

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
FINAL ENVIRONMENTAL ASSESSMENT

for

**The 2014 Hunt Plan for Crane Meadows
National Wildlife Refuge**

**Regional Director
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Abstract:

The United States Fish and Wildlife Service (Service) proposes to provide compatible hunting opportunities for migratory game birds, upland game, and big game species on units of Crane Meadows National Wildlife Refuge (Refuge) within Morrison County in Central Minnesota. This environmental assessment evaluates three possible alternatives for the hunting opportunities. The proposed action alternative will establish compatible hunting opportunities while providing non-hunting visitors with other priority public use opportunities (i.e. wildlife observation, wildlife photography, environmental education and interpretation) on lands described in the 2014 Hunt Plan. The approved acquisition boundary includes conservation easements, which will stay in private ownership and be managed by the U.S. Fish and Wildlife Service, and lands purchased in fee title. The proposed hunting opportunities will involve both conservation easements and fee title land. The general broad objectives of the hunting program are to:

- Provide the public with safe and enjoyable hunts that are compatible with the Refuge purpose.
- Provide quality hunting opportunities that minimize conflict with other public use activities.
- Provide the public with opportunities to hunt migratory game birds, upland game, and big game species consistent with the state of Minnesota, that do not adversely affect localized wildlife populations and are consistent with the 1997 National Wildlife Refuge Improvement Act.
- Promote a better understanding and appreciation of Refuge habitats and their associated fish and wildlife resources.

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Crane Meadows

National Wildlife Refuge

Environmental Assessment

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Chapter 1: Purpose and Need

1.1 Background

This Environmental Assessment (EA) was prepared using guidelines established under the National Environmental Policy Act (NEPA) of 1969. NEPA requires examination of the effects of proposed actions on the natural and human environment. This EA covers the hunting chapter, which is preceding the overall Visitor Services Plan for the Refuge. In the following sections, three alternatives are described for the future hunting opportunities on Crane Meadows National Wildlife Refuge (NWR), the environmental consequences of each alternative, and the preferred management direction based on the environmental consequences and the ability to achieve the purpose of the Refuge.

Crane Meadows NWR was created under the authority of the Emergency Wetlands Resources Act of 1986 (EWRA). The Act was enacted by Congress to promote the conservation of our Nation's wetlands by intensifying cooperative efforts among Federal agencies, states, local governments, and private interests for the conservation, management, and acquisition of wetlands. The Act requires the Secretary of the Interior to establish a National Wetlands Priority Conservation Plan to assist decision makers in identifying and selecting important wetlands for preservation through Federal and state acquisition.

The Refuge was established in 1992 to conserve and protect the diminishing number of high quality wetlands that remain on the American landscape. It is the location of one of the largest, most intact, sedge meadow wetland complexes in the state; it also protects and maintains important wildlife, recreation, and archaeological resources.

The Comprehensive Conservation Plan (CCP) for Crane Meadows NWR was completed in 2010 and included an EA. The EA and CCP addressed future management of the Refuge, including visitor services. Of the six, priority public uses (hunting, fishing, wildlife observation, photography, environmental education and interpretation) identified in the 1997 National Wildlife Refuge Improvement Act, currently hunting and fishing do not occur on the Refuge.

The wetland complex within Crane Meadows has been important to wildlife and people for thousands of years. The Refuge is located in central Minnesota and falls within a transitional zone between tallgrass prairie and deciduous forest (Figure 1). The location of Sherburne NWR



Figure 1: Location of Crane Meadows NWR

has also been denoted in Figure 1 since the two Refuges are complexed with one another for joint management. Currently there are approximately 2,100 acres of land acquired within 13,540-acre acquisition area. Of the remaining acres in the acquisition boundary, approximately 900 are owned and managed by the state of Minnesota and the remaining land is privately owned. The lands within the Refuge are a mosaic of open water, wetlands, floodplain forest, wet prairie, dry prairie, savanna, upland coniferous forest, and deciduous forest. The diversity of habitats is matched by a diversity of wildlife.

1.2 Purpose

The purpose of this Environmental Assessment is to evaluate different alternatives for implementing a Hunt Plan on Crane Meadows NWR. These alternatives include current management where only special hunts are allowed, as well as a few other alternatives exploring new hunting opportunities.

1.3 Need for Action

The 1997 National Wildlife Refuge System Improvement Act mandated six priority public uses be provided when feasible and compatible with the purpose of the Refuge. These priority uses include hunting, fishing, wildlife photography, wildlife observation, environmental education and interpretation. The need for action therefore revolves around hunting as a priority use and the requirement to allow hunting that is compatible with the purpose of the Refuge. There is also a need to reserve a portion of the Refuge for non-hunting visitors.

The 2010 CCP for Crane Meadows NWR involved an EA which addressed several hunting alternatives. The Preferred Alternative states the Refuge should work with partners to open managed white-tailed deer and wild turkey hunts on specified Refuge units for hunters with disabilities and youth hunters. Required by NEPA, this EA addresses cumulative impacts in detail.

Three goals were identified for Crane Meadows NWR:

Goal 1: Habitat

Conserve a diverse mosaic of habitats both on- and off-Refuge, particularly sedge meadow, shallow lake, oak savanna, prairie, and other declining endemic habitat types, in order to meet the needs of native plants and wildlife with an emphasis on Service Regional Conservation Priority Species. Crane Meadows NWR will remain engaged in efforts to protect and enhance water quality and natural hydrology in the watershed.

Goal 2: Wildlife

Protect, restore, and maintain native wildlife species to ensure biological diversity and abundance, with special emphasis on Service Regional Conservation Priority Species.

Goal 3: People

As an active partner in collaborative conservation, the Refuge will provide quality wildlife-dependent recreation, environmental education, and outreach to a diverse audience. These activities will preserve cultural resources and promote understanding, appreciation, and support for Crane Meadows NWR, the National Wildlife Refuge System, and natural resource conservation.

Experiences gained during the past three hunting seasons will be added throughout this document were applicable, to support maintaining and expanding this popular outdoor recreational activity.

1.4 Decision Framework

This EA evaluates the environmental consequences of opening newly acquired fee title and easement lands described in the 2014 Hunt Plan to hunting and the types of hunting that will be allowed. Three alternatives are presented in this document:

- A. Alternative 1: Continuation of the Current Hunting Program (No Action)
The no action alternative would continue the hunting program as is, which includes portions of Crane Meadows NWR for special deer firearms and archery hunts for youth and persons with disabilities. In addition, open a portion of Crane Meadows NWR to special spring wild turkey hunts for youth and persons with disabilities.
- B. Alternative 2: Discontinue Hunting on the Refuge
This alternative would not comply with the National Wildlife Refuge System Improvement Act of 1997 by failing to provide opportunities for the six priority wildlife-dependent recreational uses on National Wildlife Refuges (hunting, fishing, wildlife observation and photography, environmental education, and interpretation).
- C. Alternative 3: Expand Hunting Opportunities within Limitations to Refuge Specific Regulations (Proposed Action Alternative)
This alternative is the Service's preferred alternative and would enable Crane Meadows NWR to manage Refuge wildlife resources and public uses in accordance with establishing authorities. This alternative would comply with the National Wildlife Refuge System Improvement Act of 1997 by providing visitors with priority public use opportunities defined for National Wildlife Refuges. This alternative would permit the Refuge to expand hunting opportunities to those game species that can be determined to have huntable populations on the Refuge as determined by population surveys conducted by Refuge staff. This alternative will provide Refuge management the ability to ensure that a quality hunt experience is enjoyed by hunters and that hunting is carried out in a manner that is compatible with other Refuge public uses.

The Regional Director, U. S. Fish and Wildlife Service, Bloomington, Minnesota, is the official responsible for determining the action to be taken in the proposal by choosing an alternative. The Regional Director will also determine whether this Environmental Assessment (EA) is adequate to support a Finding of No Significant Impact (FONSI) decision, or whether there is a significant impact on the quality of the human environment, thus requiring the preparation of an Environmental Impact Statement (EIS).

Hunting activities will be permitted, but administratively limited to those areas specified in the refuge-specific regulations. All or parts of the refuge may be closed to hunting at any time if necessary for public safety, to provide wildlife sanctuary, or for other reasons.

1.5 Authority, Legal Compliance, and Compatibility

The National Wildlife Refuge System includes federal lands managed primarily to provide habitat for a diversity of fish, wildlife and plant species. National Wildlife Refuges are established under many different authorities and funding sources for a variety of purposes. The purpose for the establishment of Crane Meadows NWR was to protect a large wetland complex as outlined in Section 1.1.

In the past, the ability to open a refuge to hunting was covered under the National Wildlife Refuge Administration Act, 16 U.S.C 688dd (a) (2). This Act was amended in 1997 by the National Wildlife Refuge Improvement Act of 1997 (Public Law 105-57). These Acts support hunting opportunities on Crane Meadows NWR as proposed in this document as follows:

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

“... compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System, directly related to the mission of the System and the purposes of many refuges...”
Public Law 105-57, 111 STAT. 1254, Sec.5. (B) (National Wildlife Refuge Improvement Act of 1997).

The U. S. Fish and Wildlife Service developed a strategic plan for implementing the 1997 National Wildlife Refuge System Improvement Act called “Fulfilling the Promise” (USFWS, 1999). This plan clarifies the vision for the National Wildlife Refuge System and outlines strategies for improving delivery of the System’s mission. The proposed hunting plan is compatible with the priorities and strategies outlined in “Fulfilling the Promise.”

Additional authority delegated by Congress, federal regulations, executive orders, and several management plans, such as the 2010 Comprehensive Conservation Plan (CCP), guide the operation of the Refuge. The appendices of the CCP contain a list of the key laws, orders, and regulations that provide a framework for the proposed action.

1.6 Scoping of the Issues

The scoping for the hunting program began during the Comprehensive Conservation Plan development process for Crane Meadows NWR in December 2008 with a kickoff meeting between Refuge staff, USFWS Region 3 planning staff, and a consultant assisting with preparation of the CCP. The group reviewed existing baseline data, discussed the vision statement and goals of Crane Meadows and relevant planning documents. In addition, the group also identified a preliminary list of stakeholders, issues, concerns, challenges, opportunities, new directions, and potential sources of conflict to be addressed in the CCP. During the last week of March 2009, the Refuge hosted a planning workshop where participants helped review, evaluate, and plan the biological and visitor services programs at the Refuge. Development of a hunting program was one of the opportunities discussed during these meetings as a potential public use opportunity and what hunting seasons were desired. The hunting plan currently in order will again go out for public comment when completed.

1.6.1 Issues and Concerns

A variety of issues, concerns, and opportunities were addressed during the CCP process. Several recurring themes, including those related to hunting, emerged from discussions among citizens, open house attendees, focus group participants, resources specialists, and Refuge planning staff. Hunting was originally discussed during the public meetings that led to the establishment of Crane Meadows NWR in 1992, and has remained a public expectation ever since. Because such promises have not been fulfilled, it was one of the greatest concerns among the local community that were discussed during the planning process. A complete list of issues may be found in Chapter 2 of the 2010 CCP.

Chapter 2: Description of Hunting Alternatives

2.1 Formulation of Hunting Alternatives

Three management alternatives dealing with hunting were created during the development of the CCP for Crane Meadows NWR. The alternatives were based on issues, concerns and opportunities raised at the CCP scoping processes. The issues came from a variety of sources: the general public, local citizens and officials, cooperating agencies, colleges, conservation organizations, as well as Refuge staff.

Factors considered in the development of alternatives were:

1. Compatibility with the purpose of the Refuge and the mission of the National Wildlife Refuge System.
2. Natural resources of the Refuge
3. Demands, expectations and conflicts of public use, along with concerns for safety.

4. Issues identified in the CCP and the CCP EA.
5. Comments and requests from partners
6. Hunting opportunities on adjoining State Wildlife Management Areas
7. Requirements and guidance provided in establishment legislation.

SECTION 2.1A Alternatives Eliminated From Detailed Study

No alternative was eliminated from detailed study.

SECTION 2.1B Alternatives Carried Forward for Detailed Analysis

This Environmental Assessment is prepared to evaluate the environmental consequences of opening fee title lands within the Refuge to hunting. Three alternatives are presented in this document:

2.1B.1 Alternative 1: Continuation of the Current Hunting Program (No Action)

The no action alternative would continue the hunting program as is, which includes portions of Crane Meadows NWR for special deer firearms and archery hunts for youth and persons with disabilities. In addition, open a portion of Crane Meadows NWR to special spring wild turkey hunts for youth and persons with disabilities.

Crane Meadows NWR is open to a special deer firearms and archery hunt for youth and persons with disabilities. Crane Meadows NWR is also open to special spring wild turkey hunt for youth and persons with disabilities.

Hunting activities will be permitted, but administratively limited to those areas specified in the refuge-specific regulations. All or parts of the refuge may be closed to hunting at any time if necessary for public safety, to provide wildlife sanctuary, or for other reasons.

2.1B.2 Alternative 2: Discontinue Hunting on the Refuge

This alternative would not comply with the National Wildlife Refuge System Improvement Act of 1997 by failing to provide opportunities for the six priority wildlife-dependent recreational uses on National Wildlife Refuges (hunting, fishing, wildlife observation and photography, environmental education, and interpretation).

Under Alternative 2, Crane Meadows NWR will be closed to hunting because Service land ownership inside the Refuge acquisition boundary is relatively small, scattered, and interspersed with privately owned land.

2.1B.3 Alternative 3: Expand Hunting Opportunities within Limitations to Refuge Specific Regulations (Proposed Action Alternative)

This alternative is the Service's preferred alternative and would enable Crane Meadows NWR to manage Refuge wildlife resources and public uses in accordance with

establishing authorities. This alternative would comply with the National Wildlife Refuge System Improvement Act of 1997, by providing visitors with priority public use opportunities defined for National Wildlife Refuges. This alternative would permit the Refuge to expand hunting opportunities to those game species that can be determined to have huntable populations on the Refuge as determined by population surveys conducted by Refuge staff. This alternative will provide Refuge management the ability to ensure that a quality hunt experience is enjoyed by hunters and that hunting is carried out in a manner that is compatible with other Refuge public uses.

This alternative would allow hunting on recently acquired tracts described in the 2014 Hunt Plan within the Refuge in accordance with federal regulations, Refuge specific regulations, and the seasons and regulations set by the State of Minnesota, after the following determinations are made for each unit:

- 1) The unit is large enough to support the anticipated quantity, frequency, and duration of hunting use;
- 2) Public access to the unit does not require travel across private lands or closed government lands
- 3) Sites are available for hunting users to park their vehicles legally and in a manner that will not adversely affect the habitat in the unit or existing public travel routes
- 4) Public hunting will not have adverse effects on any federally listed or proposed species of concern
- 5) Hunting can be conducted without jeopardizing public safety

Under Alternative 3, the Refuge Manager may establish specific regulations for an individual unit to ensure the above requirements are met. Certain units or portions of units may remain closed or be periodically closed to hunting if the Refuge Manager determines that there are specific habitat, wildlife protection, and/or public safety needs that require establishing sanctuary areas. Hunting would be conducted in accordance with all applicable state, Refuge, and federal regulations. Coordination with Minnesota DNR biologists will promote continuity and understanding of Service and State resource goals and objectives, and will help ensure that the decision-making process takes into account all interests.

Crane Meadows NWR

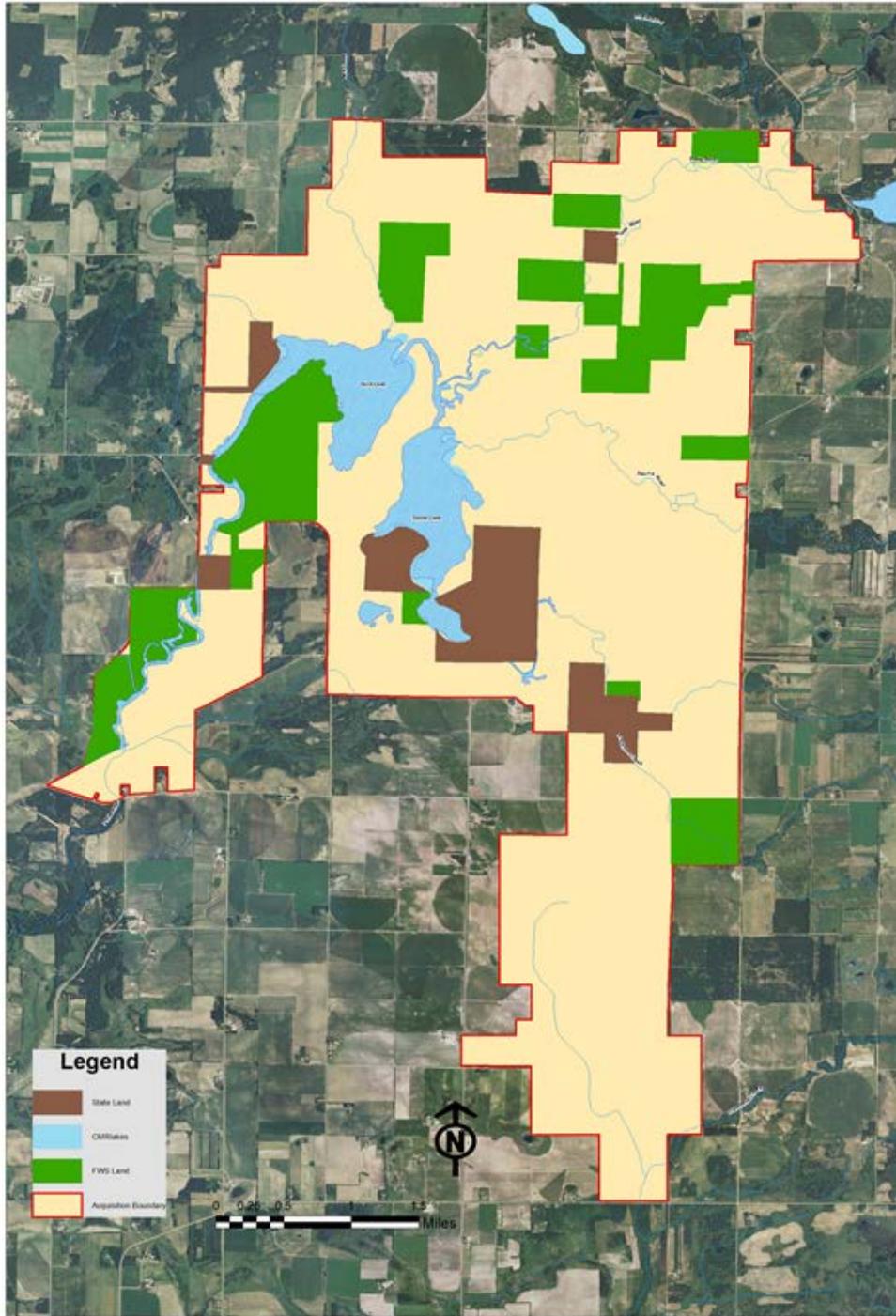


Figure 2: Refuge Unit Names and Locations, Crane Meadows NWR

Table 1: Actions involved with alternatives developed in the CMR 2014 Hunt Plan

Action	Alternative 1 (No Action) Multiple special hunts/year offered on the Refuge	Alternative 2 All lands closed to hunting	Alternative 3 All lands will be opened unless otherwise specified
Species hunted	White-tailed deer (archery and firearms) and Turkey	None	All species in regulation with MN state DNR
Compatible with Refuge Goals and Purpose?	Yes	Yes	Yes
A Priority Public Use?	Yes	No	Yes
Audience	Youth and disabled	None	All
Hunting and Non- hunting Uses Separated?	Yes, Headquarters Tract will need to be closed to other public uses during hunt	N/A	Yes, Headquarters Tract will need to be closed to other public uses during hunt
Meets Needs of Public and Partners?	Yes, but limited	No	Yes

Chapter 3: Affected Environment

3.1 Introduction

Located in central Minnesota, Crane Meadows NWR falls in a transition zone between the northern forests and the mid-continental prairies and is situated on the Anoka Sand Plain only 5 miles from the Mississippi River. The critical and diverse wetland habitats characteristic of the Upper-Midwest provide important habitat for local and migratory wildlife, maintain essential ecological services, provide an element of water control and flood relief, and offer unique recreational, educational, and research opportunities.

Presently, the Service has acquired just over 2,100 acres of the approved 13,540-acre acquisition area. Approximately 900 acres are owned and managed by the State, while the remaining land is privately owned (see Figure 2). The resulting landscape is a mosaic of land ownership and land-use types surrounded predominantly by agriculture.

The approximately 2,100 acres at Crane Meadows NWR is comprised of the following habitats:

- 21 acres of open-water wetland

- 971 acres of wetland
- 289 acres of woodland
- 5 acres of savanna
- 52 acres of lowland forest
- 390 acres of grassland/prairie

The Refuge is home to many native species and serves as a nesting ground and stopover location for several notable migratory bird species including the Greater Sandhill Crane. The Refuge also contains relatively rare habitat types including oak savanna, sand prairie, and sedge meadows.

In 1990, a Regional Wetlands Concept Plan was created by the Service for the Midwest Region (Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin) in response to the Emergency Wetlands Resources Act of 1986. Of the 6 sites identified for potential acquisition in Minnesota, the wetland system at Crane Meadows NWR was among the largest and most intact. The report indicated that this area is: “One of the last undisturbed wetland complexes in Central Minnesota. (An) important area for waterfowl, Sandhill Cranes, diverse vegetation communities, and nongame species (FWS, 1990, p. 36).” The report identified an area of 35,000 acres with conservation potential. Subsequently, an environmental assessment was conducted in June of 1992 that authorized the acquisition of 13,540 acres for a new refuge, Crane Meadows National Wildlife Refuge.

3.2 Climate, Geography, and Hydrology

The climate of east-central Minnesota is classified as ‘sub-humid continental’ and is characterized by significant variations in seasonal temperatures. This region has four distinct seasons with moderate spring and fall temperatures, short, warm summers, and cold, dry winters. The town of Little Falls, Minnesota, near Crane Meadows NWR, has an annual average temperature of 43.4 degrees Fahrenheit.

For all of Morrison County the average temperature during the winter months is approximately 12 degrees Fahrenheit with an average daily minimum of 1 degree. The lowest recorded temperature was minus 41 degrees Fahrenheit on January 9, 1977. Summer temperatures average 68 degrees Fahrenheit with a maximum daily average of 81 degrees. The highest recorded temperature in Little Falls was 101 degrees Fahrenheit on August 18, 1976. There is an average of approximately 136 frost-free days throughout the year, which constitutes the growing season. Frost often persists until mid-May and returns the end of September. The latest occurring frost in the spring is June 9, and the earliest in fall is September 3.

Annual precipitation in Morrison County is well distributed throughout the growing season. Approximately 17.1 inches, or 65 percent of the total annual precipitation, occurs from May through September. The annual average precipitation in Little Falls is 26.3 inches. The heaviest daily rainfall recorded in the county was 4.70 inches in Little Falls on August 1, 1953. Snowfall

persists from October through April and occasionally falls in May. The average annual snowfall in Little Falls is 50.4 inches, and snow usually persists on the ground all winter.

Crane Meadows NWR falls within the Platte-Spunk Watershed (MN HUC 7010201) of the Upper Mississippi River Basin. The Upper Mississippi River Basin begins at the headwaters of the Mississippi River, extends southward throughout central Minnesota, and ends near the city of St. Paul, Minnesota. The Platte-Spunk River sub-watershed begins in southern Crow Wing County, runs diagonally northeast to southwest through Morrison County, includes the northwest section of Benton County, and ends in northeast Stearns County. There are approximately 56,000 people and 1,919 farms within the 652,667-acre watershed.

The wetland complex that comprises the majority of the Refuge includes two large shallow lakes, Rice Lake (320 acres) and Skunk Lake (314 acres), and one smaller open water basin, Mud Lake (56 acres). The Rice-Skunk Lakes wetland complex is also the confluence of four major waterways: Rice Creek and the Platte River, which flow into Rice Lake from the north, and Skunk and Buckman Creeks, which enter Skunk Lake from the east and southeast and pass through to Rice Lake. The headwaters of these four creeks ultimately pass through the Refuge as well, and include Wolf, Little Mink, and Big Mink Creeks above the Platte River, Hillman Creek above Skunk Creek, and Kuntz and Mischke Creeks above Buckman Creek. In addition to waters that drain through the wetland complex, the southern spur of the Refuge contains the upper reaches of a cold water stream, Little Rock Creek. There are approximately 32 linear miles of stream and river channels within the acquisition boundary that migrate and meander slowly through the wetland complex. In total, the drainage from more than 272,000 acres of upstream land passes through the Refuge. The majority, (256,254 acres or approximately 400 miles) passes directly through the Rice-Skunk Wetland Complex (353:1 watershed to basin ratio) before eventually making its way to the Mississippi River near Rice, Minnesota 8 miles down the Platte River (DNR 2006a). The remaining effective watershed area drains through the Little Rock Creek System and finally drains into the Mississippi River just north of the city of Sartell.

3.3 Natural Resources

3.3.1 Habitats

The Refuge lies within the Anoka Sand Plain Subsection of the Eastern Broadleaf Forest Province of Minnesota. The narrow band of this Province transverses diagonally (from northwest to southwest) across the state, forming a transition zone between tallgrass prairie to the southwest and deciduous forests to the northeast, leading to a distinctive set of vegetative communities. The following habitat types are included:

Wetlands and Open Water – The wetland types in this category include: open water, river/stream, emergent marsh, sedge meadow, and willow-dogwood shrub swamp. The majority of this category is made up of sedge meadows, followed closely by shrub swamp. Open water is characterized by that portion of lake or wetland with a water depth of >1m and without emergent vegetation (Cowardin et al. 1979). River/stream is

a lotic or running water environment (Goldman and Horne 1983). Emergent marsh is defined as a shallow water wetland with water depths between 20 – 60 inches. These areas are dominated by cattails, bulrushes, submergent and floating aquatic plants (i.e. coontail, milfoil, pondweeds, waterlilies, etc.), floating mats; areas along shorelines of lakes, ponds, rivers, or shallow basins. Sedge meadow is characterized as open, wet meadow dominated by sedges, with broad-leaved graminoids and < 25 percent shrub cover. Finally, the willow-dogwood shrub swamp wetland is dominated by broad-leaved graminoids with >25 percent shrub cover. Shrubs include willows, red-osier dogwood, speckled alder, and bog birch.

Woodlands – There are three woodland types in this category; oak, oak-aspen, and jack pine. The majority of this habitat type (202 acres) is comprised of oak woodland. Oak woodland is defined as dry-mesic hardwood forests; typically deciduous-dominated, but at times mixed deciduous-coniferous. Tree species include bur, pin, northern red, and white oaks, as well as basswood and American elm. Oak-aspen woodlands are commonly dominated by northern pin oak, with quaking aspen, paper birch, big-toothed aspen, bur oak, northern red oak, and red pine. Jack pine woodland is a dry-mesic pine or hardwood forest dominated by evergreens (primarily jack pine). Other species may include red pine, quaking aspen, bur oak, and northern red oak.

Lowland Forest – The northern floodplain forest is a lowland deciduous riparian forest on the sandy alluvial soils along water courses. Trees in this habitat type are comprised of silver maple, ash, American elm, box elder, and basswood.

Oak Savanna – Today, oak savanna is among the world’s most threatened plant communities. Small patches totaling approximately 185 acres of a native oak savanna subtype, identified as southern dry savanna, have been retained in the Refuge acquisition area from pre-settlement times. This oak savanna subtype is characterized by a relatively open community of scattered or clumped, (25-50 percent canopy cover; 5-50 square-feet per acre basal area), short (15-45 feet), open grown bur oak trees that are usually interspersed with northern pin oak and may have black oak and jack pine components, as well as a nearly continuous cover of both prairie and forest forbs and graminoids (Wovcha et al. 1995).

Grasslands/Prairie – This category includes southern dry, southern mesic, and wet prairie habitats. The southern dry prairie is dominated by short grasses and herbaceous vegetation. The southern mesic prairie consists primarily of native warm season grasses and tallgrass prairie species that were planted during restoration efforts. The wet prairie is characterized by both warm and cool season grasses, sedges, and forbs. These grasslands support a variety of grassland-dependent wildlife species. Prairie habitats throughout North America have also declined significantly due to fire suppression and conversion to agricultural lands.

3.3.2 Wildlife

The various habitat types of the Refuge support a diverse assemblage of wildlife species native to central Minnesota described briefly as follows. For a complete list of wildlife species found on Crane Meadows refer to Appendix C in the Refuge CCP.

Birds – The Refuge supports populations of many bird species and attracts more than 200 species with its diverse habitats. The Refuge is important to migratory birds, in particular migratory waterfowl. Over 100 bird species have been recorded to nest in the area. The abundance of wetland habitat attracts a variety of wetland-dependent species to the area including the Greater Sandhill Crane, a bird that was almost completely extirpated from Minnesota by the beginning of the 20th century. Historical records show that cranes used Rice and Skunk Lakes in pre-settlement times. The first recorded sighting after extirpation was in 1958. Sandhill Cranes have been recorded every year since, and the area has emerged as one of the most important nesting areas for cranes in central Minnesota, with a current estimate of 40 breeding pairs in the area. The Refuge also serves as a staging ground for thousands of cranes during fall migration

Mammals – The Refuge lies within the known breeding range of 54 mammal species. Of these, 35 species have been confirmed on Refuge lands. Bison and elk were historically present on the landscape, but were extirpated in the early 1900s. The largest mammal that inhabits and breeds on the Refuge is the white-tailed deer. Other large mammals common to the Refuge include coyote, red fox, and on occasion black bear. Gray wolves will occasionally pass through the area, but have not established packs on the Refuge. Other predators on the Refuge include mink, river otter, short-tailed weasel, and badger. Observations of two State -species of concern on the Refuge include plains pocket mouse and the prairie vole. Little brown bats and red bats have also been identified on the Refuge. Muskrat, beaver, raccoon, and mink are common in wetland habitats, while uplands harbor a variety of mice, voles, shrews, and ground and tree squirrel species.

Amphibians and Reptiles – Ten species of amphibians and 11 species of reptiles have been documented on the Refuge. Many of these species are dependent on Refuge wetlands, such as painted turtles, snapping turtles, and tiger salamanders while others, including eastern garter snake, brown snake, eastern and western hognose snake, and gopher (bull) snake, are associated with the upland habitats. The state-listed threatened Blanding's turtle is dependent on both upland and wetland habitats on the Refuge. The eastern gray tree frog, Cope's gray tree frog, wood frog, and western chorus frogs are commonly heard on the Refuge and inhabit wooded areas adjacent to sedge meadows, emergent marshes, and potholes.

Fish – Forty fish species have been identified in lakes and rivers on the Refuge. Some of the game fish species include northern pike, walleye, smallmouth and largemouth bass, bluegill, and black crappie. A large population of carp and other roughfish also inhabit the open waters. Species that are indicators of ecosystem health within Refuge waters include redhorse suckers and shiners. Many fish in these areas experience winterkill caused by depletion of oxygen during the winter months. Much of the watershed is restocked naturally from the Mississippi River by way of the Platte River down-stream from the Refuge.

3.3.3 Threatened and Endangered Species

Bald Eagles were federally-listed as endangered and later as threatened, but were delisted on August 9, 2007 and moved to a protected status under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. This species is commonly observed on the Refuge, primarily from spring through fall, however, they have been observed in the area year round. There are currently five nesting pairs of bald eagles within the Refuge acquisition boundary.

Gray wolves, which were a federally-listed endangered species, are now currently listed as a species of special concern in the state of Minnesota. Wolves do not have any established packs on the Refuge, but intermittently pass through the area.

In 2001, a program was initiated to reintroduce an experimental non-essential population of federally listed endangered Whooping Cranes. The intent was to establish an eastern migratory flock that would summer and breed in central Wisconsin and winter in west-central Florida. On rare occasions, individuals from this experimental population have been observed in the area near Crane Meadows NWR. The mosaic of vegetation communities, mainly the wetland complex at Crane Meadows NWR, can provide essential habitat for this species if the population continues to grow and disperse.

3.4 Cultural Resources

To date, only three prehistoric archaeological sites have been positively identified within the Refuge acquisition boundary. All three are habitation and mound sites containing between two and ten circular burial mounds each. The largest of the mounds is reported to be between 15 and 25 feet high – likely the largest mound in Morrison County. Archaeological research conducted in the habitation areas has revealed that these locations were occupied for at least the last 3,000 years. Two of the mound sites were determined to be so significant and unique, that they were designated the *Rice Lake Prehistoric District* and listed on the National Register of Historic Places (NRHP) on October 2, 1973.

3.5 Fire Management

3.5.1 Prescribed Fire

Prescribed fire is used on the Refuge as a habitat management tool. Nearly all of the Refuge habitats are fire-dependent communities. The frequency and magnitude of burns has a profound impact on their vitality and health, successional state, and the transition from one habitat type to another. Prescribed fire is also a tool used to reduce hazardous fuel loads. Trained and qualified personnel perform all prescribed burns under precise plans. The Refuge has an approved Fire Management Plan that describes in detail how prescribed burning will be conducted. A burn is conducted only if it meets specified criteria for air temperature, fuel moisture, wind direction and velocity, soil moisture, relative humidity, and several other environmental factors. The specified criteria (prescription) minimize the chance that the fire will escape and increase the likelihood that the fire will have the desired effect on plant communities.

How often established units are burned depends on management objectives, historic fire frequency, and funding. The interval between burns may be 2 to 5 years or longer. As part of the prescribed fire program, the Refuge established a monitoring program to verify that objectives are being achieved. Most prescribed burn activities are conducted in the spring so there will be no impact on deer hunting activities that occur in the fall. If a fall burn was considered in the future, safety of deer hunters and other visitors would be priority. An area scheduled for a spring burn will restrict turkey hunting activities and the appropriate precautions will be taken to avoid potential conflicts.

Spot fires and escapes may occur on any prescribed fire. The spot fires and escapes may result from factors that cannot be anticipated during planning. A few small spot fires and escapes on a prescribed burn can usually be controlled by the burn crew. If so, they do not constitute a wildland fire. The burn boss is responsible for evaluating the frequency and severity of spot fires and escapes and, if necessary, slowing down or stopping the burn operation, getting additional help from the Refuge staff, or extinguishing the prescribed burn. If the existing crew cannot control an escaped fire and it is necessary to get help from the Minnesota DNR or other local fire units, the escape will be classified as a wildland fire and controlled accordingly. Once controlled, we will stop the prescribed burning for the burning period.

3.5.2 Fire Prevention and Detection

In any fire management activity, human safety will always take precedence over property and resource protection. Historically, fire influenced the vegetation in and around the Refuge. After Euro-American settlement, however, wildfires were traditionally suppressed and now large scale burning without a prescription is likely to cause unwanted damage. In order to minimize that damage, we will seek to prevent and quickly detect fires.

3.5.3 Fire Suppression

We are required by Service Policy to use the Incident Command System (ICS) and firefighters must meet National Wildfire Coordinating Group (NWCG) qualifications for fires occurring on Refuge property. Our suppression efforts will be directed toward safeguarding life while protecting Refuge resources and property from harm. Mutual aid resources responding from

Cooperating Agencies will not be required to meet NWCG standards, but must meet the standards of their agency.

During periods of high fire danger or when the National Preparedness level is V, prescribed fires will not be started without the approval of the Regional Fire Management Coordinator. The Refuge staff has cooperatively worked with the Minnesota Department of Natural Resources, local fire departments and agencies on wildlife suppression especially during these periods of high fire danger. Hunters and their aids will be made aware of high fire precautions. For safety purposes, either hunters or their aids will be required to carry a cell phone. Numbers will be exchanged so there may be two-way communications. Should an emergency arise, we will be able to contact those individuals about any danger. Hunting activities are typically done during early morning or evening when the threat of fire danger is usually lower.

3.6 Economic Resources

National Wildlife Refuges provide a number of benefits and services to individuals and society as a whole. Some can be tracked fiscally such as expenditures in local communities, payroll, and operations costs, while benefits such as recreation opportunities, species protection, ecosystem services, and environmental education do not come as directly connected with economic values.

According to an assessment of the economic benefits of visitation to National Wildlife Refuges, in 2004 Crane Meadows NWR had 4,998 (4,498 residents, 500 non-residents) visits for non-consumptive recreational activities; primarily the use of nature trails, observation platforms, wildlife observation in general, and other similar recreation activities. It is estimated that individuals associated with these visits brought approximately \$15,600 (\$9,300 residents, \$6,300 non-residents) in recreation-related expenditures (i.e. food, lodging, transportation, and other expenses) that year to local communities, and that a total benefit of \$21,200 and two jobs in final demand were added to the regional economy because of the Refuge (Caudill and Henderson 2005.) In 2010, visitation to the Refuge from non-consumptive users rose to just over 10,000 people. The final demand calculation simply takes actual visitor expenditures and adds benefits gained by those local individuals who earned income from the visitors' activities.

The implementation of the Crane Meadows NWR Hunt Plan is anticipated to have a beneficial impact to the local economy. According to the 2006 U.S. Fish & Wildlife Service report "Banking on Nature," Sherburne NWR generates \$1.3 million total economic activity related to Refuge recreational use and 18 jobs for the nearby communities. Hunters coming to the Refuge support the local economy by purchasing hunting licenses, gasoline, food, and miscellaneous hunting merchandise. Some hunters may also come from outside the region utilizing local motels and eating establishments. Because Crane Meadows NWR is in close vicinity to Sherburne, similar economic stimulus may be generated if hunting opportunities were implemented, but, it would be on a smaller scale because of limited landownership.

3.7 Recreational Opportunities

The National Wildlife Improvement Act of 1997 established six priority uses of the National Wildlife Refuge System. The uses include hunting, fishing, wildlife observation, wildlife photography, environmental education and environmental interpretation. All but hunting and fishing are a part of current management at Crane Meadows NWR. The Headquarters Unit is currently the only Refuge property with public access and accommodations for public use. The Refuge provides a number of facilities including trails, observation platforms, kiosks, and benches to facilitate wildlife-dependent recreation, and overall visitation for Refuge activities has increased in recent years. Refer to of the Visitor Services chapter of the CCP for a better review of recreational opportunities, programs and events currently offered at the Refuge. For future expectations see Chapter 4 of the Crane Meadow's CCP. A Visitor Services Plan is to be completed within two years of CCP completion.

Chapter 4: Environmental Consequences

This chapter describes the foreseeable environmental consequences of implementing the three Management Alternatives described 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 and Service and State biologists.

As described in Chapter 2, three alternatives are being considered:

- A. Alternative 1: Continuation of the Current Hunting Program (No Action)
The no action alternative would continue the hunting program as is, which includes portions of Crane Meadows NWR for special deer firearms and archery hunts for youth and persons with disabilities. In addition, open a portion of Crane Meadows NWR to special spring wild turkey hunts for youth and persons with disabilities.
- B. Alternative 2: Discontinue Hunting on the Refuge
This alternative would not comply with the National Wildlife Refuge System Improvement Act of 1997 by failing to provide opportunities for the six priority wildlife-dependent recreational uses on National Wildlife Refuges (hunting, fishing, wildlife observation and photography, environmental education, and interpretation).
- C. Alternative 3: Expand Hunting Opportunities Within Limitations to Refuge Specific Regulations (Proposed Action Alternative)
This alternative is the Service's preferred alternative and would enable Crane Meadows NWR to manage Refuge wildlife resources and public uses in accordance with establishing authorities. This alternative would comply with the National Wildlife Refuge System Improvement Act of 1997 by providing visitors with priority public use opportunities defined for National Wildlife Refuges. This alternative would permit the Refuge to expand hunting opportunities to those game species that can be determined to

have huntable populations on the Refuge as determined by population surveys conducted by Refuge staff. This alternative will provide Refuge management the ability to ensure that a quality hunt experience is enjoyed by hunters and that hunting is carried out in a manner that is compatible with other Refuge public uses.

4.1 Effects Common to All Alternatives

Specific environmental and social impacts of implementing each alternative are examined in several broad categories: big game, upland game, migratory birds, threatened and endangered species, habitat, other public use activities and social implications. However, several potential effects will be very similar under each alternative and are summarized below:

4.1.1 Cultural Resources

The Service is charged with the responsibility, under Section 106 of the National Historic Preservation Act of 1966 (NHPA), of identifying historic properties (cultural resources that are potentially eligible for listing on the National Register of Historic Places) that may be affected by our actions.

The Regional Historic Preservation Officer (RHPO) advises the Regional Director about procedures, compliance, and implementation of these and other cultural resource laws. The actual determinations relating to cultural resources are to be made by the RHPO for undertakings on Service fee title lands and for undertakings funded in whole or in part under the direct or indirect jurisdiction of the Service including; those carried out by or on behalf of the Service; those carried out with federal financial assistance, and those requiring a federal permit, license, or approval.

It is the responsibility of the Refuge Manager to identify undertakings that could affect cultural resources and coordinate the subsequent review process as early as possible with the RHPO and state, Tribal, and local officials. Also, the Refuge Manager assists the RHPO by protecting archeological sites and historic properties on Service managed and administered lands, by monitoring archaeological investigations by contractors and permittees, and by reporting Archaeological Resources Protection Act violations.

4.1.2 Environmental Justice

Executive Order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations” was signed by President Clinton on February 11, 1994. Its purpose was to focus the attention of federal agencies 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, to provide minority and low income communities access to public information, and to promote their 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, or health impacts on minority and low-income populations. Hunting activities that would be offered under each of the alternatives are available to any visitor regardless of race, ethnicity, or income level.

The Refuge Recreation Act of 1962 (16 U. S. C. 460K) and the National Wildlife Refuge System Administration Act of 1966 (16 U. S. C. 668-ddee) provide authorization for hunting and fishing on National Wildlife Refuges. The effects of hunting and fishing on refuges have been examined in several environmental review documents including the Final Environmental Impact Statement on the Operation of the National Wildlife Refuge System (1976), Recommendations on the Management of the National Wildlife Refuge System (1978), and the Draft Environmental Impact Statement on the Management of the National Wildlife Refuges (1988).

The Service owns and administers lands that are part of the NWR System. The Service's primary purpose for these lands is to provide for waterfowl production and to ensure the preservation of migratory birds, threatened and endangered species, and resident wildlife. An additional primary purpose established by the Service for these lands is to provide opportunities for the public to hunt, fish, observe and photograph wildlife, and increase public understanding and appreciation of the natural resources.

As stated, public hunting has been allowed for many years by the Service on refuge lands. Public hunting has not resulted in any known significant adverse effects on the Service's management activities. Extensive planning goes into all proposed actions on Service lands. Habitat characteristics, land base size, distribution, species (flora and fauna) present, and management activities are all taken into consideration prior to implementing proposed actions. Public hunting on the Refuge should not adversely impact the Service's management activities on refuge lands.

Potential public use conflicts will be minimized by seeking a balance between the consumptive (hunting) and non-consumptive uses such as wildlife observation, photography, environmental education, and environmental interpretation.

Summary of Effects by Alternative

This section describes the environmental consequences of adopting each Refuge management alternative. Table 2 addresses the likely outcomes for specific issues and is organized by broad issue categories.

4.2 Alternative 1: Current Direction (No Action)

There are currently a few white-tailed deer hunts for persons with disabilities and deer hunting opportunities for youth hunters as well. These white-tailed deer hunts are open to archery or firearm hunters. In addition, a spring turkey hunt consistent with state seasons and regulations is offered at Crane Meadows for youth hunters and persons with disabilities. The hunts are conducted on three tracts; the Headquarters (466 acres), Sedge Meadows (386.87 acres), and Platte River West Units (272.32 acres).

The limited size and distribution of current Service land ownership of the Refuge continues to limit our ability to offer quality hunting experience opportunities, but management has long understood the demand for, and importance of providing this activity on the Refuge. By beginning with short duration, assisted, managed hunts for specialty groups, Refuge staff has provided hunting opportunities in a controlled fashion, directed these activities to specific audiences, and adaptively evaluated the hunting program for expansion or reduction based on demand and program success.

4.2.1 Big Game

Refuge Deer Population Assessment and Harvest:

The Refuge currently provides limited habitat for white-tailed deer mostly because of the discontinuous state of lands held in fee title, however, suitable deer habitat is present throughout the acquisition boundary. Most of the Service-owned lands are a mosaic of sedge meadow, willow-dogwood shrub swamp, emergent marsh, prairie, oak savanna, floodplain forest, and oak woodland. White-tailed deer are habitat generalists, but will primarily inhabit deciduous forests with interspersed open areas or other habitats that offer ample cover. The diverse array of habitats on the Refuge provides the necessary food, water, and protective cover needed for deer survival.

Deer hunting is a popular activity for local hunters and landowners in the surrounding area. In fact, much of the area which is non-farmed and privately owned within the acquisition Refuge boundary is recreational hunting land. Deer populations are monitored by a combination of harvest data that are used to reconstruct the population, by formal population modeling procedures using harvest data and research on deer reproduction, survival and mortality, and when feasible the data are checked against formal population surveys.

Ideally the number of annual permits issued to hunters is determined by harvestable surplus or for the most part, by the number of animals that can be harvested without adversely affecting the breeding population. However, in some cases deer populations may be negatively affected by

design in order to reduce deer densities. The pre-fawn goal for Permit Area (PA) 221, which is the PA in which Crane Meadows NWR lies, was set for a 25% decline in deer densities over a 5-year period, starting in 2006, but has still not reached these reduction goals. This has resulted in liberal regulations with “Intensive” designation and “Early Antlerless” seasons in recent years. Beginning in 2002, the State has formally designated permit areas as Lottery, Managed or Intensive. It has since evolved to include other options such as Early Antlerless seasons. As deer densities come into line with goals set by the State, then the permit area will be downgraded to Managed or Lottery depending on circumstances. The present deer densities and high herd fertility, when combined with the limited opportunity at Crane Meadows NWR, indicate that deer hunting, as described under Alternatives 1, 2 or 3 on the Refuge will have minimal impacts on the local and permit area-wide deer population. Area-wide designation for PA221 will likely be Managed or Intensive for some years to come unless the population goals change significantly (personal communications with Beau Liddell, Area Wildlife Manager, MN DNR).

Natural predators of white-tailed deer, including gray wolves, black bears, and coyotes, have been observed on or near the Refuge. At this latitude, however, natural mortality associated with predation is insignificant and does not affect white-tailed deer populations.

A preliminary report for 2013 reported a Minnesota statewide deer harvest of 171,000 animals. That is the lowest since 1998 and the third consecutive year of decline. Part of the reason for the decline in harvest during the past few years was the restricted harvest of antlerless deer throughout more Lottery areas and a reduced number of Intensive and Managed deer areas that were used in an attempt to allow populations to stabilize or rebuild in many parts of the state. The number of deer harvested in the state was below 20,000 until the early 1980s. Since then the number of deer harvested has risen tremendously to a level where over 100,000 deer have been taken each year since 1992. The 2012 Minnesota Deer Harvest Report indicates that 186,684 deer were harvested and 192,031 deer were harvested in 2011.

In 2012, there were 2,653 deer harvested in Minnesota Deer Permit Area 221. Crane Meadows NWR, which is located within the 647 square mile PA, only accounted for 7 of those deer. They were all harvested during a 2012 special hunt with 14 participants.

The deer density goal for Permit Area 221 was established in 2006. The goal is to manage the pre-fawn population estimate at 9.0 -11.0 deer/square mile. Table 2 provides harvest figures and model density estimates for white-tailed deer in Permit Area 221.

Table 2. White-tailed deer density figures for the last 6 years for the Cambridge Region.

Permit Area	Area (mi2)	Pre-fawning Density					
		2008	2009	2010	2011	2012	2013
221	642	13	13	13	12	12	12
222	412	15	15	15	15	15	14

223	376	9	9	9	10	10	12
225	619	16	16	16	14	14	14
227	472	12	13	14	13	13	14
229	287	6	6	7	6	6	7
236	374	16	16	16	16	16	17
Total	2,895						
Average		12	13	13	12	12	13

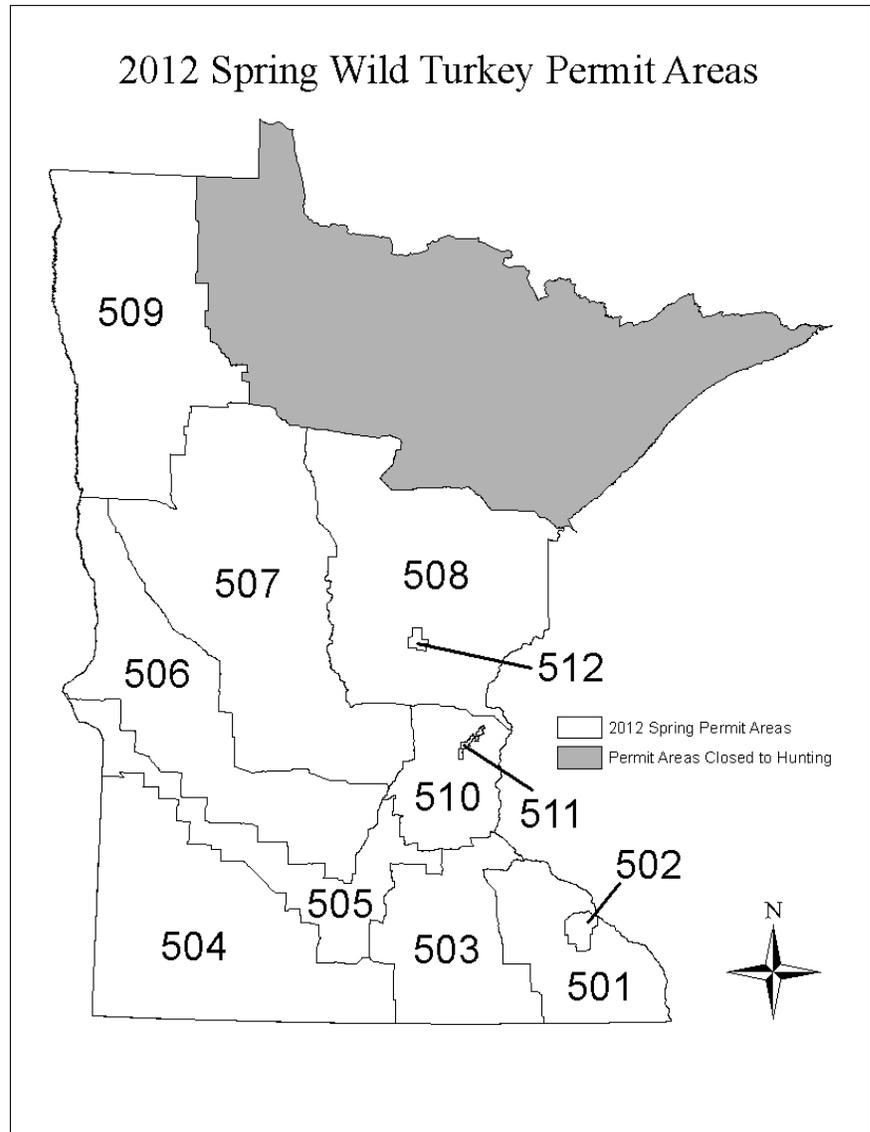
Wild Turkey Population Assessment and Harvest:

The historical range of wild turkeys in Minnesota was limited to the extreme southern portion of the state (Leopold 1931, Mosby 1959) and did not include Morrison County, Minnesota. Shortly after European settlement (approximately 1880), turkeys were extirpated from Minnesota because of habitat loss and unregulated hunting. The first successful reintroduction attempt began in 1971 with the release of 29 individuals relocated from Missouri to Houston County, Minnesota. The intent of this reintroduction was to establish a viable population in the state that could sustain annual spring and fall hunting seasons (MN DNR 2007). After this reintroduction proved successful, the Minnesota DNR released more birds in suitable habitat in other counties. This trap and transplant program has allowed the wild turkey population to expand its range throughout the entire southern and western portions of the state, including areas north of its historic range, such as Morrison County, which is currently considered one of the northernmost biological limits for this species. Wild Turkeys now occupy most of the suitable and available habitat in Minnesota with an estimated population of over 60,000 birds.

Turkey hunting on the Refuge will be limited to designated hunting zones and specific dates to limit conflict with other non-consumptive uses on the Refuge. Hunting will be conducted in accordance with all applicable state and federal regulations. Coordination with Minnesota DNR biologists will provide the population trend information necessary to manage this program long-term. Turkey hunts will be of limited duration, limited to the number of hunters specified by the Refuge hunt plan, and limited to specific units of the Refuge. Currently, there are 8 spring hunting periods in the state of Minnesota starting on the second Wednesday of April with each period being 5 days in length. The bag limit for the disabled turkey hunt on the Refuge will be consistent with state regulations for the spring; one Wild Turkey with a visible beard per hunter. Turkey population estimates indicate that the population within the Refuge can easily sustain a managed harvest without cumulative impacts to the state-wide population. The local turkey population may experience minimal impacts due to the hunts proposed in Alternatives 1 and 3. The Refuge hunts will only contribute a small percentage to the total Wild Turkey harvested in the state.

In Minnesota, the spring wild turkey hunting season is designed to regulate harvest and distribute hunting pressure by allocating permits across 12 PA’s (figure 3) covering the entire state and 8 time periods using a quota system. Although youth hunters can purchase a permit over-the

counter, adult hunters interested in pursuing wild turkeys are required to apply for a permit through a lottery system. Preference for this lottery system is determined by the number of years a valid but unsuccessful application has been submitted since last receiving a permit. Hunters can apply individually or in a group of up to 4 hunters. Successful applicants are notified through U.S. mail and unsuccessful applicants are awarded a preference point for future years. The goal of this system is to provide quality turkey hunting opportunities by minimizing hunter interference rates, conservatively harvesting turkeys in permit areas where the turkey range is expanding, while allowing a substantial harvest in the remainder of the state.



The wild turkey population is rapidly expanding in Minnesota. Starting in 2012 there were two notable regulation changes in the spring hunting season: the last 4 time periods (E, F, G and H) had an unlimited number of permits available and the number of PAs was reduced from 81 to 12 PAs by pooling smaller PAs into larger ones. Permits for time periods E through H and all surplus licenses remaining after the drawing were offered over-the counter in mid-March on a first-come, first-served basis (Walburg and Grund 2012).

Numeric changes in annual turkey harvests can be influenced by turkey population size, hunter effort, and weather. As of 2010, Minnesota's wild turkey population appeared to be stable or growing modestly throughout most of the range, with more rapid growth in the northern PAs (Giudice et al. 2011).

Figure 3. Permit areas open for hunting during the 2012 spring turkey hunting season.

Table 3. Spring Wild Turkey harvest in Permit Area 508

Year	Permits available	Applicants	Permits issued	Registered harvest	Hunter success (%) ^a
2002	3,790	5,180	2,945	594	20
2003	3,870	5,264	2,977	889	30
2004	4,380	5,878	3,277	758	23
2005	4,410	4,542	2,978	681	23
2006	4,290	4,167	2,802	618	22
2007	4,490	4,464	2,837	695	24
2008	7,560	5,834	4,981	1,187	24

2009	9,330	7,738	5,019	1,163	23
2010	10,430	6,869	6,607	1,353	20
2011	10,430	3,538	5,382	953	18
2012	Unlimited	N/A	10,779	1,753	16

Goals for harvest pressure (set by the State) are to maximize opportunity by increasing permits over time until success rates reach 25-30%. Success usually drops off 5-6 years after beginning to hunt an area. Trend for PA 508 has proceeded as expected and permits are likely to remain static or increase to approach the 25-30% goal. Turkeys can handle the pressure and permits levels are mainly dictated by interest based on application rates. Other than achieving population goals, permit levels have increased rapidly within the last couple of years because the local area Minnesota DNR Wildlife Office in Little Falls has been receiving increased nuisance and depredation complaints within PA 508 (personal communication with Beau Liddell, Area Wildlife Manager, MN DNR).

In 2012 hunters registered 11,325 turkeys in MN, an increase of 13% from 2011. Hunter success averaged 29%, which was comparable to the 5-year average of 30%.

Turkey hunting for hunters with disabilities and youth on the Refuge will follow State guidelines. Should there be a detrimental decrease in turkey populations, hunting on the Refuge will be more restrictive or eliminated if necessary.

The bag limit for hunters participating in the Refuge turkey hunt will be consistent with State regulations for the spring; one wild turkey with a visible beard per hunter. The beard is a feathered appendage protruding from the breast and is typically found only on male birds. With a one bird bag limit, the impacts to the wild turkey population on the Refuge will be little to none.

The maximum number of birds harvested on the Refuge will be 40 birds annually. The probability of all hunters taking a bird is low, but if 40 birds are harvested, the local population will experience minimal impacts. If harvest success on the Refuge is similar to PA 508 in 2012, only about 6 turkeys would be harvested per year. See Cumulative Impacts Analysis section for discussion on regional impacts of populations of wild turkey and statewide harvest statistics.

4.2.2 Upland Game

No hunting, no impact.

4.2.3 Migratory Birds

The impacts to non-game migratory birds under Alternative 1 are expected to be minimal for the following reasons; the deer hunting season would not coincide with the nesting season, the turkey hunting season will be early in the spring before most resident species are nesting, and will be limited to certain areas of the Refuge, certain times, and a select number of participants. For these reasons, there are no anticipated long-term impacts to non-game migratory birds by hunting. Disturbance to the daily activities of birds, such as feeding and resting, might occur during the managed deer hunts, but such impacts will be minimal and temporary. Disturbance to birds by hunters would probably be commensurate with that caused by non-consumptive users. Thus, cumulative effects of disturbance to non-hunted migratory birds under the proposed action are expected to be minimal.

4.2.4 Threatened and Endangered Species

Federally listed threatened or endangered species occur infrequently at Crane Meadows NWR. Whooping cranes are currently the only federally-listed species with a range that overlaps Crane Meadows NWR. Currently there are no whooping cranes inhabiting the Refuge. Whooping cranes, however, have been spotted three times in the area over the last 6 years during the spring and fall migration. The sightings were brief; here one day and gone the next. In the case of an observation, the tract will be closed to hunting during the duration of their stop. If their occurrence increases in the future, the Refuge staff will re-evaluate hunting activities to minimize or eliminate any disturbance.

Observations of wolves on the Refuge are limited and those observed are typically considered dispersing individuals. There are no known established packs within the Refuge acquisition boundary, but there are packs nearby (within 20 miles). For this reason, and due to the elusive behavior of wolves, hunters are unlikely to encounter them.

An Intra-Service Section 7 evaluation under the Endangered Species Act is attached as an appendix in the final Crane Meadows NWR CCP. It concluded that the proposed action would have no effect on threatened and endangered species on the Refuge, and thus, the cumulative impact on listed species would be minimal.

The spring turkey hunt coincides with the nesting season of Bald Eagles. During this time eagles are usually incubating for approximately 35 days. Because it is important to restrict any human activity near active eagle nests during this time, the designated turkey hunting areas will be established at least 300 meters away from any active eagle nest on the Refuge. Trumpeter Swans are also common nesters on the Refuge, but are inhabitants of wetlands, areas that will be avoided by turkey hunters.

4.2.5 Habitat

Conserving and restoring habitat for the benefit of wildlife species is an integral part of any long-range plan for National Wildlife Refuges. Thus, any public use activity deemed compatible should have no or minimal disturbance to habitat. Walking is the preferred method of travel to access hunting locations, however, other methods of transportation may be more practical

depending on accessibility and the ability of the hunter. Special access accommodations for persons with disabilities will be allowed on a situational basis and approved when reservations are made, but these accommodations will have restrictions to limit adverse impacts to Refuge habitats. No sizeable adverse impacts are expected under this alternative on Refuge habitats.

Additional disturbance to surface soils and vegetation may occur in areas selected for hunting for persons with disabilities. Variables causing disturbance will be controlled, limited to permitted hunting areas, and the anticipated impacts will be minimal. Cutting of sizable vegetation or any other manipulation near or around hunting blinds or access routes will be done prior to the hunt by Service personnel. All hunters will use permanent blinds set up by Refuge personnel or use portable blinds in pre-approved locations. Therefore, there will be no need for additional vegetation removal or destruction. Ingress and egress points will also be restricted to control access by hunters and their assistants to minimize habitat degradation. The Headquarters Unit has a 3.5 mile trail with roads and a firebreak network already established. These will be used for ingress and egress routes.

Wheeled carts and sleds will be permitted in select areas for hunting and hauling deer out. All hunters and their belongings leave the area each day. No ATVs, OHVs, or snowmobiles are permitted on the Refuge. With these limitations there are no expected adverse impacts from this alternative on habitats. Damage to vegetation is minimal, temporary and should basically be non-detectable.

4.2.6 Other Public Use Activities

Currently all of the public use activities offered at Crane Meadows NWR are confined to the Headquarters Unit. For safety considerations, the Platte River Trail will be closed for the non-hunting visitors at that time. The trail will be closed a day prior to the hunt, as well as during the hunt. This activity will be advertised prior to the event to avoid any inconvenience to visitors and inform them of the hunt.

This managed hunt will take priority over other public uses in the Headquarters Unit during that period of time. Hunting is one of the six priority wildlife-dependent recreational uses identified in the National Wildlife Refuge System Improvement Act of 1997. Service policy directs us to provide hunting opportunities when compatible with Refuge management and offering this use was a long-term goal of the Refuge when it was established in 1992. Managed hunting programs help promote an understanding and appreciation of natural resources and their management. Additionally, managed hunts on the Refuge provide a traditional recreational activity with no definable adverse impacts to the biological integrity or habitat sustainability of Refuge resources.

4.2.7 Social Implications

As public use levels at Crane Meadows NWR increase over time, unanticipated conflicts between user groups may occur. The Refuge's visitor use programs would be adjusted as needed

to eliminate or minimize conflicts and to continue providing quality wildlife-dependent recreation opportunities. Experience on many National Wildlife Refuges 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. Overall, the cumulative impact of hunting on other wildlife-dependent recreation at Crane Meadows NWR would be minor.

4.3 Alternative 2: Discontinue Hunting on the Refuge

This alternative would not comply with the National Wildlife Refuge System Improvement Act of 1997 by failing to provide opportunities for the six priority wildlife-dependent recreational uses on National Wildlife Refuges (hunting, fishing, wildlife observation and photography, environmental education, and interpretation).

The limited size and distribution of current Service land ownership on the Refuge continues to limit our ability to offer quality hunting experience opportunities, but management has long understood the demand for, and importance of providing this activity on the Refuge. By beginning with short duration, assisted, and managed hunts for specialty groups, Refuge staff are able to provide hunting opportunities in a controlled fashion, direct these activities to specific audiences, and adaptively evaluate the hunting program for expansion or reduction based on demand and program success.

4.3.1 Big Game

No hunting, no impact.

The probability of deer becoming over-populated (due to the lack of hunting) is low since hunting is allowed nearby and on non-USFWS land. Currently the land base of Refuge fee title areas is relatively small and scattered amongst privately owned and state lands where hunting is permitted.

4.3.2 Upland Game

No hunting, no impact.

4.3.3 Migratory Birds

No hunting, no impact.

4.3.4 Threatened and Endangered Species

No hunting, no impact.

4.3.5 Habitat

No hunting, no impact.

4.3.6 Other Public Use Activities

No hunting, no impact.

4.3.7 Social Implications

Alternative 2 will not meet the expectation of the public, partners, or other stakeholders to increase hunting opportunities on the Refuge that are compatible to the Refuge purpose. These issues and comments came forth during CCP Scoping Process (refer to Chapter 2 of the CCP for more information). Many individuals stated that hunting was originally discussed during the meetings that led to the establishment of Crane Meadows NWR in 1992, and it has remained a public expectation ever since. However, there are some individuals who expressed maintaining the Refuge as a sanctuary for wildlife during the scoping process. Following the drafting of the CCP, the general consensus of the public was to open the Refuge to some form of hunting.

4.4 Alternative 3: Expand Hunting Opportunities within Limitations to Refuge Specific Regulations (Proposed Action Alternative)

This alternative is the Service's preferred alternative and would enable Crane Meadows NWR to manage Refuge wildlife resources and public uses in accordance with establishing authorities. This alternative would comply with the National Wildlife Refuge System Improvement Act of 1997, by providing visitors with priority public use opportunities defined for National Wildlife Refuges. This alternative would permit the Refuge to expand hunting opportunities to those game species that can be determined to have huntable populations on the Refuge as determined by population surveys conducted by Refuge staff. This alternative will provide Refuge management the ability to ensure that a quality hunt experience is enjoyed by hunters and that hunting is carried out in a manner that is compatible with other Refuge public uses.

4.4.1 Big Game

White-tailed Deer Population Assessment and Harvest:

The Refuge currently provides limited habitat for white-tailed deer mostly because of the discontinuous state of lands held in fee title, however, suitable deer habitat is present throughout the acquisition boundary. Most of the Service-owned lands are a mosaic of sedge meadow, willow-dogwood shrub swamp, emergent marsh, prairie, oak savanna, floodplain forest, and oak woodland. White-tailed deer are habitat generalists, but will primarily inhabit deciduous forests with interspersed open areas or other habitats that offer ample cover. The diverse array of habitats on the Refuge provides the necessary food, water, and protective cover needed for deer survival.

Deer hunting is a popular activity for local hunters and landowners in the surrounding area. In fact, much of the area which is non-farmed and privately owned within the acquisition Refuge boundary is recreational hunting land. Deer populations are monitored by a combination of harvest data that are used to reconstruct the population, by formal population modeling

procedures using harvest data and research on deer reproduction, survival and mortality, and when feasible the data are checked against formal population surveys.

Ideally the number of annual permits issued to hunters is determined by harvestable surplus or for the most part, by the number of animals that can be harvested without adversely affecting the breeding population. However, in some cases deer populations may be negatively affected by design in order to reduce deer densities. The pre-fawn goal for Permit Area (PA) 221, which is the PA in which Crane Meadows NWR lies, was set for a 25% decline in deer densities over a 5-year period, starting in 2006, but has still not reached these reduction goals. This has resulted in liberal regulations with “Intensive” designation and “Early Antlerless” seasons in recent years. Beginning in 2002, the State has formally designated permit areas as Lottery, Managed or Intensive. It has since evolved to include other options such as Early Antlerless seasons. As deer densities come into line with goals set by the State, then the permit area will be downgraded to Managed or Lottery depending on circumstances. The present deer densities and high herd fertility, when combined with the limited opportunity at Crane Meadows NWR indicate that deer hunting, as described under Alternatives 1, 2 or 3 on the Refuge will have minimal impacts on the local and permit area-wide deer population. Area-wide designation for PA221 will likely be Managed or Intensive for some years to come unless the population goals change significantly (personal communications with Beau Liddell, Area Wildlife Manager, MN DNR).

Natural predators of white-tailed deer, including gray wolves, black bears, and coyotes, have been observed on or near the Refuge. At this latitude, however, natural mortality associated with predation is insignificant and does not affect white-tailed deer populations.

A preliminary report for 2013 reported a Minnesota statewide deer harvest of 171,000 animals. That is the lowest since 1998 and the third consecutive year of decline. Part of the reason for the decline in harvest during the past few years was the restricted harvest of antlerless deer throughout more Lottery areas and a reduced number of Intensive and Managed deer areas that were used in an attempt to allow populations to stabilize or rebuild in many parts of the state. The number of deer harvested in the state was below 20,000 until the early 1980s. Since then the number of deer harvested has risen tremendously to a level where over 100,000 deer have been taken each year since 1992. The 2012 Minnesota Deer Harvest Report indicates that 186,684 deer were harvested and 192,031 deer were harvested in 2011.

In 2012, there were 2,653 deer harvested in Minnesota Deer Hunting Zone Permit Area 221 . Crane Meadows NWR, which is located within this the 647 square mile border PA of the Zone, only accounted for 7 of those deer. They were all harvested during a 2012 special hunt with 14 participants. Deer harvest on the Refuge in 2012 was a total 7 deer for 14 participants of the special hunt.

The deer density goal for Permit Area 221 was established in 2006. The goal is to manage the pre-fawn population estimate at 9.0 -11.0 deer/square mile. Table 4 provides harvest figures and model density estimates for white-tailed deer in Permit Area 221.

Table 4. White-tailed deer density figures for the last 6 years for the Cambridge Region.

Permit Area	Area (mi ²)	Pre-fawning Density					
		2008	2009	2010	2011	2012	2013
221	642	13	13	13	12	12	12
222	412	15	15	15	15	15	14
223	376	9	9	9	10	10	12
225	619	16	16	16	14	14	14
227	472	12	13	14	13	13	14
229	287	6	6	7	6	6	7
236	374	16	16	16	16	16	17
Total	2,895						
Average		12	13	13	12	12	13

Table 5. White-tailed deer harvest figures for 2013 in PA 221

Permit Area	Firearm Hunters	Area Size (sq mi)	Hunters/mile ²	Harvest/mile ²
221	4,934	647	7.6	3.4

Table 6. Total Deer Harvest by Permit Area, 2012.
Includes all license types, permits, and special hunts.

Permit Area	Adult Male	Adult Female	Fawn Male	Fawn Female	Total
221	1088	880	379	306	2,653

If the average harvest for PA 221 is 3.4 deer/mi.² then that number can be used as a representative figure for estimating potential take on Crane Meadows NWR. At approximately 2,100 acres, the Refuge could assume, if all that land was huntable, 11.15 more deer would be taken across the entire 647 sq. mile PA 221. With a deer harvest around 2,653 for PA 221 in 2012 alone, 11.15 deer becomes a negligible number.

Wild Turkey Population Assessment and Harvest:

The historical range of wild turkeys in Minnesota was limited to the extreme southern portion of the state (Leopold 1931, Mosby 1959) and did not include Morrison County, Minnesota. Shortly after European settlement (approximately 1880), turkeys were extirpated from Minnesota

because of habitat loss and unregulated hunting. The first successful reintroduction attempt began in 1971 with the release of 29 individuals relocated from Missouri to Houston County, Minnesota. The intent of this reintroduction was to establish a viable population in the state that could sustain annual spring and fall hunting seasons (MN DNR 2007). After this reintroduction proved successful, the Minnesota Department of Natural Resources released more birds in suitable habitat in other counties. This trap and transplant program has allowed the wild turkey population to expand its range throughout the entire southern and western portions of the state, including areas north of its historic range, such as Morrison County, which is currently considered one of the northernmost biological limits for this species. Wild turkeys now occupy most of the suitable and available habitat in Minnesota with an estimated population of over 60,000 birds.

Minnesota offers fall and spring turkey hunting seasons. The fall turkey season was 30 days in length (October 1-30) and allowed for an unlimited number of hunters to take one wild turkey of either sex. Although there were an unlimited number of hunters, each hunter needed to select and could only hunt in 1 of the 12 permit areas (PAs) (Figure 4). The spring turkey season regulated harvest and distributed hunting pressure by allocating permits across the 12 PAs and 8 time periods using a quota system for the first 4 time periods. During spring, adult hunters interested in pursuing turkeys for the first 4 time periods were required to apply for a permit through a lottery system but youth hunters were able to purchase a permit over-the-counter during these time periods. Preference for this lottery system was determined by the number of years a valid but unsuccessful application had been submitted since last receiving a permit. Hunters could apply individually or in a group of up to 4 hunters. Successful applicants were notified through U.S. Mail and unsuccessful applicants were awarded a preference point. Hunters could simply purchase a permit over-the-counter for the last 4 seasons. The goal of this system was to provide quality turkey hunting opportunities by minimizing hunter interference rates while allowing hunters to take the harvestable surplus of turkeys.

Fall 2012 Turkey Season – This was the first year that a quota system was not used to restrict hunter numbers during the fall season. Consequently, the number of permits issued to hunters doubled from 5,382 permits in 2011 to 10,779 permits in 2012 (Table 6, Figure 5). There were 1,753 turkeys harvested during Fall 2012, which was about 400 more turkeys than the record harvest in 2010. Hunter success rates ranged from 10-19% at the permit area level (Table 6) and averaged 16% at the statewide level, which was slightly below the 5-year average of 22%. These lower hunter success rates may be related to hunters interested in harvesting a turkey opportunistically while pursuing other species and therefore were expending less effort; and/or allowing more casual turkey hunters who may not have as much experience with turkey hunting during the fall season. It is unlikely these reduced hunter success rates are related to fewer turkeys in the pre-hunt population because turkey population growth rates have been stable to slightly increasing throughout Minnesota (Giudice et al. 2011) and the 2011-12 winter was relatively mild, which would suggest that above average survival and reproduction rates occurred the previous year. Weather conditions were favorable throughout the season and most crops were harvested in early- to mid-October.

Spring 2013 Turkey Season – There were 38,831 permits issued during the spring season, including 19,113 general/landowner permits, 5,539 youth permits, 4,550 archery permits, and 9,629 surplus permits (Table 7). Hunters registered 10,390 turkeys (Table 7), which was about 12% below the 5-year average (Figure 6). Hunter success rates averaged 30% at the statewide level, which was comparable to the 5-year average of 30% (Table 7). The winter of 2012-13 was relatively mild through February, but then measurable snow was on the ground through much of April in most of the range where turkeys were abundant in Minnesota. The impact of the delayed but extended winter weather on turkey populations is unknown, but it is reasonable to believe that the winter-like weather affected hunter effort and turkey movement patterns. This likely explains much of the reduced harvest success rates and hunter participation rates, particularly during the first few hunting time periods.

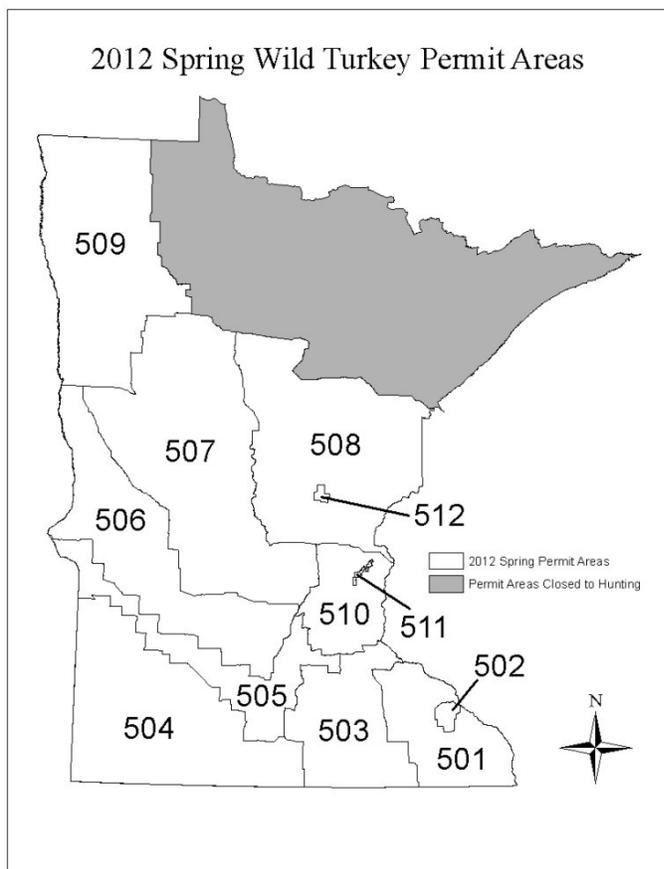


Figure 4. Permit areas open for hunting during the 2013 spring turkey hunting season, Minnesota.

Through the trap and relocation program organized and administered by the Minnesota DNR, as well as natural population and range expansion, the turkey population has significantly increased throughout Minnesota. The state estimates its turkey population based on harvest records.

Within the last 25 years, it has grown to more than 60,000 birds and the opportunities and demand for turkey hunting have also increased. The state's first turkey hunt, after the initiation of the program, was in 1978. During this hunt, 94 birds were harvested. The annual number of birds harvested has increased ever since. Since 1999 over 5,000 birds have been harvested each spring.

About two-thirds of Minnesota is currently open to turkey hunting, and hunts are primarily concentrated in the southern half of the state. Permit Area 508 (within Morrison County) surrounding the Refuge has been open to turkey hunting for many years. Since the year 2003, permits issued in Permit Area 508 have increased almost eleven fold in response to the growing turkey population in the area and now has an unlimited number of permits (Table 7). A fall hunting season was first offered in 2008. At the time the first Hunt Plan was written the fall 2010 harvest data were not available.

Based on annual harvest statistics and a survey by willing deer hunters, the Minnesota DNR uses a model to estimate the turkey populations in each permit area.

Table 6. Permits available and issued, applicants, registered harvest, and hunter success rates for fall wild turkey seasons 1990 – 2012, Minnesota.

Year	Permits available	Applicants	Permits issued	Registered harvest	Hunter success (%) ^a
2002	3,790	5,180	2,945	594	20
2003	3,870	5,264	2,977	889	30
2004	4,380	5,878	3,277	758	23
2005	4,410	4,542	2,978	681	23
2006	4,290	4,167	2,802	618	22
2007	4,490	4,464	2,837	695	24
2008	7,560	5,834	4,981	1,187	24
2009	9,330	7,738	5,019	1,163	23
2010	10,430	6,869	6,607	1,353	20
2011	10,430	3,538	5,382	953	18
2012	Unlimited	N/A	10,779	1,753	16

Table 7. Permits issued, registered harvest, and hunter success during the Fall 2012 and Spring 2013 Minnesota wild turkey seasons.

Fall 2012			Spring 2013				
Permit Area	Permits Issued	Harvest	Success (%) ^a	Permits Issued	Harvest	Success (%) ^a	
501	1,750	316	18	9,050	2,639	29	
502	175	24	14	610	169	28	
503	1,717	282	16	3,961	1,255	32	
504	401	39	10	930	278	30	
505	788	126	16	3,150	908	29	
506	466	75	16	1,334	317	24	
507	2,690	515	19	8,107	2,628	32	
508	1,425	197	14	3,868	1,170	30	
509	128	19	15	246	102	41	
510	1,144	147	13	2,788	886	32	
511	71	10	14	133	27	20	
512	24	3	13	38	11	29	
Success rates were not adjusted for non-participation.							

Goals for harvest pressure (set by the State) are to maximize opportunity by increasing permits over time until success rates reach 25-30%. Success usually drops off 5-6 years after beginning to hunt an area. Trend for PA508 has proceeded as expected and permits are likely to remain static or increase to approach the 25-30% goal. Turkeys can handle the pressure and permit levels are mainly dictated by interest based on application rates. Another reason permit levels have increased sharply within the last couple of years is because the local area Minnesota DNR Wildlife Office in Little Falls has been receiving increased nuisance and depredation complaints within Permit Area 508 (personal communication with Beau Liddell, Area Wildlife Manager, MN DNR).

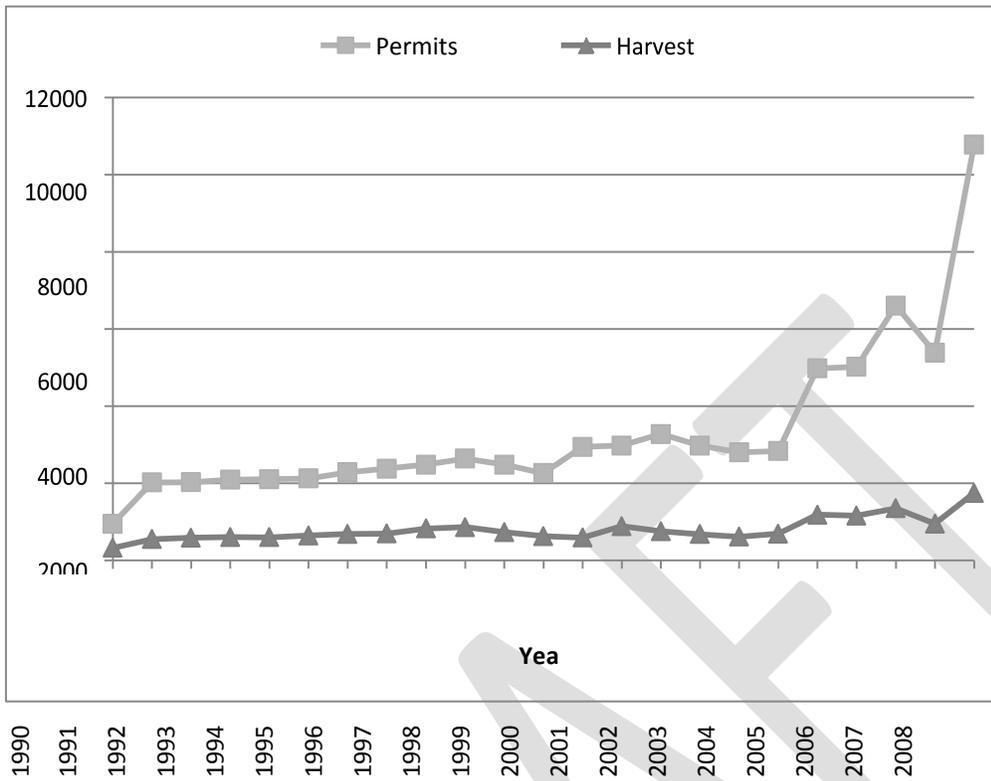


Figure 5. Permits issued and registered harvest for fall wild turkey seasons, 1990-2012, Minnesota.

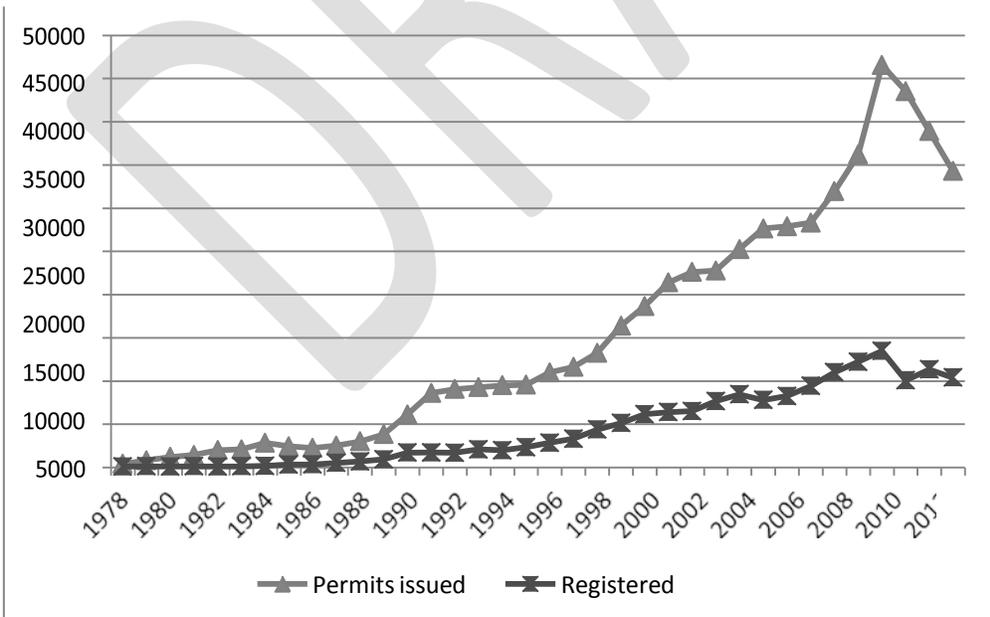


Figure 6. Permits issued and registered harvest for spring wild turkey seasons, 1978-2013, Minnesota.

The bag limit for hunters participating in the Refuge turkey hunt will be consistent with State regulations for the spring; one wild turkey with a visible beard per hunter. The beard is a feathered appendage protruding from the breast and is typically found only on male birds. With a one bird bag limit, the impacts to the wild turkey population on the Refuge will be little to none.

If harvest success is similar to Permit Area 508, only a small number would be harvested per year when interpolated for the 2100 acres at Crane Meadows NWR.

4.4.2 Small Game

Ruffed Grouse

Observers from 14 cooperating organizations which included DNR Divisions of Fish & Wildlife and Parks & Trails; Chippewa and Superior National Forests (USDA Forest Service); Fond du Lac, Grand Portage, Leech Lake, Red Lake, and White Earth Reservations; 1854 Treaty Authority; Agassiz and Tamarac National Wildlife Refuges (U.S. Fish & Wildlife Service); Vermilion Community College; Cass County Land Department; and UPM Blandin Paper Mill, all participated in surveys. Cooperators surveyed routes between 16 April and 29 May 2013. Most routes (75%) were surveyed between 6 May and 16 May, with the median date (10 May) much later than in previous years (compare to 25 April last year, and 1 – 3 May in 2009 and 2011). Excellent (61%), Good (32%), and Fair (6%) survey conditions were reported for 111 routes reporting conditions, which has been consistent in recent years.

Statewide counts of ruffed grouse drums averaged 0.9 drums per stop (dps) with a 95% confidence interval = 0.7–1.0 dps during 2013. Drum counts were 0.9 (0.8–1.1) dps in the Northeast ($n = 97$ routes), 0.7 (0.4–0.9) dps in the Northwest ($n = 8$), 0.9 (0.3–1.6) dps in the Central Hardwoods ($n = 13$), and 0.4 (0.1–0.6) dps in the Southeast ($n = 7$) regions.

Statewide drum counts declined 10% this year. This decline was expected based on the current position of the population within the 10-year cycle, with the most recent peak in drum counts during 2009. Thus, in the context of the long-term survey data, which is the appropriate context for interpretation of these results, the ruffed grouse population decline is part of a larger cycling pattern, with the expected low point in the cycle occurring within the next few years.

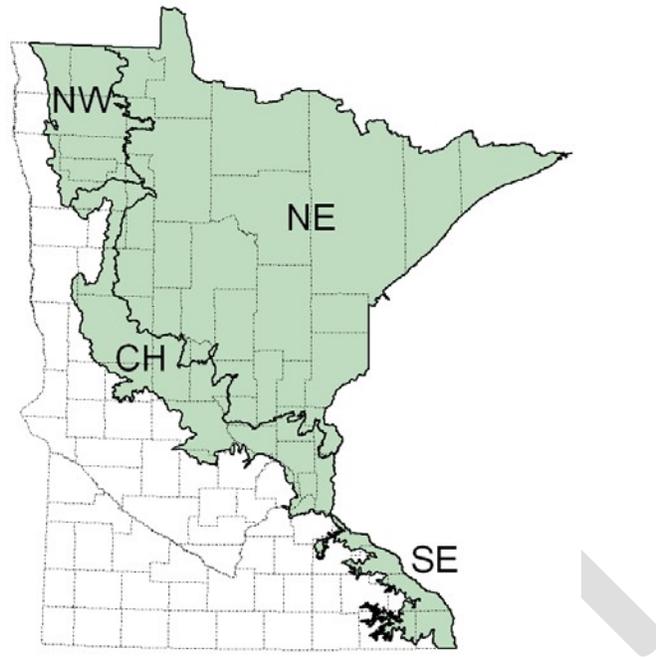


Figure 7. Survey regions for **ruffed grouse** in Minnesota. Northwest (NW), Northeast (NE), Central Hardwoods (CH), and Southeast (SE) survey regions are depicted relative to county boundaries (dashed lines) and influenced by the MN DNR’s Ecological Classification System.

Ring-Necked Pheasant

The average number of pheasants observed in 2013 (27.2/100 mi) decreased 29% from 2012, and remained 64% below the 10-year average, 72% below the long-term average and 91% below the benchmark years of 1955-64. Indices over the past 3 years suggest the pheasant population has declined considerably since 2005 with comparable indices to those calculated in the mid-1980s. Total pheasants observed per 100 miles ranged from 7.4 in the Southeast to 50.7 in the Southwest region. The most substantial decreases in counts from last year occurred in the West Central (-43%) and East Central regions (-48%).

The range-wide hen index (3.5 hens/100 mi) was 40% below 2012 and 70% below the 10-year average. The hen index varied from 0.8 hens/100 miles in the Southeast to 5.9 hens/100 miles in the Southwest region. The hen index was higher than 2012 for the Southwest, South Central, and Southeast regions. The range-wide cock index (5.1 cocks/100 mi) was higher than 2012 (16%) but 39% below the 10-year average. The 2013 hen: cock ratio was 0.68, which was below average (1.44 ± 0.36 [SD]) for the CRP years (1987-2012). The number of pheasant broods observed (3.4/100 mi) was 45% below 2012, 71% below the 10-year average and 74% below the long-term average. The brood index remains well below the benchmark years of 1955-64 (34.8 broods/100 mi). Regional brood indices ranged from 1.3 broods/100 miles in the Southeast to 6.7 broods/100 miles in the Southwest region. Average brood size in 2013 (5.4 ± 0.3 [SE] chicks/brood) was higher than 2012 (4.4 ± 0.2 [SE] chicks/brood) and the 10-

year mean (4.6 ± 0.1 [SE] chicks/brood), and was comparable to the long-term average (5.5 ± 0.1 [SE] chicks/brood; Table 2). The median hatch date for pheasants was approximately 20 June ($n = 236$), 11 days later than the 10-year average. Estimated median age of broods observed was 6 weeks (range: 1-12 weeks).

The reduction in pheasant counts may be partially attributed to both colder than normal winter temperatures and snow cover that persisted into late April and early May in some regions. In addition, heavy rainfall in May likely contributed to delay in nesting effort and reduced nest success early in the breeding season. Consequently, a decline in the range-wide pheasant index due to weather was expected. However, the high cock index and low hen: cock ratio might suggest that hens were undercounted in the survey. Historically, hens that were successful nesting later in the season tend to be underrepresented in roadside data and it is possible that hens were still nesting or under cover with young chicks during the survey period. Pheasant numbers will be higher than forecasted if hens were underrepresented in these roadside surveys. Projecting from the roadside index, an estimated 246,000 roosters may be harvested this fall.

Cottontail Rabbit and White-tailed Jackrabbit

The eastern cottontail rabbit index (4.6 rabbits/100 mi) was 17% higher than last year, but 22% below the 10-year average and 23% below the long-term average. The cottontail rabbit index ranged from 0.6 rabbits/100 miles in the Northwest to 9.5 rabbits/100miles in the South Central region. The best opportunities for harvesting cottontail rabbits are in the East Central, Southeast, and South Central regions.

The index of white-tailed jackrabbits (0.2 rabbits/100 mi) did not change from 2012 or the 10-year average, but was 87% below the long-term average. The range-wide jackrabbit population peaked in the late 1950's and declined to low levels in 1980s. The long-term decline in jackrabbits reflects the loss of their preferred habitats (i.e., pasture, hayfields, and small grains). However, indices of relative abundance and annual percent change should be interpreted cautiously because estimates are based on a small number of sightings.

4.4.3 Migratory Birds

The number of breeding waterfowl in a portion of Minnesota has been estimated each year since 1968 as a part of the overall inventory of North American breeding waterfowl. The survey consists of aerial observations in addition to more intensive ground counts on selected routes to determine the proportion of birds counted by the aerial crew. Procedures used are similar to those used elsewhere across the waterfowl breeding grounds. The 2013 aerial survey portion was flown from May 12 to May 27.

Both the start and end dates were about 10 days later than normal due to the extremely late spring and late ice out. Spring ice-out dates were 10-20 days later than average across the state and approximately 6 weeks later than 2012. Temperatures were well below normal in April with above average snowfall. Temperatures in May were also below normal with above

average precipitation, most of which was rain in mid to late May. Wetland conditions were very dry in early spring but improved in mid to late May as the result of significant rainfall events. Overall, the number of wetlands (Types II – V) increased 13% compared to 2012 and were near both the 10-year (-3%) and long-term (+2%) averages.

Minnesota’s 2013 estimated mallard breeding population was 293,000: a 30% increase from last year’s estimate of 225,000 mallards but statistically unchanged ($p = 0.36$). Mallard numbers were 14% above the 10-year average and 30% above the long-term average of 226,000 breeding mallards. The 2013 estimated blue-winged teal population was 144,000, which was 33% higher than last year’s estimate of 109,000 blue-winged teal, but statistically unchanged ($p = 0.53$). Blue-winged teal numbers remained 19% below the 10-year average and 33% below the long-term average of 216,000 blue-winged teal. The combined population index of other ducks, excluding scaup, was 246,000 ducks, which was 82% higher than the previous year’s estimate and 25% above the 10-year average and 39% above the long-term average of 177,000 other ducks. Population estimates of wood duck (72,000), ring-necked duck (60,000), northern shoveler (27,000), and gadwall (24,000) accounted for most (75%) of the total population of other ducks.

The estimate of total duck abundance (683,000), which excludes scaup, was 46% higher than the previous year’s estimate of 469,000 ducks and was 8% above the 10-year average and 10% above the long-term average of 620,000 ducks. The estimated number of Canada geese was 209,000 and 32% higher than the previous year and 18% above the 10-year average. Very few goose broods were observed during the 2013 survey due to the late spring and likely reduced nesting effort by Canada geese.

Table 8. Species Composition of the Minnesota Waterfowl Harvest, 2011 and 2012. (from: Raftovich, R.V., K.A. Wilkins. 2013.

Species	Minnesota Harvest					Mississippi Flyway Harvest		
	2011	% of Harvest	2012	% of Harvest	Percent change in Harvest 11-12	2011	2012	Percent change Harvest 11-12
Mallard	180,515	29.07	197,316	26.33	9	2,240,248	1,882,553	-19
Domestic mallard	0	0	0	0	0	3,398	647	-425
American black duck	491	0.08	587	0.08	16	21,992	20,688	-6
Black x mallard	491	0.08	587	0.08	16	5,068	2,074	-144
Gadwall	8,339	1.34	18,792	2.51	56	1,474,405	1,240,234	-19

American wigeon	5,396	0.87	9,983	1.33	46	136,779	137,133	0
Green-winged teal	36,790	5.92	56,376	7.52	35	1,001,902	932,461	-7
Blue-winged /cinnamon teal	89,767	14.45	123,322	16.46	27	704,647	932,096	24
Northern shoveler	15,697	2.53	15,856	2.12	1	375,918	391,133	4
Northern pintail	7,848	1.26	5,285	0.71	-48	212,499	156,593	-36
Wood duck	150,593	24.25	184,396	24.61	18	928,178	780,024	-19
Redhead	18,640	3.00	22,315	2.98	16	155,227	99,179	-57
Canvasback	9,811	1.58	4,111	0.55	-66	68,358	52,081	-31
Greater scaup	1,962	0.32	2,936	0.39	33	33,680	40,968	18
Lesser scaup	5,396	0.87	17,617	2.35	69	114,903	307,579	63
Ring-necked duck	63,278	10.19	75,755	10.11	16	260,061	324,658	20
Goldeneye	9,320	1.50	4,111	0.55	-127	39,306	26,055	-51
Bufflehead	7,358	1.18	3,523	0.47	-109	78,145	67,418	-16
Ruddy duck	1,962	0.32	2,349	0.31	16	21,717	20,443	-6
Scoters	0	0	0	0	0	6,014	3,989	-51
Hooded merganser	6,377	1.03	4,111	0.55	-55	53,766	45,886	-17
Other mergansers	981	0.16	0	0	0	13,368	7,214	-85

Total Duck Harvest	621,000		749,300		+ 17	8,000,100	7,522,700		-6
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Mourning Dove

The number of mourning doves observed (168 doves/100 mi) in 2013 was 20% lower than 2012, 23% below the 10-year average and 35% below the long-term average (Table 8, Figure 8). The mourning dove index ranged from 76 doves/100 miles in the East Central region to 246 doves/100 miles in the Southwest region (Table 3). The number of mourning doves heard along U.S. Fish and Wildlife Service 2013 call-count survey (CCS) routes ($n = 13$) in Minnesota was 5.6% lower than 2012. Trend analyses indicated the number of mourning doves heard along the CCS routes declined 1.6% per year (95% CI: -3.7 to 0.3%) during 2004- 2013 and declined 1.5% per year (95% CI: -2.2 to -0.7%) during 1966-2013 (Seamans et al. 2013).

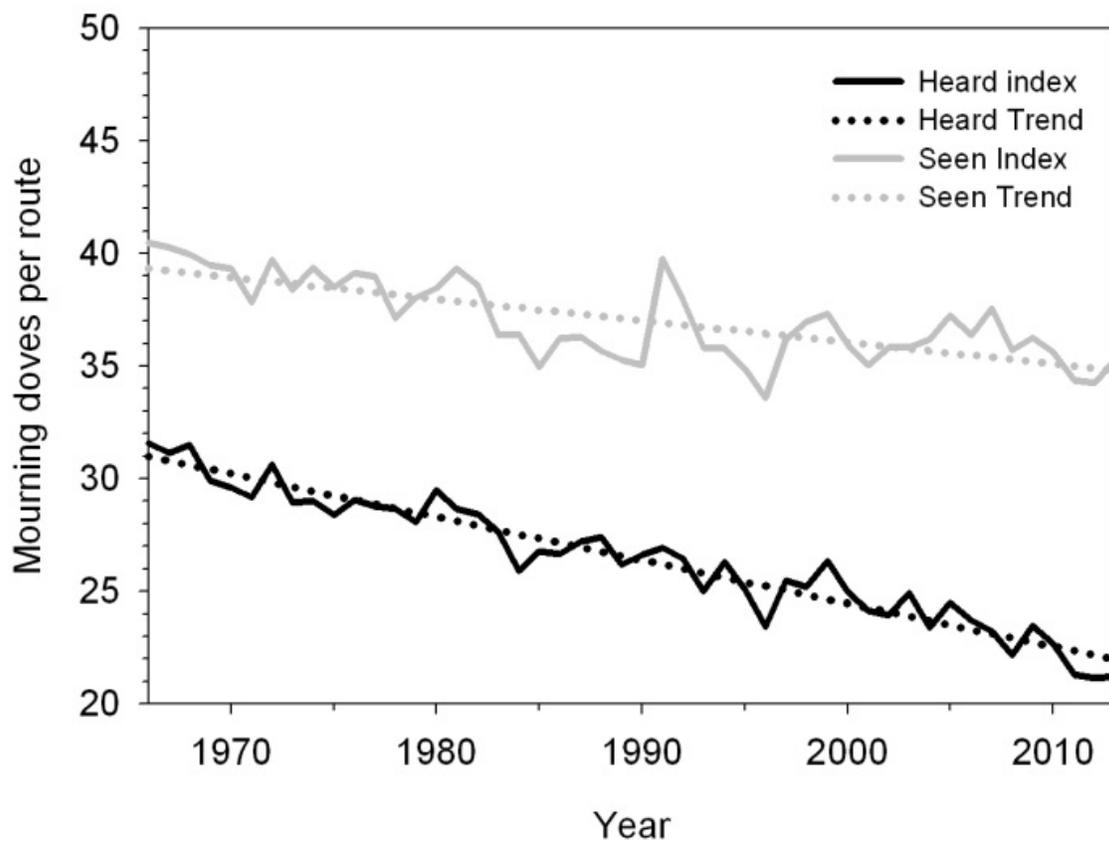


Figure 8. Mourning dove abundance indices and predicted trends in the Central Management Unit based on CCS data, 1966-2013. Trend lines are predicted values from fitting a simple linear regression line through the annual indices.

DRAFT

American Woodcock

Table 9. Short term (2012 – 13), 10 –year (2003-2013), and long-term (1968-2013) trends (% change per year ^a) in the number of American woodcock heard during the Singing-ground Survey as determined by using the hierarchical log-linear modeling technique (Sauer et al. 2008)

Mgmt. Unit/State	Number of Routes ^b	n ^c	2012-13			2003-13			1968-13		
			% Change	95%	CI ^d	% Change	95%	CI ^d	% Change	95%	CI ^d
CENTRAL	449	722	-1.13	- 8.14	6.48	- 0.08	-0.97	0.80	- 0.80	-1.06	-0.55
IL	30	45	- 0.85	-65.62	182.06	- 15.10	-24.14	-6.46	- 1.28	*4.17	1.77
IN	18	60	- 7.26	-47.09	55.63	- 2.95	- 7.74	3.08	- 4.17	-5.56	-2.92
MB ^c	19	30	- 11.90	-39.33	24.19	- 0.10	- 3.57	3.70	- 0.45	-2.60	1.80
MI	106	151	5.73	-6.58	19.54	0.05	- 1.32	1.49	- 0.72	-1.11	-0.33
MN	75	120	- 12.89	-26.13	2.58	0.74	- 1.04	2.54	- 0.03	-0.62	0.60
OH	34	72	1.35	-20.53	31.74	- 0.12	- 2.64	3.77	- 1.55	-2.29	-0.77
ON	87	156	- 3.64	-17.59	12.68	- 0.57	- 2.50	1.47	- 0.89	-1.38	-0.40
WI	80	118	2.06	-13.36	20.32	1.96	0.10	4.03	- 0.28	-0.79	0.26

^a Median of route trends estimated using hierarchical modeling. To estimate the total percent change over several years, use: $100(\% \text{ change}/100+1)^y-100$ where y is the number of years. Note: extrapolating the estimated trend statistic (% change per year) over time (e.g., 30 years) may exaggerate the total change over the period.

^b Total number of routes surveyed in 2013 for which data were received by 5 June, 2013.

^c Number of routes with at least one year of non-zero data between 1968 and 2013.

^d 95% Confidence interval, if the interval overlaps zero, the trend is considered non-significant.

^c Manitoba began participating in the Singing-ground survey in 1992.

Table 10. Preliminary estimates of woodcock hunter numbers, days afield, and harvest for selected states from the 2009-10, 2010-11, 2011-12 and 2012-13 Harvest Information Program surveys. Note: beginning 2008-09 all estimates rounded to the nearest 100 for harvest, hunters, and days afield.

Management Unit / State	Active woodcock hunters (^a)				Days afield (^{a, c})				Harvest (^{a, c})			
	2009-10	2010-11	2011-12	2012-13	2009-10	2010-11	2011-12	2012-13	2009-10	2010-11	2011-12	2012-13
Central Region	n.a. ^b	n.a. ^b	n.a. ^b	n.a. ^b	322,300 ± 14	392,400 ± 20	350,500 ± 16	276,900 ± 16	175,100 ± 17	233,100 ± 20	231,700 ± 20	193,100 ± 23
IL	1,800 ± 98	800 ± 171	2,900 ± 108	900 ± 175	6,200 ± 91	1,200 ± 123	8,800 ± 131	3,500 ± 172	5,300 ± 142	900 ± 106	3,700 ± 195	1,900 ± 160
IN	1,100 ± 63	1,000 ± 66	1,100 ± 79	400 ± 119	4,000 ± 80	3,900 ± 89	4,100 ± 86	1,500 ± 122	1,700 ± 79	3,000 ± 134	1,800 ± 102	600 ± 84
MI	26,400 ± 15	31,100 ± 14	28,400 ± 15	25,700 ± 17	146,200 ± 21	159,200 ± 19	144,000 ± 18	121,400 ± 22	80,900 ± 22	93,200 ± 21	106,900 ± 28	74,100 ± 28
MN	9,700 ± 37	13,900 ± 32	17,000 ± 29	11,200 ± 36	38,300 ± 44	55,400 ± 33	76,900 ± 46	40,400 ± 34	16,00 ± 48	34,800 ± 39	44,200 ± 42	31,000 ± 59
OH	1,600 ± 82	1,800 ± 98	3,100 ± 98	600 ± 115	7,200 ± 94	4,300 ± 70	10,200 ± 96	2,600 ± 83	1,200 ± 63	1,700 ± 93	2,300 ± 74	1,500 ± 80
WI	19,400 ± 22	14,600 ± 25	15,200 ± 25	13,700 ± 28	77,100 ± 24	65,700 ± 40	69,000 ± 30	58,000 ± 33	29,200 ± 24	42,300 ± 22	42,600 ± 31	40,400 ± 37

^a All 95% Confidence Intervals are expressed as a % of the point estimate.

^b Regional estimates of hunter numbers cannot be obtained due to the occurrence of individual hunters being registered in the Harvest Information Program in more than one state.

^c Days afield and Harvest estimates are for the entire 18 state Central Region.

4.4.4 Threatened and Endangered Species

Federally listed threatened or endangered species occur infrequently at Crane Meadows NWR. Whooping cranes are currently the only federally-listed species with a range that overlaps Crane Meadows NWR. Currently there are no whooping cranes inhabiting the Refuge. Whooping cranes, however, have been spotted three times in the area over the last 6 years during the spring and fall migration. The sightings were brief; here one day and gone the next. In the case of an observation, the tract will be closed to hunting during the duration of their stop. If their occurrence increases in the future, the Refuge staff will re-evaluate hunting activities to minimize or eliminate any disturbance.

Observations of wolves on the Refuge are limited and those observed are typically considered dispersing individuals. There are no known established packs within the Refuge acquisition boundary, but there are packs nearby (within 20 miles). For this reason, and due to the elusive behavior of wolves, hunters are unlikely to encounter them.

An Intra-Service Section 7 evaluation under the Endangered Species Act is attached as an appendix in the final Crane Meadows NWR CCP. It concluded that the proposed action would have no effect on threatened and endangered species on the Refuge, and thus, the cumulative impact on listed species would be minimal.

The spring turkey hunt coincides with the nesting season of Bald Eagles. During this time eagles are usually incubating for approximately 35 days. Because it is important to restrict any human activity near active eagle nests during this time, the designated turkey hunting areas will be established at least 300 meters away from any active eagle nest on the Refuge. Trumpeter Swans are also common nesters on the Refuge, but are inhabitants of wetlands, areas that will be avoided by turkey hunters.

4.4.5 Habitat

Conserving and restoring habitat for the benefit of wildlife species is an integral part of any long-range plan for National Wildlife Refuges. Thus, any public use activity deemed compatible should have no or minimal disturbance to habitat. Walking is the preferred method of travel to access hunting locations, however, other methods of transportation may be more practical depending on accessibility and the ability of the hunter. Special access accommodations for persons with disabilities will be allowed on a situational basis and approved when reservations are made, but these accommodations will have restrictions to limit adverse impacts to Refuge habitats. No sizeable adverse impacts are expected under this alternative on Refuge habitats.

Additional disturbance to surface soils and vegetation may occur in areas selected for hunting for persons with disabilities. Variables causing disturbance will be controlled, limited to permitted hunting areas, and the anticipated impacts will be minimal. Cutting of sizable vegetation or any other manipulation near or around hunting blinds or access routes will be done prior to the hunt by Service personnel. All hunters will use permanent blinds set up by Refuge personnel or use portable blinds in pre-approved locations. Therefore, there will be no need for additional vegetation removal or destruction. Ingress and egress points will also be restricted to control access by hunters and their assistants to minimize habitat degradation. The Headquarters Unit

has a 3.5 mile trail with roads and a firebreak network already established. These will be used for ingress and egress routes.

Wheeled carts and sleds will be permitted in select areas for hunting and hauling deer out. All hunters and their belongings leave the area each day. No ATVs, OHVs, or snowmobiles are permitted on the Refuge. With these limitations there are no expected adverse impacts of this alternative on habitats. Damage to vegetation is minimal, temporary and should basically be non-detectable.

4.4.6 Other Public Use Activities

Currently all of the public use activities offered at Crane Meadows NWR are confined to the Headquarters Unit. For safety considerations, the Platte River Trail will be closed for the non-hunting visitors at that time. The trail will be closed a day prior to the hunt, as well as during the hunt. This activity will be advertised prior to the event to avoid any inconvenience to visitors and inform them of the hunt.

Hunting is one of the six priority wildlife-dependent recreational uses identified in the National Wildlife Refuge System Improvement Act of 1997. Service policy directs us to provide hunting opportunities when compatible with Refuge management and offering this use was a long-term goal of the Refuge when it was established in 1992. The hunting programs help promote an understanding and appreciation of natural resources and their management. Additionally, hunts on the Refuge provide a traditional recreational activity with no definable adverse impacts to the biological integrity or habitat sustainability of Refuge resources.

4.4.7 Social Implications

As public use levels at Crane Meadows NWR increase over time, unanticipated conflicts between user groups may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize conflicts and to continue providing quality wildlife-dependent recreation opportunities. Experience on many National Wildlife Refuges 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. Overall, the cumulative impact of hunting on other wildlife-dependent recreational activities at Crane Meadows NWR would be minor.

4.5 Cumulative Impact Analysis

"Cumulative impact" is the term that refers to impacts on the environment that result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such additional actions. Cumulative impacts may result from individually minor but collectively significant actions taking place over a period of time. In this section, the cumulative impacts of the Preferred Alternative 1 (No Action) and Alternative 3 (Proposed Action) are fully developed. Alternative 2 was not fully developed as this alternative was deemed not preferred.

4.5.1 Alternative 1: Current Direction (No Action)

4.5.1.A. Cumulative Impact of Proposed Hunt on Wildlife Species

The special hunts that are proposed are limited in time, number of participants, and location.

The Minnesota DNR has established a general framework for hunting seasons of resident species and they select season dates, bag limits, and other regulatory options for the hunting seasons. The Refuge may be more conservative or restrictive in their selections than the state frameworks but never more liberal. The proposed hunts will be consistent with state seasons and regulations. Refuge managers have coordinated with state agencies for preapproval of an early firearms deer hunt for persons with disabilities. Season dates and bag limits for National Wildlife Refuges open to hunting are never longer or larger than the state regulations. At Crane Meadows NWR, the proposed hunts will be limited to state seasons and regulations, and will be more conservative. Finally, hunting activities on the Refuge will be; 1) consistent with resource objectives of the Refuge, and 2) supported by yearly state harvest estimates indicating that target species support a harvestable surplus.

Statewide, the number of annual permits issued to hunters is determined by harvestable surplus, or the number of animals that can be harvested without affecting the breeding population. Because of these monitoring activities and state hunting regulations, there will be no cumulative negative impacts on deer abundance and distribution if a deer hunting season is implemented on the Refuge under any of the alternatives. Natural predators of white-tailed deer, including grey wolves, black bears, and coyotes, have been observed on, or near the Refuge. With the presence of these natural predators and their potential to impact the local and state-wide deer populations, continued annual monitoring will be necessary. Studies in the Midwest have determined that the impacts of predators to deer populations are additive to the existing mortality rate, which includes hunting by humans.

Deer Population

Local (Permit Area 221) Deer Population Assessment and Harvest:

The deer population assessment and harvest statistics for Permit Area 221 are discussed in section 4.4.1.

Regional Deer Population Assessment:

Deer densities continue to increase throughout most of the farmland/transition zone. In central Minnesota, simulated deer densities indicate a slight increasing trend over the last couple years. Efforts to reduce deer in this area may be having an impact on the overall population. Population density estimates in this area were 12 to 16 deer/ mi² in 2009 (MN DNR 2010). The goal for permit area 221 is to reduce the deer herd to 9 to 11 deer/mi² (refer to section 4.4.1 for more details).

Table 4. Pre-fawn deer densities (deer/mi²) as simulated from population modeling for each subdivision in the Farmland Zone of Minnesota (MN DNR)

DMU	Average Density
Karlstad	6
Crookston	6
Mahnomen	6
Morris	4
Osakis	13
Cambridge	12
Hutchinson	6
Minnesota River	6
Slayton	4
Waseca	5
Rochester	13

Figure 4 Subdivisions in Minnesota (MN DNR).



Figure 9. Crane Meadows NWR lies within the Cambridge Deer Management Unit (DMU) in Permit Area 221. Detailed long-term trends for the Cambridge DMU can be reviewed in the following table.

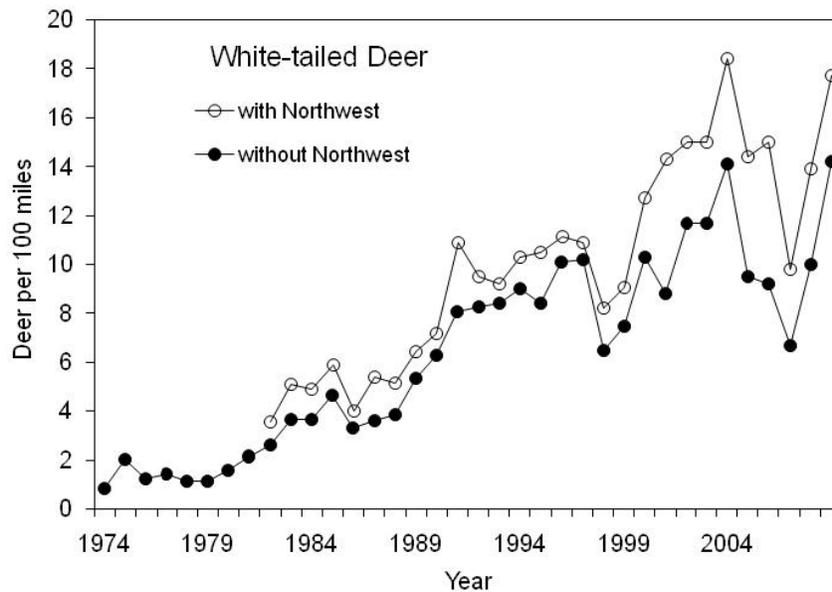
State-wide Deer Population Assessment:

2009 Minnesota August Roadside Survey: The index for white-tailed deer (17.8/100 mi) increased by 30% (95% Confidence Interval (CI): 2 to 58%) from 2008, and was 31% above the 10-year average (95% CI: 8 to 54%) and 104% above the long-term average (95% CI: 61 to 147%). Among regions, deer indices increased significantly from 2008 only in the Southwest region. Based on this survey, the general trend of the deer population in Minnesota is increasing.

Table 11. State-wide trends (% change) in the number of white-tailed deer observed per 100 miles driven, Minnesota August roadside survey, 1955-2009 (MN DNR).

n	Change from 2009 ^a				n	Change from 10-year average			n	Change from long-term average		
	2008	2009	%	95% CI		1999-09	%	95% CI		LTA	%	95 CI
170	13.7	17.8	30	±28	168	13.7	31	±23	169	8.8	104	±43

Figure 10. Minnesota index of white-tailed deer seen per 100 miles driven. Based on all survey routes completed (MN DNR).



State-wide Deer Harvest Statistics:

Pre-harvest population estimates range between 900,000 and 1,200,000 deer in Minnesota. Hunting is used as a tool to manage deer populations at acceptable levels that are sustainable and that limit excessive damage to their surrounding environment through herbivory. Each year, Minnesota hunters harvest around 200,000 deer and in 2012, hunters registered 186,634 deer (approximately 17-20% of the population).

Table 12. Deer Harvest by License Type and Zone, 2012.

Firearms/Zone	Hunters	Harvest			Overall Success
		Bucks	Antlerless	Total	
1	181,143	33,124	25,823	58,947	30.9%
2	238,964	44,345	35,611	79,956	31.8%
3A	25,210	4,578	4,235	8,813	31.2%
3B	13,099	1,256	3,566	4,822	32.4%
CWD	1,911	498	731	1,229	46.0%
Free Landowner ¹	4,773	0	1,499	1,499	31.5%
Muzzleloader ²	59,384	3,251	4,528	7,779	12.4%
Archery ³	102,276	8,663	12,942	21,605	18.8%
TOTAL⁴	514,020	97,136	89,498	186,634	33.7%

¹Includes deer taken during regular firearms, muzzleloader, and archery seasons.

²Total number of people who bought only a muzzleloader license was 6,989.

³Includes Camp Ripley. Total number of people who bought only an archery license was 32,495.

⁴Due to the fact that a hunter can buy multiple licenses, hunter numbers and success rates are calculated using unique MNDNR numbers.

Cumulative Impacts Summary for Proposed White-tailed Deer Hunting Opportunities at Crane Meadows NWR

Crane Meadows NWR is in the land acquisition phase and contains approximately 2,100 acres in fee title. Deer harvest rates for the deer hunting season will be set jointly each year by MNDNR and Refuge staff based on an annual winter deer survey, harvest rates from previous years, and biological opinion. This annual assessment allows managers to react accordingly by either increasing or decreasing harvest rates based on deer densities. Crane Meadows NWR will be offering a very limited hunt. With each hunter being successful, the maximum number of deer harvested on the Refuge is 15/year. The hunting opportunity described under Alternative 1 will have minimal impacts on the local and permit area-wide deer population. Thus, this hunt has a minimum effect on the long-term deer population in this unit and a miniscule impact on the state-wide deer population of 1.2 million deer.

Table 13. Cumulative impacts of existing deer hunt in PA 221 (2012 data) and potential deer hunt on the Refuge compared to state-wide harvest.

Hunt Location & Type	Harvest
PA 221 Firearms	2209
PA221 Archery	314
PA 221 Total Harvest	2653
Zone 2	78,524
State-wide Harvest (all types)	186,634

Wild Turkey

Refer to section 4.4.2 for turkey population assessment and harvest information for local levels (Permit Area 221).

State-wide Population Assessment and Harvest:

Minnesota offers fall and spring turkey hunting seasons. The fall turkey season was 30 days in length (October 1-30) and allowed for an unlimited number of hunters to take one wild turkey of either sex. Although there were an unlimited number of hunters, each hunter needed to select and could only hunt in 1 of the 12 permit areas (PAs) (Figure 11). The spring turkey season regulated harvest and distributed hunting pressure by allocating permits across the 12 PAs and 8

time periods using a quota system for the first 4 time periods. During spring, adult hunters interested in pursuing turkeys for the first 4 time periods were required to apply for a permit through a lottery system but youth hunters were able purchase a permit over-the-counter during these time periods. Preference for this lottery system was determined by the number of years a valid but unsuccessful application had been submitted since last receiving a permit. Hunters could apply individually or in a group of up to 4 hunters. Successful applicants were notified through U.S. Mail and unsuccessful applicants were awarded a preference point. Hunters could simply purchase a permit over-the-counter for the last 4 seasons. The goal of this system was to provide quality turkey hunting opportunities by minimizing hunter interference rates while allowing hunters to take the harvestable surplus of turkeys.

Fall 2012 Turkey Season – This was the first year that a quota system was not used to restrict hunter numbers during the fall season. Consequently, the number of permits issued to hunters doubled from 5,382 permits in 2011 to 10,779 permits in 2012 (Table 14, Figure 12).

There were 1,753 turkeys harvested during Fall 2012, which was about 400 more turkeys than the record harvest in 2010. Hunter success rates ranged from 10-19% at the permit area level and averaged 16% at the statewide level, which was slightly below the 5-year average of 22%. These lower hunter success rates may be related to hunters interested in harvesting a turkey opportunistically while pursuing other species and therefore were expending less effort; and/or allowing more casual turkey hunters who may not have as much experience with turkey hunting during the fall season. It is unlikely these reduced hunter success rates are related to fewer turkeys in the pre-hunt population because turkey population growth rates have been stable to slightly increasing throughout Minnesota (Giudice et al. 2011) and the 2011-12 winter was relatively mild, which would suggest that above average survival and reproduction rates occurred the previous year. Weather conditions were favorable throughout the season and most crops were harvested in early- to mid-October.

Spring 2013 Turkey Season – There were 38,831 permits issued during the spring season, including 19,113 general/landowner permits, 5,539 youth permits, 4,550 archery permits, and 9,629 surplus permits (Table 14). Hunters registered 10,390 turkeys (Table 14), which was about 12% below the 5-year average (Figure 13). Hunter success rates averaged 30% at the statewide level, which matched the 5-year average of 30% (Table 14). The winter of 2012-13 was relatively mild through February, but then measurable snow was on the ground through much of April in most of the range where turkeys were abundant in Minnesota. The impact of the delayed but extended winter weather on turkey populations is unknown, but it is reasonable to believe that the winter-like weather affected hunter effort and turkey movement patterns. This likely explains much of the reduced harvest success rates and hunter participation rates, particularly during the first few hunting time periods.

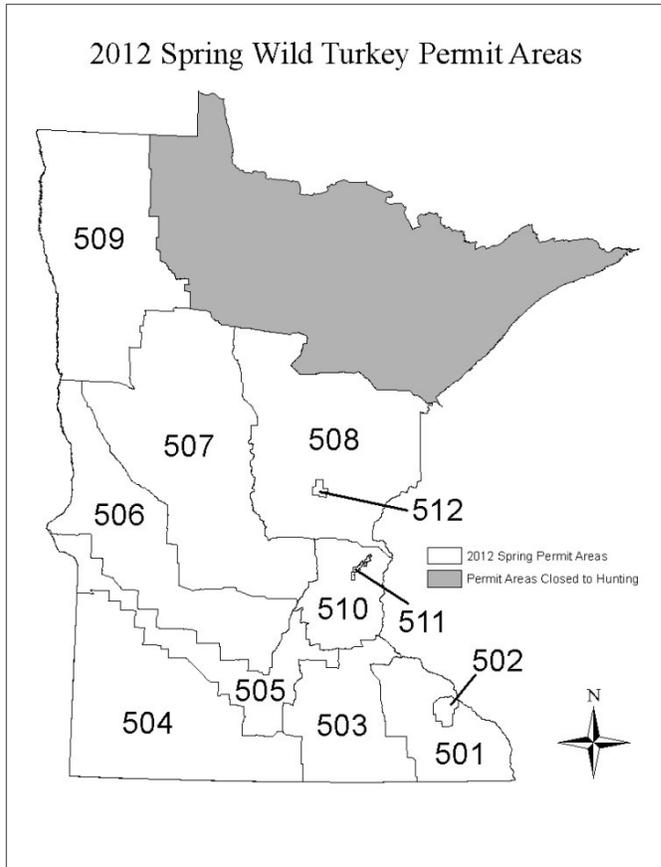


Figure 11. Permit areas open for hunting during spring turkey hunting seasons in Minnesota.

Hunters registered almost 13,500 turkeys in the spring of 2013, an increase of 10% from 2009 and the highest turkey harvest on record. Hunter success averaged 29%, which is below the 5-year average of 32%. Hunter success by PA ranged from 13% to 40%. Hunter success varied by license type from 7% (archery) to 31% (youth), 36% (general lottery and landowner), and 42% (surplus). Similar to the 10-year average, hunter success rates were highest during the first 2 time periods (Table 11). The majority of general lottery (71%), landowner (92%), and youth (79%) permits were issued during time periods A – D, while the majority of surplus permits (98%) were issued during time periods E – H (Table 11). The 8,490 permits issued to resident and non-resident youth hunters (general lottery, surplus, archery, and mentored) in 2010 was a 69% increase over the 5,024 youth permits issued in 2009. Approximately 10% (1,398) of harvested turkeys were registered using the phone registration system, 12% (1,662) through the internet, and 77% (10,407) at a registration station (MN DNR, 2010).

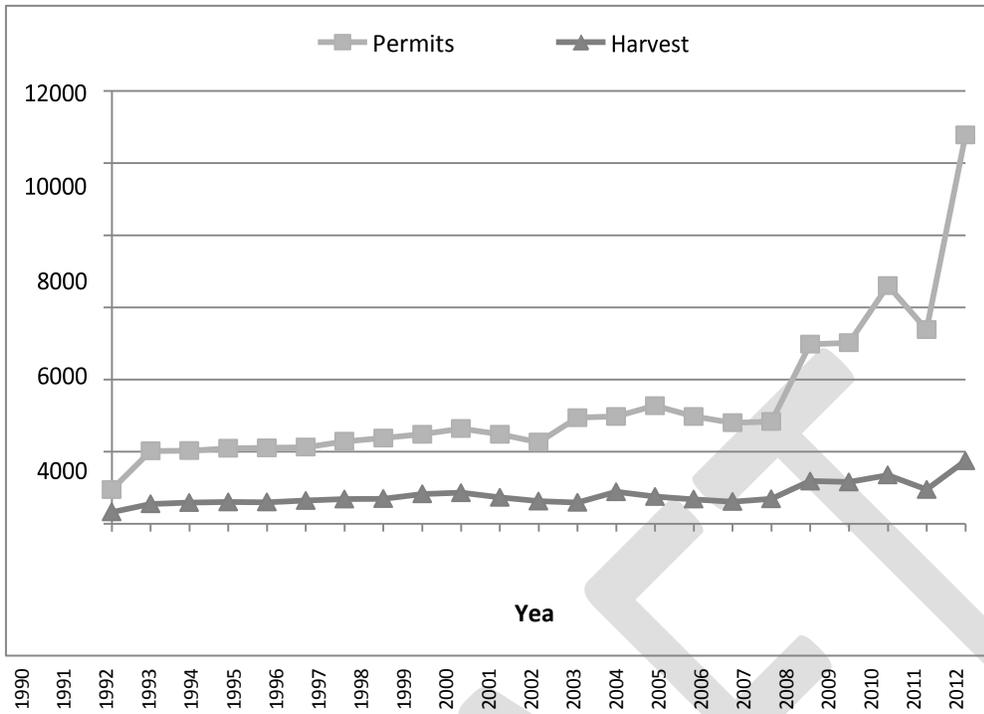


Figure 12. Permits issued and registered harvest for fall wild turkey seasons, 1990-2012, Minnesota.

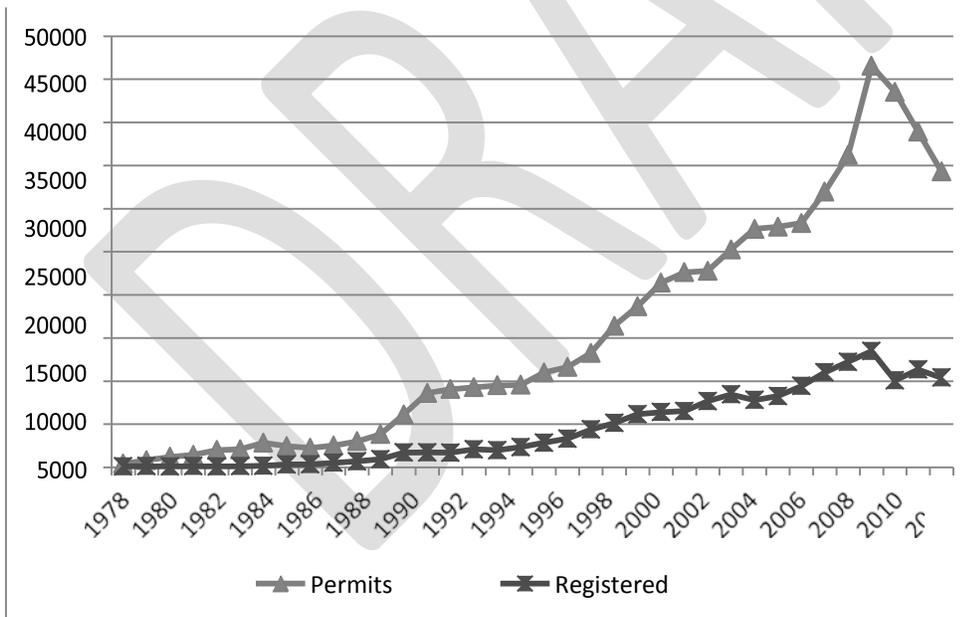


Figure 13. Permits issued and registered harvest for spring wild turkey seasons, 1978-2013, Minnesota.

Year	Permits				
	Available	Issued	Issued	Registered	Success
1978	420	411	97.9	94	23
1979	840	827	98.5	116	14
1980	1,200	1,191	99.3	98	8
1981	1,500	1,437	95.8	113	8
1982	2,000	1,992	99.6	106	5
1983	2,100	2,079	99.0	116	6
1984	3,000	2,837	94.6	178	6
1985	2,750	2,449	89.1	323	13
1986	2,500	2,251	90.0	333	15
1987	2,700	2,520	93.3	520	21
1988	3,000	2,994	99.8	674	23
1989	4,000	3,821	95.5	930	24
1990	6,600	6,126	92.8	1,709	28
1991	9,170	8,607	93.9	1,724	20
1992	9,310	9,051	97.2	1,691	19
1993	9,625	9,265	96.3	2,082	23
1994	9,940	9,479	95.4	1,975	21
1995	9,975	9,550	95.7	2,339	25
1996	12,131	10,983	90.5	2,841	26
1997	12,530	11,610	92.7	3,302	28
1998	14,035	13,229	94.3	4,361	33
1999	18,360	16,387	89.3	5,132	31
2000	20,160	18,661	92.6	6,154	33
2001	22,936	21,404	93.3	6,383	30
2002	24,136	22,607	93.7	6,516	29
2003	25,016	22,770	91.0	7,666	34
2004	27,600	25,261	91.5	8,434	33
2005	31,748	27,638	87.1	7,800	28
2006	32,624	27,876	85.4	8,241	30
2007 ^b	33,976	28,320	83.4	9,412	33
2008 ^b	37,992	31,942	84.1	10,994	34
2009 ^b	42,328	36,193	85.5	12,210	34
2010 ^b	55,982	46,548 ^c	83.0	13,467	29
2011 ^b	Unlimited	43,521 ^c	N/A	10,055	23
2012 ^b	Unlimited	38,906 ^c	N/A	11,325	29
2013 ^b	Unlimited	34,281 ^c	N/A	10,390	30

Table 14. Permits available, permits issued, and registered harvest from 1978 – 2013 for all spring wild turkey hunting seasons in Minnesota.

^a Success rates not adjusted for non-participation

^b Youth hunt data included

^c Permits issued to archery hunters were not included. There were 2,462, 3,911, and 4,550 permits issued to archers in 2011, 2012, and 2013, respectively

Cumulative Impacts Summary for Current Turkey Hunting Opportunities at Crane Meadows NWR

Turkey hunting on the Refuge will be limited in time, number of people, and location to prevent conflict with other non-consumptive uses on the Refuge and to help eliminate any potential cumulative impacts to the environment or other wildlife species. The bag limit for the disabled and youth turkey hunting on the Refuge will be consistent with state regulations for the spring; one Wild Turkey with a visible beard per hunter. Thus, only a maximum of 40 turkeys may be harvested on the Refuge per year but based on average hunter success rate of 30 percent in Permit Area 508, the probability of bagging the maximum harvest per season is low. If a 30% success rate is applied to the hunt at Crane Meadows NWR, 12 turkeys would be harvested and this accounts for approximately 10 percent of the 2009 harvest (197 birds).

The turkey population and permits issued in PA 508, as well as statewide, have increased steadily since 1978 (see figure 12 and 13). Those population estimates and a significant increase in permit availability from the state, indicate that the population within the Refuge can easily sustain this type of managed, limited harvest without cumulative impacts to local or state-wide populations. The local population may experience minimal impacts and a slight increase in mortality due to Refuge hunts, but it will be miniscule and will only contribute an extremely small percentage of total Wild Turkey harvest in the state. For this reason, the current hunt will have no cumulative impacts on the local or state turkey populations.

Other Wildlife Species

The cumulative effects of disturbance to non-hunted species due to deer hunting under Alternative 1 is expected to be minimal since deer hunting is conducted in the fall of each year and does not coincide with the breeding seasons of other wildlife species.

Cumulative impacts of the proposed turkey hunt to migratory species at the “flyway” level (i.e. Mississippi Flyway) should be negligible. Disturbance by hunting to non-migratory birds, mammals, reptiles, insects, etc. should not have cumulative negative impacts for the following reasons; 1) the overall hunting season and size of hunt (number of people involved) is limited to the spring and a maximum of 10 people per 5-day period (5 hunters plus 5 assistants), 2) turkey hunting is generally a quiet activity, and 3) any potential disturbance will be temporary. Disturbance to these species by hunters would probably be commensurate with that caused by non-consumptive users.

Threatened and Endangered Species

At the time of the completion of the 2010 CCP, Federally listed Threatened Species that occur on Crane Meadows NWR include Whooping Cranes.

Whooping Crane: The potential for cumulative impacts on Whooping Cranes is extremely low and should have no effect because there are no breeding pairs currently on the refuge and in the case of there being Whooping Cranes on a tract, the area will be closed to any activities.

4.5.1.B. Cumulative Impact of Current Hunt on Refuge Programs, Facilities, and Cultural Resources

OTHER REFUGE-WILDLIFE-DEPENDENT RECREATION

The Refuge receives about 10,000 visitors each year. Most of the visitation is from May through October for bird and wildlife observations and Refuge programs. The number of observation visitors significantly decreases in November and December. Lowest visitation occurs during the winter months. There will be overlap with the hunter user group, as well as other user groups on the Headquarters Tract, however, the Sedge Meadow and Platte River West tracts are not open to wildlife-dependent visitor uses.

REFUGE FACILITIES

The Service defines facilities as: “Real property that serves a particular function(s) such as buildings, roads, utilities, water control structures, raceways, etc.” Under the proposed action, the facilities most utilized by hunters are roads and parking lots. Any needed maintenance or improvement of existing roads and parking areas will cause minimal short term impacts to localized soils and may also cause some wildlife disturbances and damage to vegetation near Refuge facilities. Facility maintenance and improvements described are periodically conducted to accommodate daily Refuge management operations and general public uses such as wildlife observation and photography. These activities are and will be conducted at times (seasonal and/or daily) to cause the least amount of disturbance to wildlife.

Disturbance by vehicles will be limited to existing roads (Refuge and County roads) and parking lots. Refuge roads and parking lots are regularly used by Service vehicles, visitors, and volunteers throughout the year. Off-road travel will not be permitted. Special access accommodations for persons with disabilities will be allowed on a situational basis, however, these access routes will be established prior to the actual hunt. No adverse impacts are expected on Refuge roads, parking lots, or trails.

CULTURAL RESOURCES

No site listed on the National Register of Historic Places is located on the Refuge within the proposed hunting area. 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. Hunting meets only one of the two criteria (#2 listed below) 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 delineated 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, licenses, or have received assistance from the agency.

Consultation with the pertinent State Historic Preservation Office and federally recognized Tribes are, therefore, not required.

Hunting activities will result in little or no ground disturbance near cultural resources or disturbance to standing structures and will have no effect on any historical properties.

4.5.1.C. Cumulative Impact of Current Hunt on Refuge Environment and Community

Because the proposed hunts are limited in time, numbers of people, and location, Refuge personnel expect no adverse impacts of this alternative on the Refuge environment which includes soils, vegetation, air quality, water quality, hydrology, and solitude. Some disturbance to surface soils and vegetation occur, however, they are minimal and temporary. Hunting can indirectly benefit vegetation as it is used to keep deer populations in balance with the environment by reducing herbivory, thereby benefiting vegetative communities and associated wildlife species.

The local community and the state of Minnesota, in general, strongly support outdoor activities such as deer hunting. The state has passed legislation ensuring the right of Minnesotans to hunt.

Impacts to the natural hydrology and air quality will be minimal. The Refuge expects impacts to air and water quality to be very minimal and only due to visitor use of automobiles for transportation. Existing state water quality criteria and regulations on use are adequate to achieve or maintain desired on-Refuge conditions; thus, implementation of this alternative should not have cumulative impacts on the Refuge environment.

The overall impact to the community will be positive. The hunts will be limited and short in duration. These “special hunts” are unique. This may help lighten the negative feelings of the non-hunters. Based on the small and fragmented nature of current lands managed by the Refuge, offering special hunting opportunities will meet the expectations of the local community. If conflicts between user groups occur, the Service’s experience has proven that time and space zoning can be an effective tool in eliminating issues between user groups. These will be handled on a case by case basis. The onsite manager, in consultation with the Project Leader, will determine if such a tool is necessary to limit conflicts.

Managing a hunt program on the Refuge will help promote an understanding and appreciation of natural resources and their management throughout the community. Additionally, managed hunts on the Refuge provide a traditional recreational activity with no definable adverse impacts to the biological integrity of Refuge resources.

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

As additional land is acquired, Refuge staff will re-evaluate the areas available and safe for hunting. The goal is to provide an additional wildlife-dependent public use on the Refuge and to offer it to as many individuals as possible. On the other hand, safety, compatibility, and quality are the priority objectives behind each hunt.

4.5.1.E. Anticipated Impacts if Individual Hunts are Allowed to Accumulate

National Wildlife Refuges have conducted hunting programs within the framework of State and Federal regulations. The protocol is at least as restrictive as the State of Minnesota and in some cases the hunts will be more restrictive. By maintaining hunting regulations that are as, or more, restrictive than the State's, the Refuge ensures it will be maintaining seasons which are supportive of management on a regional basis.

Hunts will always be restricted with respect to duration, areas being opened, and the number of hunters allowed to participate. Each hunt will be planned and well-orchestrated. Wildlife comes first on a National Wildlife Refuge. The hunt program, as well as other visitor use programs will be discontinued if there is any definable adverse impact to the biological integrity or habitat sustainability of Refuge resources.

4.5.2 Alternative 2: No Hunting

4.5.2.A. Cumulative Impact of No Hunting on Wildlife Species

In general, if left unchecked deer populations have a tendency to increase to unnatural levels in the absence of the natural abundance of their predators. If the deer population becomes over abundant, it may have profound detrimental impacts to the ecosystem through herbivory. Thus, it is important to monitor deer populations in areas that do not allow harvest and initiate a hunting program following state guidelines on the Refuge. However, the land base managed by the Refuge is relatively small and fragmented; thereby being heavily influenced by the surrounding area where hunting is likely permitted.

4.5.2.B. Cumulative Impact of No Hunting on Refuge Programs, Facilities, and Cultural Resources

There would be no impact on other Refuge programs, facilities or cultural resources since it is an activity which is not allowed. By not allowing hunting, however, the Refuge is restricting that recreational activity from the six priority wildlife-dependent uses identified in the National Wildlife Refuge Improvement Act of 1997. Public hunting has been allowed for many years by the Service on other refuges; thus, Crane Meadows NWR is currently not consistent with the program administered by the U.S. Fish & Wildlife Service for refuges.

4.5.2.C. Cumulative Impact of No Action on Refuge Environment and Community

An over population of deer will have negative impacts on the environment. For more details see section 4.5.1.A.

Restricting hunting will not meet the expectations of the majority of the public or partners. A minority of those that provided input want the Refuge to remain closed to hunting, similar to a wildlife sanctuary with little to no disturbance by humans which does not meet the goals of the National Wildlife Refuge Improvement Act of 1997.

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

As additional land is acquired, Refuge staff will re-evaluate the areas available and safe for hunting. The goal is to provide an additional wildlife-dependent public use on the Refuge and to offer it to as many individuals as possible. On the other hand, safety, compatibility and quality are the priority objectives behind each hunt.

4.5.2.E. Anticipated Impacts if Individual Hunts are Allowed to Accumulate

National Wildlife Refuges have conducted hunting programs within the framework of State and Federal regulations. The protocol is at least as restrictive as the State of Minnesota and in some cases the hunts will be more restrictive. By maintaining hunting regulations that are as, or more, restrictive than the State's, the Refuge ensures it will be maintaining seasons which are supportive of management on a regional basis.

Hunts will always be restricted with respect to duration, areas being opened, and the number of hunters allowed to participate. Each hunt will be planned and well-orchestrated while keeping in mind that wildlife comes first on a National Wildlife Refuge. The hunt program, as well as other visitor use programs, will be discontinued if there is any definable adverse impact to the biological integrity or habitat sustainability of Refuge resources.

4.5.3 Alternative 3: Expand Hunting Opportunities within Limitations to Refuge Specific Regulations (Proposed Action Alternative)

4.5.3.A. Cumulative Impact of Proposed Hunt on Wildlife Species.

The state has established a general framework for hunting seasons of resident species and they select season dates, bag limits, and other regulatory options for the hunting seasons. The Refuge may be more conservative or restrictive in their selections than the state frameworks but never more liberal. The proposed hunts will be consistent with state seasons and regulations. Refuge managers have coordinated with state agencies for preapproval of an early firearms deer hunt for persons with disabilities. Season dates and bag limits for National Wildlife Refuges open to hunting are never longer or larger than the state regulations. At Crane Meadows NWR, the proposed hunts will be limited to state seasons and regulations, and will be more conservative. Finally, hunting activities on the Refuge will be; 1) consistent with resource objectives of the Refuge, and 2) supported by yearly state harvest estimates indicating that target species support a harvestable surplus.

Statewide, the number of annual permits issued to hunters is determined by harvestable surplus, or the number of animals that can be harvested without affecting the breeding population. Because of these monitoring activities and state hunting regulations, there will be no cumulative negative impacts on deer abundance and distribution if a deer hunting season is implemented on the Refuge under any of the alternatives. Natural predators of white-tailed deer, including gray wolves, black bears, and coyotes, have been observed on, or near the Refuge. With the presence of these natural predators and their potential to impact the local and state-wide deer populations,

continued annual monitoring will be necessary. Studies in the Midwest have determined that the impacts of predators to deer populations are additive to the existing mortality rate, which includes hunting by humans.

Deer Population

Local (Permit Area 221) Deer Population Assessment and Harvest:

The deer population assessment and harvest statistics for Permit Area 221 are discussed in section 4.4.1.

Regional Deer Population Assessment:

Deer densities continue to increase throughout most of the farmland/transition zone. In central Minnesota, simulated deer densities indicate a slight increasing trend over the last couple years. Efforts to reduce deer in this area may be having an impact on the overall population. Population density estimates in this area were 12 to 16 deer/ mi² in 2009 (MN DNR 2010). The goal for permit area 221 is to reduce the deer herd to 9 to 11 deer/mi² (refer to section 4.4.1 for more details).

Table 4. Pre-fawn deer densities (deer/mi²) as simulated from population modeling for each DMU in the Farmland Zone of Minnesota (MN DNR)

DMU	Average Density
Karlstad	6
Crookston	6
Mahnomen	6
Morris	4
Osakis	13
Cambridge	12
Hutchinson	6
Minnesota River	6
Slayton	4
Waseca	5
Rochester	13

Figure 4. DMU subdivisions in Minnesota (MN DNR).



Figure 14. Crane Meadows NWR lies within the Cambridge DMU in Permit Area 221. Detailed long-term trends for the Cambridge DMU can be reviewed in the following table.

State-wide Deer Population Assessment:

Pre-harvest population estimates range between 900,000 and 1,200,000 deer in Minnesota. Hunting is used as a tool to manage deer populations at acceptable levels that are sustainable and that limit excessive damage to their surrounding environment through herbivory. Each year,

Minnesota hunters harvest around 200,000 deer and in 2012, hunters registered 186,634 deer (approximately 17-20% of the population).

Table 15. Deer Harvest by License Type and Zone, 2012.

Firearms/Zone	Hunters	Harvest			Overall Success
		Bucks	Antlerless	Total	
1	181,143	33,124	25,823	58,947	30.9%
2	238,964	44,345	35,611	79,956	31.8%
3A	25,210	4,578	4,235	8,813	31.2%
3B	13,099	1,256	3,566	4,822	32.4%
CWD	1,911	498	731	1,229	46.0%
Free Landowner ¹	4,773	0	1,499	1,499	31.5%
Muzzleloader ²	59,384	3,251	4,528	7,779	12.4%
Archery ³	102,276	8,663	12,942	21,605	18.8%
TOTAL⁴	514,020	97,136	89,498	186,634	33.7%

¹Includes deer taken during regular firearms, muzzleloader, and archery seasons.

²Total number of people who bought only a muzzleloader license was 6,989.

³Includes Camp Ripley. Total number of people who bought only an archery license was 32,495.

⁴Due to the fact that a hunter can buy multiple licenses, hunter numbers and success rates are calculated using unique MNDNR numbers.

Cumulative Impacts Summary for Proposed White-tailed Deer Hunting Opportunities at Crane Meadows NWR

Crane Meadows NWR is in the land acquisition phase and contains approximately 2,100 acres in fee title. Deer harvest rates for the deer hunting season will be set jointly each year by MNDNR and Refuge staff based on an annual winter deer survey, harvest rates from previous years, and biological opinion. This annual assessment allows managers to react accordingly by either increasing or decreasing harvest rates based on deer densities. If the average harvest for PA 221 is 3.4 deer/mi² then that number can be used as a representative figure for estimating potential take on Crane Meadows NWR. At approximately 2,100 acres, the Refuge could assume, if all that land was huntable, 11.15 more deer would be taken across the entire 647 sq. mile PA 221. With a deer harvest around 2,653 for PA 221 in 2012 alone, 11.15 deer becomes a negligible number. The hunting opportunity described under Alternatives 1 will have minimal impacts on the local and permit area-wide deer population. Thus, this hunt has a minimum effect on the long-term deer population in this unit and miniscule impact on the state-wide deer population of 1.2 million deer.

Wild Turkey

Refer to section 4.4.2 for turkey population assessment and harvest information for local levels (Permit Area 508).

State-wide Population Assessment and Harvest:

Minnesota offers fall and spring turkey hunting seasons. The fall turkey season was 30 days in length (October 1-30) and allowed for an unlimited number of hunters to take one wild turkey of either sex. Although there were an unlimited number of hunters, each hunter needed to select and could only hunt in 1 of the 12 permit areas (PAs) (Figure 1). The spring turkey season regulated harvest and distributed hunting pressure by allocating permits across the 12 PAs and 8 time periods using a quota system for the first 4 time periods. During spring, adult hunters interested in pursuing turkeys for the first 4 time periods were required to apply for a permit through a lottery system but youth hunters were able purchase a permit over-the-counter during these time periods. Preference for this lottery system was determined by the number of years a valid but unsuccessful application had been submitted since last receiving a permit. Hunters could apply individually or in a group of up to 4 hunters. Successful applicants were notified through U.S. Mail and unsuccessful applicants were awarded a preference point. Hunters could simply purchase a permit over-the-counter for the last 4 seasons. The goal of this system was to provide quality turkey hunting opportunities by minimizing hunter interference rates while allowing hunters to take the harvestable surplus of turkeys.

Fall 2012 Turkey Season – This was the first year that a quota system was not used to restrict hunter numbers during the fall season. Consequently, the number of permits issued to hunters doubled from 5,382 permits in 2011 to 10,779 permits in 2012 (Table 1, Figure 2).

There were 1,753 turkeys harvested during Fall 2012, which was about 400 more turkeys than the record harvest in 2010. Hunter success rates ranged from 10-19% at the permit area level (Table 2) and averaged 16% at the statewide level, which was slightly below the 5-year average of 22%. These lower hunter success rates may be related to hunters interested in harvesting a turkey opportunistically while pursuing other species and therefore were expending less effort; and/or allowing more casual turkey hunters who may not have as much experience with turkey hunting during the fall season. It is unlikely these reduced hunter success rates are related to fewer turkeys in the pre-hunt population because turkey population growth rates have been stable to slightly increasing throughout Minnesota (Giudice et al. 2011) and the 2011-12 winter was relatively mild, which would suggest that above average survival and reproduction rates occurred the previous year. Weather conditions were favorable throughout the season and most crops were harvested in early- to mid-October.

Spring 2013 Turkey Season – There were 38,831 permits issued during the spring season, including 19,113 general/landowner permits, 5,539 youth permits, 4,550 archery permits, and 9,629 surplus permits (Table 2). Hunters registered 10,390 turkeys (Table 3), which was about 12% below the 5-year average (Figure 3). Hunter success rates averaged 30% at the statewide level, which matched the 5-year average of 30% (Table 3). The winter of 2012-13 was relatively mild through February, but then measurable snow was on the ground through much of April in most of the range where turkeys were abundant in Minnesota. The impact of the delayed but extended winter weather on turkey populations is unknown, but it is reasonable to believe that the winter-like weather affected hunter effort and turkey movement patterns. This likely explains much of the reduced harvest success rates and hunter participation rates,

particularly during the first few hunting time periods. Wisconsin and Iowa both reported similar trends in spring 2013 wild turkey harvests as well.

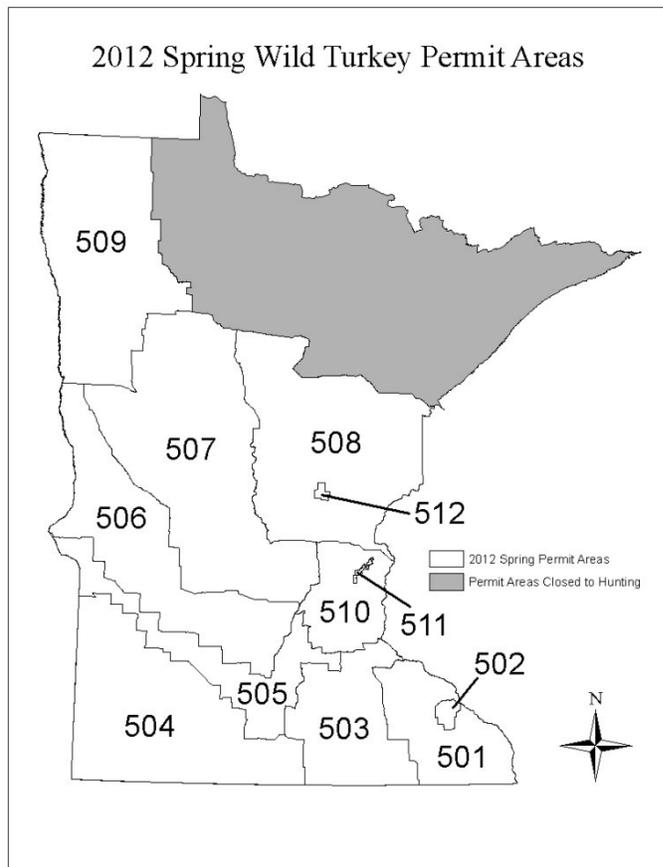


Figure 15. Permit areas open for hunting during the 2013 spring turkey hunting season, Minnesota.

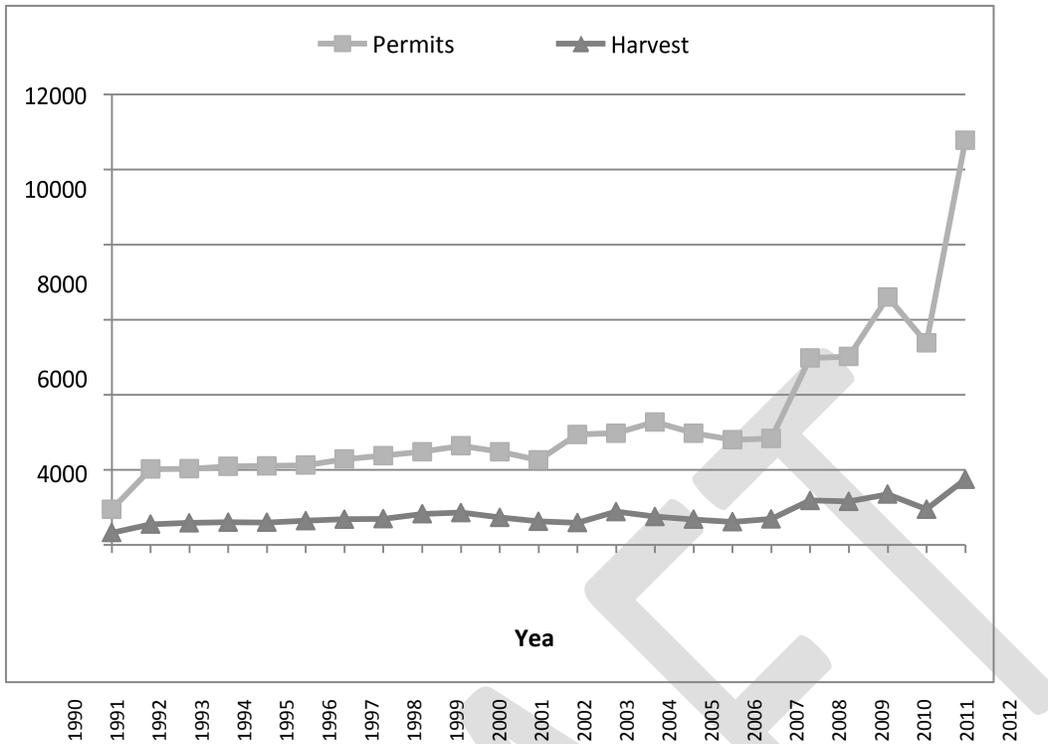


Figure 16. Permits issued and registered harvest for fall wild turkey seasons, 1990-2012, Minnesota.

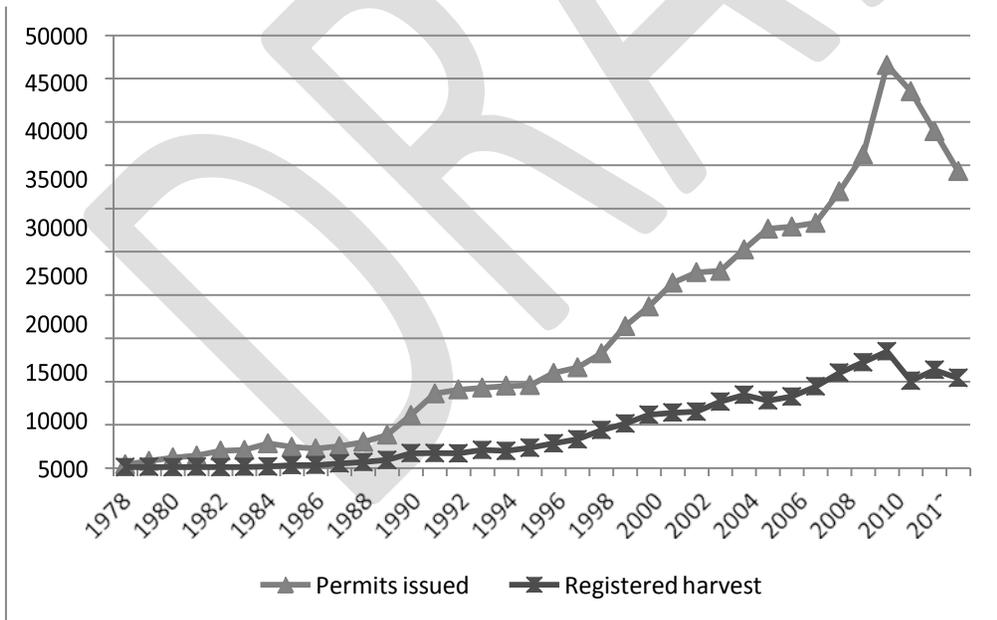


Figure 17. Permits issued and registered harvest for spring wild turkey seasons, 1978-2013, Minnesota.

Year	Permits				
	Available	Issued	Issued	Registered	Success
1978	420	411	97.9	94	23
1979	840	827	98.5	116	14
1980	1,200	1,191	99.3	98	8
1981	1,500	1,437	95.8	113	8
1982	2,000	1,992	99.6	106	5
1983	2,100	2,079	99.0	116	6
1984	3,000	2,837	94.6	178	6
1985	2,750	2,449	89.1	323	13
1986	2,500	2,251	90.0	333	15
1987	2,700	2,520	93.3	520	21
1988	3,000	2,994	99.8	674	23
1989	4,000	3,821	95.5	930	24
1990	6,600	6,126	92.8	1,709	28
1991	9,170	8,607	93.9	1,724	20
1992	9,310	9,051	97.2	1,691	19
1993	9,625	9,265	96.3	2,082	23
1994	9,940	9,479	95.4	1,975	21
1995	9,975	9,550	95.7	2,339	25
1996	12,131	10,983	90.5	2,841	26
1997	12,530	11,610	92.7	3,302	28
1998	14,035	13,229	94.3	4,361	33
1999	18,360	16,387	89.3	5,132	31
2000	20,160	18,661	92.6	6,154	33
2001	22,936	21,404	93.3	6,383	30
2002	24,136	22,607	93.7	6,516	29
2003	25,016	22,770	91.0	7,666	34
2004	27,600	25,261	91.5	8,434	33
2005	31,748	27,638	87.1	7,800	28
2006	32,624	27,876	85.4	8,241	30
2007 ^b	33,976	28,320	83.4	9,412	33
2008 ^b	37,992	31,942	84.1	10,994	34
2009 ^b	42,328	36,193	85.5	12,210	34
2010 ^b	55,982	46,548 ^c	83.0	13,467	29
2011 ^b	Unlimited	43,521 ^c	N/A	10,055	23
2012 ^b	Unlimited	38,906 ^c	N/A	11,325	29
2013 ^b	Unlimited	34,281 ^c	N/A	10,390	30

Table 17. Permits available, permits issued, and registered harvest from 1978 – 2013 for all spring wild turkey hunting seasons in Minnesota.

^a Success rates not adjusted for non-participation

Cumulative Impacts Summary for Proposed Turkey Hunting Opportunities at Crane Meadows NWR

Turkey hunting on the Refuge will be limited in time, number of people, and location to prevent conflict with other non-consumptive uses on the Refuge and to help eliminate any potential cumulative impacts to the environment or other wildlife species. Based on an average hunter success rate of 30 percent in Minnesota, the probability of significant harvest per season is low. The turkey population and permits issued in this zone, as well as statewide, have increased steadily since 1978. Those population estimates paired with a significant increase in permit availability from the state, indicate that the population within the Refuge can easily sustain this type of managed harvest without cumulative impacts to local or state-wide populations. The local population may experience minimal impacts and a slight increase in mortality due to Refuge hunts, but it will be miniscule and will only contribute an extremely small percentage of total Wild Turkey harvest in the state. For this reason, the proposed hunt will have no cumulative impacts to the local or state turkey populations.

Small Game

The Minnesota Department of Natural Resources (DNR), Division of Fish and Wildlife, Wildlife Research unit annually conducts a survey of small game hunters. Annual harvest estimates from survey data provide guidance for future hunting regulations and season structure. The following tables are the results of those surveys. Since the MNDNR does separate the population goals and data into smaller areas, more detailed results may be found in chapter 4.4.2 where the state level populations were addressed.

The models that the state has created in order to mitigate any significant population effects are based on the premise that the number of individuals taken would otherwise be lost through natural causes. Basing the bag limits on achieving a stable population by using that model has provided a fairly constant rate of hunter success as seen in Table 18, 19 and 20 below. Evaluation of the numbers found for each species in chapter 4.4.2 and the following tables provide tangible evidence that the opening of Crane Meadows NWR to hunting will have an insignificant effect on the state's overall population.

Table 18. Estimated harvest per hunter, for respondents reporting that they hunted a particular species, 2000-01 through 2012-13.

	Estimated take per hunter												
	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Ducks	8.9	9.1	9.2	9.0	6.9	7.3	8.4	8.1	8.1	7.4	8.5	8.8	9.2
Canada geese	3.9	4.0	3.3	3.9	3.8	4.1	4.9	3.9	4.9	4.1	4.8	4.8	4.9
Other geese	2.2	1.2	1.9	1.7	1.5	1.9	1.5	2.1	3.2	1.9	1.1	2.2	2.2
American coot	2.7	4.5	4.6	2.8	4.0	3.9	5.6	4.6	5.7	3.6	5.7	3.2	3.8
Common snipe	1.3	1.3	1.5	1.8	1.1	4.4	1.9	2.0	1.2	1.1	1.4	1.2	1.1
American woodcock	2.8	2.3	2.4	2.4	3.5	2.5	3.2	2.6	2.4	3.0	2.8	2.6	2.3
Mourning dove γ					6.2	7	6.7	7.7	11.4	10.5	9.4	7.8	9.0
Ring-necked pheasant	3.7	3.2	3.9	4.9	4.0	5.3	4.9	5.5	4.9	4.0	4.0	2.6	3.1
Ruffed grouse	5.1	3.3	2.8	3.8	2.5	2.9	4.5	3.2	3.7	4.1	5.0	4.3	3.7
Gray squirrel	5.3	5.6	5.2	6.0	5.7	5.0	5.5	5.2	5.4	4.9	5.9	4.9	4.7
Fox squirrel	3.9	4.1	4.5	4.2	4.1	4.1	4.2	3.2	3.9	4.1	3.9	3.7	3.4
Eastern cottontail	3.9	3.6	3.3	4.3	4.6	4.5	3.9	4.0	4.5	3.5	3.6	2.8	3.6

Table 19. Estimated number of statewide hunters by species, 2000-01 through 2012-13.

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Ducks	109,008	109,241	111,619	101,487	104,634	92,634	87,075	87,468	81,358	77,705	72,772	83,450	90,400
Canada goose	76,518	76,322	78,574	74,855	74,728	69,416	66,224	62,649	59,222	55,599	53,426	61,190	64,990
Other geese	6,834	6,502	5,981	7,373	5,327	4,628	4,529	3,695	4,411	3,275	3,647	3,020	4,110
American coot	3,809	3,901	4,411	3,912	5,099	4,129	4,529	3,454	4,166	4,094	4,614	4,580	4,700
Common snipe	2,241	1,382	2,243	1,429	1,902	1,210	2,187	1,928	1,797	1,340	1,340	1,240	1,260
American woodcock	15,909	11,542	11,962	12,789	12,023	11,035	13,510	10,843	12,171	11,834	10,790	10,080	14,000
Mourning dove					15,524	11,107	12,886	13,172	11,599	10,495	10,641	10,000	10,730
Ring-necked pheasant	100,045	84,694	91,284	105,023	104,406	110,852	118,703	118,311	106,763	99,811	89,142	77,640	84,270
Ruffed grouse	120,547	101,194	90,686	93,513	79,141	76,037	91,682	90,600	86,505	87,530	92,490	93,840	97,190
Gray squirrel	26,664	26,010	25,494	29,190	23,438	24,563	25,459	25,863	22,382	22,255	23,737	26,680	29,350
Fox squirrel	16,693	15,281	14,878	19,936	15,372	15,094	15,619	14,779	13,233	13,174	15,626	13,810	16,770
Eastern cottontail	19,830	17,150	15,700	21,441	18,644	20,148	20,070	19,598	17,644	16,300	15,031	13,730	18,620

Table 20. Statewide (resident and non-resident) small game hunting license sales and estimated hunter harvest, 2001-02 through 2012-13.

	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Small game license sales ^a	298,055	288,729	296,939	287,725	280,156	295,898	298,467	290,064	282,983	300,624	290,686	295,168
State duck stamp sales	118,590	119,677	118,757	114,003	102,143	101,792	100,134	95,675	89,942	88,069	89,681	90,052
Pheasant stamp sales	97,665	102,097	121,456	114,653	117,301	129,546	129,315	123,270	110,456	104,286	86,868	90,541
Estimated harvest ^b												
Ducks	989,723	1,024,662	914,398	727,206	676,741	730,559	708,491	658,186	576,571	619,604	730,370	834,950
Canada geese	308,341	256,937	289,689	284,714	281,829	324,498	243,705	288,411	229,068	257,532	296,040	315,380
Other geese	7,867	11,125	12,755	8,150	9,025	6,658	7,723	13,895	6,255	3,945	6,750	9,060
American coot	17,554	20,114	10,993	20,345	15,938	24,909	16,061	23,871	14,820	26,345	14,740	18,030
Common snipe	1,783	3,432	2,558	2,130	5,336	4,221	3,933	2,210	1,487	1,936	1,470	1,430
American woodcock	26,662	28,230	30,438	41,479	27,919	39,907	27,866	29,210	35,384	29,766	25,980	31,610
Mourning dove ^d				96,559	77,749	85,950	101,161	132,577	109,988	100,234	77,790	96,520
Ring-necked pheasant	266,786	357,833	511,462	419,712	585,299	587,580	655,443	522,071	400,242	359,396	204,440	264,310
Ruffed grouse	331,916	249,386	350,674	194,687	224,309	417,153	293,544	318,338	357,998	465,576	401,280	355,130
Gray squirrel	145,916	133,589	174,848	132,659	122,078	140,788	133,194	121,534	109,717	138,925	129,600	137,280
Fox squirrel	62,958	67,100	84,529	62,410	62,187	66,068	47,736	51,079	54,013	61,686	51,580	56,850
Eastern cottontail	62,426	51,967	93,054	86,508	90,062	77,872	78,588	79,927	57,702	53,874	38,780	67,000

Migratory Birds

The U.S. Fish and Wildlife Service 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 seasons and limits for recreation and sustenance as well as 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 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 the 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. Crane Meadows NWR lies 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).

Since the Service is required to take the abundance of migratory birds and other factors in to consideration, the Service undertakes 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. 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, 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.

Table 21. Species composition of the Minnesota waterfowl harvest, 2011 and 2012. (from: Raftovich, R.V., K.A. Wilkins. 2013.

Species	Minnesota Harvest					Mississippi Flyway Harvest		
	2011	% of Harvest	2012	% of Harvest	Percent change in Harvest 11-12	2011	2012	Percent change Harvest 11-12
Mallard	180,515	29.07	197,316	26.33	9	2,240,248	1,882,553	-19
Domestic mallard	0	0	0	0	0	3,398	647	-425
American black duck	491	0.08	587	0.08	16	21,992	20,688	-6
Black x mallard	491	0.08	587	0.08	16	5,068	2,074	-144
Gadwall	8,339	1.34	18,792	2.51	56	1,474,405	1,240,234	-19
American wigeon	5,396	0.87	9,983	1.33	46	136,779	137,133	0
Green-winged	36,790	5.92	56,376	7.52	35	1,001,902	932,461	-7

teal								
Blue-winged /cinnamon teal	89,767	14.45	123,322	16.46	27	704,647	932,096	24
Northern shoveler	15,697	2.53	15,856	2.12	1	375,918	391,133	4
Northern pintail	7,848	1.26	5,285	0.71	-48	212,499	156,593	-36
Wood duck	150,593	24.25	184,396	24.61	18	928,178	780,024	-19
Redhead	18,640	3.00	22,315	2.98	16	155,227	99,179	-57
Canvasback	9,811	1.58	4,111	0.55	-66	68,358	52,081	-31
Greater scaup	1,962	0.32	2,936	0.39	33	33,680	40,968	18
Lesser scaup	5,396	0.87	17,617	2.35	69	114,903	307,579	63
Ring-necked duck	63,278	10.19	75,755	10.11	16	260,061	324,658	20
Goldeneye	9,320	1.50	4,111	0.55	-127	39,306	26,055	-51
Bufflehead	7,358	1.18	3,523	0.47	-109	78,145	67,418	-16
Ruddy duck	1,962	0.32	2,349	0.31	16	21,717	20,443	-6
Scoters	0	0	0	0	0	6,014	3,989	-51
Hooded merganser	6,377	1.03	4,111	0.55	-55	53,766	45,886	-17
Other mergansers	981	0.16	0	0	0	13,368	7,214	-85
Total Duck Harvest	621,000		749,300		+ 17	8,000,100	7,522,700	-6
(retrieved kill)	±11%		±13%			±6%	±5%	

Table 22. Top 10 states in number of adult goose hunters, 2012, and number of hunter-days and retrieved goose kill, in . (from: Raftovich, R.V., K.A. Wilkins. 2013. Migratory Bird Hunting activity and harvest during the 2011-12 and 2012-13 hunting seasons. U.S. Fish and Wildlife Service, Laurel, Maryland. USA July 2013. 64 pp).

State	Number of active goose hunters	Goose hunter days afield	Total goose harvest	Seasonal goose harvest per hunter
Minnesota	58,900 ± 10%	355,400 ± 14%	236,700 ± 16%	4.0 ± 19%
Wisconsin	36,700 ± 13%	240,300 ± 19%	83,800 ± 17%	2.3 ± 21%
California	32,100 ± 12%	263,300 ± 19%	151,000 ± 18%	4.7 ± 21%
Michigan	31,900 ± 11%	183,300 ± 15%	144,700 ± 18%	4.5 ± 21%
Texas	31,300 ± 25%	83,900 ± 42%	208,400 ± 65%	6.7 ± 70%
Maryland	26,300 ± 7%	166,900 ± 11%	191,400 ± 14%	7.2 ± 16%
Pennsylvania	26,300 ± 16%	119,500 ± 17%	115,700 ± 19%	4.4 ± 25%
North Dakota	25,200 ± 7%	113,200 ± 9%	184,900 ± 16%	7.3 ± 18%
Arkansas	20,300 ± 15%	116,100 ± 20%	116,000 ± 25%	5.7 ± 29%
Illinois	19,600 ± 13%	179,000 ± 21%	100,300 ± 28%	5.1 ± 31%
Mississippi Flyway		1,520,900 ± 7%	1,020,700 ± 7%	

Mourning Doves

Table 1. Preliminary estimates and 95% confidence intervals (CI, expressed as the interval half width in percent) of mourning dove harvest and hunter activity for the Central management unit during the 2010, 2011 and 2012 seasons ^a. (From: Seamans, M.E., R.D. Rau, and T.A. Sanders. 2013. Mourning dove population status, 2013. U.S. Department of the Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Washington, D.C. 36 pp.)

Management	Active Hunters			Hunter Days Afield			Total Harvest		
	20	2011	20	20	2011	20	20	2011	2012
CENTRAL	406,100	427,700	338,700	1,362,000	1,444,800	1,108,700	7,194,900	7,657,000	6,361,600
AR	23,900	25,300	21,400	63,300	63,800 ±34	57,600 ±26	446,400 ±28	519,300 ±43	494,200 ±30
CO	15,900	15,300	17,000	38,400	44,500 ±24	43,800 ±26	172,000 ±18	178,700 ±14	204,300 ±26
IA	†	5,800	†	†	19,000 ±17	†	†	56,800 ±21	† ^b
KS	28,200	32,800	12,200	93,900	95,800 ±15	49,100 ±52	511,200 ±15	534,800 ±18	244,800 ±62
MN	10,000	9,400	6,800	55,300	25,100 ±51	21,600 ±48	98,900 ±58	57,300 ±40	65,400 ±75
MO	29,300	31,600	23,800	75,200	74,600 ±14	51,400 ±50	426,000 ±20	359,600 ±16	296,600 ±81
MT	1,600	2,200	200 ±87	4,700	5,900 ±47	500 ±1	17,400 ±36	14,400 ±61	2,600
NE	15,800	15,500	13,200	49,700	46,900 ±28	39,000 ±17	276,400 ±19	265,500 ±23	223,400 ±20
NM	5,900	6,700	9,000	21,000	24,600 ±49	38,000 ±17	128,000 ±29	76,900 ±42	160,100 ±17
ND	3,800	3,700	4,900	11,800	10,400 ±29	17,400 ±36	54,200 ±38	41,800 ±31	78,900 ±37
OK	19,500	17,100	15,700	51,300	54,200 ±25	49,200 ±19	268,700 ±28	379,400 ±33	349,700 ±26
SD	5,000	6,200	4,500	14,200	16,300 ±26	14,700 ±28	64,300 ±23	87,200 ±26	65,500 ±28
TX	244,600	253,200	207,200	876,500	958,600 ±16	720,200 ±16	4,699,300 ±14	5,061,100 ±13	4,150,800 ±20
WY	2,700	2,700	2,700	7,100	5,100 ±38	6,300 ±38	32,100 ±36	25,000 ±52	25,300 ±40

^a Hunter number estimates at the Management Unit and national levels may be biased high, because the HIP sample frames are state specific; therefore hunters are counted more than once if they hunt in >1 state. Variance is inestimable.

^b † No estimate available

American Woodcock

Analysis for the population of the American Woodcock may be found in Chapter 4.4.3.

Other Wildlife Species

The cumulative effects of disturbance to non-hunted species due to deer hunting under Alternative 2 are expected to be minimal since deer hunting is conducted in the fall of each year and does not coincide with the breeding season.

Cumulative impacts of the proposed turkey hunt to migratory species at the “flyway” level (i.e. Mississippi Flyway) should be negligible. Disturbance by hunting to non-migratory birds, mammals, reptiles, insects, etc. should not have cumulative negative impacts for the following reasons; 1) the overall hunting season and size of hunt (number of people involved) is limited to the spring and a maximum of 10 people per 5-day period (5 hunters plus 5 assistants), 2) turkey hunting is generally a quiet activity, and 3) any potential disturbance will be temporary. Disturbance to these species by hunters would probably be commensurate with that caused by non-consumptive users.

Threatened and Endangered Species

At the time of the completion of the 2010 CCP, Federally listed Threatened Species that occur on Crane Meadows NWR include Whooping Cranes.

Whooping Crane: The potential for cumulative impacts on whooping cranes is extremely low and should have no effect because there are no breeding pairs currently on the refuge and in the case of their being whooping cranes on a tract, the area will be closed to any activities.

4.5.3.B. Cumulative Impact of Proposed Hunt on Refuge Programs, Facilities, and Cultural Resources

OTHER REFUGE-WILDLIFE-DEPENDENT RECREATION

The Refuge receives about 10,000 visitors each year. Most of the visitation is from May through October for bird and wildlife observations and Refuge programs. The numbers of observation visitors significantly decreases in November and December. Lowest visitation occurs during the winter months. There will be overlap with the hunter user group, as well as other user groups on the Headquarters Tract, however, the Sedge Meadow and Platte River West tracts are not open to wildlife-dependent visitor uses.

REFUGE FACILITIES

The Service defines facilities as: “Real property that serves a particular function(s) such as buildings, roads, utilities, water control structures, raceways, etc.” Under the proposed action the facilities most utilized by hunters are roads and parking lots. Any needed maintenance or improvement of existing roads and parking areas will cause minimal short term impacts to localized soils and may also cause some wildlife disturbances and damage to vegetation near Refuge facilities. Facility maintenance and improvements described are periodically conducted to accommodate daily Refuge management operations and general public uses such as wildlife

observation and photography. These activities are and will be conducted at times (seasonal and/or daily) to cause the least amount of disturbance to wildlife.

Disturbance by vehicles will be limited to existing roads (Refuge and County roads) and parking lots. Refuge roads and parking lots are regularly used by Service vehicles, visitors, and volunteers throughout the year. Off-road travel will not be permitted. Special access accommodations for persons with disabilities will be allowed on a situational basis, however, these access routes will be established prior to the actual hunt. No adverse impacts are expected on Refuge roads, parking lots, or trails.

CULTURAL RESOURCES

No site listed on the National Register of Historic Places is located on the Refuge within the proposed hunting area. 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. Hunting meets only one of the two criteria (#2 listed below) 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 delineated 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, licenses, or have received assistance from the agency.

Consultation with the pertinent State Historic Preservation Office and federally recognized Tribes are, therefore, not required.

Hunting activities will result in no or little ground disturbance near cultural resources or disturbance to standing structures and will have no effect on any historical properties.

4.5.3.C. Cumulative Impact of Proposed Hunt on Refuge Environment and Community

The proposed hunts are limited in time, numbers of people, and location; thusly, the Refuge personnel expect no adverse impacts of this alternative on the Refuge environment which includes soils, vegetation, air quality, water quality, hydrology, and solitude. Some disturbance to surface soils and vegetation occur; however they are minimal and temporary. Hunting can indirectly benefit vegetation as it is used to keep deer populations in balance with the environment by reducing herbivory, thereby benefiting vegetative communities and associated wildlife species.

The local community and the state of Minnesota, in general, strongly support outdoor activities such as deer hunting. The state has passed legislation ensuring the right of Minnesotans to hunt.

Impacts to the natural hydrology and air quality will be minimal. The Refuge expects impacts to air and water quality to be very minimal and only due to visitor use of automobiles for transportation. Existing state water quality criteria and regulations on use are adequate to

achieve or maintain desired on-Refuge conditions; thus, implementation of this alternative should not have cumulative impacts on the Refuge environment.

The overall impact to the community will be positive. If conflicts between user groups occur, the Service's experience has proven that time and space zoning can be an effective tool in eliminating issues between user groups. These will be handled on a case by case basis. The onsite manager, in consultation with the Project Leader, will determine if such a tool is necessary to limit conflicts.

Managing a hunt program on the Refuge will help promote an understanding and appreciation of natural resources and their management throughout the community. Additionally, managed hunts on the Refuge provide a traditional recreational activity with no definable adverse impacts to the biological integrity of Refuge resources.

4.5.3.D. Other Past, Present, Proposed, and Reasonable Foreseeable Hunts & Anticipated Impacts

As additional land is acquired, Refuge staff will re-evaluate the areas available and safe for hunting. The goal is to provide an additional wildlife-dependent public use on the Refuge and to offer it to as many individuals as possible. On the other hand, safety, compatibility and quality are the priority objectives behind each hunt.

4.5.3.E. Anticipated Impacts if Individual Hunts are Allowed to Accumulate

National Wildlife Refuges have conducted hunting programs within the framework of State and Federal regulations. The protocol is at least as restrictive as the State of Minnesota and in some cases the hunts will be more restrictive. By maintaining hunting regulations that are as, or more, restrictive than the State's, the Refuge ensures it will be maintaining seasons which are supportive of management on a regional basis.

Hunts will always be restricted with respect to duration, areas being opened, and the number of hunters allowed to participate. Each hunt will be planned and well-orchestrated. Wildlife comes first on a National Wildlife Refuge. The hunt program, as well as other visitor use programs, will be discontinued if there is any definable adverse impact to the biological integrity or habitat sustainability of Refuge resources.

4.6 Summary of Environmental Consequences by Alternative

Effect	Alternative 1 (No Action) Multiple special hunts/year offered on the Refuge	Alternative 2 All lands closed to hunting	Alternative 3 All lands will be opened unless otherwise specified
Habitat	Minimal Effect	Minimal Effect	Minimal Effect
Biological	Minimal Effect	Minimal Effect	Minimal Effect
Listed Species	No Effect	No Effect	No Effect
Historical and Cultural Resources	No Effect	No Effect	No Effect
Cumulative Impacts	Minimal Effect	Minimal Effect	Minimal Effect

DRAFT

Chapter 5: List of Preparers

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Concurred By: _____ Date: _____

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Chapter 6: Consultation and Coordination with Stakeholders

A Comprehensive Conservation Plan (CCP) and Environmental Assessment were completed for Crane Meadows NWR in 2010. Both were prepared in compliance with the National Wildlife Refuge Improvement Act of 1997, the National Policy Act of 1969, and Service policy set forth in the Departmental Manual on National Wildlife Refuge Planning (part 602 FW 1).

Public involvement is a key element of any proper planning. The Service strives to provide as many opportunities for public participation as possible. Subsequently, articles in local newspapers notified citizens and it was placed on the Crane Meadows NWR website. Letters were sent to interested parties including Minnesota DNR representatives, other natural resource professionals, local hunting clubs, disabled veteran organizations, state and local government offices, local media contacts, and tribal officials. A listening post for those interested in commenting in person was held December 1 from 2 pm to 6pm. The planning effort benefited from the creative involvement of the public, tribal, state university, and federal participants.

This EA will be available for a 30 day public review period in November 15 to December 15, 2010.

- **Meeting with partners.** The Refuge Manager discussed the addition of a limited special hunt program with the general public, the Ojibwe Tribal representatives, Minnesota State Department of Natural Resources, Morrison Natural Resource Conservation, and Soil and Water Conservation District, Sherburne County Commissioners, the Crane Meadows Friends Group, local special interest, sportsman and conservation clubs, and Refuge volunteers.
- **Refuge letters.** Both the Ojibwe Tribe and Minnesota Department of Natural Resources were contacted about the potential for a limited special hunt and were invited to participate or comment for a public meeting in November 2010. Following the public meeting, letters were sent to both agencies requesting comments on the draft Hunting Plan, draft Environmental Assessment, and draft Compatibility Determination.

In May 2007, consultation letters on the cumulative impacts of turkey hunting were submitted to the Fish & Wildlife Service Regional Biologist. A consultation letter was also submitted to the MN DNR for consultation on the impacts of turkey hunting on the Refuge. FWS and MN DNR personnel concurred that impacts would be minuscule.

- **Contact with Landowners.** The Refuge Manager contacted landowners living adjacent to the Refuge via phone or visit. The purpose was to inform them about the potential to host turkey and deer hunts in the area and to discuss their concerns.

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