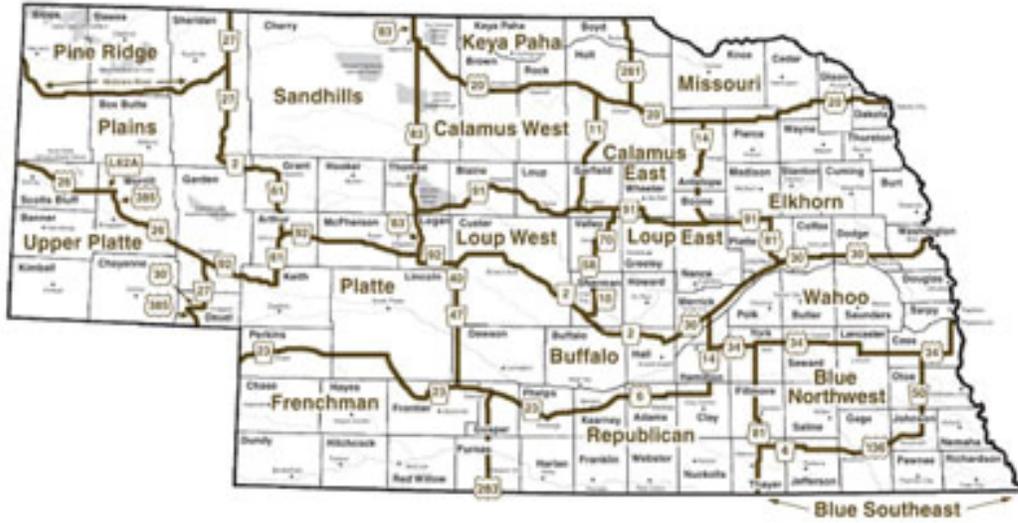
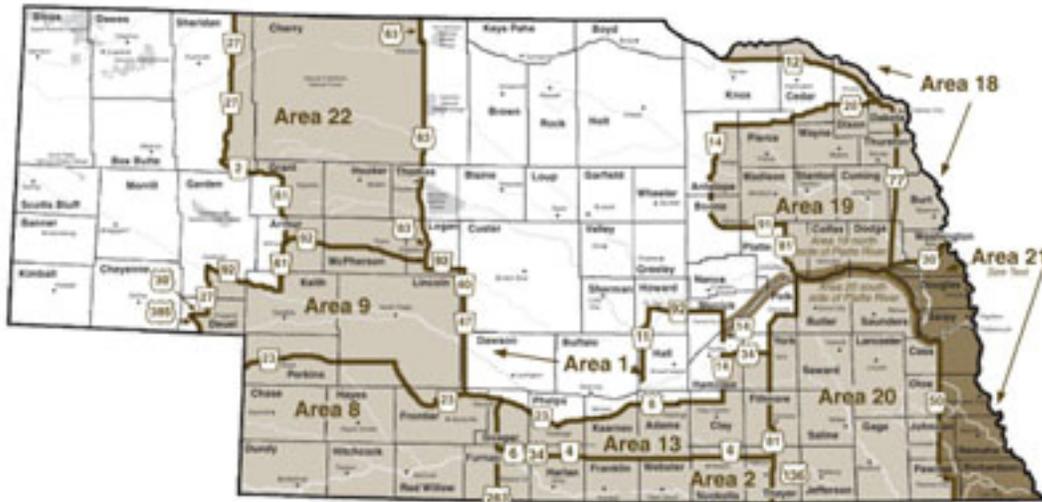


Table 4. The Wahoo Unit's deer population and harvest data:

WAHOO DEER UNIT	# OF PERMITS ISSUED	LL	% SUCCESS	ADULT BUCKS HARVESTED		ANTLERLESS HARVESTED		TOTAL KILL
				MULE DEER	WHITE TAILED DEER	MULE DEER	WHITE TAILED DEER	
YEAR	REGULAR							
1991	4000	975	62	5	1772	2	703	2482
1992	4000	901	57	5	1730	3	552	2290
1993	4000	929	59	6	1861	1	501	2369
1994	4000	965	61	3	2037	0	412	2452
1995	4000	1054	71	3	2370	1	450	2824
1996	4000	1010	72	2	2219	0	677	2898
1997	4000	1051	82	7	2282	0	1001	3290
1998	4000	1124	84	3	2285	4	1048	3340
1999	4501	1160	77	2	2447	2	994	3445
2000	4500	1232	84	3	2699	1	1067	3770
2001	4504	1245	84	2	2515	0	815	3332
2001 AO	1000	0	42	0	38	0	380	418
2002	4500	1169	65	2	2149	1	794	2946
2003	4500	1232	71	2	2493	0	669	3216
2004	4500	1291	75	5	2709	2	660	3376
2005	4500	1234	73	2	2604	0	636	3297
AVERAGES								
Av91-95	4000	965	74	4	1954	1	524	2949
Av96-00	4200	1115	80	3	2386	1	957	3349
Av01-05	4701	1234	71	3	2502	1	791	3317

A rough deer population estimate can be determined by taking the total harvest, times 5. The regional total harvest has basically increased or remained somewhat constant in the last ten years, with an increase in the amount of issued permits, demonstrating the ability of the deer population to withstand an annual harvest and maintain its population levels. In addition, the Nebraska Game and Parks created a special “Season’s Choice” tag (Figure 4), starting in 2004, to increase the harvest of deer.

Figure 4. Season’s Choice Map:



Boyer Chute NWR falls into the “Season’s Choice” area 21 zone (Table 5).

Table 5. Season’s Choice Harvest Data:

YEAR	# PERMITS ISSUED	# OF DEER HARVESTED	% SUCCESS
2004	6881	4905	70
2005	7208	5428	75

Hunting data from the 2006 Season’s Choice season has not yet been compiled by the Nebraska Game and Parks Commission. The regional deer population has been increasing annually, and the cumulative impact of the Boyer Chute NWR managed deer hunts will be practically insignificant.

Locally, the annual deer harvest at Boyer Chute NWR has ranged from 15 to 113 animals and it is estimated that future deer harvests will fall within those ranges. The number of hunts and hunters will be based on the preceding spring deer population survey. The number annual hunts have ranged from 1 to 4, and is estimated to be the number of annual hunts in the future.

Some disturbance and noise are expected, and this could potentially impact other non-migratory wildlife species. Possible effects could include disruption of feeding activities, reduced use of preferred habitat, and disturbance of resting species. However, due to the limited time frame of the controlled hunts, all of the above disruptions would occur in a relative small scale and over a short period of time, limiting any impacts. The deer hunts will not occur while any species is breeding. Under this alternative, there would not be any adverse effects on fish populations and habitat.

2. Migratory Species

This alternative would have some limited direct and indirect impacts upon migratory wildlife species. Possible impacts could include disruption of feeding activities, reduced use of preferred habitat, and disturbance of resting species. However, due to the limited time frame of the controlled hunts, all of the above disruptions would occur on a relatively small scale and over a short period of time, limiting any impacts. Small indirect impacts may occur such as minor disturbance to neo-tropical migrant habitat, such as trampling of low ground vegetation. This impact is expected to be minimal, since the deer hunts will not occur during any nesting seasons. Any small impacts to vegetation are expected to recover with spring re-growth.

3. Endangered Species

Some slight disturbance to endangered species may occur. Bald eagles use the area on a very sporadic migratory or winter visitor basis. No nesting populations are present. The disturbance caused during management hunts is not expected to be significant due to the limited time scope and controlled nature of the hunts. A consultation pursuant to Section 7 of the Endangered Species Act has been completed.

B. Anticipated Direct and Indirect Impacts of Proposed Action on Refuge Programs, Facilities, and Cultural Resources

1. Other Refuge Wildlife Dependent Recreation

This alternative would provide quality recreational opportunities for deer hunters. Under this alternative, other wildlife-dependante recreational uses of the refuge, such as hiking, fishing, cycling, wildlife observation, photography may be slightly affected. This would allow minimal interference with other users, such as bikers, hikers, fishermen, and wildlife observers. The disturbance caused during management hunts is not expected to be significant due to the limited time scope and controlled nature of the hunts. Safety levels would remain around existing levels. Other Refuge uses will be closed in the immediate hunting area during the managed deer hunts.

2. Refuge Facilities

Refuge facilities such as trails and roads could potentially be affected under this alternative. Refuge management trails used by deer hunters could become rutted if refuge hunts are concurrent with rainy weather.

3. Cultural Resources

Cultural resources are not going to be affected under this alternative.

C. Anticipated Impacts of Proposed Management Deer Hunts on Refuge Environment and Community.

1. Hydrology and Soils

Effects on soil and water quality would not be significant. Some soil disturbance is expected but without any significant effects. Hydrology would remain unaltered.

2. Air Quality

This alternative would not affect the air quality of the area.

3. Water Quality

Water quality would not be affected under this alternative.

4. Noise

With the introduction of hunting, firearms will be discharged, causing noise pollution. A slight impact will exist, but with a rock quarry blasting with dynamite located less than two miles away from the Refuge, and very few nearby residences, this impact would be minimal.

5. Important Transportation Corridor

US highway 75 is the only important road surrounding Boyer Chute. Under this alternative traffic levels might increase during the proposed time frame; however these increases would not be detrimental to the road or nearby cities.

6. Socio-economics

The refuge might have to hire or bring in additional staff for a short period of time due to increased number of hunters in order to supervise proper hunting behavior. The state would acquire some money from hunting licenses, tags, stamps, and taxes

on hunting equipment and ammunition. The local economy may see a small boost in sales due to the purchase of equipment and amenities. This boost would have a positive effect on Fort Calhoun. Recreational uses such as biking, hiking, and fishing may decline due to the small number of individuals uncomfortable with aspects that surround hunting. This impact would be localized as the proposed managed hunts would be short in duration and cover small portions of the refuge.

7. Aesthetic Environment

The aesthetic environment would only be slightly impacted. Restoration efforts would not be altered. For non-consumptive users, deer hunting may take away from the peaceful experience they hoped to attain while visiting Boyer Chute. This impact would be localized as the proposed season would be short and cover small portions of the refuge.

8. Radiological Environment

Fort Calhoun does have a nuclear power plant. It is located approximately 5 miles to the north of the refuge. No radiological contamination is known to exist on refuge property.

9. Solid Waste

Litter and trash is not foreseen as a problem due to the controlled nature of the deer. Pollution from would be minimal due to the limited nature of the hunts.

D. Other Past, Present, Proposed, and Reasonably Foreseeable Hunts and Anticipated Impacts

Managed deer hunting and limited waterfowl hunting have taken place on the Refuge since 2003. No additional hunting is anticipated or being considered in the foreseeable future.

If visitation expands in the unforeseen future, unanticipated conflicts between user groups may occur. Service 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 between user groups.

E. Anticipated Impacts if Individual Hunts are Allowed to Accumulate

The proposed project, the Refuge managed deer hunt, will have little impact to the refuge. The effects from the proposed management action were described, in detail, in the previous sections of this chapter, "Cumulative Impacts Analysis." None of these effects are expected to be cumulative in nature if individual hunts are allowed to accumulate. The deer population will be minimally affected, for a short period of time. The Refuge would continue its annual deer population survey, and base its management hunts on the deer population trends and harvest data. National Wildlife Refuges, including Boyer Chute

NWR, conduct or will conduct hunting programs within the framework of State and Federal regulations. Regionally, the Boyer Chute NWR proposed action is more restrictive than the State of Nebraska. 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 more regional basis. The cumulative effects of all Refuge hunting programs (ie., waterfowl and whitetail deer) will be insignificant. Disturbance to other wildlife species, Refuge programs, Refuge facilities, cultural resources, and environment will be minimal, and no cumulative effects are anticipated.

Alternative C: General Deer Hunting

A. Anticipated Direct and Indirect Impacts of Proposed Action on Wildlife Species

1. Resident Wildlife

This alternative may greatly affect white-tailed deer populations. Monitoring the harvest would be difficult due to the large number of hunters. Some disturbance and noise are expected, as well as habitat trampling, which could adversely impact other non-game species. Possible effects could include: disruption of roosting/bedding and feeding activities, reduced use of preferred habitat, and disturbance of resting species. Fish populations would not be affected under this alternative. Prior to the implementation of the Refuge's deer hunting program in 2003, aerial deer surveys showed the following deer populations:

Table 1. Pre-Refuge deer hunting population surveys:

Year	# Deer	Refuge Acreage surveyed	Deer/ mi²
1997	50	1953	16
1999	95	1953	31
2001	136	1953	45
2002	100	1953	33

Table 2. Post-Refuge deer hunting population surveys:

Year	# Deer	Refuge Acreage surveyed	Deer/ mi²
2004	414	3013	88
2005	230	3013	49
2006	212	4040	34
2007	322	4040	51

The Refuge deer population has increased overall during the 1997-2007 monitoring time-frame, and without management deer hunts beginning in 2003, would have very likely exceeding the habitat carrying capacity. However, without the flexibility to manage the deer hunts, over-harvest of deer is a likely possibility. There is a very limited amount of public hunting ground near the Omaha metropolitan area, and Boyer Chute NWR is located less than ten miles away. Based on the high levels of hunting activity taking place on public areas within a much greater distance of Omaha, it is expected that extremely heavy deer hunting

pressure would take place at Boyer Chute. For these reasons Alternative C is not recommended.

2. Migratory Species

This alternative would have some limited direct and indirect impacts upon migratory wildlife species. Possible impacts could include disruption of feeding activities, reduced use of preferred habitat, and disturbance of resting species. Small indirect impacts may occur such as minor disturbance of neo-tropical migrant habitat, such as trampling of low ground vegetation. This impact is expected to be minimal, since the deer hunts will not occur during any nesting seasons. Any small impacts to vegetation are expected to recover with spring re-growth.

3. Endangered Species

Some slight disturbance to endangered species may occur. Bald eagles use the area on a very sporadic migratory or winter visitor basis. No nesting populations are present. The disturbance caused during management hunts is not expected to be significant due to the limited time scope and controlled nature of the hunts. A consultation pursuant to Section 7 of the Endangered Species Act has been completed.

B. Anticipated Direct and Indirect Impacts of Proposed Action on Refuge Programs, Facilities, and Cultural Resources

1. Other Refuge Wildlife Dependent Recreation

This alternative would create a great deal of hunter interest. There is a very limited amount of public hunting ground near the Omaha metropolitan area, and Boyer Chute NWR is located less than ten miles away. Based on the high levels of hunting activity taking place on public areas within a much greater distance of Omaha, it is expected that extremely heavy deer hunting pressure would take place at Boyer Chute. Under this alternative, other recreational uses of the refuge, such as hiking, fishing, cycling, wildlife observation, photography would be affected. It is anticipated that a decrease in these activities would occur during the hunting period.

2. Refuge Facilities

Refuge facilities such as trails, roads, and parking areas could potentially be adversely affected under this alternative. Refuge management roads used by deer hunters could become rutted during wet weather. Existing facilities would not accommodate the anticipated increase in the number of hunters.

3. Cultural Resources

Cultural resources are not going to be affected under this alternative.

C. Anticipated Impacts of Proposed General Public Deer Hunts on Refuge Environment and Community.

1. Hydrology and Soils

Effects on soil and water quality would not be significant. Some soil disturbance is expected but without any significant effects. Water quality would remain unaltered, in general.

2. Air Quality

This alternative would not affect the air quality of the area.

3. Water Quality

Water quality would not be affected under this alternative.

4. Noise

With the introduction of hunting, firearms will be discharged, causing noise pollution. A slight impact will exist, but with a rock quarry blasting with dynamite located less than two miles away from the Refuge, and very few nearby residences, this impact would be minimal.

5. Important Transportation Corridor

As previously stated, US highway 75 is the only important road surrounding Boyer Chute. Under this alternative traffic levels might increase during the proposed time frame; however these increases would not be detrimental to the road or nearby cities.

6. Socio-economics

The refuge might have to hire or bring in additional staff for a short period of time due to increased number of hunters in order to supervise proper hunting behavior. The state would acquire additional money from hunting licenses, tags, stamps, and taxes on hunting equipment and ammunition. The local economy may see a small boost in sales due to the purchase of equipment and amenities. This boost would have a positive effect on Fort Calhoun. Recreational uses such as biking, hiking, and fishing would decline due to individuals uncomfortable with aspects that surround hunting. This impact may potentially offset any economic gains seen

through the increase in hunter use of the Refuge.

7. Aesthetic Environment

Regarding this alternative, the aesthetic environment would only be slightly impacted. Restoration efforts would not be altered. For non-consumptive users, deer hunting may take away from the peaceful experience they hoped to attain while visiting Boyer Chute.

8. Radiological Environment

Fort Calhoun does have a nuclear power plant. It is located approximately 5 miles to the north of the refuge. No radiological contamination is known to exist on refuge property.

9. Solid Waste

Litter and trash, including shell casings, is expected to increase considerably with this alternative.

D. Other Past, Present, Proposed, and Reasonably Foreseeable Hunts and Anticipated Impacts

Managed deer hunting and limited waterfowl hunting have taken place on the Refuge since 2003. There has never been general deer hunting available to the public. No additional hunting is anticipated or being considered in the foreseeable future.

If visitation expands in the unforeseen future, conflicts between user groups may occur. Service 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 between user groups.

E. Anticipated Impacts if Individual Hunts are Allowed to Accumulate

The effects from the proposed management action were described, in detail, in the previous sections of this chapter, "Cumulative Impacts Analysis." The general public hunting alternative may be cumulative in nature, without the flexibility to manage the deer hunts. The over-harvest of deer over time is a possibility. While this alternative would not significantly affect deer numbers within the region, it could cause a reduction below the desired Refuge deer population.

5. Cumulative Impacts Geographic Matrix

A summary table providing the cumulative environmental consequences of the three alternatives is provided below. Clearly, the preferred alternative combines the best benefits with the least amount of adverse environmental effects.

Environmental Consequences	Alternative A (no action)	Alternative B* (preferred alternative)	Alternative C (general public deer hunting)
Ecology	-	+	0
Wildlife	0	+	0
Cultural Resources	0	0	0
Public Use	0	+	+
Refuge Facilities	0	0	0
Hydrology and Soils	0	0	0
Socio-Economics	0	0	0
Radiology	0	0	0
Air Quality	0	0	0
Water Quality	0	0	0
Noise	0	0	0
Transportation	0	0	0
Aesthetic	0	0	0
Solid Waste	0	0	-

- * Preferred Alternative
- 0 No significant change
- + Increase in benefits
- Decrease in benefits

6. Conclusion

Alternative B, to conduct Refuge-managed deer hunts, is the preferred alternative. The Refuge deer population has increased overall during the 1997-2007 monitoring time-frame, and without management deer hunts beginning in 2003, would have very likely exceeded the habitat carrying capacity. The preferred alternative would allow the refuge to continue to manage the white-tailed deer population. Refuge managed hunts would allow the most accurate management of the deer population, and allow the collection of harvest data.

7. Prepared By

Written by:

Matthew Freis, Biological Technician, Boyer Chute NWR

Date

Submitted by:

Larry Klimek, Project Leader, Boyer Chute NWR

Date

Concur:

Jon Kauffeld, Refuge Supervisor (Area 3)

Date

Nita M. Fuller
Regional Chief
National Wildlife Refuge System

Date

Approve:

Robyn Thorson
Regional Director

Date

Appendix A. Regulatory Compliance

Archeological Resources Protection Act of 1979 - In compliance. No evidence of cultural resources has been discovered at Boyer Chute.

Bald Eagle Protection Act - In compliance. While bald eagles are occasionally sited, no significant threat will be introduced by expanding hunting activities.

Clean Air Act - In compliance. Air quality will not be impacted.

Clean Water Act - In compliance. While some level of water degradation is expected, particularly from the infiltration of lead from ammunition into the watershed, this impact will be marginal. No significant impact to water quality will occur.

National Environmental Policy Act - NEPA established a national policy for the environment. This document is part of the USFWS compliance.

Endangered Species Act of 1973, as amended - A consultation pursuant to Section 7 of the Endangered Species Act has been completed.

National Historic Preservation Act - In compliance. Boyer Chute has been previously surveyed by the Corps of Engineers and no artifacts or evidence of cultural resources has been found.

The Native American Graves Protection and Repatriation Act of 1990 - In compliance. All Native American human remains and associated burial items located on, or removed from, Boyer Chute will be protected.

The Federal Farmland Protection Policy Act of 1981, as amended. - In compliance. This proposal will not contribute to the conversion of existing farmland into non-agricultural uses.

The Refuge Revenue Sharing Act of 1935, as amended. - This Act established procedures for making payments to counties in which national wildlife refuges are located. Such payments come from revenues derived from the sale of products and privileges from national wildlife refuges, supplemented by Congress appropriations. The revenues are deposited in a special Treasury account, and net receipts there from are distributed to counties to help offset their loss of tax revenue that occurs when land for national wildlife refuges is acquired by the Federal Government and removed from tax rolls. The basic formula in use in Nebraska and Iowa is $\frac{3}{4}$ of 1 percent of the appraised value of the land multiplied by the percent entitlement annually appropriated by Congress.

Noise Control Act - In compliance. The proposed action would contribute to slightly increased noise levels due to the discharging of firearms during the controlled hunts. However, the noise contributed is not expected to be significant, especially compared to the high level of noise contributed by the rock quarry located nearby. Furthermore, the

noise from firearms would be present only during the scheduled hunt during regular hunting seasons.

North American Wetlands Conservation Act, 16 U.S.C. Sec. 4401 et seq. - In compliance. Any of the selected alternatives under this proposal would not significantly impact any wetland conservation efforts in place or wetlands-based migratory birds.

Appendix B. Literature cited

Boyer Chute. (2003). US Fish and Wildlife Service.

<<http://midwest.fws.gov/desoto/boyerbro.html>>(2003, November 28).

Effects of Management Practices on Grassland Birds. (2003). Northern Prairie Wildlife Center-USGS.<<http://www.npwrc.usgs.gov>>(2003, November 2).

Fort Atkinson. (2003). <http://www.fortatkinsononline.org/FortAtkinsonahistory.htm>> (2003, November 4).

James C. Pack, Gary W. Norman, Curtis I. Taylor, David E. Steffen, David A. Swanson, Kenneth H. Pollock, Russell Alpizar-Jara Journal of Wildlife Management 63(3):964-975

Sampson, F.B., & Knopf, F.L. (1994). Prairie Conservation in North America. *Bioscience* 44: 418-420

US Fish and Wildlife Service Nebraska Acquisition/Planning Office. (1997).

Environmental Assessment Boyer Chute National Wildlife Refuge Expansion.

West Virginia Cooperative Extension Bulletin No. 806. (1999). Fundamentals of Deer Harvest Management.

Appendix C Public Comment on Draft Environmental Assessment and Responses

We received two comments on our draft EA titled Deer Hunting at Boyer Chute National Wildlife Refuge, that was available for public comment from March 17th to April 17th.

One comment was in support of the Service's preferred Alternative in the draft EA. One comment was in opposition to the preferred Alternative.

We received a letter from the Safari Club International that contained comments relative to this EA. Their comments provided additional information to be included in the cumulative analysis. While the Service is in agreement with their comments on the cumulative benefits of hunting, the Service feels that those cumulative impacts are addressed adequately in this document.

We received a letter from the Humane Society of the United States 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 Service. These comments were not specific to this draft EA and are noted but not responded to here.