

Swan Lake

National Wildlife Refuge

Comprehensive Conservation Plan Approval

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Swan Lake

National Wildlife Refuge

Comprehensive Conservation Plan

Table of Contents

Chapter 1: Introduction and Background	1
Introduction	1
Refuge Purposes	1
Refuge Vision	1
Refuge Goals	1
Purpose and Need for Plan	2
The U.S. Fish and Wildlife Service	3
The National Wildlife Refuge System	3
Existing Partnerships	4
Legal and Policy Guidance	4
Chapter 2: The Planning Process	5
Introduction	5
Meetings and Involvement	5
Summary of Issues, Concerns, and Opportunities	5
Alternatives Development	8
Preparation, Review, and Finalization of the CCP	8
Wilderness Review	8
Chapter 3: The Refuge Environment and Management	9
Introduction	9
Ecological Context	9
Hydrologic Units, Watersheds, and Ecoregions	9
Historic Vegetation	11
Land Use/Cover	11
Migratory Bird Conservation Initiatives	11
Missouri Comprehensive Wildlife Strategy	11
Region 3 Fish and Wildlife Conservation Priorities	12
Other Conservation and Recreation Lands in the Area	13
Socioeconomic Context	13
Population and Demographics	13
Employment	13
Income and Education	13
Demand and Supply for Wildlife-Dependent Recreation	13
Climate	15
Geology and Soils	15
Water and Hydrology	15
Refuge Habitats and Wildlife	16
Bottomland Forest	16
Emergent Wetland	20

Open Water	20
Agricultural Fields	20
Native Prairie	20
Wet Meadow	20
Shrub Swamp	20
Old Field	20
Wildlife	20
Birds	20
Mammals	20
Amphibians and Reptiles	21
Fish and Other Aquatic Species	21
Invertebrates	21
Threatened and Endangered Species	21
State-listed Species	21
Federally Listed Threatened/Endangered/Candidate Species	21
Threats to Resources	21
Invasive Species	21
Exotic/Pest Species	21
Siltation	22
Contaminants	22
Climate Change Impacts	22
Observed Climate Trends	23
Scenarios of Future Climate	23
Midwest Key Issues:	23
1. Reduction in Lake and River Levels	23
2. Agricultural Shifts	24
3. Changes in Semi-natural and Natural Ecosystems	24
Administrative Facilities	25
Cultural Resources and Historic Preservation	25
Visitation	26
Current Management	26
Habitat Management	26
Wetland Management	26
Moist Soil Units	26
Grasslands	26
Forests	26
Cropland	26
Monitoring	28
Bald Eagle	28
Waterfowl	28
Shorebirds, Marsh Birds and Other Waterbirds	28
Vegetation	28
Public Use	28
Hunting	28
Fishing	28
Wildlife Observation, and Photography	30
Environmental Education and Interpretation	30
Non Wildlife-dependent Recreation	30
Species Management	30

Animal Species	30
Plant Species	30
Archaeological and Cultural Resources	30
Other Management Areas	30
Research Natural Area	30
Farm Service Agency Conservation Easements and Fee Title Tracts	30
Chapter 4: Management Goals and Objectives	33
Goal 1: Habitat	33
Goal 2: Wildlife	40
Goal 3: People	40
Chapter 5: Plan Implementation	46
Introduction	46
New and Existing Projects	46
Staffing	46
Partnership Opportunities	46
Step-down Management Plans	46
Monitoring and Evaluation	47
Plan Review and Revision	47
Appendix A: Finding of No Significant Impact	49
Appendix B: Glossary	53
Appendix C: Species List	55
Appendix D: Regional Conservation Priority Species for the Lower Missouri River Ecosystem	73
Appendix E: Swan Lake NWR Priority Refuge Operations and Maintenance Costs	77
Appendix F: References and Literature Cited	81
Appendix G: Compliance Requirements	85
Appendix H: Mailing List	91
Appendix I: Compatibility Determinations	93
Appendix J: Appropriate Use Determinations	125
Appendix K: List of Preparers and Contributors	133
Appendix L: Response to Comments Received on the Draft CCP	135

Figures

Figure 1: Location of Swan Lake NWR	2
Figure 2: Watersheds and Habitats, Swan Lake NWR	10
Figure 3: Conservation Lands in the Area of Swan Lake NWR	14
Figure 4: Lower Grand River Watershed, Swan Lake NWR	17
Figure 5: Watershed Comparison, Swan Lake NWR	18
Figure 6: Current Land Cover, Swan Lake NWR	19
Figure 7: Management Units, Swan Lake NWR	27
Figure 8: Current Visitor Services Facilities, Swan Lake NWR	29
Figure 9: Yellow Creek Research Natural Area	31
Figure 10: FSA Parcels Managed by Swan Lake NWR	32
Figure 11: Potential Water Movement and Likely Associated Vegetation, Swan Lake NWR	34
Figure 12: 15-Year Desired Land Cover, Swan Lake NWR	36
Figure 13: Future Visitor Facilities, Swan Lake NWR	41

Tables

Table 1: Current Land Cover and Potential Natural Vegetation in Grand River Watershed and Sub-basins	12
Table 2: Maximum Adult Audiences Within 30, 60, and 90 Miles of Swan Lake NWR for Four Activities	15
Table 3: Swan Lake NWR Soil Types by Acreage	16
Table 4: Current and Proposed Staffing Under the CCP	46
Table 5: Step-down Management Plan Schedule	47

Chapter 1: Introduction and Background

Introduction

Located in Chariton County near the town of Sumner, Swan Lake National Wildlife Refuge (NWR) bounds more than 11,000 acres of bottomland forest, grasslands, and wetlands within the Grand River floodplain of north central Missouri. Franklin D. Roosevelt established the Refuge in 1937 through Executive Order. In 1938, Company 1727 of the Civilian Conservation Corps (CCC) began work on levees to impound the waters flowing into the Refuge from Elk Creek, Turkey Creek, and Tough Branch. The CCC completed its work in 1942 and left behind several thousand acres of freshwater marsh and open water within Silver Lake and Swan Lake, the Refuge namesake. This change to the landscape caught the attention of migrating waterbirds, especially Canada Geese, which shifted their wintering grounds north to the Refuge with a steady annual increase that peaked at more than 180,000 birds in 1977. Fewer geese winter on the Refuge today, but its mixture of habitats are home to a diverse wildlife community that attracts hunters, anglers, and wildlife watchers.

Refuge Purposes

“Refuge purposes” is a term that refers to the purposes specified in or derived from one or more legal authorities used for establishing, authorizing, or expanding a national wildlife refuge, national wildlife refuge unit, or national wildlife refuge sub-unit. Below are the purposes of Swan Lake NWR and their sources:

- “as a refuge and breeding ground for migratory birds and other wildlife” Executive Order 7563, dated Feb. 27, 1937)
- “for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. § 715d (Migratory Bird Conservation Act)
- “... particular value in carrying out the national migratory bird management program.” 16



Waterfowl on Swan Lake NWR. Photo credit: USFWS

U.S.C. § 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife)

Refuge Vision

The Refuge vision is a concise, descriptive statement of what the planning unit should be, or what we hope to do, based primarily upon the mission of the National Wildlife Refuge System (Refuge System) and specific Refuge purposes, and other mandates. We established the following vision statement for Swan Lake NWR:

Diverse and abundant wildlife flourishes within a mosaic of grass, trees, and wetlands recalling an earlier era when the Grand River meandered across its broad, open floodplain. Visitors enjoy recreation dependent on wildlife and show their appreciation by supporting conservation and Swan Lake National Wildlife Refuge.

Refuge Goals

Considering the purposes of the Refuge and our vision for the future, we have established the following goals for Swan Lake NWR:

Figure 1: Location of Swan Lake NWR



Habitat: Wetlands, grasslands, and bottomland forests providing habitat for migratory birds, threatened and endangered species, and other wildlife within the Grand River floodplain.

Wildlife: Diverse wildlife teeming within native habitats of the Grand River floodplain.

People: Visitors enjoy wildlife-dependent recreation and understand the natural and cultural resources of the Refuge and its role in their conservation.

Purpose and Need for Plan

This Comprehensive Conservation Plan (CCP) identifies the role Swan Lake NWR will play in supporting the mission of the National Wildlife Refuge System and provides primary management guidance for the Refuge. The Plan articulates management goals for the next 15 years and defines objectives and strategies that will achieve those goals. Several legislative mandates within the National Wildlife Refuge System Improvement Act of 1997 have guided the development of this Plan. These mandates include:

- Wildlife has first priority in the management of refuges.
- Wildlife-dependent recreation activities of hunting, fishing, wildlife observation, wildlife photography, environmental education and interpretation are the priority public uses of the

NWRS. These uses will be facilitated when they do not interfere with a refuge’s purposes or the mission of the NWRS.

- Other uses of the refuge will only be allowed when they are determined to be appropriate and compatible with the refuge purposes and mission of the NWRS.

Following the recommendations of this CCP will enhance management of Swan Lake NWR by:

- Providing a clear statement of direction for future management of the Refuge.
- Giving Refuge neighbors, visitors, and the public an understanding of the U.S. Fish and Wildlife Service’s management actions on and around the Refuge.
- Ensuring that the Refuge’s management actions and programs are consistent with the mandates of the NWRS.
- Ensuring that Refuge management considers federal, state, and county plans.
- Establishing long-term Refuge management continuity.
- Providing a basis for the development of budget requests for Refuge operations, maintenance, and capital improvement needs.

The U.S. Fish and Wildlife Service

Swan Lake NWR is administered by the U.S. Fish and Wildlife Service (Service). The Service is the primary federal agency responsible for conserving, protecting, and enhancing the nation's fish and wildlife populations and their habitats. It oversees the enforcement of federal wildlife laws, management and protection of migratory bird populations, restoration of nationally significant fisheries, administration of the Endangered Species Act, and the restoration of wildlife habitat such as wetlands. The Service also manages the Refuge System.

The National Wildlife Refuge System

Refuge lands are part of the National Wildlife Refuge System, which was founded in 1903 when President Theodore Roosevelt designated Pelican Island in Florida as a sanctuary for Brown Pelicans. Today, the System is a network of about 545 refuges and wetland management districts covering about 95 million acres of public lands and waters. Most of these lands are in Alaska, with approximately 16 million acres located in the lower 48 states and several island territories.

The National Wildlife Refuge System is the world's largest collection of lands specifically managed for fish and wildlife. Overall, it provides habitat for more than 5,000 species of birds, mammals, fish, amphibians, reptiles, and insects. As a result of international treaties for migratory bird conservation and other legislation, such as the Migratory Bird Conservation Act of 1929, many refuges have been established to protect migratory waterfowl and their migratory flyways.

Refuges also play a crucial role in preserving endangered and threatened species. Among the most notable is Aransas NWR in Texas, which provides winter habitat for the highly endangered Whooping Crane. Likewise, the Florida Panther Refuge protects one of the nation's most endan-



Swan Lake NWR offers wildlife viewing opportunities. Photo credit: USFWS

gered predators. Refuges also provide unique recreational and educational opportunities for people.

When human activities are compatible with wildlife and habitat conservation, refuges are places where people can enjoy wildlife-dependent recreation such as hunting, fishing, wildlife observation, photography, environmental education, and environmental interpretation. Many refuges have a visitor center, wildlife trails, an automobile tour, and environmental education programs. Nationwide, approximately 30 million people visited national wildlife refuges in 2004.

The National Wildlife Refuge System Improvement Act of 1997 established several important mandates aimed at making the management of national wildlife refuges more cohesive. The preparation of comprehensive conservation plans (CCPs) is one of those mandates. The legislation directs the Secretary of the Interior to ensure that the mission of the National Wildlife Refuge System and purposes of the individual refuges are carried out. It also requires the Secretary to maintain the biological integrity, diversity, and environmental health of the National Wildlife Refuge System.

The goals of the National Wildlife Refuge System are to:

- Conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered.
- Develop and maintain a network of habitats for migratory birds, anadromous and interjurisdictional fish, and marine mammal populations that is strategically distributed and carefully managed to meet important life history needs of these species across their ranges.
- Conserve those ecosystems, plant communities, wetlands of national or international significance, and landscapes and seascapes that are unique, rare, declining, or under-represented in existing protection efforts.
- Provide and enhance opportunities to participate in compatible wildlife-dependent recreation (hunting, fishing, wildlife observation and photography, and environmental education and interpretation).
- Foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats.

Existing Partnerships

Working with others via intra- and interagency partnerships is important in accomplishing the mission of the Service as well as assisting Swan Lake NWR in meeting its primary objective of providing a resting and feeding area for migratory birds and other wildlife. Partnerships with other federal and state agencies and with a diversity of other public and private organizations are increasingly important. Other agencies can provide invaluable assistance in research and maintenance. Private groups and non-profit organizations greatly enhance public involvement in the Refuge, building enthusiasm and support for its mission.

Besides the partnerships that the Service holds on a national level, Swan Lake NWR maintains informal partnerships with several organizations:

- Friends of Swan Lake NWR
- Missouri Department of Conservation
- Missouri Department of Natural Resources
- Missouri Department of Transportation
- Natural Resources Conservation Service
- U.S. Army Corps of Engineers
- U.S Environmental Protection Agency
- Farm Service Agency
- Ducks Unlimited

Legal and Policy Guidance

In addition to the legislation establishing the Refuge and the National Wildlife Refuge System Improvement Act of 1997, other federal laws, executive orders, and regulations govern the administration of Swan Lake NWR. See Appendix G for a list of the guiding legislation and executive orders.

Chapter 2: The Planning Process

Introduction

Work on the comprehensive conservation plan for Swan Lake NWR began in 2006. This chapter describes key points in planning, public involvement, issues and opportunities identified for Swan Lake NWR, the publication of the Draft CCP, public review and comment period for the Draft CCP, and the additional public review and comment period for Alternative 4.

Meetings and Involvement

The comprehensive conservation planning process began with the CCP planning team holding a “kick-off” meeting in October 2006. Members of the planning team, which includes Refuge staff and Service planners, identified a list of issues and concerns associated with management of Swan Lake NWR. These preliminary issues and concerns were based on staff knowledge of the area and discussions with citizens in the community.

The CCP planning team then invited Refuge neighbors, organizations, local government agencies, and local staff of national and state government agencies, schools, and interested citizens to share their thoughts in an open house meeting on January 11, 2007, at the Refuge Visitor Center. More than 75 people attended the open house. We received 70 responses with dozens of individual comments by the close of the scoping period on February 22, 2007. Following the public comment period, an additional meeting was held in the Fish and Wildlife Service Regional Office to review the public comments and identify concerns from subject specialists.

A Biological Program Review, which is an evaluation of the relevance and direction of the biological program through the collective inputs of professionals among the various fields of ecology and wildlife sciences, began with a 2-day meeting on February 21 and 22 of 2007. The Regional Refuge Biologist facilitated the event, which was attended by 16 individuals with various state, federal, and academic affiliations. Information was presented on the Ref-



Sign repair at Swan Lake NWR. Photo credit: USFWS

uge, the general ecology of the region, establishing legislation and policy directives, current issues facing the Refuge, prior program accomplishments, a report on the current biological inventory and monitoring program, and a draft vision for the future.

The meeting was punctuated with field trips to specific sites to stimulate discussion and demonstrate issues of concern. The group discussed management alternatives and potential strategies, identified potential biological program priorities, discussed the draft goals and objectives for the various program components and other ideas for the future of the program.

Summary of Issues, Concerns, and Opportunities

Issues play an important role in planning. Issues focus the planning effort on the most important topics and provide a base for considering alternative approaches to management and evaluating the consequences of managing under these alternative approaches. The issues, concerns, and opportunities expressed during the first phase of planning have been sorted and summarized into a number of issue statements along with fuller explanations that include background information and comments.

Issue Statement: The decline in Canada Goose use of the Refuge in recent decades has decreased the quality of goose hunting, drawn fewer hunters and wildlife watchers, and changed the cultural identity of the local communities.

Background: Beginning in the 1950s, use of the Refuge by wintering Canada Geese steadily increased until it peaked in 1977 at 181,000 birds. The large numbers of geese produced a spectacle that annually attracted hunters and wildlife watchers to this rural area and prompted the nearby town of Sumner, Missouri, to adopt the slogan “Wild Goose Capital of the World” and to erect a 40-foot Canada Goose statue known as “Maxi.”

The decades following the peak saw a steady decline in the number of geese wintering on the Refuge. This diminished the annual spectacle, which drew fewer visitors and affected the prosperity and notoriety of the local communities. One popular belief is that a reduction in the amount of agriculture on Refuge lands is responsible for lower goose use of the area and that farming more acres would increase goose numbers. This view is not supported by studies of the Canada Goose population that show a variety of factors interact to affect their distribution. These include increased availability of habitats across the landscape, fall and winter weather conditions, and variations in hunting pressure along the migratory flyway.

Issue Statement: The Refuge attracts high numbers of waterfowl and other wildlife, making it appealing as a sanctuary as well as for those interested in hunting and other wildlife-dependent recreation.

Background: Despite lower numbers of wintering Canada Geese, the Refuge still harbors abundant wildlife, notably ducks and white-tailed deer. Although goose hunting has been allowed for years, duck hunting has never been permitted at the Refuge. There is an increasing interest in allowing duck hunting on the Refuge in part to offset the decline in the quality of goose hunting. Others would prefer there be less or no hunting on the Refuge and instead support maintaining the Refuge as a sanctuary for waterfowl and other wildlife.

Issue Statement: Accumulation of sediment over several decades has decreased the depth and water holding capacity of Silver Lake and affected water quality.

Background: Silver Lake serves as a reservoir that supplies water for management of wetland units across the Refuge. It also provides fishing opportunities. The average volume of Silver Lake has decreased by about 25 percent from 1983 to present. Through the years, sediment carried from

the 64,000-acre watershed by Turkey Creek and Elk Creek accumulated in Silver Lake, decreasing the depth and water holding capacity of the basin and reducing its water clarity. If this continues it would threaten wetland management across the Refuge. It also decreases the quality of the habitat for sport fish. Although changes in land use practices within the watershed in recent years are believed to have slowed the sedimentation rate, there are no measurements to support this.

Issue Statement: There are diverse and sometimes conflicting expectations regarding the presence, variety, and abundance of Refuge wildlife.

Background: Many people made specific suggestions regarding management of Refuge habitats or wildlife populations. Suggestions included:

- increasing the number of pheasants, quail, or deer
- decreasing the numbers of deer or predators
- reintroducing Prairie Chickens
- managing more intensively for waterfowl
- managing less intensively for waterfowl

Developing guidance regarding Refuge habitat and population management that considers public input, Refuge purposes, the mission of the National Wildlife Refuge System, and other Service policies is one outcome of the comprehensive conservation planning process.

Issue Statement: Slow water movement out of the Grand River Watershed during high water events increases duration of flooding on the Refuge and surrounding private lands.

Background: The nearly 12-mile Garden of Eden levee south of the Refuge protects 3,500 acres of land from flooding during high water events. The levee also narrows the outlet of the Grand River



Flooding is a significant issue facing Swan Lake NWR. Photo credit: USFWS

Watershed from 5 miles to about one-half mile. Floodwaters that accumulate across thousands of acres must funnel through this narrowed outlet. This slows water movement and aggravates flood severity and duration within the watershed. Severe flooding often damages Refuge roads and facilities, impedes management capabilities, and in some cases degrades wildlife habitat. Sluggish drainage also affects lands adjoining the Refuge, especially if Refuge pools are at or near capacity when flooding begins.

Issue Statement: Refuge waters could be managed to create more favorable fishing opportunities.

Background: Although fishing occurs on Refuge waters, there has been little emphasis on improving the quality of the sport fishery. A 2007 fisheries survey of Silver Lake, where most fishing occurs, reported it as shallow, turbid, and lacking deep water habitat and structure, none of which indicate a quality sport fishery. Wind action across the shallow basin churns sediment and reduces water clarity, hampering the growth of aquatic plants that would otherwise serve as fish habitat. Only four of 14 species captured during the survey were sport fish, but these four species – white crappie, freshwater drum, flathead catfish, and channel catfish – accounted for nearly half of the total fish sampled. A number of people commented that Silver Lake should be made deeper to improve fish habitat. Others suggested removing rough fish and stocking game fish.

Issue Statement: There are threats to the ecological integrity of Refuge ecosystems and opportunities for restoration and enhancement of native habitats and rare species.

Background: Service policy supports maintaining and, where appropriate, restoring biological integrity, diversity, and environmental health. There are a number of threats to these elements, including the introduction and spread of invasive plants, declining water quality, and flooding. There are also opportunities to restore drainage pathways and native habitat. This includes habitat restoration that would benefit the eastern massasauga rattlesnake, a candidate for federal listing under the Endangered Species Act, which is found on the Refuge.

Issue Statement: There is demand for wildlife-dependent recreation opportunities, other public uses, and facilities beyond what is presently available.

Background: Service policy encourages national wildlife refuges to provide opportunities for six wildlife dependent public uses: hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation. Additionally, Swan



Swan Lake NWR. Photo credit: FWS

Lake NWR provides visitors opportunities for gathering berries, mushrooms, or shed antlers. Zoning of these uses in both duration and extent helps avoid conflicts between user groups. A number of comments supported increasing the duration, available area, or amount of facilities for one or more of the existing uses. Others suggested allowing additional uses. Any use permitted on the Refuge must be found compatible in accordance with Service policy.

Issue Statement: The amount of maintenance, management, and visitor services needs exceeds existing capacity to fulfill these needs.

Background: The Refuge staff is responsible for maintaining 26 miles of roads and levees, 20 water control structures, managing more than 800 acres of moist soil, assisting with the implementation of three hunts as well as other aspects of Refuge administration and management. Refuge maintenance, management, and programming have declined in recent years as the number of staff fell from a high of seven to two. This is compounded by aging infrastructure and increased demand for visitor services. A number of people commented that more staff is needed.

Issue Statement: Widely scattered parcels and easements beyond the Refuge boundary provide management challenges and opportunities.

Background: Refuge staff members are responsible for managing 46 easements and outlying fee title parcels scattered across 15 Missouri counties. Some of the properties have potential for habitat restoration and wildlife-dependent recreation opportunities that would help fulfill Refuge purposes and support the mission of the National Wildlife Refuge System. But few staff and long distances mean these properties currently receive little attention.

Issue Statement: There is interest in maintaining the remnant bottomland forest community within the Yellow Creek Research Natural Area.

Background: The Yellow Creek Research Natural Area encompasses 1,000 acres of bottomland forest along Yellow Creek. According to guidance, Research Natural Areas are not to be actively managed so as to serve as a reference point for comparison with other bottomland forest areas. Log jams within Yellow Creek impede flow during high water events, causing flooding that affects the bottomland forest within the Research Natural Area.

Alternatives Development

The practice of developing management alternatives as a part of the Refuge planning process is derived from the National Environmental Policy Act of 1970 (NEPA) [42 U.S.C. 4321 et seq.] This act requires federal agencies to consider the impacts of proposed actions and to develop a reasonable range of alternatives to those actions.

The development of an initial set of management alternatives occurred during the Refuge planning workshop in May 2007, and included representatives from the Service and Missouri Department of Conservation. Subsequent staff changes prolonged development of alternatives into 2009. Ultimately, a set of three alternatives was developed and included in an environmental assessment released for public review in 2010.

Preparation, Review, and Finalization of the CCP

The CCP for Swan Lake NWR was prepared by a team consisting of Refuge and Regional Office staff, and a contractor. The first full draft was completed in May 2010. The CCP was then published in two phases, draft and final, in accordance with the National Environmental Policy Act (NEPA). The Draft Environmental Assessment, Appendix A of the Draft CCP, presented a range of alternatives for future management and identified the preferred alternative, which was the basis for the CCP.

The Draft CCP/EA was first reviewed and revised by Refuge and Regional Office staff, a time period that culminated with an internal review meeting at the Midwest Regional Office on March 5, 2010. The Draft CCP/EA was then released to the public for a 35-day review period running from June 1 to July 5, 2010. The public was notified of the release with a notice in the Federal Register as well as through local media outlets.

A summary brochure or the full Draft CCP/EA was sent to approximately 200 individuals, organizations, elected officials, and local, state, and federal agencies; and an electronic copy was made available on the Service's website.

An open house was held during the comment period (June 22, 2010) at the Refuge Visitor Center, providing the public with an opportunity to discuss the plan with Service staff. An estimated 385 people attended the event and submitted more than 130 written comments.

Private citizens, local government officials, organizations, and conservation agencies submitted approximately 500 letters or e-mails during the public review period. Three elements of the Draft CCP drew the most comments: a proposal to periodically draw down Silver Lake to promote aquatic vegetation, a proposal to eliminate cropland on the Refuge, and a proposal to manage grasslands to promote the eastern massasauga rattlesnake.

In response to local concerns, a fourth alternative was developed and a second public review and comment period was held. Approximately 50 comments were received following the release of Alternative 4 in September 2010. Appendix L of the CCP includes a summary of the comments received during both comment periods and the Service's response to the comments.

The final CCP will become the basis for guiding management on the Refuge over the coming 15-year period. It will also guide the development of more detailed step-down management plans for specific resource areas, and it will underpin the annual budgeting process through Service-wide allocation databases. Most importantly, it will lay out the general approach to managing habitat, wildlife, and visitor services at Swan Lake NWR, and will direct day-to-day decision-making and actions.

Wilderness Review

As part of the CCP process, lands within Swan Lake NWR were reviewed for wilderness suitability. No lands were considered suitable for Congressional designation as wilderness as defined by the Wilderness Act of 1964. Swan Lake NWR does not contain 5,000 contiguous acres of roadless, natural lands, nor does the Refuge possess any units of sufficient size to make their preservation practicable as wilderness. Refuge lands and waters have been substantially altered by humans, especially by agriculture, drain construction, and road-building. Extensive modification of natural habitats and manipulation of natural processes has occurred. Adopting a "hands-off" approach to management at the Refuge would not facilitate the restoration of a pristine or pre-settlement condition, which is the goal of wilderness designation.

Chapter 3: The Refuge Environment and Management

Introduction

Swan Lake NWR includes more than 11,000 acres of bottomland forest, grasslands, wetlands, and open water within Chariton County in north-central Missouri. Management responsibilities also include 57 smaller parcels totaling more than 2,000 acres scattered across 15 Missouri counties.

Ecological Context

Hydrologic Units, Watersheds, and Ecoregions

In the 1990s the Service adopted an ecosystem approach to management. This shift demanded a spatial framework, some type of mapped unit, which could be identified as an ecosystem. The Service chose to define its ecosystems based largely on hydrologic units as mapped by the U.S. Geological Service (USFWS, 1995). The U.S. Fish and Wildlife Service referred to these hydrologic units as watersheds although the definitions and application of the two terms are different. A watershed is an area delineated by topography such that all surface drainage within the area converges to a single point, usually the point where the collected waters leave the watershed. The hydrologic units that form the basis of the Service's ecosystem units in many cases do not follow the same boundaries as topographic watersheds.

The Service's 53 ecosystem units each typically cover thousands of square miles. However, the hydrologic units, or watersheds as they have come to be known, form a nested hierarchy meaning that smaller watersheds combine to form larger watersheds. Working from a narrow to a broad extent, the Refuge is within the Lower Grand River Watershed which is within the Grand River Watershed which is within the Lower Missouri River Watershed, which the Service recognizes as the Lower Missouri River Ecosystem.

Ecoregions are a different concept also used as a basis for describing ecosystems. Ecoregion boundaries are based on a number of components includ-

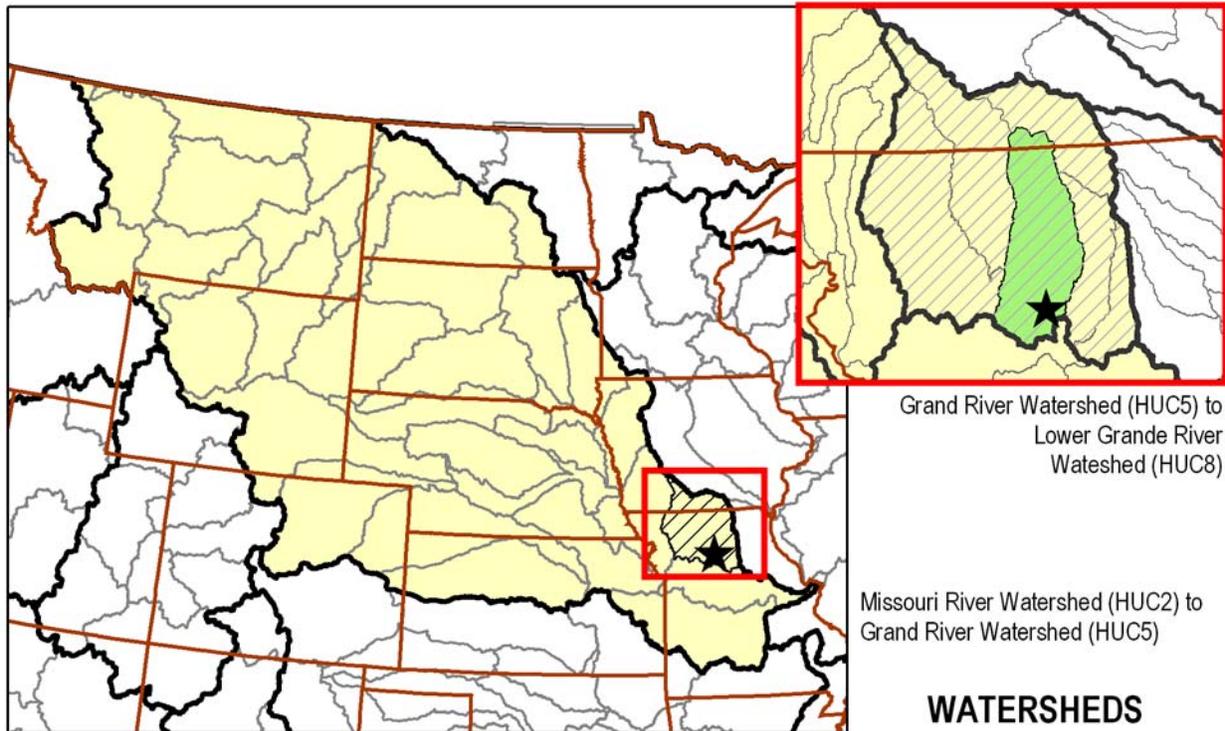


Great Egret at Swan Lake NWR. Photo credit: USFWS

ing climate, geology, physiography, soils, and land cover. The intent of ecoregions is to depict areas within which the mosaic of these components is different than that of adjacent areas. An interagency effort derived a common set of ecological units for Missouri based on the National Hierarchical Framework of Ecological Units (Cleland et al. 1997). Ecoregion boundaries do not coincide with watershed boundaries, but like watersheds ecoregions occur within a nested hierarchy. Working from a narrow to a broad extent, the Refuge is within the Missouri-Grand River Alluvial Plain Land Type Association which is within the Missouri River Alluvial Plain Subsection which is in the Central Dissected Till Plains Section.

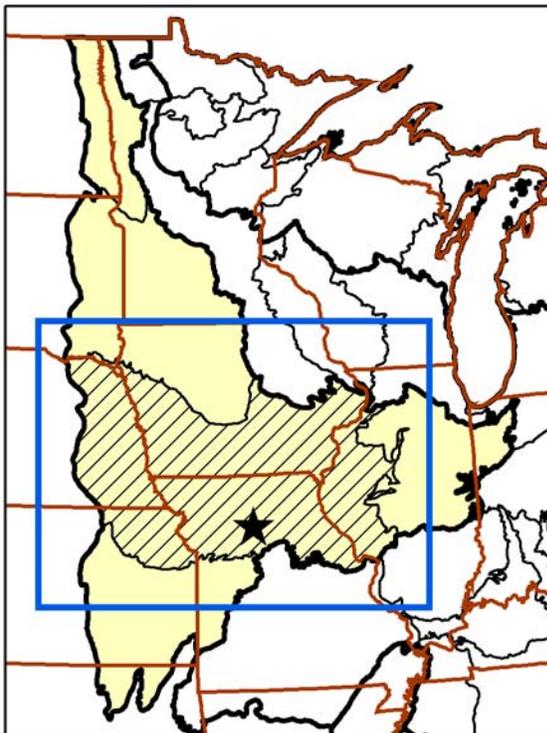
Watershed boundaries are helpful in determining the source of surface water flowing into the Refuge and assessing factors that affect water quantity and quality. Ecoregion boundaries are helpful in discovering relationships with other areas that have similar habitats and other features (see Figure 2 on page 10).

Figure 2: Watersheds and Habitats, Swan Lake NWR



★ : Swan Lake National Wildlife Refuge

BAILEY'S ECOREGIONS



Prairie Parkland (Temperate) to
Central Dissected Till Plains

Central Dissected Till Plains to
Missouri River Alluvial Plain &
Central Dissected Till & Loess Plain

Produced by USFWS
R3 Conservation Planning



Historic Vegetation

The following description of historic vegetation within the Grand River watershed is excerpted from the Grand River Inventory and Assessment (MDC undated).

The presettlement Grand River Watershed was characterized by long narrow prairies generally oriented north-south and divided by timbered ridge tops and stream valleys (Schroeder 1982). Only in the southwest part of the basin did prairies open up to wide expanses averaging 1 or 2 miles across.

Schroeder (1982) describes the riparian areas common to the watershed:

“In addition to the upland prairies, bottomland prairies occurred regularly on the flood plains of streams, sometimes becoming so extensive that timber was restricted to the river bank and rougher valley slopes.

“Large areas of the broad flood plains of streams in the Grand-Chariton region supported a `luxuriant growth of coarse wild grass' (Watkins et al. 1921). Sometimes these wet prairies occupied the entire bottomland, except for a timber strip fringing the banks of streams. Clay or gumbo soils prevented good drainage, and marshes and ponds abounded.

“Survey notes reveal a complex pattern of small lakes or ponds, wet prairie, intensively meandering creeks with and without river bank timber, and dense timber only along the Grand River channel in northwest Chariton County in what is now the Swan Lake area. There was nothing but wet prairie at the present Swan Lake site.”

Land Use/Cover

The Grand River Watershed extends across more than 5 million acres and was once covered by a mosaic of prairies and forests. Extensive land use conversion over the past century produced the current landscape dominated by agriculture. Table 1 on page 12 shows the distribution of current land cover as well as the potential natural vegetation based on county soil survey data for the Grand River Watershed and several of its sub-basins.

Migratory Bird Conservation Initiatives

Several migratory bird conservation plans have been published over the last decade that can be used to help guide management decisions on refuges. Bird conservation planning efforts have evolved from a largely local, site-based orientation to a more regional, even inter-continental, landscape-oriented perspective. Several transnational migratory bird conservation initiatives have emerged to help guide

the planning and implementation process. The regional plans relevant to Swan Lake NWR are:

- Partners in Flight Bird Conservation Plan – Dissected Till Plains
- Upper Mississippi River and Great Lakes Region Joint Venture of the North American Waterfowl Management Plan
- The Upper Mississippi Valley/Great Lakes Regional Shorebird Conservation Plan
- The Upper Mississippi Valley/Great Lakes Regional Waterbird Conservation Plan

Each of the bird conservation initiatives has a process for designating priority species, modeled to a large extent on the Partners in Flight method of computing scores based on independent assessments of global relative abundance, breeding and wintering distribution, and vulnerability to threats, area importance, and population trends. These scores are often used by agencies in developing lists of priority bird species. The Service based its 2001 list of Non-game Birds of Conservation Concern primarily on the Partners in Flight shorebird and waterbird status assessment scores.

Missouri Comprehensive Wildlife Strategy

Congress asked each state to develop a comprehensive wildlife strategy or, as they have become known, wildlife action plan. These plans examine the health of wildlife and prescribe actions to conserve wildlife and vital habitat before they become more rare and more costly to protect. Using wildlife information gathered over the past 30 years, Missouri's comprehensive wildlife strategy promotes management and benefits all wildlife, rather than targeting single species. The strategy identifies 33 Conservation Opportunity Areas in which management strategies will conserve both wildlife populations and the natural systems on which they depend. For each Conservation Opportunity Area, a team of partners developed a common vision of issues and actions. Swan Lake NWR is part of the Lower Grand River Conservation Opportunity Area, which also includes Fountain Grove Conservation Area, Yellow Creek Conservation Area, Little Compton Lake Conservation Area, Floyd Memorial Conservation Area, Sumner Access, and Pershing State Park. This network of lands and partners is working to fulfill the following strategies:

- Restore riverine habitat abundance and diversity for native plants and animals.
- Restore bottomland forests and woodlands to provide habitat for native plants and animals, with emphasis on species of conservation concern.

Table 1: Current Land Cover and Potential Natural Vegetation in Grand River Watershed and Sub-basins

Potential Natural Vegetation	Current Land Cover	Grand River Watershed	Lower Grand River Watershed	Yellow Creek Watershed	Turkey Creek Watershed
Prairie	Pasture/Hay	1,479,521			
Prairie	Cropland	1,148,901			
Forest	Pasture/Hay	891,699			
Forest	Forest	402,278			
Forest	Wetland	347,450			
Forest	Cropland	215,917			
Forest	Pasture/Hay		459,825		
Prairie	Pasture/Hay		278,183		
Prairie	Cropland		268,057		
Forest	Forest		142,800		
Forest	Cropland		111,289		
Forest	Pasture/Hay			152,029	
Forest	Forest			31,593	
Prairie	Pasture/Hay			20,330	
Prairie	Cropland			19,794	
Forest	Cropland			17,542	
Prairie	Cropland				21,572
Prairie	Pasture/Hay				11,867
Forest	Pasture/Hay				11,401
Forest	Cropland				5,023
Prairie	Wetland				2,433

- Manage wetlands and wet prairie habitats to benefit resident and migratory wildlife.
- Expand wet prairie habitat to allow the connection of eastern massasauga populations at Pershig State Park and Swan Lake NWR.
- Control populations of problematic exotic and invasive plants.
- Educate landowners about the importance of conservation practice.
- All federally listed threatened and endangered species and proposed and candidate species that occur in the Region.
- Migratory bird species derived from Service wide and international conservation planning efforts.
- Rare and declining terrestrial and aquatic plants and animals that represent an abbreviation of the Endangered Species program’s preliminary draft “Species of Concern” list for the Region.

Region 3 Fish and Wildlife Conservation Priorities

Every species is important; however the number of species in need of attention exceeds the resources of the Service. To focus effort effectively, Region 3 of the Fish and Wildlife Service compiled a list of Resource Conservation Priorities. The list includes:

Appendix D lists Regional Resource Conservation Priority species relevant to the Refuge.



Swan Lake NWR. Photo credit: USFWS

Other Conservation and Recreation Lands in the Area

The state of Missouri and other federal agencies own and manage lands and recreation access sites within a 50-mile radius of the Refuge (Figure 3 on page 14). There are more than 100 state areas that include public access sites, fish and wildlife areas, including recreation areas, forests, historic sites, and nature preserves. The federal areas include several units of the Big Muddy National Fish and Wildlife Refuge along the Missouri River. Local governments also own and manage community parks in the area. Conservation easements and lands enrolled in the Natural Resources Conservation Service's Wetland Reserve Program contribute thousands of acres to long-term conservation efforts.

Socioeconomic Context

Swan Lake NWR is located in Chariton County. The county is less racially and ethnically diverse than the state of Missouri as a whole. The population in the county has a lower average income and a lower percentage of high school and college graduates than the state's population as a whole.

Population and Demographics

Based on U.S. Census Bureau data, the population estimate for Chariton County was 8,046 in 2006. The population decreased 4.6 percent from 2000 while the population of the state grew 4.4 percent during the same period. The county population was 95.9 percent white in 2006; the state population was 85.1 percent white. In Missouri, 5.1 percent of the people 5 years and older speak a language other than English at home; in Chariton County it is 2.2 percent. The county population is projected to be 6,492 in 2025, a 19.3 percent decrease from 2006. The largest community in Chariton County is Salisbury with a 2006 population of 1,614.

Employment

There were 5,073 jobs in Chariton County in 2006. Farm employment accounted for more than 24.3 percent of the total jobs. Retail trade, local government, and construction are also notable sectors.

Income and Education

Per-capita income in the county was \$24,701 in 2005; in Missouri it was \$31,231. The median household income in 2004 was \$34,315; for Missouri \$40,885. In Chariton County, 11.4 percent of persons over 25 years of age hold a bachelor's degree or higher; in Missouri 21.6 percent of persons older than 25 years hold a bachelor's degree or higher.

Demand and Supply for Wildlife-Dependent Recreation

In order to estimate the potential market for visitors to the Refuge, we looked at 2007 consumer behavior data within approximately 30, 60, and 90 mile drives of the Refuge. The data were organized by zip code areas. We used the three driving distances because we thought this was an approximation of reasonable maximum drives to the Refuge for an outing by different groups. From experience we know, for example, that visitors come from the nearby local area to view wildlife in the evening. We also know that people seeking interesting varieties of bird species drive from all over Missouri and eastern Kansas and western Illinois to visit the Refuge. The 30-mile area extended beyond the communities of Chillicothe, Brookfield, and Carrollton. The 60-mile area included Cameron, Trenton, Kirksville, Moberly, Boonville, Lexington and a number of other communities. The 90-mile area included the Kansas City metropolitan area, Columbia, and Jefferson City.

The consumer behavior data that we used in the analysis is derived from Mediamark Research Inc. data. The company collects and analyzes data on consumer demographics, product and brand usage, and exposure to all forms of advertising media. The consumer behavior data were projected by Tetrad Computer Applications Inc. to new populations using Mosaic data. Mosaic is a methodology that classifies neighborhoods into segments based on their demographic and socioeconomic composition. The basic assumption in the analysis is that people in demographically similar neighborhoods will tend to have similar consumption, ownership, and lifestyle preferences. Because of the assumptions made in the analysis, the data should be considered as relative indicators of potential, not actual participation.

Figure 3: Conservation Lands in the Area of Swan Lake NWR

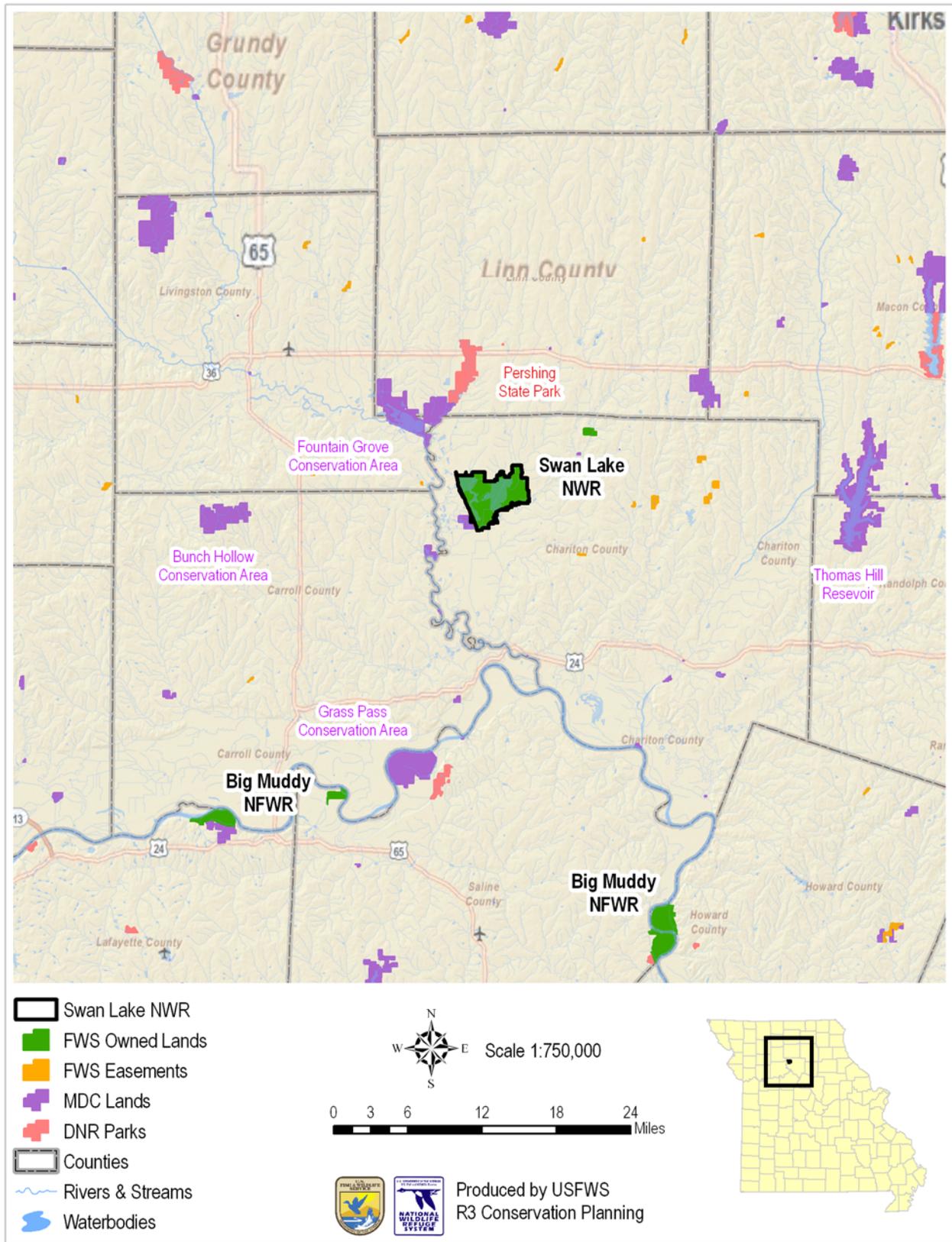


Table 2: Maximum Adult Audiences Within 30, 60, and 90 Miles of Swan Lake NWR for Four Activities

Approximate Driving Distance to Refuge	Total Population	Birdwatching	Fishing	Hunting with shotgun	Contribute to environmental organization
30 miles	108,198	5,143	18,014	5,798	5,009
60 miles	535,531	26,933	84,471	26,939	15,691
90 miles	2,444,707	112,026	331,819	93,772	43,064

We looked at potential participants in birdwatching, fishing, and hunting with shotgun. In order to estimate the general environmental orientation of the population, we also looked at the number of people who might contribute to an environmental organization.

The consumer behavior data apply to persons more than 18 years old. Table 2 displays the consumer behavior numbers for each of the three distances to the Refuge. The projections represent the maximum audience that we might expect to make a trip to the Refuge for approximate drives of half-hour, 1 hour, and 1 and a half hours. Actual visitors will be fewer because the estimate is a maximum, and we expect only a fraction of these people will travel to the Refuge.

We also considered the maximum number of students that might potentially participate in environmental education offered by the Refuge by looking at the school populations in Chariton County and in neighboring Carroll, Livingston, and Linn Counties. For Chariton County the school enrollment in preschool through grade 12 was 1,729 according to the 2000 census. For Carroll, Livingston, and Linn Counties the equivalent enrollments were 2,099, 2,961, and 2,852 respectively. The projected school age (5-19) population for the four counties for 2030 is 7,756.

Climate

The climate of north-central Missouri is characterized by hot, humid summers and mild winters. Spring weather is turbulent and thunderstorms and tornados are fairly common. Average monthly temperatures range from 15 degrees Fahrenheit in January to 80 degrees Fahrenheit in July. Average annual precipitation is 38.27 inches, with the heaviest amounts usually occurring during the months of May, June, and September.

Geology and Soils

The Refuge lies in the glacial till plain of north-central Missouri. Underlying bedrock is primarily shale and coal with occasional limestone. The topog-

raphy is relatively flat with elevations ranging from 653.91 feet to 741.56 feet.

Soil types of the Refuge are listed in Table 3 on page 16.

Water and Hydrology

The Refuge presently contains three major impoundments containing a combined total of about 4,300 acres and many smaller moist soil units. The largest impoundment, Silver Lake, contains 2,387 acres at full pool and is fed by a drainage area of 110 square miles (70 square miles from Turkey Creek plus 40 square miles from Elk Creek, see Figure 4 on page 17). Silver Lake waters can be drained to South Pool, Swan Lake, or other moist soil units on the Refuge. Additional local drainage adds 13 square miles to the drainage area of South Pool (918 acres at full pool) and approximately 5 square miles to the drainage of Swan Lake (987 acres at full pool).

Flooding is a frequent occurrence at many locations within the Grand River Watershed. The Refuge is subject to flooding from local intermittent streams, the Grand River, and Yellow Creek. Two broad factors affect flood intensity and duration within any watershed: precipitation characteristics and the physical characteristics of the basin or watershed. Precipitation characteristics describe the supply of water to a basin and include the amount, duration, intensity, and distribution. The watershed shape, topography, and soils are determined by geologic factors and are in many cases literally set in stone. Land use is the primary basin characteristic controlled by humans. Modifications to the landscape by practices such as deforestation, mining, and farming, as well as structures such as dams, levees, bridges, channels, and pavement all affect runoff and flooding. There are many such modifications within the Grand River Watershed that both speed and impede surface runoff. All of these factors interact and contribute to flood frequency and duration within the watershed (see Figure 5 on page 18).

Two modifications that are prevalent are channelization and levee construction. Channelization

Table 3: Swan Lake NWR Soil Types by Acreage

Soil Type	Acreage	Percent
Carlow silty clay, 0 to 2 percent slopes, rarely flooded	0	0.0%
Shannondale silt loam, 0 to 2 percent slopes	10	0.1%
Zook silty clay loam, 0 to 2 percent slopes, occasionally flooded	10	0.1%
Gifford silty clay loam, 2 to 9 percent slopes, eroded, rarely flooded	35	0.3%
Grundy silt loam, 2 to 5 percent slopes	38	0.3%
Speed silt loam, 0 to 2 percent slopes, occasionally flooded	151	1.4%
Lagonda silt loam, 2 to 5 percent slopes, eroded	168	1.5%
Blackoar silt loam, 0 to 2 percent slopes, occasionally flooded	217	2.0%
Triplett silt loam, 0 to 2 percent slopes, rarely flooded	367	3.3%
Dockery silt loam, 0 to 2 percent slopes, frequently flooded	419	3.8%
Tice silt loam, 0 to 2 percent slopes, frequently flooded	440	4.0%
Tina silt loam, 0 to 2 percent slopes, rarely flooded	797	7.2%
Carlow silty clay, 0 to 2 percent slopes, occasionally flooded	1125	10.2%
Water	3137	28.5%
Tuskeego silty clay loam, 0 to 2 percent slopes, occasionally flooded	4110	37.3%
	11,025	100.0%

includes straightening natural stream meanders, clearing the banks, and widening and deepening the channel (Funk and Ruhr 1971). This results in a loss of stream habitat, increased bank erosion, and lower ground water levels (Funk and Ruhr 1971). Levee construction separates the stream from its floodplain. Flood water can no longer spread out and is concentrated within the channel, causing further streambank erosion. Many landowners consider channelization and levee construction legitimate stream management practices. Several streams within the basin have been channelized for over one-half their length. A substantial portion of the streams in the basin are confined by levees.

Refuge Habitats and Wildlife

All wildlife requires some combination of food, water, cover, and space. Together these elements are commonly referred to as habitat. Cover types, also referred to as habitat types, are one method of describing habitat. Cover types are discrete areas delineated by differences in dominant vegetative cover. Although cover typing does not fully describe all of the components of habitat it is a useful concept to assist in management. Cover types are derived from aerial photographs that show the variation of Refuge habitats. The boundaries of each cover type are digitally outlined forming a mosaic of polygons that are individually labeled. The resulting map

seen in Figure 6 on page 19 depicts the existing cover types found on the Refuge.

The cover types shown in Figure 6 were developed based on the National Vegetation Classification System (NVCS), the Federal Standard for vegetative classification. A number of the NVCS categories were combined to form the eight cover types depicted.

Bottomland Forest

There are more than 3,100 acres of bottomland forest on the Refuge with the largest contiguous block found within the Research Natural Area along Yellow Creek. This cover type consists of bottomland closed-canopy hardwood forest generally occurring on wet soil and in floodplains. It is dominated by pin oak, silver maple, swamp white oak, and shagbark hickory with green ash, elm, black willow, river birch, and honey locust. The understory varies from open areas dominated with sedges and woodland forbs to denser areas with a shrub layer composed of Missouri gooseberry (*Ribes missouriense*), Western snowberry (*Symphoricarpos occidentalis*), and common pricklyash (*Zanthoxylum americanum*). These areas are subject to seasonal flooding.

Figure 4: Lower Grand River Watershed, Swan Lake NWR

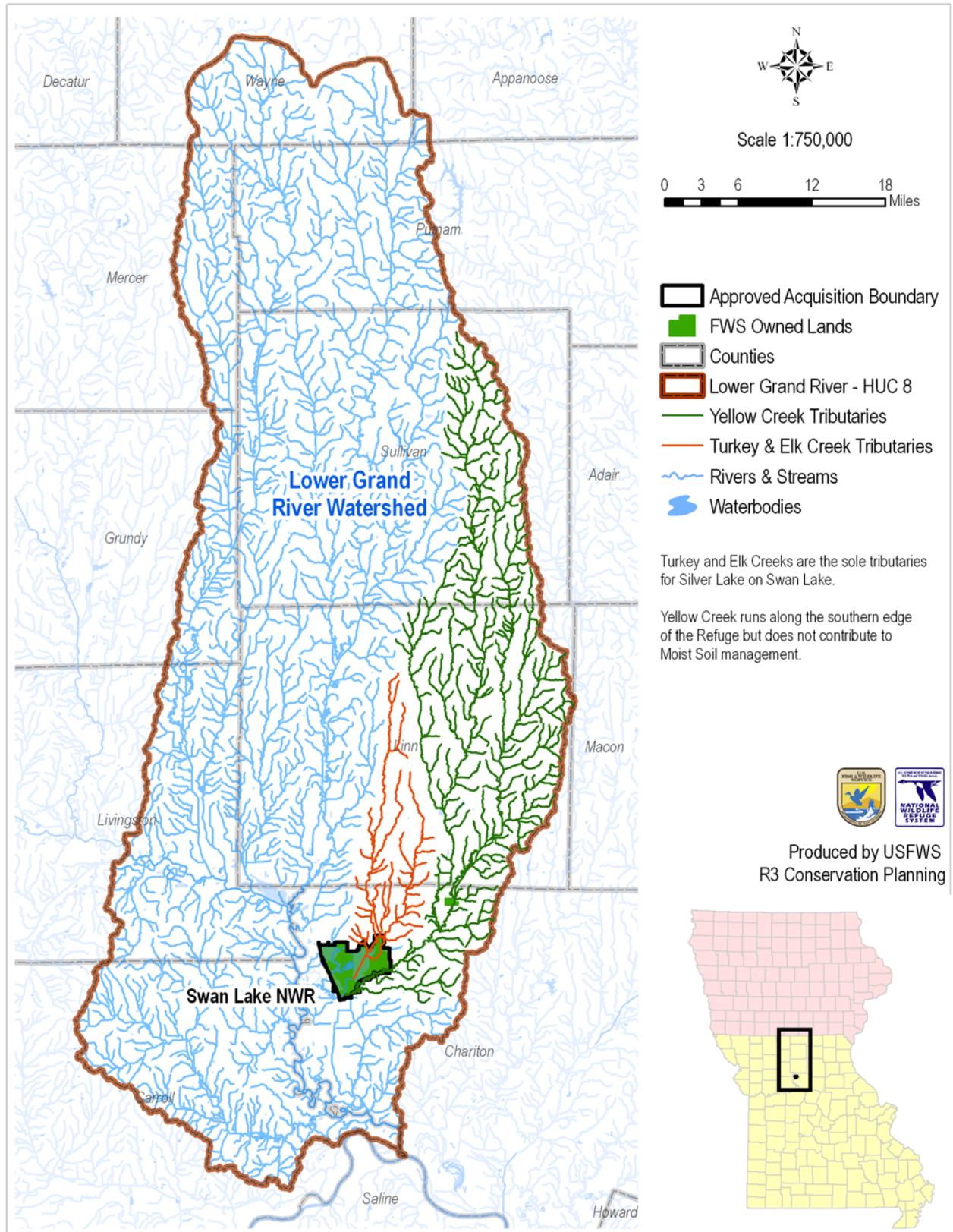


Figure 5: Watershed Comparison, Swan Lake NWR

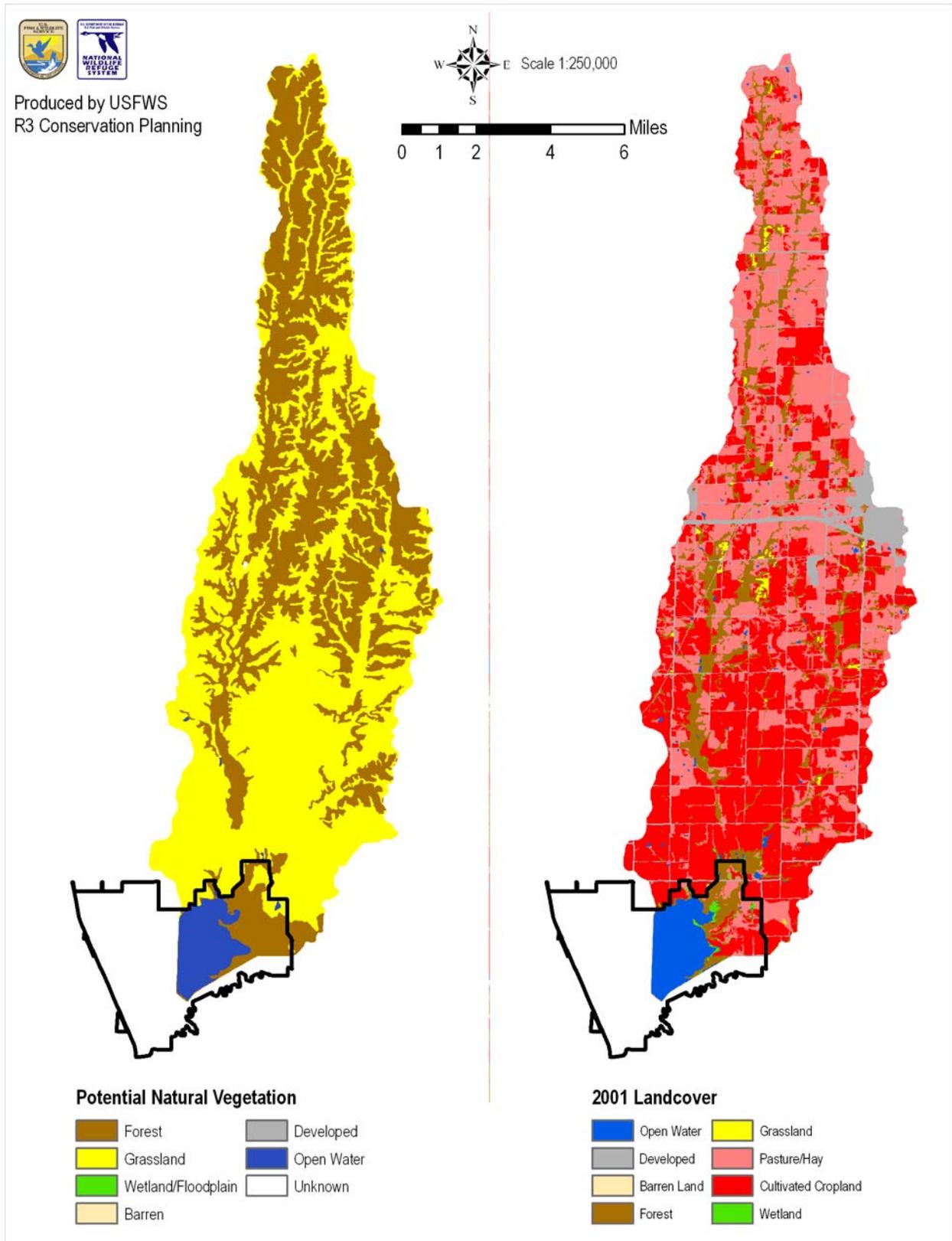
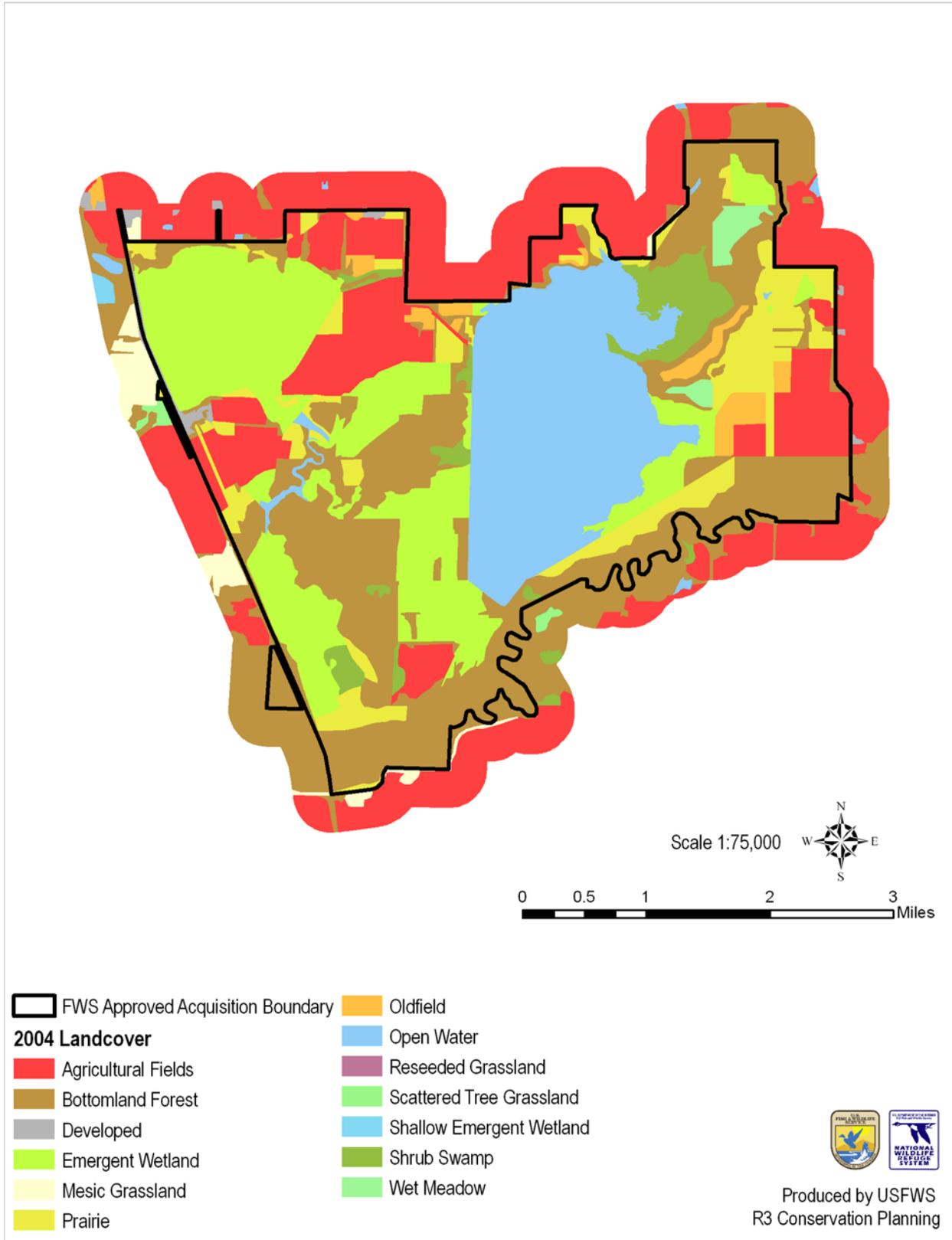


Figure 6: Current Land Cover, Swan Lake NWR



Emergent Wetland

There are over 2,000 acres of emergent wetland habitat on the Refuge. Emergent wetlands, commonly referred to as marshes and sloughs, are characterized by erect, rooted water plants that are present for most of the growing season in most years. These wetlands normally contain standing water, though at times they will dry up. Common perennial plants found in emergent wetlands include cattail, bulrushes, arrowheads, and sedges. Presently more than 800 acres of this habitat are managed using moist soil practices in which water levels are manipulated to create optimum wetland habitat conditions for migratory birds.

Open Water

Silver Lake contains nearly all of the more than 2,100 acres of open water on the Refuge. This cover type is defined as having less than 4 percent visible vegetation, which is either floating or submerged.

Agricultural Fields

There are 1,365 acres of agricultural fields on the Refuge. These are cultivated areas that consist of a variety of grasses and forbs or row crops such as wheat, corn or annual/perennial mixtures mowed for hay. Some of these areas are subject to occasional flooding.

Native Prairie

The Refuge contains approximately 1,000 acres of native prairie. These areas were either rarely or never cultivated in the past. Flooding and surface water is often present during much of the year. Native prairie sites are grassy fields dominated by reed canary grass, sedges and native grasses with a small number of scattered shrubs and small trees.

Wet Meadow

Wet meadow habitat occurs on about 110 acres of the Refuge. It is a type of wetland that commonly occurs in poorly drained areas such as shallow lake basins, low-lying farmland, and the land between shallow marshes and upland areas. Wet meadows often resemble grasslands, but are typically drier than other marshes except during periods of seasonal high water. For most of the year wet meadows are without standing water, though the high water table allows the soil to remain saturated. A variety of water-loving grasses, sedges, rushes, and wetland wildflowers proliferate in the highly fertile soil of wet meadows.

Shrub Swamp

There are approximately 410 acres of shrub swamp habitat on the Refuge, most of which occurs along the perimeter of open water and emergent

wetland habitats. Shrub swamp is dominated by deciduous woody vegetation less than 20 feet in height. Dominant species are mostly buttonbush (*Cephalanthus occidentalis*) and willow *Salix* spp. with an underlying mix of sedges and grasses and/or emergent vegetation, depending on water depth. The shrub layer varies from mostly open (25 percent) to closed (80 percent) and may contain scattered trees.

Old Field

The 240 acres of old field habitat occurs on disturbed soils and is dominated by reed canary, smooth brome, quack grass and weedy herbaceous species. These areas are usually drier than those of wet meadow habitat and were once regularly cultivated for crops but now are left fallow. They are subject to occasional flooding.

Wildlife

Birds

A variety of birds are year-around residents of Swan Lake NWR, including many waterfowl. During the spring and fall migrations, there is a great diversity of migrants due to its location between two major migratory bird corridors, the Central Flyway and the Mississippi Flyway. It is not uncommon for the Refuge to host up to 100,000 ducks, comprised mostly of dabblers, during the fall migration. The Eastern Prairie Population (EPP) of Canada Geese used Swan Lake NWR as their main wintering grounds until the late 1980s. In recent years winter distribution of the EPP flock has shifted farther north, but thousands of geese still winter on the Refuge. Wintering waterfowl also attract Bald Eagles. The Refuge also provides habitat for thousands of migratory shorebirds and is designated as a regionally important site under the Western Hemisphere Shorebird Reserve Network. The shallow water wetlands and moist soil units on the Refuge provide critical habitat for many species of waterfowl, shore birds, and marsh birds while the grasslands, forested wetlands, and farmland provide habitat for a variety of passerine birds. A complete list of bird species and a general guide to their seasonal occurrence and status on the Refuge can be found in Appendix C.

Mammals

There are 46 mammals documented as occurring on the Refuge. The mammals include the federally listed endangered Indiana bat as well as the white-tailed deer, a species popular for hunting and wildlife viewing. The presence of a reproductively active female Indiana bat was documented in 2003. The bats appear to be finding summer roosts within the



Eastern massasauga rattlesnake. Photo credit: USFWS

bottomland forest of the Yellow Creek Research Natural Area. Seven mammal species: plains pocket gopher, Franklin's ground squirrel, Eastern chipmunk, hispid cotton rat, Norway rat, Eastern spotted skunk, and gray fox are known to have occurred but have not been documented in recent years. A complete list of mammal species that occur on the Refuge can be found in Appendix C.

Amphibians and Reptiles

A variety of salamanders, toads, turtles, lizards, frogs, and snakes inhabit the Refuge including the eastern massasauga rattlesnake, a candidate for listing under the Endangered Species Act. Candidate species are plants and animals for which the U.S. Fish and Wildlife Service has sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. Swan Lake NWR is one of only three sites left in the state of Missouri where the rattlesnakes are known to be present.

Fish and Other Aquatic Species

A 2007 fisheries survey of Silver Lake found 15 species including white crappie, freshwater drum, flathead catfish, and shortnose gar. Flood events dramatically affect the number and composition of the Silver Lake fishery. An earlier survey of Silver Lake conducted in 1996 identified 16 fish species, but only 9 of these were reported again in the 2007 survey. No fisheries surveys have been conducted on other Refuge waters.

Eleven mussel species have been documented within Refuge waters including the Flat Floater

(*Anodonta suborbiculata*), a species listed as imperiled within Missouri.

Invertebrates

No comprehensive survey of invertebrates has been completed on the Refuge, but 20 species of butterflies and 24 species of dragonflies are documented as occurring on the Refuge. A list of these species is included in Appendix C.

Threatened and Endangered Species

State-listed Species

A number of species of concern within the state of Missouri are documented within the Refuge including: Least Bittern, Sora, Common Moorhen, and Franklin's ground squirrel.

Federally Listed Threatened/Endangered/Candidate Species

Presently, two species listed as federally endangered, Interior Least Tern and Indiana bat, have been documented as occurring on the Refuge. The Interior Least Tern uses the Refuge as migratory stop-over habitat and the Indiana bat uses the bottomland hardwoods of the Yellow Creek Research Natural Area as breeding habitat. The Refuge is also one of the few places where the eastern massasauga rattlesnake, a candidate for federal listing, is known to occur.

Threats to Resources

Invasive Species

Exotic/Pest Species

Some exotic (also known as non-native or alien) plants greatly alter the plant communities of natural areas while others more commonly affect already disturbed or agricultural areas. Left unchecked, noxious plant species can seriously degrade the productivity and wildlife value of invaded habitats.

Fortunately, most Refuge wetlands are relatively free of noxious plants. Those in the area possessing the greatest potential for serious impacts include reed canary grass. Monitoring will be necessary to assure prompt action is taken to control these plants before they become a problem in the future.

On upland sites and agricultural communities, the most troublesome noxious plant is *Sericia Lespedeza*. Owing to its hardiness, growth and reproductive mechanisms, this introduced species is difficult to control and located in various areas of the Refuge. Currently little is known of what areas are infested, monitoring will need to be completed to determine the extent of infestation on the Refuge.

Siltation

With its 7,900-square-mile watershed extending into Iowa, the Grand River has been a constant source of floodwater and debris entering Swan Lake NWR. Hundreds of levees have increased velocity and frequency of flooding, impacting Refuge water management, facilities, and habitat. This alteration of hydrology is of major concern.

Contaminants

A Contaminant Assessment Process (CAP) was conducted for this Refuge in 1993 and updated in 2005. A CAP is an information gathering process and initial assessment of a national wildlife refuge in relation to environmental contaminants.

The Refuge is surrounded by an agricultural landscape. Agricultural runoff flows into the streams of the Grand River Watershed, four of which flow through or adjacent to the Refuge. This agricultural runoff contains whatever residue from pesticides and fertilizers that have been used on the fields in the watershed.

Pesticide re-deposition is a phenomenon that has been documented throughout the Midwest, including Missouri. Pesticides become airborne through volatilization and wind erosion of particles both during and after the application process. Once airborne, the pesticide can be carried by wind and deposited onto unintended areas by dry (gas and particle) and wet (fog and precipitation by rain and snow) depositional processes. These deposited residues can revolatilize, re-enter the atmosphere, and be transported and redeposited downwind repeatedly until they are transformed and accumulated, usually in areas with cooler climates. For example, atrazine, a commonly used herbicide, is frequently found in rivers, streams, and groundwater. It is also often found in air and rain. The U.S. Geological Survey found that atrazine was detected in rain at nearly every location tested. Atrazine in air or rain can travel long distances from application sites. The effects of nonpoint source pollution and pesticide re-deposition on the resident and migratory communities of the Swan Lake NWR have not been determined.

The 1993 Swan Lake NWR Contaminants Survey documented potential contamination problems from dieldrin, chlordane, copper, chromium, manganese, and zinc on the Refuge. The major source of these compounds was speculated to be agricultural runoff from the area surrounding the Refuge. It was recommended that if there was concern that populations of fish and wildlife using the Refuge were decreasing or did not seem healthy, there should be further investigations into the abovementioned compounds.

Since that 1993 CAP survey, there may have been changes in agricultural practices in the watershed. Confined animal facility operations have become more prevalent in the watershed. The effects of these changes should be monitored. Eutrophication from increased nutrients from nonpoint source pollution has become a cause for concern on many natural areas throughout the nation (Molitor, 2006).

Climate Change Impacts

The U.S. Department of the Interior issued an order in January 2001 requiring federal agencies under its direction that have land management responsibilities to consider potential climate change impacts as part of long range planning endeavors.

The increase of carbon dioxide (CO₂) within the earth's atmosphere has been linked to the gradual rise in surface temperature commonly referred to as global warming. In relation to comprehensive conservation planning for national wildlife refuges, carbon sequestration constitutes the primary climate-related impact that refuges can affect in a small way. The U.S. Department of Energy's "Carbon Sequestration Research and Development" defines carbon sequestration as "...the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere."

Vegetated land is a tremendous factor in carbon sequestration. Terrestrial biomes of all sorts – grasslands, forests, wetlands, tundra, and desert – are effective both in preventing carbon emission and acting as a biological "scrubber" of atmospheric CO₂. The Department of Energy report's conclusions noted that ecosystem protection is important to carbon sequestration and may reduce or prevent loss of carbon currently stored in the terrestrial biosphere.

Conserving natural habitat for wildlife is the heart of any long-range plan for national wildlife refuges and management areas. The actions proposed in this CCP would conserve or restore land and habitat, and would thus retain existing carbon sequestration on the WMA. This in turn contributes positively to efforts to mitigate human-induced global climate change.

One Service activity in particular – prescribed burning – releases CO₂ directly to the atmosphere from the biomass consumed during combustion. However, there is actually no net loss of carbon, since new vegetation quickly germinates and sprouts to replace the burned-up biomass and sequesters or assimilates an approximately equal amount of carbon as was lost to the air (Boutton et al. 2006). Overall, there should be little or no net change in the amount of carbon sequestered at

Swan Lake NWR from any of the proposed management alternatives.

Several impacts of climate change have been identified that may need to be considered and addressed in the future:

- Habitat available for cold water fish such as trout and salmon in lakes and streams could be reduced.
- Forests may change, with some species shifting their range northward or dying out, and other trees moving in to take their place.
- Ducks and other waterfowl could lose breeding habitat due to stronger and more frequent droughts.
- Changes in the timing of migration and nesting could put some birds out of sync with the life cycles of their prey species.
- Animal and insect species historically found farther south may colonize new areas to the north as winter climatic conditions moderate.

The managers and resource specialists responsible for the WMA need to be aware of the possibility of change due to global warming. When feasible, documenting long-term vegetation, species, and hydrologic changes should become a part of research and monitoring programs on the WMA. Adjustments in land management direction may be necessary over the course of time to adapt to a changing climate.

The following paragraphs are excerpts from the 2000 report: *Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change*, produced by the National Assessment Synthesis Team, an advisory committee chartered under the Federal Advisory Committee Act to help the US Global Change Research Program fulfill its mandate under the Global Change Research Act of 1990. These excerpts are from the section of the report focused upon the eight-state Midwest Region.

Observed Climate Trends

Over the 20th century, the northern portion of the Midwest, including the upper Great Lakes, has warmed by almost 4 degrees Fahrenheit (2 degrees Celsius), while the southern portion, along the Ohio River valley, has cooled by about 1 degree Fahrenheit (0.5 degrees Celsius). Annual precipitation has increased, with many of the changes quite substantial, including as much as 10 to 20 percent increases over the 20th century. Much of the precipitation has resulted from an increased rise in the number of days with heavy and very heavy precipitation events.

There have been moderate to very large increases in the number of days with excessive moisture in the eastern portion of the Great Lakes basin.

Scenarios of Future Climate

During the 21st century, models project that temperatures will increase throughout the Midwest, and at a greater rate than has been observed in the 20th century. Even over the northern portion of the region, where warming has been the largest, an accelerated warming trend is projected for the 21st century, with temperatures increasing by 5 to 10 degrees Fahrenheit (3 to 6 degrees Celsius). The average minimum temperature is likely to increase as much as 1 to 2 degrees Fahrenheit (0.5 to 1 degree Celsius) more than the maximum temperature. Precipitation is likely to continue its upward trend, at a slightly accelerated rate; 10 to 30 percent increases are projected across much of the region. Despite the increases in precipitation, increases in temperature and other meteorological factors are likely to lead to a substantial increase in evaporation, causing a soil moisture deficit, reduction in lake and river levels, and more drought-like conditions in much of the region. In addition, increases in the proportion of precipitation coming from heavy and extreme precipitation are very likely.

Midwest Key Issues:

1. Reduction in Lake and River Levels

Water levels, supply, quality, and water-based transportation and recreation are all climate-sensitive issues affecting the region. Despite the projected increase in precipitation, increased evaporation due to higher summer air temperatures is likely to lead to reduced levels in the Great Lakes. Of 12 models used to assess this question, 11 suggest significant decreases in lake levels while one suggests a small increase. The total range of the 11 models' projections is less than a 1-foot increase to more than a 5-foot decrease. A 5-foot (1.5-meter) reduction would lead to a 20 to 40 percent reduction in outflow to the St. Lawrence Seaway. Lower lake levels cause reduced hydropower generation downstream, with reductions of up to 15 percent by 2050. An increase in demand for water across the region at the same time as net flows decrease is of particular concern. There is a possibility of increased national and international tension related to increased pressure for water diversions from the Lakes as demands for water increase. For smaller lakes and rivers, reduced flows are likely to cause water quality issues to become more acute. In addition, the projected

increase in very heavy precipitation events will likely lead to increased flash flooding and worsen agricultural and other non-point source pollution as more frequent heavy rains wash pollutants into rivers and lakes. Lower water levels are likely to make water-based transportation more difficult with increases in the costs of navigation of 5 to 40 percent. Some of this increase will likely be offset as reduced ice cover extends the navigation season. Shoreline damage due to high lake levels is likely to decrease 40 to 80 percent due to reduced water levels.

Adaptations: A reduction in lake and river levels would require adaptations such as re-engineering of ship docks and locks for transportation and recreation. If flows decrease while demand increases, international commissions focusing on Great Lakes water issues are likely to become even more important in the future. Improved forecasts and warnings of extreme precipitation events could help reduce some related impacts.

2. Agricultural Shifts

Agriculture is of vital importance to this region, the nation, and the world. It has exhibited a capacity to adapt to moderate differences in growing season climate, and it is likely that agriculture would be able to continue to adapt. With an increase in the length of the growing season, double cropping, the practice of planting a second crop after the first is harvested, is likely to become more prevalent. The CO₂ fertilization effect is likely to enhance plant growth and contribute to generally higher yields. The largest increases are projected to occur in the northern areas of the region, where crop yields are currently temperature limited. However, yields are not likely to increase in all parts of the region. For example, in the southern portions of Indiana and Illinois, corn yields are likely to decline, with 10-20 percent decreases projected in some locations. Consumers are likely to pay lower prices due to generally increased yields, while most producers are likely to suffer reduced profits due to declining prices. Increased use of pesticides and herbicides are very likely to be required and to present new challenges.

Adaptations: Plant breeding programs can use skilled climate predictions to aid in breeding new varieties for the new growing conditions. Farmers can then choose varieties that are better attuned to the expected climate. It is likely that plant breeders will need to use all the tools of plant breeding, including genetic engineering, in adapting to climate change. Changing

planting and harvest dates and planting densities, and using integrated pest management, conservation tillage, and new farm technologies are additional options. There is also the potential for shifting or expanding the area where certain crops are grown if climate conditions become more favorable. Weather conditions during the growing season are the primary factor in year-to-year differences in corn and soybean yields. Droughts and floods result in large yield reductions; severe droughts, like the drought of 1988, cause yield reductions of over 30 percent. Reliable seasonal forecasts are likely to help farmers adjust their practices from year to year to respond to such events.

3. Changes in Semi-natural and Natural Ecosystems

The Upper Midwest has a unique combination of soil and climate that allows for abundant coniferous tree growth. Higher temperatures and increased evaporation will likely reduce boreal forest acreage, and make current forestlands more susceptible to pests and diseases. It is likely that the southern transition zone of the boreal forest will be susceptible to expansion of temperate forests, which in turn will have to compete with other land use pressures. However, warmer weather (coupled with beneficial effects of increased CO₂), are likely to lead to an increase in tree growth rates on marginal forestlands that are currently temperature-limited. Most climate models indicate that higher air temperatures will cause greater evaporation and hence reduced soil moisture, a situation conducive to forest fires. As the 21st century progresses, there will be an increased likelihood of greater environmental stress on both deciduous and coniferous trees, making them susceptible to disease and pest infestation, likely resulting in increased tree mortality.

As water temperatures in lakes increase, major changes in freshwater ecosystems will very likely occur, such as a shift from cold water fish species, such as trout, to warmer water species, such as bass and catfish. Warmer water is also likely to create an environment more susceptible to invasions by non-native species. Runoff of excess nutrients (such as nitrogen and phosphorus from fertilizer) into lakes and rivers is likely to increase due to the increase in heavy precipitation events. This, coupled with warmer lake temperatures, is likely to stimulate the growth of algae, depleting the water of oxygen to the detriment of other living things. Declining lake levels are likely to cause large impacts to the current distribution of wetlands. There is some chance that some wetlands could gradually

migrate, but in areas where their migration is limited by the topography, they would disappear. Changes in bird populations and other native wildlife have already been linked to increasing temperatures and more changes are likely in the future. Wildlife populations are particularly susceptible to climate extremes due to the effects of drought on their food sources.

Administrative Facilities

Administrative facilities consist of roads and developed sites for administration of the Refuge and public use activities. The administrative area of the Refuge currently consists of a maintenance shop, carpentry shop, three cold storage buildings for vehicle and equipment parking and a couple of out-buildings for storage, the Refuge Visitor Center/Headquarters building, Refuge quarters and a public toilet.

There are 13 pit blinds located on the Refuge available for goose hunters, a short nature trail, boat ramp, 5 small fishing platforms, a kiosk and viewing area on the main entrance road overlooking Swan Lake, and approximately 20 miles of auto tour route. There is also the old hunting headquarters site which was previously occupied by MDC personnel. That site consists of two buildings, one is closed and no longer used, the other is a half-finished garage/storage area where goose draws and hunter check-in are conducted during the hunting season. There are also two vault toilets at the site which still belong to MDC.

Cultural Resources and Historic Preservation

North-central Missouri contains archeological evidence for the earliest suspected human presence in the Americas, the Early Man cultural period prior to 12,000 B.C.; and extending through the PaleoIndian, Archaic, Woodland, Mississippian, and historic Western cultures. Although a complete cultural survey of the Refuge has not been performed, earlier partial surveys have located 30 historical and archeological sites.

Section 106 of the National Historic Preservation Act provides the framework for federal review and consideration of cultural resources during federal project planning and execution. The implementing regulations for the Section 106 process (36 CFR Part 800) have been promulgated by the Advisory Council on Historic Preservation (ACHP). The Secretary of the Interior maintains the National Register of Historic Places (NRHP) and sets forth significance criteria (36 CFR Part 60) for inclusion in the register. Cultural resources may be consid-



Swan Lake NWR Visitor Center. Photo credit: FWS

ered “historic properties” for the purpose of consideration by a federal undertaking if they meet NRHP criteria. The implementing regulations at 36 CFR 800.16(v) define an undertaking as “a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; those requiring a federal permit, license or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a federal agency.” Historic properties are those that are formally placed in the NRHP by the Secretary of the Interior, and those that meet the criteria and are determined eligible for inclusion.

Like all federal agencies, the Service must abide by Section 106 of the NHPA. Cultural resources management in the Service is the responsibility of the Regional Director and is not delegated for the Section 106 process when historic properties could be affected by Service undertakings, for issuing archeological permits, and for Indian tribal involvement. The Regional Historic Preservation Officer (RHPO) advises the Regional Director about procedures, compliance, and implementation of the several cultural resources laws. The Refuge Manager assists the RHPO by informing the RHPO (early in the process) about Service undertakings, by protecting archeological sites and historic properties on Service managed and administered lands, by monitoring archeological investigations by contractors and permittees, and by reporting violations.

Swan Lake NWR follows these procedures to protect the public’s interest in preserving any cultural legacy that may potentially occur on the Refuge. Whenever construction work is undertaken that involves any excavation with heavy earth-moving equipment like tractors, graders, and bulldoz-

ers, the Refuge contracts with a qualified archaeologist/cultural resources expert to conduct an archaeological survey of the subject property. The results of this survey are submitted to the RHPO as well as the Missouri State Historic Preservation Officer (SHPO). The SHPO reviews the surveys and determines whether cultural resources will be impacted, that is whether any properties listed in or eligible for listing in the NRHP will be affected. If cultural resources are actually encountered during construction activities, the Refuge is to notify the SHPO immediately.

Visitation

Swan Lake NWR is open Refuge-wide sunrise to sunset from March through October, amounting to about 240 days a year. There are three entrances to the Refuge including the main entrance, north entrance and the west entrance. The Refuge is open to goose hunting during the goose season, which is usually mid November through the end of February. The Visitor Center is opened during weekdays and occasionally opened during special events and staffed by the local Audubon group.

The Refuge annual visitation was estimated at approximately 25,000 in 2008. The number of visitors per year is obtained through estimates derived in large part from traffic counters at the three Refuge entrances.

We do not have an accurate breakdown of visitor numbers per activity but we believe the largest segment of our visitors come for wildlife viewing, followed by fishing, education, and hunting.

Current Management

Habitat Management

Current habitat management activities consist of water level manipulation, farming, moist soil man-



Environmental education program. Photo credit: USFWS

agement, prescribed burning, mowing, and deer population control through public hunting programs. (Figure 7)

Wetland Management

Most wetland management activities on the Refuge are carried out through moist soil management described in the following section. Other wetlands are typically held in emergent marsh with natural fluctuations of water through natural flooding and drought cycles.

Moist Soil Units

Approximately 800 acres are under moist soil management to produce food for migrating waterfowl and shorebirds. Moist soil units are developed to impound water through construction of dikes and water control structures. Moist soil management entails manipulating water levels to encourage the growth of plants occurring naturally in the seed bank. The plants produce seeds that are high energy food for migrating waterfowl.

Flooding of moist soil units begins in September and proceeds in stages. Progressive flooding concentrates feeding waterfowl, more fully utilizing moist soil foods. Draining begins in March to exposes mud flats and attract migrating shorebirds that feed on invertebrates. The moist soil units remain dry throughout the growing season to produce food for the following year. Periodically, the units are disturbed to disturb the soil and retard invasion of woody vegetation.

Grasslands

The Refuge's 19 management units include a total of 920 acres of grassland. These units are burned every 3-5 years to reduce the amount of woody vegetation and organic matter (litter) and encourage growth of grass and forbs.

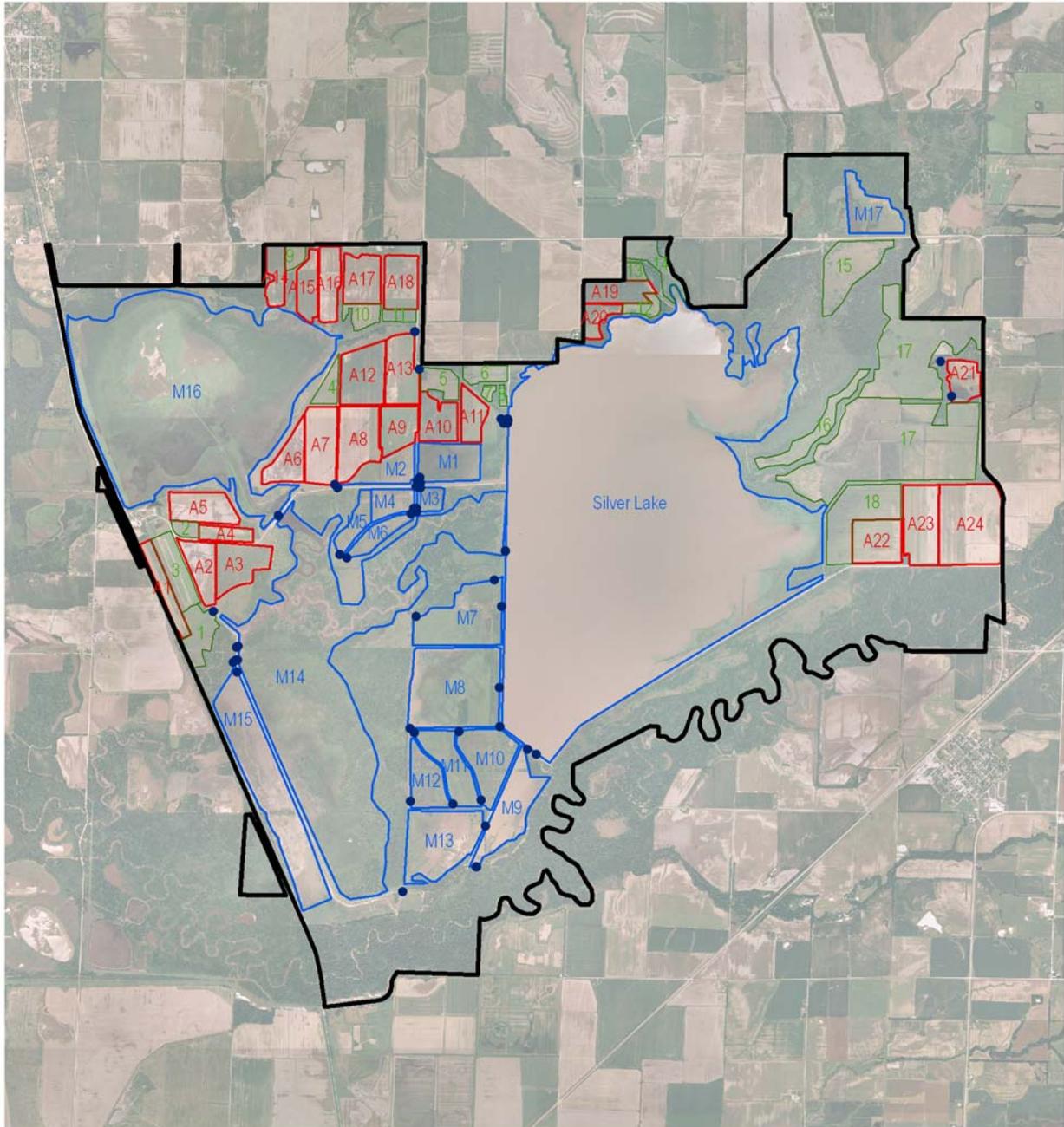
Forests

Presently, the forests on the Refuge are not actively managed.

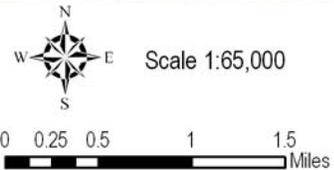
Cropland

The Refuge crops 1,365 acres through cooperative farming agreements, an arrangement where local farmers plant and harvest the crops but must leave a portion of the crop as food for wildlife. The location of the portion left is determined by the Refuge. Crops, usually corn, soybeans, wheat, clover, or buckwheat, are planted in the spring and harvested anywhere from mid-September to the end of October, but may occur later if conditions are too wet in the fall to allow harvesting. Winter wheat is generally planted in October and left through the winter and harvested in June or July. On some areas, clover is frost seeded in February. Frost seeding

Figure 7: Management Units, Swan Lake NWR



-  Swan Lake NWR Approved Acquisition Boundary
-  Grassland Management Unit
-  Agricultural Management Unit
-  Wetland Management Unit
-  Water Control Structure



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*Cooperative farming is a management tool on Swan Lake NWR.
Photo credit: USFWS*

entails broadcast seeding clover over existing winter wheat and allowing the freeze thaw action to work the seed into the ground. The clover fixes nitrogen into the soil and is either ploughed under in the fall or left through the winter.

The Refuge encourages the use of no-till farming, also known as conservation tillage. This method is practiced on about half of the sites annually. It is a way of growing crops from year to year without disturbing the soil through tillage. In no-till farming the soil is left intact and crop residues – stalks, stubble, leaves, and seed pods left after harvesting – are left in the fields. Despite the advantages to soils, no-till farming usually requires planting herbicide-resistant crop plants and then chemically weeding with herbicides. Herbicide-resistant crops are genetically modified organisms and their use on the Refuge is governed by regional policy.

Monitoring

Bald Eagle

Bald Eagles are monitored in conjunction with waterfowl counts.

Waterfowl

Waterfowl are monitored weekly in the spring and fall; however, it is difficult to get an accurate count of waterfowl use in the moist soil units during periods of heavy use because the birds are readily flushed from one unit to settle in an adjacent unit as the observer moves through the area.

Shorebirds, Marsh Birds and Other Waterbirds

Spring and fall shorebird surveys are conducted by Refuge staff. Marsh birds and other waterbirds are typically counted during shorebird surveys. Although there is much variation and many missing species in these counts due to the secretive nature of

many of these birds, documentation of species occurrence is still considered important.

Vegetation

Vegetation surveys are usually conducted in late August or early September. Species variety is noted in the moist soil units as well as the presence of invasive plants.

Public Use

The National Wildlife Refuge System Improvement Act established six priority uses of the Refuge System. These priority uses all depend on the presence of, or expectation of the presence, of wildlife, and are thus called wildlife-dependent uses. These uses are hunting, fishing, wildlife observation, photography, environmental education, and interpretation. Swan Lake NWR provides opportunities in all of the six priority uses of the Refuge System.

Hunting

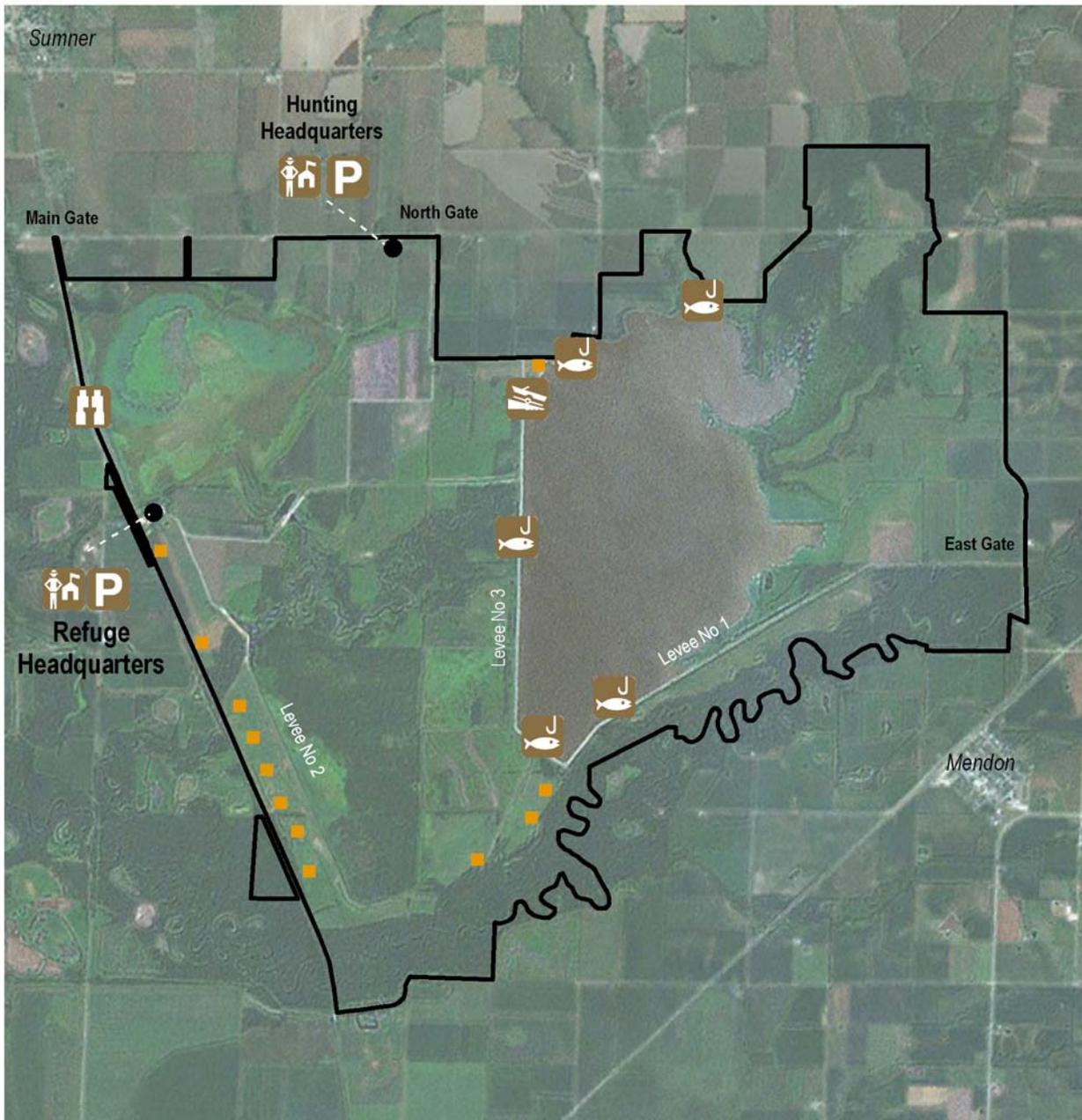
Currently goose and white-tailed deer hunting are permitted on the Refuge. The goose hunting season typically begins in November and ends in January. It occurs at 21 designated units allocated to hunters with a daily drawing on each day of the hunt (see Figure 8). No fees are charged for the goose hunt program. At the conclusion of the regular goose season a special season established through the Service's Conservation Order to reduce Snow Goose numbers begins and continues until March 1.

There are three white-tailed deer hunts. Two of the hunts are considered managed hunts and are listed as such in the Missouri Department of Conservation hunting season regulations and usually occur on successive weekends in November and December. One of the public hunts is a youth hunt open to modern firearms and the other hunt is a regular public hunt open to muzzleloaders only. The Refuge also offers a hunt for disabled hunters that is not part of the MDC managed deer hunt program.

Fishing

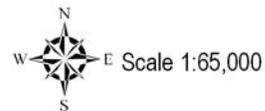
The Refuge has a boat ramp and three paved bank fishing platforms on Silver Lake (Figure 8). Fishing activity also includes archery fishing and trotlines. The most common species in the Refuge are channel catfish, bullhead, carp, buffalo, and crappie. Fishing platforms are universally accessible. No special permit is required for fishing on the Refuge, and all state and Refuge regulations apply. The Refuge is open to fishing from March 1 until October 15 with the exception of the area of the Refuge that is accessed by the Taylor Point Road, which allows fishing access along Elk Creek and the north shore of Silver Lake.

Figure 8: Current Visitor Services Facilities, Swan Lake NWR



- | | |
|-----------------------------------|----------------|
| FWS Approved Acquisition Boundary | Piers |
| Facility | Spotting Scope |
| Boat Launch | Hunting Blind |
| Parking Lot | |

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Scale 1:65,000
0 0.25 0.5 1 1.5 2 Miles

Wildlife Observation, and Photography

Opportunities for wildlife observation and photography are found along the Refuge roads, at the overlook, and along the nature trail (Figure 8). The benches provided at the fishing platforms on Silver Lake and the universally accessible hunting blind can also be used for wildlife observation.

From 10,000 to 80,000 Canada Geese, up to 150,000 Snow Geese, and over 100,000 ducks can commonly be seen. In addition, more than 240 other species of birds are found here. Appendix C includes the Refuge's bird checklist.

Environmental Education and Interpretation

The Refuge is located in a rural setting in North-central Missouri that requires long commutes from most schools. Nonetheless, the Refuge is an attractive environmental education opportunity because of its unique wildlife resources and its location near a state park that also attracts school groups. Self-guided interpretation is available at the Refuge visitor center and along a nearby trail.

Non Wildlife-dependent Recreation

Visitors are allowed to gather nuts, berries, and mushrooms as well as to collect shed antlers in accordance with Refuge regulations.

Species Management

Animal Species

High densities of species like white-tailed deer, beaver, and raccoons can severely affect habitat quality and/or other species. Our primary goal in managing these populations is to provide complex



Information kiosk on the Refuge. Photo credit: FWS

habitat structures to meet the nesting, feeding, and resting requirements of migratory birds, listed species, and other wildlife. We continue to monitor deer herd size and health and attempt to manage density through a public hunt. Beaver are trapped when a management problem is identified.

Plant Species

Invasive or pest plants can affect many habitat types found at the Refuge. Reed canary grass and American lotus can invade wetlands, and *Sericia lespedeza*, Johnson grass, black locust, and honey locust can invade grasslands. To reduce encroachment by these species, we use several management techniques, such as hand pulling individual plants, mowing, burning, water level manipulation, plowing, and chemical applications. The technique we select is influenced by management objectives, intensity of encroachment, best land use practices, cost, and timing of application.

Archaeological and Cultural Resources

Cultural resources are important parts of the nation's heritage. The Service is committed to protecting valuable evidence of human interactions with each other and the landscape. Protection is accomplished in conjunction with the Service's mandate to protect fish, wildlife, and plant resources.

Other Management Areas

Research Natural Area

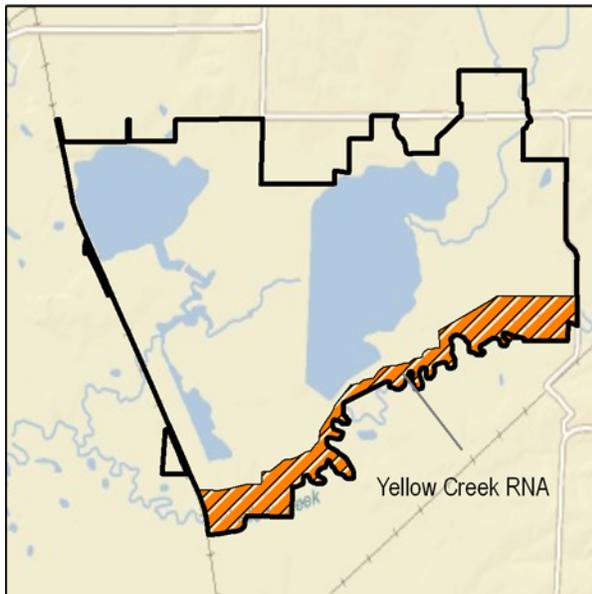
The 1,000-acre Yellow Creek Research Natural Area (Figure 9) was established in 1973 and includes mature bottomland hardwood forest. No management activities occur in the Research Natural Area. Research Natural Areas are part of a national network of reserved areas under various ownerships. Research Natural Areas are intended to represent the full array of North American ecosystems with their biological communities, habitats, natural phenomena, and geological and hydrological formations.

In research natural areas, as in designated wilderness, natural processes are allowed to predominate without human intervention. Under certain circumstances, deliberate manipulation may be used to maintain the unique features for which the research natural area was established. Activities such as hiking, bird watching, hunting, fishing, wildlife observation, and photography are permissible, but not mandated, in research natural areas.

Farm Service Agency Conservation Easements and Fee Title Tracts

Swan Lake NWR manages 46 easements and outlying fee title tracts scattered across 15 Missouri counties (see Figure 10 on page 32). Little active

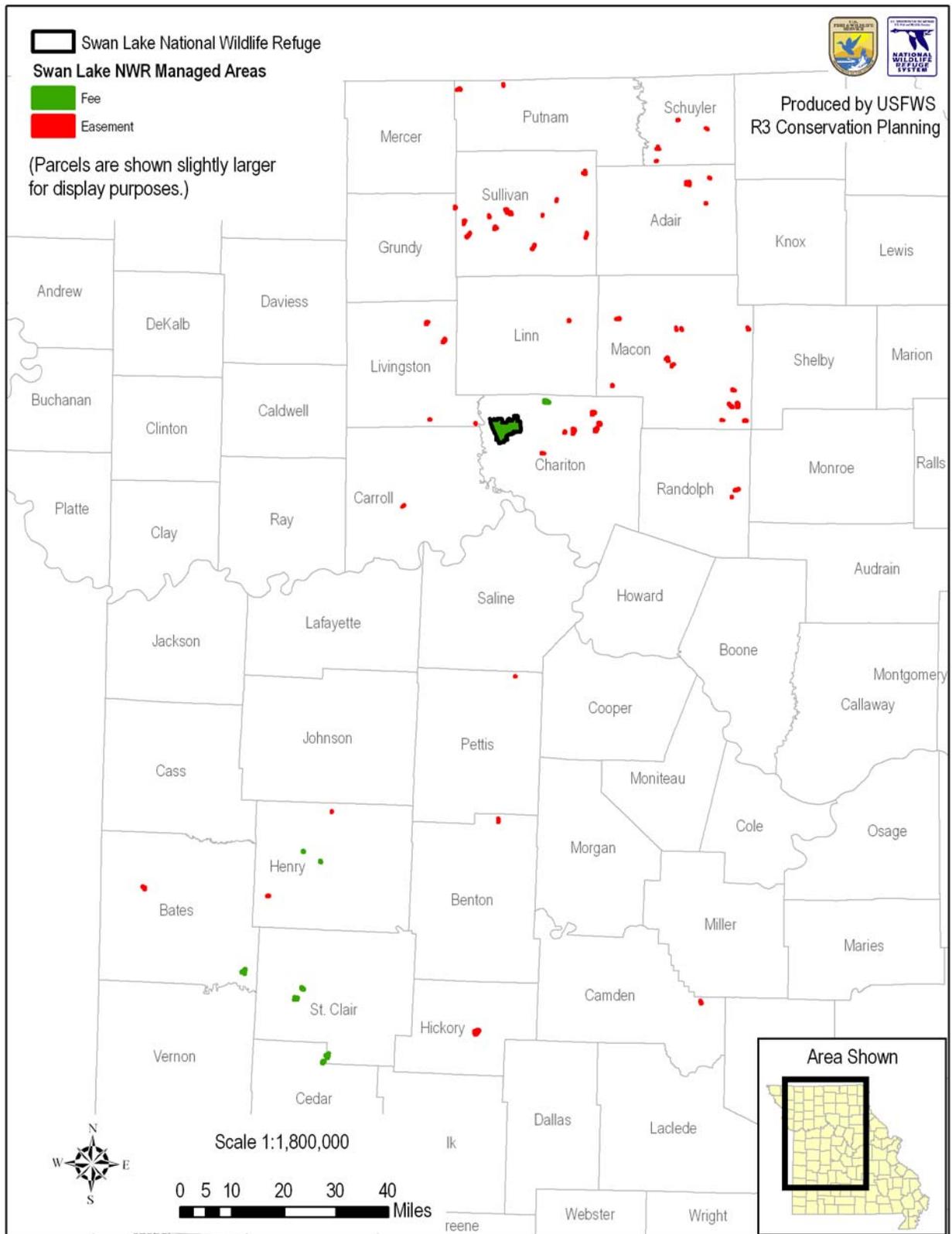
**Figure 9: Yellow Creek Research
Natural Area**



management occurs on these sites. The Farm Services Agency, formerly known as the Farm Services Administration, is an agency within the U.S. Department of Agriculture. The FSA makes loans to farmers and ranchers temporarily unable to obtain credit from commercial lending institutions. The FSA sometimes obtains title to real property when a borrower defaults on a loan secured by the property and holds such properties in inventory until sale or other disposal.

The Service is involved in the inventory disposal program because some FSA inventory properties contain or support significant fish and wildlife resources or have healthy restorable wetlands or other unique habitats. Some qualifying properties are transferred to the Service and become part of the National Wildlife Refuge System. Others are sold with restrictions known as conservation easements, which protect wetlands or other habitats. In most cases, the Service is responsible for the management and administration of properties with conservation easements.

Figure 10: FSA Parcels Managed by Swan Lake NWR



Chapter 4: Management Goals and Objectives

This chapter presents the goals, objectives and strategies that will guide management and administration of the District over the next 15 years. This management direction represents the plan for the Refuge and mirrors Alternative 4 in the Environmental Assessment, which was prepared as part of the planning process. The initial version of the Environmental Assessment was included in the Draft CCP as Appendix A. The revised version, which includes the addition of Alternative 4, is available on the Swan Lake NWR planning webpage at <http://www.fws.gov/midwest/planning/SwanLake>.

Goals, objectives, and strategies comprise the proposed future management direction. Goals are descriptive broad statements of desired future conditions that convey a purpose. There are three goals for Swan Lake NWR. Goals are followed by objectives, which are specific statements describing management intent. Objectives provide detail and are supported by rationale statements that describe background, history, assumptions, and technical details to help clarify how the objective was formulated.

Finally, beneath each objective there is a list of strategies, the specific actions, tools, and techniques required to fulfill the objective. The strategies may be refined or amended as specific tasks are completed or new research and information come to light. Some strategies are linked to the duties of an employee position, which indicates that the strategy will be accomplished with the help of a new staff position. When a time in number of years is noted in an objective or strategy, it refers to the number of years from approval of this CCP. If no time is given, the objective is to be accomplished within the 15 years of the life of the Plan.



Bullfrog. Photo credit: FWS

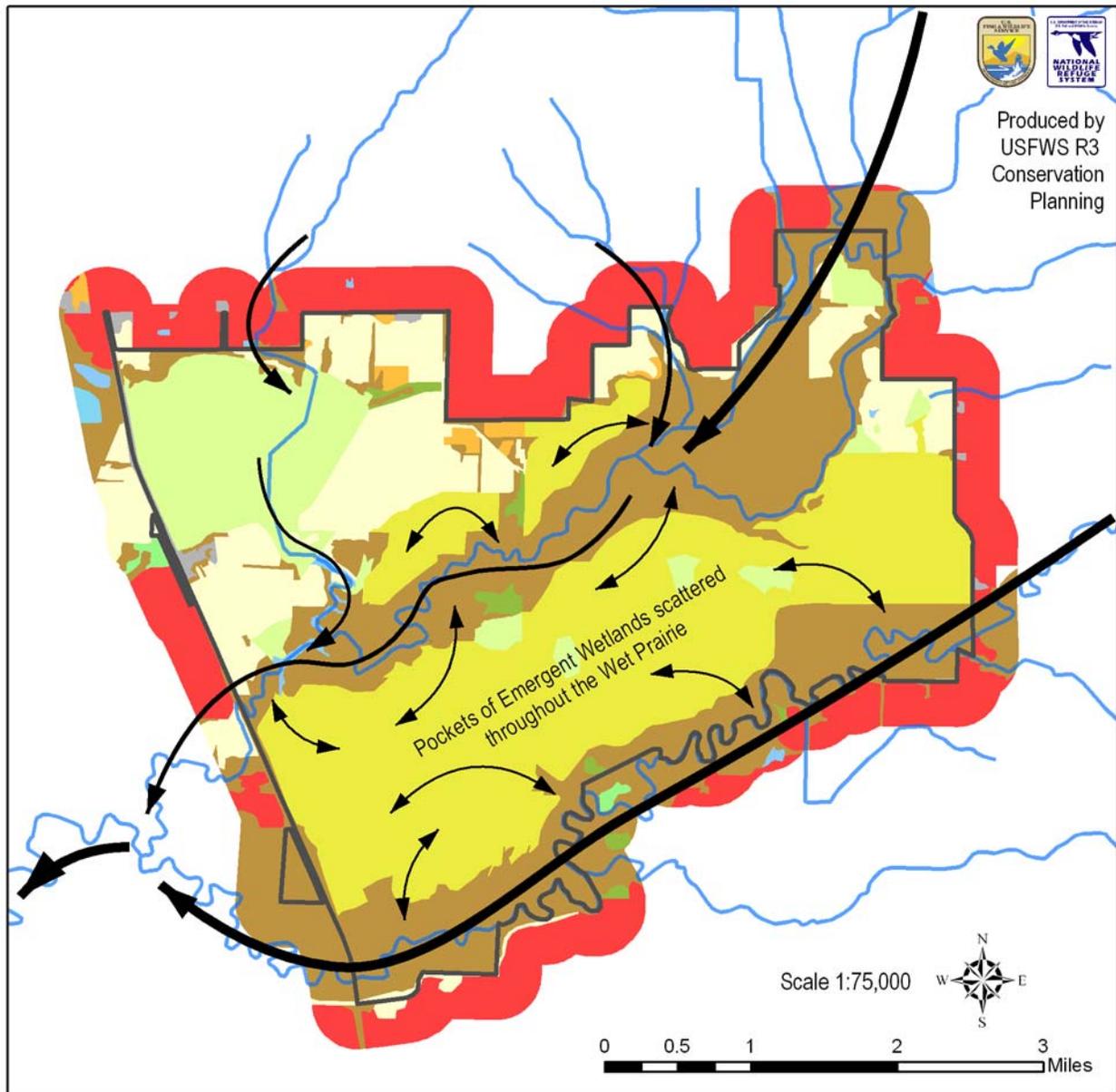
Goal 1: Habitat

Wetlands, grasslands, and bottomland forests providing habitat for migratory birds, threatened and endangered species, and other wildlife within the Grand River floodplain.

Objective 1-1: Managed Wetlands

Over the 15-year life of the plan, increase the amount of native foods for waterfowl within the Silver Lake and Swan Lake basins by managing water levels to create or maintain a dense mixture of native aquatic and wetland plants that includes both emergents and submergents (for example wild millet, panic grass, smartweed, sedges, and pondweed). Make no changes to Silver Lake water management during the initial years of the planning period. Continue to collect additional monitoring data and within 5-7 years of CCP approval develop a detailed habitat management plan for achieving this objective that draws on the monitoring data and the results of a hydrogeomorphic study of the watershed. The habitat management plan will identify source water storage and management

Figure 11: Potential Water Movement and Likely Associated Vegetation, Swan Lake NWR



- Normal Streamflow
- Seasonal Flooding & Retreat

Wet prairie dominates the landscape and flooding occurs during high water events with lower areas remaining wet for longer periods of time.

Landcover based on NRCS SSURGO soils data and associated potential natural vegetation.

- FWS Approved Acquisition Boundary
- Potential Streamflow
- Potential Landcover**
- Agricultural Fields
- Bottomland Forest
- Developed
- Emergent Wetland
- Native Upland Prairie
- Oldfield
- Open Water
- Reseeded Grassland
- Scattered Tree Grassland
- Shallow Emergent Wetland
- Shrub Swamp
- Wet Meadow

Landcover based on NRCS SSURGO soils data and associated potential natural vegetation.

actions with measurable outcomes regarding things such as vegetation response and waterfowl numbers. These management actions will be implemented incrementally and monitored to measure success and to modify future actions to better meet stated outcomes. Increasing waterfowl foods within the Silver Lake basin will not be done at the expense of source water for wetland management across the Refuge.

Rationale

Presently (2010), the Silver Lake basin serves as a reservoir to provide source water for management activities across the Refuge. This dedicates approximately one-fifth of total Refuge acres as open water, which is largely devoid of aquatic vegetation and provides little food for migratory birds. Increasing the amount of aquatic and wetland plants would increase the amount of seeds, rhizomes, tubers, and invertebrates used as food by migratory birds, especially waterfowl.

Strategies

1. Conduct a hydrogeomorphic evaluation of the Refuge and surrounding area to assess historic hydrologic functions and map current and future hydrologic and soil conditions.
2. Monitor surface waters that affect Refuge hydrology (e.g. stage, stream flow, volume) including seasonal inflow variations within Elk Creek and Turkey Creek.
3. Monitor common invasive species pathways (e.g. streams, waterways, roads, trails) to aid in early detection of invasive species while continuing to treat known infestations as appropriate throughout the Refuge.
4. Develop a habitat management plan that includes details (as noted in the objective statement) on management of Refuge lands and waters including Silver Lake, Swan Lake, and moist soil units.

Objective 1-2: Emergent Wetland

Within Moist Soil Management Units

Current (2010) amount 13 units totaling about 800 acres

Over the life of the Plan, manage approximately 800 acres of moist soil habitats (as described in "Moist Soil Units" on page 26). Future location of moist soil units may change as croplands are converted to other habitats. Manage moist soil areas to provide a diversity of native herbaceous plant foods such as wild millet (*Echinochloa* spp.); panic grass (*Panicum* spp.); smartweed (*Polygonum* spp.); sedges (*Cyperus* spp. and *Carex* spp.); and beggarticks (*Bidens*

spp.), and ensure that up to 25 percent of the acreage is available as mud flat or shallow water (6 inches or less) unvegetated habitat in the spring and up to 10 percent of the acreage is available as mud flat or shallow water habitat with less than 50 percent cover in the fall for migrating shorebirds.

Rationale

The Upper Mississippi River and Great Lakes Region Joint Venture (UMRGLRJV) Waterfowl Habitat Conservation Strategy identifies two sets of habitat objectives: 1) Maintenance and Protection, that is the type and amount of habitat necessary to meet current waterfowl populations, and 2) Restoration and Enhancement, the amount and type of habitat necessary to meet waterfowl population goals. Emergent wetland managed using moist soil techniques fits within the Plan under the habitat categories Wet mudflat/moist soil plants. Within the portion of Missouri covered by the Joint Venture, the Plan identifies a need for more than 3,300 acres of Wet mudflat/moist soil plants to meet existing waterfowl population levels. There is also a need for an additional 692 acres of wet mudflats/moist soil plant habitat to meet the target population goals. In addition, the Missouri Department of Conservation Wetland Management Plan (a step-down of the NAWMP) has an objective for state and federal refuges to provide habitat to support 29 million duck use days. Maintaining existing Wet mudflat/moist soil plant habitats on Swan Lake NWR contributes to meeting these larger conservation objectives as well as contributing to conservation objectives outlined in the United States Shorebird Conservation Plan and the North American Waterbird Conservation Plan.

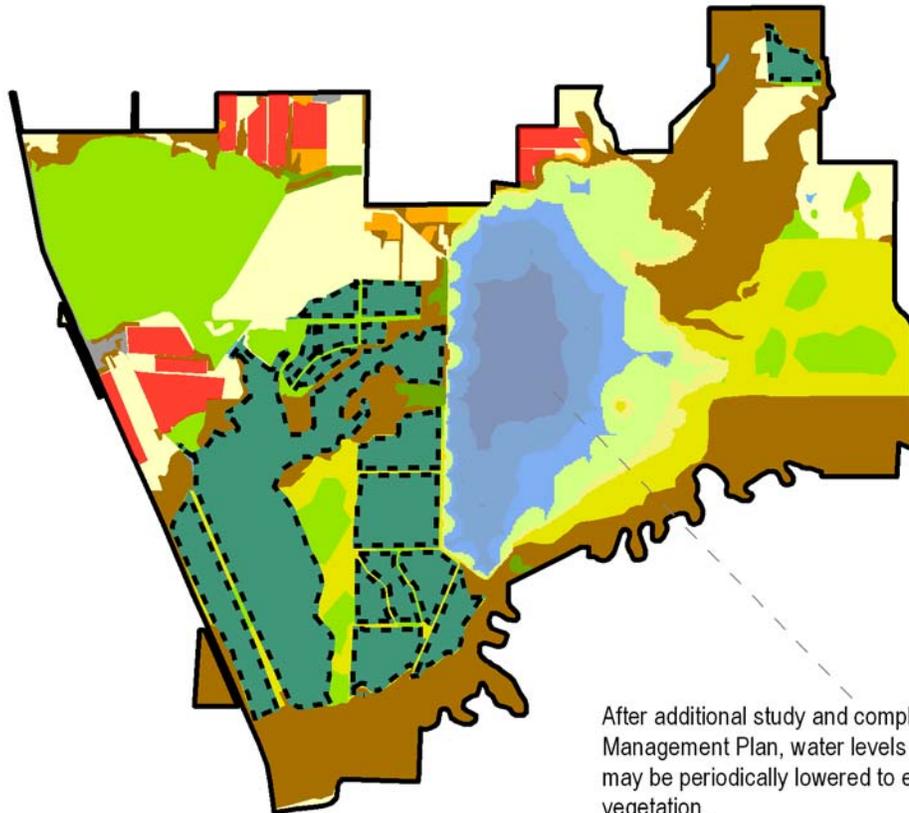
Strategies

1. Use water manipulation to encourage growth of desired species of emergent marsh plants while retarding the growth of undesirable species.
2. Ensure that up to 25 percent of the acreage of moist soil units is available as mud flat or shallow water (6 inches or less) unvegetated habitat in the spring and up to 10 percent of the acreage is available as mud flat or shallow water habitat with less than 50 percent cover in the fall for migrating shorebirds.
3. Periodically disturb areas under moist soil management through burning, disking, cropping, and seeding to retard succession of woody vegetation.
4. Treat known infestations of invasive species as appropriate within emergent wetland habitat

Figure 12: 15-Year Desired Land Cover, Swan Lake NWR

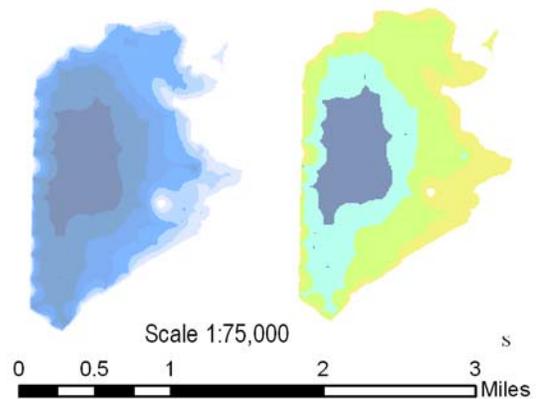


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After additional study and completion of a Habitat Management Plan, water levels within Silver Lake may be periodically lowered to establish wetland vegetation.

- | | |
|-----------------------------------|--------------------------|
| Moist Soil Units | Oldfield |
| FWS Approved Acquisition Boundary | Open Water |
| Desired Landcover | Reseeded Grassland |
| Agricultural Fields | Scattered Tree Grassland |
| Bottomland Forest | Shallow Emergent Wetland |
| Developed | Shrub Swamp |
| Emergent Wetland | Wet Meadow |
| Native Upland Prairie | |



Landcover based on NRCS SSURGO soils data and associated potential natural vegetation.

while continuing to monitor common invasive species pathways (e.g. streams, waterways, roads, trails) to aid in early detection of invasive species introductions.

Objective 1-3 Shrub Swamp

Current (2010) amount is about 400 acres.

Over the life of the Plan, maintain 300 to 500 acres of shrub swamp dominated by at least 50 percent areal coverage of buttonbush and willow.

Rationale

The Upper Mississippi River and Great Lakes Region Joint Venture (UMRGLRJV) produced four conservation strategies directed at shorebirds, landbirds, waterbirds, and waterfowl that identify habitat objectives necessary to maintain existing bird populations and additional habitat necessary to support target populations. The compiled habitat objectives for all four conservation strategies are summarized in the UMRGLRJV Implementation Plan (2007). Shrub swamp fits within the Plan under the habitat category “Marsh” with associated forest/shrub. Within the portion of Missouri covered by the Joint Venture (approximately two-thirds of the state) the Plan identifies a need for nearly 17,000 acres of marsh with associated forest/shrub habitat to meet existing bird population levels and the need for an additional 3,367 acres to meet bird population goals. Maintaining existing shrub swamp habitat on the Refuge contributes to meeting this larger conservation objective.

Strategies

1. Use water manipulation to encourage growth of desired species while retarding the growth of undesirable species.
2. Look at past aerial photography to determine the changes in the amount of this habitat within the Refuge.
3. Encourage and allow overgrowth of shrub communities along riparian areas and in some cases along the toe of Refuge levees.
4. Treat known infestations of invasive species as appropriate within shrub swamp habitat while continuing to monitor common invasive species pathways (e.g. streams, waterways, roads, trails) to aid in early detection of invasive species introductions.

Objective 1-4 Wet Meadow

Current (2010) amount is about 100 acres.

Within 5 years of Plan approval, convert a portion of existing cropland; food plots; areas of

dense early successional forest largely comprised of willow; buttonbush, and silver maple; and areas dominated by reed canary grass to wet meadow comprised of sedges (e.g. *Cyperus* spp. and *Carex* spp.), prairie cordgrass (*Spartina pectinata*), and forbs (e.g. *Asclepias* spp., *Polygonum* spp., *Vernonia* spp., *Solidago* spp., *Bidens* spp., *Ambrosia* spp., *Rudbeckia* spp.).

Rationale

Service policy calls for maintaining or restoring Refuge habitats to historic conditions if doing so is feasible and does not conflict with Refuge purposes (U.S. Fish and Wildlife Service 2001). The primary purpose of the Refuge is to provide habitat for migratory birds. In addition to waterfowl, this includes many other water birds and migrant landbirds. Cropland and food plots are not native habitat, and although they attract wildlife, are not as diverse as native habitat. Properly managed wet meadows can provide an important food source for migrating waterfowl. Wet meadows are a type of wetland that occurs where groundwater is at or near the surface most of the growing season following spring runoff. Wet meadows provide important ecological benefits including breeding and foraging habitat for birds and invertebrates and habitat for wetland plants. The single most important characteristic of a wet meadow is its hydrology. Seasonality and reliability of yearly water inflows and outflows largely determine the vegetational stability of wet meadows.

Strategies

1. Study the possibility of restoring sheet flow across the Refuge to create wet meadow habitat in support of the suite of species associated with wet meadow habitat.
2. Consider restoring wet meadow in the corridor that leads into Swan Lake.
3. Periodically disturb areas through burning, mowing, grazing, or other means to retard woody succession. Coordinate with Ecological Services regarding appropriate activities within habitat for eastern massasauga rattlesnake but, in general, avoid haying, grazing, mowing or other disturbance methods that may be harmful to the snake.
4. Treat known infestations of invasive species as appropriate within wet meadow habitat while continuing to monitor common invasive species pathways (e.g. streams, waterways, roads, trails) to aid in early detection of invasive species introductions.

Objective 1-5 Native Upland Prairie

Current (2010) amount is about 1,000 acres.

Within 10 years of Plan approval, convert a portion of existing cropland or food plots to native prairie, and maintain a diverse floral community within converted and existing grasslands composed of at least 50 percent of native prairie plant species identified for this area.

Rationale

Service policy calls for maintaining or restoring Refuge habitats to historic conditions if doing so is feasible and does not conflict with Refuge purposes (U.S. Fish and Wildlife Service 2001). The primary purpose of the Refuge is to provide habitat for migratory birds. In addition to waterfowl, this includes many other water birds and migrant landbirds. Cropland and food plots are not native habitat, and although they attract wildlife, are not as diverse as native habitat. Short and tall grass prairies were major habitat types in much of the Great Plains including part of Central Missouri. These habitat types were actively maintained and managed by Native Americans using fire as a management tool. Fire suppression and a major shift to agriculture have dramatically reduced the extent of this ecosystem type. Providing a representative example of this habitat type on the Refuge will serve a variety of species that prefer this habitat and provide the public with an important environmental education opportunity as to the importance of this habitat and its history in the area.

Strategies

1. Increase species diversity of existing grasslands to include forbs, etc.
2. Develop a fire management plan for the maintenance of this habitat type.
3. Implement a grazing program that introduces natural grazing regimes to native grasslands to maintain grassland quality and biological diversity.
4. Coordinate with Ecological Services regarding appropriate activities within habitat for eastern massasauga rattlesnake but, in general, avoid haying, grazing, mowing or other disturbance methods that may be harmful to the snake.
5. Treat known infestations of invasive species as appropriate within prairie habitat while continuing to monitor common invasive species pathways (e.g. streams, waterways, roads, trails) to aid in early detection of invasive species introductions.

Objective 1-6 Cropland

Current (2010) amount is about 1,400 acres.

Over the 15-year life of the plan, gradually convert 1,000 acres of cropland to native vegetation, with approximately 400 acres of cropland remaining by year 15 located on suitable sites least affected by flooding. Also, continue to use farming as a tool to reduce undesirable vegetation and set back succession as needed within moist soil areas.

Rationale

Service policy calls for maintaining or restoring refuge habitats to historic conditions if doing so is feasible and does not conflict with refuge purposes (U. S. Fish and Wildlife Service 2001). Cropland is not native habitat, it requires intensive management, and although it attracts some types of wildlife, it has less value to many species of migratory birds in decline, especially grassland birds. A greater number of species benefit from native habitat, especially habitats that are scarce such as prairie and wet meadow. Providing native habitat helps fulfill Refuge purposes by benefiting migratory birds as well as other wildlife including the eastern massasauga rattlesnake. However, the availability of native seed, staff, and funding limit the amount of cropland that can be restored to more productive habitats in any given year. Therefore, the change from cropland to other habitats will be gradual over a number of years. By year 15 of the plan, approximately 400 acres will still be in crops, as well as additional periodic cropping within moist soil units. In these locations it is likely that farming practices will include the use of herbicide-resistant crop plants that are genetically modified to make them resistant to herbicides used to chemically weed the crops. Herbicide-resistant crops are genetically modified organisms and their use on the Refuge is governed by national policy. If national or regional policy changes, farming practices on Swan Lake NWR will be adjusted to be consistent with the revised policy.

Objective 1-7 Bottomland Forest

Current (2010) amount about 3,100 acres.

Over the long term (100-200 years), maintain the existing amount of bottomland hardwood stands with a mosaic of age and structural classes distributed across a narrow elevation gradient with lower elevations dominated by black willow, silver maple, and river birch, mid elevations dominated by pin oak, swamp white oak, red maple, green ash, sycamore, and cottonwood, and upper elevations dominated by other oaks, hickory, and pecan. Within 10 years of Plan approval ensure that approximately 20 percent of stands are converting to red oak spe-

cies, willow oak and their associates based on regeneration surveys.

Rationale

Bottomland hardwood forests provide important riparian habitat buffer for many watercourses on the Refuge. This buffer helps improve water quality in Refuge streams and provides habitat for a variety of native wildlife. In addition, a number of bottomland forest-dependent migratory songbirds are declining as a result of insufficient or fragmented habitat. Conservation and management of suitable habitat are principal strategies for attaining more abundant populations of these birds.

Strategies

1. Complete a forest resources inventory to determine the quality and quantity of woodlands for wildlife.
2. Study the causes for the loss of bottomland forests understory that is adversely affecting woodland birds and other wildlife.
3. Levels of forest on the Refuge need to be inventoried for composition, recruitment, survival, and growth rates.
4. Within 3 to 5 years of Plan approval, determine high priority areas for invasive plant removal based on level of threat, potential for reinfestation, etc., targeting areas where treatment will be most effective with the aim of allowing no more than 10 percent to be affected by invasive species.
5. Treat known infestations of invasive species as appropriate within bottomland forest habitat while continuing to monitor common invasive species pathways (e.g. streams, waterways, roads, trails) to aid in early detection of invasive species introductions.
6. Based on forest inventory and analysis, conduct timber stand improvement, including thinning and selective harvest, as necessary to provide habitat diversity and stimulate forest regeneration and plant growth on the forest floor.

Objective 1-8 Watershed Conservation

Within 5 years of Plan approval, quantify water needs and available water sources necessary to meet Refuge management objectives. Also, over the life of the Plan, maintain or improve water quality within Refuge source waters to meet Refuge management objectives and comply with current standards of the Environmental Protection Agency and Missouri Department of Natural Resources.

Rationale

At present annual water requirements and available water sources (other than the Silver Lake basin) are not well documented for the Refuge. Because the purpose of the Refuge is to provide habitat for migratory birds, many of which depend on water, quantifying water needs and sources is necessary to meet current and future Refuge management objectives. Service policy regarding Biological Integrity, Diversity, and Environmental Health (U.S. Fish and Wildlife Service 2001) acknowledges the importance of water quality. Working within and beyond the Refuge to maintain or improve water quality helps meet the purposes of the Refuge and the goals of the National Wildlife Refuge System.

Strategies

1. Work with the Service's Partners for Fish and Wildlife program and other agencies and organizations to improve erosion control within the Refuge watershed.
2. Evaluate Refuge water control structures to ensure that they are adequate to minimize flooding on neighboring lands.
3. Within 5 years of Plan approval, collect baseline information on stream flora, fauna, and hydrology to help identify opportunities for restoring habitat and natural flow patterns.
4. Monitor current stream vegetation, and explore options for restoring natural flows.
5. Continue to participate as a partner in the Lower Grand River Conservation Opportunity Area.

Objective 1-9 Outlying Fee Title Properties and Easements

Within 5 years of Plan approval, develop a strategy for ensuring that the condition and management of outlying fee title properties and easements are in compliance with Service direction.

Rationale

Beyond the core area of the Refuge proper, Refuge personnel are responsible for condition and management of 46 parcels and easements ranging in size from 10 acres to more than 200 acres at varying distances from the Refuge with some more than 100 miles from the Refuge headquarters.

Strategies

1. Annually contact landowners of all parcels.
2. Annually inspect easements.

3. Post boundaries of outlying parcels.
4. Survey/post all easement boundaries.
5. Consider priority public use opportunities on fee-owned easements.

Goal 2: Wildlife

Diverse wildlife teeming within native habitats of the Grand River floodplain.

Objective 2-1: Threatened and Endangered Species

Within 5 years of Plan approval, implement a monitoring program to track abundance, population trends, and/or habitat associations of selected species to guide future management of habitats important to these species.

Rationale

Conserving a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered is one of the goals of the National Wildlife Refuge System. To evaluate whether management actions are having the predicted consequences, we need to monitor actual outcomes, most often using a representative sample of sites to ensure that, on average, the effects of a particular type of treatment match expectations. Information gained through monitoring helps us learn and adapt our management actions, increasing our effectiveness in meeting conservation objectives.

Strategies:

1. Working with the state of Missouri and the Indiana Bat Recovery Team, determine what role Swan Lake NWR plays in supporting viable populations of these species/subspecies. From this information, the station can determine whether long-term monitoring is appropriate and what information with regard to future management is expected to be gained from such effort.
2. Follow Ecological Services guidelines when working in Refuge forested areas by not removing potential roost trees with loose exfoliating bark, primarily Shagbark Hickory, or dead or dying trees with a diameter (dbh) of 9 inches or greater.
3. Coordinate with Ecological Services on management activities (such as prescribed burning, mowing, haying, construction activities, etc.) when species of conservation concern are potentially affected by management.

Objective 2-2 Migratory and Resident Birds

Within 5 years of Plan approval, implement a monitoring program to track abundance, population trends, and/or habitat associations of migratory bird species with emphasis on waterfowl and shorebirds. Link monitoring to management information needs and to species or habitats of concern or special interest.

Rationale

Conserving a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered, is one of the goals of the National Wildlife Refuge System. Furthermore, one of the purposes of Refuge is to provide habitat for migratory birds. To evaluate whether management actions are having the predicted consequences, we need to monitor actual outcomes, most often using a representative sample of sites to ensure that, on average, the effects of a particular type of treatment match expectations. Information gained through monitoring that is clearly linked to our management actions helps us learn and adapt, increasing our effectiveness in meeting conservation objectives.

Strategies

1. Develop an Inventory and Monitoring Plan that links monitoring to management information needs and to species or habitats of concern or special interest.
2. Work in support of the Missouri Department of Conservation with regard to ensuring Refuge management can be as compatible as possible to the surrounding management efforts of resident birds in Missouri without compromising the mission of the Refuge to create a win/win situation.

Goal 3: People

Visitors enjoy wildlife-dependent recreation and understand the natural and cultural resources of the Refuge and its role in their conservation.

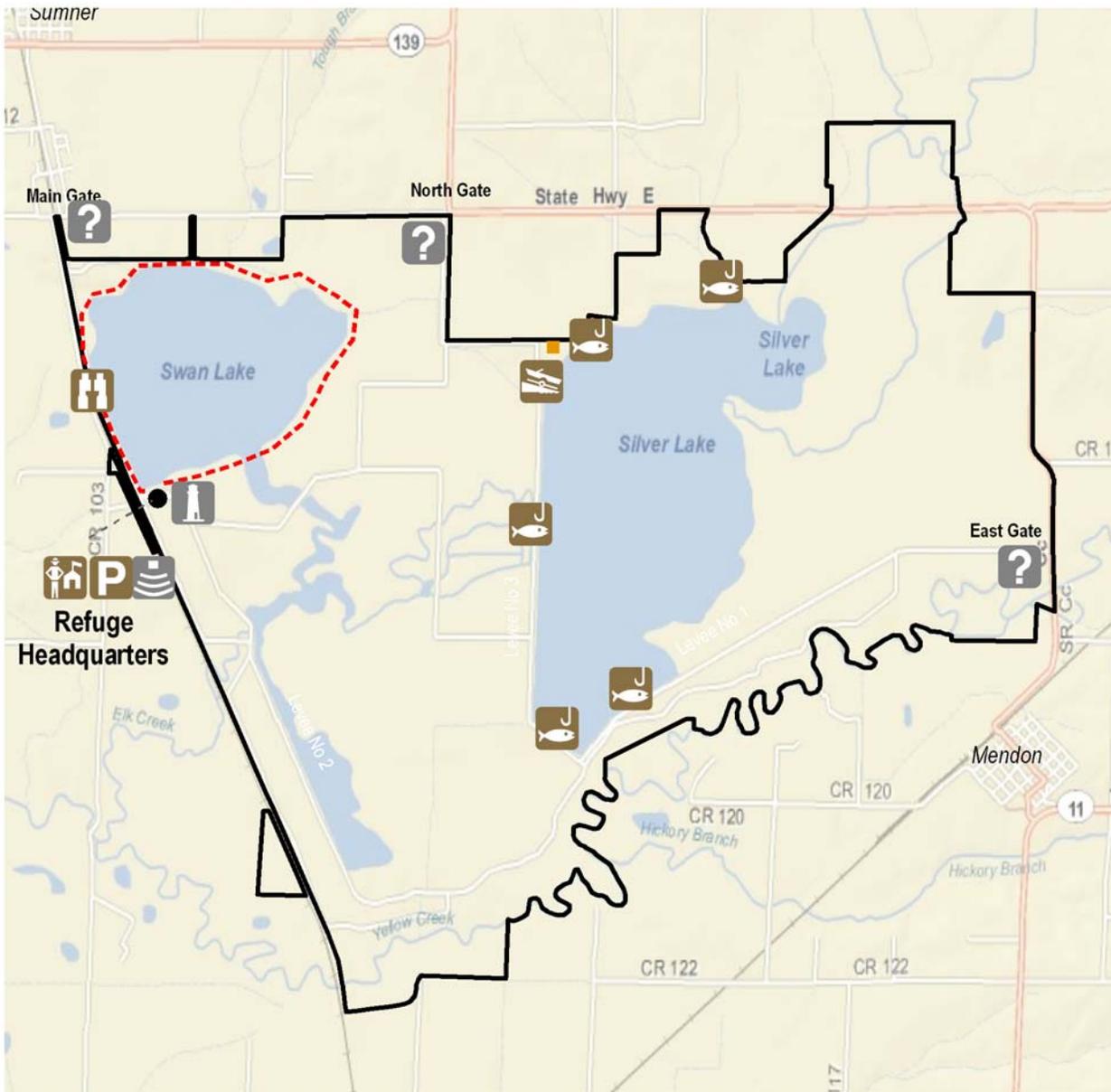
Objective 3-1: Welcoming and Orienting Visitors

Within 10 years of Plan approval, provide a staffed point of contact during normal working hours year-round on business days and seasonally on holidays and weekends to accommodate up to 50,000 visitors annually.

Rationale

Welcoming and orienting Refuge visitors contributes to several of the criteria defining a quality wildlife-dependent recreation program (U.S. Fish and Wildlife Service 2006a). Maintaining a staffed point

Figure 13: Future Visitor Facilities, Swan Lake NWR



- FWS Approved Acquisition Boundary
- ADA Hunting Blind
- Current Facilities**
 - Piers
 - Boat Launch
 - Parking Lot
- Future Facilities**
 - Kiosks
 - Bench
 - Observation Tower
 - Future Swan Lake Trail
- Spotting Scope

Produced by USFWS
R3 Conservation Planning



Scale 1:65,000



of contact during periods of highest visitation is an effective way to help welcome and orient the largest volume of visitors.

Strategies

1. Determine options for increasing opportunities for compatible public uses to occur concurrently.
2. Develop and have available brochures that are up-to-date and informative.
3. Office personnel will ensure that the office is open to the public as much as possible during business hours.
4. Explore opportunities to use staff and volunteer resources, in compliance with Service policies on wildlife-dependent recreation and volunteers, to open the Visitor Center during peak visitation periods.
5. Fully utilize Refuge website and Refuge phone systems to update visitors about Refuge information, including wildlife counts.

Objective 3-2: Hunting

Maintain existing hunting opportunities and within 2 years of CCP approval, propose changes to Refuge regulations (as part of a formal opening package) that includes introducing duck hunting and small game hunting, and emphasize opportunities for youth and the disabled. Within 7 years of approval of the Plan, reliably determine the number of hunting visits to the Refuge and that at least 85 percent of hunters judge that they are being provided a quality opportunity.

Rationale

Hunting is an important wildlife management tool that the Service recognizes as a healthy, traditional outdoor pastime, deeply rooted in the American heritage. Hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs. Hunting programs help promote understanding and appreciation of natural resources and their management on all lands and waters in the Refuge System. Hunting is a priority general public use of the National Wildlife Refuge System, and Service policy directs us to provide hunting opportunities when compatible (U.S. Fish and Wildlife Service 2006b). To initiate or expand hunting programs, the Service must publish in the Federal Register any proposed and final refuge-specific regulations pertaining to that use prior to implementing or publishing them in Refuge hunt brochures or other public documents. These regulations may include an entirely new hunt program, a new category of hunting (e.g., small game), a new



Hunting is a popular wildlife-dependent recreation on the Refuge. Photo credit: FWS

species not addressed in a previous opening package (e.g. ducks), or a new area(s) open to public hunting not addressed in a previous opening package. Monitoring hunter participation and satisfaction are necessary to evaluate the quality of the Refuge hunting program.

Strategies

1. Any existing Refuge waterfowl hunting sites affected by the conversion of cropland to other habitats would be offset by providing hunting opportunities at other locations.
2. As appropriate, prepare hunting opportunities for disabled hunters.
3. Maintain one or more sanctuary areas free of hunting and other human disturbance to provide a feeding and resting area for migratory birds.
4. Compile annual hunting statistics to determine hunter use, success, etc.
5. Host a pre-season hunt public meeting to discuss and inform hunters about the hunting program and a post season hunt public meeting to receive feedback from hunters regarding the Refuge hunt program.
6. Develop a mentoring program for youth waterfowl hunters.

7. Continue cooperating with MDC in implementing seasons for resident game species.

Objective 3-3: Fishing

Over the life of the Plan, provide access for fishing in accordance with state and Refuge regulations.

Rationale

The primary purpose of the Refuge is to provide for the needs of migratory birds. Although the Refuge does harbor some sport fish of interest to anglers, the small, warm water streams and turbid waters within the Silver Lake basin do not support a diverse or abundant fishery. The Service recognizes fishing as a healthy traditional outdoor pastime that is deeply rooted in America's natural heritage, but neither the purpose of the Refuge nor the available resources are well suited to providing a quality fishing experience as defined by Service policy (U.S. Fish and Wildlife Service 2006c). The Refuge will continue to provide access for the limited fishing opportunities that exist, but these opportunities are likely to be sporadic and not a focus of Refuge management.

Strategies

1. Ensure adequate access to Refuge fisheries resources so that the fishing public can access fishing opportunities that exist on the Refuge in accordance with Missouri state regulations and specific Refuge regulations.
2. Allow fishing access to the Taylor Point area of Elk Creek during the winter closure of the Refuge (November through February).

Objective 3-4: Wildlife Observation and Photography

Provide quality wildlife observation and photography opportunities by continuing to allow visitors access to the entire Refuge from early March through late October, and by allowing visitors limited access to selected portions of the Refuge during closed periods.

Rationale

Service policy supports providing opportunities for wildlife observation and photography when it is compatible with Refuge purposes and the mission of the National Wildlife Refuge System (U.S. Fish and Wildlife Service 2006d). Wildlife observation can promote understanding and appreciation of natural resources and their management on all lands and waters in the Refuge System. Providing opportunities to observe wildlife fosters a sense of stewardship for the Refuge System, wildlife, and habitat resources through direct experience. Wildlife observation is a popular activity at the Refuge especially

in October and November during fall migration. Allowing visitors limited access during fall and winter months is one way to accommodate this use while also minimizing disturbance to wildlife.

Strategies

1. Provide quality wildlife observation and photography opportunities by continuing to allow visitors access to the entire Refuge from early March through late October.
2. Allow visitors limited access to selected portions of the Refuge during closed periods.
3. Develop a foot trail around Swan Lake and incorporate photo blinds, overlooks, and interpretation within the trail system.
4. Provide for periodic guided tours through the interior of the Refuge throughout the year. Limit participants to a reasonable number to minimize disturbances between October 31 and February 28.
5. Rehabilitate the old observation tower to meet safety standards and make it available to the public. Incorporate a video camera on the tower for accessible viewing opportunities.

Objective 3-5: Interpretation

Within 10 years of Plan approval, provide staffed interpretive facilities during normal working hours year-round on business days and seasonally on holidays and weekends.

Rationale

Well-designed interpretive programs can be effective resource management tools that provide us an opportunity to influence visitor attitudes about natural resources, refuges, the Refuge System, and the Service to influence visitor behavior when visiting units of the Refuge System. Interpretation is a priority general public use of the National Wildlife Refuge System, and Service policy directs that refuges provide interpretation when it is compatible with refuge purposes and the mission of the National Wildlife Refuge System (U.S. Fish and Wildlife Service 2006g).

Strategies

1. Consider using a portion of the Refuge headquarters to house a diorama of important habitat types on the Refuge.
2. Train a volunteer visitor center host to interpret Swan Lake NWR, the National Wildlife Refuge System and the U. S. Fish and Wildlife Service.

3. Place a kiosk at each Refuge entrance providing a Refuge map, regulations, activities and interpretation.
4. Develop an auto tour route that includes interpretive information.

Objective 3-6: Environmental/Conservation Education

Within 5 years of Plan approval, develop an environmental education site that includes an outdoor classroom. Once the site is developed, 80 percent of educators using the site annually report it supports their curriculum and helps in promoting resource stewardship and conservation.

Rationale

Providing and promoting environmental education helps develop a citizenry that has the awareness, knowledge, attitudes, skills, motivation, and commitment to work cooperatively toward the conservation of our nation's environmental resources. Environmental education is a priority general public use of the National Wildlife Refuge System, and Service policy directs refuges to provide environmental education programs when they are compatible with refuge purposes and the mission of the Refuge System.

Strategies

1. Develop an environmental education site at a suitable location outside of the flood plain and in an area that does not lose access due to flooding. Conservation education will be a priority use for this small area. Until that site is identified and established, utilize the current Refuge Headquarters and Visitor Center site (approximately 10 acres) for this purpose.
2. Work with area schools and educational organizations to develop educational/interpretive facilities that meet state conservation education requirements.
3. Ensure that environmental education facilities fit into the natural landscape of the Refuge and that they are energy efficient and facilitate students getting to the outdoors.
4. Develop a wetland education program that uses a wetland within the environmental education site to provide year-around access for students.
5. Incorporate outdoor education related to the priority public uses within the education program.
6. Use special events throughout the year for public interpretation and education.

Objective 3-7: Other Compatible Recreation and Uses

Over the life of the Plan, provide compatible opportunities for gathering mushrooms, berries, and antlers for personal use.

Rationale

The National Wildlife Refuge System Improvement Act of 1997 identifies six priority public uses: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. These priority uses receive enhanced consideration over other general public uses in planning and management of the Refuge System. Other uses can occur but must support a priority public use or not conflict with priority public uses. No use of a national wildlife refuge can detract from accomplishing the purposes of the Refuge or the mission of the System. Gathering of mushrooms, berries, and antlers has historically been allowed on the Refuge and has become a custom of the local community. The Refuge is open to the public during the time periods that the use is allowed, so no additional disturbance is created by allowing this use. Gathering allows the public to build a connection to the Refuge through personal outdoor experiences that engage the senses and foster an appreciation of the outdoors.

Strategies:

1. Provide opportunities for these harvesting activities including gathering nuts, berries, mushrooms, and deer antlers consistent with Refuge regulations.
2. As part of the Visitor Services step-down management plan, develop Refuge policy that defines times and limitations on gathering mushrooms, berries, and antlers so as to allow equity among visitors for access to these resources.

Objective 3-8: Friends and Volunteers

Over the life of the Plan, continue to develop the Friends group and provide volunteer opportunities that total at least 1,000 hours annually.

Rationale

A Refuge Friends Group is a grassroots organization formed by citizens who have a shared vision of supporting their local national wildlife refuge. They join with Service personnel in a partnership that seeks to accomplish mutually defined goals. Establishing a Friends group helps build a constituency of support for the Refuge, provides people with opportunities to assist us in accomplishing our mission, and enhances our performance through the creativity, innovations, labor, and expertise contributed by Friends members.

Strategies

1. Refuge staff will initiate and nurture relationships with volunteers and Refuge support groups with the goal of fortifying important Refuge activities.
2. Refuge personnel will seek to make the Refuge an integral part of the community by providing volunteer opportunities that total at least 1,000 hours annually.
3. Develop a work camper program to provide volunteer services for the visitor services program and Refuge management and maintenance activities.
4. Develop a volunteer program by utilizing members of the local community to provide volunteer services to the Refuge. This will include volunteers for mentoring youth hunters as well.

Objective 3-9 Community Relations

Within 3 years of approval of the Plan increase local community support and appreciation for fish and wildlife conservation and endorse the Refuge's role in conservation.

Rationale

The Service's National Outreach Strategy (U.S. Fish and Wildlife Service, 1997) defines outreach as two-way communication between the U.S. Fish and Wildlife Service and the public to establish mutual understanding, promote involvement, and influence attitudes and actions, with the goal of improving joint stewardship of our natural resources. Providing a clear, consistent message about the role of the Refuge helps build support and understanding.

Strategies

1. Speak to local civic and outdoor enthusiasts groups and at special events throughout the year.
2. Continue to provide information and interviews for local news media and outdoors writers as well as distribute news annually.
3. Refuge staff will provide support and assistance to the local community in planning and carrying out the annual Goose Festival in Summer.
4. Refuge staff will attend and make presentations to area service organizations providing information about the Refuge.
5. Make use of an established friends group to better educate the public in outlying communities such as Chillicothe, Brookfield, Carrollton, Moberly, etc. about the Refuge.

Objective 3-10 Archeological, Cultural, and Historic Protection

Over the life of the Plan, avoid and protect or mitigate against disturbance of all known cultural, historic, or archeological sites.

Rationale

The integrity of cultural resources located on Service lands is subject to threats from erosion, neglect, vandalism, grazing, cultivation, and other land disturbing activities. The Service is required by statute to exercise caution in carrying out its activities to assure that historic properties are not inadvertently sold, demolished, substantially altered, or allowed to deteriorate significantly without adequate review and protection.

Strategies

1. Conduct an archeological, cultural and historical review of Refuge properties and facilities and ensure any areas identified are managed within archeological, cultural and historic policy.

Chapter 5: Plan Implementation

Introduction

This chapter summarizes the actions, funding, coordination, and monitoring to implement the CCP. As noted in the inside cover of this document, this Plan does not constitute a commitment for staffing increases or operational and maintenance increases. These decisions are at the discretion of Congress in overall appropriations, and in budget allocation decisions made at the Washington and Regional levels of the Service.

New and Existing Projects

This CCP outlines an ambitious course of action for the future management of Swan Lake NWR. It will require considerable staff commitment as well as funding commitment to actively manage the wildlife habitats and add and improve public use facilities. The Refuge will continually need appropriate operational and maintenance funding to implement the objectives in this Plan. A full listing of unfunded Refuge projects and operational needs can be found in Appendix E along with a brief description of the highest priority Refuge projects.

Staffing

Implementing the vision set forth in this CCP will require changes in the organizational structure of the Refuge. Existing staff will direct their time and energy in new directions and new staff members will be added to assist in these efforts. Table 4 presents current staffing and the increases proposed for the Refuge in this Plan.

Partnership Opportunities

Partnerships are an essential element for the successful accomplishment of goals, objectives, and strategies at Swan Lake NWR. The objectives outlined in this CCP need the support and the partnerships of federal, state and local agencies, non-governmental organizations and individual citizens.

Table 4: Current and Proposed Staffing Under the CCP

Current Staff 4.0 FTEs	Proposed Additions 7.0 FTEs
Project Leader	Assistant Project Leader
Office Assistant	Maintenance Worker
Maintenance Mechanic	Park Ranger
Heavy Equipment Operator (Vacant)	Wildlife Biologist
	Biological Technician
	Private Lands Biologist
	Rangeland Technician

Refuge staff will continue to seek creative partnership opportunities to achieve the vision of the Refuge.

We expect to continue to work with the following notable partners, while developing new partnerships:

- Friends of Swan Lake NWR
- Missouri Department of Conservation
- Missouri Department of Natural Resources
- Missouri Department of Transportation
- Natural Resources Conservation Service
- U.S. Army Corps of Engineers
- U.S Environmental Protection Agency
- Farm Service Agency
- Ducks Unlimited
- The Greater Chillicothe Visitors Region

Step-down Management Plans

The CCP is a plan that provides general concepts and specific wildlife, habitat, and people related objectives. Step-down management plans provide greater detail to managers and employees

Table 5: Step-down Management Plan Schedule

Step-down Management Plan	Estimated Time of Completion After CCP Approval
Hunting Plan	2 years
Habitat Management Plan, including forest, wetland and grassland components	5-7 years
Visitor Services Plan	5 years
Integrated Pest Management Plan	5 years
Inventory and Monitoring Plan	4 years

who will carry out the strategies described in the CCP. The Refuge staff will revise or develop the step-down plans described in Table 5.

Monitoring and Evaluation

The direction set forth in this CCP and specifically identified strategies and projects will be monitored throughout the life of this Plan. On a periodic basis, the Regional Office will assemble a station review team to visit the Refuge and evaluate current activities in light of this Plan. The team will review all aspects of Refuge management, including direction, accomplishments and funding. The goals and objectives presented in this CCP will provide the baseline for evaluation of this field station.

Plan Review and Revision

The CCP is meant to provide guidance to the Refuge manager and staff over the next 15 years. However, the CCP is also a dynamic and flexible document and several of the strategies contained in this Plan are subject to uncontrollable events of nature. Likewise, many of the strategies are dependent upon Service funding for staff and projects. Because of all these factors, the recommendations in the CCP will be reviewed periodically and, if necessary, revised to meet new circumstances. If any revisions are major, the review and revision will include the public.

Appendix A: Finding of No Significant Impact

Finding of No Significant Impact

Environmental Assessment and Comprehensive Conservation Plan for Swan Lake National Wildlife Refuge, Missouri

An Environmental Assessment (EA) has been prepared to identify management strategies to meet the conservation goals of Swan Lake National Wildlife Refuge (NWR). The EA examined the environmental consequences that each management alternative could have on the quality of the physical, biological, and human environment, as required by the National Environmental Policy Act of 1969 (NEPA). The EA evaluated four alternatives for the future management of Swan Lake NWR.

The alternative selected for implementation on the refuge is *Alternative 4*. The alternative maintains a mixture of woodland, wetland, and grassland habitats with an emphasis on increasing native habitats such as prairie and wet meadow. Moist soil management would continue and there would be additional study on methods for increasing the amount of native foods for waterfowl within a 2,100-acre reservoir on the Refuge. The alternative also calls for measuring Refuge water needs, identifying source water, and working with others to address watershed issues including water quality and flooding. Monitoring of migratory birds and threatened and endangered species would be closely linked to management information needs. The introduction of duck hunting and small game hunting would add to existing wildlife dependent recreation opportunities available on the Refuge.

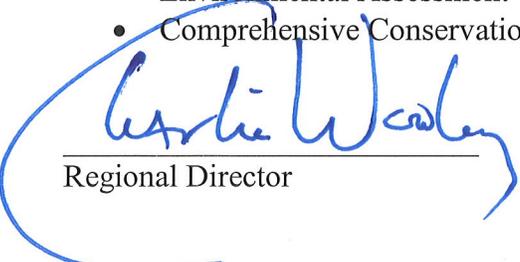
For reasons presented above and below, and based on an evaluation of the information contained in the Environmental Assessment, we have determined that the action of adopting Alternative 4 as the management alternative for Swan Lake NWR is not a major Federal action which would significantly affect the quality of the human environment, within the meaning of Section 102 (2)(c) of the National Environmental Policy Act of 1969.

Additional Reasons:

- Future management actions will have a neutral or positive impact on the local economy.
- This action will not have an adverse impact on threatened or endangered species.

Supporting References:

- Environmental Assessment
- Comprehensive Conservation Plan


Regional Director

2/24/11
Date

Appendix B: Glossary

Alternative

A set of objectives and strategies needed to achieve refuge goals and the desired future condition.

Biological Diversity

The variety of life forms and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.

Compatible Use

A wildlife-dependent recreational use, or any other use on a refuge that will not materially interfere with or detract from the fulfillment of the mission of the Service or the purposes of the refuge.

Comprehensive Conservation Plan

A document that describes the desired future conditions of the refuge, and specifies management actions to achieve refuge goals and the mission of the National Wildlife Refuge System.

Cultural Resources

“Those parts of the physical environment -- natural and built -- that have cultural value to some kind of sociocultural group ... [and] those non-material human social institutions...” Cultural resources include historic sites, archeological sites and associated artifacts, sacred sites, traditional cultural properties, cultural items (human remains, funerary objects, sacred objects, and objects of cultural patrimony), and buildings and structures.

Ecosystem

A dynamic and interrelated complex of plant and animal communities and their associated non-living environment.

Ecosystem Approach

A strategy or plan to protect and restore the natural function, structure, and species composition of an ecosystem, recognizing that all components are interrelated.

Ecosystem Management

Management of an ecosystem that includes all ecological, social and economic components that make up the whole of the system.

Endangered Species

Any species of plant or animal defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range, and published in the Federal Register.

Environmental Assessment

A systematic analysis to determine if proposed actions would result in a significant effect on the quality of the environment.

Extirpation

The local extinction of a species that is no longer found in a locality or country, but exists elsewhere in the world.

Goals

Descriptive statements of desired future conditions.

Interjurisdictional Fish

Fish that occur in waters under the jurisdiction of one or more states, for which there is an interstate fishery management plan or which migrates between the waters under the jurisdiction of two or more states bordering on the Great Lakes.

Issue

Any unsettled matter that requires a management decision. For example, a resource management problem, concern, a threat to natural resources, a conflict in uses, or in the presence of an undesirable resource condition.

National Wildlife Refuge System

All lands, waters, and interests therein administered by the U.S. Fish and Wildlife Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas, and other areas for the protection and conservation of fish, wildlife and plant resources.

Objectives

A concise statement of what we want to achieve, how much we want to achieve, when and where we want to achieve it, and who is responsible for the work. Objectives derive from goals and provide the basis for determining strategies, monitoring refuge accomplishments, and evaluating the success of strategies.

Preferred Alternative

The Service's selected alternative identified in the Draft Comprehensive Conservation Plan.

Scoping

A process for determining the scope of issues to be addressed by a comprehensive conservation plan and for identifying the significant issues. Involved in the scoping process are federal, state and local agencies; private organizations; and individuals.

Species

A distinctive kind of plant or animal having distinguishable characteristics, and that can interbreed and produce young. A category of biological classification.

Strategies

A general approach or specific actions to achieve objectives.

Threatened Species

Those plant or animal species likely to become endangered species throughout all of or a signifi-

cant portion of their range within the foreseeable future. A plant or animal identified and defined in accordance with the 1973 Endangered Species Act and published in the Federal Register.

Undertaking:

"A project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; those requiring a federal permit, license or approval..." i.e., all federal actions.

Vegetation

Plants in general, or the sum total of the plant life in an area.

Vegetation Type

A category of land based on potential or existing dominant plant species of a particular area.

Watershed

The entire land area that collects and drains water into a stream or stream system.

Wetland

Areas such as lakes, marshes, and streams that are inundated by surface or ground water for a long enough period of time each year to support, and that do support under natural conditions, plants and animals that require saturated or seasonally saturated soils.

Wildlife-dependent Recreational Use

A use of refuge that involves hunting, fishing, wildlife observation and photography, or environmental education and interpretation, as identified in the National Wildlife Refuge System Improvement Act of 1997.

Wildlife Diversity

A measure of the number of wildlife species in an area and their relative abundance.

Water Birds

This general category includes all birds that inhabit lakes, marshes, streams and other wetlands at some point during the year. The group includes all waterfowl, such as ducks, geese, and swans, and other birds such as loons, rails, cranes, herons, egrets, ibis, cormorants, pelicans, shorebirds and passerines that nest and rely on wetland vegetation.

Appendix C: Species List

Amphibians	56
Birds	57
Butterflies	66
Fish	67
Mammals	68
Mussels	70
Odonates	71
Plants (Rare)	71
Reptiles	72

Swan Lake NWR Amphibian List

Species	Scientific Name	Presence in 2003 Frog and Toad Breeding Survey	State Status
Frogs			
Blanchard's Cricket Frog	<i>Acris crepitans blanchardi</i>	✓	
Gray Treefrog	<i>Hyla versicolor</i>	✓	
N. Spring Peeper	<i>Pseudacris crucifer crucifer</i>	✓	
W. Chorus Frog	<i>Pseudacris triseriata triseriata</i>	✓	
Plains Leopard Frog	<i>Rana blairi</i>	✓	
S. Leopard Frog	<i>Rana sphenoccephala</i>	✓	
Green Frog	<i>Rana clamitans</i>	✓	
Bullfrog	<i>Rana catesbeiana</i>	✓	
Northern Crawfish Frog	<i>Rana areolata</i>		Vulnerable
Toads			
American Toad	<i>Bufo americanus</i>	✓	
Woodhouse's Toad	<i>Bufo woodhousei woodhousei</i>	✓	
Fowlers Toad	<i>Bufo woodhousei fowleri</i>		
Great Plaions Toad	<i>Bufo cognatus</i>		Status Unknown
Eastern Narrow-mouthed Toad	<i>Gastrophyrne carolinensis</i>		
Plains Spadefoot Toad	<i>Scaphiopus bombifrons</i>		
Salamanders			
Eastern Tiger Salamander	<i>Ambystoma tigrinum</i>		Status Unknown
Small-mouthed Salamander	<i>Ambystoma texanum</i>		

Swan Lake NWR Bird Checklist

Common Name	Nest On/ Near Swan Lake NWR	Seasonal Presence				Status	
		Spring (Mar- May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Winter (Dec- Feb)	Federal	State
Loons							
Common Loon		r		u			
Grebes							
Pied-billed Grebe		c	o	c			
Horned Grebe		o		o			
Eared Grebe		r		r			
Pelicans							
American White Pelican		c	u	a			
Cormorants							
Double-crested Cormorant		u	o	o			
Hérons and Bitterns							
American Bittern		u	u	u			critically imperiled
Least Bittern		r	u	r			vulnerable
Great Blue Heron	✓	c	a	c	u		
Great Egret		c	c	c			vulnerable
Snowy Egret		o	o	r			imperiled
Little Blue Heron		r	o	o			vulnerable
Cattle Egret		o	o	o			
Green Heron	✓	o	o	o			
Black-crowned Night Heron		u	u	o			vulnerable
Yellow-crowned Night Heron	✓	o	o	r			
Swans, Geese, and Ducks							
Tundra Swan		r		r	r		
Trumpeter Swan		r		r	r		
Greater White-fronted Goose			r	o	c		
Snow Goose		r	r	c	a		
Ross's Goose				r	o		
Canada Goose	✓	a	u	a	a		
Wood Duck	✓	u	c	c	o		
Green-winged Teal		c	o	c	u		
American Black Duck		r		r	r		
Mallard	✓	o	u	c	a		
Northern Pintail		c	o	a	c		

Swan Lake NWR Bird Checklist (Continued)

Common Name	Nest On/ Near Swan Lake NWR	Seasonal Presence				Status	
		Spring (Mar- May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Winter (Dec- Feb)	Federal	State
Blue-winged Teal		c	u	a	o		
Cinnamon Teal		r		r	r		
Northern Shoveler		c	o	a	o		
Gadwall		c		c	u		
American Wigeon		u		c	u		
Canvasback		u		r	o		
Redhead		o		o	u		
Ring-necked Duck		c	r	u	c		
Lesser Scaup		c		o	c		
Greater Scaup		r		r	r		
Common Goldeneye		u		u	u		
Bufflehead		o		o	o		
Hooded Merganser		o	u	u	o		
Common Merganser		o		u	u		
Red-breasted Merganser		o		r	r		
Ruddy Duck		c	r	o	o		
Kites							
Mississippi Kite		r		r			
Vultures							
Turkey Vulture		c	c	c			
Hawks and Eagles							
Osprey		r	r	r			status unknown
Bald Eagle		o	r	c	c		vulnerable
Northern Harrier	✓	c	o	c	c		imperiled
Sharp-shinned Hawk		u	o	u	u		vulnerable
Cooper's Hawk	✓	o	u	o	o		
Northern Goshawk				r	r		
Red-shouldered Hawk		u	u	u	u		
Broad-winged Hawk		o		c			
Swainson's Hawk		r		r			imperiled
Red-tailed Hawk	✓	c	c	c	c		
Rough-legged Hawk		o		u	u		
Golden Eagle		r		r	r		

Swan Lake NWR Bird Checklist (Continued)

Common Name	Nest On/ Near Swan Lake NWR	Seasonal Presence				Status	
		Spring (Mar- May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Winter (Dec- Feb)	Federal	State
Falcons							
American Kestrel	✓	c	u	c	c		
Merlin		o		o	r		
Peregrine Falcon		u		u	r		critically imperiled
Upland Game Birds							
Ring-necked Pheasant		u	u	u	u		
Wild Turkey	✓	u	u	u	u		
Northern Bobwhite	✓	c	c	c	c		
Rails and Coots							
King Rail	✓	r	r				critically imperiled
Virginia Rail		u	r	r			imperiled
Sora		u	r	c			imperiled
American Coot		a	u	a	r		
Common Moorhen		r	r	r			imperiled
Cranes							
Sandhill Crane		r	r	r			status unknown
Shorebirds							
Black-bellied Plover		u	r	o			
American Golden Plover		c	r	c			
Semipalmated Plover		c	u	o			
Piping Plover		r		r		endangered	
Killdeer	✓	c	c	c	o		
American Avocet		r	r	r			
Greater Yellowlegs		c	u	c			
Lesser Yellowlegs		a	c	a			
Solitary Sandpiper		u	c	o			
Willet		c	r	u			
Spotted Sandpiper	✓	c	u	u			
Upland Sandpiper	✓	o	o	o			
Whimbrel		o	r	r			
Hudsonian Godwit		u		o			

Swan Lake NWR Bird Checklist (Continued)

Common Name	Nest On/ Near Swan Lake NWR	Seasonal Presence				Status	
		Spring (Mar- May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Winter (Dec- Feb)	Federal	State
Marbled Godwit		r		r			
Ruddy Turnstone		u		o			
Red Knot		o		o			
Sanderling		u	u	o			
Semipalmated Sandpiper		c	u	c			
Western Sandpiper		r		u			
Least Sandpiper		c	u	c			
Baird's Sandpiper		u	r	u			
Pectoral Sandpiper		a	c	a			
Dunlin		o		c			
Stilt Sandpiper		u	o	c			
Buff-breasted Sandpiper		o	r	o			
Short-billed Dowitcher		c	u	c			
Long-billed Dowitcher		c	u	c			
Wilson's Snipe		c	u	c	r		
American Woodcock		o	u	u	r		
Wilson's Phalarope		u	r	u			
Red-necked Phalarope		r		r			
Gulls and Terns							
Franklin's Gull		c	u	c	r		
Bonaparte's Gull		o	r	c	r		
Ring-billed Gull		c	c	c	o		
Herring Gull		r	r	o	o		
Caspian Tern		u	r	u	r		
Common Tern		o	o	o			
Forster's Tern		u	o	c			
Least Tern		r	r	r		Endangered	critically imperiled
Black Tern		c	c	u			SX
Doves							
Rock Dove	✓	o	c	c	o		
Mourning Dove	✓	c	a	c	o		
Cuckoos and Roadrunners							
Black-billed Cuckoo	✓	u	u	u			

Swan Lake NWR Bird Checklist (Continued)

Common Name	Nest On/ Near Swan Lake NWR	Seasonal Presence				Status	
		Spring (Mar- May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Winter (Dec- Feb)	Federal	State
Yellow-billed Cuckoo	✓	c	c	o			
Owls							
Common Barn Owl		r	r	r	r		vulnerable
Eastern Screech Owl	✓	u	u	u	u		
Great Horned Owl	✓	c	c	c	c		
Snowy Owl				r			
Barred Owl	✓	c	c	c	c		
Short-eared Owl		o	r	o	o		imperiled
Long-eared Owl		r	r	r	o		status unknown
Nighthawks and Nightjars							
Common Nighthawk	✓	u	u	u			
Whip-poor-will	✓	u	u	u			
Swifts							
Chimney Swift	✓	u	o	u			
Hummingbirds							
Ruby-throated Hummingbird	✓	u	c	c			
Kingfishers							
Belted Kingfisher	✓	u	c	o	o		
Woodpeckers							
Red-headed Woodpecker	✓	c	c	c	o		
Red-bellied Woodpecker	✓	c	c	c	c		
Yellow-bellied Sapsucker		o	r	o	r		
Downy Woodpecker	✓	c	c	c	c		
Hairy Woodpecker	✓	u	u	u	u		
Northern Flicker	✓	c	c	c	c		
Pileated Woodpecker	✓	u	u	u	u		
Flycatchers							
Olive-sided Flycatcher		o	r	u			
Eastern Wood Pewee	✓	u	c	u			
Acadian Flycatcher	✓	u	u	r			
Least Flycatcher		c		c			
Willow Flycatcher	✓	u	u	r			

Swan Lake NWR Bird Checklist (Continued)

Common Name	Nest On/ Near Swan Lake NWR	Seasonal Presence				Status	
		Spring (Mar- May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Winter (Dec- Feb)	Federal	State
Eastern Phoebe	✓	e	e	e			
Great Crested Flycatcher	✓	u	e	o			
Western Kingbird		r		r			
Eastern Kingbird	✓	e	e	e			
Larks							
Horned Lark	✓	e	e	u	u		
Swallows							
Purple Martin	✓	o	o	r			
Tree Swallow	✓	e	e	e			
Northern Rough-winged Swallow	✓	e	e	a			
Bank Swallow	✓	e	e	e			
Cliff Swallow	✓	u	o	u			
Barn Swallow	✓	e	e	e			
Jays, Magpies and Crows							
Blue Jay	✓	e	e	e	e		
American Crow	✓	e	e	a	e		
Chickadees and Titmice							
Black-capped Chickadee	✓	e	e	e	e		
Tufted Titmouse	✓	e	e	e	e		
Nuthatches							
Red-breasted Nuthatch		r		r	o		
White-breasted Nuthatch	✓	u	u	u	u		
Creepers							
Brown Creeper		u		u	u		status unknown
Wrens							
Carolina Wren	✓	r	r	r	r		
House Wren	✓	e	e	e			
Winter Wren					r		
Sedge Wren	✓	o	e	o			
Marsh Wren	✓	o	o	u			vulnerable
Kinglets, Bluebirds, and Thrushes							
Golden-crowned Kinglet		e		e	u		

Swan Lake NWR Bird Checklist (Continued)

Common Name	Nest On/ Near Swan Lake NWR	Seasonal Presence				Status	
		Spring (Mar- May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Winter (Dec- Feb)	Federal	State
Ruby-crowned Kinglet		u		u	u		
Blue-gray Gnatcatcher	✓	u	u	r			
Eastern Bluebird	✓	c	u	c	r		
Gray-cheeked Thrush		o					
Swainson's Thrush		u	r	u			
Hermit Thrush		u		u			
Wood Thrush	✓	u	o	u			
American Robin	✓	c	c	c	o		
Mimics							
Gray Catbird	✓	c	c	c			
Northern Mockingbird	✓	u	u	u	r		
Brown Thrasher	✓	c	c	c			
Pipits							
American Pipit		u		u			
Waxwings							
Cedar Waxwing		c	u	c	u		
Shrikes							
Loggerhead Shrike	✓	u	u	u	u		imperiled
Starlings							
European Starling	✓	c	c	c	c		
Vireos							
White-eyed Vireo	✓	r	r	r			
Bell's Vireo	✓	u	u	u			
Blue-headed Vireo	✓	o		o			
Yellow-throated Vireo	✓	u	u	r			
Warbling Vireo	✓	c	c	u			
Red-eyed Vireo	✓	c	c	c			
Warblers							
Blue-winged Warbler		u	r	u			
Golden-winged Warbler		u		u			
Tennessee Warbler		u		u			
Nashville Warbler		u		u			
Northern Parula	✓	u	u	r			

Swan Lake NWR Bird Checklist (Continued)

Common Name	Nest On/ Near Swan Lake NWR	Seasonal Presence				Status	
		Spring (Mar- May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Winter (Dec- Feb)	Federal	State
Yellow Warbler	✓	u	u	r			
Chestnut-sided Warbler		u		u			vulnerable
Magnolia Warbler		u		u			
Yellow-rumped Warbler		c		c	o		
Blackburnian Warbler		u		u			
Blackpoll Warbler		u		o			
Black-and-white Warbler		u		u			
American Redstart	✓	c	u	c			
Prothonotary Warbler	✓	u	r	r			
Ovenbird	✓	u	r	u			
Louisiana Waterthrush	✓	u	r	u			
Kentucky Warbler	✓	u	u				
Mourning Warbler		u		r			
Common Yellowthroat	✓	c	c	c			
Wilson's Warbler		u		u			
Yellow-breasted Chat	✓	o		o			
Tanagers							
Summer Tanager	✓	o	o	o			
Scarlet Tanager		u		u			
Sparrows, Buntings, and Grosbeaks							
Northern Cardinal	✓	c	c	c	c		
Rose-breasted Grosbeak	✓	u	u	u			
Indigo Bunting	✓	c	c	c			
Dickcissel	✓	a	a	c			
Eastern Towhee	✓	c	c	c			
American Tree Sparrow		u		u	c		
Chipping Sparrow	✓	u	u	u	r		
Field Sparrow	✓	u	u	u	r		
Vesper Sparrow		u	r	u			
Lark Sparrow	✓	u	o	r			
Savannah Sparrow		c	r	c			
Grasshopper Sparrow	✓	c	u	c			
Le Conte's Sparrow		o		o			

Swan Lake NWR Bird Checklist (Continued)

Common Name	Nest On/ Near Swan Lake NWR	Seasonal Presence				Status	
		Spring (Mar- May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Winter (Dec- Feb)	Federal	State
Sharp-tailed Sparrow		r		r			
Fox Sparrow		u		u	r		
Song Sparrow	✓	c	c	c	u		
Lincoln's Sparrow		o		o	r		
Swamp Sparrow		u	o	u	u		
White-throated Sparrow		c		c	u		
White-crowned Sparrow		u		u	u		
Harris' Sparrow		o		o	r		
Dark-eyed Junco		u		u	c		
Lapland Longspur		u		u	o		
Snow Bunting					r		
Blackbirds and Orioles							
Bobolink		u	r	u			
Red-winged Blackbird	✓	a	a	a	c		
Eastern Meadowlark	✓	c	c	c	c		
Western Meadowlark		r	r	r	u		
Yellow-headed Blackbird		r		r			vulnerable
Rusty Blackbird		u		u	o		
Brewer's Blackbird		o		o			
Common Grackle	✓	a	c	a	c		
Brown-headed Cowbird	✓	c	c	c	u		
Orchard Oriole	✓	c	c	o			
Baltimore Oriole	✓	c	c	o			
Finches							
Purple Finch		c		c	u		
Pine Siskin		r		r	r		
Common Redpoll		r		r	r		
American Goldfinch	✓	c	c	c	c		
Old World Sparrows							
House Sparrow	✓	c	c	c	c		
Accidental Birds							
Tricolored Heron							
Ferruginous Hawk							

Swan Lake NWR Bird Checklist (Continued)

Common Name	Nest On/ Near Swan Lake NWR	Seasonal Presence				Status	
		Spring (Mar- May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Winter (Dec- Feb)	Federal	State
White-faced Ibis							
Glossy Ibis							
Sprague's Pipit							
Roseate Spoonbill							
Prairie Warbler							
Surf Scoter							
Lark Bunting							
Great-tailed Grackle							
Western Grebe							

Swan Lake NWR Butterflies

Species	Scientific Name
Roadside Skipper	<i>Amblyscirtes vialis</i>
Least Skipper	<i>Ancyloxypha numitor</i>
European Cabbage Butterfly	<i>Artogeia rapae</i>
Red-spotted Purple	<i>Basilarchia arthemis astyanax</i>
Wood Nymph	<i>Cercyonis pegala</i>
Gorgone Checkerspot	<i>Charidryas gorgone carlota</i>
Alfalfa Butterfly	<i>Colias eurytheme</i>
Clouded Sulphur	<i>Colias philodice philodice</i>
Monarch	<i>Danaus plexippus</i>
Eastern-tailed Blue	<i>Everes comyntas comyntas</i>
Buckeye	<i>Junonia coenia</i>
Black Swallowtail	<i>Papilio polyxenes asterius</i>
Cloudless Sulphur	<i>Phoebis sennae eubule</i>
Common Sooty Wing	<i>Pholisora catullus</i>
Pearl Crescent	<i>Phyciodes tharos</i>
Comma	<i>Polygonia comma</i>
Tiger Swallowtail	<i>Pterourus glaucus glaucus</i>
Little Sulphur	<i>Pyrisitia lisa lisa</i>
Great Spangled Fritillary	<i>Speyeria cybele cybele</i>
Red Admiral	<i>Vanessa atalanta rubria</i>

Swan Lake NWR Fish Species

Species	Scientific Name	Federal Status	State Status	1996 Silver Lake Fish Survey	Found in Past Surveys But Not in 1996 Survey.	Missouri Natural Heritage Database Imperiled Fish Species that Occur In the Lower Grand River Watershed
Black Bullhead	<i>Ameiurus melas</i>			✓		
Yellow Bullhead	<i>Ameiurus natalis</i>			✓		
Freshwater Drum	<i>Aplodinotus grunniens</i>			✓		
River Carpsucker	<i>Carpionodes carpio</i>				✓	
Quillback Sucker	<i>Carpionodes cyprinus</i>			✓		
Blue Sucker	<i>Cylopterus elongatus</i>		vulnerable			✓
Red Shiner	<i>Cyprinella lutrensis</i>			✓		
Common Carp	<i>Cyprinus carpio</i>			✓		
Gizzard Shad	<i>Dorosoma cepedianum</i>			✓		
Mooneye	<i>Hiodon tergisus</i>		vulnerable			✓
Western Silvery Minnow	<i>Hybognathus argyritis</i>		imperiled			✓
Plains Minnow	<i>Hybognathus placitus</i>		imperiled			✓
Channel Catfish	<i>Ictalurus punctatus</i>			✓		
Smallmouth Buffalo	<i>Ictiobus bubalus</i>			✓		
Bigmouth Buffalo	<i>Ictiobus cyprinellus</i>			✓		
Longnose Gar	<i>Lepisosteus osseus</i>				✓	
Shortnose Gar	<i>Lepisosteus platostomus</i>			✓		
Green Sunfish	<i>Lepomis cyanellus</i>			✓		
Bluegill	<i>Lepomis macrochirus</i>			✓		
Silver Chub	<i>Macrhybopsis storianna</i>		vulnerable			✓
Largemouth Bass	<i>Micropterus salmoides</i>			✓		
Golden Shiner	<i>Notemigonus crysoleucas</i>				✓	
Trout-perch	<i>Percopsis omniscomycus</i>		critically imperiled			✓
White Crappie	<i>Pomoxis annularis</i>			✓		
Black Crappie	<i>Pomoxis nigromaculatus</i>			✓		
Flathead Catfish	<i>Pylodictis olivaris</i>				✓	
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	Endangered	Endangered			✓

Swan Lake NWR Mammals

Species	Scientific Name	Status		2004 species list	Species on the 1979 List But Not Recently Seen	Species Listed as Captured in 2003 Bat Survey Report
		Federal	State			
Pouched Mammals						
Virginia Opossum	<i>Didelphis virginiana</i>			✓		
Insectivors						
Short-tailed Shrew	<i>Blarina brevicauda</i>			✓		
Least Shrew	<i>Cryptotis parva</i>			✓		
Masked Shrew	<i>Sorex cinereus</i>			✓		
Southeastern Shrew	<i>Sorex longirostris</i>			✓		
Eastern Mole	<i>Scalopus aquaticus</i>			✓		
Bats						
Little Brown Bat	<i>Myotis lucifugus</i>			✓		✓
Big Brown Bat	<i>Eptesicus fuscus</i>			✓		✓
Eastern Red Bat	<i>Lasiurus borealis</i>			✓		✓
Hoary Bat	<i>Lasiurus cinereus</i>			✓		✓
Evening Bat	<i>Nycticeius humeralis</i>			✓		✓
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Endangered	✓		✓
Northern Long-eared Bat ^{1,3}	<i>Myotis septentrionalis</i>			✓		✓
Eastern Pipistrelle	<i>Pipistrellus subflavus</i>			✓		✓
Lagomorphs						
Eastern Cottontail	<i>Sylvilagus floridanus</i>			✓		
Rodents						
White-footed Mouse	<i>Peromyscus leucopus</i>			✓		
Deer Mouse	<i>Peromyscus maniculatus</i>			✓		
Meadow Jumping Mouse	<i>Zapus hudsonius</i>			✓		
Western Harvest Mouse	<i>Reithrodontomys megalotis</i>			✓		
Woodchuck	<i>Marmota monax</i>			✓		
Beaver	<i>Castor canadensis</i>			✓		
Muskrat	<i>Ondatra zibethicus</i>			✓		
Prairie Vole	<i>Microtus ochrogaster</i>			✓		
Meadow Vole	<i>Microtus pennsylvanicus</i>			✓		
Southern Bog Lemming	<i>Synaptomys cooperi</i>			✓		

Swan Lake NWR Mammals

Species	Scientific Name	Status		2004 species list	Species on the 1979 List But Not Recently Seen	Species Listed as Captured in 2003 Bat Survey Report
		Federal	State			
Plains Pocket Gopher	<i>Geomys bursarius</i>				✓	
Southern Flying Squirrel	<i>Glaucomys volans</i>			✓		
Eastern Gray Squirrel	<i>Sciurus carolinensis</i>			✓		
Fox Squirrel	<i>Sciurus niger</i>			✓		
Franklins Ground Squirrel	<i>Spermophilus franklinii</i>		Imperiled		✓	
Eastern Chipmunk	<i>Tamias striatus</i>				✓	
Hispid Cotton Rat	<i>Sigmodon hispidus</i>				✓	
Norway Rat	<i>Rattus norvegicus</i>				✓	
Carnivores						
Raccoon	<i>Procyon lotor</i>			✓		
Long-tailed Weasel	<i>Mustela frenata</i>		Imperiled	✓		
Least Weasel	<i>Mustela nivalis</i>		Apparently Secure	✓		
Mink	<i>Mustela vison</i>			✓		
Badger	<i>Taxidea taxus</i>			✓		
Coyote	<i>Canid latrans</i>			✓		
Red Fox	<i>Vulpes vulpes</i>			✓		
Bobcat	<i>Lynx rufus</i>			✓		
River Otter	<i>Lutra canadensis</i>			✓		
Striped Skunk	<i>Mephitis mephitis</i>			✓		
Eastern Spotted Skunk	<i>Spilogale putorius</i>		Endangered		✓	
Gray Fox	<i>Urocyon cinereoargenteus</i>				✓	
Deer						
White-tailed Deer	<i>Odocoileus virginianus</i>			✓		

Swan Lake NWR Mussels

Species	Scientific Name	State Status
Flat Floater	<i>Anodonta suborbiculata</i>	Imperiled
Giant Floater	<i>Anodonta grandis spp.</i>	
Squaw Foot	<i>Strophitus undulatus</i>	
White heel-splitter	<i>Lasmigona complanata</i>	
Maple Leaf	<i>Quadrula quadrula</i>	
Pond-horn	<i>Unio merus tetralasmus</i>	
Pink heel-splitter	<i>Potamilus alatus spp.</i>	
Sandshell sp.	<i>Lampsilis teres sp.</i>	
Liliput shell	<i>Toxolasma parvum</i>	
Paper Floater	<i>Anodonta imbecilis</i>	
Fragile Paper Shell	<i>Leptodea fragilis</i>	
List based on 1997 survey of Swan Lake NWR waters		

Swan Lake NWR Odonates

Species	Scientific Name
Common Green Darner	<i>Anax junius</i>
Blue-fronted Dancer	<i>Argia apicalis</i>
Powdered Dancer	<i>Argia moesta</i>
Halloween Pennant	<i>Celithemis eponina</i>
Familiar Bluet	<i>Enallagma civile</i>
Prince Baskettail	<i>Epicordulia princeps</i>
Eastern Pondhawk	<i>Erythemis simplicicollis</i>
Citrine Forktail	<i>Ischnura hastata</i>
Fragile Forktail	<i>Ischnura posita</i>
Eastern Forktail	<i>Ischnura verticalis</i>
Common Spreadwing	<i>Lestes disjunctus</i>
Slender Spreadwing	<i>Lestes rectangularis</i>
Spangled Skimmer	<i>Libellula cyanea</i>
Widow Skimmer	<i>Libellula luctuosa</i>
Twelve-spotted Skimmer	<i>Libellula pulchella</i>
Blue Dasher	<i>Pachydiplax longipennis</i>
Wandering Glider	<i>Pantala flavescens</i>
Eastern Amberwing	<i>Perithemis tenera</i>
Common Whitetail	<i>Plathemis lydia</i>
Riverine Clubtail	<i>Stylurus plagiatus</i>
Blue-faced Meadowhawk	<i>Sympetrum ambiguum</i>
Variiegated Meadowhawk	<i>Sympetrum corruptum</i>
Saffron-winged meadowhawk	<i>Sympetrum costiferum</i>
Black Saddlebags	<i>Tramea lacerata</i>
List compiled from 2003 Refuge Survey.	

Swan Lake NWR Rare Plants

Species	Scientific Name	State Status ¹
A Barnyard Grass	<i>Echinochloa walteri</i>	critically imperiled
An Umbrella Sedge	<i>Cyperus flavicomus</i>	critically imperiled
A Sedge	<i>Carex arkansana</i>	vulnerable

Swan Lake NWR Reptiles

Snakes	Scientific Name	Status		¹ 1999 Snake Inventory Report	² 2003-2004 Drift Fence Survey
		Federal	State		
Diamondback Watersnake	<i>Nerodia rhombifer</i>			✓	✓
Yellowbelly Watersnake	<i>Nerodia erythrogaster flavigaster</i>			✓	✓
Blotched Watersnake	<i>Nerodia erythrogaster transversa</i>			✓	
Northern Watersnake	<i>Nerodia sipedon sipedon</i>			✓	
Rough Greensnake	<i>Opheodrys aestivus</i>			✓	
Graham's Crayfish Snake	<i>Regina grahamii</i>			✓	✓
Northern Redbelly Snake	<i>Storeria occipitomaculata occipitomaculata</i>			✓	
Midland Brown Snake	<i>Storeria dekayi wrightorum</i>			✓	
Western Ribbon Snake	<i>Thamnophis proximus proximus</i>			✓	✓
Eastern Plains Garter Snake	<i>Thamnophis radix radix</i>			✓	✓
Red-sided Garter Snake	<i>Thamnophis sirtalis parietalis</i>			✓	✓
Easter Yellowbellied Racer	<i>Coluber constrictor flaviventris</i>				✓
Speckled Kingsnake	<i>Lampropeltis getula holbrooki</i>				✓
Prairie Kingsnake	<i>Lampropeltis calligaster calligaster</i>				✓
Prairie Ring-necked Snake	<i>Diadophis punctatus arnyi</i>				✓
Eastern Hog-nosed Snake	<i>Heterodon platirhinos</i>				✓
Eastern Gartersnake	<i>Thamnophis sirtalis sirtalis</i>				✓
Lined Snake	<i>Tropidoclonion lineatum</i>				✓
Western Spiny Softshell	<i>Apalone spinifera hartwegi</i>				✓
Black Rat Snake	<i>Elaphe obsoleta obsoleta</i>				
Eastern Massasauga	<i>Sistrurus catenatus catenatus</i>	Candidate	Endangered		✓
Turtles					
Red-eared Slider	<i>Trachemys scripta elegans</i>				
Common Snapping Turtle	<i>Chelydra serpentina serpentina</i>				
Western Painted Turtle	<i>Chrysemys picta bellii</i>				
Three-toed Box Turtle	<i>Terrapene carolina triunguis</i>				
Ornate Box Turtle	<i>Terrapene ornata ornata</i>				
Midland Smooth Softshell Turtle	<i>Apalone mutica mutica</i>				

Appendix D: Regional Conservation Priority Species for the Lower Missouri River Ecosystem

RCP Species for the Lower Missouri River Ecosystem

COMMON NAME	SCIENTIFIC NAME
Indiana bat	<i>Myotis sodalis</i>
Elktoe	<i>Alasmidonta marginata</i>
Threeridge	<i>Amblyma plicata</i>
Rock pocketbook	<i>Arcidens confragosus</i>
Asiatic clam	<i>Corbicula fluminea</i>
Spectaclecase	<i>Cumberlandi mondonga</i>
Zebra mussel	<i>Dreissena polymorpha</i>
Snuffbox	<i>Epioblasma triquetra</i>
Pink mucket pearlymussel	<i>Lampsilis abrupta</i>
Neosho mucket	<i>Lampsilis rafinequeana</i>
Scaleshell mussel	<i>Leptodea leptodon</i>
Black sandshell	<i>Ligumia recta</i>
Washboard	<i>Megalonaias nervosa</i>
Sheepnose	<i>Plethobasus cyphus</i>
Round pigtoe	<i>Pleurobema coccineum</i>
Fat pocketbook	<i>Potamilus capax</i>
Monkeyface	<i>Quadrula metanevra</i>
Pimpleback	<i>Quadrula pustulosa</i>
Mapleleaf	<i>Quadrula quadrula</i>
Pistolgrip	<i>Tritogonia verrucosa</i>
Mead's milkweed	<i>Asclepias meadii</i>
Decurrent false aster	<i>Boltonia decurrens</i>
Geocarpon (no common name)	<i>Geocarpon minimum</i>
Prairie bush-clover	<i>Lespedeza leptostachya</i>

RCP Species for the Lower Missouri River Ecosystem

Missouri bladderpod	<i>Lesquerella filiformis</i>
Western prairie fringed orchid	<i>Platanthera praeclara</i>
Hall's bulrush	<i>Schoenoplectus hallii</i>
Eastern massasauga	<i>Sistrurus catenatus catenatus</i>
Wood Duck	<i>Aix sponsa</i>
Grasshopper Sparrow	<i>Ammodramus savannarum</i>
Mallard	<i>Anas platyrhynchos</i>
Short-eared Owl	<i>Asio flammeus</i>
Long-eared Owl	<i>Asio otus</i>
Upland Sandpiper	<i>Bartramia longicauda</i>
Canada Goose – Eastern Prairie population	<i>Branta canadensis</i>
Canada Goose – Giant population	<i>Branta canadensis</i>
Swainson's Hawk	<i>Buteo swainsoni</i>
Stilt Sandpiper	<i>Calidris himantopus</i>
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>
Whip-poor-will	<i>Caprimulgus vociferus</i>
Piping Plover	<i>Charadrius melodus</i>
Piping Plover – Great Lakes Population	<i>Charadrius melodus</i>
Piping Plover – Northern Great Plains Population	<i>Charadrius melodus</i>
Snow Goose	<i>Chen caerulescens</i>
Northern Harrier	<i>Circus cyaneus</i>
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>
Northern Flicker	<i>Colaptes auratus</i>
Acadian Flycatcher	<i>Empidonax virescens</i>
Rusty Blackbird	<i>Euphagus carolinus</i>
Common Moorhen	<i>Gallinula chloropus</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Wood Thrush	<i>Hylocichla mustelina</i>
Orchard Oriole	<i>Icterus spurius</i>
Loggerhead Shrike	<i>Lanius ludovicianus</i>
Short-billed Dowitcher	<i>Limnodromus griseus hendersoni</i>
Swainson's Warbler	<i>Limnothlypis swainsonii</i>
Marbled Godwit	<i>Limosa fedoa</i>
Hudsonian Godwit	<i>Limosa haemastica</i>
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>
Whimbrel	<i>Numenius phaeopus</i>
Kentucky Warbler	<i>Oporonis formosus</i>
Wilson's Phalarope	<i>Phalaropus tricolor</i>
Prothonotary Warbler	<i>Protonotaria citrea</i>
King Rail	<i>Rallus elegans</i>

RCP Species for the Lower Missouri River Ecosystem

Louisiana Waterthrush	<i>Seiurus motacilla</i>
Dickcissel	<i>Spiza americana</i>
Field Sparrow	<i>Spizella pusilla</i>
Least Tern – Interior population	<i>Sterna antillarum</i>
Forster's Tern	<i>Sterna forsteri</i>
Western Meadowlark	<i>Sturnella neglecta</i>
Bewick's Wren	<i>Thryomanes bewickii</i>
Greater Yellowlegs	<i>Tringa melanoleuca</i>
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>
Barn Owl	<i>Tyto alba</i>
Blue-winged Warbler	<i>Vermivora pinus</i>
Bell's Vireo	<i>Vireo bellii</i>
Rusty crayfish	<i>Orconectes rusticus</i>
Lake sturgeon – Inland population	<i>Acipenser fulvescens</i>
Crystal darter	<i>Ammocrypta asprella</i>
Grass carp	<i>Ctenopharyngodon idella</i>
Blue sucker	<i>Cycleptus elongatus</i>
Niangua darter	<i>Etheostoma nianguae</i>
Western silvery minnow	<i>Hybognathus argyritis</i>
Plains minnow	<i>Hybognathus placitus</i>
Sturgeon chub	<i>Hybopsis gelida</i>
Flathead chub	<i>Hybopsis gracilis</i>
Sicklefin chub	<i>Hybopsis meeki</i>
Bighead carp	<i>Hypophthalmichthys nobilis</i>
Paddlefish	<i>Polyodon spathula</i>
Pallid sturgeon	<i>Scaphirhynchus albus</i>
Shovelnose sturgeon	<i>Scaphirhynchus platorynchus</i>

Appendix E: Swan Lake NWR Priority Refuge Operations and Maintenance Costs

Monitor & Research Invasive and Endangered Species, & Migratory Bird Resources

This includes hiring one full time Wildlife Biologist to assist with monitoring and management of Refuge resources. Swan Lake NWR contains approximately 12,000 acres of habitat important to migratory birds and threatened/endangered species (Indiana Bat/Massasagua Rattlesnake). These Refuge habitats are utilized by over 400,000 migratory birds and numerous resident wildlife species. This requires management coordination with the State of Missouri and other agencies. The Refuge is also located in the hydrologically complicated ecosystem of the Grand River Riparian Zone. This intensive management in a complicated system requires scientifically supported decision making with the ability to adapt to changing circumstances such as the effects of Climate Change. This project would provide the science to support adaptive management decision with a special emphasis to Climate Adaptation. It would provide the scientific research for decision making and monitoring to make better decisions within the adaptive management process.

Estimated cost: \$118,458 annually

Restore/Maintain 3,100 acres of managed wetland moist soil habitat.

This includes funding for one half-time temporary worker. Swan Lake NWR currently has 1,075 acres of managed moist soil wetland units. Refuge staff is working with private partners and the Missouri Department of Conservation on a project that would add an additional 300 acres of habitat into managed moist soil units with private funding. This project would ensure the proper resources to maintain 3,100 acres of wetland moist soil and an addi-

tional 1,800 acres of emergent Marsh as called for in the station CCP. Adequate wetland conditions are necessary to support the more than 1,000,000 migrating birds (Geese, ducks, and shorebirds) that utilize the Refuge. It also requires the assistance of seasonal employees over and above permanent staff levels during peak work times. This funding would fully allow the Refuge to meet its responsibilities in the long term upkeep of these habitats restored through private partnerships as well as maintain over 1,800 acres in emergent marsh and additional wet meadow habitats. Estimated first year cost: \$247,181

Estimated recurring annual cost: \$45,000

Provide Conservation Education & Land Stewardship Opportunities to Landowners, Schools, & Rural Communities.

Swan Lake NWR is located in Chariton County, Missouri. With approximately 20,107 acres enrolled, Chariton County has more acres of wetlands enrolled in the Wetland Reserve Program (WRP) than any county in Missouri. There are an additional 29,937 WRP acres in the surrounding counties as well. The first part of this project would be to forge an educational partnership between Swan Lake NWR and private landowners who hold over 50,000 acres of WRP easements. This partnership would allow Swan Lake to be utilized as a learning site for private landowners to learn how to properly manage and maintain their wetlands to meet habitat objectives of migratory birds. The second part of this project would enhance outdoor learning opportunities at Swan Lake NWR for area schools. There are 12 schools with over 6,000 enrolled students within a 25 mile radius of the Refuge that could make use of

Swan Lake as an outdoor learning destination.

Estimated first year cost: \$105,901

Estimated recurring annual cost: \$55,000

Manage Satellite Properties and Assist With Daily Refuge Operations

This includes hiring and Assistant Refuge Manager. Swan Lake National Wildlife Refuge is responsible for overseeing 12,000 acres of on Refuge property and 53 units (4,058 acres) of off-Refuge property. This involves the complex oversight of wetland moist soil management and managed hunt programs requiring much of the staffs time. The Refuge is located in the wetland riparian zone of the Gran River requiring extensive permitting for project work. In addition to the on Refuge work load there is an extensive work load for off Refuge fee title properties and easements, which are currently not receiving the needed management attention due to lack of Refuge staff. This project would allow the Refuge to meet management obligations on off-Refuge responsibilities and provide needed relief to the current staff for on-Refuge management activities.

Estimated cost: \$118,458 annually

Partner With Landowners to Improve Water Quality and Watershed Resources

This includes hiring one full time Private Lands Biologist. Swan Lake National Wildlife Refuge is supplied with water from four separate watersheds; Elk Creek, Turkey Creek, Tuff Branch, and Yellow Creek. Over 90% of these drainages which covers thousands of acres are in private land. The water quality of these watersheds carries significant sediment loads. This project would allow the Refuge to work more closely with private landowners in these drainages to improve the water quality of incoming water onto the Refuge. It would enhance wetland acres surround the Refuge and allow private landowners an opportunity to preserve the biological integrity of their properties.

Estimated cost: \$97,911 annually

Maintain On/off Refuge Wetland Resources and Visitor Services Facilities

This includes hiring one full time Maintenance Worker. Swan Lake NWR currently has 1,998 acres of managed moist soil wetland units. Refuge staff is working with Ducks Unlimited, the Friends of Swan Lake NWR, and the State of Missouri on a project that would add an additional 1,370 acres of habitat into managed moist soil units with private funding. This project would ensure the proper resources to maintain 3,368 acres of wetland moist soil. Adequate

wetland moist soil conditions are necessary to support migrating birds that utilize the Refuge as a rest area. This requires the operation of farm equipment to adequately maintain. The addition of these 1,998 acres of moist soil will expand maintenance responsibilities. In addition, the Refuge has 53 units (4,058 acres) of off-Refuge fee title and easement properties that are currently not receiving maintenance attention. This project would ensure maintenance attention to the wetland moist soil units and the off-Refuge properties in addition to Refuge visitor services facilities.

Estimated cost: \$72,371 annually

Develop a Comprehensive Conservation Plan (CCP) Mandated Refuge Hunting Plan

This includes funding for one half-time temporary worker. The Swan Lake Comprehensive Conservation Plan calls for the development of a Refuge Hunting Plan. Within that Hunting Plan it calls to expand hunting opportunities to include duck hunting and provide some opportunities for small game hunting. This will require writing a plan and all the necessary public input and planning strategies for the new hunting programs. The project will provide the necessary resources to develop and write a new hunting plan for the Refuge.

Estimated first year cost: \$35,951

Estimated recurring annual cost: \$7,000

Restore Moist Soil Capabilities and Shrub Swam Habitat of Wetland Units 12 and 14

This project would involve restoring the management integrity of two moist soil units, MSU 12 and 14. These units both total 1,000 acres of wetland habitat. They are managed for moist soil to provide migration habitat for waterfowl, geese, and shorebirds. In recent years due to a lack of staff much they have been encroached by undesirable plants. This encroachment has limited the Refuges ability to manage much of the unit as moist soil. This has tremendous impacts on managing the unit for mudflats around the edges for shorebird migrations. This project would be a two year project to dry the unit out and remove this woody vegetation through mechanical treatments. The Swan Lake CCP calls for some of these areas to provide Shrub Swamp habitat as well. This project will enhance the shrub swamp type habitat by removing undesirable species and thinning areas that have become too thick with vegetation creating a mosaic of shrub swam with moist soil habitat.

Estimated first year cost: \$85,000

Estimated recurring annual cost: \$5,000

Design a Comprehensive Conservation Plan (CCP) Mandated Refuge Visitors Brochure

Swan Lake NWR is located in rural North Central Missouri and provides a significant economic impact to the area by attracting visitors from all over the US. The Refuge is scheduled to have completed its Comprehensive Conservation Plan in 2009. Once the CCP is completed, the Refuge will need a new Brochure for the public. The Refuge does not have a current brochure and with changes made from the CCP process a new brochure will be necessary to properly orient the public as to opportunities on the Refuge.

Estimated Cost: \$18,000

Forge Educational Partnerships With Schools and Private Landowners

This includes hiring one full time Park Ranger. Swan Lake NWR is located in Chariton County, Missouri. With approximately 20,107 acres enrolled, Chariton County has more acres of wetlands enrolled in the Wetland Reserve Program (WRP) than any county in Missouri. There are an additional 29,937 WRP acres in the surrounding counties as well. The first part of this project would be to forge an educational partnership between Swan Lake NWR and private landowners who hold over 50,000 acres of WRP easements. This partnership would allow Swan Lake to be utilized as a learning site for private landowners to learn how to properly manage and maintain their wetlands to meet habitat objectives of migratory birds. The second part of this project would enhance outdoor learning opportunities at Swan Lake NWR for area schools. There are 12 schools with over 6,000 enrolled students within a 25 mile radius of the Refuge that could make use of Swan Lake as an outdoor learning destination.

Estimated cost: \$97,911 annually

Manage/maintain 3,400 Acres of Wetlands and Migratory Bird Resources

This includes hiring on full time Biological Science Technician. The Refuge Comprehensive Conservation Plan calls for over 3,000 acres of moist soil management on Swan Lake NWR. This project would ensure field support in management and monitoring of wetland conditions on the Refuge. There are over 200,000 migratory birds that utilize the Refuge as well and that number is expected to increase with habitat enhancements on the Refuge. This project would ensure field support in wildlife population and disease monitoring, surveys, and censuses.

Estimated cost: \$80,046 annually

Restore/maintain 2,600 Acres of Native Grasslands and Bottomland Hardwood Forest

This includes hiring one full time Rangeland Management Technician. The Swan Lake NWR currently has 921 acres of native grasslands on the Refuge. The Comprehensive Conservation Plan calls for the Refuge to eventually convert approximately 327 more acres of Refuge property to grasslands. This would give the Refuge over 1,200 acres of grassland units to manage in addition to the 1,400 acres of native bottomland hardwood forest in need of management. This project would ensure the necessary management activities are carried out to these habitats on Swan Lake National Wildlife Refuge.

Estimated cost: \$80,046 annually

Provide Visitor, Resource, and Facility Protection (Law Enforcement)

Provide one full-time law enforcement officer to protect wildlife, lands, facilities, employees and the general public on Swan Lake National Wildlife Refuge and its outlying Fee Title properties. The Directors Order #155 requires the Service to reduce dependency on dual-function Refuge officers and progress towards a full-time officer workforce. This officer will assist in fulfilling these needs by placing an officer in the field full time to protect wildlife resources. Service wetland easement violations, trespass farming, hunting violations and off-road vehicle use are increasing on Refuge lands. Protection is the most basic form of wildlife management and this project will dedicate a full-time law enforcement officer to preserve and protect wildlife and wildlife habitats. Currently the Refuge depends on State Game Wardens for LE support which puts an additional strain on them and the Refuge cannot depend upon them to make Refuge enforcement a priority.

Estimated cost: \$150,000 annually

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Appendix G: Compliance Requirements

Rivers and Harbor Act (1899) (33 U.S.C. 403)

Section 10 of this Act requires the authorization by the U.S. Army Corps of Engineers prior to any work in, on, over, or under a navigable water of the United States.

Antiquities Act of 1906. 16 U.S.C. 431 et seq.

Authorizes the scientific investigation of antiquities on Federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.

Migratory Bird Treaty Act, 16 U.S.C. 703 et seq.

Designates the protection of migratory birds as a federal responsibility. This Act enables the setting of seasons, and other regulations including the closing of areas, federal or non federal, to the hunting of migratory birds.

Migratory Bird Conservation Act, 16 U.S.C. 715 et seq.

Establishes procedures for acquisition by purchase, rental, or gift of areas approved by the Migratory Bird Conservation Commission.

Fish and Wildlife Coordination Act 16 U.S.C. 661 et seq. (1934)

Requires that the Fish and Wildlife Service and state fish and wildlife agencies be consulted whenever water is to be impounded, diverted or modified under a federal permit or license. The Service and state agency recommend measures to prevent the loss of biological resources, or to mitigate or compensate for the damage. The project proponent must take biological resource values into account and adopt justifiable protection measures to obtain maximum overall project ben-

efits. A 1958 amendment added provisions to recognize the vital contribution of wildlife resources to the Nation and to require equal consideration and coordination of wildlife conservation with other water resources development programs. It also authorized the Secretary of Interior to provide public fishing areas and accept donations of lands and funds.

Migratory Bird Hunting Stamp Act. Also known as the Duck Stamp Act, 16 U.S.C. 718 et seq. (1934)

Requires every waterfowl hunter 16 years of age or older to carry a stamp and earmarks proceeds of the Duck Stamps to buy or lease waterfowl habitat. A 1958 amendment authorizes the acquisition of small wetland and pothole areas to be designated as 'Waterfowl Production Areas,' which may be acquired without the limitations and requirements of the Migratory Bird Conservation Act.

Historic Sites, Buildings and Antiquities Act. Also known as the Historic Sites Act of 1935, 16 U.S.C. 461 et seq.

Declares it a national policy to preserve historic sites and objects of national significance, including those located on refuges. Provides procedures for designation, acquisition, administration, and protection of such sites.

Refuge Revenue Sharing Act, 16 U.S.C. 715s (1935)

Requires revenue sharing provisions to all fee-title ownerships that are administered solely or primarily by the Secretary through the Service.

Transfer of Certain Real Property for Wildlife Conservation Purposes Act, 16 U.S.C. 667b-667d (1948)

Provides that upon a determination by the Administrator of the General Services Administration, real property no longer needed by a federal agency can be transferred without reimbursement to the Secretary of Interior if the land has particular value for migratory birds, or to a state agency for other wildlife conservation purposes.

Federal Records Act of 1950, 44 U.S.C. 31

Directs the preservation of evidence of the government's organization, functions, policies, decisions, operations, and activities, as well as basic historical and other information.

Fish and Wildlife Act of 1956, 16 U.S.C. 742a et seq.

Established a comprehensive national fish and wildlife policy and broadened the authority for acquisition and development of refuges.

Refuge Recreation Act, 16 U.S.C. 460k et seq. (1962)

Allows the use of refuges for recreation when such uses are compatible with the refuge's primary purposes and when sufficient funds are available to manage the uses.

Wilderness Act of 1964, 16 U.S.C. 1131 et seq.

Directed the Secretary of Interior, within 10 years, to review every roadless area of 5,000 or more acres and every roadless island (regardless of size) within National Wildlife Refuge and National Park Systems and to recommend to the President the suitability of each such area or island for inclusion in the National Wilderness Preservation System, with final decisions made by Congress. The Secretary of Agriculture was directed to study and recommend suitable areas in the National Forest System.

Land and Water Conservation Fund Act of 1965, 16 U.S.C. 460 et seq.

Uses the receipts from the sale of surplus federal land, outer continental shelf oil and gas sales, and other sources for land acquisition under several authorities.

National Wildlife Refuge System Administration Act of 1966, 16 U.S.C. 668dd, 668ee

Defines the National Wildlife Refuge System and authorizes the Secretary to permit any use of a refuge provided such use is compatible with the major purposes for which the refuge was established. The Refuge Improvement Act clearly defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation and photography, or environmental education and interpretation); establishes a formal process for determining compatibility; established the responsibilities of the Secretary of Interior for managing and protecting the System; and requires a Comprehensive Conservation Plan for each refuge by the year 2012. This Act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

National Historic Preservation Act, 16 U.S.C. 470 et seq. (1966)

Establishes as policy that the Federal Government is to provide leadership in the preservation of the nation's prehistoric and historic resources. Section 106 requires federal agencies to consider impacts their undertakings could have on historic properties; Section 110 requires federal agencies to manage historic properties, e.g., to document historic properties prior to destruction or damage; Section 101 requires federal agencies to consider Indian tribal values in historic preservation programs, and requires each federal agency to establish a program leading to inventory of all historic properties on its land.

Architectural Barriers Act of 1968, 42 U.S.C. 4151 et seq.

Requires federally owned, leased, or funded buildings and facilities to be accessible to persons with disabilities.

National Environmental Policy Act of 1969, 42 U.S.C. 4321 et seq.

Requires the disclosure of the environmental impacts of any major federal action significantly affecting the quality of the human environment.

Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, 42 U.S.C. 4601 et seq.

Provides for uniform and equitable treatment of persons who sell their homes, businesses, or farms to the Service. The Act requires that any purchase offer be no less than the fair market value of the property.

Endangered Species Act of 1973, 16 U.S.C. 1531 et seq.

Requires all federal agencies to carry out programs for the conservation of endangered and threatened species.

Rehabilitation Act of 1973, 29 U.S.C. 701 et seq.

Requires programmatic accessibility in addition to physical accessibility for all facilities and programs funded by the federal government to ensure that anybody can participate in any program.

Archaeological and Historic Preservation Act 16 U.S.C.469-469c

Directs the preservation of historic and archaeological data in federal construction projects.

Clean Water Act of 1977, 33 U.S.C. 1251

Requires consultation with the Corps of Engineers (404 permits) for major wetland modifications.

Surface Mining Control and Reclamation Act of 1977, 30 U.S.C. 1201 et seq.

Regulates surface mining activities and reclamation of coal-mined lands. Further regulates the coal industry by designating certain areas as unsuitable for coal mining operations.

Executive Order 11988 (1977)

Each federal agency shall provide leadership and take action to reduce the risk of flood loss and minimize the impact of floods on human safety, and preserve the natural and beneficial values served by the floodplains.

Executive Order 11990

Executive Order 11990 directs federal agencies to (1) minimize destruction, loss, or degradation of wetlands and (2) preserve and enhance the natural and beneficial values of wetlands when a practical alternative exists.

Executive Order 12372 (Intergovernmental Review of Federal Programs)

Directs the Service to send copies of the Environmental Assessment to state planning agencies for review.

American Indian Religious Freedom Act, 42 U.S.C. 1996, 1996a (1976)

Directs agencies to consult with native traditional religious leaders to determine appropriate policy changes necessary to protect and preserve American Indian religious cultural rights and practices.

Fish and Wildlife Improvement Act of 1978, 16 U.S.C. 742a

Improves the administration of fish and wildlife programs and amends several earlier laws including the Refuge Recreation Act, the National Wildlife Refuge System Administration Act, and the Fish and Wildlife Act of 1956. It authorizes the Secretary to accept gifts and bequests of real and personal property on behalf of the United States. It also authorizes the use of volunteers on Service projects and appropriations to carry out a volunteer program.

Archaeological Resources Protection Act of 1979, 16 U.S.C. 470aa et seq.

Protects materials of archaeological interest from unauthorized removal or destruction and requires federal managers to develop plans and schedules to locate archaeological resources.

Farmland Protection Policy Act, Public Law 97-98, 7 U.S.C. 4201 (1981)

Minimizes the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.

Emergency Wetlands Resources Act of 1986, 16 U.S.C. 3901 et seq.

Promotes the conservation of migratory waterfowl and offsets or prevents the serious loss of wetlands by the acquisition of wetlands and other essential habitats.

Federal Noxious Weed Act of 1974, 7 U.S.C. 2801 et seq.

Requires the use of integrated management systems to control or contain undesirable plant species, and an interdisciplinary approach with the cooperation of other federal and state agencies.

Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001 et seq. (1990)

Requires federal agencies and museums to inventory, determine ownership of, and repatriate cultural items under their control or possession.

Americans with Disabilities Act of 1990, 42 U.S.C. 12101 et seq.

Prohibits discrimination in public accommodations and services.

Executive Order 12898 (1994)

Establishes environmental justice as a federal government priority and directs all federal agencies to make environmental justice part of their mission. Environmental justice calls for fair distribution of environmental hazards.

Executive Order 12996 Management and General Public Use of the National Wildlife Refuge System (1996)

Defines the mission, purpose, and priority public uses of the National Wildlife Refuge System. It also presents four principles to guide management of the System.

Executive Order 13007 Indian Sacred Sites (1996)

Directs federal land management agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and where appropriate, maintain the confidentiality of sacred sites.

National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd

Considered the “Organic Act of the National Wildlife Refuge System. Defines the mission of the System, designates priority wildlife-dependent public uses, and calls for comprehensive refuge planning. Section 6 requires the Service to make a determination of compatibility of existing, new and changing uses of Refuge land; and Section 7 requires the Service to identify and describe the archaeological and cultural values of the refuge.

The Act also directs the administration of the Refuge System to ensure the biological integrity, diversity, and environmental health of the System. According to the U.S. FWS Service Manual (601 FW3) this refers to the maintenance of existing elements, and where appropriate the restoration of lost or severely degraded elements.

Integrity pertains to biotic composition, structure, and function at genetic, organismal, and community levels. Diversity includes protection of the broad variety of living organisms, genetic distinctions, and community compositions. Environmental health recognizes the importance of both biotic and abiotic features and processes in the System. The standard of measure for each of these terms is defined using historic conditions, or conditions and processes present prior to substantial anthropogenic changes, as indicated by the best available science and sound professional judgment.

National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act of 1998, 16 U.S.C. 742a

Amends the Fish and Wildlife Act of 1956 to promote volunteer programs and community partnerships for the benefit of national wildlife refuges, and for other purposes.

National Trails System Act, 16 U.S.C. 1241 et seq. (1968)

Assigns responsibility to the Secretary of Interior and thus the Service to protect the historic and recreational values of congressionally designated National Historic Trail sites.

Treasury and General Government Appropriations Act, Pub. L. 106-554, §1(a)(3), Dec. 21, 2000, 114 Stat. 2763, 2763A–125

In December 2002, Congress required federal agencies to publish their own guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information that they disseminate to the public (44 U.S.C. 3502). The amended language is included in Section 515(a). The Office of Budget and Management (OMB) directed agencies to develop their own guidelines to address the requirements of the law. The Department of the Interior instructed bureaus to prepare separate guidelines on how they would apply the Act. The U.S. Fish and Wildlife Service has developed “Information Quality Guidelines” to address the law.

Cultural Resources and Historic Preservation

The National Wildlife Refuge System Improvement Act of 1997, Section 6, requires the Service to make a determination of compatibility of existing, new and changing uses of Refuge land; and Section 7 requires the Service to identify and describe the archaeological and cultural values of the refuge.

The National Historic Preservation Act (NHPA), Section 106, requires federal agencies to consider impacts their undertakings could have on historic properties; Section 110 requires federal agencies to manage historic properties, e.g., to document historic properties prior to destruction or damage; Section 101 requires federal agencies consider Indian tribal values in historic preservation programs, and requires each federal agency to establish a program leading to inventory of all historic properties on its land.

The Archaeological Resources Protection Act of 1979 (ARPA) prohibits unauthorized disturbance of archeological resources on federal and Indian land; and other matters. Section 10 requires establishing “a program to increase public awareness” of archeological resources. Section 14 requires plans to survey lands and a schedule for surveying lands with “the most scientifically valuable archeological resources.” This Act requires protection of all archeological sites more than 100 years old (not just sites meeting the criteria for the National Register) on federal land, and requires archeological investigations on federal land be performed in the public interest by qualified persons.

The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) imposes serious delays on a project when human remains or other cultural items are encountered in the absence of a plan.

The American Indian Religious Freedom Act (AIRFA) iterates the right of Native Americans to free exercise of traditional religions and use of sacred places.

EO 13007, Indian Sacred Sites (1996), directs federal agencies to accommodate access to and ceremonial use, to avoid adverse effects and avoid blocking access, and to enter into early consultation.

Appendix H: Mailing List

The following is an initial list of government offices, private organizations, and individuals who will receive notice of the availability of this Draft CCP. We continue to add to this list.

Federal Officials

- U.S. Senator Christopher Bond
- U.S. Senator Claire McCaskill
- U.S. Representative Sam Graves
- U.S. Representative Ike Skelton
- U.S. Representative Blaine Luetkemeyer

Federal Agencies

- U.S. Army Corps of Engineers, Kansas City District
- USDI/Fish and Wildlife Service, Albuquerque, New Mexico; Anchorage, Alaska; Atlanta, Georgia; Denver, Colorado; Fort Snelling, Minnesota; Hadley, Massachusetts; Portland, Oregon; Sacramento, California; Washington, D.C.
- U.S. Department of Agriculture/NRCS, Columbia, Missouri
- U.S. Fish and Wildlife Service, Ecological Services, Columbia, Missouri

State Officials

- Governor Jay Nixon
- Representative Therese Sander
- Senator Bill Stouffer

State Agencies

- Missouri Department of Natural Resources
- Missouri Department of Conservation
- University of Missouri, Extension Services

- State Historic Preservation Officer

City/County/Local Governments

- Chariton County
- City of Chillicothe
- City of Sumner

Libraries

- Livingston County Library
- Brookfield Public Library
- Carnegie Library
- Hale Library and Museum
- Carrollton Library

Organizations

- Audubon Society of the District of Columbia
- Chillicothe Chamber of Commerce
- Conservation Federation of Missouri
- Defenders of Wildlife
- Friends of Swan Lake National Wildlife Refuge
- Grand River Audubon Society
- Mississippi Valley Duck Hunters Association
- National Trappers Association, Inc.
- National Wildlife Federation - Great Lakes Field Office
- National Wildlife Refuge Association
- National Wild Turkey Federation
- Northwestern University
- Public Employees for Environmental Responsibility (PEER)
- Sierra Club – Midwest Office

- The Conservation Fund
- The Humane Society of the United States
- The Wilderness Society
- Wilderness Watch
- Yellow Creek Chapter Ducks Unlimited

Media

- Local Radio and TV Stations; Refuge Media Contacts

Individuals

- Individuals who participated in open house sessions or who requested to be on the Comprehensive Conservation Plan mailing list.

Appendix I: Compatibility Determinations

Antler, Nut, Berry and Mushroom Collecting.....	94
Environmental Education, Interpretation and Special Events	97
Farming	100
Fishing	104
Haying.....	107
Hunting	110
Research	114
Trapping	116
Tree Harvest by Third Parties	119
Wildlife Observation.....	122

COMPATIBILITY DETERMINATION

Use: Gathering Antlers, Nuts, Berries, or Mushrooms

Refuge Name: Swan Lake National Wildlife Refuge (NWR)

Establishing and Acquisition Authorities: Executive Order 7563 established Swan Lake National Wildlife Refuge on February 27, 1937.

Refuge Purposes:

- "... as a refuge and breeding ground for migratory birds and other wildlife: ..." Executive Order 7563, dated Feb. 27, 1937
- "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)
- "... particular value in carrying out the national migratory bird management program." 16 U.S.C. § 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife)

National Wildlife Refuge System Mission: "The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."

Description of Use:

Is the use a priority public use?

No. Gathering (antlers, nuts, berries, and mushrooms) is not a priority public use of the National Wildlife Refuge System.

Where would the use be conducted?

Gathering is permitted in any portion of the Refuge open to the public. Mushroom and berry gathering is typically concentrated along roadsides and foot paths and is limited to one gallon per person per day. Antler gathering does occur over the entire Refuge but is typically carried out during the first couple weeks of March and is limited to four antlers per person and restricted to shed antlers only (antlers that have been sawed or still attached to the skull are prohibited from being gathered).

When would the use be conducted?

Gathering of antlers, nuts, berries, or mushrooms would occur during daylight hours from early March (once the Refuge is opened to the public) through late October (when the Refuge is closed to public access).

How would the use be conducted?

Antlers, nuts, berries and mushrooms are seasonally collected on the Refuge for personal use. This occurs without ground disturbance along road sides, edges of fields, and bottomland forests. Harvest of nuts, berries and mushrooms typically occurs during a stretch of several days in early spring and summer as particular items ripen. These foods are hand harvested by picking the products from the plant or gathering what has fallen to the ground. Mushrooms are picked by hand in the spring. Most antler collecting occurs in March after the Refuge opens to the public. Harvest is during daylight hours and generally involves individuals or small groups. Access to harvest sites is typically accomplished by walking from a parking area or along the side of Refuge roadways.

Why is this use being proposed?

This use has historically been allowed on the Refuge and has become a custom of the local community. The Refuge is open to the public during the time periods that the use is allowed so no additional disturbance is created by allowing this use. Gathering allows the public to build a connection to the Refuge through personal outdoor experiences that engage the senses and foster an appreciation of the outdoors. The Refuge along with Yellow Creek State Conservation Area and Fountain Grove State Conservation Area are the only public lands located in the area that provide the public this type of use. Otherwise opportunities exist on private lands where access is limited for the public.

Availability of Resources:

What resources are needed to properly (considering quality and compatibility) and safely administer the use?

Staff is needed to post regulations regarding these activities, which is accomplished in conjunction with posting other Refuge regulations. Law Enforcement is needed to ensure access at allowed times is adhered to, which is done in conjunction with other Refuge access. Law Enforcement is also

periodically necessary to check gatherers to ensure compliance with the restrictions placed on gathering limits.

Are existing Refuge resources adequate to properly and safely administer the use?

Existing Refuge resources are adequate to ensure this activity is safely administered and carried out according to compatibility requirements.

Anticipated Impacts of the Use:

How does gathering affect Refuge purposes and the NWRs mission?

The Refuge was established to provide for the needs of migratory birds and other wildlife. Gathering does not adversely affect the ability of the Refuge to fulfill this purpose.

How does gathering affect fish, wildlife, plants, and their habitats; and the biological integrity, diversity, and environmental health of the Refuge/NWRs?

Wildlife disturbance and removal of wildlife foods are the direct impacts associated with this activity.

Disturbance

In *Managing Visitor Use and Disturbance of Waterbirds: A Literature Review of Impacts and Mitigations* DeLong (2002) includes a summary of effects on wildlife from disturbance from various forms of recreation. The author documents that disturbance can alter behavior (e.g. foraging time), population structure, and distribution patterns of wildlife. It is probable that gathering would cause some or all of these effects to some degree on Refuge wildlife, but at present and expected future levels is not expected to adversely affect wildlife populations on the Refuge. A number of measures mitigate these effects.

Habitat

No adverse impacts to Refuge habitats are expected from this activity. Presently, the level of this use is estimated at 50 visits annually and is not expected to increase much above present rates in the future. The use occurs for short durations during spring and summer when nuts, berries, mushrooms, or antlers are most likely available. Gathering occurs in the same areas as other public uses and practiced at prescribed levels is not expected to harm Refuge habitats.

Biological Integrity, Diversity, and Environmental Health

Gathering of nuts, berries, mushrooms, or antlers conducted in accordance with Refuge regulations is

not expected to adversely affect fish and wildlife populations or the biological integrity, diversity, and environmental health of the Refuge as it is defined in Service policy (USFWS 2001). Historically, public participation in the collection of nuts, berries, mushrooms, and antlers on the Refuge is estimated at about 50 visits per year, and future participation is also expected to be at or slightly above the current level. Individuals gathering wild edibles are limited to 1 gallon per day of mushrooms, 1 gallon per day of nuts or berries, and 4 shed antlers per day. This is not anticipated to adversely impact the biological integrity, diversity, or environmental health of the Refuge. Archeological evidence from within the Refuge shows it has been inhabited by humans for more than 12,000 years. Many of the early inhabitants relied heavily on wild plants for food. It is reasonable to conclude that individual gathering today is consistent with the historic conditions of the area.

Other Uses and Public Safety

Gathering is not expected to adversely affect other Refuge uses or public safety. As public use levels on the Refuge expand across time, unanticipated conflicts between user groups may occur. The Refuge's Visitor Services programs would be adjusted as needed to eliminate or minimize each problem and provide quality wildlife-dependent recreational opportunities which include promoting public safety. 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 gathering on priority wildlife-dependent recreation activities or public safety at Swan Lake NWR is expected to be minor.

Public Review and Comment: This compatibility determination was part of the Swan Lake NWR Draft Comprehensive Conservation Plan and Environmental Assessment. Public notification and review included a notice of availability published in the Federal Register, a 30-day comment period, local media announcements, and a public meeting near the Refuge. Comments received and agency responses are included in the final version of the Swan Lake NWR Comprehensive Conservation Plan.

Determination:

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Digging of plants or their roots is prohibited.
2. Plant products are for personal use only and cannot be sold or traded.
3. Quantities are restricted to the gathering of 1 gallon per day of nuts, berries, or mushrooms and 4 shed antlers per day
4. Damaging trees, shrubs or any other vegetation is prohibited.
5. The host plant can not be destroyed or removed for berry picking.
6. Shed Antlers are only allowed to be gathered (those with a bur that indicates it was shed and not forcibly removed). Antlers that have been sawed or still attached to the skull are prohibited from being gathered.

Justification: The use has little impact to wildlife or habitat since it is non-motorized, involves few visitors, and disturbance is local and short-duration. Little harvest occurs in the fall, which is the beginning of the peak of the waterfowl migration. Due to the relatively small number of visitors for this activity and the personal-use-only stipulation, the amount of plants or parts harvested will not create any shortage of wild foods for any particular wildlife species. Refuge infrastructure and law enforcement staff already in place will be sufficient to facilitate and administer this use into the future. In view of the above and with the stipulations previously described, gathering nuts, berries, mushrooms, and antlers will not materially interfere with or detract from the purposes of the Refuge or the mission of the Refuge System. These uses also foster an appreciation of our natural resources by the public and are a means of allowing the Refuge to more effectively connect people to nature as per the Region 3 “Lets Go Outside-Connecting People With Nature” Initiative.

Signed:

Refuge Manager: s/Steve Whitson, Feb. 3, 2011

Concurrence:

Regional Chief: s/Rick Schultz, Feb. 15, 2011

Mandatory 10- or 15-year Re-evaluation Date: 2021

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Compatibility Determination

Use: Environmental Education, Interpretation, Special Events, and other programs

Refuge Name: Swan Lake National Wildlife Refuge (NWR)

Establishing and Acquisition Authorities: Executive Order 7563 established Swan Lake National Wildlife Refuge on February 27, 1937.

Refuge Purposes:

- "... as a refuge and breeding ground for migratory birds and other wildlife: ..." Executive Order 7563, dated Feb. 27, 1937
- "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)
- "... particular value in carrying out the national migratory bird management program." 16 U.S.C. § 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife)

National Wildlife Refuge System Mission: The mission of the National Wildlife Refuge System (NWRS) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

Is the use a priority public use?

Environmental Education and Interpretation are priority public uses of the National Wildlife Refuge System as stated in the 1999 National Wildlife Refuge Improvement Act.

Where would the uses be conducted?

Environmental Education

Environmental education encompasses planned, often sequential, instructional programs and activities aimed at building skills, abilities, and knowledge about wildlife-related environmental topics. This use would primarily occur at an area of the Refuge developed as an environmental education site with an outdoor classroom.

Interpretation, Including Special Events

Interpretation is a communication process that forges emotional and intellectual connections between the audience and the resource. Interpretation is less instructional than environmental education and is usually self-guided or directed. This use would primarily occur at existing interpretive facilities at the visitor center, along a 10-mile auto tour route, and the Refuge nature trail.

Other Programs

Other programs include conservation-related activities such as outdoor skills classes, landowner workshops, and scouting activities. These activities would occur at the Visitor Center, the Environmental Education site, the Nature Trail and as tours along open Refuge roadways.

When Would the Use be Conducted?

These activities would occur throughout the year with greater activity expected when school is in session.

How would the use be conducted?

Environmental Education

Environmental Education is a priority public use that currently contributes about 500 visits to the Refuge each year. The Environmental Education program will be developed with a focus on partnerships with area schools, clubs, organizations, State and Federal agencies and Missouri Department of Conservation all participating in staff/volunteer led and self led Environmental Education activities on the Refuge. Programs will be designed to complement the Missouri public schools curriculum that requires students to learn about natural resources in preparation for the annual Missouri Mastery and Achievement Test. Environmental education programs will focus on Refuge specific issues including wildlife, history, archaeology, culture, and habitats. The Refuge will also connect and coordinate educational activities with resources at surrounding locations such as Fountain Grove Wildlife Management Area, Pershing State Park, and The Land Learning Foundation, all of which are near Swan Lake NWR.

Interpretation Including Special Events

In addition to interpretive facilities, Refuge staff and volunteers will provide guided tours and programs upon request. Special events will be planned out each year and posted on a Refuge calendar of events.

Other Programs

Other conservation related programs would be led by Refuge staff, volunteers, or others from State agencies or conservation organizations.

Why is this Use Being Proposed?

Environmental education and Interpretation are priority general public uses of the National Wildlife Refuge System. These programs promote understanding and appreciation of natural and cultural resources and their management on all lands and waters of the Refuge System.

Availability of Resources:

What resources are needed to properly (considering quality and compatibility) and safely administer the use?

Existing Refuge staff will be utilized when necessary to assist the environmental education, interpretation, and other programs in addition to their normal duties. The Refuge volunteer program will be utilized to carry the bulk of environmental education, interpretation, and other related duties through the use of volunteers, work campers, and interns. If funding is sufficient, seasonal employees or an additional permanent employee may also be used to carry out these programs.

Are existing Refuge resources adequate to properly and safely administer the use?

At the present level of use there are adequate Refuge resources to administer programs for environmental education, interpretation and other events. There is an opportunity to provide increased services through expansion of the Refuge volunteer program.

Anticipated Impacts of the Use:

How does environmental education affect Refuge purposes and the NWRS mission?

The Refuge was established to provide for the needs of migratory birds and other wildlife. Environmental education, interpretation, and other programs and events do not adversely affect the ability of the Refuge to fulfill this purpose. Environmental education and interpretation are priority general public uses of the National Wildlife Refuge System and supports two of the goals the NWRS.

How does environmental education affect fish, wildlife, plants, and their habitats; and the biological integrity, diversity, and environmental health of the Refuge/NWRS?

Migratory Birds

Environmental education, interpretation, and other similar activities are not expected to adversely affect migratory bird populations that occur on the Refuge.

Disturbance

In *Managing Visitor Use and Disturbance of Waterbirds: A Literature Review of Impacts and Mitigations* DeLong (2002) includes a summary of effects on wildlife from disturbance from various forms of recreation. The author documents that disturbance can alter behavior (e.g. foraging time), population structure, and distribution patterns of wildlife. It is probable that outdoor environmental education, interpretation, or other similar activities would cause some or all of these effects to some degree on Refuge wildlife. A number of measures mitigate these effects, and they are not expected to occur at levels that would interfere with the purposes of the Refuge. The area most directly impacted would be the environmental education site located along the perimeter of the Refuge at the site of the existing hunting headquarters building. School buses and personal vehicles would utilize developed roads and parking areas to access trails which are already in place. Self-guided interpretation would be sporadic use by small groups of people at established trails and kiosks. This may cause short term disturbance as well, but again would have minimal impact.

Habitat

Environmental education, interpretation and other similar activities may cause minor habitat disturbance, but are not expected to adversely affect Refuge habitats.

Biological Integrity, Diversity, and Environmental Health

Environmental education, interpretation and other similar activities are not expected to adversely impact the biological integrity, diversity, and environmental health of the Refuge.

Other Uses and Public Safety

Environmental education, interpretation and other similar activities are not expected to adversely affect other Refuge uses or public safety. As public use levels on the Refuge expand across time, unanticipated conflicts between user groups may occur. The Refuge's Visitor Services program would be

adjusted as needed to eliminate or minimize each problem and provide quality wildlife-dependent recreational opportunities that include promoting public safety. 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 environmental education, interpretation and other similar activities on other wildlife-dependent recreation or public safety at Swan Lake NWR is expected to be minor since it is concentrated in a few locations.

Public Review and Comment:

This compatibility determination was part of the Swan Lake NWR Draft Comprehensive Conservation Plan and Environmental Assessment. Public notification and review included a notice of availability published in the Federal Register, a 30-day comment period, local media announcements, and a public meeting near the Refuge. Comments received and agency responses are included in the final version of the Swan Lake NWR Comprehensive Conservation Plan.

Determination (check one below):

- Use is Not Compatible
- Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Use of motorized vehicles is limited to maintained roads and parking areas except for extenuating circumstances approved by the Refuge Manager.
2. Environmental education activities not led by Refuge staff would require verbal approval or a Special Use Permit by the Refuge Manager to minimize conflicts with other groups, safeguard students and resources, and to allow tracking of use levels.
3. Harassment of wildlife or excessive damage to vegetation is prohibited.
4. Educational groups are required to have a sufficient number of adults to supervise their groups, a minimum of 1 adult per 10 students.
5. Visitors involved in environmental education or interpretive activities are to adhere to all Refuge regulations unless approved by the Refuge Manager.

Justification:

In view of the above and with the stipulations previously described, environmental education, interpretation and other similar programs will not materially interfere with or detract from the NWRS mission or purposes of the Refuge. Environmental education and interpretation are priority public uses of the Refuge System and providing these programs contributes to achieving one of the Refuge goals. Well-designed environmental education and interpretation programs can be effective resource management tools that provide an opportunity to influence visitor attitudes about natural resources, refuges, the Refuge System, and the Service and to influence visitor behavior when visiting units of the Refuge System.

Signed:

Refuge Manager: s/Steve Whitson, Feb. 3, 2011

Concurrence:

Regional Chief: s/Rick Schultz, Feb. 15, 2011

Mandatory 10- or 15-year Re-Evaluation Date: 2026

Compatibility Determination

Use: Farming

Refuge Name: Swan Lake National Wildlife Refuge (NWR)

Establishing and Acquisition Authorities: Executive Order 7563 established Swan Lake National Wildlife Refuge on February 27, 1937.

Refuge Purposes:

“... as a refuge and breeding ground for migratory birds and other wildlife: ...” Executive Order 7563, dated Feb. 27, 1937

“... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. § 715d (Migratory Bird Conservation Act)

“... particular value in carrying out the national migratory bird management program.” 16 U.S.C. § 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife)

National Wildlife Refuge System Mission: The Mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

Is the use a priority public use?

Farming is not a priority public use of the National Wildlife Refuge System.

Where would the use be conducted?

Presently, farming occurs on up to 1,365 acres or about 12 percent of presently owned (11,473 acres as of 2008) Refuge lands annually.

When would the use be conducted?

Spring planting can begin as early as April and fall harvest may occur until late October.

How would the use be conducted?

The Refuge will allow farming by private individuals for the purpose of habitat management. Cooperative farming is the term used for cropping activities (growing agricultural products) conducted by a third party on land that is owned by or managed as part of the Refuge. Cooperative farming is

conducted under the terms and conditions of a Cooperative Farming Agreement or Special Use Permit issued by the Refuge Manager. The terms of the Agreement or Permit ensure compliance with Service policy and area-specific stipulations to meet management objectives and safeguard resources. In most circumstances where farming is permitted, the use agreement will require a portion of the area be planted to a mixture of species specified by the Refuge. This portion is left unharvested in the field for the benefit of wildlife.

Farming entails the use of mechanical equipment such as tractors, disks, and seeders. Each site is tilled prior to spring planting, once ground conditions permit the use of heavy equipment without damage to the soil. Tilling requires 1-2 days per site. Some sites may also be treated with herbicide prior to planting. Next, crops such as corn, milo, wheat, and soybeans are planted. Typically, planting is completed in one day or less on any individual site and planting on all sites usually begins as early as mid April and is completed as late as early July depending on soil conditions and type of crop planted.

The Refuge encourages the use of no-till farming, also known as conservation tillage. This method is practiced on about half of the sites annually. It is a way of growing crops from year to year without disturbing the soil through tillage. Tillage is the preparation of the soil to receive seeds, usually done with equipment such as a plow, disk, or harrow that is pulled behind a tractor. Tilling can lead to unfavorable effects like soil compaction from heavy machine traffic and erosion caused by pulverizing the soil and removing plant cover, allowing topsoil to easily blow away or run off in rainwater. In no-till farming the soil is left intact and crop residues—stalks, stubble, leaves, and seed pods left after harvesting—are left in the fields. Despite the advantages to soils, no-till farming usually requires planting herbicide-resistant crop plants and then chemically weeding with herbicides. All herbicide-resistant crops will be carried out within the guidelines of Regional Policy regarding genetically modified organism. Herbicide may be applied up to two times annually on each site. This is usually done with a tractor-drawn sprayer or self-propelled sprayer and requires up to one day per site for each application.

Traditional farming which uses tillage, and often herbicide as well, is practiced on about half the sites annually. It entails disking the site one or more

Heavy Equipment Use Days Per Site for No-till and Conventional Farming

Activity	No-till Farming	Conventional Farming
Spring tilling		1-3 days
Spring planting	1 day	1 day
herbicide application	2 days	
Herbicide application or mechanical weeding		1 day
Harvesting	1 day	1 day
Total	4 days/year	4-6 days/year

times before spring planting to remove competing vegetation. This requires 1-3 days per site. Later in the growing season herbicide is applied to reduce the amount of weedy competition. This takes up to one day per site for each application. A harrow or other tractor-drawn implement may be used in place of herbicide to reduce the amount of weedy competition. This also would require about one day per site. This practice may also be utilized in areas managed for moist soil as a maintenance tool. The moist soil units are mechanically disturbed every 4-6 years to maintain their vitality and the Refuge may utilize farming as a cost effective means of managing the moist soil units.

Harvest techniques are the same for both no-till and traditional farming practices. Harvest begins in the fall, using a self propelled harvesting implement such as a combine, and usually takes about one day per site and is complete on all sites by late October.

Why is this use being proposed?

At Swan Lake NWR, farming is used as a low cost means to maintain open habitats and reduce the amount of undesirable herbaceous and woody vegetation within moist soil management units. On some sites it is used to provide supplemental food for waterfowl and other wildlife. Farming may also occur if parcels containing currently farmed land are purchased as additions to the Refuge. However, over the long term we expect the amount of farmed Refuge lands will decrease as permanent native habitat is established on these areas.

Availability of Resources:

What resources are needed to properly (considering quality and compatibility) and safely administer use?

Are existing Refuge resources adequate to properly and safely administer the use?

The needed staff time for development and administration of a cooperative farming program is available. Most of the needed work to prepare for

this use would be done as part of routine management duties. The decision to use cooperative farming as a management tool would occur as part of strategies developed under specific program or unit habitat management planning. The additional time needed to coordinate issuance and oversight of the needed Special Use Permit or Agreements is relatively minor and within existing Refuge resources.

Anticipated Impacts of the Use:

How does farming affect Refuge purposes, the NWRS mission, as well as fish, wildlife, plants, and their habitats; and the biological integrity, diversity, and environmental health of the Refuge/NWRS?

Refuge Purposes and NWRS mission

Since its establishment, the Refuge has fulfilled its purposes by providing for the needs of migratory birds and other wildlife, with an emphasis on waterfowl. Farming is one tool used to accomplish this. It does this in two ways: 1) the residual crops left in the fields provide food, primarily for waterfowl, and 2) farming is used as a disturbance agent on some moist soil units to prevent the encroachment of woody vegetation. Although moist soil management is known to provide a greater diversity of foods with higher nutritive value than cereal grains produced by farming, it is not suited to all sites because it requires levees and water level control. Row crops are planted on a portion of the Refuge to ensure adequate food is available for migrating waterfowl.

Fish, Wildlife, Plants, and their Habitats

On sites where farming occurs there would be periodic short-term disturbance and displacement typical of any noisy heavy equipment operation. These sites may be used by wildlife for feeding and resting at times equipment is not operating, but successful nesting is unlikely because of soil and habitat disturbance. Soil disturbance from farming would reduce undesirable plant species in moist soil units allowing native species that provide dense cover and foods of high nutritive value to flourish in years the

sites are not farmed. The crops left on-site as well as other crop residue would provide supplemental food, attracting wildlife to sites, where at some locations, it could be easily viewed by Refuge visitors. Any herbicide application would be done with products approved by the Service for such use and in compliance with label instructions. No short-term or long-term adverse impacts are expected. Farming and any associated impacts are expected to occur on no more than 12 percent of Refuge lands annually.

Biological Integrity, Diversity, and Environmental Health

Service policy calls for maintaining or restoring refuge habitats to historic conditions if doing so does not conflict with refuge purposes (U. S. Fish and Wildlife Service 2001). Retaining up to 1,365 acres of cropland departs substantially from the prairies that likely once occurred on these sites according to maps of pre-settlement vegetation, or the potential vegetation identified in soil surveys (USDA) but it helps fulfill Refuge purposes by providing food for migratory waterfowl.

Public Review and Comment:

This compatibility determination was posted at the Refuge Visitor Center for a two week period and was displayed during the monthly Refuge First Friday program which is attended by more than 200 people. It was also posted in the local US Post Office public bulletin board. There were no comments received during this period.

Determination (check one below):

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

Cooperative Farming Agreements will be issued on a three year cycle and will be highly regulated to minimize damage to natural resources and provide supplemental food source. Each year of the Cooperative Farming Agreement the Refuge Manager will issue the cooperator a annual crop plan that specifies the crops to be planted for that year. Agreements will be awarded to the highest bidder based upon a per acre dollar figure or a crop share left unharvested.

1. Cooperating farmers will be subject to Service policy and regulation regarding use of chemicals. Herbicide and pesticide use is restricted by type and to the minimum necessary amount applied.

2. Special conditions of Cooperative Farming Agreements will address unique local conditions as applicable.
3. Farming must meet specific habitat and related wildlife objectives and contribute to the purposes of the Refuge.
4. Planting and harvest activities are restricted to minimize disturbance of wildlife species.

Justification: In view of the above and with the stipulations previously described, farming will not materially interfere with or detract from the NWRS mission or purposes of the Refuge. As practiced at Swan Lake NWR, farming contributes to the achievement of Refuges purposes and the National Wildlife Refuge System mission because it provides food resources for migratory waterfowl.

Signed:

Refuge Manager: s/Steve Whitson, Feb. 3, 2011

Concurrence:

Regional Chief: s/Rick Schultz, Feb. 15, 2011

Mandatory 10- or 15-year Re-evaluation Date: 2021

References:

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NC-244. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 267 p. Available URL: http://ners.fs.fed.us/pubs/gtr/gtr_nc244/gtr_nc244_ch3.pdf

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U. S. Fish and Wildlife Service. 2001. Biological integrity, diversity, and environmental health. 601 FW 3. National Wildlife Refuge System, Department of Interior. Available URL: <http://policy.fws.gov/601fw3.html>

Compatibility Determination

Use: Fishing

Refuge Name: Swan Lake National Wildlife Refuge (NWR)

Establishing and Acquisition Authorities: Executive Order 7563 established Swan Lake National Wildlife Refuge on February 27, 1937.

Refuge Purposes:

- "... as a refuge and breeding ground for migratory birds and other wildlife: ..." Executive Order 7563, dated Feb. 27, 1937
- "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)
- "... particular value in carrying out the national migratory bird management program." 16 U.S.C. § 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife)

National Wildlife Refuge System Mission: The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

Is the use a priority public use?

Fishing is a priority public use of the National Wildlife Refuge System.

Where would the use be conducted?

All Refuge waters are open to fishing consistent with State and Refuge regulations. Most fishing occurs on Silver Lake, but some fishing also occurs on Refuge streams.

When would the use be conducted?

Refuge regulations (2008) permit fishing during daylight hours from early March through late October. The area known as Taylor Point is open to fishing year-round during daylight hours. The area can be accessed by a Refuge gravel road that comes off State Highway E. Bank fishing is all that is allowed along the shore of Silver Lake that is adjacent to the

Refuge Road and 200 yards up or down Elk Creek from the parking area at the end of the Refuge Road.

How would the use be conducted?

Three fishing piers and a boat launch provide fishing access to Silver Lake. Refuge regulations call for no wake on Silver Lake and non-motorized boats on all other Refuge waters. Bank fishing is permitted along all Refuge waters. The Refuge recorded 1,000 fishing visits in 2007.

Why is this use being proposed?

Fishing is a priority general public use of the Refuge System. The Service recognizes fishing as a traditional outdoor pastime, deeply rooted in the American heritage (USFWS 2006b). Fishing programs promote understanding and appreciation of natural resources and their management on all lands and waters in the Refuge System. Public fishing opportunities are also available nearby on the 7,100-acre Fountain Grove Conservation Area administered by the Missouri Department of Conservation and at the 3,500-acre Pershing State Park administered by the Missouri Department of Natural Resources.

Availability of Resources

What resources are needed to properly (considering quality and compatibility) and safely administer use?

The present Refuge fishing program is designed to be administered with minimal Refuge resources. Refuge regulations mirror State regulations in large part, which allows Missouri Department of Conservation Officers to assist in law enforcement. There is a small amount of maintenance, mowing, and other upkeep at boat launching facilities that is funded as part of regular Refuge management activities. Approximately \$300 annually is required for labor and materials to update and print maps, and maintain signs.

Are existing Refuge resources adequate to properly and safely administer the use?

At the present level of fishing use there are adequate Refuge resources to implement the fishing program. Law enforcement is the primary tool necessary to ensure proper and safe administration of this use, and although there is no Law Enforcement Officer stationed at the Refuge, law enforcement

services are available through the Regional Law Enforcement Program. State Conservation Officers also patrol the Refuge and provide additional law enforcement support.

Anticipated Impacts of the Use:

How does fishing affect Refuge purposes and the NWR mission?

The fishing program on the Refuge helps fulfill the NWR mission and does not detract from the ability to fulfill Refuge purposes. The Refuge was established to provide habitat for migratory birds and other wildlife. Fishing conducted in accordance with State and Refuge regulations does not adversely affect the ability of the Refuge to fulfill this purpose. Fishing is a priority public use of the Refuge System and allowing fishing on the Refuge helps fulfill the Refuge System mission.

How does fishing affect fish, wildlife, plants, and their habitats; and the biological integrity, diversity, and environmental health of the Refuge/NWR?

Fish and Fish Habitat

Fishing is not expected to adversely affect fish populations and fish habitat within the Refuge. Conserving a diversity of fish and their habitat is included in one of the goals of the NWR (USFWS 2006a). But the focus is on maintaining populations not individuals (USFWS 1992). Fishing does cause mortality and wounding of individuals within a fish population, but fishing is regulated so it does not threaten the perpetuation of fish populations. The effects of fishing on fish populations are monitored by the Missouri Department of Conservation and are considered in setting annual limits.

Wildlife and Wildlife Habitat

In *Managing Visitor Use and Disturbance of Waterbirds: A Literature Review of Impacts and Mitigations* DeLong (2002) includes a summary of effects on wildlife from disturbance from fishing and other forms of recreation. The author documents that disturbance can alter behavior (e.g. foraging time), population structure, and distribution patterns of wildlife. It is probable that fishing would cause some or all of these effects to some degree on Refuge wildlife. A number of Refuge regulations mitigate these effects. Much of the Refuge is not affected because fishing is limited to lakes and streams. Fishing activity is estimated at 1,000 visits annually on the Refuge and is expected to increase over time.

The cumulative disturbance caused by fishing activity and all other public uses occurring on the Refuge is not expected to adversely affect fish and

wildlife populations or their habitats. A number of factors including suitable site conditions, presence of facilities, access limitations, and seasonal restrictions or other regulations tend to concentrate uses. At any one time, much of the Refuge is unaffected by these uses and is free of disturbance.

Biological Integrity, Diversity, and Environmental Health

Fishing conducted in accordance with State and Refuge regulations is not expected to adversely affect fish and wildlife populations or the biological integrity, diversity, and environmental health of the Refuge as it is defined in Service policy (USFWS 2001).

Other Uses and Public Safety

Fishing is not expected to adversely affect other Refuge uses or public safety.

As public use levels on Swan Lake NWR expand over time, unanticipated conflicts between user groups may occur. The Refuge's Visitor Services programs would be adjusted as needed to eliminate or minimize each problem and provide quality wildlife-dependent recreational opportunities that include promoting public safety. 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 fishing on other wildlife-dependent recreation or public safety at Swan Lake NWR is expected to be minor.

Public Review and Comment:

This compatibility determination was part of the Swan Lake NWR Draft Comprehensive Conservation Plan and Environmental Assessment. Public notification and review included a notice of availability published in the Federal Register, a 30-day comment period, local media announcements, and a public meeting near the Refuge. Comments received and agency responses are included in the final version of the Swan Lake NWR Comprehensive Conservation Plan.

Determination (check one below):

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Fishing must be conducted in accordance with State and Federal regulations and special Refuge regulations.

2. Fishing may be more restrictive than State seasons and regulations to ensure compliance with visitor safety and to reduce wildlife disturbance.
3. Use of air boats is prohibited.
4. Fishing is prohibited within identified areas.

Justification: In view of the above and with the stipulations previously described, fishing will not materially interfere with or detract from the NWRS mission or purposes of the Refuge. Fishing is a priority public use of the Refuge System and providing a fishing program contributes to achieving one of the Refuge goals. Fishing seasons and limits are established by the Missouri Department of Conservation and adopted by the Refuge. These restrictions help ensure the continued well-being of fish populations. Fishing is not expected to adversely affect the biological integrity, diversity, and environmental health of the Refuge or the Refuge System.

Signed:

Refuge Manager: s/Steve Whitson, Feb. 3, 2011

Concurrence:

Regional Chief: s/Rick Schultz, Feb. 15, 2011

Mandatory 10- or 15-year Re-Evaluation Date: 2026

References:

- DeLong, A. K. 2002. Managing visitor use and disturbance of waterbirds — a literature review of impacts and mitigation measures — prepared for Stillwater National Wildlife Refuge. Appendix L (114 pp.) *in* Stillwater National Wildlife Refuge Complex final environmental impact statement for the comprehensive conservation plan and boundary revision (Vol. II). Dept. of the Interior, U.S. Fish and Wildlife Service, Region 1, Portland, OR. Available URL: <http://www.fws.gov/stillwater/lit-review.pdf>
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COMPATIBILITY DETERMINATION

Use: Haying

Refuge Name: Swan Lake National Wildlife Refuge (NWR)

Establishing and Acquisition Authorities: Executive Order 7563 established Swan Lake National Wildlife Refuge on February 27, 1937.

Refuge Purposes:

- "... as a refuge and breeding ground for migratory birds and other wildlife: ..." Executive Order 7563, dated Feb. 27, 1937
- "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)
- "... particular value in carrying out the national migratory bird management program." 16 U.S.C. § 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife)

National Wildlife Refuge System Mission: The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

Is the use a priority public use?

No. Haying is not a priority public use of the National Wildlife Refuge System.

Where would the use be conducted?

Presently, haying occurs on up to 100 acres or about 1 percent of presently owned (11,473 acres as of 2008) Refuge lands annually.

When would the use be conducted?

Haying begins in July and takes approximately 7-10 days to complete.

How would the use be conducted?

The Refuge will allow haying by private individuals for the purpose of habitat management. Haying is the cutting and processing (typically baling) of grass and forbs, with subsequent removal to an off-Refuge location. Haying will be conducted by third

parties on grassy openings owned by or managed as part of the Refuge by jurisdictional agreement. Administration of haying programs will be conducted in accordance with a Habitat Management Plan. Haying activities will be subject to the terms and conditions of a Cooperative Farming Agreement or Special Use Permit issued by the Refuge Manager. The terms of the Agreement or Permit ensure compatibility through implementation of Service policy and Refuge specific stipulations.

The haying process typically requires 3-4 visits to each site with heavy equipment over a period of 7-10 days. Haying begins in July when standing grasses and forbs are cut and gathered into windrows using a tractor, mower, and rake; or a swather—a self-propelled mowing machine. The hay cures for 3-7 days to reduce moisture content, and is usually turned once with a tractor-drawn rake to speed and even drying. Once cured a tractor-drawn baler is used to package the windrows into bales of hay. A tractor-drawn wagon is used to collect the bales and remove them from the site.

Why is this use being proposed?

At Swan Lake NWR haying is used as a low-cost means to prevent encroachment of woody vegetation within grasslands and to provide stubble as a fall and winter food source for migrating waterfowl. Historically, grazing by native wildlife along with periodic fires were the primary disturbance agents that helped retard growth of woody vegetation and maintain plant vigor and diversity within grasslands. Although prescribed fire is in many cases the preferred method of disturbance, its use is not always practical or possible, and it does not produce the same response as disturbance from grazing. Today, native grazers are largely absent from grassland habitats. Haying is used to partially mimic the disturbance once created by grazing.

Availability of Resources:

What resources are needed to properly (considering quality and compatibility) and safely administer use?

A Refuge staff person is required to administer a special use permit and ensure that the haying is done to specifications identified within the permit with regard to safety and timing of haying operations.

Are existing Refuge resources adequate to properly and safely administer the use?

The needed staff time for development and administration of a cooperative haying program is available. Most of the needed work to prepare for this use would be done as part of routine management duties. The decision to use cooperative haying as a management tool will occur as part of strategies developed under specific unit or program habitat management planning. The additional time needed to administer and monitor the needed Special Use Permit or Agreements is relatively minor and within existing Refuge resources.

Anticipated Impacts of the Use:

Haying can temporarily remove cover for birds but the long-term benefits of preserving habitats in a grassland state outweigh any short-term impacts. By haying after July 15 any negative impacts to nesting birds are significantly reduced.

How does haying affect Refuge purposes, the NWRs mission, as well as fish, wildlife, plants, and their habitats; and the biological integrity, diversity, and environmental health of the Refuge/ NWRs?

Refuge Purposes and NWRs mission

Since its establishment, the Refuge has fulfilled its purposes by providing for the needs of migratory birds and other wildlife, with an emphasis on waterfowl. Haying is one tool used to accomplish this. It does this in two ways: 1) by preventing the encroachment of woody vegetation in grassland habitats attractive to migrating and wintering waterfowl, and by 2) providing green stubble used as a food source by waterfowl and other wildlife during spring and fall migration.

Fish, Wildlife, Plants, and their Habitats

On sites where haying occurs there would be periodic short-term disturbance and displacement typical of any noisy heavy equipment operation. These sites may be used by wildlife for feeding and resting at times equipment is not operating. The sites may also be used by nesting birds because in most years haying would be prohibited until July 15, a time when most birds have fledged young. Despite this it is likely that some nests and pre-fledglings would be destroyed during haying. National Wildlife Refuges are managed first and foremost for wildlife (USFWS 2001). But the focus is on wildlife populations not individuals (USFWS 1992). Haying is likely to cause mortality of some individual animals, but is not expected to affect the perpetuation of wildlife populations.

Biological Integrity, Diversity, and Environmental Health

Service policy calls for maintaining or restoring refuge habitats to historic conditions if doing so does not conflict with refuge purposes (U. S. Fish and Wildlife Service 2001). The Refuge is located in a transitional area between forest and prairie. Historically, the area was likely a shifting mosaic of prairie and forest driven by disturbance agents like fire and wind. Most native habitats in areas surrounding the Refuge have been converted to agriculture and do not contribute to this large mosaic that existed as part of historic conditions. In lieu of these large scale processes, the Refuge retains some areas in a permanently non-forested condition to maintain this habitat on the landscape. Restoring historic habitats contributes to biological integrity, diversity, and environmental health of the Refuge. Haying is one tool used to maintain these open habitats.

Public Review and Comment:

This compatibility determination was part of the Swan Lake Draft Comprehensive Conservation Plan and Environmental Assessment. Public notification and review included a notice of availability published in the Federal Register, a 30-day comment period, local media announcements, and a public meeting near the Refuge. Comments received and agency responses are included in the final version of the Swan Lake Comprehensive Conservation Plan.

Determination:

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Begin haying after July 15 to minimize disturbance to nesting migratory birds. In some years it may be necessary for haying to occur before July 15 to prevent seed dispersal of undesirable plant species.
2. Bales must be removed from the Refuge within 7 days of baling.
3. Windrowed grass left lying to dry should remain on the ground no more than 7 days prior to baling.
4. Haying must meet specific habitat and related wildlife objectives and contribute to the purposes of the Refuge.

5. Prohibit haying within known or potential habitat for the eastern massasauga rattlesnake.

Justification: Maintaining open habitats through cooperative farming contributes to the achievement of Refuge purposes and the National Wildlife Refuge System mission because it partially restores historic habitat conditions and provides habitat for migratory waterfowl and other wildlife. Haying is one low-cost method used to disturb these sites and temporarily diminish the amount of woody vegetation.

Signed:

Refuge Manager: s/Steve Whitson, Feb. 3, 2011

Concurrence:

Regional Chief: s/Rick Schultz, Feb. 15, 2011

Mandatory 10- or 15-year Re-evaluation Date: 2021

References:

- U. S. Fish and Wildlife Service. 1992. Population Management at Field Stations: General. 701 FW 1. Department of Interior. Available URL: <http://www.fws.gov/policy/701fw1.html>
- U. S. Fish and Wildlife Service. 2001. Biological integrity, diversity, and environmental health. 601 FW 3. National Wildlife Refuge System, Department of Interior. Available URL: <http://policy.fws.gov/601fw3.html>

Compatibility Determination

Use: Hunting

Refuge Name: Swan Lake National Wildlife Refuge (NWR)

Establishing and Acquisition Authorities: Executive Order 7563 established Swan Lake National Wildlife Refuge on February 27, 1937.

Refuge Purposes:

- "... as a refuge and breeding ground for migratory birds and other wildlife: ..." Executive Order 7563, dated Feb. 27, 1937
- "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)
- "... particular value in carrying out the national migratory bird management program." 16 U.S.C. § 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife)

National Wildlife Refuge System Mission: The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

Is the use a priority public use?

Hunting is a priority public use of the National Wildlife Refuge System.

Where would the use be conducted?

Goose hunting is permitted at 11 designated blinds and 10 field sites. The preferred alternative in the Environmental Assessment of the Draft Comprehensive Conservation Plan calls for allowing duck hunting and small game hunting, which will be designated in a step down hunting plan. All waterfowl hunting will be restricted to within 300 yards of the perimeter of the Refuge, leaving the vast majority of the interior of the Refuge as a waterfowl sanctuary. Waterfowl hunting will be restricted to 3-5 days a week with rest days being designated on an annual basis by the Refuge Manager. During the Conservation Order season for Snow Geese, designated areas will be open to hunting 7 days a week. If

implemented, duck hunting would likely occur on some or all of the sites where goose hunting is permitted. In past years, two muzzle-loader hunts for white-tailed deer were conducted on separate weekends on the eastern and western halves of the Refuge, respectively. White-tailed deer muzzle-loader hunting also occurs at one blind constructed to accommodate physically disabled hunters. In cooperation with the Missouri Department of Conservation (MDC), beginning in 2008 there will be a disabled deer hunt on one weekend, a youth conventional firearm deer hunt on one weekend and a public muzzle-loader hunt on another weekend. Bag limits will be coordinated with the MDC on an annual basis. The Refuge will also allow small game hunting as identified in a Refuge Hunting Plan in areas that do not impact other Refuge uses or cause undue disturbance to wildlife.

When would the use be conducted?

Goose hunting typically starts on the Refuge on November 1 and ends on January 31. As part of a Conservation Order issued to reduce Snow Goose numbers, there is also an additional season with no bag limit for light geese (Snow Geese and Ross's Geese) that starts on February 1 and ends when the Refuge opens to the public on March 1. The preferred alternative in the Environmental Assessment of the Draft Comprehensive Conservation Plan calls for allowing duck hunting. The specific dates and duration of duck hunting season vary annually, but typically occurs between late October and late December.

Two of the white-tailed deer hunts are considered managed hunts and are listed as such in the Missouri Department of Conservation (MDC) hunting season regulations and usually occur on successive weekends in December or January. One of the managed hunts is a youth deer hunt and the second a public deer hunt. The Refuge also offers a hunt for the physically disabled that is not part of the MDC managed deer hunt program. Beginning in 2008 it is scheduled to occur on a weekend prior to the first managed hunt.

How would the use be conducted?

Hunters use harvest methods and firearms consistent with the Wildlife Code of Missouri and Refuge regulations. Waterfowl hunters are required to check in at hunting headquarters located on the northern border of the Refuge. A daily drawing is used to assign no more than four waterfowl hunters

to each available blind or hunting site and an associated parking site. Dogs are allowed for retrieving waterfowl. The number of participants in the two muzzleloader deer hunts is regulated by MDC through their managed hunt program, but is typically around 50 for each of the two hunts. Deer hunters enter the Refuge at times specified in MDC regulations for hunting hours and park on public access roads. The hunt occurs from one-half hour before official sunrise and one-half hour after official sunset each day and hunters must abide by all MDC hunting regulations and Refuge-specific regulations. Hunters must check in all harvested deer at the hunting headquarters building. Hunters are required to attend a pre-hunt meeting on Friday afternoon before the hunt and are allowed to scout the hunt areas after the meeting on Friday afternoon up until official sunset. Arrangements for physically disabled deer hunters are coordinated by Refuge staff. Typically from 5-10 hunters participate during this two-day hunt, and are provided drive-in access to an accessible blind with parking.

The Comprehensive Conservation Plan calls for the addition of squirrel hunting. It would be allowed, with the completion of a hunting plan, in a designated portion along Yellow Creek and would be open August 1- October 15. Squirrel hunting would be conducted in accordance with MDC squirrel hunting regulations and bag limits as well as any additional Refuge specific regulations.

Why is This Use Being Proposed?

Hunting is a priority general public use of the Refuge System that is also an important wildlife management tool. The Service recognizes hunting as a healthy, traditional outdoor pastime, deeply rooted in the American heritage (USFWS 2006). Hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs. Hunting programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System. Public hunting opportunities are also available nearby on the 7,100-acre Fountain Grove Conservation Area administered by the Missouri Department of Conservation.

Availability of Resources:

What resources are needed to properly (considering quality and compatibility) and safely administer use?

Refuge staff will be required to conduct pre-hunt meetings and either staff, volunteers, or contractors will be required to staff the hunter check station. Refuge regulations mirror State regulations in large part, which allows Missouri Department of Conservation Officers to assist in law enforcement. There is

a small amount of road maintenance, mowing, and other upkeep performed that is funded as part of regular Refuge management activities. Approximately \$1,000 annually is required for labor and materials to update and print maps, and maintain signs.

Are existing Refuge resources adequate to properly and safely administer the use?

At the present level of hunting use there are adequate Refuge resources to implement the hunting program. Law enforcement is the primary tool necessary to ensure proper and safe administration of this use, and although there is no Law Enforcement Officer stationed at the Refuge, law enforcement services are available through the Regional Law Enforcement Program. Missouri Department of Conservation Officers provide additional law enforcement support.

Anticipated Impacts of the Use:

The Environmental Assessment for the Draft CCP for Swan Lake NWR contains a thorough discussion of the anticipated impacts of hunting. Parts of this analysis are summarized below.

How does hunting affect Refuge purposes and the NWRS mission?

The Refuge was established to provide for the needs of migratory birds and other wildlife. Hunting does not adversely affect the ability of the Refuge to fulfill this purpose. National Wildlife Refuges are managed first and foremost for wildlife (USFWS 2001). But the focus is on wildlife populations not individuals (USFWS 1992). Hunting causes mortality and wounding of individual animals, but is regulated so it does not threaten the perpetuation of wildlife populations. The effects of hunting on wildlife populations are monitored within the State and across the nation and are considered in setting annual hunting bag limits. Hunting is a priority public use of the Refuge System and allowing hunting on the Refuge helps fulfill the Refuge System mission.

How does hunting affect fish, wildlife, plants, and their habitats; and the biological integrity, diversity, and environmental health of the Refuge/NWRS?

Migratory Birds

Hunting is not expected to adversely affect migratory game bird populations that occur on the Refuge. The U.S. Fish and Wildlife Service works closely with state and provincial governments, as well as with the public, in a joint effort to establish annual hunting regulations for migratory birds. The Service's Division of Migratory Birds establishes

framework regulations to manage all migratory bird hunting in the United States. These regulations establish limitations by which states can then create season lengths, bag limits and areas of migratory bird hunting.

Regulations on migratory bird hunting are determined through the assessment of annual data (USFWS 1995). Data is obtained through aerial surveys of the North American Flyway, which count birds, ponds and nests, and provide information for analyzing population and habitat conditions. Hunter surveys and questionnaires determine the number of hunters participating yearly. Recommendations from the Flyway Council are considered when original rules are created. Rules are presented to the public through the Federal Register and followed by a series of public meetings for any recommendations. The final regulations are assessed based on a collective analysis of all factual information as well as council and public recommendations.

White-tailed Deer

The Missouri Department of Conservation annually reviews hunting seasons and bag limits and modifies them to avoid any long-term population declines. Hunting is not expected to adversely impact deer populations.

Disturbance

In *Managing Visitor Use and Disturbance of Waterbirds: A Literature Review of Impacts and Mitigations* DeLong (2002) includes a summary of effects on wildlife from disturbance from hunting and other forms of recreation. The author documents that disturbance can alter behavior (e.g. foraging time), population structure, and distribution patterns of wildlife. It is probable that hunting would cause some or all of these effects to some degree on Refuge wildlife. A number of measures mitigate these effects. Hunting seasons largely occur outside the times when most wildlife species are raising offspring and are most sensitive to disturbance. Also, waterfowl hunting is limited to designated sites, leaving much of the Refuge free of hunting disturbance. The number of deer hunters permitted daily is presently limited to 50, and hunting occurs on four days throughout the entire year and is limited to half the Refuge on any of the four days. Hunting activity is estimated at about 500 visits annually on the Refuge and is expected to increase over time especially if waterfowl and small game hunting are offered.

Habitat

Hunting is not expected to adversely affect Refuge habitat.

Biological Integrity, Diversity, and Environmental Health

Hunting conducted in accordance with State and Federal regulations is not expected to adversely affect wildlife populations that occur on the Refuge and likely assists in maintaining the biological integrity, diversity, and environmental health of the Refuge. Some species, such as white-tailed deer, today occur at levels well above those thought to occur under historic conditions. Left unchecked high numbers of such species could adversely affect biological integrity, diversity, and environmental health. Hunting is a closely monitored tool that helps regulate wildlife populations.

Other Uses and Public Safety

Hunting is not expected to adversely affect other Refuge uses or public safety. Dogs are permitted for hunting for retrieving. At present levels of use, dogs used for this purpose are not expected to adversely impact non-target species or conflict with other uses. As public use levels on the Refuge expand across time, unanticipated conflicts between user groups may occur. The Refuge's Visitor Services programs would be adjusted as needed to eliminate or minimize each problem and provide quality wildlife-dependent recreational opportunities that include promoting public safety. 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 or public safety at Swan Lake NWR is expected to be minor.

Public Review and Comment

This compatibility determination was part of the Swan Lake NWR Draft Comprehensive Conservation Plan and Environmental Assessment. Public notification and review included a notice of availability published in the Federal Register, a 30-day comment period, local media announcements, and a public meeting near the Refuge. Comments received and agency responses are included in the final version of the Swan Lake NWR Comprehensive Conservation Plan.

Determination (check one below):

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility

1. Hunting must be conducted in accordance with State and Federal regulations and special Refuge regulations.
2. Hunting may be more restrictive than State seasons and regulations to ensure compliance with visitor safety and to reduce wildlife disturbance.
3. Vehicles must remain on designated roadways or parking areas.
4. Hunting is allowed only in designated areas.

Justification: In view of the above and with the stipulations previously described, hunting will not materially interfere with or detract from the NWRS mission or purposes of the Refuge. Hunting is a priority public use of the Refuge System and providing a hunting program contributes to achieving one of the Refuge goals. Hunting seasons and bag limits are established by the Missouri Department of Conservation and adopted by the Refuge. These restrictions help ensure the continued well-being of game populations. Disturbance of wildlife will occur, but limitations on hunting mean much of the Refuge would be free of disturbance. Hunting is not expected to adversely affect the biological integrity, diversity, and environmental health of the Refuge or the Refuge System.

Signed:

Refuge Manager: s/Steve Whitson, Feb. 3, 2011

Concurrence:

Regional Chief: s/Rick Schultz, Feb. 15, 2011

Mandatory 10- or 15-year Re-Evaluation Date: 2026

References:

- DeLong, A. K. 2002. Managing visitor use and disturbance of waterbirds — a literature review of impacts and mitigation measures — prepared for Stillwater National Wildlife Refuge. Appendix L (114 pp.) *in* Stillwater National Wildlife Refuge Complex final environmental impact statement for the comprehensive conservation plan and boundary revision (Vol. II). Dept. of the Interior, U.S. Fish and Wildlife Service, Region 1, Portland, OR. Available URL: <http://www.fws.gov/stillwater/lit-review.pdf>
- U. S. Fish and Wildlife Service. 1995. Migratory Game Bird Hunting: Regulations Development Process. 723 FW 3. Department of Interior. Available URL: <http://www.fws.gov/policy/723fw3.html>
- U. S. Fish and Wildlife Service. 1992. Population Management at Field Stations: General. 701 FW 1. Department of Interior. Available URL: <http://www.fws.gov/policy/701fw1.html>
- U. S. Fish and Wildlife Service. 2001. Biological integrity, diversity, and environmental health. 601 FW 3. National Wildlife Refuge System, Department of Interior. Available URL: <http://policy.fws.gov/601fw3.html>
- U. S. Fish and Wildlife Service. 2006. Wildlife-Dependent Recreation: Hunting. 605 FW 2. National Wildlife Refuge System, Department of Interior. Available URL: <http://www.fws.gov/policy/605fw2.html>

Compatibility Determination

Use: Research projects by third parties

Refuge Name: Swan Lake National Wildlife Refuge (NWR)

Establishing and Acquisition Authorities: Executive Order 7563 established Swan Lake National Wildlife Refuge on February 27, 1937.

Refuge Purposes:

- "... as a refuge and breeding ground for migratory birds and other wildlife: ..." Executive Order 7563, dated Feb. 27, 1937
- "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)
- "... particular value in carrying out the national migratory bird management program." 16 U.S.C. § 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife)

National Wildlife Refuge System Mission: The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

What is the use? Is the use a wildlife-dependent use?

The Refuge allows research investigations on a variety of biological, physical, archeological, and social components to address Refuge management information needs or other issues not related to Refuge management. Studies are or may be conducted by federal, state, and private entities, including the U.S. Geological Survey, state departments of natural resources, state and private universities, and independent researchers and contractors. This is not a wildlife-dependent use.

Where would the use be conducted?

Sites for this use would depend on the particular study being conducted and could occur in a variety of habitat types. Access would be restricted by Special Use Permit to only the study sites needed to meet the objectives of the research.

When would the use be conducted?

The timing of research activities would depend on the individual project. The entire Refuge is open for allowed research activities throughout the year in conjunction with the issuance of a Special Use Permit. The timing and number of visits by researchers may be restricted by Special Use Permit.

How would the use be conducted?

Any research study sites, sampling locations, and transects can be temporarily marked by highly visible wooden or metal posts and must be removed when research ceases. Access to study sites is by foot, truck, all-terrain vehicle, boat, airboat, canoe, and other watercraft. Vehicle use is allowed on Refuge roads, trails, and parking lots normally open to the public.

Why is this use being proposed?

Most research by third parties is done to address Refuge management information needs or to contribute to a larger knowledge base about resources of concern to the Refuge and/or the U.S. Fish and Wildlife Service.

Availability of Resources:

Facilities and staff are currently available to provide access, maintain roads, parking lots, secondary access roads, as well as to issue Special Use Permits for research projects. Staff resources are deemed adequate to manage this use at anticipated use levels. Access points, boats, vehicles, miscellaneous equipment, and limited logistical support are available on the Refuge. Housing is available for researchers who are signed up as Refuge volunteers.

Anticipated Impacts of the Use:

Short-term Impacts:

Research activities may disturb fish and wildlife and their habitats. For example, the presence of researchers can cause waterfowl to flush from resting and feeding areas, cause disruption of birds and turtles on nests or breeding territories, or increase predation on nests and individual animals as predators follow human scent or trails. Efforts to capture animals can cause disturbance, injury, or death to groups of wildlife or to individuals. To wildlife, the energy cost of disturbance may be appreciable in terms of disruption of feeding, displacement from preferred habitat, and the added energy expended to avoid disturbance.

Sampling activities can cause compaction of soils and the trampling of vegetation, the establishment of temporary foot trails and boat trails through vegetation beds, disruption of bottom sediments, and minor tree damage when temporary observation platforms are built or when tree climbers access bird nests.

The removal of vegetation or sediments by core sampling methods can cause increased localized turbidity and disrupt non-target plants and animals. Installation of posts, equipment platforms, collection devices and other research equipment in open water may present a hazard if said items are not adequately marked and/or removed at appropriate times or upon completion of the project.

Long-term Impacts:

Long-term effects should generally be beneficial by gaining information valuable to Refuge management. No long-term negative impacts are expected and the Refuge Manager can control the potential for long-term impacts through Special Use Permits.

Cumulative Impacts:

Cumulative impacts would occur if multiple research projects were occurring on the same resources at the same time or the duration of the research was excessive. No cumulative impacts are expected and the Refuge Manager can control the potential for cumulative impacts through Special Use Permits. Managers retain the option to prohibit research on the Refuge that does not contribute to the purposes of the Refuge or the mission of the Refuge System, or causes undo resource disturbance or harm.

Public Review and Comment:

This compatibility determination was part of the Swan Lake NWR Draft Comprehensive Conservation Plan and Environmental Assessment. Public notification and review included a notice of availability published in the Federal Register, a 30-day comment period, local media announcements, and a public meeting near the Refuge. Comments received and agency responses are included in the final version of the Swan Lake NWR Comprehensive Conservation Plan.

Determination:

- Use is Not Compatible
 Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Prior to conducting investigations, researchers will obtain Special Use Permits from the Refuge that make specific stipulations related

to when, where, and how the research will be conducted. Managers retain the option to prohibit research on the Refuge that does not contribute to the purposes of the Refuge or the mission of the Refuge System, or causes undo resource disturbance or harm.

2. Researchers must possess all applicable state and federal permits for the capture and possession of protected species, for conducting regulated activities in wetlands, and for other regulated activities. Researchers must demonstrate that they have approval from the Animal Care and Use Committee if required by the research institution.
3. Archeological researchers must obtain an Archeological Resource Protection Act permit from the Regional Director prior to obtaining a special use permit from the Refuge Manager.
4. Researchers will submit annual status reports and a final report concerning Refuge research to the Refuge Manager.
5. Researchers will submit an electronic copy of all raw data collected to the Refuge Manager with the understanding that the researcher will have the opportunity to produce publications based on the data.

Justification:

Research by third parties may play an integral role in Refuge management by providing information needed to manage the Refuge on a sound scientific basis. Investigations into the biological, physical, archeological, and social components of the Refuge provide a means to analyze management actions, impacts from internal and outside forces, and ongoing natural processes on the Refuge environment.

Adverse impacts of research that cause localized vegetation trampling or disruption of wetland bottom sediments are often short-term and would be minimized through stipulations above. Any research equipment that remains in the field for the duration of the project would be clearly marked to avoid potential hazards presented to other Refuge users and/or Refuge staff.

Signed:

Refuge Manager: s/Steve Whitson, Feb. 3, 2011

Concurrence:

Regional Chief: s/Rick Schultz, Feb. 15, 2011

Mandatory 10-Year Re-evaluation Date: 2021

Compatibility Determination

Use: Trapping of nuisance wildlife

Refuge Name: Swan Lake National Wildlife Refuge (NWR)

Establishing and Acquisition Authorities: Executive Order 7563 established Swan Lake National Wildlife Refuge on February 27, 1937.

Refuge Purposes:

- "... as a refuge and breeding ground for migratory birds and other wildlife: ..." Executive Order 7563, dated Feb. 27, 1937
- "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)
- "... particular value in carrying out the national migratory bird management program." 16 U.S.C. § 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife)

National Wildlife Refuge System Mission:

The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

Is the use a wildlife-dependent public use?

No. Trapping is not a priority wildlife-dependent public use of the National Wildlife Refuge System as defined by the Refuge Improvement Act of 1997.

Where would the use be conducted?

Trapping would occur in and around locations where wildlife (such as beaver or muskrats) are hampering efforts to achieve Refuge land and water management objectives. Typically, along roads, levees, and water control structures. Trapping may occur around Refuge buildings where wildlife become a nuisance.

When would the use be conducted?

Trapping would be used, at the Refuge Manager's discretion, whenever necessary to eliminate nuisance wildlife that is hampering efforts to achieve Refuge land and water management objectives.

Trapping could occur whenever a problem arises. Live trapping and relocation is the first preference when dealing with nuisance animals. If lethal trapping is necessary it would occur during Missouri furbearer season if possible, but may occur at other times if necessary to meet Refuge management objectives.

How would the use be conducted?

The use would occur whenever necessary and at the discretion of the Refuge Manager through issuance of a Special Use Permit to a qualified trapper. Trapping would be used only in specific locations to remove or eliminate wildlife hampering Refuge management objectives. Live trapping and relocation is the first preference when dealing with nuisance animals. This work would be done by Service employees or through contract with qualified individuals. Animals would be relocated to other outlying fee title properties or to other sites with willing landowners and suitable habitat. If live trapping efforts are not successful in removing the nuisance animal, lethal methods will be employed. In most circumstances this would occur during Missouri furbearer season, and would be done by qualified trappers. If lethal trapping is necessary outside of furbearer season the work would be done through a paid contract. The use of snares on the Refuge is prohibited. The approved trapping methods are qualified under State regulation as to trap size and types of allowable sets in order to protect non-target species, and provide for the safe use of the area by others.

Why is this use being proposed?

Some furbearers cause damage to dikes and water control structures through burrowing and, in the case of beavers, through dam building or associated flooding. Trapping is used as a management tool to remove or eliminate wildlife hampering Refuge management activities.

Availability of Resources:

Sufficient staff exists to issue the required permits, and oversee this periodic use. Facilities and staff are currently available to provide access, maintain roads, parking lots, and secondary access roads.

Anticipated Impacts of the Use:

How does trapping affect Refuge purposes and the NWRS mission?

The Refuge was established to provide for the needs of migratory birds and other wildlife. Trapping does not adversely affect the ability of the Refuge to fulfill this purpose, and is employed as a tool to help accomplish Refuge management objectives. National Wildlife Refuges are managed first and foremost for wildlife (USFWS 2001). But the focus is on wildlife populations not individuals (USFWS 1992). Trapping causes mortality of individual animals, but at Swan Lake NWR its use is limited to instances where wildlife are hampering Refuge management objectives, and it does not threaten the perpetuation of wildlife populations.

How does trapping affect fish, wildlife, plants, and their habitats; and the biological integrity, diversity, and environmental health of the Refuge/NWRS?

Wildlife, plants, and habitat

Trapping would be done in support of Refuge management objectives and is expected to improve or help maintain habitats of many wildlife species. Any lethal trapping would cause mortality of targeted species and in some cases is likely to cause mortality of non-targeted species. In either case, mortality of individuals is not expected to adversely affect wildlife populations on the Refuge. Trapping is expected to benefit Refuge habitats in those areas where wildlife (such as beaver) are hampering Refuge management objectives.

Disturbance

In *Managing Visitor Use and Disturbance of Waterbirds: A Literature Review of Impacts and Mitigations* DeLong (2002) includes a summary of effects on wildlife from disturbance from various forms of recreation. The author documents that disturbance can alter behavior (e.g. foraging time), population structure, and distribution patterns of wildlife. It is probable that trapping along with all other public uses of the Refuge would cause some or all of these effects to some degree on Refuge wildlife. A number of measures mitigate these effects. The use occurs at the discretion of the Refuge Manager and is limited to specific locations and times when problems occur.

Biological Integrity, Diversity, and Environmental Health

Periodic trapping to remove or eliminate nuisance wildlife is not expected to adversely affect wildlife populations that occur on the Refuge and

likely assists in maintaining the biological integrity, diversity, and environmental health of the Refuge.

Other Uses and Public Safety

Trapping is not expected to adversely affect other Refuge uses or public safety.

Cumulative Impacts:

There are no anticipated cumulative impacts.

Public Review and Comment:

This compatibility determination was part of the Swan Lake NWR Draft Comprehensive Conservation Plan and Environmental Assessment. Public notification and review included a notice of availability published in the Federal Register, a 30-day comment period, local media announcements, and a public meeting near the Refuge. Comments received and agency responses are included in the final version of the Swan Lake NWR Comprehensive Conservation Plan.

Determination:

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Trapping will be conducted in accordance with an approved Trapping Plan.
2. Trapping will be conducted under permit by experienced trappers.

Justification:

In view of the above and with the stipulations previously described, trapping will not materially interfere with or detract from the NWRS mission or purposes of the Refuge. Trapping is a tool used to control nuisance wildlife and help fulfill Refuge management objectives. Its use is regulated and at the discretion of the Refuge Manager. It is not expected to adversely affect wildlife populations or their habitats, or conflict with other Refuge uses.

Signed:

Refuge Manager: s/Steve Whitson, Feb. 3, 2011

Concurrence:

Regional Chief: s/Rick Schultz, Feb. 15, 2011

Mandatory 10-Year Re-Evaluation Date: 2021

References:

- DeLong, A. K. 2002. Managing visitor use and disturbance of waterbirds — a literature review of impacts and mitigation measures — prepared for Stillwater National Wildlife Refuge. Appendix L (114 pp.) *in* Stillwater National Wildlife Refuge Complex final environmental impact statement for the comprehensive conservation plan and boundary revision (Vol. II). Dept. of the Interior, U.S. Fish and Wildlife Service, Region 1, Portland, OR. Available URL: <http://www.fws.gov/stillwater/lit-review.pdf>
- U. S. Fish and Wildlife Service. 1992. Population Management at Field Stations: General. 701 FW 1. Department of Interior. Available URL: <http://www.fws.gov/policy/701fw1.html>
- U. S. Fish and Wildlife Service. 2001. Biological integrity, diversity, and environmental health. 601 FW 3. National Wildlife Refuge System, Department of Interior. Available URL: <http://policy.fws.gov/601fw3.html>

Compatibility Determination

Use: Tree harvest by third parties for personal use, habitat management, or maintenance purposes

Refuge Name: Swan Lake National Wildlife Refuge (NWR)

Establishing and Acquisition Authorities: Executive Order 7563 established Swan Lake National Wildlife Refuge on February 27, 1937.

Refuge Purposes:

- "... as a refuge and breeding ground for migratory birds and other wildlife: ..." Executive Order 7563, dated Feb. 27, 1937
- "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)
- "... particular value in carrying out the national migratory bird management program." 16 U.S.C. § 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife)

National Wildlife Refuge System Mission:

The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

Is the use a wildlife-dependent use?

No. Tree harvest for habitat management or maintenance purposes is not wildlife-dependent.

Where would the use be conducted?

The use would be conducted in forested areas and in areas where trees are invading otherwise open habitats such as grasslands and moist soil units. Today there are approximately 3,100 acres of bottomland forest on the Refuge.

When would the use be conducted?

Tree harvest could occur any time of year at the discretion of the Refuge Manager.

How would the use be conducted?

Tree harvesting may be done by individuals for personal use at the discretion of the Refuge Manager and under a Special Use Permit. Harvest may include standing and fallen trees for personal-use firewood. Removal of trees that are a hazard to property and human safety would be permitted in specific circumstances. Tree harvest would be considered and may be permitted within most forested areas of the Refuge as a method of habitat management. Tree harvesting within these areas may also be conducted by individuals through a Special Use Permit, or through commercial timber sales carried out by professional loggers. The areas open to tree harvest and management strategies would be specified in a Habitat Management Plan.

Why is this use being proposed?

The Refuge would allow cutting and removal of trees from the Refuge for the purpose of improving forest diversity and health through thinning, creating openings, or removal of invasive tree species. Personal use tree cutting would also be allowed as a means of maintaining public use trails or roads, i.e., remove blow down, hazard trees, road shoulder maintenance, or for trail modification. Tree removal is also sometimes necessary to restore grassland sites and maintain moist soil units that become invaded by trees.

Availability of Resources:

Periodic and small-scale personal use tree harvest operations can be adequately administered with existing staff resources. Any permit fees or timber sale receipts would not off-set costs since these funds are deposited in general accounts and not returned to the Refuge.

Anticipated Impacts of the Use:

How does tree harvesting for personal use affect Refuge purposes, the NWRs mission, as well as fish, wildlife, plants, and their habitats; and the biological integrity, diversity, and environmental health of the Refuge/NWRs?

Refuge Purposes and NWRs Mission

Since its establishment, the Refuge has fulfilled its purposes by providing for the needs of migratory birds and other wildlife, with an emphasis on waterfowl. Tree harvest would be done to meet Refuge habitat management objectives or to assist with

maintenance of Refuge roads, trails, or other facilities. This would help fulfill Refuge purposes and is consistent with the NWRs mission.

Fish, Wildlife, Plants, and their Habitats

National Wildlife Refuges are managed first and foremost for wildlife (USFWS 2001). But the focus is on wildlife populations not individuals (USFWS 1992). Harvesting trees would alter habitat and associated wildlife, but would be done in compliance with a Habitat Management Plan to meet Refuge objectives. On sites where tree harvesting occurs there would be periodic short-term disturbance and displacement typical of any noisy heavy equipment operation. These sites may be used by wildlife for feeding and resting at times equipment is not operating. Harvest occurring within forested stands would increase the amount of light available within the understory. This is expected to stimulate new growth and change the structure within these stands. This would in turn affect the types of wildlife attracted to these sites.

Biological Integrity, Diversity, and Environmental Health

Service policy calls for maintaining or restoring refuge habitats to historic conditions if doing so does not conflict with refuge purposes (U. S. Fish and Wildlife Service 2001). Removal of individual trees for personal use as described above is not expected to adversely affect the biological integrity, diversity or environmental health of the Refuge. Harvesting trees across a larger area would act as a disturbance agent to promote forest renewal. This would alter the composition, diversity, and abundance of plant and wildlife species in the areas it is practiced. Maintaining a mosaic of structure and age class diversity within forested areas of the Refuge is consistent with alternatives discussed in the draft Comprehensive Conservation Plan (CCP) and with what is known about historic conditions of the area. Harvesting trees does remove woody material and associated nutrients and habitats from the site, but this is mitigated by requiring that some material be left on site. The location, timing, frequency, and duration of any harvesting activity would be guided by a Habitat Management Plan in support of direction included in the CCP.

Public Review and Comment:

This compatibility determination was part of the Swan Lake NWR Draft Comprehensive Conservation Plan and Environmental Assessment. Public notification and review included a notice of availability published in the Federal Register, a 30-day comment period, local media announcements, and a public meeting near the Refuge. Comments

received and agency responses are included in the final version of the Swan Lake NWR Comprehensive Conservation Plan.

Determination:

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Any tree cutting must meet specific habitat and related wildlife/maintenance/safety objectives and contribute to the purposes of the Refuge.
2. Special use permits will be issued by the Refuge Manager and list special conditions that must be met to avoid or minimize adverse impacts to habitat, fish and wildlife resources, cultural resources, and the visiting public.
3. Due to the prevalence of hydric soils, tree harvest will be required to take place when conditions minimize soil compaction, erosion, and impacts to cultural resources.

Justification:

Tree harvest has been determined to be compatible because impacts would be minimal and can be controlled by permits, and the activity would ultimately benefit forest, grassland, and wetland habitats, or public use trails on the Refuge. Adverse impacts from harvest would be short-term in nature and more than off set by the long-term gains in wildlife and plant benefits and/or maintained/improved visitor use facilities. Taken in this long-term context, harvest of trees would contribute to the purposes of the Refuge and the mission of the Refuge System.

Signed:

Refuge Manager: s/Steve Whitson, Feb. 3, 2011

Concurrence:

Regional Chief: s/Rick Schultz, Feb. 15, 2011

Mandatory 10-Year Re-Evaluation Date: 2021

References:

- U. S. Fish and Wildlife Service. 1992. Population Management at Field Stations: General. 701 FW 1. Department of Interior. Available URL: <http://www.fws.gov/policy/701fw1.html>
- U. S. Fish and Wildlife Service. 2001. Biological integrity, diversity, and environmental health. 601 FW 3. National Wildlife Refuge System, Department of Interior. Available URL: <http://policy.fws.gov/601fw3.html>

Compatibility Determination

Use: Wildlife Observation and Photography (including the means of access such as automobile driving, hiking, biking, canoeing, kayaking and boating and picnicking incidental to these uses)

Refuge Name: Swan Lake National Wildlife Refuge (NWR)

Establishing and Acquisition Authorities: Executive Order 7563 established Swan Lake National Wildlife Refuge on February 27, 1937.

Refuge Purposes:

- "... as a refuge and breeding ground for migratory birds and other wildlife: ..." Executive Order 7563, dated Feb. 27, 1937
- "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)
- "... particular value in carrying out the national migratory bird management program." 16 U.S.C. § 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife)

National Wildlife Refuge System Mission: The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

Is the use a priority public use?

Wildlife observation and photography are priority public uses of the National Wildlife Refuge System.

Where would the use be conducted?

Wildlife observation and photography occur along roads, trails, and waters throughout the Refuge. The Refuge nature trail is currently located near the office and is roughly three-quarters of mile long. This compatibility determination will include the use of this trail and extending the trail around the Swan Lake wetland to provide more wildlife viewing opportunities and access to photography blinds with minimal wildlife disturbance.

When would the use be conducted?

Wildlife observation and photography would occur year-round along the entrance road and the nature trail near the Visitor Center. The remainder of the Refuge is open for wildlife observation and photography from early March through late October. Permanent photography/observation blinds will be available by reservation only. The blinds will be locked and a key will be issued when reservations are made. The blinds will be accessible for 1 hour before official sunrise and 30 minutes after official sunset by reservation and available on a year-round basis with the exception of times during the special deer hunts. Refuge tours can be conducted anytime of the year with the approval of the Refuge Manager to ensure they do not conflict with other Refuge uses or make negative impacts on wildlife.

How would the use be conducted?

Visitors observe and photograph wildlife from vehicles along roads and on foot throughout the Refuge. There is an observation platform and scope along the entrance road that provides wildlife observation opportunities. The Refuge will place 2- 4 photography/observation blinds at high quality wildlife viewing locations that will be available by a reservation system. The blinds will be locked and when reservations are made a key will be issued. Wildlife observation can also be conducted by Refuge tours either staff-led or self-led by various groups approved by the Refuge Manager at opportune times for wildlife viewing.

Why is this use being proposed?

Wildlife observation and photography are priority general public uses of the Refuge System. Wildlife observation and photography programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System. There are also opportunities to observe and photograph wildlife near the Refuge on the 7,100-acre Fountain Grove Conservation Area administered by the Missouri Department of Conservation and at the 3,500-acre Pershing State Park administered by the Missouri Department of Natural Resources.

Availability of Resources:

Facilities and staff are currently available to provide access, maintain roads, parking lots, secondary access roads, and signage. Maintaining the public use facilities is part of routine management duties

and staff and funding is available. Kiosks and interpretive trail signs may be added to improve visitor information, but are not necessary to support the use.

Anticipated Impacts of the Use:

How does wildlife observation and photography affect Refuge purposes and the NWRS mission?

Wildlife observation and photography do not adversely affect Refuge purposes and they help fulfill the mission of the NWRS.

How does wildlife observation and photography affect fish, wildlife, plants, and their habitats; and the biological integrity, diversity, and environmental health of the Refuge/NWRS?

Wildlife and Wildlife Habitat

In *Managing Visitor Use and Disturbance of Waterbirds: A Literature Review of Impacts and Mitigations* DeLong (2002) includes a summary of effects on wildlife from disturbance from various forms of recreation. The author documents that disturbance can alter behavior (e.g. foraging time), population structure, and distribution patterns of wildlife. It is probable that wildlife observation and photography would cause some or all of these effects to some degree on Refuge wildlife. Much of the Refuge is not affected because wildlife observation and photography tend to be concentrated along roads and trails and at observation facilities. Damage to habitat by walking is minimal and temporary. Large groups typically use established foot trails or roads with little to no impact on vegetation. There is some temporary disturbance to wildlife due to boating and human activities on trails, however the disturbance is generally localized and would not adversely impact overall populations. Wildlife observation and photography are expected to increase over time. In the future measures may be necessary to ensure wildlife disturbance from these wildlife observations and photography as well as other uses is kept to acceptable levels.

The cumulative disturbance caused by wildlife observation and photography and all other public uses occurring on the Refuge is not expected to adversely affect fish and wildlife populations or their habitats. A number of factors including suitable site conditions, presence of facilities, access limitations, and seasonal restrictions or other regulations tend to concentrate uses. At any one time, much of the Refuge is unaffected by these uses and is free of disturbance.

Biological Integrity, Diversity, and Environmental Health

Wildlife observation and photography conducted in accordance with Refuge regulations is not expected to adversely affect fish and wildlife populations or the biological integrity, diversity, and environmental health of the Refuge as it is defined in Service policy (USFWS 2001).

Other Uses and Public Safety

Wildlife observation and photography are not expected to adversely affect other Refuge uses or public safety. As public use levels on Swan Lake NWR expand across time, unanticipated conflicts between user groups may occur. The Refuge's Visitor Services programs would be adjusted as needed to eliminate or minimize each problem and provide quality wildlife-dependent recreational opportunities which includes promoting public safety. 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 wildlife observation and photography on other wildlife-dependent recreation or public safety at Swan Lake NWR is expected to be minor.

Public Review and Comment:

This compatibility determination was part of the Swan Lake NWR Draft Comprehensive Conservation Plan and Environmental Assessment. Public notification and review included a notice of availability published in the Federal Register, a 30-day comment period, local media announcements, and a public meeting near the Refuge. Comments received and agency responses are included in the final version of the Swan Lake NWR Comprehensive Conservation Plan.

Determination:

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The Refuge Manager will monitor use patterns and densities and make adjustments in timing, location, and duration as needed to limit disturbance.
2. Use will be directed to public use facilities (both existing and in the future), which are not in or near sensitive areas.

3. Personal portable photo or viewing blinds must be removed by sunset each day.
4. Trail layout and design will continue to ensure adequate adjacent cover for wildlife and avoid sensitive wildlife areas or habitat.
5. Interpretive signs will include messages on minimizing disturbance to wildlife.
6. Certain modes of access such as motorized vehicles will be limited to designated roads and parking lots.

Justification:

This use has been determined compatible because the level of use for wildlife observation and photography is moderate and generally consolidated to the developed public-use areas (trails, roads, parking lots). The associated disturbance to wildlife is temporary and minor. Wildlife observation and photography are priority public uses and provide visitors with opportunities to enjoy and learn about our lands and wildlife. These uses also help fulfill the mission of the National Wildlife Refuge System. Wildlife viewing and photography would not materially interfere with or detract from Refuge purposes

Signed:

Refuge Manager: s/Steve Whitson, Feb. 3, 2011

Concurrence:

Regional Chief: s/Rick Schultz, Feb. 15, 2011

Mandatory 10- or 15-year Re-Evaluation Date: 2026

References:

- DeLong, A. K. 2002. Managing visitor use and disturbance of waterbirds — a literature review of impacts and mitigation measures — prepared for Stillwater National Wildlife Refuge. Appendix L (114 pp.) *in* Stillwater National Wildlife Refuge Complex final environmental impact statement for the comprehensive conservation plan and boundary revision (Vol. II). Dept. of the Interior, U.S. Fish and Wildlife Service, Region 1, Portland, OR. Available URL: <http://www.fws.gov/stillwater/lit-review.pdf>
- U. S. Fish and Wildlife Service. 2001. Biological integrity, diversity, and environmental health. 601 FW 3. National Wildlife Refuge System, Department of Interior. Available URL: <http://policy.fws.gov/601fw3.html>

Appendix J: Appropriate Use Determinations

Appropriate Refuge Uses

The Service's Appropriate Use policy describes the initial decision process a refuge manager follows when first considering whether or not to allow a proposed use on a refuge. The refuge manager must first find a use to be appropriate before undertaking a compatibility review of the use and outlining the stipulations of the use.

This policy clarifies and expands on the compatibility policy (603 FW 2.10D(1)), which describes when refuge managers should deny a proposed use without determining compatibility. If we find a proposed use is not appropriate, we will not allow the use and will not prepare a compatibility determination. By screening out proposed uses not appropriate to the refuge, the refuge manager avoids unnecessary compatibility reviews. By following the process for finding the appropriateness of a use, we strengthen and fulfill the Refuge System mission. Although a refuge use may be both appropriate and compatible, the refuge manager retains the authority to not allow the use or modify the use.

Background for this policy as it applies to Muscatatuck NWR is found in the following statutory authorities:

National Wildlife Refuge System Administration Act of 1966, as amended by the *National Wildlife Refuge System Improvement Act of 1997* (16 U.S.C. 668dd-668ee). This law provides the authority for establishing policies and regulations governing refuge uses, including the authority to prohibit certain harmful activities. The Administration Act does not authorize any particular use, but rather authorizes the Secretary of the Interior to allow uses only when they are compatible. The Improvement Act provides the Refuge System mission and includes specific directives and a clear hierarchy of public uses on the Refuge System.

Refuge Recreation Act of 1962, (16 U.S.C. 460k). This law authorizes the Secretary of the Interior to allow public recreation in areas of the Refuge System when the use is an "appropriate incidental or secondary use."

This policy does NOT apply to:

Situations Where Reserved Rights or Legal Mandates Provide We Must Allow Certain Uses.

Refuge Management Activities. Refuge management activities conducted by the Refuge System or a Refuge System-authorized agent are designed to conserve fish, wildlife, and plants and their habitats. These activities are used to fulfill a refuge purpose(s) or the Refuge System mission, and are based on sound professional judgment.

Uses that have been administratively determined to be appropriate are:

Six wildlife-dependent recreational uses. As defined by the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act), the six wildlife-dependent recreational uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation) are determined to be appropriate. However, the refuge manager must still determine if these uses are compatible.

Take of fish and wildlife under State regulations. States have regulations concerning take of wildlife that includes hunting, fishing, and trapping. We consider take of wildlife under such regulations appropriate. However, the refuge manager must determine if the activity is compatible before allowing it on a refuge.

Refuge uses must meet at least one of the following 4 conditions to be deemed appropriate:

It is a wildlife-dependent recreational use of a refuge as identified in the Improvement Act.

It contributes to fulfilling the refuge purpose(s), the Refuge System mission, or goals or objectives described in a refuge management plan approved after the Improvement Act was signed into law.

The use involves the take of fish and wildlife under State regulations.

The refuge manager has evaluated the use following the guidelines in this policy and found that it is appropriate. The criteria used by the manager to evaluate appropriateness can be found on each of the appropriate use forms included in this appendix. Also included under this condition are 'specialized uses,' or uses that require specific authorization from the Refuge System, often in the form of a special use permit, letter of authorization, or other permit document. These uses do not include uses already granted by a prior existing right. We make appropriateness findings for specialized uses on a case-by-case basis.

Finding of Appropriateness of a Refuge Use

Refuge Name: Swan Lake National Wildlife Refuge

Use: Trapping of Nuisance Wildlife

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
Do we have jurisdiction over the use?	X	
Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
Is the use consistent with applicable Executive orders and Department and Service policies?	X	
Is the use consistent with public safety?	X	
Is the use consistent with goals and objectives in an approved management plan or other document?	X	
Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
Is the use manageable within available budget and staff?	X	
Will this be manageable in the future within existing resources?	X	
Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies.

Yes X
No

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate
Appropriate X

Refuge Manager: s/Steve Whitson
Date: Feb. 3, 2011

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: s/Richard T. Speer (Acting)
Date: Feb. 10, 2011

A compatibility determination is required before the use may be allowed.

Finding of Appropriateness of a Refuge Use

Refuge Name: Swan Lake National Wildlife Refuge

Use: Tree Harvest by Third Parties

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
Do we have jurisdiction over the use?	X	
Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
Is the use consistent with applicable Executive orders and Department and Service policies?	X	
Is the use consistent with public safety?	X	
Is the use consistent with goals and objectives in an approved management plan or other document?	X	
Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
Is the use manageable within available budget and staff?	X	
Will this be manageable in the future within existing resources?	X	
Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies.

Yes X
No

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate
Appropriate X

Refuge Manager: s/Steve Whitson
Date: Feb. 3, 2011

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: s/Richard T. Speer (Acting)
Date: Feb. 10, 2011

A compatibility determination is required before the use may be allowed.

Finding of Appropriateness of a Refuge Use

Refuge Name: Swan Lake National Wildlife Refuge

Use: Gathering of Antlers, Nuts, Berries or Mushrooms

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
Do we have jurisdiction over the use?	X	
Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
Is the use consistent with applicable Executive orders and Department and Service policies?	X	
Is the use consistent with public safety?	X	
Is the use consistent with goals and objectives in an approved management plan or other document?	X	
Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
Is the use manageable within available budget and staff?	X	
Will this be manageable in the future within existing resources?	X	
Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies.

Yes X

No ____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate ____

Appropriate X

Refuge Manager: s/Steve Whitson

Date: Feb. 3, 2011

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: s/Richard T. Speer (Acting)

Date: Feb. 10, 2011

A compatibility determination is required before the use may be allowed.

Finding of Appropriateness of a Refuge Use

Refuge Name: Swan Lake National Wildlife Refuge

Use: Farming

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
Do we have jurisdiction over the use?	X	
Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
Is the use consistent with applicable Executive orders and Department and Service policies?	X	
Is the use consistent with public safety?	X	
Is the use consistent with goals and objectives in an approved management plan or other document?	X	
Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
Is the use manageable within available budget and staff?	X	
Will this be manageable in the future within existing resources?	X	
Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies.

Yes X

No

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate

Appropriate X

Refuge Manager: s/Steve Whitson

Date: Feb. 3, 2011

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: s/Richard T. Speer (Acting)

Date: Feb. 10, 2011

A compatibility determination is required before the use may be allowed.

Finding of Appropriateness of a Refuge Use

Refuge Name: Swan Lake National Wildlife Refuge

Use: Haying

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
Do we have jurisdiction over the use?	X	
Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
Is the use consistent with applicable Executive orders and Department and Service policies?	X	
Is the use consistent with public safety?	X	
Is the use consistent with goals and objectives in an approved management plan or other document?	X	
Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
Is the use manageable within available budget and staff?	X	
Will this be manageable in the future within existing resources?	X	
Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies.

Yes X
No

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate
Appropriate X

Refuge Manager: s/Steve Whitson
Date: Feb. 3, 2011

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: s/Richard T. Speer (Acting)
Date: Feb. 10, 2011

A compatibility determination is required before the use may be allowed.

Finding of Appropriateness of a Refuge Use

Refuge Name: Swan Lake National Wildlife Refuge

Use: Research Projects by Third Parties

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
Do we have jurisdiction over the use?	X	
Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
Is the use consistent with applicable Executive orders and Department and Service policies?	X	
Is the use consistent with public safety?	X	
Is the use consistent with goals and objectives in an approved management plan or other document?	X	
Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
Is the use manageable within available budget and staff?	X	
Will this be manageable in the future within existing resources?	X	
Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies.

Yes X
No _____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate ____
Appropriate X

Refuge Manager: s/Steve Whitson
Date: Feb. 3, 2011

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: s/Richard T. Speer (Acting)
Date: Feb. 10, 2011

A compatibility determination is required before the use may be allowed.

Appendix K: List of Preparers and Contributors

Refuge Staff

- Steve Whitson, Refuge Manager
- John Guthrie, Refuge Manager (retired)
- Levi Miller, Maintenance Worker (retired)

Squaw Creek NWR Staff Contributors:

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Mangi Environmental Group (Contractor):

- Randy Williams, Senior Environmental
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- Meghan Morse, Environmental Specialist

Appendix L: Response to Comments Received on the Draft CCP

The Midwest Region of the U.S. Fish and Wildlife Service received approximately 500 comments on the Draft Comprehensive Conservation Plan for Swan Lake NWR.

The Draft CCP's comment period ran for 30 days and ended on July 5, 2010. The Service addressed those comments by creating a new alternative, Alternative 4, and selecting it as the preferred alternative.

Three objectives drew the most comments:

- The proposal to vary water levels in Silver Lake instead of maintaining the impoundment at full pool.
- The proposal to restore all 1,400 acres of existing cropland to native habitat.
- The proposal to manage Refuge grasslands to support the eastern massasauga rattlesnake.

The comment period for Alternative 4, the new preferred alternative, ran for 30 days and closed on Oct. 4, 2010. The Service received approximately 50 comments on the new preferred alternative.

This appendix includes two sections, Draft CCP Comments and Alternative 4 Comments. To avoid repetition, all of the comments expressing identical opinions are not included in this appendix. In cases where there were multiple comments expressing the same opinion, one representative comment and the Service's response to that comment are shown. In other instances, several comments are listed that share a common response.

Comments on the Draft CCP

Waterfowl hunting in and around Swan Lake NWR would be drastically reduced if management of Silver Lake changes.

The CCP states that water management on Silver Lake will not change until we have collected additional hydrological data. That is expected to take a minimum of 5 years. We expect waterfowl use of the Refuge and the quality of waterfowl hunting to continue at or above present levels.

Lack of sufficient hunting blinds has diminished the quality of goose hunting on the Refuge.

The Service recognizes that goose hunting on the Refuge has changed over time. . As identified in the CCP, hunting opportunities on the Refuge will be re-evaluated so that the Service can provide hunting opportunities that are consistent with purposes for which the Refuge was established.

Swan Lake NWR should be treated as a wildlife sanctuary with no hunting or trapping allowed.

Trapping is not allowed as a recreational activity on the Refuge. The National Wildlife Refuge System, is guided by laws enacted by Congress and the President as well as policy derived from those laws. The 1997 National Wildlife Refuge System Improvement Act identifies hunting as one of six priority public uses to be facilitated when compatible with the purposes of a refuge and the mission of the Refuge System. Hunting is consistent with the purposes of the Refuge. While National Wildlife Refuges are managed first and foremost for wildlife the focus is on perpetuating populations not individuals.

Hunting on the Refuge should be limited only to those individuals unable to hunt in the traditional manner due to disabilities.

The Service has and will continue to provide recreational opportunities to hunters with disabilities; however, we will not limit these opportunities to disabled hunters.

Regarding the proposed hunting changes, we would rather see waterfowl hunting in the present areas only.

Expand hunting opportunities, but carefully consider the location, duration, and extent of new opportunities.

We desire more public access for waterfowl hunting and feel it is appropriate to allow duck hunting on the Refuge.

We desire more public access for small game hunting and feel it is appropriate to allow it on the Refuge.

We support providing limited goose hunting and deer hunting opportunities.

Please open up more hunting opportunities at Swan Lake. We need all the public hunting land we can get for people who don't have access to private land.

The selected alternative (Final CCP) calls for introducing duck hunting and small game hunting on the Refuge as well as maintaining existing hunting opportunities for geese and white-tailed deer. The details regarding new hunting opportunities must be evaluated in a subsequent analysis that requires additional public involvement and review. The location, duration, and extent of hunting opportunities as well as maintaining a portion of the Refuge as a sanctuary free of hunting will be important considerations as we develop the Refuge hunting plan. We expect this process to begin within two years of approval of the Final CCP.

We support providing hunting opportunities for youth and people with disabilities.

The Service shares this view and will identify areas that will be accessible to persons with disabilities when a new hunting plan is prepared for the Refuge. We expect the plan to be complete in 3-5 years.

The decline of quality goose hunting is directly related to not providing quality water and crops for the geese during migration.

The relationship between migrating geese and hunting opportunities is complex and in all likelihood is constantly changing. The number of geese in the local area as well as the distribution and movement of whatever numbers are present are factors that affect goose hunting opportunities. Canada Goose use of the Refuge has declined from a peak of 181,000 in 1977 to present levels of 20,000 to 40,000 birds. The decades following the peak saw a steady decline in the num-

ber of geese wintering on the Refuge despite a steady increase in Canada Goose numbers within the Mississippi Flyway. During this same time there was abundant water on the Refuge and according to Refuge records about 2,000 acres of cropland maintained annually. This supports research that shows distribution of wintering geese is influenced by factors beyond the Refuge which include increased availability of habitats across the landscape, fall and winter weather conditions, and variations in hunting pressure along the migratory flyway. Locally, movement and distribution of wintering geese are influenced by the availability of rest areas and food resources. Historically, cropland was used to provide food for wintering geese, but current Service policy calls for restoring native habitat. Cropland is not native habitat, and although it attracts wildlife including geese, it is not as diverse as native habitat and the food produced is available to a limited number of species. Swan Lake NWR is part of a larger conservation network, the National Wildlife Refuge System, and is not solely dedicated to providing food for wintering geese. The primary purpose of the Refuge is to provide habitat for migratory birds. In addition to waterfowl, this includes many other water birds and migrant landbirds.

Area residents and visitors highly value fishing on Silver Lake.

We received many comments regarding the value of fishing on Silver Lake; these ranged from its economic value to its value in building family connections. It is clear many people have a strong association with this activity. Nevertheless, the establishing purpose of the Refuge primarily is to provide for the needs of migratory birds. This includes Silver Lake, which was originally constructed to benefit migratory birds. While we recognize the value of fishing to many Refuge visitors, we are obligated to provide the highest quality habitat for the wide range of migratory birds that use the Refuge. Under the selected alternative we will continue to provide fishing opportunities at Silver Lake, but also will continue to collect additional data to help develop options for managing the water levels in the lake to increase the amount of food for migratory birds. If water management occurs, it would impact the amount and type of fish in Silver Lake as well as the opportunities to fish there.

The Refuge should improve Silver Lake's access, upkeep and fishery.

Under the CCP fishing opportunities at Silver Lake would continue, but could be affected if water levels are managed to increase native foods for waterfowl. The primary purpose of Silver

Lake is to help the Refuge meet its mandates for providing Refuge and a breeding area for migratory birds and other wildlife.

Silver Lake is more accessible for elderly and disabled anglers than bank or river fishing.

Providing accessible wildlife dependent recreational opportunities for the public is a priority of the Service. Under the CCP fishing opportunities at Silver Lake would continue, but could be affected if water levels are managed to increase native foods for waterfowl. If water levels are changed and fishing continues to be allowed on Silver Lake, the Service will ensure that fishing opportunities are available for persons with disabilities.

I would like to see the inner refuge roads remain open for wildlife viewing/photography.

The CCP includes direction to provide public access to the entire Refuge from early March through late October, and allow limited access to selected portions of the Refuge from late October to early March.

We support expanding visitor services opportunities on Swan Lake NWR, but not at the expense of the sanctuary function of the Refuge.

We agree. Under the CCP a portion of the Refuge will continue to be maintained as a sanctuary.

Witnessing the spring and fall migrations of birds and viewing whitetail deer are what many people come to the refuge for.

Viewing annual bird migrations as well as white-tailed deer are popular activities on the Refuge. We expect migratory birds and white-tailed deer to continue using the Refuge and the CCP includes direction to provide wildlife observation opportunities.

How do you plan to segregate the hunters and birders?

We will complete a hunting plan as part of a broader plan for all visitor services. As part of that planning effort, we will work to minimize conflicts between user groups.

We prefer the visitor opportunities available with open water on the Refuge.

Open water and the visitor services associated with them will continue under the CCP. The amount of water in Silver Lake, which makes up the majority of open water on the Refuge, is not proposed to change until completion of additional study and completion of a habitat management plan. If water levels in Silver Lake are managed it would affect the amount of open water and associated opportunities.

The bird check list Appendix C is out of date.

We reviewed and revised the bird list.

We disagree with some aspects of Alternative 3 but like its environmental education elements.

Alternative 4 was selected as the CCP for the Refuge. Alternative 4 differs from Alternative 3 in a number of ways, but retains the objective for environmental education.

As tax payers, we expect the Service to maintain Swan Lake NWR in the manner that area residents want.

The establishing purpose of the Refuge primarily is to provide for the needs of migratory birds. We are obligated to provide the highest quality habitat for the wide range of migratory birds that use the Refuge.

Unhappiness over Refuge planning will reduce visitation and volunteerism at the Refuge as well as private conservation efforts.

Many people continue to visit and support the Refuge. We will work with the Friends group and others to grow those numbers as we implement the CCP. We will also continue to encourage private conservation efforts. At times comprehensive conservation planning produces conflict. It is challenging to produce a plan that addresses issues identified by the public, the Service, and others in a way that fulfills the purposes of the Refuge and the mission of the National Wildlife Refuge System, and that also adheres to Service policies. We have invited public comment throughout this process and made changes based on those comments. We will continue to engage the public and build support as we carry out the direction in the CCP.

It appears that the FWS doesn't care about area residents.

The Service has invited public comment throughout this process and made changes based on those comments. We will continue to engage the public and build support as we carry out the direction in the CCP.

Partner with MDC and Ducks Unlimited.

The Service has and will continue to partner with MDC and Ducks Unlimited.

Some of the people who offered comments said that they strongly value having large flocks of migratory waterfowl on Silver Lake both for observation and hunting purposes. They said that changing water levels in Silver Lake will diminish the spectacle of annual migration and the quality of hunting opportunities at Swan Lake NWR and could compromise the health of migratory waterfowl.

As identified in the CCP, any future changes on Silver Lake will only be taken after further review of the hydrology of the watershed. Chang-

ing water levels on Silver Lake will only move forward if the Service believes that it will improve habitat for migratory birds and other wildlife at the Refuge.

Some people expressed strong opposition to draining Silver Lake. Some people noted that there are other ways to control carp, some said that the impoundment is important to managing habitat, some said the Refuge has an obligation to preserve Silver Lake the way it is, and some said that it is an invaluable draw for tourists.

The Service is not proposing to drain Silver Lake. We recognize that Silver Lake provides water for other wetland management units on the Refuge; however, the Service does not have an obligation to preserve Silver Lake. We have an obligation to manage the Refuge for its establishing purposes, which is for migratory birds and other wildlife.

Many people summarized their view on management of Silver Lake as “if it ain’t broke don’t fix it.” While this sentiment was the bottom line, the reasons why people believe Silver Lake functions well included: quality fishing, quality duck hunting, ability to maintain a guaranteed source of water, preserving community heritage, the need to improve the lake.

As identified in the CCP, no change in the management of Silver Lake will occur unless future hydrological studies suggest that active management of Silver Lake water levels will benefit migratory birds and other wildlife.

Some people opposed changing the management of Silver Lake because they see it providing a guaranteed source of water for moist soil management at no cost to the Refuge. Additionally, converting and maintaining habitat within the Silver Lake basin would be more expensive than open water.

The Service is not proposing to drain Silver Lake. We recognize that Silver Lake provides water for other wetland management units on the Refuge; however, the water being maintained within Silver Lake does have costs. Maintaining reservoir conditions in Silver Lake precludes the establishment of other wildlife habitat. Additionally, maintenance of infrastructure associated with Silver Lake is not without its costs. Periodic dam safety inspections, vegetation control and a variety of other maintenance costs must be considered when suggesting that the Silver Lake reservoir is maintained at “no cost” to the Refuge.

People opposing the proposal to vary water levels in Silver Lake said that the Service has an obligation to improve the lake and manage it as open water, and they suggested a variety of techniques for doing so.

The Service does not have an obligation to improve the lake and manage it as open water. The Service is mandated to manage the Refuge,

and its habitats, for its establishing purposes, which is for the benefit of migratory birds and other wildlife.

Many people voiced concern that changing Silver Lake in any way would diminish recreational uses to the point where the local and regional economy would be imperiled.

The CCP is not proposing changes for Silver Lake. Any future changes of the management of Silver Lake will take into consideration those effects on the recreation and the socioeconomic effects.

Many people voiced concern that the proposed management would result in a fish kill similar to what occurred in 1989 when Silver Lake was completely drawn down.

The Service is not proposing to alter management on Silver Lake until further hydrological studies are complete. That is expected to take a minimum of 5 years. If future changes to the management of Silver Lake are proposed the Service will take fishery management issues into consideration during that planning effort.

Sumner is known as the “Goose Capital of the World,” and many people expressed concern that changing the management of Silver Lake would be detrimental to geese and, with it the community’s identity. In addition, Silver Lake has been central to family outings over the years and many people said that proposed changes to how the lake is managed would diminish good memories and lessen opportunities for future family outings at the lake.

The Service is not proposing to alter management on Silver Lake until further hydrological studies are complete. That is expected to take a minimum of 5 years. Any future changes on Silver Lake would not be made without an assessment of how such changes would affect migratory bird habitat and the value of the Refuge to the American public.

Silver Lake serves as a catch-basin for reed canary grass seeds, slowing or preventing the spread of the invasive plant on the Refuge.

Reed canary grass and other invasive species travel via a number of pathways and it requires constant action to slow or eliminate their spread. A number of strategies in the CCP call for treating known infestations of invasive species and monitoring common invasive pathways such as streams, waterways, roads, and trails to aid in early detection.

Reed Canary grass is capable of forming monotypic stands that preclude other herbaceous vegetation and is particularly well adapted to the wet soils typical of many areas of the Refuge.

Some individuals said that Alternative 3 would result in more flooding on neighboring land and a shift in the beaver population, which would be detrimental to neighboring land owners.

Under any of the Alternatives, the Service would not intentionally flood neighboring land without a landowner agreement or flowage easement. It is difficult to evaluate how Alternative 3 would shift beaver populations.

Please do not make any major changes, but return to similar management practices that were in place when MDC was in charge prior to 2000.

The Service has managed the Refuge since it was established in 1937. At one time, MDC did carry out certain activities on the Refuge through an agreement with the Service. The CCP maintains many long standing management practices used on the Refuge, but it also includes a number of changes. Management direction included in the CCP helps fulfill Refuge purposes and responds to planning issues in a way that is consistent with Service policy.

Managing water levels in Silver Lake is not consistent with Refuge purposes.

The Service is not proposing to alter management on Silver Lake until further hydrological studies are complete. That is expected to take a minimum of 5 years. Any future changes on Silver Lake would not be made unless the Service believes that those changes would improve habitat for selected migratory birds and other wildlife.

Silver Lake as a stable open water body is key to wild-life-dependent recreation in the area. It is a place where families can introduce children to fishing and nature, seniors can enjoy fishing and observation,, and everyone can enjoy the lake's beauty.

The Service is not proposing to alter management on Silver Lake until further hydrological studies are complete. That is expected to take a minimum of 5 years. Any future changes on Silver Lake would not be made without an assessment of how such changes would affect migratory bird habitat and the value of the Refuge to the American public.

Silver Lake provides unique opportunities for the local area.

The Service is not proposing to alter management on Silver Lake until further hydrological studies are complete. That is expected to take a minimum of 5 years. Any future changes on Silver Lake would not be made without an assess-

ment of how such changes would affect migratory bird habitat and the value of the Refuge to the American public.

The Refuge's management has diminished Swan Lake's value for wildlife habitat and food, and varying its water levels will have the same effect on Silver Lake.

Multiple years of high water in the area have prevented the Service from managing Swan Lake for the greatest benefit of migratory birds. As Swan Lake has converted from a wetland dominated by plants typical of early successional communities (millet, smartweed) to one dominated by plants typical of later successional communities (river bulrush), food resources for migrating ducks likely have decreased.

Managing water levels in Silver Lake will not reduce sedimentation.

We agree, upstream land practices are the key to the amount of sediment entering Silver Lake.

Stable open water provided by Silver Lake is essential as habitat and food for wildlife, including waterfowl, fish, and the predators that depend on them.

The amount of water in Silver Lake is not proposed to change until completion of additional study and completion of a habitat management plan. Open water is important to some species, but maintaining reservoir conditions in Silver Lake precludes the establishment of other wildlife habitat. If water levels in Silver Lake are managed it would affect the amount of open water and associated species.

Managing water levels in Silver Lake puts an otherwise guaranteed source of water at risk. Especially in dry years, there won't be enough water to manage refuge wetlands and support waterfowl numbers, which could change migration patterns. Managing water levels in Silver Lake should not happen at all, or should not happen without further study.

The Service is not proposing to alter management on Silver Lake until further hydrological studies are complete. That is expected to take a minimum of 5 years. Any future changes on Silver Lake would not be made unless the Service believes that those changes would improve habitat for selected migratory birds and other wildlife.

Pumping ground water to compensate for lack of surface water would be expensive, may not be sufficient or timely, and could affect the local aquifer. This should not happen at all, or should not happen without further study.

We agree that further study would be necessary to assess the feasibility of groundwater use.

We like how the plan decreases open water and increases emergent wetland, wet meadow, shallow emergent wetland, shrub swamp and maintains bottom land Forest. It appears the Refuge is going to become a better waterfowl location than it is currently.

It is the intent of the Service that the CCP result in a Refuge with more favorable habitat for migratory birds, including waterfowl.

Base management on hydrology studies, then conduct drawdowns incrementally and monitor results before proceeding.

The Service is not proposing to alter management on Silver Lake until further hydrological studies are complete. That is expected to take a minimum of 5 years. Any future changes on Silver Lake would not be made unless the Service believes that those changes would improve habitat for selected migratory birds and other wildlife.

If you do anything, you should plant more row crops and increase the surface water.

Service policy restricts the use of non-native plant communities (e.g., row crops) unless they are needed to meet the purposes of the Refuge. The Service believes that the Refuge will better meet its purpose by converting 1000 acres of row crops to more natural habitats. Surface water can provide resting areas to certain species; however, the Service believes that wetlands with diverse plant communities will provide better habitat resources to a wide range of migratory birds.

Reduce cropland acres incrementally and, as desirable wetland plants replace them, monitor the effects before proceeding.

The conversion of cropland will occur incrementally over the next 15 years. The CCP also calls for developing an Inventory and Monitoring plan that links monitoring to management information needs.

Converting land from row crops to wetland vegetation will cost more and require more effort from Refuge staff.

In some cases managing wetlands or native vegetation requires more effort from staff, in other cases it requires less. Cost is an important factor, but it is not the sole factor in determining management actions. Converting cropland to native habitats is consistent with Service policy and provides habitat for a wide range of migratory birds and other wildlife which helps fulfill Refuge purposes.

Cropland on the refuge greatly reduces the crop depredation on private landowners' crops; eliminating crops on the Refuge would suggest that the Service doesn't care about impacts to neighboring lands.

Crop depredation by wildlife is a challenge for any farming operation. The Missouri Department of Conservation sets population objectives for resident wildlife and the Refuge works closely with MDC to help achieve the objectives. Maintaining wildlife populations at specified levels helps alleviate crop depredation. As far as waterfowl impacts on agriculture, Alternative 4 will leave some crop lands on the Refuge that will emphasize more winter browse for migratory birds.

There is no way that natural habitat will provide sufficient food for wildlife, and reducing the amount of corn and soybeans available at Swan Lake NWR will force waterfowl and other wildlife to move elsewhere.

Agriculture draws some species of wildlife, however native habitat is a better source of food and it is a source of food for more species than row crops. Typically, highly adaptable species like white-tailed deer and Canada Geese respond to agriculture; declining species, grassland bird species for example, have a greater need for native habitat. Refuges throughout the Midwest have reduced their farming programs without experiencing lower numbers of migrating waterfowl or other wildlife.

Instead of the "all or nothing" approach as outlined in your Alternatives 1 & 2, why not compromise and leave possibly a third of the crop land as food plots?

This is the approach included in the selected alternative (CCP). Cropland will be reduced from 1,365 acres to approximately 400 acres by the end of the planning period.

Continue to farm existing croplands on Swan Lake NWR because cropland:

- adds to the diversity of Refuge habitat
- provides food and cover for wildlife
- holds ducks on the Refuge
- enhances wildlife observation opportunities
- creates income for farmers

Agriculture draws some species of wildlife, typically highly adaptable species like white-tailed deer, mallards, and Canada Geese. However, native habitat is a better source of food and it is a source of food for more species than row crops, especially those with declining numbers such as grassland birds. Reducing the amount of row crops is not unique to Swan Lake NWR's CCP. Service policy requires refuges to maintain or restore habitat to historic conditions if doing so is feasible and does not conflict with refuge pur-

poses. Farming is not an establishing purpose at Swan Lake NWR, and we cannot justify the existing acreage in row crops. However, the availability of native seed, staff, and funding limit the amount of cropland that can be restored to other habitats in any given year. Therefore, the change from cropland to other habitats will be gradual over a number of years. By year 15 of the plan, approximately 400 acres will still be in crops, as well as additional periodic cropping within moist soil units.

Perhaps agriculture can be used as a tool for managing more natural environments on a rotational bases as opposed to planting the same areas over and over.

Cropping is a valuable tool to maintain agriculturally developed areas until resources are available for restoration. We also recognize its value in management where agriculture can be utilized in moist soil management to set back succession of perennial vegetation and other undesirable plants. It can also be utilized in areas overly infested with invasive plants as a first step in restoring more native habitats.

More deer moving off the refuge and across highways will cause much more danger to motorists also.

We work closely with the Missouri Department of Conservation to help achieve white-tailed deer population objectives by providing hunting opportunities on the Refuge. Maintaining deer numbers within specified levels reduces habitat degradation and helps reduce deer/vehicle collisions.

Is it feasible to restore historic conditions and eliminate cropland under the refuge purpose to provide habitat for migrating waterfowl and other resident wildlife?

Converting cropland to native habitats does help fulfill the Refuge purpose of providing habitat for migratory birds and other wildlife. Agriculture draws some species of wildlife, typically highly adaptable species like white-tailed deer, mallards, and Canada Geese. However, native habitat is a better source of food and it is a source of food for more species than row crops, especially those with declining numbers such as grassland birds.

How will the Refuge manage succession, especially woody vegetation, as it moves from crops to restoring native habitat?

Management tools such as prescribed burning, grazing, and mowing will be utilized to manage succession.

We support the proposal to reduce cropland on Swan Lake NWR. Most waterfowl managers would agree that the need for corn to feed the Eastern Prairie Population of Canada geese has been diluted with time, and a large chunk of the area is already planted to row crops.

It is Service policy that when feasible and consistent with refuge purpose(s) we restore and manage habitat to maintain or increase biological integrity, diversity, and environmental health.

We also suggest consideration of an "engineered wetland community" using the CP-23 E practice used elsewhere in Missouri. For example, by obtaining a topographical survey of the site, the Service could restore and manage an emergent wetland/moist soil/rowcrop area buffered by a wet mesic prairie on this higher deck crop ground.

We will consider a variety of options for habitat arrangement as we develop a step down management plan with additional details on the location of future habitats. The step down plan will draw on the results of a hydrogeomorphic study of the Lower Grand River Watershed as well as additional monitoring data.

Adequate moist soil habitat exists on Swan Lake NWR without draining Silver Lake.

The amount of water in Silver Lake is not proposed to change until completion of additional study and completion of a habitat management plan. Specific actions and arrangement of habitats will be included in a step down management plan which will be guided by results of a hydrogeomorphic study as well as additional monitoring data.

Converting moist soil habitat to wet meadow is a terrible idea. Moist soil habitat is more valuable to waterfowl and other wildlife than wet meadow habitat, especially in cold weather, less expensive to maintain, and would lead to reed canary grass infestation.

The CCP includes direction to increase the amount of wet meadow habitat, but not at the expense of moist soil habitat.

Any management action promoting the eastern massasauga rattlesnake at Swan Lake NWR is unwelcome for a variety of reasons:

Venomous snakes are a threat to children and other visitors, as well as hunting dogs.

An expanded range for the snake would translate to limitations on management actions on the Refuge.

The Refuge has enough eastern massasauga rattlesnakes.

The Refuge was established to provide waterfowl habitat, not snake habitat.

The Draft CCP included "Objective 2.3: Eastern Massasauga Rattlesnake," however the objective was not included in Alternative 4, which is the basis of the completed CCP. The Eastern massa-

sauga rattlesnake is a candidate for listing under the Endangered Species Act. Although we eliminated the objective for the snake, the Service is obligated to manage habitat in a way that helps maintain the existing population that occurs on the Refuge.

Figure 11 only shows a small amount of emergent wetland and Silver Lake is non-existent. How will the land cover on this map provide habitat for migrating waterfowl?

Figure 11 in the Draft CCP is not the future land cover map, it shows potential water movement and likely associated vegetation. Figure 12 shows the 15-year desired land cover and includes Silver Lake and emergent wetland habitat.

Both open water and row crops are essential to keeping waterfowl on and in the vicinity of the Refuge.

Open water and crops benefit certain migratory bird species; however, other managed habitats, such as moist soil managed areas also provide beneficial resources to waterfowl and a variety of other wetland species. Open water does provide rafting areas for waterfowl, including diving ducks, but these open water habitats are devoid of vegetation and lack food resources for waterfowl. While picked crop fields (e.g., corn) can provide feeding opportunities for species such as Canada geese and mallards, they provide little to no food resources for diving ducks, rails, herons, egrets and many other migratory waterbirds.

Alternative 3 would result in decreased numbers of waterfowl on Swan Lake NWR, which would:

- Diminish the spectacle of migration
- Affect species that prey on ducks, such as eagles
- Diminish the area's ability to absorb changes in migration that might occur because of the devastating Gulf oil spill

We believe all alternatives suggested within the CCP would continue to allow the Refuge to meet its purpose to provide habitat for migratory birds and other wildlife. While waterfowl numbers may vary between alternatives, each would provide critical migration habitat that would likely result in relatively large concentrations of migratory birds.

Because Swan Lake NWR is a mid-migration stop-over, it cannot be conclusively stated that habitat at this latitude mitigates negative consequences of the gulf oil spill.

Is native upland prairie a suitable habitat for migrating waterfowl?

Typically, upland prairies are not flooded and only provide nesting cover for waterfowl.

What benefit does wet meadow habitat provide to migrating waterfowl?

When flooded, particularly during spring migration, wet meadows provide suitable habitat for migrating waterfowl. During spring migration, waterfowl are engaged in pairing and courtship behavior and flooded meadows provide food resources and areas for courtship and pair bonding activities.

How will the historic hydrologic functions benefit waterfowl at Swan Lake?

Restoring hydrologic function may or may not benefit waterfowl depending on the location. Removing a flood control levee and permitting inundation of crop fields would increase wetland habitat and benefit waterfowl; however, removal of levees and restoring hydrologic function in another location may convert a man-made wetland into a prairie thus benefitting grassland nesting birds and other species such as Eastern massasauga rattlesnakes

Will the results from the hydro geomorphic evaluation identify ample and adequate opportunity to provide suitable managed habitat for current levels of migrating waterfowl?

The purpose of the hydrogeomorphic modeling (HGM) evaluation is not intended to identify suitable managed habitat for current levels of migrating waterfowl. It is intended to help identify restoration potential within the Lower Grand Watershed. While not the intended purpose of the HGM, the modeling effort should identify areas within the Lower Grand Watershed that would most appropriately be managed for migrating waterfowl.

Draining Silver Lake and the fish that presently help to feed the Bald Eagles could only harm the present population.

Any decision made during the Habitat Management Planning (HMP) process with regards to managing water levels on the Silver Lake Basin will take into consideration its impacts on all wildlife species especially migratory birds and endangered species.

Manage the refuge for what it was intended for: waterfowl.

The purpose of Swan Lake NWR is for the management of migratory birds which includes waterfowl as well as many other waterbirds, shorebirds, and landbirds. We recognize and understand the association of waterfowl and Swan Lake NWR. Waterfowl management will be an important management aspect of Swan Lake NWR for the foreseeable future. In the vast

majority of cases managing for all migratory bird species is not in contradiction to managing for waterfowl.

Improve facilities including boat ramp access and rest rooms, and staff the visitor center on weekends.

Facility management is an important part of delivering a quality visitor services program. Swan Lake will maintain and improve these facilities within budget and staffing capabilities. Improvements beyond the existing visitor use facilities will be outlined in the Visitor Services Plan.

Swan Lake NWR has already implemented a Work Camper program that allows work camper volunteers to keep the Refuge visitor center open on weekends from March through October.

The livelihood of many people in the area depends on waterfowl, waterfowl hunters, and fishing. Eliminating fishing and decreasing waterfowl on the Refuge will decrease tourism, which will devastate area merchants and ruin the economy in Sumner and the entire surrounding area.

National wildlife refuges do affect local economies, perhaps most prominently by attracting visitors. Management direction included in the CCP is expected to increase overall Refuge visitation. Improving the quality of habitat for waterfowl and other migratory birds, introducing duck hunting, and focusing on other visitor services all are features of the CCP that we expect will draw more visitors to the Refuge, which has the potential to benefit area businesses.

Consideration should be given to the correction of any silt problems in Silver Lake by first conducting a cost/benefit ratio study, which the Army Corps of Engineers has used so successfully in addressing problems arising in providing benefits for the public.

The Army Corps of Engineers and the National Wildlife Refuge System of the U.S. Fish and Wildlife Service are guided by different Congressional mandates. National wildlife refuges are managed to fulfill the purposes of each Refuge as well as the mission of the National Wildlife Refuge System. We address refuge related issues through comprehensive conservation planning and step down management planning in a way that meets our mandates and adheres to Service policy. Siltation of Silver Lake is a process that is best dealt with at its source. The CCP includes direction to work with others to improve erosion control within the watershed.

Decreasing cropland on the Refuge will cause wildlife to invade neighboring farmland, which will decrease income as well as affect property values.

Conversion of cropland on the Refuge will be implemented over a 15 year period. This will allow sufficient time for the Service to evaluate wildlife use as cropland is converted. The Refuge will work closely with Missouri Department of Conservation and local landowners to manage depredation problems.

Fishing at Silver Lake attracts many people from outside the area that contribute to the local economy.

National wildlife refuges do affect local economies, perhaps most prominently by attracting visitors. Management direction included in the CCP is expected to increase overall Refuge visitation. Improving the quality of habitat for waterfowl and other migratory birds, introducing duck hunting, and focusing on other visitor services all are features of the CCP that we expect will draw more visitors to the Refuge, which has the potential to benefit area businesses.

This refuge is the staple of our community and if it goes the way it is planned it will be the demise of us.

Your plan will have a severe impact economically to Missouri as many out of State hunters use this area-bringing in much needed State Revenue.

National wildlife refuges do affect local economies, perhaps most prominently by attracting visitors. Management direction included in the CCP is expected to increase overall Refuge visitation. Improving the quality of habitat for waterfowl and other migratory birds, introducing duck hunting, and focusing on other visitor services all are features of the CCP that we expect will draw more visitors to the Refuge, which has the potential to benefit area businesses.

Many properties in the area are more valuable due to their proximity to Refuge lands, and stand to suffer considerably.

According to Banking on Nature, a study of how the presence of a national wildlife refuge impacts local economies, managing land to benefit wildlife has very positive impacts on people. We expect that changes at Swan Lake NWR, such as expanding hunting opportunities on the Refuge, will have positive effects for surrounding communities.

Property values will decline, and tax basis for local County governments will be impacted from lower sales tax and property tax assessments.

National wildlife refuges do affect local economies, perhaps most prominently by attracting visitors. Management direction included in the CCP is expected to increase overall Refuge visitation. Improving the quality of habitat for water-

fowl and other migratory birds, introducing duck hunting, and focusing on other visitor services all are features of the CCP that we expect will draw more visitors to the Refuge, which has the potential to benefit the local area.

Changes in Refuge management threaten income opportunities such as farming on the Refuge and renting land to hunters.

The Service is mandated by law and policy to make management decisions based on the benefits to wildlife and habitat, and the changes at Swan Lake NWR are consistent with that mandate. Reduced farming is not unique to Swan Lake NWR; the Service has been steadily reducing the amount of farming for the past several years and we expect to continue to farm less as we restore more land Region-wide. Changes to Refuge management may reduce opportunities in some ways and improve them in others. For example, private land owners may see greater opportunity for renting land to hunters as the Refuge begins the process of opening land to duck and small game hunting.

Opening up public duck and small game hunting in Swan Lake NWR will also bring economic benefits to the local businesses as well, with hunters seeking motels, restaurants, food, fuel and miscellaneous hunting supplies.

“Banking on Nature,” a study of the economic impacts national wildlife refuges have on the local economy, supports this thought.

There is no benefit of native prairie grass for migrating waterfowl.

If flooded, particularly during spring migration, wet meadows consisting of native prairie grass and other herbaceous wetland species can provide suitable habitat for migrating waterfowl. During spring migration, waterfowl are engaged in pairing and courtship behavior and flooded meadows can provide food resources and areas for courtship and pair bonding activities.

There will undoubtedly be more cost in maintenance of upland prairie and wet meadow to control succession of woody cover and undesirable plant succession. My understanding is that the current arrangement doesn't cost USFWS any money.

Any type of land management costs money. When making land management decisions we first and foremost make those decisions based upon the best biological science we have and look at the best options we have to fulfill Refuge purposes. From that point we do consider the feasibility of management actions based upon staffing and budget limitations. There may be situations

where staffing and budget limitations do limit what we are able to accomplish with regards to the whole realm of habitat management.

Considering the highly altered extent of this system, we recommend the deck ground soils between Swan and Silver Lakes (old EPP crop ground) for restoration to wet mesic to mesic prairie instead of restoration to wet prairie/meadow.

Upon completion of the hydrogeomorphic evaluation (HGM) we will have a better understating of what can be achieved and what might be difficult to achieve or impossible to achieve in certain locations. This information along with other biological information will be utilized in making decisions.

We suggest the Service consider agriculture or other managed disturbances at appropriate spatial and temporal scales as management methods to emulate natural processes to achieve desired habitat conditions.

Agriculture and other managed disturbances are important tools for moist soil management. We will continue to use these tools as appropriate to meet habitat objectives.

Alternative 3 would encourage the spread of invasive species such as Reed canary grass, which is already occurring on the refuge in a significant fashion in unmanaged areas.

Invasive species such as reed canary grass are a persistent problem on many national wildlife refuges including Swan Lake NWR. The CCP includes direction to treat known infestations of invasive species and monitor common invasive species pathways such as streams, waterways, roads, and trails to aid in early detection of invasive species introductions.

The CCP needs to give more consideration to native species, such as promoting deer, turkey, rabbit and quail, and discouraging beaver, coyote, bobcat and mosquitoes.

Promoting and discouraging native (non-migratory) species is generally within the jurisdiction of state conservation offices. The U.S. Fish and Wildlife Service is primarily responsible for migratory wildlife, interjurisdictional fish, and endangered and threatened species.

The real goal of the Draft CCP is to cut costs at Swan Lake NWR.

The goal of the CCP is to establish a management direction that improves Swan Lake NWR for wildlife and people and contributes to meeting the goals of the National Wildlife Refuge System. Some strategies called for in the CCP will increase the operational expense of the Refuge and will be contingent upon increased funding.

Use volunteers to cut the costs of running all the current and future programs.

Volunteers contribute a great ideas and enthusiasm, and the Service is very supportive of expanding opportunities for volunteers at Swan Lake NWR. The level of training required for many programs and the level of responsibility that go with them make it unrealistic, and even unfair, to expect volunteers to run them.

Increase or at least do not decrease Refuge funding, and use funding to promote the Refuge's current management.

Funding levels at the Refuge are determined annually based on congressional appropriations and regional priorities. Future Refuge funding will be used to implement the approved CCP.

The Service needs to fund the biological and visitor services strategies outlined in the plan even though at the present time, needs such as the hiring of replacement personnel apparently cannot be funded. If staffing and maintenance cannot be funded, the Service should consider turning over management of the Refuge to the Missouri Department of Conservation.

We always look for opportunities to partner with State and Local agencies to accomplish our mission and will do so in the future. Staffing on National Wildlife Refuges is significantly impacted by federal budgets and the Service does the best it can within those parameters to ensure that every refuge is adequately staffed.

There has not been adequate funding for the Refuge in the past, and without funding all of the alternatives could be at risk.

Implementation of the CCP is dependent upon future funding. If insufficient funding is available to implement all aspects of the preferred alternative, funding will be dedicated to the highest priority projects at the Refuge.

Rather than waste the money spent on the Refuge for the last 73 years, it would be beneficial to operate it with higher staff levels. Why is it that the proposed staffing solution could not be implemented to improve the habitat that is already established?

A number of things influence staffing levels at the Refuge including congressional appropriations and regional priorities. If regional funding increases, Refuge budgets and staffing are likely to increase.

The maintenance and improvement of existing conservation areas is equally as crucial as the creation of new areas.

We agree. The purpose of the comprehensive conservation planning process is to produce management direction for Swan Lake NWR, an existing conservation area.

To help manage this put a user fee on the area for fishermen, hunters, and the other folks that use the area. Plus encourage volunteers to help manage these programs and activities.

User fees are not included as part of the CCP. The CCP does include direction to continue developing the Friends group and to provide volunteer opportunities.

We believe Alternative 2 should be implemented regarding Threatened and Endangered species including the bats that inhabit some of the bottomland hardwoods.

Alternative 4 was selected as the CCP that will guide Refuge management for the succeeding 15 years.

While we don't agree with the habitat objectives described in Alternative 3, we support other aspects of the alternative (Threatened and Endangered Species, Welcoming and Orienting visitors, Hunting, Interpretation, Friends and Volunteers, and Outreach).

These elements of Alternative 3 were preserved in Alternative 4 of the Environmental Assessment, which serves as the foundation for the CCP.

Some proposed changes in the objectives are favorable and some are not. Why do we have to accept any of the 3 alternatives as a whole instead of picking and choosing the best alternative for each objective?

That is essentially what happened after the release of the Draft CCP in June 2010. Elements that drew the most criticism were changed or deleted from Alternative 4 and other elements were carried over from Alternative 3.

U.S. Fish and Wildlife Service and the Missouri Dept. of Natural Resources need to work together to develop a master plan for the entire area. (Swan Lake, Fountain Grove & Pershing Park) These areas are so close together that a plan that does not look at the entire area as a whole could hardly be called comprehensive.

The Swan Lake Refuge Manager is currently part of a working team for the Lower Grand River Conservation Opportunity Area (LGRCOA) which includes these three units. That group is what initiated and led to accomplishing the hydrogeomorphic evaluation (HGM). The results of the HGM will be utilized by the LGRCOA to help manage the area. The LGRCOA is also working on some preliminary strategic habitat planning to help facilitate partnership opportunities between units of the LGRCOA.

We believe the HGM evaluation should be the basis, at least partially, for decisions concerning alternatives and which areas are suitable for conversion to specific native habitats. We are surprised and disturbed that the action to be implemented in the CCP is being proposed before the results of the study are available.

The Draft CCP proposed a very broad direction for managing Swan Lake NWR. The HGM evaluation will be utilized as we develop a more detailed habitat management plan for the Refuge.

We fear a half implemented plan, higher costs and almost triple the present budget – and if the habitat really suffers – abandonment without responsibility.

Comprehensive conservation plans walk a line between being visionary and practical. We want to identify a higher level of achievement in a CCP, and we also want to identify how we can work toward a Refuge's vision assuming no increases and possibly decreases to current funding. The Swan Lake NWR CCP identifies staffing and projects that may or may not be funded, but it also establishes how the Refuge will manage habitat without additional funding. "Abandonment without responsibility" is an unlikely scenario for National Wildlife Refuge System lands.

The whole plan is such a waste of money that could be put to much better use.

Planning is essential to achieving habitat and wildlife goals on national wildlife refuges, and it gives everyone interested in a refuge – neighbors, communities, state and local government – an opportunity to know what's being planned and to weigh in on it. Beyond being a good idea, it's a law: with the National Wildlife Refuge System Improvement Act of 1997, Congress mandated that the Service develop a comprehensive conservation plan for all land within the Refuge System.

Romantic ideas about easily being able to return to historic, all-native habitat should be examined critically and closely for likely success before upsetting the current successful balance of the habitat, or may we suggest trying to root out the present infestations of reeds canary grass first?

Service policy directs refuges to maintain or restore habitat to historic conditions if doing so is feasible and does not conflict with refuge purposes. We believe it is possible to increase the amount of native habitat and continue to meet the purposes of the Refuge and mission of the National Wildlife Refuge System. Specific actions and arrangement of habitats will be included in a step down management plan which will be guided by results of a hydrogeomorphic study as well as additional monitoring data. Invasive species such as reed canary grass are a persistent problem on

many national wildlife refuges including Swan Lake NWR. The CCP includes direction to treat known infestations of invasive species and monitor common invasive species pathways such as streams, waterways, roads, and trails to aid in early detection of invasive species introductions.

The draft CCP Summary is written to skew opinions toward the proposed changes - i.e. naming Alternative 3 the (Preferred Alternative) and naming Alternative 1 the (No Action Alternative)...The name (No Action Alternative) subliminally gives the impression of an apathetic and non-aggressive approach to management.

An Environmental Assessment has very specific requirements per the National Environmental Policy Act (NEPA). These requirements include developing a range of alternatives for how land is used, and one of those alternatives is required to be the current activity and must be labeled "No Action." This is a NEPA term, it is not unique to the Swan Lake NWR and it is not used to suggest apathy. Comprehensive conservation plans are based on an alternative developed in the Environmental Assessment, and we have to have a preferred alternative before we can write a Draft CCP and release it for public review. In general, it seems less than straightforward to release an Environmental Assessment without clearly identifying a preferred alternative. As the Service demonstrated at Swan Lake NWR and in other plans, sometimes the preferred alternative is revised following public review and sometimes a new alternative becomes the preferred alternative.

This plan needs serious alterations to hold to the original scope on which the SWAN LAKE REFUGE was originally built for being the enhancement of wetlands for waterfowl and primarily the CANADA goose.

The purpose of Swan Lake NWR is to provide for the needs of migratory birds and other wildlife. This includes ducks and geese, but also many other species of migratory birds. Management direction in the CCP provides for the needs of a wide variety of migratory birds with an emphasis on waterfowl and shorebirds.

I'm beginning to think that perhaps the Swan Lake mission is being changed without anyone actually saying that's what they're doing.

The purpose of Swan Lake NWR continues to be to provide for the needs of migratory birds and other wildlife.

We are totally against the whole plan. The reports on how things will go cannot be believed, just like the bear attacks in Yellowstone that are all covered up. This is just another case of our agencies making up their own laws instead of obeying what is already in place and I think the government should do something about it.

The U.S. Fish and Wildlife Service does not make up its own laws, we follow the laws and policies established by Congress. See Appendix G for a list of laws, policies and executive orders that apply to planning. The CCP and step-down plans that address all aspects of Refuge management are public documents.

It was hard to hear people at the open house at Swan Lake NWR in June, and some participants would have preferred a presentation rather than an open house.

We are sorry that the meeting style didn't meet people's needs. The Service prefers open house style meetings because, typically, they allow for more one-on-one conversations. Between the number of people who attended and the acoustics, the open house style was less successful than it could have been.

I am quite sure that the Missouri Conservation Department has weighed in on this matter, that your department has totally ignored their opinions. I find that insulting to our Conservation Department, it's agents and Missouri Citizens.

The Missouri Department of Conservation has been involved throughout this process and offered comments on the Draft CCP.

Can you help educate the people in our community about the positive impacts this could have for Swan Lake's wildlife?

Over time, we expect the CCP to provide education by demonstrating how changes to habitat management can have positive impacts for wildlife. Refuge's education programs and events will contribute to greater education about the CCP and its impacts on wildlife.

I am putting my comments in on these future plans, not that it will make a difference. Because your mind is all ready made up and you have all ready destroyed the best Canada goose Refuge in the MidWest.

Public comment resulted in the Service creating a new alternative that eliminated Objective 2-3: Eastern Massasauga Rattlesnake, eliminated Objective 1-1: Streams and Water Bodies, and created a new objective for managing Silver Lake that addresses concerns raised during the comment period. A new preferred alternative was selected. Your comments made a difference.

It is time for us to scrap this plan that was so clearly dreamed up in a committee of people sitting in a room out of touch with what Swan Lake is really about, and to use some common sense to come up with a plan to solve the problems of Swan Lake without devastating this refuge.

The CCP was developed with the participation of Refuge staff, Refuge System managers who have supervised Swan Lake NWR managers for decades and know it well, and state conservation officials. Public comment also shaped the completed CCP.

I hope you will consider the real life application of these changes and the affect it will have on local people and wildlife, the economy and the visitors to Swan lake Wildlife Refuge.

According to Banking on Nature, a study of how the presence of a national wildlife refuge impacts local economies, managing land to benefit wildlife has very positive impacts on people. We expect that changes at Swan Lake NWR, such as expanding hunting opportunities on the Refuge, will have positive effects for surrounding communities.

Why have a public comment period if the concern of the public is not going to be taken into consideration prior to adoption of the proposed Draft CCP

Public comments were considered and acted on throughout the Swan Lake NWR planning process. The CCP began with an open house and a 30-day comment period to find out what issues and opportunities people believed should be addressed in the CCP. Another open house and 30-day comment period were scheduled when a Draft CCP was available for review. A third comment period was held to give people an opportunity to comment on the new preferred alternative that was developed in response to public comment on the Draft CCP.

I know that this proposed plan is very limited in it's scope. It revolves around only one species, completely ignoring the entire ecosystem that is Swan Lake.

The CCP touches on all aspects of Refuge management to varying degrees. It provides management direction to address issues identified by the public, the Service, and others in a way that fulfills the purposes of the Refuge and the mission of the National Wildlife Refuge System, and that also adheres to Service policies. The purpose of the Refuge is to provide for the needs of migratory birds and other wildlife which includes hundreds of species.

If the Draft CCP is an opportunity for everyone who cares about Swan Lake and its future to review the proposed management direction and comment on it, why is management so intent on selecting an alternative that makes sense to them and no one else? It's opposed by most of the locals, the hunting clientel, and numerous congressional representatives.

A variety of conservation organizations supported the management direction proposed in the Draft CCP. While some people disagreed with the Draft CCP based on benefits to wildlife, much of the opposition was based on something other than wildlife issues. The Service is mandated by law and policy to manage the National Wildlife Refuge System for the benefit of wildlife first over competing interests.

Public Comments on Alternative 4

Retain the objective in Alternative 4 to introduce duck hunting and small-game hunting.

The objective is included in the CCP.

You also need to instruct the refuge manager to open the gates to south pool when freeze up occurs for the geese and ducks have open water. They have not been doing this and all the geese and ducks move to the Missouri river and don't come back till it warms up. Your lucky to have a few days of decent hunting in the last part of December and the whole month of January.

The Refuge manages water as a habitat management technique. The Refuge does not and will not "artificially" attempt to maintain open water during inclement weather conditions in order to hold birds in the local area.

Drawing down Silver Lake will eliminate fishing opportunities for people with disabilities; consider building a lake or pond that would be accessible.

Providing access for people with disabilities is an important part of Refuge visitor services. Fishing opportunities and associated facilities will be addressed in a Visitor Services Plan.

Another question is, when and if you draw down Silver lake will there be a special permit available to seine, hand fish etc. I believe this should be discussed before the draw down begins. It would be a shame for the fish to die, without the opportunity to get the fish.

We allow the collection of rough fish, in accordance with Missouri State Regulations, on Refuge wetland units that are drawn down. State law prohibits seining or hand fishing for game fish.

Finally, I continue to urge you to use the partner resources available...particularly Missouri Department of Conservation (MDC) and Ducks Unlimited (DU). I know that both have submitted constructive comments and are standing by to be helpful.

The Service has and will continue to partner with MDC and Ducks Unlimited.

Also thank you for attending the meeting on Sept. 17, 2010 in regard to the CCP. That proves to me you do care about this area and Silver Lake.

Thanks for the feedback.

It appears to me that all alternatives call for a draw down of Silver Lake.

Alternative 1, the No Action alternative proposed to continue existing management direction and did not include a drawdown of Silver Lake.

I am strongly opposed to changing Silver Lake into a wetlands program. If it has to be done, do it with Swan Lake itself.

There will be no changes to Silver Lake management during the initial years of the planning period. Under current management water levels are manipulated on the Swan Lake impoundment. Management of Silver Lake will be addressed in a Habitat Management Plan that will be developed within the next 5-7 years.

Increase the capacity of the Swan Lake water control structure to improve water management capacity for waterfowl habitat.

This has been discussed and we are currently looking at options. A larger water control structure would enhance management capabilities of the Swan Lake Impoundment as well as decrease flood damage to existing infrastructure. We will look at future budget opportunities to do this and partnership opportunities with organizations such as Ducks Unlimited and the Friends of Swan Lake NWR.

If the water level is dropped, the sprouting of willow trees will greatly reduce the water area and increase siltation on Silver lake. In addition you will have other invasive species that will have to be addressed.

There will be no changes to Silver Lake management during the initial years of the planning period. Management of Silver Lake, including treatment of invasive species, will be addressed in a Habitat Management Plan that will be developed within the next 5-7 years.

Continue to manage Silver Lake as source water for managing wetland units.

There will be no changes to Silver Lake water management during the initial years of the planning period. The CCP includes an objective to increase the amount of native foods for waterfowl within the Silver Lake by managing water levels. We will continue to collect additional monitoring data and within 5-7 years of CCP approval develop a detailed habitat management plan for achieving this objective that draws on the monitoring data and the results of a hydrogeomorphic study of the watershed. The habitat management plan will identify source water storage and man-

agement actions which will be implemented incrementally and monitored. Increasing waterfowl foods within the Silver Lake basin will not be done at the expense of source water for wetland management across the Refuge.

The recommended acreage of remaining crop ground should be guided by the results of the HGM.

Utilize farming to provide a low cost way to effectively manage as much suitable and feasible acreage as possible.

Service policy directs refuges to maintain or restore habitat to historic conditions if doing so is feasible and does not conflict with refuge purposes. Farming is not an establishing purpose at Swan Lake NWR, and we cannot justify the existing acreage in row crops. However, the availability of native seed, staff, and funding limit the amount of cropland that can be restored to other habitats in any given year. Therefore, the change from cropland to other habitats will be gradual over a number of years. By year 15 of the plan, approximately 400 acres will still be in crops, as well as additional periodic cropping within moist soil units. Specific actions and arrangement of habitats will be included in a step down management plan which will be guided by results of a hydrogeomorphic (HGM) study as well as additional monitoring data.

You also need to plant all 1,400 acres in row crops. Geese and ducks can live on grass and weeds early in the season but when it gets cold they need grain.

The Refuge provides habitat for a diversity of ducks and geese (26 documented species; see Appendix C) which require high energy foods especially during migration and wintering. Crops, especially corn, do provide high energy food but it is available to only a few of the waterfowl species that occur on the Refuge (mostly mallards and geese). The CCP calls for converting about 1,000 acres of cropland to native habitats that include plants used as food by a diversity of waterfowl and many other migratory birds.

Small game and waterfowl hunting is proposed in Alternative 4. Even though there is still goose hunting lets make sure we retain the small game and duck hunting for Swan Lake. If done right this could possibly rival the best waterfowl hunting that the state of Missouri has to offer. This would be a big economic boost to the entire Swan Lake Zone! We want duck hunting at Swan Lake!

Regarding funding, the draft does not mention the possibility of adding partners and seeking a NAWCA grant to help pay for wetland restoration. This would seem to be prudent and it might be helpful to mention it in the final plan.

The CCP includes an objective to introduce duck hunting. We will further evaluate hunting opportunities available at Swan Lake as we develop a hunting plan and evaluate hunting through an Environmental Assessment. Specific habitat improvement projects will be identified in a habitat management plan. Once specific projects are identified we will seek suitable funding including North American Wetlands Conservation Act (NAWCA) grants.

This refuge of 10,795 acres should have more key staff members.

The CCP calls for increasing the amount of staff at the Refuge contingent on available funding.

If you draw down the Silver lake without forming this small lake or pond Cindy and others that is handicapped will not have a place to fish. Cindy's daughter was at Sept. 17 meeting asking you about handicap fishing places. She feels she did not get a straight answer.

We will ensure that public use opportunities are readily accessible to and usable by individuals with disabilities, unless it would result in a fundamental alteration in the nature of a service, program, or activity or in undue financial and administrative burdens.

It seems that your strategy is to study, evaluate and delay till those in opposition to the plan to drawn down Silver Lake will tire or go away. Mr. Springer's closing remark was that after meeting with this group tonight, "I do not think that this is going happen."

There is no effort to delay a decision until opposition tires or goes away. We have decided to collect more information to ensure that we make the best decision for wildlife resources and the public.

