U.S. Fish & Wildlife Service

Iowa River Corridor Project

Port Louisa National Wildlife Refuge

Final Comprehensive Management Plan

U.S. Department of the Interior
Fish and Wildlife Service
Region 3 (Midwest Region); Bloomington, MN

The mission of the U.S. Fish & Wildlife Service is working with others to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people.

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.

This comprehensive management plan was completed in partnership with the Iowa Department of Natural Resources (Department) per the terms of the 2004 Memorandum of Understanding (MOU) between the Department and the U.S. Fish and Wildlife Service (Service). The plan is signed by the Service as approval of this plan for implementation on National Wildlife Refuge System lands that are part of the Iowa River Corridor Project in Iowa. It will be implemented under the terms of the MOU with the Department. A Comprehensive Conservation Plan (CCP) that meets Service planning policy for refuge lands will be completed during the next revision of the Port Louisa National Wildlife Refuge (Refuge) CCP.

Cathy Henry 5/29/13

Cathy Henry, Refuge Manager — Date

6/4/13

Kevin Foerster, Area 1 Refuge Supervisor — Date

6-24-13

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Chapter 1: Introduction and Background

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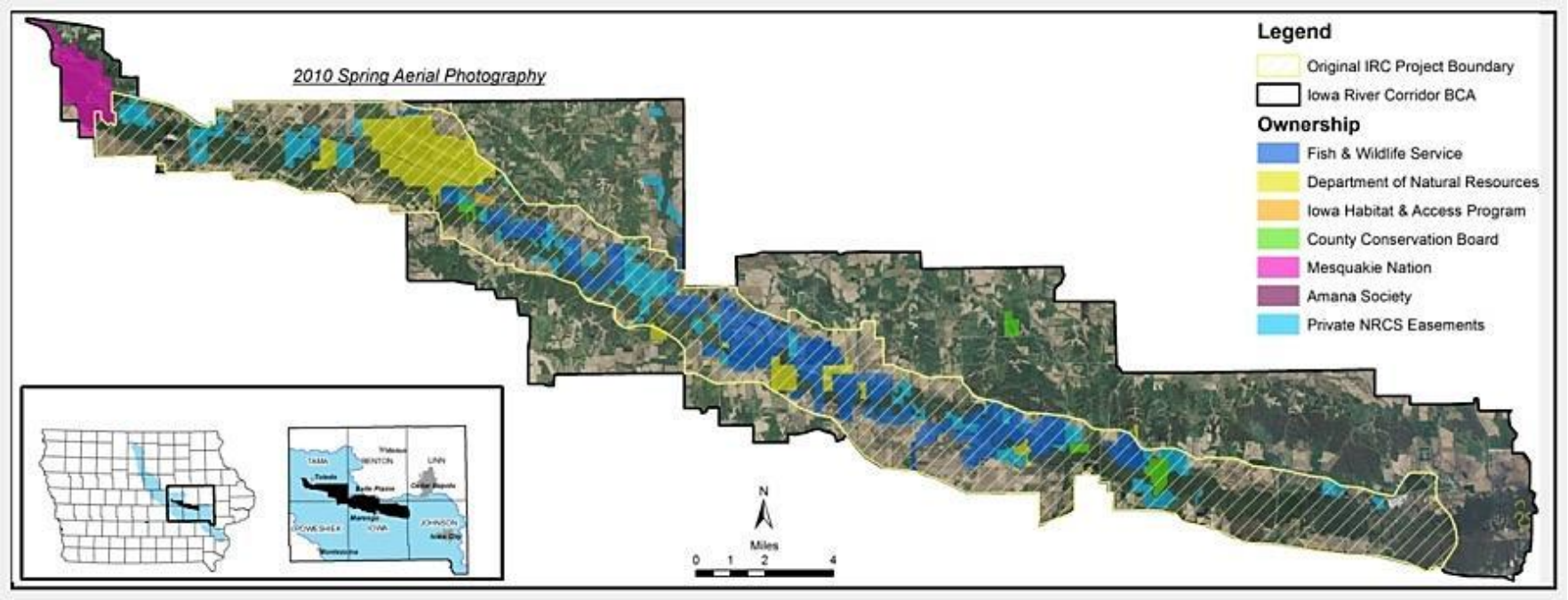
The Iowa River Corridor Project (IRCP) in east central Iowa was created following the Great Flood of 1993 to provide options to landowners plagued by increased flooding and to reduce the recovery costs from floods. For decades, landowners in the Iowa River floodplain responded to floods by repairing levees and fields, because no other options were available. But when the 1993 flood caused an estimated 6.9 million dollars in damages to land levees in the corridor, landowners responded enthusiastically to alternatives that would provide a permanent solution to chronic flood damage. The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) provided an alternative to field and levee repair through the Emergency Wetland Reserve Program (EWRP). Through the EWRP, landowners with wet, flood-damaged crop ground were offered a one-time payment that was roughly equal to the value of their crop rights. In return, they agreed to grant a permanent easement and to restore their crop ground to its original wetland condition.

The U.S. Fish and Wildlife Service (FWS, Service) evaluated the wildlife and recreational potential of the IRCP and agreed to buy the residual value of the land where landowners desired a total buyout. Lands acquired by the Service became part of the National Wildlife Refuge System (NWRS, Refuge System) managed under Port Louisa National Wildlife Refuge (NWR, Refuge) in Wapello, Iowa. The Iowa Department of Natural Resources (DNR) entered into a Memorandum of Understanding (MOU) with the Service to manage these public lands as a state wildlife management area (WMA) on behalf of the Service (appendix A). The lands are therefore managed as part of the DNR's Iowa River Wildlife Unit.

An Environmental Assessment (EA) for land acquisition was completed in 1995 (FWS, 1995) and lands were subsequently acquired through the late 1990s. The acquisition boundary surrounds the floodplain area from just west of Tama, Iowa east to Amana, Iowa (figure 1-1). The authority for acquisition of these lands was the Emergency Wetland Resources Act of 1986 (16 U.S.C. 3901). The purposes of these refuge lands are therefore the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions. The 1995 EA also outlines the purposes of:

- Providing habitat for migratory birds and endangered species.
- Improving the natural diversity of the ecosystem through restoration and protection of floodplain habitat.
- Providing an alternative to levee reconstruction and reclaiming damaged farmland.
- Increasing public opportunities for outdoor recreation, such as hunting or fishing, and environmental education compatible with the preceding purposes.

Figure 1-1: Iowa River Corridor Project showing Bird Conservation Area, Service acquisition boundary and land ownership



The IRCP acquisition boundary is approximately 50,000 acres and stretches along 45 miles of the Iowa River, from the city of Tama to the Amana Colonies in Benton, Iowa, and Tama Counties. Additional USDA easements have been enrolled since the inception of the IRCP. There are currently 105 USDA easements in the IRCP, for about 12,886 acres, using a combination of EWRP, Wetland Reserve Program (WRP) and Emergency Watershed Program (EWP) easements. The Service has purchased fee title on 7,775 acres of these easements, as well as an additional 1,558 acres of unencumbered county owned land. Iowa DNR owns 4,226 acres in the IRCP, some also overlaying easements. Figure 1-1 shows all public ownership in the IRCP. In this document, IRCP will be used to refer to the Service acquisition boundary. Easements that have remained in private ownership are also shown in figure 1-1 and make up 5,111 acres with 52 easements.

Much restoration work has been completed since lands were acquired and more remains to be done. Wetlands have been restored, native prairie has been planted, forest resources have been rejuvenated, and fire has been returned to the land as a natural management tool. The IRCP provides a relatively large block of habitat in a largely agricultural area and contributes to many wildlife population goals. It also provides a place of recreation, flood protection, and aesthetic values for its citizens.

Need for the Plan

Refuge System lands in the IRCP are administered from Port Louisa NWR in Wapello, Iowa. A Comprehensive Conservation Plan (CCP) was completed for Port Louisa NWR in 2004 but it did not include the IRCP in its identified Area of Ecological Concern encompassed by the plan (FWS, 2004). The MOU between the Service and DNR (appendix A) states that the DNR will prepare and maintain a Comprehensive Management Plan (CMP) that considers the NRCS easement tract plans. This CMP is needed to establish long-term management direction, and to clarify habitat goals, agency roles, and public use opportunities. A CCP is not being completed at this time, but the IRCP will be included in the next revision of the Port Louisa NWR CCP due in 2019. There have been increasing stressors on the Iowa River watershed with ongoing changes to hydrology, potential climate change impacts, and human uses that have increased the need to review and plan management of these lands. In addition, new habitat management strategies may be available that were not considered in the 1990s.

The CMP is also needed to clarify public uses and align with federal policies. The Code of Federal Regulations (50 CFR 32.1 and 32.4) requires that a hunting and fishing plan be completed to open refuge lands to these activities. The hunting/fishing plan must undergo an EA under the National Environmental Policy Act (NEPA) and subsequently be submitted to the Federal Register to publish the associated rules. IRCP lands were originally opened under the MOU as lands were acquired and the state took over management; therefore, hunting/fishing plans were never completed for the IRCP. The lands are currently open to hunting, fishing, and trapping. Hunting and fishing plans have been completed.

According to the MOU, the CMP describes the overall habitat objectives and public use program, as well as specific management strategies. The plan is to describe habitat development and maintenance activities required to achieve and support Refuge System goals, refuge purposes, and IRCP objectives. The MOU states that project plans will not significantly affect river hydrology, and wildlife and habitat objectives will be based on migratory bird and

indigenous wildlife habitat needs. Public use objectives will be wildlife-dependent activities consistent with Refuge System policies.

Planning Area and Partnerships

The IRCP is a good example of agencies and partners working together to conserve wildlife and their habitats

The primary purpose of the IRCP was as a floodplain protection effort with multiple agencies and landowners involved. The goals of the project were intended to be ecosystem based and not single resource driven (FWS, 1995). This philosophy and purpose must be kept in mind when developing plans for this area, and refuge lands and wildlife habitat cannot be viewed in isolation. The IRCP is a good example of agencies and partners working together to conserve wildlife and their habitats while improving the floodplain for the people that live there. Refuge lands in the IRCP are intermingled with, or adjacent to, state lands, U.S. Army Corps of Engineers lands, private lands with easements, private lands without easements, tribal lands, Iowa's largest privately held and managed forest (Amana Forest), and city and county lands.

Subsequent to the IRCP, a Bird Conservation Area (BCA) was established in 2004 encompassing 133,475 acres with 25 percent of the lands within it protected (figure 1-1). This area was chosen as a BCA because it contained a core area of protected lands with a diversity of habitats. It provides habitat for 87 percent of Iowa's Bird Species of Greatest Conservation Need (SGCN) (appendix C). This BCA represents a logical area for a larger scale planning area of interest where partners are already communicating and working together to protect and restore wildlife habitat. This CMP therefore assesses and formulates goals for lands managed under the MOU in the context of this larger area of interest. The CMP only outlines goals and objectives for lands in Service ownership but considers the entire BCA in development of those objectives and discusses joint efforts in the IRCP.

The IRCP is managed under a unique partnership between the Service, Iowa DNR, and NRCS. Other partners also contribute significantly to the management of the IRCP. The DNR retains the majority of day-to-day, on-the-ground management. The DNR has staff at the Iowa River Wildlife Unit dedicated to managing Service and DNR lands in the IRCP. NRCS has provided restoration funding and technical assistance. The Service provides prescribed fire management oversight and assistance, shares equipment, and provides funding when possible for supplies or services. This partnership has been successful and will hopefully continue well into the future.

Legal Context and Other Relevant Plans

National Wildlife Refuge System Mission and Goals

The mission of the 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.

Revised goals for the Refuge System were adopted on July 26, 2006 and are incorporated into Part 601, chapter 1, of the *Fish and Wildlife Service Manual* (601 FW 1). The goals are:

- 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 underrepresented 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 the natural environment.

In July 2011, the Refuge System adopted a new vision with ratification of the *Conserving the Future: Wildlife Refuges and the Next Generation* document (FWS, 2011). The new vision calls for embracing a scientific, landscape-level approach to conserving, managing, and restoring refuge lands and waters, and working to facilitate conservation benefits beyond our boundaries. The Refuge System seeks to make wildlife conservation more relevant to American citizens and foster their engagement in and support of the Refuge System.

National Wildlife Refuge System Improvement Act of 1997

The passage of this act gave guidance to the Secretary of the Interior for the overall management of the Refuge System. The act's main components include:

- A strong and singular wildlife conservation mission for the Refuge System;
- A requirement that the Secretary of the Interior maintain the biological integrity, diversity and environmental health of the Refuge System;
- A new process for determining compatible uses on refuges;
- A recognition that wildlife-dependent recreational uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation, when

determined to be compatible, are legitimate and appropriate public uses of the Refuge System;

- That these compatible wildlife-dependent recreational uses are the priority general public uses of the Refuge System; and
- A requirement for preparing a comprehensive conservation plan for each refuge.

Other laws that apply to management of national wildlife refuge lands are the National Wildlife Refuge System Administration Act of 1966, Fish and Wildlife Coordination Act of 1934, Archaeological and Historic Preservation Act of 1974 and Archaeological Resources Protection Act of 1979 as amended, and National Environmental Policy Act of1969. See appendix H for a list of laws and policies relevant to the National Wildlife Refuge System.

Biological Integrity, Diversity, and Environmental Health Policy

The Service's Biological Integrity, Diversity, and Environmental Health policy (601 FW3) is an additional directive for refuge managers to follow while achieving refuge purposes and the Refuge System mission. It provides for the consideration and protection of the broad spectrum of fish, wildlife, and habitat resources found on refuges and associated ecosystems. Further, it provides refuge managers with an evaluation process to analyze their refuge and recommend the best management direction to prevent further degradation of environmental conditions; and where appropriate and in concert with refuge purposes and Refuge System mission, restore lost or severely degraded components.

The policy recognizes that biological integrity, diversity, and environmental health can be described at various landscape scales from refuge to ecosystem, national, and international. Each landscape scale has a measure of biological integrity, diversity, and environmental health dependent on how the existing habitats, ecosystem processes, and wildlife populations have been altered in comparison to historic conditions. Levels of biological integrity, diversity, and environmental health vary among refuges and often within refuges over time. Individual refuges contribute to biological integrity, diversity, and environmental health at larger landscape scales, especially when they support populations and habitats that have been lost at an ecosystem, national, or even international scale. In pursuit of refuge purposes, individual refuges may at times compromise elements of biological integrity, diversity, and environmental health at the refuge scale in support of those components at larger landscape scales. When evaluating the appropriate management direction for refuges, refuge managers will consider their refuges' contribution to biological integrity, diversity, and environmental health at multiple landscape scales.

Existing levels of biological integrity, diversity, and environmental health must first be maintained at the refuge scale. Lost or severely degraded elements of integrity, diversity, and environmental health will be restored at the refuge scale and other appropriate landscape scales where it is feasible and supports achievement of refuge purpose(s) and Refuge System mission.

Management, ranging from preservation to active manipulation of habitats and populations, is necessary to maintain biological integrity, diversity, and environmental health. Management that restores or mimics natural ecosystem processes or functions to achieve refuge purpose(s) is preferred. Some refuges may differ from the frequency and timing of natural processes in order

to meet refuge purpose(s) or address biological integrity, diversity, and environmental health at larger landscape scales.

Refuge managers will use sound professional judgment when implementing this policy primarily during the comprehensive conservation planning process to determine: the relationship between refuge purpose(s) and biological integrity, diversity, and environmental health; what conditions constitute biological integrity, diversity, and environmental health; how to maintain existing levels of all three; and how and when to appropriately restore lost elements of all three. These determinations are inherently complex. Sound professional judgment incorporates field experience, knowledge of refuge resources, the refuge role within an ecosystem, applicable laws, and best available science including consultation with others both inside and outside the Service.

USDA Easements

The IRCP began with disastrous floods and subsequent programs to enroll eligible landowners into various easement programs, as noted above, that are designed to return farmland to wetlands. All of these programs are voluntary, offering landowners the opportunity to protect, restore, and enhance wetlands on their property. The USDA NRCS provides technical and financial support to help landowners with their wetland restoration efforts. Additional funding for easements was provided after the 2008 flood under the EWP program that authorizes the Secretary of Agriculture to undertake emergency measures, including the purchase of floodplain easements, for runoff retardation and soil erosion prevention. There is a mixture of easements on private lands, DNR lands, and Service lands within the IRCP (figure 1-1).

The purpose of the easements are to restore, protect, and maintain the functional values of wetlands and other eligible lands for wildlife habitat, water quality improvement, flood water retention, groundwater recharge, open space, aesthetic values, and environmental education. NRCS developed restoration plans under a plan of operations for each easement and retains oversight of easements in federal and state ownership (appendix B). Prohibitions under the easements include construction of structures, planting for harvest any agricultural commodity, manipulation of the easement area, which would have an adverse effect on the hydrology, and alteration of the wildlife habitat or other natural land features of the easement area. NRCS has completed planned wetland restorations, but there is more potential for restorations. Funds for additional wetland or grassland restoration may come from NRCS, DNR, or the Service. Compatible uses according to the easements allow production and harvest of forestry products from areas within the scope of a DNR forestry management plan, grazing in accordance with a NRCS grazing management plan, and one cutting of hay annually. Improvements for environmental education are allowed such as parking lots, interpretive signage, and observation decks. Hunting, fishing, and trapping are allowed on easement lands. Annual management plans and reports have been used to determine that management and uses on refuge lands that overlay easements are compatible under NRCS guidelines and rules.

Iowa DNR Wildlife Management Area Mission and Goals

The Iowa DNR mission is to conserve and enhance natural resources in cooperation with individuals and organizations to improve the quality of life in Iowa and ensure a legacy for future generations. Core DNR functions are conservation, preservation, and stewardship, enforcement and investigation, recreation, regulation and compliance, research, analysis, and information management, and resource management. Iowa Code 571-51.2 (481A.6)

establishes lands and waters under the jurisdiction of the Department of Natural Resources as game management areas.

Cooperative Farming on National Wildlife Refuge lands

Crop production has been used since the 1990s as a habitat management tool on both DNR and Service lands in the IRCP. Food plots for wildlife and habitat purposes are allowed on USDA easements with their Compatible Use Authorization. However, food plots have typically been placed on lands that do not have easements on them. Most years, about 200 acres, or two percent of refuge lands, have been put into food plots as part of annual DNR management strategies in the Iowa River Wildlife Unit. Some of the acres are planted in row crops of corn or soybeans by a cooperative farmer, and some smaller food plots of corn, soybean, sorghum, rape, sunflowers are planted by the DNR or by a cooperator. Crops may be used to control weeds and woody encroachment and prepare lands for restoration to native grasslands, but also to provide supplemental food for both migrating and resident wildlife. Grain is used as a food source by waterfowl, Sandhill Cranes, turkeys, deer, pheasants, and other wildlife in the IRCP. Restoration of grassland and forest habitat has met with limited success on the lowest elevations of the corridor lands where invasive reed canary grass dominates. Subsequently, native foods are not as abundant as desired. The Iowa DNR has found that food plots can help to attract depredating wildlife from adjacent private croplands to assist with neighbor relations.

In 2011, Region 3 (Midwest Region) of the Service completed an EA for row crop farming and the use of genetically modified glyphosate tolerant (GMGT) corn and soybeans on refuge lands (FWS, 2011). The Service has used row crop farming on refuge lands as a tool in restoring native habitats, controlling noxious weeds, and providing food for migratory birds and resident wildlife for many years. For the past several years, the Service has been reducing the number of acres farmed on Refuge System lands. Farming policy and changes in agricultural practices, such as the increased use of genetically-modified crops, prompted a need to reevaluate farming on Service lands in the Midwest Region.

Under the selected alternative, beginning in calendar year 2012, the use of GMGT corn and soybeans on Refuge System lands in the Midwest Region would continue only for the purpose of habitat restoration (FWS, 2011, appendix E). The use of GMGT corn and soybeans would be limited to five years for any individual tract in preparation for habitat restoration. Farming could continue to be used as a management tool for achieving multiple objectives; however, it would be limited to non GMGT crops only for objectives other than habitat restoration. Multiple objectives include but are not limited to the following:

- habitat restoration
- habitat management
- supplemental food for wildlife
- attracting wildlife for viewing and photography

The Service's biological integrity policy specifies that GMGT crops cannot be used on Refuge System lands unless they are "essential to accomplishing refuge purposes." Habitat restoration is a core objective of most refuges and wetland management districts (district) to achieve purposes, and the use of GMGT crops could be essential in some circumstances. However, habitat management, providing supplemental food, and wildlife viewing objectives can more

readily be accomplished without the use of GMGT corn and soybeans, and thus the use of GMGT crops would not be essential.

Refuge and district managers would be required to demonstrate that their proposed use of GMGT crops is essential for habitat restoration. The Service has established an approval process for the use of GMGT corn and soybeans that includes completion of an Eligibility Questionnaire for Genetically Modified Crops. When managers propose to use GMGT corn and soybeans, they are required to complete this questionnaire as part of the approval process. The regional chief of refuges approved the request for authorization to use GMGT corn and soybeans on refuge lands in the IRCP (appendix D).

Currently, food plot programs involve either DNR staff and equipment or a third party, who farms under the terms and conditions of a cooperative habitat management agreement. The DNR has been developing and managing the agreements to establish how long planting of food plots is allowed on a specific tract and establish the crops and crop rotation that will be used. The terms and conditions typically include a provision for leaving some percentage of the crops in the field as food for wildlife, primarily migrating birds. The farming activities have to be found compatible through a refuge compatibility determination before they can be allowed. The compatibility determinations for corridor lands are in appendix D.

DNR staff work with cooperators to use best management practices to improve soils, reduce pest issues, lessen impacts to wildlife, and to prevent sediment, chemical and nutrient runoff. These practices include crop rotation, cover crops, no-till planting, and use of herbicides with low environmental impact.

Relation to Other Conservation Plans

Planning for habitat management on the refuge must consider the role of the refuge in contributing to wildlife population goals and meeting larger landscape-wide conservation priorities. IRCP lands are located within several different landscape-level planning units, which emphasizes its importance in regional conservation efforts. In addition, several ongoing migratory bird conservation initiatives are relevant to this planning effort. Described below are existing plans or documents that were used to help determine conservation priorities and wildlife habitat management objectives.

Iowa Wildlife Action Plan

Each state was instructed by Congress to create a state wildlife action plan (SWAP). These plans evaluate the vitality of wildlife populations and recommend actions to conserve the targeted species and their habitats. The Iowa plan was completed in 2005 with a 2006 revision (Zohrer, 2006). The SWAP identifies SGCN for the state. SGCN that occur in the IRCP are given in appendix C. The plan states that all wildlife habitats in Iowa that support SGCN have been greatly reduced and all are imperiled to some extent. Therefore, efforts to preserve SGCN should address all species in all habitats. The IRCP is one of the larger existing protected land complexes in the state and is identified as a priority area for cooperative conservation action (Zohrer, 2006). Habitat objectives in this IRCP management plan were developed primarily to meet the needs of Iowa's SGCN and the goals in the SWAP. Most of the SGCN species are also on the Service's Birds of Conservation Concern list, or threatened and endangered species, and meet larger Service objectives as well.

Iowa River Corridor Bird Conservation Area

The Iowa River Corridor BCA was the first Iowa BCA centered on a river corridor. Extending 45 miles from near Montour in Tama County to the Homestead area in Iowa County, the BCA includes a wealth of habitats including forest, wetland, grassland, woodland, and savanna.

This diverse landscape provides habitat for 87 percent of Iowa's 85 Bird SCGN. Bald Eagle, Least Bittern, Grasshopper Sparrow, Cerulean Warbler, Black-crowned and Yellow-crowned Night-Herons, Bobolink, Loggerhead Shrike, and Red-headed Woodpecker are examples of species that rely on this area for nesting or migration. Sandhill Cranes have nested in the area since 1992. A wide variety of other wildlife species are provided for by the diversity of habitat that is present including the ornate box turtle, river otter, and regal fritillary butterfly.

Sandhill Crane in the Iowa River Corridor BCA

Because of the nationwide importance of this area for birds, especially the waterbirds that depend on the IRCP for nesting and migration, it has also been designated as one of the Audubon Society's Important Bird Areas (IBA). This program is a global effort to identify and conserve areas that are vital to birds and other wildlife. Designated IBAs include sites for breeding, wintering, and/or migrating birds. By working to identify and implement conservation strategies, the IBA program hopes to minimize the effects of habitat degradation and loss on birds and other wildlife. The IBA program is a starting point for site-based conservation efforts in the IRCP, and stakeholders met in 2012 to identify needs in the BCA. More information on wildlife species, particularly birds, was identified as a need, as well as education about birds and their habitats.

Eastern Tallgrass Prairie/Big Rivers Landscape Conservation Cooperative

The Iowa River lies within the Eastern Tallgrass Prairie/Big Rivers (ETPBR) Landscape Conservation Cooperative (LCC). LLCs have been formed, initiating at the federal level, across the country to bring partners and stakeholders together to develop and implement common conservation goals. The ETPBR LCC cuts a vast swath across the middle of America's heartland, covering the area more commonly referred to as the "corn belt." The ETPBR LCC covers portions of 11 states, and runs from southwest Ohio westward across to parts of eastern Kansas, Oklahoma, and Nebraska and northward up into segments of Iowa, South Dakota, and Minnesota. While the ETPBR LCC landscape is predominantly agricultural and in private ownership, the area also contains numerous state and federally managed tracts of land such as national wildlife refuges, state WMAs, land trust parcels, and nature preserves providing habitat for a wide variety of aquatic and terrestrial species of wildlife. Additionally, many of the agricultural practices and set-aside programs through the Federal Farm Bill have created wildlife habitat, as well as state and federal programs to create and conserve forested lands, usually in small fragmented woodlots, which dot the agricultural landscape

(http://www.fws.gov/midwest/climate/LCC/ETPBR/). Currently, there are not larger conservation goals for this LCC that the IRCP can link to, but those may be developed in the future. The IRCP is a good example of a local area where multiple partners have come together to provide floodplain protection and wildlife conservation goals that contribute to larger landscape goals.

FWS Region 3 Fish and Wildlife Resource Priorities, 2002

The priorities presented within this Region 3 report identify the 243 species considered to be in the greatest need of attention within the Midwest under the Service's full span of authorities (FWS, 2002). The identified strategies will contribute to the conservation, protection, and recovery of migratory birds, threatened and endangered species, and interjurisdictional fish, as well as the habitats on which they depend. The priority species identified and their associated conservation management recommendations were considered in development of this IRCP plan.

FWS Birds of Conservation Concern List, 2008

The 1988 amendment to the Fish and Wildlife Conservation Act mandates the Service to "identify species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for Listing under the Endangered Species Act (ESA) of 1973". Birds of Conservation Concern 2008 (FWS) is the most recent effort to carry out this mandate. The overall goal of this report is to accurately identify the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent the Service's highest conservation priorities. Birds are listed by Bird Conservation Region (BCR) in this list. The Iowa River Corridor lies within BCR 22.

North American Waterfowl Management Plan

The North American Waterfowl Management Plan (NAWMP) is a partnership effort to restore waterfowl populations to historic levels; it was developed in 1986, with objectives and strategies evolving through NAWMP Updates. A new document was released in 2012 with specific population objectives forthcoming (http://static.nawmprevision.org/sites/default/files/NAWMP-Plan-EN-may23.pdf). The IRCP lies within the Upper Mississippi River and Great Lakes Region Joint Venture area. However, the IRCP is not identified within an area of greatest continental significance in the 2012 revised plan.

North American Waterbird Conservation Plan

Version 1 of the North American Waterbird Conservation Plan (Kushlan et al., 2002), provides an overarching continental framework and guide for conserving waterbirds. It sets forth goals and priorities for waterbirds in all habitats from the Canadian Arctic to Panama, from Bermuda through the U.S. Pacific Islands, at nesting sites, during annual migrations, and during nonbreeding periods. It advocates continent-wide monitoring; provides an impetus for regional conservation planning; proposes national, state, provincial, and other local conservation planning and action; and gives a larger context for local habitat protection.

The Upper Mississippi River Great Lakes Region Joint Venture (UMRGLR JV) Waterbird Habitat Conservation Strategy (Soulliere et al., 2007) lists priority species, population trends, and population goals for BCR 22. The five focal species identified in this plan (Yellow Rail, King

Rail, Black Tern, Common Tern, Black-crowned Night-Heron) all can occur in the IRCP. Habitats in the IRCP contribute to the amount of hectares of each habitat type identified for BCR 22 in Iowa in the Joint Venture plan.

U.S. Shorebird Conservation Plan

Partners from state and federal agencies and non-governmental organizations from across the country pooled their resources and expertise to develop a conservation strategy for migratory shorebirds and the habitats upon which they depend (Brown et al., 2001). The plan provides a scientific framework to determine species, sites, and habitats that most urgently need conservation action. Main goals of the plan, completed in 2000, are to ensure that adequate quantity and quality of shorebird habitat is maintained at the local level and to maintain or restore shorebird populations at the continental and hemispheric levels. Separate technical reports were developed for a conservation assessment, research needs, a comprehensive monitoring strategy, and education and outreach. These national assessments were used to step down goals and objectives into 11 regional conservation plans. A UMRGLR JV plan was developed in 2007 (Potter et al., 2007). Habitats in the IRCP contribute to the restoration and habitat objectives identified for BCR 22.

North American Landbird Conservation Plan

The North American Landbird Conservation Plan provides a continental synthesis of priorities and objectives that will guide landbird conservation actions at national and international scales. While the scope for this first version is limited to the 448 native landbirds that breed in the United States and Canada, full participation by Mexican partners will add another 450 breeding species to the next iteration of the plan. Together with plans for shorebirds, waterbirds, waterfowl, and other game birds, this document serves as the blueprint for continental habitat conservation under the North American Bird Conservation Initiative (NABCI) (Rich et al., 2004). The IRCP is in the Prairie avifaunal biome. Species of continental importance for this biome, such as Henslow's Sparrows, Grasshopper Sparrows, Bell's Vireo, Red-headed Woodpecker, and others occur in the IRCP.

This plan is stepped down into Partners in Flight Plans for physiographic areas. The IRCP is in physiographic area 32 (Fitzgerald and Pashley, 2000). Partners in Flight priority bird species are designated in appendix C.

National (Refuge System) Strategy for the Management of Invasive Species (2002)

Invasive species have become the single greatest threat to the Refuge System and the Service wildlife conservation mission. Their many negative effects include habitat degradation, competition with native species, and significant contribution to the decline of trust species. This strategy was developed to function as the internal guidance document for invasive species throughout the Refuge System. The prevalent invasive species in the IRCP is reed canary grass.

Iowa-Cedar Watershed Interagency Coordination Team

In 2009, the Iowa-Cedar Watershed Interagency Coordination Team was initiated by the U.S. Army Corps of Engineers to provide a comprehensive watershed plan and process for interagency collaboration and public participation to address water resource and related land resource problems and opportunities in the basin in the interests of increasing social and economic value, increasing ecological integrity, and managing risk (http://iowacedarbasin.org/). The geographic scope of this planning area includes IRCP lands and the Iowa-Cedar Rivers Basin, Hydrologic Unit Code (HUC) 8 Watersheds, and Micro-Watersheds (HUC12) for special study. Planning is ongoing.

Chapter 2: Planning Process and Issues

In this chapter:

Scoping of the issues was conducted in a meeting with the Iowa Department of Natural Resources (DNR) and the Natural Resources Conservation Service (NRCS) in January 2012. Issues for the larger Bird Conservation Area (BCA) were also discussed at a meeting with partners that was held by the Audubon Society in April 2012.

Planning issues were identified as follows:

- Altered hydrology of the Iowa River and watershed
- Invasive species impacts, primarily reed canarygrass (RCG)
- Invasion of early successional woody species, primarily willow, into grasslands
- Low diversity floodplain forests
- Runoff from surrounding agricultural lands
- Potential new management tools such as biofuels harvest
- Clarification of public uses allowed
- Lack of specific or extensive data on biological resources

Hydrology Issues

As noted in the introduction, the Iowa River has experienced major floods in the last couple of decades. 2008 was the new flood of record subsequent to 1993. Although the Iowa River Corridor Project (IRCP) was established to return floodplain lands to a naturally revegetated state, flooding and altered hydrology make restoration and management challenging. Although about 18,670 acres of the floodplain within the IRCP is in Wetland Reserve Program (WRP), Emergency Watershed Program, or public ownership for conservation, it is still affected by surrounding land uses. Land use and land cover in the Iowa-Cedar watershed is primarily agricultural with about 93 percent of the total area used for cropland or pasture (http://iowacedarbasin.org/). Land is largely privately owned in the watershed. The principal crops are corn, soybeans, hay, and oats. The remaining land area consists of about four percent forests, about two percent urban, and about one percent water and wetlands (http://iowacedarbasin.org/). This land use greatly affects the hydrology and habitats within the IRCP. The Service hydrologist completed a water resources inventory and assessment for this area in 2012 that is summarized in the hydrology section in chapter 3 and provides information that assists with planning.

Wildlife Issues

More information and assessment of migratory bird use is needed in the IRCP. Little is known about songbird or waterbird populations in the IRCP or the larger BCA. Additional inventory information would aid in development of management objectives and strategies. The new Iowa breeding bird atlas will be a useful tool to assess breeding birds in the IRCP. Many of the Species of Greatest Conservation Need (SGCN) identified in Iowa's state wildlife action plan and as Fish and Wildlife Conservation Priorities for U.S. Fish and Wildlife Service (FWS, Service), Region 3 (FWS, 2002), use the IRCP. Local pheasant populations have declined along with the state population (Iowa DNR, 2012) thereby decreasing hunter use of the area.

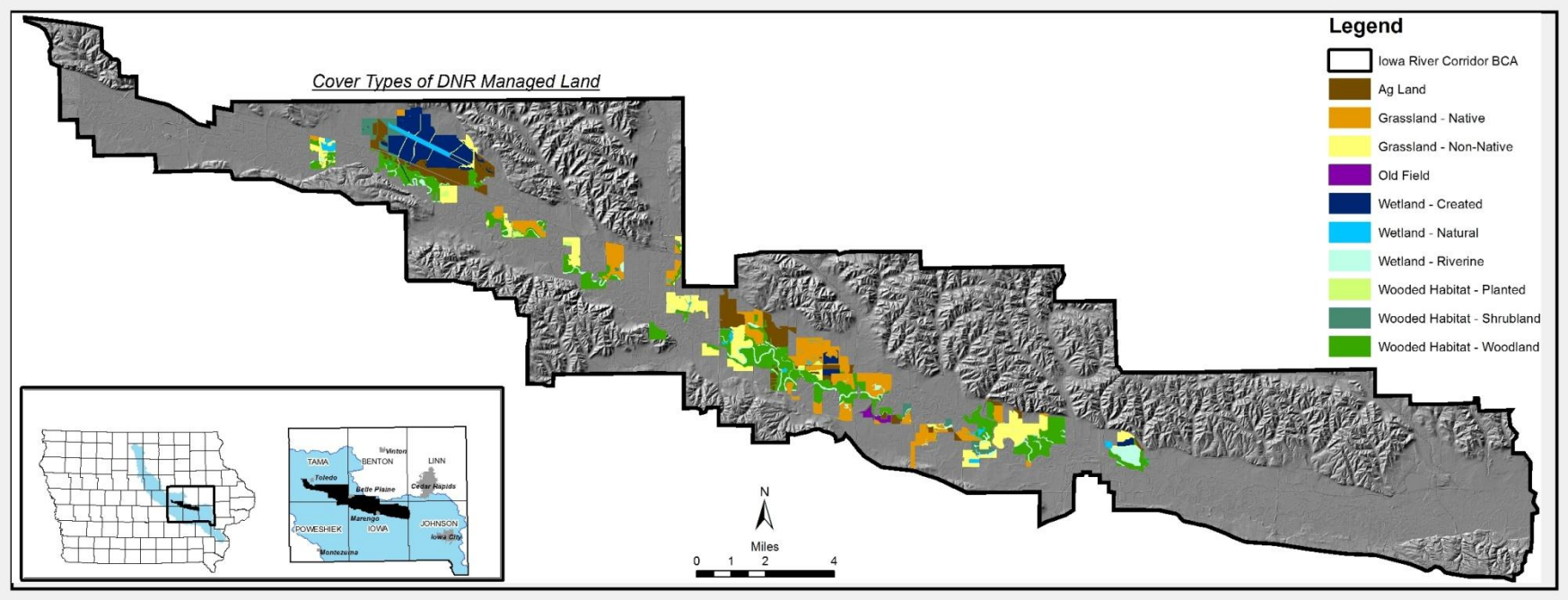
Habitat Issues

Although much of the IRCP has been successfully restored to native prairie species, grassland and forest restoration efforts in the IRCP have often been unsuccessful due to flooding and prolonged inundation before plants could become established. Planting container trees has been used with some success, but is more labor intensive. The largest habitat challenge is RCG invasion. RCG is widespread in floodplains in the Midwest and is an aggressive perennial grass. Approximately 1,900 acres of the IRCP are invaded by this species, predominantly in the lowest elevations (figure 2-1). RCG is present in most of the Iowa River watershed, and seed is spread through flooding so that there is a continual input of seed. RCG can be set back for two to four years with mowing and chemical treatment to provide annual plant growth that provides an interim food source for wildlife and improved habitat. Some RCG dominated fields have been treated with herbicide and seeded with native prairie species with success.

Much of the grassland acres are also undergoing succession with woody species due to lack of disturbances and altered hydrology. Sandbar willow, cottonwood, ash, and dogwood are the predominant successional species. Although some percentage of this habitat is desirable for many bird species, if left unmanaged it will become the dominant habitat type. Willow and early successional species are currently estimated to be 15 to 20 percent of the habitat in the IRCP. Flooding and wet conditions have made access for management difficult during many years, which exacerbate the problem. Fire, mowing, and chemical treatment have all been used successfully to provide at least short-term control, but it is difficult to treat enough acres due to funding, staffing, weather and seasonal constraints, and flooding. Recent interests in the harvest of grass or woody material for biofuels may be a new tool for treating larger areas of both RCG and woody successional species. A more precise determination of how much of this habitat exists, and where, in the IRCP is needed.

The prolonged duration of the 1993 flood killed many of the oaks and walnuts in the floodplain forest along the Iowa River. Continued wet conditions and RCG have made it difficult to reestablish these trees on a large-scale to improve forest diversity. Planting root production method containerized trees appears to be the most promising method for reestablishing these species. A determination of the best methods to achieve optimum survival for tree plantings is needed.

Figure 2-1: Current land cover types on DNR and Service lands as determined by Iowa DNR staff, 2012



Public Use Issues

The IRCP lands are managed jointly with the provisions of the National Wildlife Refuge System Administration Act and DNR Wildlife Management Area code. Some uses allowed on state wildlife management areas may not be determined to be appropriate or compatible under Refuge System policy. Although there are few changes, this plan will clarify what public uses are allowed on refuge lands.

Floodplain Partnerships and Context of IRCP Lands

IRCP refuge lands consist of tracts intermixed with state lands, private lands, and lands with conservation easements. They are within a larger area designated by the state as a BCA, and they are part of a watershed that has received considerable attention because of large floods. National wildlife refuge (NWR, refuge) habitats must be viewed in the context of surrounding land uses and combined habitat potentials. Larger blocks of some habitat types are important for certain bird species, and connectivity of habitats is important for wildlife movements. Partnerships with other agencies, non-governmental organizations, and landowners will be key to a working floodplain that benefits wildlife and people.

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. Three alternatives were developed by considering the primary purposes of the refuge lands and the partnership with DNR to also manage for resident wildlife and manage floodplain habitats (see Appendix E: Final Environmental Assessment for Iowa River Corridor Project).

Wilderness Review

As part of the planning process, lands within the legislative boundaries of the refuge were reviewed for wilderness suitability. The Wilderness Act of 1964 defines and outlines the requirements for a wilderness area as follows:

A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined. . . (as) an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

No lands in the IRCP were found suitable for designation as wilderness as defined by the Wilderness Act. The refuge does not contain 5,000 contiguous roadless acres, nor does it have

any units of sufficient size to make preservation practicable as wilderness. Lands and waters within the defined acquisition boundary have been substantially affected by humans, particularly through agriculture, transportation infrastructure, and water control.

Chapter 3: Land and Resources Description

In this chapter:

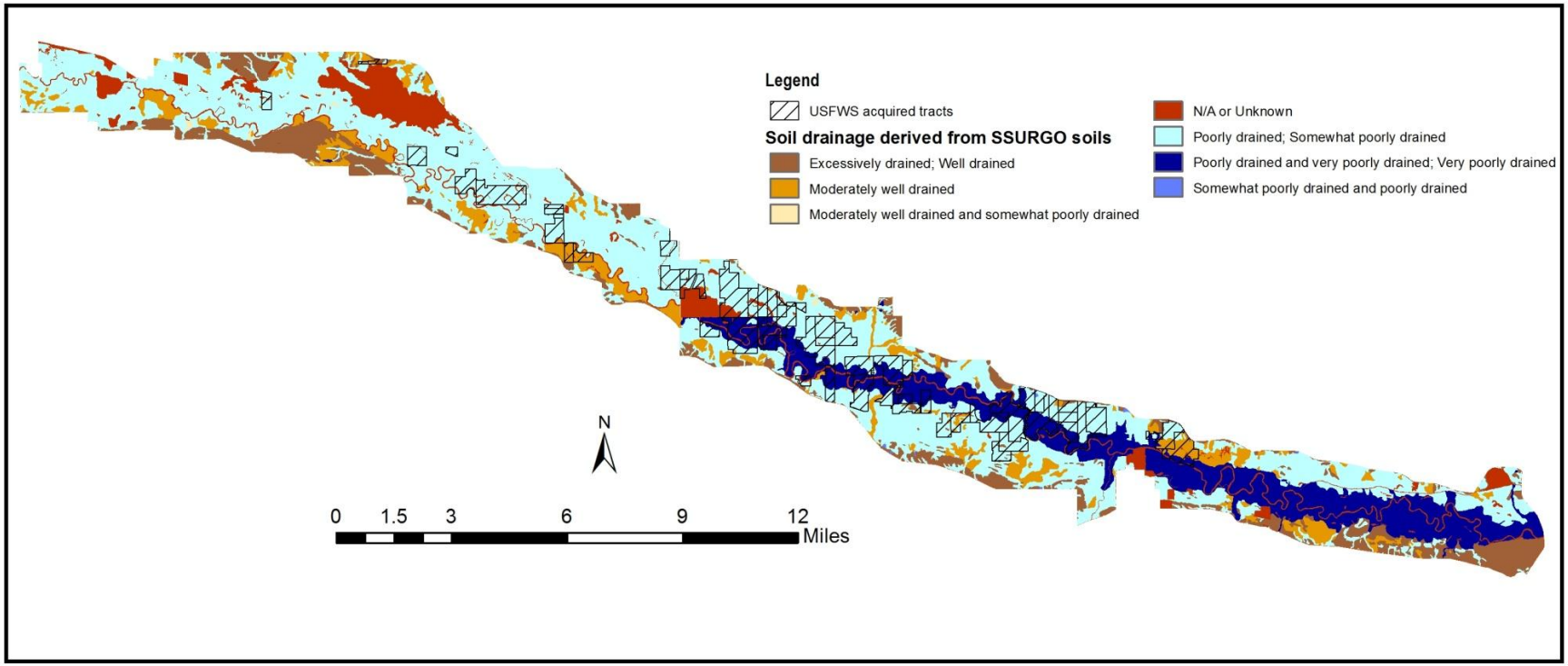
Physical Environment

Soils

The Iowa River Corridor Project (IRCP) is within the Rolling Loess Prairies Ecoregion and part of the Colo-Bremer-Nevin-Nodaway association, which has soils generally described as loess deposits on well drained plains and open low hills. Loess deposits tend to be thin, generally less than 25 feet in depth. Loess is very fine grained silt or clay, thought to have formed as the result of grinding by glaciers and to have been deposited by the wind and likely redeposited and resorted by the Iowa River. Most loess is believed to have originated from areas of land covered by glaciers and from desert surfaces. For the IRCP, the commonly identified soils series were: Zook, Quiver, Bremer, Colo, Amana, which are all deep silty clay loam soils formed in alluvium within a floodplain. These soils are often on a slope of less than two percent, typical of floodplains and poorly drained with a saturated condition often less than one foot below the surface. On first-bottoms, moderately well drained to somewhat poor-drained Nodaway soils are frequently flooded and have a seasonally high water table at, or near, the surface (U.S. Department of Agriculture [USDA] soil survey). Oxbows and old channels are filled with standing water during most of the year. Second bottoms are composed of poorly-drained Nevin soils of silty clay loam alluvium, are subject to flooding only at high floods, and maintain a seasonally high water table at, or near, the surface (USDA soil survey). Finally, the Bremer series of poorly drained soil is occasionally flooded and also maintains a high water table (USDA soil survey).

These types of soils will typically host prairie and savanna plant species with deciduous forest in some areas. The fertile organic layer often extends well over 30 inches below ground surface. Carbonates are typically only found at depths of greater than 60 inches and the frequent proximity of sub-surface water is indicated by redoximorphic features throughout the soil. Generally, the soils within the IRCP area do not vary significantly in type, which suggests subtle changes in topography will make a significant impact on the success of plants and the ability of wetlands to hold water, more so than soil type. However, there may be additional information from the Natural Resources Conservation Service (NRCS) highlighting local differences within the soils. Soil survey geographic database (SSURGO) data were used to derive drainage based on soil characteristics, indicating most units ranged from very poorly to somewhat poorly drained (figure 3-1, U.S. Fish and Wildlife Service [FWS, Service], 2012). Notably, the soil derived layers require judicious application and a finer scale evaluation, as there are discrepancies in soil data (classifications) between the different counties.

Figure 3-1: Drainage derived from SSURGO soil types



Geology and Topography

The majority of the IRCP lies in the Southern Iowa Drift Plain, with the extreme western edge of the river in Tama County, lying in the Iowa Surface. The Iowa River itself acquired much of its width, depth, and alluvial fill during the melting of the Wisconsin ice sheet and has been in its valley for over 100,000 years (Prior, 1991). The Iowa River is an unusually flat and winding river in this section, with a wide floodplain that is abundant with wetlands, sloughs, and backwater oxbows. The Iowa River rises in Hancock County, Iowa, and drains about 4,806 square miles above the confluence of the Cedar River in southeastern Iowa. Most of the Iowa River was channelized in the 1940s; however, the IRCP section of the river is very meandered.

The IRCP is within the Iowa River floodplain, following the Iowa River from northwest to southeast, in a fairly flat area contained by rapidly rising bluffs to the northeast and southwest. Previously available topographic info for the IRCP lacked the resolution to be informative, but now Light Detection and Ranging (LiDAR) data are available. LiDAR will not tend to penetrate water and therefore will often misrepresent water features or be a flat surface representative of the water surface level at the time of data collection. The LiDAR information is particularly useful in the generally flat floodplain for evaluating the micro-topographical changes, areas with depressions, and historical river meanders. A three-meter (cell size) digital elevation model (DEM) is available along with a hillshade image derived from a one-meter DEM. Additionally, if measurements for Iowa River cross sections were available, a reasonably accurate 1-D model could be constructed to determine flooding within the different units. The 2008 flood event may have flooded greater than 90 percent of the area of the acquired Service units; however, it is currently not clear the variability or magnitude of flooding events. A detailed description of 2008 flood elevation data is available in Linhart and Eash (2010).

Hydrology

The Service recently completed a Water Resources Inventory and Assessment (WRIA) Summary Report for the IRCP that describes and summarizes current hydrologic information, provides an assessment of water resource needs, identifies issues of concern, and makes recommendations regarding national wildlife refuge (NWR, refuge) water resources (FWS, 2012). The WRIA is a reconnaissance-level effort intended to inventory and assess water rights, water quantity, water quality, water management, climate, and other water resource issues. Most of the information below is from the WRIA.

The IRCP is located within the Middle Iowa River Hydrologic Unit Code (0780208). A brief evaluation of the flow lines available from the National Hydrologic Dataset within the acquired refuge units indicated roughly 57 km of streams, rivers, or artificial flow paths. The Iowa River was approximately 11.3 km of this total. The remaining identified creeks with names were: Salt Creek, Otter Creek, Plague Mine Creek, Buckeye Creek, and Honey Creek. The average width of the Iowa River is 100 feet, with an average depth of 3.5 feet. The average precipitation in the IRCP area is 32 to 33 inches per year, with 71 percent of it falling in the growing season (USDA soil survey). Flooding has become a near annual occurrence, with 50 percent of the floods occurring May through September, 32 percent of which are in June and July (USDA soil survey). Another 23 percent of the floods occur in March with snowmelt (USDA soil survey).

Wetland identification and categorization for the IRCP was completed using color infrared aerial photography from 2002 (1:40,000). The primary wetland types were identified from the National Wetlands Inventory (NWI) for the acquired units within the IRCP. The most common wetland

types included: freshwater emergent (2,500 acres), freshwater forested or shrub (1,950 acres), freshwater pond (177 acres), and riverine (250 acres). Roughly 1,616 acres of the freshwater emergent wetlands were considered temporarily flooded, 857 acres were seasonally flooded and approximately 36 acres were considered semi-permanently flooded. In addition, 1,172 acres of the freshwater forested wetlands were considered temporary and 400 acres were considered seasonally flooded. The majority of the freshwater pond type wetlands were considered to be semi-permanent water features. Finally, approximately 160 acres of wetlands were given the modifier "d," indicating they are influenced by ditches. The calculated acreage of wetlands (45 percent) was slightly higher than the acreage calculated from the 2006 National Land Cover Data (NLCD) (34 percent). These discrepancies are a function of the methods used to define the wetlands within the NWI versus the remote sensing methods used for the NLCD.

The locations of the water infrastructure (e.g., structures) were identified from NRCS records. There are some wetlands with water control structures that are used to hold water in spring and fall, and lower water in summer for plant growth. Most wetland restorations were created using ditch plugs or other types of hydrologic dams that retain water up to an established elevation.

The Iowa River stream gage at Marengo, Iowa (U.S. Geological Survey [USGS] 05453100) has a long history and is the most directly relevant gage for understanding the historical and potential changing hydrologic regime of the IRCP. This site has been in continual operation since 1956 and contains a comprehensive data set that includes: water stage, discharge, temperature, and a variety of chemical analysis. As part of the National Water Quality Assessment (NAWQA) program numerous types of chemical and biological sampling were completed (see Kalkhoff et al., 2001; Akers et al., 2000). This information was summarized in a number of publications available from the USGS, where they concluded in 2000 that the Eastern Iowa Basins have some of the highest nutrient concentrations of surface waters in the Service's Midwest Region. There are a couple of additional sites that have been monitored, including a newer gage location on the Iowa River at Tama. A water quality and biological assessment was performed by the USGS in 2006 and 2007. That assessment included three sites on the Iowa River. Results of that assessment indicated that nitrates exceeded the U.S. Environmental Protection Agency's (EPA) primary drinking water Maximum Contaminant Level of 10 mg/L; however, none of the samples analyzed for pesticides, trace metals, wastewater, or fuel contaminants were found to exceed drinking water regulations for the EPA or State of Iowa targeted constituents (Littin & McVay, 2008). The periphyton community was sampled to provide an indicator of nutrient enrichment or trophic condition. Results indicated that the surface water could be considered nutrient enriched. This would not be unexpected given the agricultural land use throughout the Iowa River Basin.

Available water chemistry information is primarily after 1996 and includes common nutrients, trace nutrients, metals and some commonly measured contaminants. The results are typically near the top of the range of chemistry values reported by the EPA for nutrient Ecoregion IV (Corn Belt and Northern Great Plains). Nitrogen and phosphorous levels were often above appropriate levels for suggested human consumption (nitrate > 10 mg/L) but within the levels that are not necessarily detrimental to aquatic life. All of the samples did test positive for metabolites of commonly measured pesticides, often in proportion to local application. The metabolites are persistent throughout the year, with the parent chemicals found mostly during certain times of year.

Historically groundwater quality and elevation were monitored at a number of wells. Water level and comprehensive chemical monitoring were also completed at many of these sites from 1996 through 1998 (FWS, 2012). The NAWQA study suggested that the alluvial aquifers in this region

tend to have fairly low levels of nutrients and pesticides, which typically did not exceed EPA Maximum Contaminant Levels.

USGS topographical maps indicate that there were flowing wells (artesian wells) at a couple of locations within the floodplain. A review of the groundwater data indicated that for a large percentage of the wells, water depth was often within 1.5 to 4 feet of the surface, with a peak in the early spring (March and April) coinciding with the Iowa River runoff. Water levels were low from 1988 until 1991 (approximately eight feet below ground). Water levels rebounded and remained fairly steady until 1998, when many of the sites were discontinued.

Peak flood recurrence intervals were received from the Iowa USGS water center for the Iowa River at Marengo. A 10-year return interval would be approximately 25,000 cubic feet per second (cfs) (gage height of approximately 19.16 feet.), which means that there is a one in ten chance of seeing flows equal or exceeding this discharge in any given year. The flood of record occurred in 2008 at 51,000 cfs. Additional recurrence intervals, flood hydrographs, and flood elevations are available in the WRIA (FWS, 2012).

Based on the National Oceanic and Atmospheric Administration National Weather Service site, flood stage is generally when the height of the gage exceeds approximately 14 feet (approximately 5,900 cfs). However, starting at 11 feet up to 16 feet, the river is primarily inundating only low-lying non-urban areas adjacent to the river. From 1975 to 2010, the river exceeded this flow (5,900 cfs) approximately nine percent, based on daily values, which suggest that some areas are inundated as much as 20 percent of the time during a typical growing season.

Flooding in the fee title Service tracts in the IRCP will tend to happen as soon as the Iowa River or tributaries begin topping the banks. Determining the regularity and extent of flooding is difficult for units that are within a flat floodplain. This difference between the Iowa River being within its banks and widespread inundation can have a relatively narrow range of several feet, due to the relatively large area of the floodplain. Therefore, there will not be a significant change in elevation of water surface between the different recurrence intervals. The gage information does not suggest that there is a long-term trend in increasing peak discharge, despite the relatively recent large flood events in 1993, 2008, and 2010. During these types of large events, flood peak elevations will increase by approximately 1.1 feet for every mile of the Iowa River upstream from Marengo, Iowa. For example, adjacent to the town of Marengo, any point above 740 feet is unlikely to see flood inundation. Elevations between 740 and 738 will see extremely irregular flooding. Elevations below 738 will tend to see intermittent flooding (one out of every 10 to 20 years). This type of information can be roughly extrapolated upstream in lieu of a hydrologic flood inundation model to qualitatively understand flooding on the units. For example, two miles upstream of Marengo, elevations above 742.2 feet are unlikely to see flooding and elevations between 742.2 and 740.2 will tend to see very irregular flooding.

The WRIA process included a review of the climate literature to determine the relevant water resources data and monitoring sites directly applicable to the refuge lands. In 2010, a report to the Iowa Governor and General Assembly provided recommendations for addressing climate change and documented the current impacts of changing climate on lowlands in Iowa over the last 50 years (Berendzen et al., 2010). This report suggests Iowa is experiencing warmer winters, warmer nighttime temperatures, and changes in precipitation regularity and intensity. Hydrologically, these types of changes suggest increased evaporation, evapotranspiration, peak and mean streamflow change and variability in ice-in/ice-out dates. For example, an approximately 31 percent change in very heavy precipitation events in Iowa has taken place in

the last 50 years, which likely has led to flashier streamflow and greater levels of erosion (Karl et al., 2009).

Climate information for the IRCP was gathered from the weather station at Belle Plaine, Iowa, which is near the western edge of the acquired units within the IRCP. This information suggests that monthly precipitation will typically peak in June (figure 3-2), varying from one to five inches per month, and monthly temperature will typically peak in July or August (figure 3-3), based on information from 1975 to 2010. From 1950 to 2010, for a water year (WY, which is October 1 to September 31) the temperature and precipitation did not show a statistically significant pattern. However, it does appear that the last 10 years have been warmer and the last five years have been wetter than what is typical for this area.

Figure 3-2: Mean monthly precipitation from 1975-2010 at Belle Plaine, Iowa (130600)

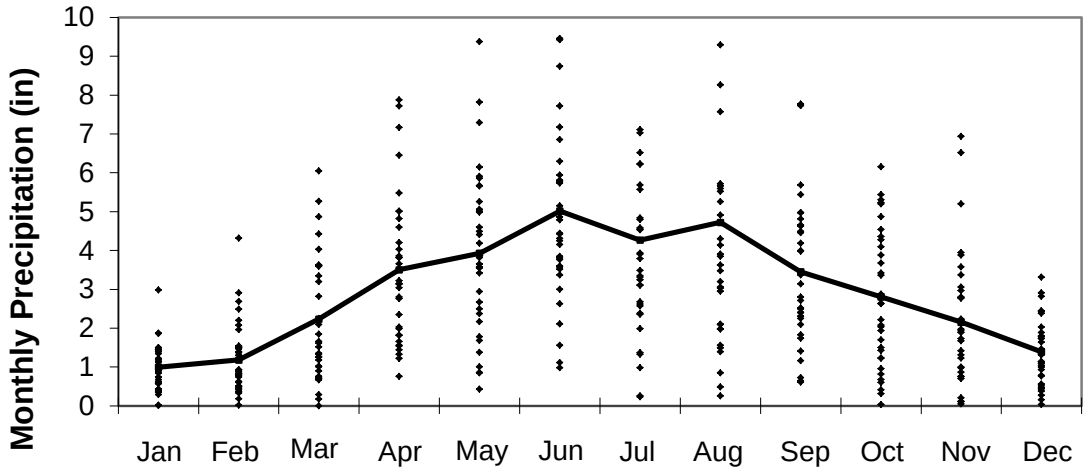
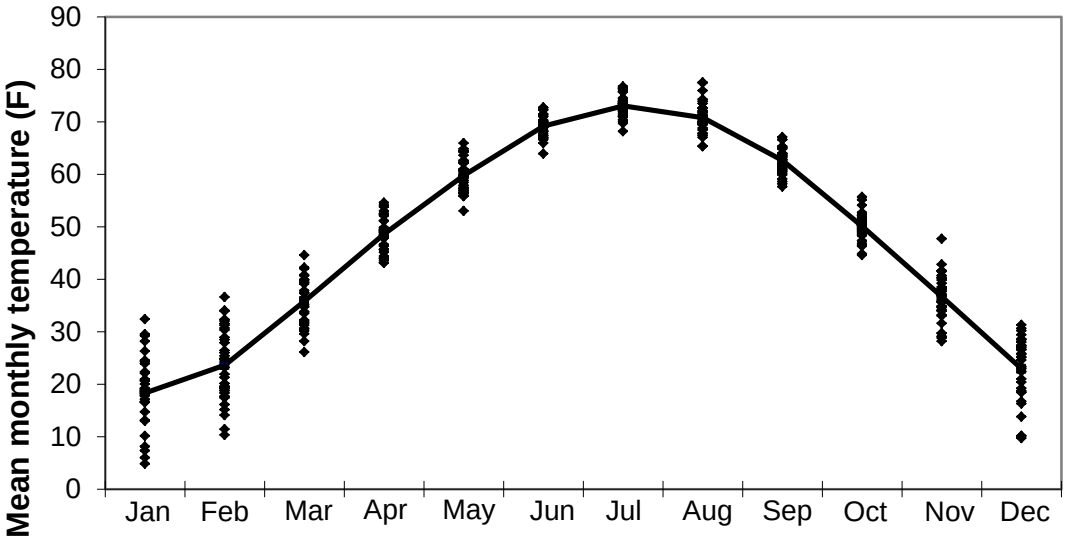


Figure 3-3: Mean monthly temperatures 1975-2010 at Belle Plaine, Iowa (130600)



Biological Environment

Historic Vegetation

Historical and scientific accounts of the vegetation of the Iowa River are difficult to find. Early descriptions by pre-settlement geologists and Anglo-Saxon settlers offer some of the best and only firsthand information available. Accounts are conflicting, and it is easy to tell the plant community preference of the authors. It has been commonly held that prior to settlement, timber dominated the streams and rivers of Iowa. Although there is no doubt that there were trees along the Iowa River, historical accounts and paleobotony accounts seem to suggest that while trees were present, they did not always dominate. In an early geological survey, geologist and naturalist, David Owen, noted that, "Rivers cannot boast dense forests. Instead the level meadow lands of prairie are excellent for farming." Owen also reported that the prairie extended into the Red Cedar, Iowa and Des Moines River Valleys to 42 degrees 31 minutes, and north of 42 degrees it was very difficult to find timber. Near Iowa City, bottomlands were covered by luxuriant meadows and low prairie (Owen et al., 1852). Additionally, sketches of the Iowa River show prairie on the west side and forests on the east (Owen et al., 1852). In 1855, Parker spoke specifically about Tama and Iowa Counties, "These counties are rich in alluvial soil. The prairies and timberlands are exceedingly well proportioned to each other." Gleason added in 1923, "The wide alluvial bottomlands of the larger rivers seem to have resisted forest invasion, and on them the forests are limited to relatively narrow strips along the channel and the abandoned oxbows, alternating with strips of prairie."

Finally, there are scientific accounts of prairie coexisting with timber on floodplains, bottomlands, and wet, marshy areas. Although there is little or no scientific information on surveys of the vegetation of the IRCP area, historical vegetation can be inferred from other accounts of floodplains as defined by prairie ecologist, John Weaver, who placed tallgrass prairies on lower slopes in wet soil along plains lined with trees, while alluvial and poorly drained plains were covered in six to eight-foot tall big bluestem and slough grass (Hayden, 1945). The alluvial first bottomlands were often occupied by floodplain forests, shrubs, or course grass while hydric second bottomlands were dominated by big bluestem (Weaver, 1968).

The Government Land Office survey data shows that historical vegetation in the 1800s within the IRCP consisted of about 67,775 acres of prairie, 52,048 acres of timber, and 2,208 acres of scattering trees (figure 3-4). Scattering trees are often interpreted as savanna habitat. The WRIA completed by the Service (2012) identified historic vegetation based on the soil survey geographic database (SSURGO, figure 3-5). This analysis shows largely prairie with significant forest close to the river in the southeastern part of the IRCP. Historically, trees were largely confined to the riparian corridor, with a combination of mesic and hydric grasslands filled with temporary and seasonal wetlands (Benson et al., 2006). Historic vegetation within the Bird Conservation Area (BCA) is estimated at 51 percent prairie and 39 percent forest. There likely was not the amount of early successional willow/cottonwood growth that occurs now.

Figure 3-4: Historic vegetation in the IRCP derived from Government Land Office surveys

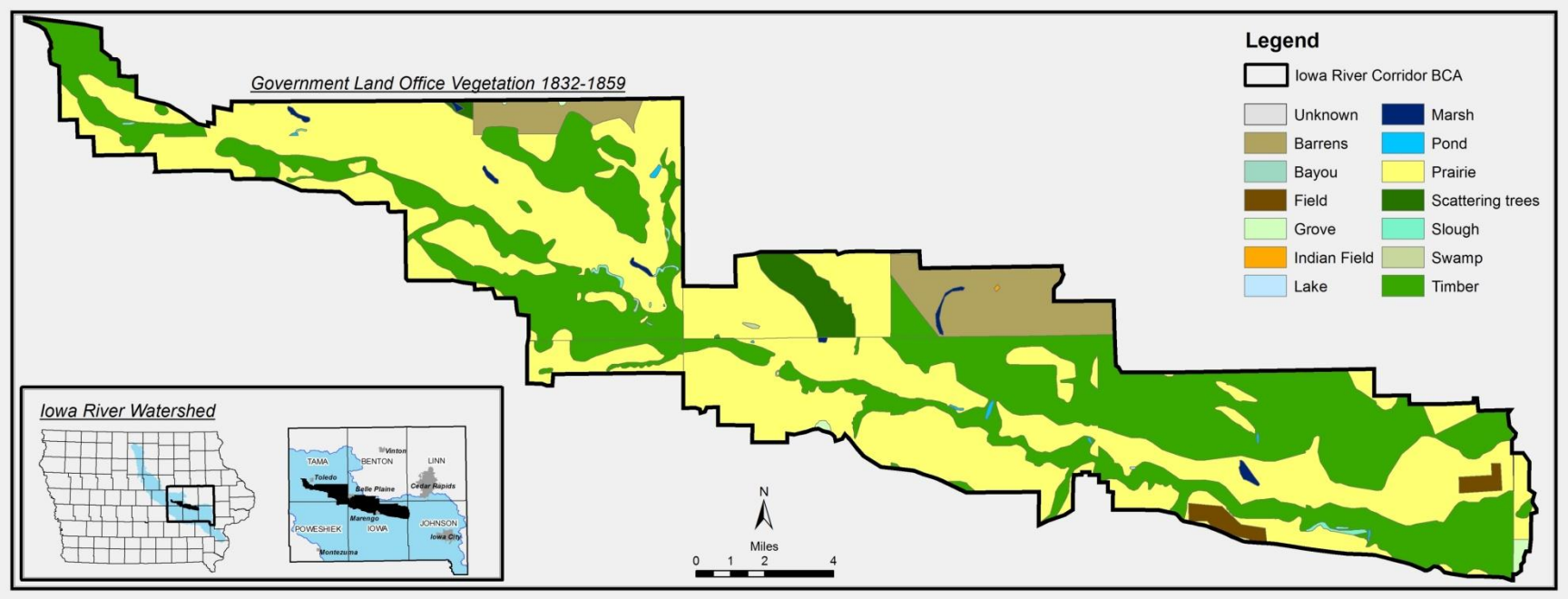
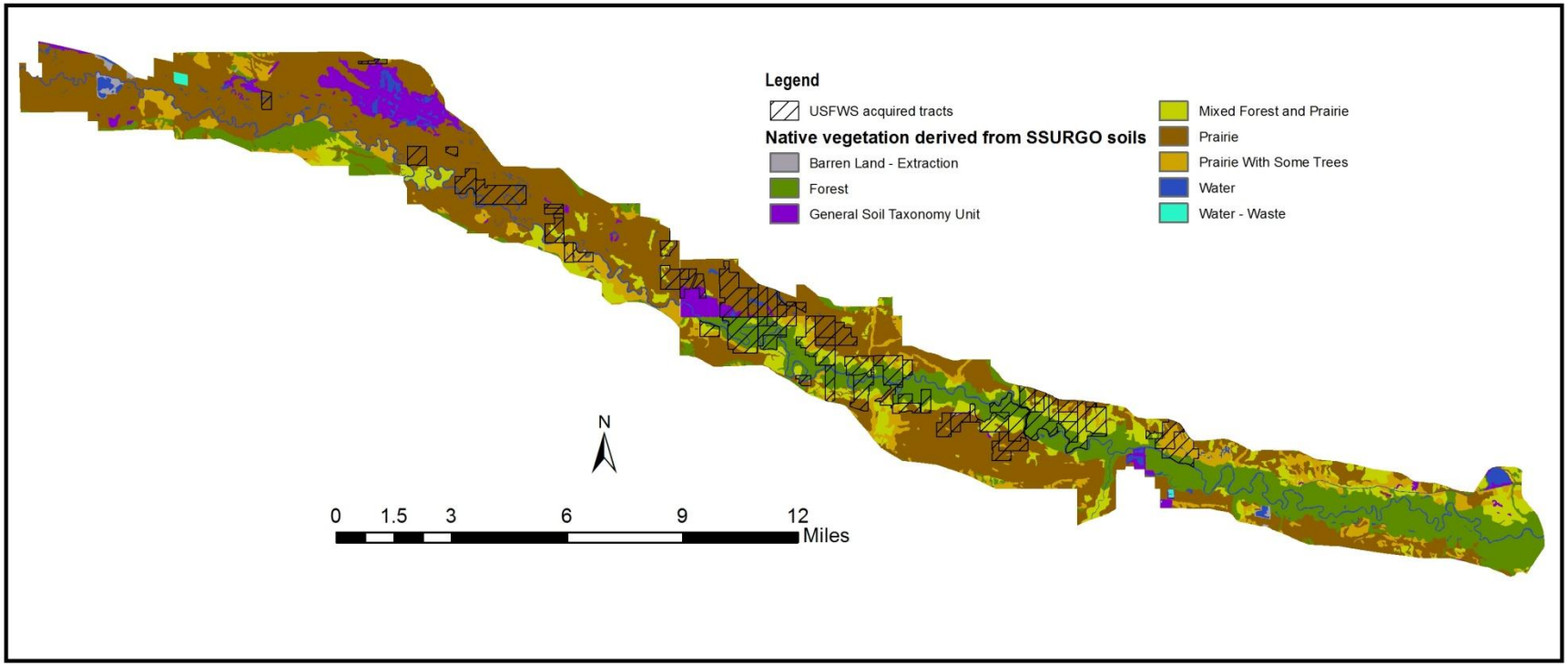


Figure 3-5: Native vegetation derived from SSURGO soil types (FWS, 2012)



Current Land Cover and Vegetation

Detailed and complete vegetation mapping for the IRCP is not currently available. The 2009 High Resolution Land Cover (HRLC) by the Iowa Department of Natural Resources (DNR) is the most current land cover information, but it did not include ground truthing and has its limitations for determining habitat types. There are differences in quality of data across the state due to variability in LiDAR data. An explanation of each classification can be found within the metadata for the HRLC as provided by the Iowa DNR (2009). The information below does not include all classifications in the HRLC but only the ones of interest for determining habitat types of interest in the IRCP, therefore percentages may not equal 100.

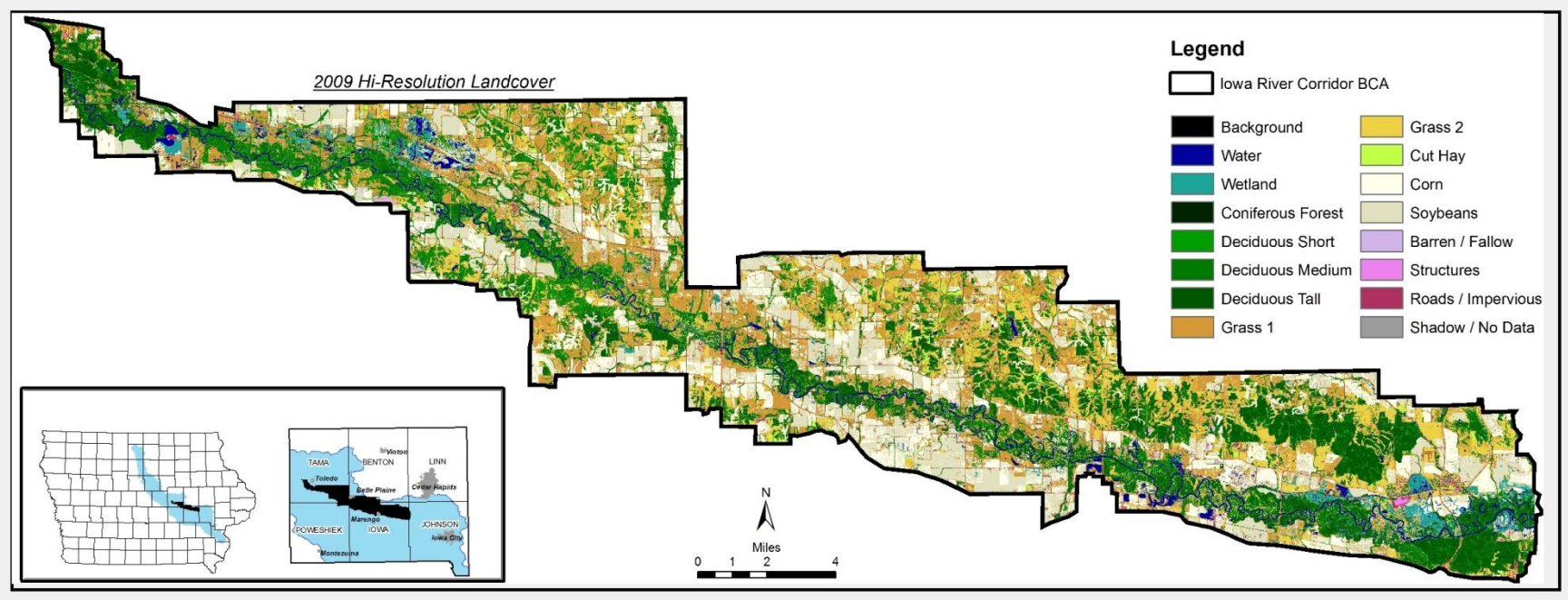
In addition, the DNR recently completed cover mapping for most of the state wildlife management areas (WMAs) with general cover classes (figure 2-1). More precise vegetation mapping would be needed to determine specific acres of vegetation or habitat classes. Therefore, the available data given below is used to give a coarse idea of land cover and habitat in the IRCP.

Based on the 2009 HRLC, the land cover within the IRCP acquisition boundary is approximately 10 percent wetlands, 17 percent forest, and 28 percent grassland (Iowa DNR) (table 3-2). The NWI shows a higher amount of wetlands in the IRCP likely due to classifying much of the floodplain as inundated seasonally or temporarily, depending on river levels. The NWI uses the Cowardin et al. (1979) wetland classification system. Those acres likely include much of the wetlands classified as forested and shrub wetlands, which were removed from the acre tally shown in Table 3-1 to attempt to show more traditional temporary, semipermanent, and permanent wetlands in an average water level year. DNR cover typing measured created, natural, and riverine wetlands and recorded 981 acres.

Early successional habitat was derived from the HRLC deciduous short classification, which includes trees or shrubs less than 3.5 meters. The spatial extent of this class is a good estimation, but height classes were dependent on LiDAR data, and this may include other vegetation besides willow/cottonwood. This HRLC layer shows 2,253 acres (~15 percent) on DNR and Service fee title lands in the deciduous short class and only gives a rough estimate of areas that may have been in woody early successional habitat at the time of the photography (table 3-1). There are 7,229 acres of this cover type within the IRCP and 14,533 acres in the BCA (table 3-2). The DNR shrub class was strictly shrub lands and did not include willow early successional areas, and some early successional vegetation was captured in the wooded habitat category, therefore this habitat type was not classified in that effort.

Forest acres are similar between HRLC and DNR cover typing and include a variety of forest types (figure 3-6, table 3-1). DNR vegetation cover mapping identified about 2,600 acres of woodland on Service lands (table 3-1, figure 2-1) that includes both floodplain maple/cottonwood and oak/hickory forests. This acre figure also includes some willow successional areas. The IRCP acquisition area includes about 10,000 acres of forest, and the BCA contains about 27,000 acres of forest (table 3-2). The adjacent Amana forest contains 3,500 acres of bottomland maple and cottonwood forest, and 3,500 acres of upland forest. The adjacent Mesquaki Nation lands also contain a significant block of old growth oak forest.

Figure 3-6: 2009 High resolution land cover for the IRCP (Iowa DNR)



The HRLC shows 5,832 acres of grassland (figure 3-6, table 3-2) on DNR and FWS lands in the IRCP. Grassland is likely overestimated in the HRLC, because it includes road ditches, grassland/forest edges, lawns, and other features that might not be considered grassland in the habitat sense. The HRLC does not differentiate between native and non-native grasses. DNR cover typing identified about 2,558 acres of native grassland and 2,050 acres of non-native grassland on Service lands in the IRCP (Table 3-1). The non-native grass is predominantly reed canarygrass (RCG).

For comparison and to help with larger landscape objectives in chapter 4, cover types for the BCA are also given in table 3- 2. The IRCP acres and BCA acres include lands in private ownership that also have cropland, pasture, residential areas, and others that are not included in the cover types listed here. There is likely more RCG than native grass on private lands within the IRCP and BCA since there is generally not good native grass cover. There are 18,964 acres of corn and soybeans within the IRCP acquisition boundary and 37,152 acres of corn and soybeans in the BCA (Iowa DNR, 2009).

Table 3-1: Land cover types within the IRCP from different classification systems

DNR cover typing distinguished between native and non-native grassland but HRLC did not. Percentage is taken from the entire acres of all cover classes that are not all shown here; therefore, percentages in the table do not add up to 100 percent.

	Wetland/water acres (percent)	**Shrub/woody early successional acres (percent)**	**Forest acres (percent)**	**Grassland acres (percent)**
High Resolution land cover class FWS/DNR lands	1,648 (11)	2,253 (15)	2,786 (18)	5,832 (38) all types
DNR cover typing DNR and FWS lands	2,914 (21)	Not classified	3,884 (27)	2,692 (19) native 2,313 (16) non-native
DNR cover typing FWS lands only	981 (10)	Not classified	2,693 (28)	2,588 (27) native 2,050 (22) non-native
NWI	2,685 (29)	NA	NA	NA

Table 3-2: Acres and percentage of selected land cover types within fee title lands, IRCP boundary, and BCA

Percentage is taken from the entire acres of all cover classes that are not all shown here; therefore, percentages in the table do not add up to 100 percent.

High Resolution land cover class	FWS/DNR fee title lands acres (percent)	IRCP Acquisition Boundary acres (percent)	BCA acres (percent)
Water/wetland	1,648 (11)	6,444 (10)	7,906 (6)
Early successional (deciduous short trees)	2,253 (15)	7,229 (12)	14,533 (10)
Forest (deciduous medium/tall trees)	2,786 (18)	10,699 (17)	26,980 (19)
Grass (both native and non-native)	5,832 (38)	17,448 (28)	47,508 (34)

Wildlife

The Iowa River floodplain wetlands, grasslands, and woodlands provide an important interior corridor for migrating birds and has been identified as such by the Service (FWS, 2008). There are 268 bird species within the Iowa River Corridor BCA. Fifty-eight of these birds are identified as nesting Species of Greatest Conservation Need (SGCN) and 16 as migratory SGCN (appendix C). Birds are identified in appendix C as being priority species for the state, Service, or in national plans. Eighteen bird species on these lists use grasslands for at least part of their life cycle, 28 use forest, and 35 use wetland habitats. In 1992, the first successful nesting of Sandhill Cranes in Iowa since the early 1900s occurred at Otter Creek Marsh. Sandhill Cranes have successfully reared young every year since. Mammals in the IRCP include white-tailed deer, red fox, coyotes, raccoons, beavers, mink, river otter, bobcat, squirrels, cottontail rabbits, opossum, skunks, weasels, bats, and other small rodents. SGCN mammals include the federally endangered Indiana bat. There are two active heronries in the IRCP, a Great Blue Heron one in Tama County, and a Great Egret one in Iowa County. Additional SGCN species include six reptiles and amphibians, 12 odonates, and 13 butterflies (appendix C).

Fisheries

The fisheries resource is primarily restricted to the river and a few shallow oxbow ponds. The Iowa River in the IRCP is one of the more productive portions of this river due to the absence of channelization. Channel and flathead catfish are the dominant game fish in this section of the river. Northern pike, walleye, saugeye, white and black crappie, white bass, and black bullhead are species of moderate abundance. Bluegill, yellow bass, and largemouth and smallmouth bass are not as common. Non-game species are dominated by common carp, bigmouth and smallmouth buffalo, river carpsucker, gizzard shad, brassy minnow, bluntnose minnow, suckermouth minnow, spotfin, common shiner, and creek and silver chub. Other species include yellow bullhead, wiper, green sunfish, orangespotted sunfish, freshwater drum, white amur, quillback carpsucker, highfin carpsucker, shorthead redhorse, golden redhorse, white sucker, common shiner, spotfin shiner, river shiner, sand shiner, bigmouth shiner, fathead minnow, creek chub, silver chub, central stoneroller, and johnny darter. The river also contains mussel species common to Iowa's interior rivers.

Rare, Endangered, or Unique Plant and Animal Species

The project area may support the following federally listed species: Indiana bat, fat pocketbook mussel, prairie bush-clover, eastern prairie fringed orchid, and western prairie fringed orchid; however, there are no known populations of these species in the IRCP, except for a recent Indiana bat location in Tama County that was not on refuge lands. Several state listed threatened and endangered species also occur in the IRCP including birds, mammals, amphibians and reptiles, and butterflies.

Habitat

Native grassland restoration in the IRCP

When land in the IRCP was first acquired, restoration plans for each tract were formulated by NRCS and formally approved by the agencies involved. These plans are all available at county courthouses and NRCS offices. Some examples have been provided in appendix B. Wetlands and uplands have been restored under NRCS easement plans and by the Iowa DNR. The original restoration plan was to allow natural revegetation to occur on much of the area with a goal of about one-third bottomland forest, one-third grassland, and a maximum of one-third early successional habitat on the entire IRCP. This percentage is still the overall goal with perhaps a slightly higher amount of grassland habitat and lower amount of early successional habitat, and with wetlands and riverine habitat intermingled. Natural revegetation is still used as a follow up to some habitat treatments. These habitat percentages may change with additional monitoring and species requirements information. Additional specific habitat planning is needed subsequent to this management plan that can be used in an adaptive management framework. For example, savanna habitat is not specifically identified in an objective but may be a lacking habitat type that could be provided in the IRCP. More baseline inventory and monitoring data is needed to develop specific wildlife and habitat objectives.

A small amount of acreage (about 200 acres) is planted to food plots each year as a supplemental food source for resident wildlife and some migratory waterbirds. The difficulty of restoring plant diversity to both forest and grassland habitats has limited some native food sources for wildlife. However, much of the landscape surrounding the IRCP is in crops that wildlife have access to. As oaks and other mast producing trees are restored, and native forb diversity increases, then some of this native food source will return and alleviate the need for supplemental foods.

Forest

Most of the forest is located in a band along the Iowa River near washes and oxbows and consists of both maple/cottonwood and oak/hickory stands. Much of the forested area consists of tracts of former crop and pastureland, which is now dominated by silver maples, with cottonwood as a minor species. Silver maples have diameters up to 30 cm and seem to be arranged in age classes. A few small burr oak groves, remnants perhaps of the “groves” reported in pre-settlement times, remain throughout the IRCP. The flood of 1993 caused

immense damage to mast producing hardwoods, such as the oaks and walnuts. In 1994, following the flood of 1993, timber harvesting was active in the Iowa River Corridor to recover any marketable wood.

A Forest Wildlife Habitat Plan was completed in 2011 (Iowa DNR) for the northwest unit of the IRCP, which includes forest inventory information and goals. Current management includes some timber stand improvement, tree planting, and maintenance of new tree plantings. Additional forest inventory is needed.

Current management includes tree planting

Direct nut seedings have been done on approximately 25 acres over the last couple of years, and container trees were planted on approximately 40 acres. Container trees have primarily been root production method trees, and although this technique is more expensive initially, it appears to be the more successful method in the long-term.

Grassland

Grasslands in the IRCP currently consist of native plantings of varying diversity, stands dominated by non-native RCG, and cool season stands dominated by brome or foxtail. Initially, native grassland plantings in the IRCP were done to get cover established on a large area after land was taken out of agricultural production. Some fields were allowed to naturally revegetate. In the mid-1990s, seed diversity was not always available, and forbs were sometimes excluded so that chemical control of weeds could be completed. Some sites are currently dominated by two or three warm season grass species. Restoration is still occurring with more diverse seed mixes and there is more potential for grassland restoration. Efforts are being made to find native species more tolerant to flooding. Woody encroachment threatens IRCP grasslands and has been managed with prescribed fire and mowing. Treatments are sporadic due to flooding and wet conditions.

Non-native grasslands primarily consist of RCG that is managed on a small scale with chemical treatment, mowing, and disking to provide short-term control that allows annual plants to grow and provide a diverse food and cover source for wildlife for two to three years. More grassland is dominated by RCG at lower elevations, and although RCG is present in many of the grasslands, it does not always dominate at the higher elevations.

Early Successional Woody Habitat

Although the current estimated percentage of this habitat type is within the desired range, one or two wet years without management action can drastically change the amount of willow growth. Some areas have been, and will be allowed to go through, natural succession dictated by areas where conditions do not allow equipment access or adequate fire effects. These are typically lower elevation areas. Transition areas with shrubs and small trees near mature forest sites are a desirable component as well. Prescribed fire has been used successfully to limit woody growth, but some years it is too wet to burn effectively or to burn significant acres. Fire sets back succession, but willows typically resprout during the same season as the burn took

place. If conditions allowed consistent burning, then this tool may be adequate to maintain and set back willow growth. However, the area treated is inconsistent due to river levels, weather conditions, and lack of personnel. Managers target treatment of about 2,500 to 3,000 acres of grassland annually with prescribed fire. Mechanical treatment has been done but is labor intensive and expensive. As a management practice is completed to set back this succession, the habitat is typically allowed to naturally regenerate, and the cycle begins again. Complete restoration to a different habitat type may be targeted on some areas but requires follow up chemical control and planting of desirable species.

Wetland

Depending on the classification used, there are 1,000 to 2,500 acres of wetlands on DNR managed lands in the IRCP (table 3-1). The majority of these wetlands are temporary floodplain wetlands and also include seasonally flooded, semipermanent, and permanent wetlands. Approximately 82 wetlands were restored by the NRCS using ditch plugs, tile plugs, and dikes since easements were established. A few water control structures were placed on some wetlands. Some wetlands have encroaching willows and undesirable vegetation.

Visitor Services

The IRCP provides ample area for wildlife-dependent recreation such as hunting, fishing, trapping, birdwatching, canoeing, hiking, and education. Wildlife is abundant and those who are willing to hike through tall prairie vegetation and wade the river banks will be rewarded with a quality nature experience. The DNR and Service lands are not developed and therefore attract users that prefer more primitive conditions. Hunting and fishing are the most prevalent uses with bird watchers also common. A bird list for the BCA has been developed.

Facilities include one observation deck, parking lots, boat ramps, and mowed service roads or fire breaks that serve as trails, although they are not formally designated as such. There are currently 19 parking areas providing access to most of the IRCP between Marengo and Chelsea. These areas are considered designated access areas based on road conditions, the ability to maintain them, and boundaries. Boat ramps are available on adjacent DNR lands. Accessible locations include areas known as: Big Bend, Burr Oak, Simmons Timber Cottonwood Banks, Fish Ponds, Koszta Access, Randolph Access, Highway 21 Access, and unnamed areas south and southeast of Chelsea (figures 3-7, 3-8, and 3-9; at the end of this chapter). Primitive camping is allowed on WMAs, but not allowed on refuge lands or on easements. Motorized vehicles are prohibited. Law enforcement is provided by the DNR conservation officers for those counties as well as a Service refuge officer located at Neal Smith NWR.

The point of contact for visitors is the DNR's Otter Creek Wildlife Management Area office near Chelsea, Iowa. With Service lands intermingled with other types of ownership, and the potential for more land acquisition in the future, clear signage and adequate visitor information is essential. The ease with which the public can navigate to visitor use areas, understand guidelines for appropriate conduct and safety, have basic needs met (i.e., parking, restrooms, maps, etc.), and fully engage in wildlife-related activities directly translates to a quality recreational experience, a positive impression of the DNR and the Service, and an identification with the mission and goals of the IRCP. Proper signage and other welcoming and orienting materials can also reduce the need for direct interaction with staff, which is difficult to offer at all times with current staffing levels.

The IRCP is managed jointly with the provisions of the National Wildlife Refuge System Administration Act, Code of Federal Regulations, and the provisions of the Iowa code for WMAs. The Memorandum of Understanding (MOU) states that public use objectives will be consistent with those authorized in 50 Code of Federal Regulations (CFR) and Refuge System guidelines. The MOU cites that uses are to be wildlife-dependent activities in the areas of hunting, fishing, wildlife observation, photography, and environmental education and interpretation, unless otherwise approved. Public uses allowed on refuge lands are determined by the compatibility standards under the National Wildlife Refuge System Improvement Act of 1997. The six priority wildlife-dependent public uses defined in the act are hunting, fishing, wildlife observation, wildlife photography, environmental education, and environmental interpretation. Other uses may be allowed if deemed appropriate and compatible with the purposes of the refuge. The purposes of the refuge lands in the IRCP are given in the introduction above for protection of wetlands and migratory birds. The Service has completed compatibility determinations for wildlife observation and photography, environmental education and interpretation, and trapping (appendix D).

Opening refuge lands to hunting and fishing also involves publishing regulations in the Code of Federal Regulations. Therefore, environmental assessments and hunting and fishing plans have already been completed for these activities (FWS, 2012). The final compatibility determinations for hunting and fishing are found in appendix D. Hunting and fishing activities generally follow state regulations with some refuge specific regulations.

Facilities such as parking lots, interpretive signs, and hiking trails are provided to facilitate these activities where compatible. Uses such as horseback riding, ATV use, snowmobiles, and camping are not wildlife-dependent and generally are incompatible activities. The primary objective on state WMAs is developing and restoring wildlife habitat for breeding, resting, and feeding. Wildlife dependent recreational activities such as those listed above are allowed. Hunting, fishing, and educational activities are allowed on USDA easements, which overlay DNR and Service lands.

Cultural Resources

No national historic landmarks are located within the IRCP boundaries. The Iowa Historic Preservation Officer has identified 76 know archaeological sites within the floodplain of the Iowa River. A few of these sites occur within the boundary of the IRCP.

Cultural resources (archaeological sites, historic structures, and Native American traditional cultural properties) are important parts of the Nation's heritage. The Service strives to preserve evidence of these human occupations, which can provide valuable information regarding not only human interactions with each other, but also with the natural environment. Protection of cultural resources is accomplished in conjunction with the Service's mandate to protect fish, wildlife, and plant resources.

The Service is charged with the responsibility, under Section 106 of the National Historic Preservation Act of 1966, of identifying historic properties (cultural resources that are potentially eligible for listing on the National Register of Historic Places) that may be affected by our actions. The Service is also required to coordinate these actions with the State Historic Preservation Office, Native American tribal governments, local governments, and other interested parties. Cultural resource management in the Service is the responsibility of the

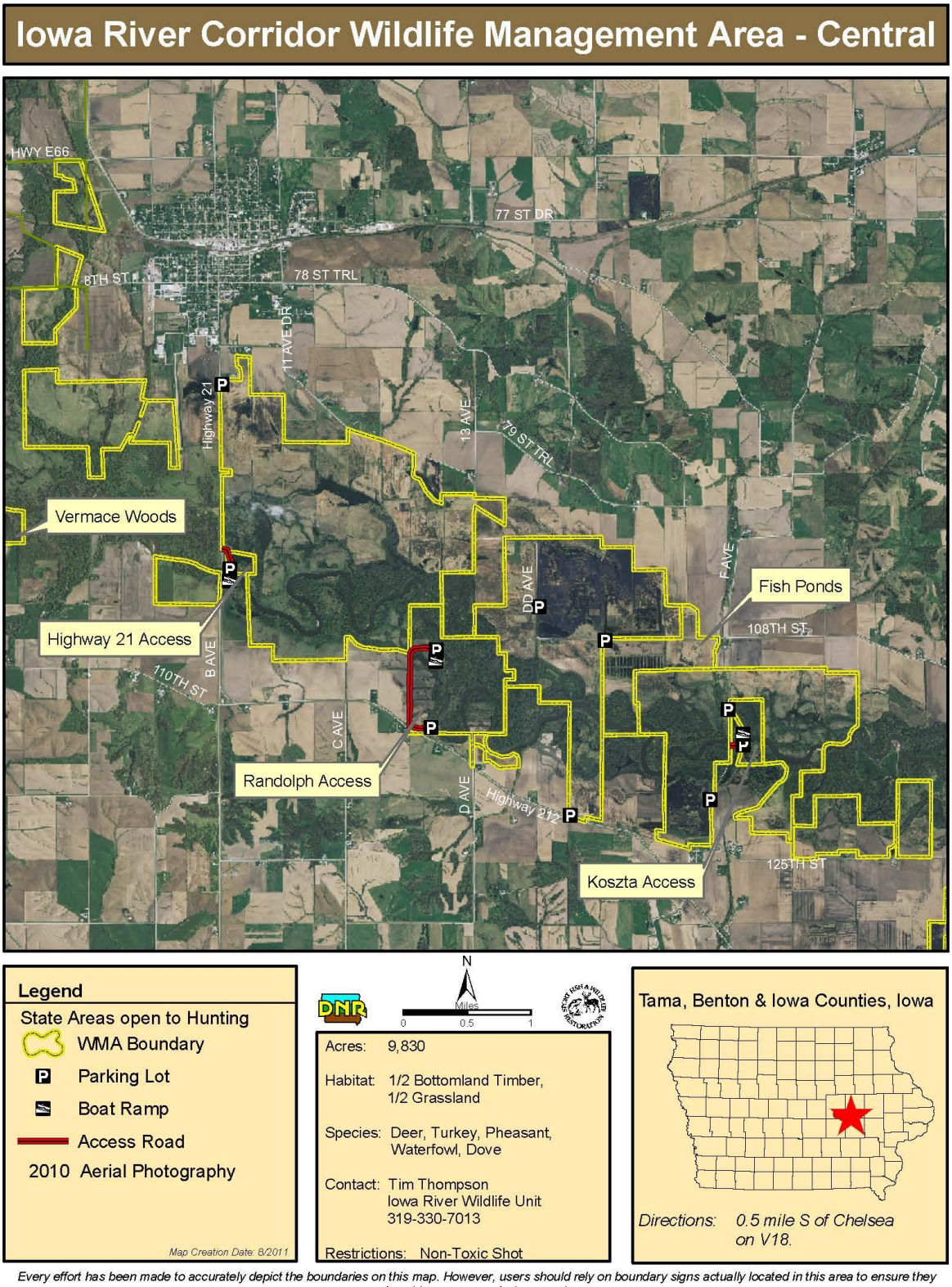
regional director and is not delegated for the Section 106 process when historic properties could be affected by Service undertakings, for issuing archaeological permits, and for Indian tribal involvement.

The Archaeological Resources Protection Act of 1979 (ARPA) Section 14 requires plans to survey lands and a schedule for surveying lands with "the most scientifically valuable archaeological resources." This act also affords protection to all archeological and historic 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 Regional Historic Preservation Officer (RHPO) advises the regional director about procedures, compliance, and implementation of these and other cultural resource laws. The actual determinations relating to cultural resources are to be made by the RHPO for undertakings on Service fee title lands and for undertakings funded in whole or in part under the direct or indirect jurisdiction of the Service, including those carried out by or on behalf of the Service; those carried out with federal financial assistance; and those requiring a federal permit, license, or approval.

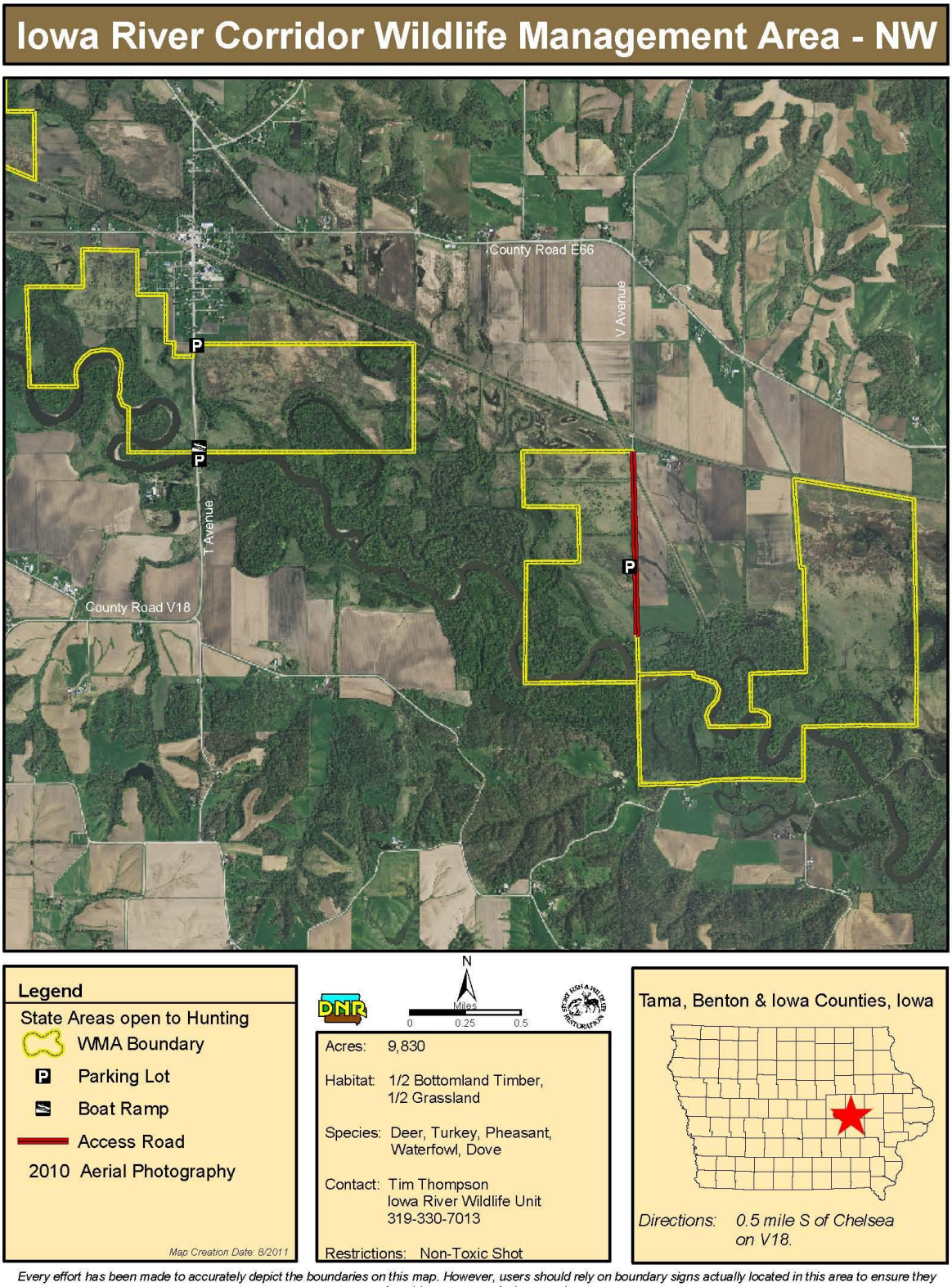
The responsibility of the refuge manager is to identify undertakings that could affect cultural resources and coordinate the subsequent review process as early as possible with the RHPO and state, tribal, and local officials. Also, the refuge manager assists the RHPO by protecting archeological sites and historic properties on Service managed and administered lands by monitoring archaeological investigations by contractors and permittees and by reporting ARPA violations.

Figure 3-7: Iowa River Corridor public access facilities and locations



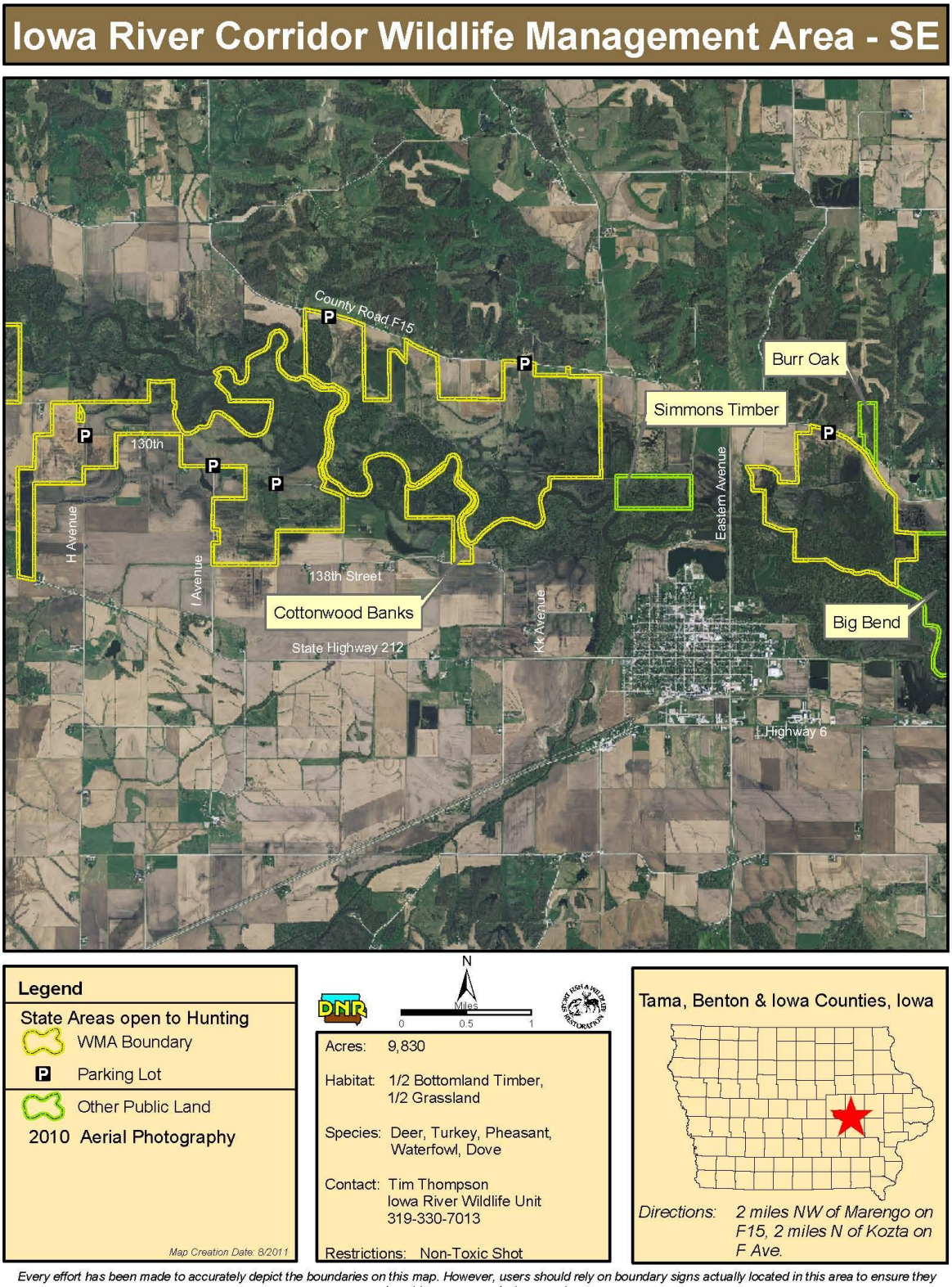
Every effort has been made to accurately depict the boundaries on this map. However, users should rely on boundary signs actually located in this area to ensure they do not trespass on private property.

Figure 3-8: Iowa River Corridor public access facilities and locations



Every effort has been made to accurately depict the boundaries on this map. However, users should rely on boundary signs actually located in this area to ensure they do not trespass on private property.

Figure 3-9: Iowa River Corridor public access facilities and locations



Every effort has been made to accurately depict the boundaries on this map. However, users should rely on boundary signs actually located in this area to ensure they do not trespass on private property.

Chapter 4: Management Direction

In this chapter:

Wildlife Goal

In partnership, restore and maintain a natural diversity and abundance of migratory birds and other native fauna on refuge lands within the Iowa River Corridor Project and contribute to maintaining bird populations listed as Species of Greatest Conservation Need in Iowa.

Objective 1-1 Migratory Birds

Over the life of the Comprehensive Management Plan (CMP), maintain or increase the existing diversity of grassland nesting birds, migrant forest birds, and migrant water birds, particularly Species of Greatest Conservation Need (SGCN), utilizing the Iowa River Corridor Project (IRCP) national wildlife refuge (NWR, refuge) lands.

Measure

- Trend in diversity and abundance of migratory birds within the IRCP, assessed biennially per Multispecies Inventory and Monitoring (MSIM) and/or defined bird monitoring program results.

Rationale

IRCP lands combine with other areas within the Bird Conservation Area (BCA) to form a dynamic ecosystem for SGCN birds. The Iowa River is one of the river corridors in Iowa with substantial habitat available for birds to use and provides core areas of habitat within the BCA. It is well known that disconnected and fragmented habitats and low diversity of vegetation can impact bird populations (Andren, 1994; Fitzgerald and Pashley, 2000). Restoring and connecting floodplain forests and other habitats to maintain a contiguous habitat corridor within the BCA that will provide SGCN nesting areas and contribute to migration routes is an important role for IRCP lands. IRCP habitats include forest for migrating and nesting songbirds, wetlands for migrant and breeding waterbirds, grassland for grassland breeding birds, and early successional or shrub type habitat for certain birds like Bell's Vireo. The diversity of representative habitats, and diversity (structure, height, density, plant species) within each habitat type, is important in this part of Iowa for maintaining a migration corridor and breeding habitat for certain groups of birds.

Habitats in the IRCP should be evaluated to determine where larger blocks of habitat (at least 20 acres, preferably 40 acres) can be provided to sustain populations of area sensitive bird species and to determine if habitat types are adequately connected. Although some habitats on refuge lands may be adequately connected, they may be isolated from larger blocks of habitat within the BCA. Some grassland and forest areas within the BCA have relatively low plant

species diversity as well. Specific habitat objectives below are aimed at improving species diversity in both grassland and forest habitats.

Waterfowl depend on seasonal and permanent wetlands

The state wildlife action plan identifies that gaps in information about the distribution and abundance of SGCN species in the state and the IRCP (Zohrer, 2006) are a problem for managing for these species. Some inventory and monitoring in the IRCP has been completed under the Iowa Department of Natural Resources (DNR) MSIM program that is ongoing. This program was designed to gather information on the SGCN and collects inventory data on a variety of taxa including birds. However, a long-term monitoring program to identify bird use and responses to habitat management in the IRCP is needed. Monitoring would also document whether rare species, such as king rails, are present and which habitats they are using.

The Audubon Society has been active in identifying goals in the Iowa River Corridor BCA as well. Specifically, they have identified the priority projects of avian surveys within the BCA, environmental education, and incorporating the Iowa River Corridor into the Audubon Minnesota Geographic Information System (GIS) planning tool. The GIS tool will focus on bird species of conservation concern and provide information and best management practices to be used in on-the-ground management efforts.

About 200 acres of food plots are currently used to provide supplemental food for resident wildlife and migratory birds because of the lack of some native food sources such as acorns. As these food sources are restored over time, then the need for food plots should decrease. However, mast producing trees take time to mature and produce nuts. Likewise, establishment of prairie forbs can take several years. The limiting life cycle factors for migratory birds and certain resident wildlife species in the IRCP should be evaluated to determine needs associated with habitat restoration and to ensure habitat fragmentation is reduced. Food plots can also serve to provide recreational opportunities by concentrating wildlife in certain areas. However, diverse native vegetation provides quality hunting and wildlife observation experiences by providing habitat for a greater variety of birds and other wildlife. Observing wildlife in large blocks of habitat may take more effort, but can be a quality outdoor experience.

The Iowa River has received much attention because of the flooding of communities along its banks. The 2008 flood resulted in a planning effort for the Iowa-Cedar River watershed by the U.S. Army Corps of Engineers. This planning and resulting action will benefit IRCP habitats, and the IRCP will undoubtedly help to achieve goals outlined in that watershed plan. As stated at the beginning of this document, the main purpose of the IRCP was floodplain protection. Much work remains to be done to restore hydrology and improve water quality and habitat in this riparian corridor that will ultimately benefit migratory birds. Most of this work is needed outside of IRCP lands.

The original U.S. Fish and Wildlife Service (FWS, Service) land acquisition goal for the IRCP was 15,000 acres, which was identified as the preferred alternative in the 1995 Environmental Assessment (EA) (FWS). The need to permanently protect lands within the Iowa River watershed and IRCP is greater than ever. Land use and climate change place ever increasing stressors on this river system. The original goal of promoting biological diversity and natural floodplain structure and function is increasingly relevant. Additional habitat restoration and protection will also meet the goals of the BCA and benefit Iowa SGCN. Acquisition will continue to make boundaries more manageable for prescribed fire and reduce conflicts with human encroachment and wildlife. Acquisition is also important for wetland restorations since the flat terrain could cause water or wet conditions on upstream private land. There continue to be small private inholdings that present access and wildlife disturbance issues. In addition, the public is seeking more places to hike, canoe, and recreate. Acquisition is dependent on funding. However, both DNR and the Service have the potential to acquire lands as funding becomes available.

Strategies

- Acquire land within the IRCP from willing sellers as opportunities and funding arise; available tracts will be identified by Iowa DNR and referred to the Service if they cannot acquire them.
- Convert any newly acquired cropland to native grassland or, if applicable, other native vegetation within three years of acquisition.
- By 2016, develop a GIS vegetation and/or land cover layer for the IRCP and the BCA using the National Vegetation Classification System or other standard system and develop an inundation layer to help prioritize management actions.
- Partner with The Audubon Society to evaluate habitat and management actions for bird species of concern by utilizing their new GIS planning tool.
- By 2015, develop a bird monitoring program for the IRCP, in conjunction with BCA partners, as a measure to monitor habitat quality, changes in habitat, and distribution of birds within the IRCP (and ultimately the BCA).
- Provide supplemental food for wildlife (i.e., food plots) on 200 acres or less (no more than two percent) within the IRCP with a goal of reducing acres in food plots over the life of the plan as habitat restorations improve diversity of habitats and native foods available. Food plots are typically not placed on lands with U.S. Department of Agriculture easements.
- Participate in agency planning efforts to evaluate hydrology, vegetation, and water quality in the watershed, and determine strategies for continuing to restore hydrology and habitats in the IRCP and BCA.

Habitat Goal

In partnership, maintain, restore and enhance the wetland and upland habitat in the IRCP to emulate a naturally functioning, dynamic floodplain, emphasizing a variety of habitat conditions that were present prior to European settlement but that can withstand flooding.

Objective 2-1 Forest

Over the life of the plan, maintain approximately 30 percent forest within IRCP refuge lands with 10 percent containing a dominant component of oak/hickory/walnut.

Measure

- Percentage of the IRCP in a forest cover type.

Rationale

The IRCP's dynamic ecosystem of forest types provides an important migration route and breeding area for SGCN birds. Forest connection will also provide larger blocks of forest and provide food for a variety of wildlife. The connected migration corridor may not all be along the banks of the river and may include the cottonwoods/silver maple community as well as the oak/hickory community.

This objective is aimed at increasing hard mast species and improving tree species diversity in IRCP forests. Forest is one of the IRCP's largest remaining natural habitats, because the trees are not easily farmed or logged. The 1993 flood dramatically altered the composition of floodplain forest in the IRCP. Many of the walnuts and oaks were above the lowest river elevations, but the duration of the flood killed most of them. Silver maple and cottonwood trees now dominate at all floodplain elevations. These species are also important and will remain as the primary species on the lowest elevations adjacent to the Iowa River. But, there may be opportunity to restore the oak, hickory, and walnut component on the higher elevations, and some work has already been done. More work is needed to determine the amount of specific forest types needed and the relationship to habitat needs of SGCN birds. Tree cover also provides important protection and enhancement for the water sources of the Iowa River. These forests are effective in removing excess nutrients and sediment from surface runoff and shallow groundwater and in shading streams to optimize light and temperature conditions for aquatic plants and animals.

Forest restoration efforts will consider the potential impacts of floods on this resource. Large floods will surely occur again and may occur with more frequency. Nearly all areas of the IRCP will experience inundation at some point; however, even a few inches of elevation in this relatively flat floodplain can make a significant difference in how long and how often trees are inundated . Light Detection and Ranging (LiDAR) data can be used to map elevations and determine the best locations for planting that will have the best chance for success. Trees will be planted above the elevations where the most frequent inundation occurs to increase chances of survival. The lower elevations are also often more difficult to access with equipment for mowing, spraying, and other maintenance. Forest restoration will entail planting of primarily hard mast species but will also strive to restore diversity to the forest resource with burr oak, swamp white oak, pin oak, pecan, hickory, walnut, hackberry, and others.

A healthy forest is diverse, vigorous, and is able to regenerate itself over time. The primary means of keeping a forest healthy are to prevent overgrazing, control invasive species, prevent physical damage to trees, monitor for insect pests and disease, and periodically thin to provide optimal spacing, particularly for desirable tree species (Iowa DNR, 2011). A forestry plan has been developed by the Iowa DNR district forester for the northwest unit of the IRCP (Iowa DNR, 2011). The plan identifies areas where previous plantings need maintenance and where crop

tree releases are needed to promote oaks and other desirable species. Forestry plans are needed for the remaining units of the IRCP.

Strategies

- By 2020, identify suitable sites (consider soils, inundation, proximity to established forest stands) for, and plant 100 acres to hard mast trees with primarily oak species on optimum elevations (irregular and intermittently flooded) to reach a goal of 10% of forest having a dominant component of these species.
- By 2020, complete timber stand improvement on 250 acres of forest.
- Complete forest inventory and forest management plans for the central and southeast units with an Iowa DNR forester.

Objective 2-2 Native Grassland

Over the life of the plan, increase native grassland to approximately 30 percent of refuge lands within the IRCP with a minimum of 25 native forb species on 30 percent of refuge grasslands, and add an additional 200 acres of native grassland on private land within the Iowa River Corridor BCA.

Measures

- Percentage of the IRCP in a native grassland cover type.
- Forb diversity in native stands.
- Acres of native grasslands on private lands within the Iowa River Corridor BCA.

Rationale

Prairie and meadow grassland habitat was prevalent in the IRCP prior to European settlement and is a much needed habitat in the region for declining bird species and other wildlife. At least 18 of the SGCN or FWS Bird Species of Conservation Concern require grasslands (appendix C). The goal of prairie plantings is to mimic the diversity and structure of native prairie as much as possible. Grassland bird breeding habitat must have suitable structure, size, and food resources (Sample and Mossman, 1997). Some grassland nesting songbirds are area dependent, and restoration and management should be targeted to meet minimum sizes. Management targeted at large tracts is more likely to support viable populations (Sample and Mossman, 1997). Large blocks of grassland at least 40 acres in size are important to ensure nesting success of grassland birds from avian and terrestrial predators (Sample and Mossman, 1997). These blocks should not be isolated but be as close together as possible and connected (Sample and Mossman, 1997).

Grassland habitat is also very important for game bird species such as the Ring-necked Pheasant. Many of these birds need grassland habitat for nesting. The Ring-necked Pheasant is the largest grassland bird in the IRCP and is Iowa's number one game bird species. Hens prefer fields with a mixture of grasses and forbs for nesting, while tall dense vegetation is important for winter survival. Most management practices to enhance or restore grasslands for songbirds will also benefit pheasants.

Initially, grassland plantings in the IRCP were done to get cover established on a large area after land was taken out of agricultural production. In the mid-1990s seed diversity was not always available, and forbs were sometimes excluded so that chemical control of weeds could be completed. Some sites are currently dominated by two or three grass species. Forb diversity promotes a more diverse insect community that attracts nesting birds and is an important food source for juvenile and adult birds through the entire nesting season.

Some past grassland plantings have been repeatedly unsuccessful due to flooding, and competition from RCG currently limits the amount of native species that can be restored. Some species tolerate flooding better, and there may be opportunities to plant species more tolerant of wet conditions. Prairie cordgrass plugs have been planted in several areas with successful growth that can compete with RCG. Much of the IRCP grasslands may remain as low diversity grasslands that can withstand flooding and compete with RCG.

Woody encroachment threatens IRCP grasslands and has been managed with prescribed fire and mowing. Treatments are sporadic due to flooding and wet conditions. Some areas, particularly at lower elevations, will remain as early successional habitat (see objective 2-4). However, grasslands are an important and limited habitat within the IRCP and BCA and need to be maintained. Increasing native grassland by three to five percent over the life of the plan includes converting some areas dominated by RCG or willows and may not necessarily be from new plantings. Some current food plot areas may also be planted to native grassland over the life of the plan.

There is new potential for treating larger areas of woody encroachment with mechanical harvest to meet biofuels demands in the region. The biofuels technology and logistics are still in development in this area of Iowa. This technique may allow larger areas to be treated, but follow up treatment may be needed to prevent re-sprouting willow and restore an area to the desired habitat type. A management prescription that includes the desired habitat outcome for these areas would need to be developed and coordinated with the cooperator.

The IRCP is also one of the larger protected habitat complexes in the state and is important in state and partner plans for bird conservation. The FWS Partners for Fish and Wildlife strategic plan for Iowa identifies the Iowa River Corridor as a focus area for that program. This cost share program works with private landowners to establish habitat on their lands. The plan calls for restoration of 250 acres of wetlands and 500 acres of uplands in the next five years. The Natural Resources Conservation Service (NRCS) is still active in the IRCP and has a waiting list for the Wetland Reserve Program (WRP). There is additional opportunity for habitat restoration in the BCA on private lands.

Strategies

- Maintain 2,500 acres of native grassland over the life of the plan; convert newly acquired cropland to native grassland within three years of acquisition.
- Utilize grain crop production methods if necessary, to prepare areas for planting to native species; a complete specific restoration plan is required for review by the Service and NRCS.
- Plant an additional 250 acres with diverse native prairie species by 2020 on higher elevations where success is more likely; experiment with flood tolerant species such as cordgrass or sedges that may compete with RCG.

- Annually maintain at least 1,000 acres of native grassland with prescribed fire and mechanical treatments in minimum 20 acre-size blocks.
- Map native grassland plantings that need enhancement, determine which have the most chance for success based on inundation (intermittently or irregularly flooded) and RCG invasion, then increase forbs diversity to a minimum of 25 species.
- Within five years of plan completion, work with partners to add 200 acres of native grassland to private lands within the Iowa River BCA.

Objective 2-3 Non-Native Grassland

Over the life of the plan, RCG dominated fields do not exceed 20 percent of irregularly flooded areas and 20 percent of intermittently flooded areas within IRCP refuge lands.

Measures

- Acres of non-native grassland cover type within the IRCP.
- Acres of RCG within the IRCP.

Rationale

RCG (*Phalaris arundinacea*) is an invasive species prevalent in many wetlands and floodplains of the Midwest (Wisconsin Reed Canary Grass Management Working Group, 2009). It is a perennial cool season grass that invades and dominates a variety of wetland types, often creating monotypic and dense stands. There are approximately 2,000 acres of RCG in the IRCP. Eradication is likely impossible and control is difficult with chemical treatment being the best option for management. Although there is potential to chemically treat many acres, subsequent establishment of native plants in these areas has proven difficult due to the frequency of flooding. Most RCG invasion is at lower elevations, but it is interspersed in other areas as well. RCG can establish on uplands but is typically on waterways and draws and is sometimes in upland locations. In most upland sites in the IRCP, it can be managed with fire to result in predominant native grasses or other cool season grasses.

In an effort to provide short-term alternative habitat that provides more benefits than RCG, managers have treated RCG fields with a combination of mowing, disking, and herbicide treatment that results in temporary control of RCG and a flush of annual plants for one to three years before RCG returns. This treatment is done on fields ranging in size from five to 40 acres. Up to 400 acres have been treated annually depending on conditions. Different areas are treated each year, although the rotation may return to previously treated areas. Annual plant species that appear after this treatment are generally Bidens spp. (wild sunflowers), ragweed, and foxtail, which provide an abundant seed source for many birds. These treatments also help reduce woody encroachment. Although native habitats are preferable, this interim measure provides much better habitat than monotypic stands of RCG where complete restoration to native species is difficult.

Another new potential tool to treat larger areas is harvest (mowing and baling) of RCG for biofuels. There is recent interest from nearby facilities, but harvest of these types of materials is still in the planning stages. However, this type of harvest may allow larger areas to be treated and restored, or treated temporarily to provide annual plants. Again, a specific management

prescription that includes the desired habitat outcome for these areas would need to be developed.

RCG is also present on a large amount of private land within the BCA. Although it will never be eradicated, strategically working to control some other areas within the BCA with partners may help to alleviate continued RCG spread in the IRCP.

Strategies

- Rotationally treat 50 to 400 acres of RCG annually by mowing, disking, and spraying with herbicides.
- Use mowing/baling/biomass harvest to temporarily control RCG or to prepare for chemical treatment and planting of desirable species.
- Utilize grain crop production methods if necessary, to prepare areas for planting to native species; a complete specific restoration plan is required for review by the Service and NRCS.
- Within five years of plan completion, experiment with RCG control, and expand the area of control to initiate restoration to native species; include planting aggressive native prairie species such as prairie cordgrass, switch grass, or lake sedge.
- Share successful RCG control techniques with other land managers and landowners in the IRCP and BCA.

Objective 2-4 Early Successional Habitat

Over the life of the plan, maintain a maximum of 25 percent early successional woody habitat on refuge lands within the IRCP.

Measure

- Percentage of the IRCP in early successional woody cover type.

Rationale

Early successional habitats will always be part of the floodplain and will expand and recede with hydrologic conditions and management techniques used. Willow species are the most predominant and aggressive early successional species in the IRCP, but dogwood, cottonwood, and maple are also present. This habitat is important cover for many species of wildlife and is a source of insects in early spring for migrating songbirds, and some component of this habitat is desirable. Scattered shrubs, shrubby patches, and small trees (less than 30 percent total cover and less than 10 feet

Willow and early successional species are currently estimated to be 15 to 20 percent of the habitat in the IRCP

tall) may be beneficial to shrub-grassland species such as Loggerhead Shrike, Bell's Vireo, and Field and Clay-colored Sparrow (Sample and Mossman, 1997). However, encroachment of woody vegetation threatens restored grasslands as well as wetland basins. If left with no management, the percentage of this habitat type would rapidly increase. Therefore, rotational treatments with prescribed fire, mowing, and/or herbicide treatment are essential. Willow encroachment is more prevalent at the lower, more frequently inundated elevations. Inundation mapping is needed to determine where management actions will be most successful.

There is new potential for treating larger areas of woody encroachment with mechanical harvest to meet biofuels demands in the region. The biofuels technology and logistics are still in development. This technique may allow larger areas to be treated, but follow up treatment may be needed to prevent re-sprouting willow and restore an area to the desired habitat type. A management prescription that includes the desired habitat outcome for these areas would need to be developed.

Strategies

- Map existing location of willow and other early successional woody species.
- Track locations of management actions.
- Determine where treatments are most effective (elevations) and where early successional habitat interspersion will not interfere with larger blocks of grassland or forest habitat.

Objective 2-5 Wetland

Over the next 10 years, maintain 1,000 acres of a variety of seasonal and permanent wetlands for migrating waterfowl within the IRCP, manage invasive and undesirable vegetation, and restore an additional 100 acres of wetlands on private lands within the Iowa River Corridor BCA.

Measures

- Acres of wetlands in the IRCP (all types included).
- Acres of wetlands on private lands within the Iowa River Corridor BCA.

Rationale

One of the main purposes of the refuge lands in the Iowa River Corridor Project is the protection of wetlands. Hydric soils and a variety of wetlands were historically present in the Iowa River floodplain. These wetlands are key habitat for migrating and nesting waterbirds as well as many other birds and resident wildlife. They also contribute to improved water quality and flood control. There are opportunities for wetland restorations or enhancements to further restore hydrology. Restorations in the floodplain typically use as little structure as possible to avoid flood damage and costly repairs. The river changes and moves and restorations are completed to allow this to happen. Restoration plans need to be flexible and aimed at restoring floodplain functions. However, some wetlands were restored with water control structures to allow water level manipulations to promote aquatic vegetation. There may be old levees or structures that could be removed to restore natural hydrology.

Some wetland basins are becoming dominated by woody vegetation such as willow. Prescribed fire is used to control this woody vegetation, but is not always effective in these wet areas and other techniques may need to be used. Mechanical treatment is one option for removing encroaching woody vegetation.

The IRCP is one of the larger protected habitat complexes in the state and is important in state and partner plans for bird conservation. The FWS Partners for Fish and Wildlife strategic plan for Iowa identifies the Iowa River Corridor as a focus area for that program. This cost share program works with private landowners to establish habitat on their lands. The plan calls for restoration of 250 acres of wetlands and 500 acres of uplands in the next five years. NRCS is still active in the IRCP and has a waiting list for WRP. There is additional opportunity for habitat restoration in the BCA on private lands.

Strategies

- Remove encroaching undesirable vegetation from wetlands where feasible, and manage water levels where possible to promote desirable vegetation.
- Identify remaining opportunities for restoring wetlands on DNR/Service fee title lands, and initiate restoration on 50 percent of these wetlands by 2016.
- Identify impediments to natural floodplain functions such as levees to continue to restore natural hydrology to IRCP lands.
- Within five years of plan completion, work with partners to add 100 acres of wetland to private lands within the Iowa River BCA.

People Goal

In partnership for collaborative conservation, provide quality visitor services to preserve cultural heritage and promote understanding, appreciation, and support for the Iowa River Corridor Project.

Objective 3-1 Appropriate Recreational Opportunities

Over the life of the plan, allow public uses deemed compatible for the IRCP.

Measures

- Appropriate Use Designations completed and available.
- Refuge Compatibility Determinations completed and available.

Rationale

<u>Hunting</u>

Refuge land is considered closed to public use until legally opened to such uses. Therefore, a hunt plan and associated EA have been completed to formally open the IRCP to hunting (FWS, 2012). Public and private land in the IRCP planning area support huntable populations of migratory birds, big game, and upland game. State and federal fee title units of the IRCP are

open to the public for hunting. Development of special hunts for youth or disabled persons may be explored if staff is available to manage these hunts.

Where allowed, hunting on the IRCP will follow the season dates and bag limits in the State of Iowa regulations. This helps reduce confusion when hunters participate in hunting activities on refuge lands. A final compatibility determination has been completed for hunting (appendix D).

Recreational Fishing

Refuge land is considered closed to public use until legally opened to such uses. Therefore, a fishing plan and associated EA have been completed to formally open the lands to fishing (FWS, 2012).

Neither the DNR nor Service manage a fishing program specifically for the Iowa River. The Iowa River is accessible from public and private lands in the IRCP. The planning area supports harvestable populations of a variety of fish species. State and federal fee title units of the IRCP are open to the public for fishing.

Fishing on the IRCP follows the season dates and bag limits in the state regulations. This helps reduce confusion when anglers participate in fishing activities within a mixture of land ownerships. A final compatibility determination has been completed for sport fishing (appendix D).

Trapping

Trapping of furbearers is an additional consumptive public use of some refuge land. Furbearer trapping in the State of Iowa continues to be a popular public use but tends to fluctuate with the fur prices. Furbearers commonly pursued in the State include raccoon, mink, muskrat, beaver, and otter. Trappers are required to follow state regulations and possess a state license. A final compatibility determination has been completed for trapping (appendix D).

Wildlife Observation and Photography

Wildlife observation and photography are growing activities in the United States drawing enthusiasts to natural areas such as refuges. Visitors can find tremendous opportunities to both view and photograph wildlife species. During the spring visitors can view and photograph numerous birds using the river corridor as they migrate. During the summer and fall, forest, prairie and wetlands can display inspiring vistas of color that change during the growing season with various wildflower blooms. Furthermore, the IRCP is an excellent place to both observe and photograph resident wildlife such as white-tailed deer and turkeys. Photo or observation blinds may be a facility that could be added on the IRCP.

Most areas of the IRCP are accessible from gravel roads, and parking areas are provided (figures 3-7, 3-8, and 3-9; at the end of chapter 3 in this CMP). Designated hiking trails may be difficult to maintain with current resources, but mowed fire breaks and service roads are available to serve as trails to allow easier access to the river and other features of IRCP lands. Maps are available on the DNR website. A final compatibility determination has been developed for wildlife observation and photography (appendix D).

Environmental Education

The IRCP provides excellent areas for local schools, clubs, and county programs to utilize for teaching the public about the Iowa River, bird migration, floodplain forest, etc. The IRCP does not have the staff or budget to produce large environmental education programs; however, this can be mitigated by developing partnerships with County Conservation Board (CCB) naturalists, the Audubon Society and others. It is important that the public understand the river system and how it influences their lives. A final compatibility determination has been developed for environmental education (appendix D).

Interpretation

Similar to environmental education, the IRCP has little staff and budget to develop interpretive programs. Areas with excellent wildlife viewing opportunities or exceptional features near easily accessible areas within the IRCP could be potential target areas for interpretive displays in the future. Partnerships with CCB naturalists and the Audubon Society could be explored to provide programs/media interpreting the importance of river systems, floodplain forest, tallgrass prairie and wetland habitat. A final compatibility determination has been developed for interpretation (appendix D).

Strategies

- Upon approval of the CMP:
    - The following uses are Appropriate and Compatible: hunting in accordance with state regulations, recreational fishing in accordance with state regulations, and trapping in accordance with state regulations, wildlife observation, photography, environmental education, and interpretation.
    - The following uses are Not Appropriate: camping and horseback riding.
- Evaluate appropriateness and compatibility (if found appropriate) of other uses upon request per the Service's appropriate use and compatibility determination policy.
- Develop a method to document the number of visitors to the IRCP.

Objective 3-2 Awareness and Understanding

Within five years of plan approval, provide the infrastructure and information necessary for visitors to locate and recreate in the IRCP.

Measures

- Number of interpretive kiosks present within the IRCP.
- IRCP informational brochure is available.
- Number of environmental education programs regarding the IRCP completed.
- Consistent signage across the IRCP.

Rationale

Currently, the only interpretive signs on the IRCP are at an observation deck that was completed in 2012. A few environmental education events are conducted by the Iowa DNR each year, but staff is currently lacking to expand this program. Partnering with local groups and schools may allow more education programs to be completed. Special tours could be conducted for the local community to explain the area and highlight wildlife resources. Boundary signs designate the partnership between the Service, DNR, and NRCS. A few signs at wetland restoration sites will also highlight this partnership.

Materials about the BCA are available and need to be more widely distributed. The IRCP is also highlighted in "A Birder's Guide to the Iowa and Cedar River Valleys" that was completed by the Iowa Valley Resource Conservation and Development (2009).

An IRCP brochure is needed for visitors to explain the IRCP and provide visitor information. The brochure will provide outreach to local communities. Highway signage to direct people to IRCP lands and facilities should also be installed. Other outreach tools such as applications for mobile phones could be explored.

Strategies

- By 2015, develop an informational brochure for the IRCP.
- By 2016, install two interpretive kiosks at popular access locations within the IRCP.
- Over the life of the plan, ensure proper signage across the IRCP.
- Partner with others such as the Audubon Society to provide more environmental education programs and develop related materials.

Chapter 5: Implementation

Current DNR staffing dedicated to the Iowa River Corridor, under the Otter Creek Wildlife Unit, are one wildlife biologist, one biological technician II, and three biological technician I. U.S Fish and Wildlife Service staff that have management involvement at the Iowa River Corridor are the Port Louisa National Wildlife Refuge refuge manager and fire management specialist. Other refuge staff also assists with prescribed burning or special projects when needed.

This plan was written with current staff and funding levels in mind. It was assumed that annual operating funds will remain about the same and some work, such as treating reed canarygrass (RCG) to provide annual weeds, prescribed fire, and maintenance of tree plantings is ongoing with annual operation funds. Most objectives in this plan can be accomplished with current funding. Additional funding needs to meet objectives in this management plan are given in table 5-1. Most needs are funding for trees, seed, materials, or contracts.

Table 5-1: Funding needs for implementation of Comprehensive Management Plan

CMP Activity	Funding Needed
Plant root production method trees	$3,000 to 5,000 per year
Complete forest inventory and Timber Stand Improvement (TSI)	$30,000 total
Prairie planting	$10,000 total
Expand RCG control	$2,000 per year
Geographic Information System (GIS) vegetation layer	$10,000 total
Inventory and Monitoring (I&M) plan	$5,000
Private lands habitat restorations	$25,000 or more
Kiosks	$15,000
Brochure development and printing	$10,000
Acquire 200 acres	$500,000

Appendix A: U.S. Fish and Wildlife Service and Iowa DNR Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING
Regarding Management of the Iowa River Corridor Project area
Of the Port Louisa National Wildlife Refuge

Iowa Department of Natural Resources
State of Iowa

Fish & Wildlife Service
U. S. Department of Interior

This MEMORANDUM OF UNDERSTANDING, entered into by and between the Iowa Department of Natural Resources, State of Iowa, (Department), under Chapters 107.24 and 107.30, Code of Iowa; and the Fish and Wildlife Service (Service), acting by and through the Regional Director, Region 3, under the Authority of the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of October 9, 1997; Migratory Bird Conservation Act of February 18, 1929, as amended (16 U.S.C. 715-715r); Migratory Bird Hunting and Conservation Stamp Act of March 16, 1934 (48 Stat. 451), as amended (16 U.S.C. 718 et seq.); Fish and Wildlife Act of August 8, 1956 (708 Stat. 1119), as amended (16 U.S.C. 742a-742j); the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 460 et seq.); the Emergency Wetland Resources Act of 1986 (P.L. 99-645); the 1994 Emergency Supplemental Allocation and in accordance with the policy detailed in 43 CFR, part 24, regarding state-federal relationships and cooperation.

This agreement updates and replaces the prior Memorandum of Understanding between the Department and Service for this purpose dated April 1, 1997.

WHEREAS, the Department has been created under the laws of the state of Iowa to provide an adequate and flexible system for the protection, development, and use of forests, fish and wildlife, lakes, streams, plant life, flowers, and other outdoor resources; and the Department has a responsibility for the management of migratory birds and other wildlife within the boundaries of the state of Iowa, and

WHEREAS, the Service is a Federal agency whose mission, working with others, is to conserve fish and wildlife and their habitats for the continuing benefit of the American people, in part through management of the National Wildlife Refuge System, which is 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, and

WHEREAS, both the Department and the Service recognize the value to wildlife species, wetlands and upland habitats protected under this agreement as valuable contribution to fulfilling their missions,

Now therefore, it is the mutual desire of the Department and the Service to work together in a partnership for the common purpose of acquiring, restoring and managing habitat within the designated Iowa River Corridor Project area in order to maintain and increase wildlife populations for the best interests of the people of Iowa and the United States.

This MEMORANDUM OF UNDERSTANDING between the Department and the Service helps support the goals of the Iowa River Corridor Project (IRCP). Specifically, the goals for the IRCP in partnership with the USDA, Natural Resources Conservation Service (NRCS), are to: 1) provide corridor landowners with a broad menu of assistance options that represent sound floodplain management including fee-title and easement acquisition, 2) manage public lands and easements to provide for the natural diversity and functions of the Iowa River System, 3) utilize the characteristics of the floodplain to improve the Iowa River water quality, 4) provide an interpretive opportunity to illustrate floodplain system management, 5) demonstrate and illustrate the economic outcomes of alternative floodplain management and land uses

and 6) utilize private and public partnerships to accomplish the objectives. The efforts of other partners, such as the Department of Agriculture, Natural Resources Conservation Service (NRCS), is also essential for meeting each the goals of the overall partnership program. This agreement relates to the management of Service fee title lands within the project area, a Division of Port Louisa NWR, in a manner that is consistent with both Service and Department authorities and policies, while contributing to the broader IRCP goals where appropriate.

Liaison and Coordination

The Refuge Manager at the Port Louisa National Wildlife Refuge (NWR), Wapello, IA, is designated as Iowa River Corridor Project Land Manager. The Refuge Manager will represent the Service in exercising Refuge System oversight pertaining to the management of Service owned IRCP lands, and providing assistance to the Department in carrying out the corridor management program. The primary Department contact is the Wildlife Biologist in charge of the Otter Creek Wildlife Unit.

Comprehensive Management Plan

Each tract in the project that is subject to a Wetland Reserve Program (WRP) easement through the NRCS has an associated Restoration Plan. These plans will collectively set much of the management direction within the IRCP area. Considering these individual tract plans a Comprehensive Management Plan (CMP) will be prepared and maintained by the Department for all Service acquired lands, in consultation with the Service and NRCS. This plan will describe the overall habitat and public use program for the project area, as well as, specific management strategies that go beyond tract-by-tract boundaries. The plan will describe development and maintenance activities required to achieve and support Refuge System goals and IRCP objectives, and will be approved by both the Department and Service. The CMP will include;

a. Project plans are to provide an alternative to flood controlling levees. Project management features should not significantly affect river hydrology. It is agreed that low-level berms relating to wetland restoration and management will be a part of the IRCP plan as approved.

b. Wildlife and habitat objectives will be based on migratory bird and indigenous wildlife species habitat needs.

c. Public use objectives will be consistent with those authorized in Title 50 CFR and National Wildlife Refuge System Guidelines. Uses are to be wildlife dependent activities in the area of hunting, fishing, wildlife observation, photography, wildlife and habitat interpretation and environmental education, unless otherwise approved. Facilities such as parking lots, interpretive signs and hiking trails are appropriate where compatible. Uses such as horseback riding, ATV use, snowmobiles and camping are not wildlife dependent and generally incompatible activities.

d. Plan format will be consistent with Department planning documents while content will meet Service standards for refuge planning elements. Service Refuge Manager will prepare Compatibility Statement for drafted plan. Major management changes will be addressed by CMP revisions as needed.

The Department and the Service Mutually Agree:

1. That all lands acquired by the Fish and Wildlife Service under the IRCP will be managed jointly as part of the National Wildlife Refuge System under the provisions of the National Refuge System Administration Act (16 U.S.C. 668dd-668ec), the National Wildlife Refuge System Improvement Act of 1997, under the regulations of 50 CFR, parts 25-34, and as part of the Wildlife management areas of the State of Iowa code (section 481A.6).
2. To cooperate in planning, carrying out, and operating a program to acquire, protect, and manage lands in the Iowa River Corridor as an alternative to agricultural production and levee reconstruction.
3. To cooperate in preparing appraisal reports and negotiating with landowners associated with Service land acquisition in the project area when funds are available.
4. To cooperate with the Department of Agriculture (NRCS) in preparing guidelines and plans for the development and management of easement lands acquired under this Program for wildlife diversity and alternative flood management.
5. To participate in interagency coordination meetings annually, or as otherwise needed, to review the management of lands acquired under this Program and to plan future Program direction as appropriate.
6. That each and every provision of this Memorandum of Understanding is subject to the laws of the state of Iowa and the laws of the United States.
7. That the Department is assigned primary management responsibility of any lands acquired under this Program, and that the Service shall retain fee title land oversight jurisdiction to ensure the management of these lands is consistent with the National Wildlife Refuge System.
8. Proprietary law enforcement jurisdiction to protect the federal land resources contained herein rests in the Department and the Service under the Cooperative Management Plan.
9. That nothing in this Memorandum shall be construed as obligating the Department or the state of Iowa to the expenditure of funds or for the future payment of money in excess of appropriations authorized by law.
10. That nothing in the Memorandum shall be construed as obligating the Service to expend or as involving the United States in any contracts or other obligations for the future payment of money in excess of the appropriations authorized by law.
11. That this Memorandum shall become effective as of the date it is signed by both parties hereto and shall continue in force for a period of fifteen (15) years, or until terminated by either party upon a ninety (90) day written notice of intention to terminate presented to the other party. Memorandum is renewable on expiration upon mutual agreement of both parties.
12. That amendment to this basic Memorandum of Understanding may be proposed by either party and shall become effective upon approval by both parties.
13. That in the event problems are identified in interpretation or compliance with any of the elements of this agreement every effort will be made to settle the issues at the lowest possible administrative level. If matters can not be resolved by the field managers the following dispute resolution process will be followed;

    a. Refuge Complex Manager and Department Regional Wildlife Supervisor will meet with field managers to discuss the pertinent issues and seek resolution;

b. In the event that these informal efforts are not successful, the Regional Refuge Supervisor will meet with the Department Wildlife Division Chief to seek a written resolution;

c. If this effort is not successful the Regional Refuge Chief will address the matter with the Department Director to seek an interpretation that will work for both agencies;

d. Finally, in the unlikely event the matter remains unresolved, it will be referred to the Service Regional

Director, whose decision will be final for management related to these Service lands.

The Fish and Wildlife Service Agrees To:

1. Work with the Department to ensure that all lands acquired for this program with Service funds will be managed in a manner consistent with the provisions of the National Refuge System Administration Act, as amended, and relevant CFR 50 regulations.

2. Assist with certain management activities, as outlined below.

3. Make payment in lieu of taxes to county governments containing project lands in amounts appropriated by Congress annually as required under the Refuge Revenue-Sharing Act of 1964. Provide summary of payments made each year to the Department.

4. In consultation with the Department, issue appropriate Special Use Permits for approved activities not covered in approved plan. Complete associated Compatibility Determination associated with such permits.

5. Process all applications for rights-of-way, or any other real estate related privilege request.

6. Meet National Environmental Policy Act (NEPA) and historic preservation requirements in relation to real estate permit issues or proposed Department project developments. Department personnel will provide adequate lead-time such proposals and assist the Service on impact analysis as requested.

7. Conduct and maintain real property inventory for Service Realty management program based on information provided by the Department in IRCP annual reports.

8. Investigate and prosecute federal violations that are not covered by state law, and to assist when possible with enforcement of refuge regulations, including violations of state regulations for permitted hunting and fishing activities.

9. Provide fire program training needed for Department to meet federal fire management standards. Service will continue program support, such as planning and reporting assistance, equipment and fire event personnel, as requested and within program funding and scheduling constraints. The Service will establish and maintain agreements with local fire departments for responses to wild fire events.

10. Administer contracts for any forest management activities or timber stand improvement (TSI) work agreed to in the CMP.

11. Resolve land boundary encroachment issues identified by the Department's annual boundary review or other patrol that could not be resolved by the Department biologist. The Service and Department shall coordinate enforcement efforts or legal actions against those responsible.

And if additional land acquisition funds are available to the Service for this project:

12. To work with the Department on determining the suitability of lands for purchase in the project that

are consistent with Refuge System standards.

13. To review and approve or disapprove completed land acquisition appraisal reports provided by the Department.

14. To prepare and authorize Statements of Just Compensation, as required by provision of P. L. 91-646.

15. To take necessary steps to vest title in the United States of land acquired for this Program, and make payment for property so purchased.

16. To make payment for all relocation benefits to displaced persons affected by the acquisition of lands under this Memorandum of Understanding, as required by P. L. 91-646.

The Iowa Department of Natural Resources Agrees To:

1. Manage lands acquired by the Service for the IRCP in accordance jointly with the provisions of the National Wildlife Refuge System Administration Act, relevant regulations contained in 50 CFR pertaining to the Refuge System, and as Wildlife management areas code (481A.5.1) and provision contained in this Memorandum, subject to oversight and retention of jurisdiction by the Service as specified above.

2. Conduct cadastral surveys, where necessary, of lands purchased for this program within available funding.

3. Provide a concise calendar year management report to the Service Regional Director, through designated Refuge Liaison, by 1 March annually.

4. Negotiate and implement any Cooperative Farming Agreements necessary to meet program objectives on Service lands. The farm program is subject to Service compatibility review and Iowa DNR Administrative Code, Chapter 21. Department intentions for annual program and any proposed changes from CMP related to farming shall be included along with the previous calendar year report for Service review in advance of changes. Conduct compliance checks for all Cooperative Farming Agreements.

5. Erect, maintain, and/or remove fences as needed to meet program needs and consistent with state laws related to grazing and animal controls.

6. Install and maintain boundary, orientation and regulatory signs at designated locations. Service will provide IRCP boundary signs and any signs needed to address Refuge System regulations that are beyond Department standards. Department will provide posts, supports and signs necessary to meet State regulation standards.

7. In conjunction with Department CMP and NRCS restoration plans, maintain restored wetlands, grasslands and existing uplands for native diversity. Fire management activities will be conducted to Service standards.

8. Control noxious weeds as necessary.

9. Obtain Service clearance for use of any herbicides and pesticides, including those used by cooperative farmers, as permitted by federal policy and regulations.

10. Assume primary enforcement responsibility for regulations needed to control public as outlined in CMP, in a manner that protects Refuge lands and habitat, in accordance with Iowa state law.

11. Inspect at least one quarter of all tracts annually for boundary encroachments or other land-use violations, in coordination with NRCS easement inspection. Inspect all non-easement boundaries at least once every two years. Take appropriate action to prevent and resolve minor trespass or unauthorized use of property and immediately report instances of more serious unauthorized land use or trespass to Refuge liaison.

12. Restore and maintain biological integrity and diversity. To this end, control undesirable or exotic fish and animal populations, if necessary, subject to Department regulations and policy for control program. Non-indigenous flora or fauna will not be introduced to refuge lands.

And if additional land acquisition funds are available to the Service for this project:

13. To provide, at state expense, appraisal reports to standards required by the Service on all lands to be purchased for this Program.

14. To negotiate, at state expense, with landowners and obtain purchase agreements on Service forms, to conduct relocation advisory services as required by P. L. 91-646, and to assist the landowners in filing claims for reimbursement of expenses under this act.

15. To obtain necessary state approvals for lands purchased for this Program in accordance with applicable state and federal laws.

16. To forward purchase agreements signed by the vendors, completed appraisal reports and other documents deemed necessary, such as preparation of materials sufficient to support the required pre-acquisition contaminants survey, to the Regional Director, U. S. Fish and Wildlife Service, Fort Snelling, Minnesota, for review, approval and execution by the Service.

In WITNESS WHEREOF, the parties hereto have executed this Memorandum of Understanding as of the date when last signed below.

State of Iowa Iowa Department of Nature Resources	U.S. Department of the Interior Fish and Wildlife Service
By _____ Director	By _____ ACTING Regional Director
Date February 3, 2004	Date 26 January 2004

Appendix B: NRCS EWRP Easement Example with Plan of Operations

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

BOOK ... PAGE 011

IOWA COUNTY, IOWA
FILED

NOT RECORDED

WETLANDS RESERVE PROGRAM
EASEMENT

95 DEC 14 AM 9:55

BOOK ... PAGE 11-23
DIANNE RATHJE
RECORDER

THIS EASEMENT is made this 13th day of December, 1995

whose address is _____
(Landowner), and the United States of America (United States) by and through the Natural Resources Conservation Service (NRCS), an agency of the United States Department of Agriculture. The Landowner and the United States are jointly referred to as the "Parties".

This conveyance is subject to the terms of the Wetlands Reserve Program (WRP), contract number _____

in the County (Borough or Parish) of Iowa, State of Iowa

DOC. NO. 2
REC. FEE 65.00
Surchg. 1.00

FOR AND IN CONSIDERATION of the sum of money set forth in the WRPO, and/or other good and valuable consideration, receipt of which is hereby acknowledged, the Landowner does hereby grant and convey to the United States an easement on the property described in Part II, Paragraph A, including appurtenant rights of access described in Part II, Paragraph E. Those rights specified in Part III, Paragraph D, are reserved to the landowner for the duration of the easement specified in Part II, Paragraph D, of this document. By this easement, the Landowner covenants compliance with the terms and conditions enumerated for the use of lands described in this document, and in the WRPO, and will refrain from any activity not specifically allowed or that is inconsistent with the purpose of this easement, the WRPO, or with the exercise of the rights granted to the United States or its representatives.

PART I - PURPOSE AND AUTHORITY

A. Purpose. The purpose of this easement is to restore, protect, and maintain the functional values of wetlands and other eligible lands for wildlife habitat, water quality improvement, flood water retention, groundwater recharge, open space, aesthetic values, and environmental education. The details of how this is to be accomplished are provided in the Wetlands Reserve Plan of Operation (WRPO) developed for the easement area. A summary of the WRPO and plan map of the easement area is attached.

B. Authority. Title XII of the Food Security Act of 1985, as amended (16 U.S.C. 3837)

PART II - PROPERTY DESCRIPTION

A. Easement Area. The property encumbered by this Wetlands Reserve Program (WRP) easement is described as follows: (Provide a legal description of the land comprising the easement area. Append a plat (photocopy)

As shown on Plat of Survey attached hereto as Exhibit A, but excluding therefrom the two right of ways described as,

DOC. NO. 1
REC. FEE 50.00
Surchg 1.00

I Avenue Right of Way Description

Commencing at the West quarter corner of Section 31, Township 81 North, Range 11 West of the 5TH Principal Meridian, Iowa County, Iowa; Thence N0°00'00"E, 80.41 feet to the Point of Beginning; Thence N0°00'00"E along the centerline of I Avenue, 1,236.73 feet; Thence N89°58'26"E along the North line of the Southwest quarter of the Northwest quarter of said Section 31, 33.00 feet; Thence S0°00'00"W, 1,236.82 feet; Thence S89°49'19"W, 33.00 feet to the Point of Beginning containing 0.94 Acres more or less subject to easements and restrictions of record

AND

I Avenue Right-of-Way Description

Commencing at the West quarter corner of Section 31, Township 81 North, Range 11 West of the 5TH Principal Meridian, Iowa County, Iowa; Thence S0°00'00"W, 469.59 feet to the Point of Beginning; Thence N89°23'35"E, 33.00 feet; Thence S0°00'00"W, 821.09 feet; Thence N83°56'16"E, 2904.58 feet; Thence S0°03'10"E, 30.00 feet; Thence S89°35'14"W along the centerline of 130th Street, 3,038.01 feet; Thence N0°00'00"E along the centerline of I Avenue, 860.06 feet to the Point of Beginning containing 2.44 Acres more or less and is subject to easements and restrictions of record.

IOWA COUNTY, IOWA
FILED

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Book 203 Page 212

DIANNE RATHJE
RECORDER

g. Landowner agrees to refra[in] from engaging in the following activities on l[and] owned by the Landowner: (Ins[ert] ess otherwise specified by th[e] ed States).

NONE

2. Definitions. For purpose of this easement:

1. "Easement Area" means the land, placed into the WRP by this easement, on which approved practices are required to restore and maintain the wetland. The legal description of the easement area is described in Part II, Paragraph A, of this document and is depicted in the attached plat. To the extent of any conflict with the attached plat, the land descriptions in this document shall control.

2. "Easement Practice" means the wetland and easement area development restoration measures agreed to in the WRPO and the attached WRPO summary to accomplish the desired program objectives.

3. "Landowner" means the person or persons who has title to the easement area. "Landowner" shall also include such person's heirs, successors, and assigns.

4. Wetland Reserve Plan of Operation (WRPO) means that plan which prescribes implementation measures for this easement.

3. Duration of Easement.

This easement shall continue in perpetuity.

4. Access. The United States and its representative shall have the right of access to the easement area. Such access shall be for any purposes the United States and its representatives determine necessary to ensure compliance with the WRPO and the easement. Establishment and maintenance of such access shall be the responsibility of the Landowner and all costs resulting from access establishment and maintenance shall be borne by the Landowner. The United States will pay the fair market value of a planted crop destroyed because of the United States exercising its right to access to the easement area. The Landowner is free to locate and relocate the place of access as the landowner deems desirable, provided that such location is sufficient to provide reasonable access to the easement area.

PART III - COVENANTS BY THE LANDOWNER

Title. The Landowner covenants that the Landowner is vested with good title to the easement area and will warrant and defend on behalf of the United States the same against all claims and demands including, but not limited to, claims and demands against the quiet and peaceable use and enjoyment by the United States of the easement area and the right of access granted herein.

B. Easement Practices.

1. Compliance. The Landowner shall comply with all easement practices specified in the WRPO. In the event of a conflict or ambiguity between the WRPO or this easement, the provisions of this easement shall prevail.

2. Cost Incurred in Maintaining WRPO. All costs involved in the maintaining the WRPO and the rights of access granted to the United States and its representatives, or otherwise incurred with respect to the maintenance of the easement area shall, together with all other charges associated with maintenance of the easement area, including taxes, be the responsibility of the Landowner.

3. Rights of the United States to Inspect Property and Perform Work on the Property. By this easement, the United States and its authorized representatives have a right of access to the easement area, including but not limited to, the right to inspect the easement area, and, if necessary, the right to perform measures necessary to maintain the easement practices specified in the attached WRPO summary and the WRPO.

C. Rights of The United States Run with the Land and Bind the Landowner's Successors. The rights granted to the United States in this easement run with the land and shall be superior to the rights of all others in the easement area. All obligations of the Landowner under this easement shall also bind the Landowner's heirs, successors, and assigns.

D. Use of the Easement Area. The Landowner shall have the right to quiet enjoyment of the easement area and to control access by the general public consistent with the terms of this easement and the WRP regulations. When specified in the WRPO and the attached WRPO summary, such rights may also include regulated hunting and fishing, periodic timber harvesting, and haying or grazing.

E. Violations and Remedies. If there is any failure to comply with the provisions of this easement or the WRPO; to provide the United States and its representatives access to the easement area; to establish and maintain the easement practice as specified in the WRPO; or to comply with such WRPO, the United States, or its authorized representative, may enter onto the property to perform the necessary work, seek specific performance, or seek any other legal remedy provided by law. All expenses incurred by the United States (including any legal fees or attorney fees) thereby incurred shall be assessed against the Landowner.

F. Prohibitions. No action shall be taken on the easement area by the Landowner, the landowner's representative, heirs, successors, or assigns, unless such action is in accordance with the WRPO, this easement, and the WRP regulations. Generally, unless otherwise specified in the WRPO and in the attached WRPO Summary, such prohibitions include, but are not limited to the following:

1. Construction of structures.

2. Planting for harvest any agricultural commodity.

3. Manipulation of the easement area which would have an adverse effect on the hydrology.

4. Alteration of the wildlife habitat or other natural land features of the easement area.

IN WITNESS WHEREOF, the Landowner hereunto sets hand(s) and seal(s) on the day of the year first written above.

Grantor(s)

(ACKNOWLEDGMENT IN ACCORDANCE WITH STATE OR LOCAL PRACTICE)

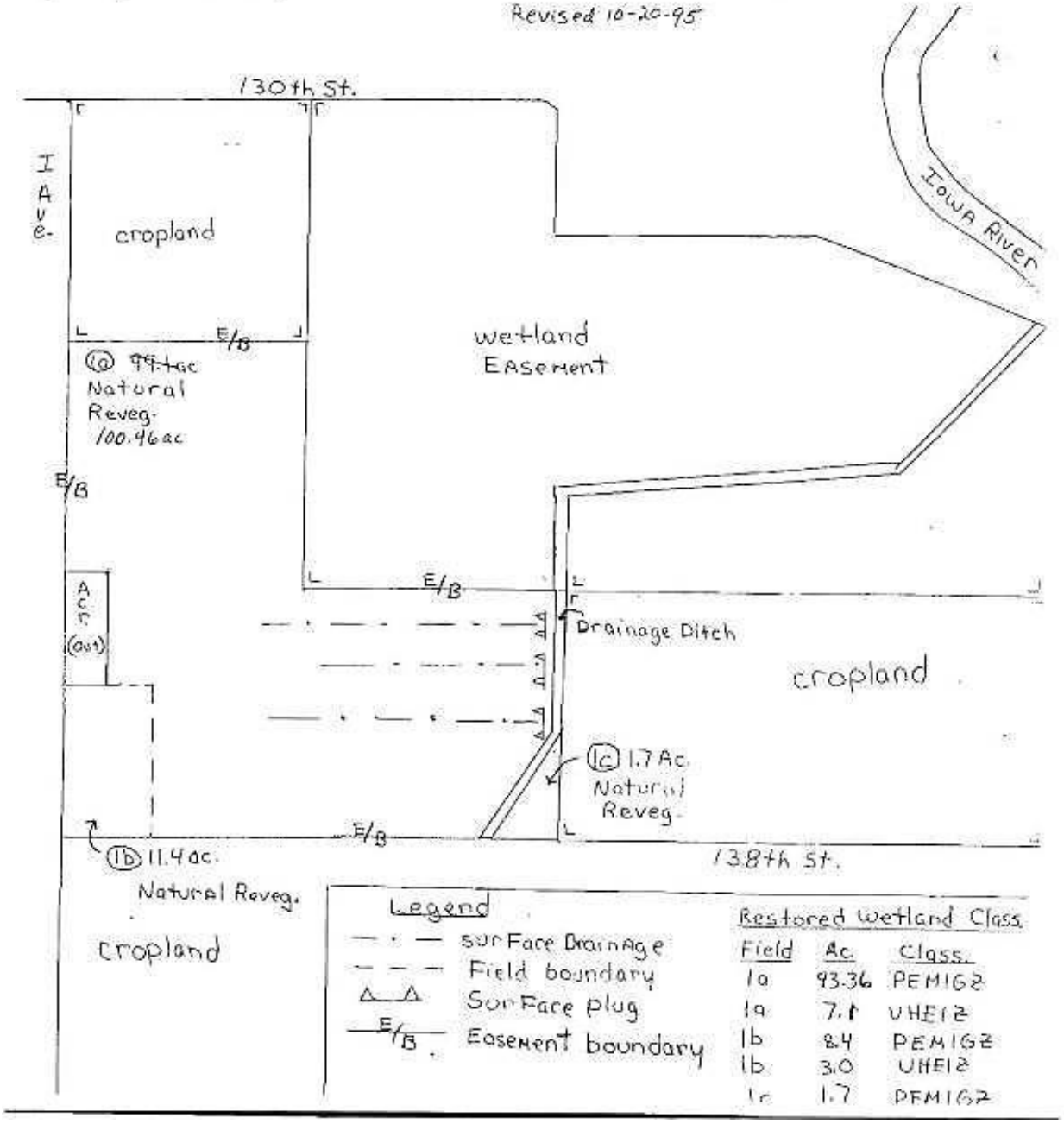
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SCS-CPA-16
2-81

CONSERVATION PLAN MAP

Owner _____ Operator _____
County Iowa State Iowa Date 3-17-95
Approximate acres 112.2ac 113.56ac Approximate scale 1" = 660'
Cooperating with Iowa County Soil and Water Conservation District
Plan identification Sec. 21 Photo number _____
Assisted by S. Johnston USDA Soil Conservation Service

Revised 10-20-95



SUMMARY OF
WETLANDS RESERVE PLAN OF OPERATIONS
FOR
EASEMENT AREA

Name:

Contract Number:
Contract Acres: 113.56

RR # 1 Box 125
Marengo, IA 52301

Purpose and Function: The primary purpose of this easement is the restoration of wetlands for flood storage, water quality protection, wildlife habitat, and aesthetic quality.

Summary of Restoration: Fields 1a-c (113.56 acres) as shown on the plan map, and in the WRP contract, will be placed under a permanent easement. Restoration of the wetlands will be accomplished as per the details shown in the Wetland Restoration Plan and Plan Map. Summarized below are the main items included in this plan.

1. The 100.46 acres in field 1a will be restored to wetland by plugging the surface drainage ditches at the point of the outlet, as shown on the plan map.

2. The 113.56 acres in field 1a-c will be allowed to revegetate to a natural wetland plant community. The area will be managed as a wetland habitat area.

Compatible Uses: The following uses have been determined to be compatible with the purposes of this easement and are established as part of the easement conditions and terms:

1. Production and harvest of forestry products from fields 1a-c is allowed within the scope of the IDNR forestry management plan.

2. One cutting of hay annually from fields 1a-c is permitted as long as the criteria established by the forage management plan, developed by the NRCS, are followed. The cutting must be made between July 15th and September 1st.

3. Grazing of domestic livestock from fields 1a-c is permitted in accordance to the NRCS grazing management plan. Grazing is permitted as long as vegetation is not adversely impacted and harvested efficiency does not exceed 25% in any given year and there is adequate regrowth to provide winter cover and early spring nesting cover.

4. Hunting, fishing, and trapping consistent with all Federal and State laws is permitted. The landowner has the right to enjoy these uses himself and is permitted to grant such use, either gratis or for a fee, to any individual or group.

5. The landowner has the right to allow schools or educational groups to use the area for educational tours.

6. The landowner has the right to other quiet enjoyment of the area for aesthetic reasons.

7. The existing surface drainage ditch along the southeast end of field 1a, can be maintained as needed to provided offsite drainage.

All compatible uses are allowed as long as there is no degradation of the purpose and functions for which the easement area was established.

Access: The access route for inspection of the easement area or other necessary duties by USDA personnel is shown on the plan map. The landowner controls all access to the site by the public. Access is available along 138 th street to the south, and I Ave. to the west.

Operation and Maintenance: The easement area will have all necessary operations and maintenance performed by the landowner to ensure that the purposes and functions for which the area was restored continue to be carried out. Required items include:

1. The surface drain plugs, in field 1a, will be inspected annually and after every flood event to ensure that still meet design specifications. They will be maintained to maintain the wetland hydrology.

2. All federal and state listed noxious weeds will be controlled as required by law by either spot mowing or spraying. All such control will be done in a manner that does not degrade the purpose and functions of the wetland easement.

3. The access route will be maintained. Access is available off of 138th Street and off of I Ave.

Note: The Wetland Reserve Program Plan of Operations contains specific details of design, engineering, planting, forage and forestry management, and operation and maintenance for this tract. These details are an official part of this easement. Failure to follow these requirements may negate this contract. The landowner has the right to appeal any Natural Resources Conservation Service decision that adversely affects participation in this program. Any variations in this plan must be approved by the landowner, the Natural Resources Conservation Service, and the Fish and Wildlife Service.

Appendix C: Species Lists

In this appendix:

*Iowa Department of Natural Resources Bird Species of Greatest Conservation Need (D), U.S. Fish and Wildlife Service (FWS) Birds of Conservation Concern (F), FWS Region 3 Resource Conservation Priorities (C), Partners in Flight priority species for physiographic area 32 (P). Bird species listed by the state as threatened or endangered species are noted in bold. Nuisance species that are of management concern were not included on this list. Determination of species occurrence was determined from the IRC BCA checklist below.

Bird Species

Bird Species	*Status	Habitat	Migratory – M, Nesting – N,
Trumpeter Swan	D, C	Wetland	N, R
Northern Pintail	D, C	Wetland, grassland	N, R
Canvasback	D, C	Wetland	N, R
Redhead	D	Wetland	N
Wood Duck	C	Wetland	N
American Black Duck	C	Wetland	M
Mallard	C	Wetland	N
Blue-winged Teal	C	Wetland	N
Lesser Scaup	C	Wetland	M
Pied-billed Grebe	F	Wetland	N
Horned Grebe	F	Wetland	M
Northern Bobwhite	D, P	Grassland, shrubland	N
American White Pelican	D	Wetland	M
American Bittern	D,F	Wetland	N, R
Least Bittern	D,F,C	Wetland	N, R
Black-crowned Night-Heron	D,F,C	Wetland, wet shrubland	N, R
Yellow-crowned Night-Heron	D	Wetland, riparian forest	N
Osprey	D, C	Wetland, riparian forest	N
Bald Eagle	D, F, C, P	Riparian forest, deciduous forest	N, R
Northern Harrier	D, C, P	Grassland, marsh	N, R
Northern Goshawk	C	Upland forest	M
Red-shouldered Hawk	D, C	Riparian forest	N, R
Broad-winged Hawk	D	Deciduous forest	N
Swainson's Hawk	D, C	Savanna, open woodland	N, R
Peregrine Falcon	D, C	Riparian forest, deciduous forest	N
King Rail	D, C, F	Wetland	N, R
Common Gallinule	D, C	Wetland	N, R
Sandhill Crane	D	Wetland, grassland	N
Solitary Sandpiper	D, F	Wetland	M
Greater Yellowlegs	D, C	Wetland	M, R
Lesser Yellowlegs	D, F	Wetland	M
Upland Sandpiper	D, F, C	Grassland	N, R
Stilt Sandpiper	D, C	Wetland	M, R
Short-billed Dowitcher	D, F, C	Wetland	M, R
American Golden Plover	D	Wetland	M
Hudsonian Godwit	D, F, C	Wetland	M, R
Marbled Godwit	D, F, C	Wetland	M, R

Buff-breasted Sandpiper	D, F, C	Wetland, short grassland	M, R
American Woodcock	D, C	Deciduous forest, open woodland, riparian forest	N, R
Wilson's Phalarope	C	Wetland	M
Black Tern	D, F, C	Wetland	N, R
Forster's Tern	D, C	Wetland	N, R
Common Tern	F	Wetland	M
Yellow-billed Cuckoo	D	Deciduous forest, shrubland, open woodland	N
Black-billed Cuckoo	D, F, C	Riparian and deciduous forest, open woodland, shrubland	N, R
Barn Owl	D, C	savanna	N, R
Long-eared Owl	D, C, P	Open woodland, savanna, deciduous forest	N, R
Short-eared Owl	D, F, C, P	Grassland	N,R
Common Nighthawk	D	Grassland, savanna	N
Eastern Whip-poor-will	D, F, C	Deciduous forest, open woodland	NR
Chimney Swift	D, P		N
Red-headed Woodpecker	D, F, C, P	Savanna, open woodland, deciduous forest	N, R
Northern Flicker	F, C		
Olive-sided Flycatcher	C, F		
Acadian Flycatcher	D, F, C	Deciduous forest, riparian forest	N, R
Willow Flycatcher	D	Wet shrubland	N
Least Flycatcher	D	Deciduous forest, open woodland	N
Loggerhead Shrike	D, F, C, P	Savanna, shrubland	N, R
White-eyed Vireo	D	Open woodland, shrubland	N
Bell's Vireo	D, F, C, P	Shrubland, savanna	N, R
Brown Creeper	D	Deciduous and riparian forest	N
Sedge Wren	D, C, F	Grassland, wetland	N, R
Veery	D	Riparian forest, deciduous forest	N
Wood Thrush	D, F, C	Deciduous forest, riparian forest	N, R
Blue-winged Warbler	D, F, C	Deciduous forest, shrubland	N, R
Golden-winged Warbler	D, C	Deciduous forest, open woodland shrubland	M
Cerulean Warbler	D, F, C, P	Deciduous forest	N
Black-and-white Warbler	D	Deciduous forest	N
Prothonotary Warbler	D, F, C, P	Riparian forest	N
Worm-eating Warbler	D, C, F	Deciduous forest	N
Louisiana Waterthrush	D, C, F	Riparian and deciduous forest	N
Kentucky Warbler	D, F, C, F	Deciduous and riparian forest	N
Hooded Warbler	D	Deciduous forest	N
Canada Warbler	D, C, F	Deciduous forest	M
Cape May Warbler	C	Deciduous forest	M
Yellow-breasted Chat	D	Open woodland, shrubland	N
Field Sparrow	D, F, C, P	Shrubland, grassland	N
Grasshopper Sparrow	D, F, C, P	Grassland	N
Henslow's Sparrow	D, F, C, P	Grassland	N
LeConte's Sparrow	D, C, F	Grassland	M
Nelson's Sharp-tailed Sparrow	D, C	Grassland, wetland	M
Dickcissel	D, F, C, P	Grassland	N
Bobolink	D, C, P, F	Grassland	N
Eastern Meadowlark	D, C	Grassland, savanna	N
Western Meadowlark	C	Grassland	N
Rusty Blackbird	D, F, C	Riparian forest, wetland, wet shrubland	M
Orchard Oriole	C, P,F	Deciduous forest, early successional	N
Brown Thrasher	F	Deciduous forest, shrubland, open woodland	N

Field Checklist for Iowa River Corridor BCA

* = confirmed or likely area breeder
Iowa Wildlife Action Plan *Migratory* Species of Greatest Conservation Need
Iowa Wildlife Action Plan *Nesting* Species of Greatest Conservation Need

___Greater White-fronted Goose
___Snow Goose
___Ross's Goose
___Cackling Goose
___Canada Goose*
___**Trumpeter Swan***
___Mute Swan
___Tundra Swan
___Wood Duck*
___Gadwall*
___American Wigeon
___American Black Duck
___Mallard*
___Blue-winged Teal*
___Northern Shoveler*
___**Northern Pintail**
___Green-winged Teal
___**Canvasback**
___**Redhead**
___Ring-necked Duck
___Greater Scaup
___Lesser Scaup
___Bufflehead
___Common Goldeneye
___Hooded Merganser*
___Common Merganser
___Red-breasted Merganser
___Ruddy Duck
___**Northern Bobwhite***
___Gray Partridge*
___Ring-necked Pheasant*
___Wild Turkey*
___Pied-billed Grebe*
___Horned Grebe
___Red-necked Grebe
___Eared Grebe
___**American White Pelican**
___Double-crested Cormorant
___**American Bittern***
___**Least Bittern***
___Great Blue Heron*
___Great Egret*
___Snowy Egret
___Little Blue Heron
___Cattle Egret
___Green Heron*
___**Black-crowned Night-Heron***
___**Yellow-crowned Night-Heron**
___White-faced Ibis
___Turkey Vulture*
___**Osprey**
___Swallow-tailed Kite
___Mississippi Kite
___**Bald Eagle***
___**Northern Harrier***
___Sharp-shinned Hawk
___Cooper's Hawk*
___Northern Goshawk
___**Red-shouldered Hawk***
___**Broad-winged Hawk***
___**Swainson's Hawk**
___Red-tailed Hawk*
___Rough-legged Hawk
___Golden Eagle
___**Yellow Rail***
___**King Rail**
___Virginia Rail
___Sora*
___**Common Gallinule**
___American Coot*
___**Sandhill Crane***
___Black-bellied Plover
___**American Golden-plover**
___Semipalmated Plover
___**Piping Plover**
___Killdeer*
___Black-necked Stilt
___Spotted Sandpiper*
___**Solitary Sandpiper**
___**Greater Yellowlegs**
___Willet
___**Lesser Yellowlegs**
___**Upland Sandpiper***
___**Hudsonian Godwit**
___**Marbled Godwit**
___Ruddy Turnstone

___Semipalmated Sandpiper
___Western Sandpiper
___Least Sandpiper
___White-rumped Sandpiper
___Baird's Sandpiper
___Pectoral Sandpiper
___Dunlin
___Stilt Sandpiper
___Buff-breasted Sandpiper
___Short-billed Dowitcher
___Long-billed Dowitcher
___Wilson's Snipe
___American Woodcock*
___Wilson's Phalarope
___Red-necked Phalarope
___Bonaparte's Gull
___Franklin's Gull
___Ring-billed Gull
___Herring Gull
___Caspian Tern
___Black Tern
___Common Tern
___Forster's Tern
___Rock Pigeon*
___Eurasian Collared-Dove*
___Mourning Dove*
___Yellow-billed Cuckoo*
___Black-billed Cuckoo*
___Barn Owl*
___Eastern Screech-Owl*
___Great Horned Owl*
___Snowy Owl
___Barred Owl*
___Long-eared Owl
___Short-eared Owl*
___Northern Saw-Whet Owl
___Common Nighthawk*
___Eastern Whip-poor-will*
___Chimney Swift*
___Ruby-throated Hummingbird*
___Belted Kingfisher*
___Red-headed Woodpecker*
___Red-bellied Woodpecker*
___Yellow-bellied Sapsucker
___Downy Woodpecker*
___Hairy Woodpecker*
___Northern Flicker*
___Pileated Woodpecker*
___American Kestrel*
___Merlin
___Peregrine Falcon
___Eastern Wood-Pewee*
___Yellow-bellied Flycatcher
___Acadian Flycatcher*
___Alder Flycatcher
___Willow Flycatcher*
___Least Flycatcher
___Eastern Phoebe*
___Great Crested Flycatcher*
___Western Kingbird
___Eastern Kingbird*
___Loggerhead Shrike*
___Northern Shrike
___White-eyed Vireo*
___Bell's Vireo*
___Yellow-throated Vireo*
___Blue-headed Vireo
___Warbling Vireo*
___Philadelphia Vireo
___Red-eyed Vireo*
___Blue Jay*
___American Crow*
___Horned Lark*
___Purple Martin*
___Tree Swallow*
___Northern Rough-winged Swallow*
___Bank Swallow*
___Cliff Swallow*
___Barn Swallow*
___Black-capped Chickadee*
___Tufted Titmouse*
___Red-breasted Nuthatch
___White-breasted Nuthatch*
___Brown Creeper
___Carolina Wren*
___House Wren*
___Winter Wren
___Sedge Wren*
___Marsh Wren*
___Blue-gray Gnatcatcher*
___Golden-crowned Kinglet
___Ruby-crowned Kinglet
___Eastern Bluebird*
___Veery*
___Gray-cheeked Thrush
___Swainson's Thrush
___Hermit Thrush
___Wood Thrush*

___Henslow's Sparrow*
___Le Conte's Sparrow
___Nelson's Sparrow
___Fox Sparrow
___Song Sparrow*
___American Robin*
___Gray Catbird*
___Northern Mockingbird*
___Brown Thrasher*
___European Starling*
___Cedar Waxwing*
___Lapland Longspur
___Snow Bunting
___Ovenbird*
___Worm-eating Warbler
___Louisiana Waterthrush*
___Northern Waterthrush
___Golden-winged Warbler
___Blue-winged Warbler*
___Black-and-white Warbler
___Prothonotary Warbler*
___Tennessee Warbler
___Orange-crowned Warbler
___Nashville Warbler
___Mourning Warbler
___Kentucky Warbler*
___Common Yellowthroat*
___Hooded Warbler*
___American Redstart*
___Cape May Warbler
___Cerulean Warbler*
___Northern Parula*
___Magnolia Warbler
___Bay-breasted Warbler
___Blackburnian Warbler
___Yellow Warbler*
___Chestnut-sided Warbler*
___Blackpoll Warbler
___Palm Warbler
___Yellow-rumped Warbler
___Yellow-throated Warbler*
___Black-throated Green Warbler
___Canada Warbler
___Wilson's Warbler
___Yellow-breasted Chat*
___Eastern Towhee*
___American Tree Sparrow
___Chipping Sparrow*
___Clay-colored Sparrow
___Field Sparrow*
___Vesper Sparrow*
___Lark Sparrow*
___Savannah Sparrow*
___Grasshopper Sparrow*
___Lincoln's Sparrow
___Swamp Sparrow*
___White-throated Sparrow
___White-crowned Sparrow
___Harris's Sparrow
___Dark-eyed Junco
___Summer Tanager
___Scarlet Tanager*
___Northern Cardinal*
___Rose-breasted Grosbeak*
___Indigo Bunting*
___Dickcissel*
___Bobolink*
___Red-winged Blackbird*
___Eastern Meadowlark*
___Western Meadowlark*
___Yellow-headed Blackbird*
___Rusty Blackbird
___Brewer's Blackbird
___Common Grackle*
___Great-tailed Grackle*
___Brown-headed Cowbird*
___Orchard Oriole*
___Baltimore Oriole*
___Purple Finch
___House Finch*
___Pine Siskin
___American Goldfinch*
___House Sparrow*
___Eurasian Tree Sparrow*

Mammals, Reptiles and Amphibians, and Invertebrates

Mammals, reptiles and amphibians, and invertebrates on the Iowa Species of Greatest Conservation Need list. Species on the FWS Region 3 Resource Conservation Priority list are noted with an asterisk (*). Species listed by the state as threatened or endangered species are noted in bold.

Reptiles and Amphibians	**Mammals**	**Odonates**	**Butterflies**
Northern cricket frog (*Acris crepitans*)	**Least shrew** (*Cryptotis parva*)	Mocha dmerald (*Somatochlora linearis*)	Sleepy duskywing (*Erynnis brizo*)
Prairie skink (*Plestiodon septentrionalis*)	Evening bat (*Nycticeius humeralis*)	Carolina daddlebags (*Tramea Carolina*)	Wild Indigo duskywing (*Erynnis baptisiae*)
Smooth greensnake (*Opheodrys vernalis)*	**Indiana bat** (*Myotis sodalis*)*	Sulphur-tipped clubtail (*Gomphus militaris*)	Zabulon skipper (*Poanes zabulon*)
Gophersnake (Bullsnake) (*Pituophis catenifer*)	Northern myotis (*Myotis septentrionalis*)	Canada darner (*Aeshna Canadensis*)	Sedge skipper (*Euphyes dion*)
Blanding's turtle (*Emydoidea blandingii*)	Franklin's ground squirrel (*Spermophilus franklinii*)	Blue-eyed darner (*Aeshna multicolor*)	Two-spotted skipper (*Euphyes bimacula*)
Ornate box turtle (*Terrapene ornate*)	Southern flying squirrel (*Glaucomys volans*)	Green-striped darner (*Aeshna verticalis*)	Acadian hairstreak (*Satyrium acadicum*)
	Prairie vole (*Microtus ochrogaster*)	Four-spotted skimmer (*Libellula quadrimaculata*)	Edwards' hairstreak (*Satyrium edwardsii*)
	Southern bog lemming (*Synaptomys cooperi*)	Cyrano darner (*Nasiaeschno pentacantha*)	Hickory hairstreak (*Satyrium caryaevorum*)
	Woodland vole (*Microtus pinetorum*)	Smoky shadowdragon (*Neurocordulia molesta*)	Striped hairstreak (*Satyrium liparops*)
	River otter (*Lutra Canadensis*)	Vesper bluet (*Enallagma vesperum*)	Regal fritillary (*Speyeria idalia*)
	Spotted skunk (*Spilogale* putorius)	Spotted spreadwing (*Lestes congener*)	**Byssus skipper** (*Problema byssus*)
	Bobcat (*Lynx rufus*)*	Sweetflag spreadwing (*Lestes forcipatus*)	

Appendix D: U.S. Fish and Wildlife Service Appropriate Use and Compatibility Determinations

In this appendix:

Appropriate Use

The following Appropriate Use documents are included:

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Iowa River Corridor Project, Port Louisa National Wildlife Refuge

Use: Camping

This form is not required for wildlife-dependent recreational uses, 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
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?		✓
(d) Is the use consistent with public safety?		✓
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		✓
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?		✓
(h) Will this be manageable in the future within existing resources?		✓
(i) 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?		✓
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?		✓

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 ✓ 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** ___

Refuge Manager: Catherine J. Hey Date: 3/8/13

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: [signature] Date: 6/4/13

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Iowa River Corridor Project, Port Louisa National Wildlife Refuge

Use: Horseback riding

This form is not required for wildlife-dependent recreational uses, 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
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?		✓
(c) Is the use consistent with applicable Executive orders and Department and Service policies?		✓
(d) Is the use consistent with public safety?		✓
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		✓
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?		✓
(h) Will this be manageable in the future within existing resources?		✓
(i) 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?		✓
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?		✓

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 ✓ 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** ___

Refuge Manager: Catherine J. Hey Date: 5/29/13

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: Kevin S. Foerster Date: 6/4/13

Refuge Supervisor

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Iowa River Corridor Project, Port Louisa National Wildlife Refuge

Use: Wood cutting/timber harvest

This form is not required for wildlife-dependent recreational uses, 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
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistant with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) 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?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

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 ✓ 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** ✓

Refuge Manager: Catherine J. Hey Date: 5/29/13

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: Kevin S. Foerster Refuge Supervisor Date: 6/4/13

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319 02/06

Compatibility Determinations

The following Compatibility Determinations are included:

Compatibility Determination

Use: Cooperative Farming for Habitat Management and Supplemental Wildlife Food

Refuge Name: Port Louisa National Wildlife Refuge (Refuge), Iowa River Corridor Project

Establishing and Acquisition Authority(ies):

The Port Louisa National Wildlife Refuge was established in 1958 under authorities of the Migratory Bird Conservation Act, the Fish and Wildlife Coordination Act, and the Refuge Recreation Act. In addition, lands in the Iowa River Corridor in Tama, Iowa, and Benton Counties in Iowa were added to the Refuge under the authority of the Emergency Wetland Resources Act of 1986 (16 U.S.C. – 3901(b) 100 Stat. 3583) subsequent to the 1993 flood.

Refuge Purpose(s):

"…the conservation of wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions…"

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:

The Refuge will allow farming by private individuals for the purpose of habitat restoration and management and for providing supplemental food for wildlife. Iowa River Corridor lands are managed by the Iowa Department of Natural Resources (DNR) through a Memorandum of Understanding. The Iowa DNR establishes the agreements or contracts with local farmers.

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 by jurisdictional agreement. Farming of any single field or area is usually done on a short-term basis (5 years or less) to: remove undesirable vegetation; reduce unacceptable chemical concentrations in the soil; prepare optimum site conditions for establishment of native vegetation, including forest, prairie or wetland communities. In some circumstances, cooperative farming may occur for longer time periods to maintain suitable conditions for future habitat management actions that require completion of complex planning and coordination. For

example, maintaining an area free of woody vegetation, or invasive reed canary grass, for future native plantings is typically less harmful, more efficient, and cost effective compared to removing such vegetation at a later time. In most circumstances where farming is permitted, the use agreement will require a portion of the crop be left unharvested in the field for the benefit of wildlife. Cash rent, in lieu of crop share, may be considered by the manager, and implemented with justification.

Very little of the Iowa River Corridor's 10,000 acres is suitable for farming. Most areas are wetlands, or within the frequently inundated river flood plain. Most relatively higher land within the Refuge suitable for farming has been converted to permanent native habitat. Areas that are currently farmed, or may be farmed in the future, are being prepared for habitat restoration/enhancement projects. Approximately 200 acres, involving two permittees, are currently farmed on the Refuge. We estimate that up to 250 acres Refuge-wide may be cooperatively farmed at any one period during the next decade. The total area farmed may exceed this amount for short periods 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. In addition, approximately 25 acres are currently planted as supplemental wildlife food due to the loss of native foods from flooding.

Cooperative farming is conducted under the terms and conditions of a Cooperative Farming Agreement or DNR agreement issued by the Refuge Manager or local DNR manager. The terms of the Agreement or Permit ensure compliance with Service policy and area-specific stipulations to meet management objectives and safeguard resources.

Availability of Resources:

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 a 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 Use:

Cooperative farming to prepare suitable site conditions for habitat management purposes will result in short-term disturbances and long-term benefits to both resident and migratory wildlife using the Refuge. Short-term impacts will include disturbance and displacement typical of any noisy heavy equipment operation. Farming activities will also result in short-term loss of habitat for any species using those areas for nesting, feeding, or resting. Long-term benefits are positive due to establishment of diverse native habitat. The resulting habitat will improve conditions for most of the same species adversely affected by the short-term negative impacts. The relative

small size of the areas being farmed, and the control of timing and duration of farming practices will limit anticipated impacts.

Public Review and Comment:

This Compatibility Determination modifies one that was included in the Refuge's Comprehensive Conservation Plan and Environmental Assessment (EA) approved in 2004.

This modification of the 2004 Compatibility Determination consists of the addition of stipulations 5 and 6 in the Stipulations Necessary to Ensure Compatibility section found below. These stipulations are being added as a result of the recently completed environmental assessment by the Midwest Region of the U.S. Fish and Wildlife Service entitled "Use of Row Crop Farming and Genetically-modified, Glyphosate-tolerant Corn and Soybeans on National Wildlife Refuges and Wetland Management Districts."

A draft of the modified Compatibility Determination will be made available for public review and comment at the Refuge office in Wapello, Iowa and at the DNR office in Chelsea, Iowa. The document will also be made available for public review on the Refuge's webpage during the same time period. No comments were received after a 14 day comment period.

Determination:

_____Use is Not Compatible

__X X__Use is Compatible with Following Stipulations:

Stipulations Necessary to Ensure Compatibility:

1. Cooperative Farming Agreements will be limited to five years or less, unless otherwise approved by the Refuge Manager.

2. Cooperating farmers will be subject to Service policy and regulations regarding use of chemicals.

3. Special conditions of Cooperative Farming Agreements will address unique local conditions as applicable.

4. Farming must meet specific habitat and related wildlife objectives and contribute to the purposes of the Refuge.

5. The use of Genetically Modified Crops (GMO crops), specifically Glyphosate-tolerant corn and soybeans, may be authorized on Refuge lands consistent with current Regional policy.

6. Beginning in Calendar Year 2012, the use of Genetically-Modified, Glyphosate-tolerant corn and soybeans will be used only for the purpose of habitat restoration, or as soon as current farming contracts can be modified. Crops planted for supplemental wildlife food will not use genetically modified seed.

Justification:

Farming on the Refuge to prepare lands for restoration or enhancement will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the Refuge because:

1. Cooperative farming activities will be conducted where it provides the fastest, most cost effective way to establish native prairie, forest, or managed wetlands on areas that have unacceptable chemical residue, invasive plants, or other undesirable plant species or ecotypes.

2. Farming for supplemental food will occur until native mast producing trees and other native foods can be established. Beginning in 2012, genetically modified seed will not be used for these crops.

3. The total area on which farming will be permitted is a small portion of the Refuge, and thus cause insignificant adverse effects on habitat overall.

4. Farming will be conducted in accordance with a Management Plan which will identify management units, desired habitat goals/objectives, and management strategies.

5. Short-term adverse effects on habitat caused by farming activities are offset by long-term habitat improvement.

Signature: Refuge Manager: Catherine J. Henry 6/15/11
Signature and Date

Concurrence: Regional Chief: Rick Schultz 6/30/11
Signature and Date

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

Standard Eligibility Questionnaire for the Use of Genetically Modified Crops on National Wildlife Refuge System Lands

The Biological Integrity, Diversity, and Environmental Health Policy (601 FW 3), as amended, states, "We do not use genetically modified organisms in refuge management unless we determine their use is essential to accomplishing refuge purpose(s) and the Regional Chief or the Assistant Manager, California/Nevada Operations Office (CNO), National Wildlife Refuge System, approves the use." Therefore, in order to approve the use of genetically modified crops (GMCs), the Regional Chief must concur that GMCs are "essential" for fulfilling refuge purposes.

However, several other factors may prevent a Regional Chief from approving the use of GMCs, even when GMCs are considered essential for fulfilling refuge purposes. For example, if a state or local law prohibits the use of GMCs, the Regional Chief may not approve the use of GMCs.

From 2004-2006 the FWS GMC Team developed an eligibility questionnaire for use by two primary parties: 1) Refuge managers, to determine the appropriateness of requesting approval for GMC use; and, 2) Regional Chiefs in considering the merits of requests for using GMCs. The intent now is to provide an eligibility questionnaire that will be used in all Regions, providing greater consistency and accountability throughout the Refuge System.

If GMCs are to be used, they must be addressed (along with farming in general) in refuge NEPA documents and compatibility determinations. However, once farming is determined to be an appropriate and compatible use, the eligibility questionnaire is the key document for determining whether GMCs will be used on refuges. Conversely, the process of filling out the questionnaire will also be useful to refuge staff in preparing NEPA documents and compatibility determinations in addition to determining whether to seek approval for the use of GMCs.

In general, 601 FW 3 clearly sets a high bar for the use of GMCs as well as farming and pesticides in general. This was intentional and is something to keep in mind when considering the content of the eligibility questionnaire and subsequently when considering requests for the use of GMCs.

Following is a revised eligibility questionnaire, based upon a combination of features from the GMC Team and comments from regions.

U.S. Fish and Wildlife Service, National Wildlife Refuge System
Genetically Modified Crops (GMC) Eligibility Questionnaire

Name of FWS representative: Catherine J. Henry

Title of FWS representative: Refuge Manager

Date: 6/16/11

Refuge(s): Port Louisa NWR, Iowa River Corridor Project

Refuge Purpose(s): ...the conservation of the wetlands of the nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions (Emerg. Wetlands Res. Act 1986)

Instructions: Use this questionnaire to determine if GMCs are eligible for use on your refuge(s). If you determine that GMCs are eligible for use, you may submit the completed questionnaire to your Regional Chief with a memo requesting approval of the use of specific GMCs. Approval must be obtained prior to the use of GMCs. NEPA documentation, compatibility determination, and ESA Section 7 consultation addressing the use of GMCs must also be finalized prior to the use of GMCs. Once GMC approval is obtained, no renewal process is required.

1. Is it practicable to achieve refuge purposes by managing native plant communities and without growing domesticated crops?

☐ **Yes?** Stop here. GMCs are not permitted and farming will not be practiced.

☑ **No?** Describe why and go to Question 2.

The use of agriculture provides a means to prevent succession from encroaching on fields until they can be restored. The corridor properties are subject to willow and cottonwood invasion. Farming also helps control reed canary grass that is a prevalent problem on corridor lands. In addition, much of the riparian forest with hardwood mast trees was harmed by the 1993 floods. Crops provide some food source for migratory waterfowl and resident wildlife until mast trees can be reestablished. Corridor properties are managed by the Iowa DNR. About 200 acres, or 2% of the lands owned by the Service are currently farmed.

2. Is it possible to grow conventional crops (non-GMCs) in a quantity sufficient to achieve refuge purposes without using pesticides or herbicides?

☐ **Yes?** Stop here. Pesticides, herbicides, and GMCs are not permitted. Conventional crops may be used without the use of pesticides or herbicides.

☑ **No?** Describe why and go to Question 3.

It would be difficult to secure individuals to farm with the use of herbicides due to the cost of production. It is also difficult for cooperative farmers to obtain non-GMC seed, or not cost effective to use that seed for the portion of the operation that is on Refuge lands. In addition, undesirable vegetation that the Refuge is trying to control with farming would outcompete the crops.

3. Are there any federal or state laws or regulations that prohibit the planting or production of GMCs on the refuge or in the area in which the refuge is located? (Contact the local County Extension Service in your area for updated information pertaining to this question.)

☐ **Yes?** Stop here. GMCs are not permitted. (Please identify the law(s) or regulation(s) below for FWS informational purposes.)

☑ **No?** Go to Question 4.

4. Which GMCs do you seek approval for using?

Glyphosate tolerant corn and soybeans

5. Are there any known wild relatives of the GMCs listed above on or within 6 miles of the refuge?

☐ **Yes?** Stop here. GMCs are not permitted. (Please identify the known wild relatives below for FWS informational purposes.)

_____

_____

_____

☑ **No?** Go to Question 6.

6. Is the use of the GMCs listed under Question 4 considered essential for achieving refuge purposes?

☑ **Yes?** Go to Question 7.

☐ **No?** Stop here. GMCs are not permitted. Conventional crops may be used, with or without the use of pesticides.

7. Describe briefly how and where on the refuge(s) you would use the GMCs listed under Question 4, and why these GMCs are considered essential for fulfilling refuge purposes. (Include detailed information on refuge purposes. Also include information on how the use of these GMCs would assist with accomplishing habitat and population objectives. Attach another page if necessary.)

It is essential to use GMC crops on the Refuge for the 2011 season since cooperative farmers have already purchased seed and production is already underway. Farming will cover approximately 200 acres of the 10,000 Iowa River Corridor acres. The purpose of these lands are "... the conservation of wetlands....and to help fulfill international obligations contained in various migratory bird treaties and conventions." Farming is used to control succession of woody species and invasive species until restoration to native habitats can be completed, and to provide food for migrating waterfowl. Food sources are lacking due to past flooding. After harvest 2011, GMC's will only be used on a short term basis for habitat restoration and will eventually be discontinued.

8. Do federally listed threatened or endangered species (or species proposed for listing) inhabit the refuge or does critical habitat (proposed or designated) as described in the Endangered Species Act occur on the refuge in and around the immediate areas in which GMC's will be grown?

☐ **Yes?** Identify the species and critical habitat proposals and designations here and go to Question 9.

☑ **No?** Go to Question 11.

Notes on threatened and endangered species, listing proposals, and critical habitat:

9. Will the use of the GMCs listed under Question 4 potentially affect listed species (or species proposed for listing) and/or critical habitat (designated or proposed) directly or indirectly?

☐ **Yes?** Initiate Section 7 consultation as required by the Endangered Species Act and go to Question 10.

☑ **No?** Go to Question 11.

10. Do Section 7 consultations indicate that using the GMCs listed under Question 4 is likely to adversely impact or adversely modify a listed species or critical habitat in and around the immediate area in which GMCs will be planted? (Attach the biological opinion to the questionnaire.)

☐ **Yes?** GMCs are not permitted.

☑ **No?** Go to Question 11.

11. Is the use of the GMCs listed under Question 4 addressed in final NEPA documents?

☑ **Yes?** Go to Question 12.

☐ **No?** Approval for the use of GMCs may be requested after NEPA documentation is finalized. See also Question 12.

12. Is the use of the GMCs listed under Question 4 addressed in a published compatibility determination?

☑ **Yes?** Regional Chief's approval for the use of GMCs may be requested. The request must be in writing (hardcopy or email) and must include this questionnaire.

☐ **No?** Approval for the use of GMCs may be requested after a compatibility determination is published or in press.

Catherine J. Henry — 6/15/11

Signature of FWS Representative Completing Questionnaire — Date

Request Approved ☑ Request Denied ☐

Regional Refuge Chief Rick Schultz — Date 6/30/11

Compatibility Determination

Use: Hunting

Refuge Name: Iowa River Corridor Project, Port Louisa National Wildlife Refuge

Establishing and Acquisition Authorities:

The Iowa River Corridor Project (IRCP) is a partnership between the U.S. Fish and Wildlife Service (Service); Iowa Department of Natural Resources (IDNR); and the USDA Natural Resources Conservation Service (NRCS). The partnership was established in 1993 following the Midwest flood. Authority for land acquisition by the Service is provided under the Emergency Wetland Resources Act of 1986 (P.L. 99-645).

Authority for this partnership is provided under Chapters 107.24 and 107.30, Code of Iowa; the Migratory Bird Conservation Act of 1929 as amended (16 U.S.C. 715-715r); Migratory Bird Hunting and Conservation Stamp Act of 1934 (48 Stat. 451), as amended (16 U.S,C. 718 et seq.); the Fish and Wildlife Act of 1956 (708 Stat. 1119), as amended (16 U.S.C 742a-742j); the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 460 et seq.); National Wildlife Refuge System Administration Act of 1966, as amended (16 U.S.C. 668dd – 668ee); the Emergency Wetland Resources Act of1986 (PL 99-645; the Emergency Supplemental Appropriations Act of 1994; and the National Wildlife Refuge System Improvement Act of 1997 (PL 105–57).

Refuge Purpose(s):

The partnership focus area is a 45 mile section of the Iowa River floodplain in Tama, Benton, and Iowa Counties that encompasses about 50,000 acres. Within this focus area the Service owns approximately 9300 acres, managed as a division of Port Louisa National Wildlife Refuge. Under the acquisition authority of the Emergency Wetland Resources Act, the primary purposes of these refuge lands are the conservation of the wetlands of the nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions.

The 1995 Environmental Assessment and Finding of No Significant Impact (USFWS) for land acquisition in the Iowa River Corridor Project noted four management purposes: (1) Providing habitat for migratory birds and endangered species; (2) Improving the natural diversity of the ecosystem through restoration and protection of floodplain habitat; (3) Providing an alternative to levee reconstruction and reclaiming damaged farmland; and (4) Increasing public opportunities for outdoor recreation, such as hunting or fishing, and environmental education compatible with the preceding purposes.

The IDNR manages the IRCP refuge lands under a 2004 Memorandum of Understanding (MOU) between the Service and IDNR. The refuge lands are managed as part of the Iowa River Wildlife Unit. The MOU between the Service and IDNR describes six specific goals for the IRCP: (1) Provide IRCP landowners with a broad menu of assistance options that represent sound floodplain management including fee-title and easement acquisition; (2) Manage public lands and easements to provide for the natural diversity and functions of the Iowa River System; (3) Utilize the characteristics of the floodplain to improve the Iowa River water quality for fish and wildlife; (4) Provide an interpretive opportunity to illustrate floodplain system management; (5) Demonstrate and illustrate the economic outcomes of alternative floodplain management

and land uses; and (6) Utilize private and public partnerships to the fullest extent of each agency's resources to accomplish the objectives.

In addition, most refuge lands in the IRCP overlay USDA wetland easements. Hunting and fishing are allowed on those easements.

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? Allow IRCP visitors to hunt certain wildlife species according to state seasons and regulations with some refuge-specific regulations.

Is the use a priority public use? Hunting is a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge Improvement Act of 1997.

Where is the use conducted? Public hunting for certain species is an existing use that occurs throughout the IRCP on Service fee title land, adjacent federal easement property, state land, and private property. The IRCP lies within the state's Otter Creek and Coralville Wildlife Management Units.

How would the use be conducted? Bag limits and harvest methods for authorized species are consistent with Iowa State regulations, except when more restrictive refuge regulations apply. Hunting is allowed for the following species: big game (white-tailed deer and wild turkey); migratory birds (ducks and geese, coots and gallinules, sora and Virginia rails, doves, woodcock, snipe, and crows); upland game (ring-necked pheasant, bobwhite quail, grey and fox squirrel, and cottontail rabbit); and furbearing game animals (coyote, fox, and raccoon). Currently 100% of the IRCP is open to hunting for these species.

When is the use conducted? Season dates, bag limits, and harvest methods are generally consistent with state regulations, with a few refuge-specific regulations. Dates and times will vary depending on species. Times of day are according to regulations for each allowed species. Season information can be found at http://www.iowadnr.gov/portals/idnr/uploads/Hunting/huntingregs.pdf

Why is the use being proposed? Hunting is a priority 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. Hunting is an existing use on the IRCP, and was determined a compatible use on several divisions of Port Louisa National Wildlife Refuge in 2005. In order to promote consistent regulation of hunting across the IRCP partner lands and private lands, a hunt plan and environmental assessment have been prepared.

Availability of Resources:

The designated areas open to public hunting are open in accordance with state and refuge regulations and do not require preparation and administration of special hunts. The area is popular for hunting pheasants, deer, waterfowl, and turkeys. Except for localized areas on the opening day of firearms deer season, crowding has not been an issue as sufficient resources appear to exist to accommodate the current level of participation and provide a quality hunting experience.

Hunters use the existing network of roads to access areas open to hunting. Parking lots, and signs are provided by the refuge for use by hunters, and boat ramps are provided by the IDNR. The IDNR also provides staff and volunteers to maintain these facilities and disseminate information to visitors. The main point of contact for visitors is the IDNR office at the Otter Creek wildlife unit in Chelsea, Iowa. Additional parking lots and boat ramps are provided by other agencies, local units of government, or private interests. Hunters residing next to the refuge boundary are often able to access open hunting areas from their property. Refuge law enforcement officers and state conservation officers enforce state and refuge hunting regulations.

Adequate resources are available to manage the existing hunting program at the current level of participation. Addition or improvement of facilities would require additional funds.

Anticipated Impacts of the Use:

Short-term impacts: As an ongoing activity throughout the IRCP, accommodating this wildlife-dependent use is expected to result in minimal impacts. Although hunting causes mortality to wildlife, season dates and bag limits are set with the long-term health of populations in mind. Populations of certain species, for example white-tailed deer, are monitored by the IDNR. Survey information indicates that a limited harvest will not adversely affect the overall deer population level. Without harvest, deer will quickly overpopulate an area causing degradation to the quality and quantity of vegetation. Therefore, deer hunting promotes a healthier, more robust, and diverse Refuge plant community. Deer hunting may also reduce the number of deer/car collisions on adjacent highways.

Disturbance to wildlife may also result from hunting activity. This disturbance is expected to be limited in scope and duration. Dogs are permitted for hunting for retrieving and trailing. At present levels of use dogs used for these purposes are not expected to adversely impact non-target species or conflict with other uses. All motor vehicle use is restricted to designated roads, trails, and parking areas which reduces disturbance to wildlife. Disturbance to habitat is minimal given the nature of this hunting and restriction of vehicle use.

Hunters occasionally violate regulations, such as exceeding the daily bag limit, using permanent tree stands, or hunting in the wrong area. However, these incidents usually have only minor impacts to wildlife populations or refuge resources.

Long-term impacts: With continued population monitoring by federal and state agencies, no long-term negative impacts to wildlife are anticipated. By maintaining this priority public use over the long-term, state and local economic benefits would be expected to be stable or improve.

Cumulative impacts: There are no anticipated cumulative negative impacts. Cumulative positive impacts include wildlife population stability, and in particular a positive response from refuge plant communities with deer harvest and associated control of deer populations. Within the entire IRCP area, harvest on the refuge would be limited and would fall within the state's population management goals which are based on the best available information each year. Economic benefits from wildlife-associated recreation, including hunting, are reported every 5 years by the U.S. Fish and Wildlife Service (2011). For Iowa, total expenditures for hunting increased from $288,324,000 in 2006 to $405,451,000 in 2011. Maintaining and expanding opportunities to hunt are expected to have positive cumulative effects on the economy at multiple scales.

Other uses that may occur on these lands are fishing, wildlife observation, hiking, environmental education and routine management. These uses are generally spread out over the entire area such that they are not all occurring at the same time and place. Therefore, little cumulative impacts are expected from other uses.

This activity has shown no assessable environmental impact to the refuge, its habitats or wildlife species. Concerns primarily center on the possibility of impacting sensitive non-target species through excessive disturbance. Visitor safety and law enforcement issues are also important. Providing restrictions that limit access to specific locations on the refuge will minimize disturbance and unsafe vehicle access. Disturbance to wildlife is limited to occasional flushing of non-target species during the open hunting season. The hunt follows all applicable laws, regulations and policies; including, 50 CFR, National Wildlife Refuge System Manual, National Wildlife Refuge System Administration Act, National Wildlife Refuge System goals and objectives, and Port Louisa NWR goals and objectives. This activity is also compliant with the purpose of the refuge and the National Wildlife Refuge System Mission. Operating this activity does not alter the refuge's ability to meet habitat goals, provides for the safety of the area's citizens, and supports several of the primary objectives of the refuge.

Public Review and Comment:

This compatibility determination was available for a 30 day comment period in November 2013 together with the IRCP hunt environmental assessment. A notice was sent to local newspapers and posted at the Refuge office and DNR office. The CD was available to all interested parties through the Port Louisa NWR website (http://www.fws.gov/refuge/port_louisa). The documents were also available at the Wapello, Iowa and Belle Plaine, Iowa libraries, the refuge office in Wapello, and the DNR office in Chelsea, Iowa. No comments were received.

Determination:

___ Use is Not Compatible
_X_ Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

To ensure compatibility with IRCP and refuge purposes and the mission of the National Wildlife Refuge System, hunting can occur on the refuge if the following stipulations are met:

1. This use must be conducted in accordance with state and federal regulations, and special refuge regulations published in the Federal Register.

2. Populations will be monitored by the Iowa DNR to ensure a healthy population exists that may be removed without depleting the resource below a point of normal recruitment/recovery.
3. Law enforcement patrols will be conducted by state and federal officers to ensure compliance with hunting regulations and refuge special use regulations.
4. Any hunting program may be canceled if, in the judgment of the refuge manager, it causes disturbance to wildlife populations, or harm to other resources beyond that associated with normal entry/access to the area.
5. Litter will be collected, as necessary, by refuge staff and/or volunteers. Special signs will be erected where necessary, to provide information to hunters regarding regulations, boundaries and closed areas.
6. Hunting may be more restrictive than state seasons and regulations to ensure compliance with visitor safety and to reduce wildlife disturbance.
7. Vehicle use is prohibited including the use of snowmobiles and all terrain and utility terrain vehicles (ATV/UTV).
8. The construction or use of permanent binds, stands or scaffolds is prohibited. All personal property, including but not limited to stands, temporary blinds, platforms, and ladders must be removed at the end of each day's hunt.

Justification:

Hunting seasons and bag limits are established by the states and generally adopted by the refuge, including the IRCP. These restrictions ensure the continued well-being of overall populations of game animals. Hunting does result in the taking of many individuals within the overall population, but restrictions are designed to safeguard an adequate breeding population from year to year. Specific refuge regulations address equity and quality of opportunity for hunters, and help safeguard refuge and IRCP habitat. Disturbance to other fish and wildlife does occur, but this disturbance is generally short-term and adequate habitat occurs in adjacent areas. Loss of plants from boat or foot traffic is minor, or temporary, since hunting occurs mainly after the growing season.

Conflicts between hunters are localized and are addressed through law enforcement, public education, and continuous review and updating to state and refuge hunting regulations. Conflicts between other various user groups are minor given the season of the year for hunting and the location of most hunting away from public use facilities.

Stipulations above will ensure proper control of the means of use and provide management flexibility should detrimental impacts develop. Allowing this use also furthers the mission of the National Wildlife Refuge System by promoting a priority public use and by providing renewable resources for the benefit of the American public while conserving fish, wildlife, and plant resources on the refuge.

References

U.S. Fish and Wildlife Service. 1995. Final Environmental Assessment and Finding of No Significant Impact. Proposed Land Acquisition in the Iowa River Corridor Project. Fort Snelling, MN.

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

U.S. Fish and Wildlife Service. 2011. 2011 National Survey of hunting, fishing, and wildlife associated recreation.

Refuge Manager: Catherine J. Henry 12/19/12
Catherine J. Henry Date

Concurrence: Jim Yeager, Acting 12/27/12
Kevin Foerster, Refuge Supervisor Date

Regional Chief: Tom Worthington JAN 28 2013
Tom Worthington, Acting Refuge Chief Date

Mandatory 10-or 15 year Re-evaluations Date: 2022

Compatibility Determination

Use: Sport Fishing

Refuge Name: Iowa River Corridor Project, Port Louisa National Wildlife Refuge

Establishing and Acquisition Authorities:

The Iowa River Corridor Project (IRCP) is a partnership between the U.S. Fish and Wildlife Service (Service), Iowa Department of Natural Resources (IDNR), and the USDA Natural Resources Conservation Service (NRCS). The partnership was established in 1993 following the great midwest flood. Authority for land acquisition is provided under the Emergency Wetland Resources Act of 1986 (P.L. 99-645).

Authority for this partnership is provided under Chapters 107.24 and 107.30, Code of Iowa; the Migratory Bird Conservation Act of 1929 as amended (16 U.S.C. 715-715r); Migratory Bird Hunting and Conservation Stamp Act of 1934 (48 Stat. 451), as amended (16 U.S,C. 718 et seq.); the Fish and Wildlife Act of 1956 (708 Stat. 1119), as amended (16 U.S.C 742a-742j); the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 460 et seq.); National Wildlife Refuge System Administration Act of 1966, as amended (16 U.S.C. 668dd – 668ee); the Emergency Wetland Resources Act of 1986 (PL 99-645; the Emergency Supplemental Appropriations Act of 1994; and the National Wildlife Refuge System Improvement Act of 1997 (PL 105–57).

Refuge Purpose(s):

The partnership focus area is a 45 mile section of the Iowa River floodplain in Tama, Benton, and Iowa Counties that encompasses about 50,000 acres. Within this focus area the Service owns approximately 9,300 acres, managed as a division of Port Louisa National Wildlife Refuge. Under the acquisition authority of the Emergency Wetland Resources Act, the primary purposes of these refuge lands are the conservation of the wetlands of the nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions.

The 1995 Environmental Assessment and Finding of No Significant Impact for Land Acquisition in the Iowa River Corridor Project (USFWS) noted four management purposes: (1) Providing habitat for migratory birds and endangered species; (2) Improving the natural diversity of the ecosystem through restoration and protection of floodplain habitat; (3) Providing an alternative to levee reconstruction and reclaiming damaged farmland; and (4) Increasing public opportunities for outdoor recreation, such as hunting or fishing, and environmental education compatible with the preceding purposes.

The IDNR manages the IRCP refuge lands under a 2004 Memorandum of Understanding (MOU) between the Service and IDNR. The refuge lands are managed as part of the Iowa River Wildlife Unit. The MOU describes six specific goals for the IRCP: (1) Provide IRCP landowners with a broad menu of assistance options that represent sound floodplain management including fee-title and easement acquisition; (2) Manage public lands and easements to provide for the natural diversity and functions of the Iowa River System; (3) Utilize the characteristics of the floodplain to improve the Iowa River water quality for fish and wildlife; (4) Provide an interpretive opportunity to illustrate floodplain system management; (5) Demonstrate and illustrate the economic outcomes of alternative floodplain management and land uses; and (6) Utilize private

and public partnerships to the fullest extent of each agency's resources to accomplish the objectives.

In addition, most refuge lands in the IRCP overlay USDA wetland easements. Hunting and fishing are allowed on those easements.

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? Allow IRCP visitors to fish the Iowa River and its associated backwaters and wetlands on the refuge for fish species according to state of Iowa seasons and regulations.

Is the use a priority public use? Fishing is a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997.

Where is the use conducted? Sport fishing for certain species is an existing use that occurs throughout the IRCP on Service fee title land, adjacent federal easement property, state land, and private property. The IRCP lies within the state's Otter Creek and Coralville Wildlife Management Units. Most fishing opportunities occur on the Iowa River, but there are also wetlands that may contain fish. Access to the refuge for fishing is by foot or by canoe or motorized boat.

How would the use be conducted? Length, bag, and possession limits and harvest methods for authorized species are consistent with State of Iowa regulations, except when more restrictive refuge regulations apply. Fishing is allowed under statewide regulations for the following species: Black bass, bluegill, crappie, pumpkinseed, catfish, frogs, muskellunge, mussels, northern pike, paddlefish, shovelnose sturgeon, trout, yellow bass, white bass, rock bass, walleye (and sauger), yellow perch and all other fish except endangered species. Not all of the preceding species are found in the IRCP reach of the Iowa River. Currently 100% of the IRCP is open to fishing for these species.

When is the use conducted? Season dates; length, bag, and possession limits, and harvest methods are consistent with state regulations, with a few refuge-specific regulations. Dates and times vary depending on species. That information is available at http://www.iowadnr.gov/fish/regulations/iafshregs.html

Why is the use being proposed? Fishing is a priority general public use of the Refuge System that is also an important wildlife management tool. The Service recognizes fishing as a healthy, traditional outdoor pastime, deeply rooted in the American heritage (USFWS 2006). Fishing can instill a unique understanding and appreciation of fish and wildlife, their behavior, and their habitat needs. Fishing programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System. Fishing is an existing use on the IRCP, and was determined a compatible use on several divisions of Port Louisa National Wildlife Refuge in 2005. In order to promote consistent regulation of fishing across the IRCP partner lands and private lands, a fishing plan and environmental assessment

have been prepared. There was no opening package completed for fishing when these lands were originally acquired, but that is now being completed.

Availability of Resources:

The areas open to sport fishing are open in accordance with state and refuge regulations and do not require preparation and administration of special events. Fishing visitation to the IRCP has not been estimated or recorded. Crowding has not been an issue as sufficient resources appear to exist to accommodate the current level of participation and provide a quality fishing experience. Law enforcement is provided by the IDNR conservation officers for those counties, as well as a Service refuge officer located at Neal Smith NWR.

Anglers use the existing network of roads to access areas open to fishing. They can also access the river by motorized boat or by canoe. Parking lots, boat ramps, restrooms, leaflets, information kiosks, and signs are provided by the IDNR and refuge for recreational users. The refuge also provides staff and volunteers to maintain these facilities and disseminate information to visitors. Additional parking lots and boat ramps are provided by other agencies, local units of government, or private interests. Anglers residing next to the refuge boundary are often able to access the Iowa River from their property.

Adequate resources are available to manage the existing fishing activity at the current level of participation. Additional funds would be required to expand or improve facilities.

Anticipated Impacts of the Use:

Short-term impacts: As an ongoing activity throughout the IRCP, accommodating this wildlife-dependent use is expected to result in minimal impacts. Although fishing causes mortality to fish, season dates and bag limits are set with the long-term health of fish populations in mind. Populations of certain species, for example black bass (largemouth and smallmouth), are maintained at sustainable levels through the enforcement of length limits that ensure the maturation to reproductive age of those species. Other species with no length limit, and/or liberal bag and possession limits would be considered locally abundant and harvest would not be expected to adversely affect their overall populations.

Disturbance to wildlife may also result from angling activity. This disturbance is expected to be limited in scope and duration. All motor vehicle use is restricted to designated roads, trails, and parking areas which reduces disturbance to wildlife. Disturbance to habitat is minimal given the nature of this activity, and restriction of vehicle use.

Discarded fishing line and other fishing litter can entangle wildlife and cause injury and death. Additionally, litter impacts the visual experience of refuge visitors. With periodic monitoring of angler access points, trash collection, and installation of monofilament recycling containers, the physical and aesthetic effects of visitor-generated trash can be reduced if not eliminated.

Anglers occasionally violate regulations, such as exceeding the daily bag limit, length limits or possession. However, these incidents are infrequent and usually have only minor impacts to fish populations or refuge resources.

Long-term impacts: Fishing activities may impact refuges when anglers trample vegetation, create unauthorized trails, or cause erosion of the shorelines. No increases in vegetation damage, trail creation or erosion have been noticed since establishment of the IRCP, therefore

no long-term effects are anticipated at this time. With continued population monitoring by federal and state agencies, no long-term negative impacts to the Iowa River fishery are anticipated. By maintaining this priority public use over the long-term, state and local economic benefits would be expected to be stable or improve.

Cumulative impacts: There are no anticipated cumulative negative impacts. Cumulative positive impacts include increased recreational opportunities for refuge visitors, and an increased appreciation for floodplain natural resources. Within the entire IRCP area, harvest on the refuge would be a small percentage and would fall within the state's population management goals which are based on the best available information each year. Economic benefits from wildlife-associated recreation, including fishing, are reported every 5 years by the U.S. Fish and Wildlife Service (2011). For Iowa, although the total number of anglers went up from 438,000 to 473,000, total expenditures for fishing decreased slightly from $288,324,000 in 2006 to $277,999,000 in 2011. Maintaining and expanding opportunities to fish are expected to have positive cumulative effects on the economy at multiple scales.

This activity has shown no assessable environmental impact to the refuge, its habitats, fish, or wildlife species. Concerns primarily center on the possibility of impacting sensitive non-target species through excessive disturbance. Visitor safety and law enforcement issues are also important. Providing restrictions that limit types of access to specific locations on the refuge will minimize disturbance and unsafe vehicle access. Disturbance to wildlife is limited to occasional flushing of non-target species during fishing activity. Fishing combined with other public activities and management actions will not cause cumulative impacts since most uses are separated by time and area. Adequate area exists for all uses to occur.

Fishing the Iowa River from IRCP lands will follow all applicable laws, regulations and policies; including, 50 CFR, National Wildlife Refuge System Manual, National Wildlife Refuge System goals and objectives, and Port Louisa NWR goals and objectives. This activity is also compliant with the purpose of the refuge and the National Wildlife Refuge System Mission. Operating this activity does not alter the refuge's ability to meet habitat goals, provides for the safety of the area's citizens, and supports several of the primary objectives of the refuge.

Public Review and Comment:

This compatibility determination was available for a 30 day comment period along with the IRCP fishing plan environmental assessment. A notice was sent to local newspapers and posted at the refuge office and DNR office. The EA was available to all interested parties through the Port Louisa NWR website (http://www.fws.gov/refuge/port_louisa). The documents were also available at the Wapello and Belle Plaine, Iowa libraries, the refuge office in Wapello, Iowa and IDNR office in Chelsea, Iowa. No comments on this Compatibility Determination were received.

Determination:

___ Use is Not Compatible
_X_ Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

To ensure compatibility with IRCP and refuge purposes and the mission of the National Wildlife Refuge System, fishing can occur on the refuge if the following stipulations are met:

1. This use must be conducted in accordance with state and federal regulations, and special refuge regulations published in the Federal Register.
2. This use is subject to modification if on-site monitoring by refuge personnel or other authorized personnel results in unanticipated negative impacts to fisheries, natural communities, wildlife species, or their habitats.

Justification:

Fishing seasons, length, bag and possession limits are established by the state and adopted by the refuge on IRCP lands. These restrictions ensure the continued well-being of the river fishery. Fishing does result in the taking of many individuals within the overall population, but restrictions are designed to safeguard adequate populations from year to year. Specific refuge regulations address equity and quality of opportunity for anglers, and help safeguard refuge and IRCP habitat. Disturbance to other fish and wildlife does occur, but this disturbance is generally short-term and adequate habitat exists throughout the IRCP. Loss of plants from boat or foot traffic is minor, or temporary, since submersed aquatic vegetation is limited in the Iowa River and bank fishing locations receive only moderate pressure.

Conflicts between anglers are localized and are addressed through law enforcement, public education, and continuous review and updating to state and refuge fishing regulations. Conflicts between other various user groups are minor given that uses typically occur in different areas and different times.

Stipulations above will ensure proper control of the means of use and provide management flexibility should detrimental impacts develop. Allowing this use also furthers the mission of the National Wildlife Refuge System by providing renewable resources for the benefit of the American public while conserving fish, wildlife, and plant resources on the refuge.

References

U.S. Fish and Wildlife Service. 1995. Final Environmental Assessment and Finding of No Significant Impact. Proposed Land Acquisition in the Iowa River Corridor Project. Fort Snelling, MN.

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

U.S. Fish and Wildlife Service. 2011. 2011 National Survey of hunting, fishing, and wildlife associated recreation.

Refuge Manager: Catherine J. Henry 12/19/12
Catherine J. Henry — Date

Concurrence: Kevin Yeager, Acting 12/27/12
Kevin Foerster, Refuge Supervisor — Date

Regional Chief: Tom Worthington JAN 28 2013
Tom Worthington, Acting Refuge Chief — Date

Mandatory 10-or 15 year Re-evaluations Date: 2022

Compatibility Determination

Use: Environmental Education and Interpretation

Refuge Name: Iowa River Corridor Project, Port Louisa National Wildlife Refuge

Establishing and Acquisition Authorities:

The Iowa River Corridor Project (IRCP) is a partnership between the U.S. Fish and Wildlife Service (Service); Iowa Department of Natural Resources (IA DNR); and the USDA Natural Resources Conservation Service (NRCS). The partnership was established in 1993 following the Midwest flood. Authority for land acquisition by the Service is provided under the Emergency Wetland Resources Act of 1986 (P.L. 99-645).

Authority for this partnership is provided under Chapters 107.24 and 107.30, Code of Iowa; the Migratory Bird Conservation Act of 1929 as amended (16 U.S.C. 715-715r); Migratory Bird Hunting and Conservation Stamp Act of 1934 (48 Stat. 451), as amended (16 U.S,C. 718 et seq.); the Fish and Wildlife Act of 1956 (708 Stat. 1119), as amended (16 U.S.C 742a-742j); the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 460 et seq.); National Wildlife Refuge System Administration Act of 1966, as amended (16 U.S.C. 668dd – 668ee); the Emergency Wetland Resources Act of1986 (PL 99-645); the Emergency Supplemental Appropriations Act of 1994; and the National Wildlife Refuge System Improvement Act of 1997 (PL 105–57).

Refuge Purpose(s):

The partnership focus area is a 45 mile section of the Iowa River floodplain in Tama, Benton, and Iowa Counties that encompasses about 50,000 acres. Within this focus area the Service owns approximately 9300 acres, managed under Port Louisa National Wildlife Refuge. The authority for acquisition of these lands was the Emergency Wetland Resources Act of 1986 (16 U.S.C. 3901). The purpose of these refuge lands is therefore the conservation of the wetlands of the nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions.

The 1995 Environmental Assessment and Finding of No Significant Impact (U.S. Fish and Wildlife Service) for land acquisition in the Iowa River Corridor Project noted four management purposes: (1) Providing habitat for migratory birds and endangered species; (2) Improving the natural diversity of the ecosystem through restoration and protection of floodplain habitat; (3) Providing an alternative to levee reconstruction and reclaiming damaged farmland; and (4) Increasing public opportunities for outdoor recreation, such as hunting or fishing, and environmental education compatible with the preceding purposes.

The 2004 Memorandum of Understanding between the Service and IADNR describes six specific goals for the IRCP: (1) Provide IRCP landowners with a broad menu of assistance options that represent sound floodplain management including fee-title and easement acquisition; (2) Manage public lands and easements to provide for the natural diversity and functions of the Iowa River System; (3) Utilize the characteristics of the floodplain to improve the Iowa River water quality for fish and wildlife; (4) Provide an interpretive opportunity to illustrate floodplain system management; (5) Demonstrate and illustrate the economic outcomes of alternative floodplain management and land uses; and (6) Utilize private and public partnerships to the fullest extent of each agency’s resources to accomplish the objectives.

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? Conduct wildlife interpretation and environmental education programs. Refuge and IADNR staff and volunteers will prepare, schedule, and organize formal programs for school-aged children and other organized groups upon request. In most cases, curriculums and program schedules are prepared in advance. These curriculums may address a number of wildlife conservation topics such as wetland conservation, prescribed fire management, protection of water resources, migratory bird management, floodplain functions and management, and endangered species. Informal programs may also occur and include casual visitors, self-guided tours along public roads and nature trails, impromptu presentations and discussions of wildlife conservation issues with interested citizens, and visitations by unscheduled groups. Visitation and use of the refuge lands within the IRCP by local educators and their classes would also be classified as an informal program. Interpretive information may be provided through the use of signage at refuge locations and through brochures.

Is the use a priority public use? Environmental education and interpretation is a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997.

Where is the use conducted? Refuge lands within the IRCP will be utilized as environmental education and interpretation sites for schools, natural resource organizations, and other visitors. Refuge and/or IADNR staff will assist teachers with group visits, presentations, and demonstrations on these lands.

Entry on all, or portions of designated routes, may be temporarily suspended by posting upon occasions of unusual or critical conditions affecting land, water, vegetation, wildlife populations, or public safety. For example, flooding may limit or suspend access to IRCP refuge lands for environmental education and interpretation programs.

When is the use conducted? The uses occur during daylight hours (sunrise to sunset) throughout the year. There may be some exception to hours of use under Special Use Permits to allow entry or exit in darkness so as not to disturb wildlife.

How is the use conducted? In most cases, programs are scheduled in advance. Impromptu presentations and discussions of wildlife conservation issues by Refuge and/or IADNR staff with interested citizens, casual visitors, and unscheduled groups may also occur. Group size varies from just a few people to larger groups during educational field days. Interpretive and environmental education programs are provided on the IRCP by Refuge and IADNR staff and volunteers. Teachers may also give programs.

Interpretive or environmental education programs focus on wildlife and habitats. These programs address a number of wildlife conservation issues including wetland conservation, floodplain habitats, water resources protection, migratory bird management, and endangered

species conservation. Programs also involve development of outdoor skills, which enhance appreciation of wildlife and their associated habitats.

Why is the use being proposed? Interpretation and environmental education are priority general public uses of the National Wildlife Refuge System. The programs promote understanding and appreciation of natural and cultural resources and their management on all lands and waters of the Refuge System. The Refuge is proposing this use to interpret Refuge resources to local school children, adults, and the visiting public, and educate them about broader conservation issues that would promote support for the Refuge System, migratory birds, habitat conservation, conservation issues, and a greater appreciation of our natural resources.

Availability of Resources:

Maintaining public use facilities is part of routine refuge management duties, and staff and funding are available. Kiosks with interpretive information may be added and some facilities may need upgrading and maintenance. Roads, trails, and parking lots are gravel or natural surface and maintained annually and the public is informed of what conditions to expect. Improvements may be made to infrastructure as funds allow, but the existing facilities are adequate. Additional signage is needed, but will be a minor expense. The refuge does not have a law enforcement officer on staff to enforce stipulations or refuge regulations and will rely on the refuge zone officer located at Neal Smith NWR, the IADNR conservation officer, and county law enforcement officers. Administrative costs for administering Special Use Permits for individual access will be minimal due to the few permits that will be requested or allowed.

Anticipated Impacts of Use:

Short-term impacts: The overall impacts to the Refuge and its associated wildlife populations from environmental education and interpretation would be minimal. There would be some disturbance to wildlife and vegetation at the locations where interpretive programs occur, but at levels that would not interfere with the purposes of the IRCP. 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, by small groups of people, and at established trails. This may cause short term disturbance as well, but would have minimal impact. Visits to the refuge provide opportunities for local economic expenditures.

Long-term impacts: Anticipated long-term impacts are beneficial to the IRCP, as these activities promote a conservation ethic in the local community. This use would increase in the future if new visitor facilities are added. As improvements are made there may be some additional short-term, localized disturbance, but use would continue to be in existing developed areas.

Cumulative impacts: There are no anticipated cumulative impacts. Other uses that may occur on these lands are fishing, wildlife observation, hiking, hunting, and routine management. These uses are generally spread out over the entire area such that they are not all occurring at the same time and place. Therefore, little cumulative impacts are expected from other uses. The cumulative positive impacts of educating the public about conservation issues would be beneficial to meeting the Service mission and Refuge purposes.

Public Review and Comment:

This compatibility determination was included in the Draft Comprehensive Management Plan with Environmental Assessment and was available for public review for 30 days. News releases

were sent to local newspapers about the public comment period. It was available on the Refuge website at www.fws.gov/refuge/port_louisa. It was available at the Port Louisa NWR office, the IADNR office in Chelsea, IA and the libraries in Belle Plaine, IA and Wapello, IA. No comments were received.

Determination:

___ Use is Not Compatible
_X_ Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

To ensure compatibility with the National Wildlife Refuge System mission and IRCP purposes, goals and objectives, the activity can only occur under the following stipulations:

General Environmental Education and Interpretation:

1. The IRCP refuge lands are open to public access year-round during daylight hours.
2. Group events for environmental education and interpretation activities that are not led by Refuge or IADNR staff would require verbal approval or a Special Use Permit by the Refuge Manager, or designee, 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. Use of motorized vehicles is limited to maintained roads and parking areas.
5. Camping, overnight use, and fires are prohibited.

Justification:

Provided compliance with the above stipulations, interpretation and environmental education have been determined compatible because the use would benefit the conservation role of the Refuge, would cause minimal disturbance to wildlife and habitats, and would not increase costs to the Refuge. The level of use would be light to moderate, and generally consolidated to developed public-use areas (roads, parking lots, and trails). The associated disturbance to wildlife is temporary and minor. Interpretation and environmental education are priority public uses that help fulfill the mission of the National Wildlife Refuge System. This use would not materially interfere with or detract from Refuge purposes.

References:

U.S. Fish and Wildlife Service. 1995. Final Environmental Assessment and Finding of No Significant Impact for U.S. Fish and Wildlife Service Proposed Land Acquisition in the Iowa River Corridor Project, dated July 20, 1995.

Refuge Manager: Catherine J. Henry 5/29/13
Catherine J. Henry Date

Concurrence: Kevin Foerster, Refuge Supervisor Area 1 — Date: 6/4/13

Regional Chief: Charles Blair, Refuge Chief — Date: 6-24-13

Mandatory 10 or 15 year Re-evaluation Date: 2023

Compatibility Determination

Use: Firewood Cutting/Timber Harvest

Refuge Name: Iowa River Corridor Project, Port Louisa National Wildlife Refuge

Establishing and Acquisition Authorities:

The Iowa River Corridor Project (IRCP) is a partnership between the U.S. Fish and Wildlife Service (Service); Iowa Department of Natural Resources (IADNR); and the USDA Natural Resources Conservation Service (NRCS). The partnership was established in 1993 following the Midwest flood. Authority for land acquisition by the Service is provided under the Emergency Wetland Resources Act of 1986 (P.L. 99-645). The purpose of these refuge lands is therefore the conservation of the wetlands of the nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions.

Authority for this partnership is provided under Chapters 107.24 and 107.30, Code of Iowa; the Migratory Bird Conservation Act of 1929 as amended (16 U.S.C. 715-715r); Migratory Bird Hunting and Conservation Stamp Act of 1934 (48 Stat. 451), as amended (16 U.S,C. 718 et seq.); the Fish and Wildlife Act of 1956 (708 Stat. 1119), as amended (16 U.S.C 742a-742j); the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 460 et seq.); National Wildlife Refuge System Administration Act of 1966, as amended (16 U.S.C. 668dd – 668ee); the Emergency Wetland Resources Act of1986 (PL 99-645); the Emergency Supplemental Appropriations Act of 1994; and the National Wildlife Refuge System Improvement Act of 1997 (PL 105–57).

Refuge Purpose(s):

The partnership focus area is a 45 mile section of the Iowa River floodplain in Tama, Benton, and Iowa Counties in east central Iowa that encompasses about 50,000 acres. Within this focus area the Service owns approximately 9300 acres, managed under Port Louisa National Wildlife Refuge.

The authority for acquisition of these lands was the Emergency Wetland Resources Act of 1986 (16 U.S.C. 3901). The purpose of these refuge lands is therefore the conservation of the wetlands of the nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions.

The 1995 Environmental Assessment and Finding of No Significant Impact (U.S. Fish and Wildlife Service) for land acquisition in the Iowa River Corridor Project noted four management purposes: (1) Providing habitat for migratory birds and endangered species; (2) Improving the natural diversity of the ecosystem through restoration and protection of floodplain habitat; (3) Providing an alternative to levee reconstruction and reclaiming damaged farmland; and (4) Increasing public opportunities for outdoor recreation, such as hunting or fishing, and environmental education compatible with the preceding purposes.

The 2004 Memorandum of Understanding between the Service and IADNR describes six specific goals for the IRCP: (1) Provide IRCP landowners with a broad menu of assistance options that represent sound floodplain management including fee-title and easement acquisition; (2) Manage public lands and easements to provide for the natural diversity and

functions of the Iowa River System; (3) Utilize the characteristics of the floodplain to improve the Iowa River water quality for fish and wildlife; (4) Provide an interpretive opportunity to illustrate floodplain system management; (5) Demonstrate and illustrate the economic outcomes of alternative floodplain management and land uses; and (6) Utilize private and public partnerships to the fullest extent of each agency's resources to accomplish the objectives.

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? The removal of standing or fallen trees by contractors or private individuals. This CD covers all wood removal activities regardless of the ultimate use of the wood (i.e., firewood, timber, pulp, wood chips, biofuels, etc.). There is recent interest in harvesting willows and other trees for biofuels use. This use is not wildlife dependent but may affect local wildlife populations. Harvest for biofuels use would be another management tool that may allow treatment of larger areas than traditional methods.

Is the use a priority public use? Wood cutting is not a priority public use, as defined by the National Wildlife Refuge System Improvement Act of 1997.

Where is the use conducted? Refuge lands within the IRCP. Harvestable cover types on the Refuge include bottomland and upland forest, grassland with encroaching trees, oak savanna, and remaining areas of tree plantations. During timber harvest and wood cutting activities, buffers will be implemented according to best management practices around wetlands, rivers, and creeks to prevent erosion, sedimentation, and pollution thereby limiting degradation of water quality. Some areas may not be accessible during wet conditions and access would be restricted.

Entry on all, or portions of designated routes, may be temporarily suspended by posting upon occasions of unusual or critical conditions affecting land, water, vegetation, wildlife populations, or public safety. For example, flooding may limit or suspend access to IRCP refuge lands for firewood cutting and/or timber harvest.

When is the use conducted? Wood removal activities may be authorized throughout the year. Most often, removal of dead, dry, or cured wood will occur from October through February. Some of the remaining woody debris may then be eliminated in the following prescribed burn season. Commercial harvest activities will most likely occur during the winter months. During winter, frozen ground will facilitate access while providing protection to underlying soils, vegetation, and to adjacent wetlands by reducing sedimentation and erosion. Due to the extensive floodplain system on the IRCP, access and working conditions are generally limited by hydric soils, drainages, and wetlands. Cutting or harvesting activities may also be limited or prohibited by the Refuge Manager at times to prevent the spread of disease or invasive/exotic species, or to comply with provisions of endangered species recovery plans.

How is the use conducted? Harvest may include standing and fallen trees for personal use and commercial timber harvest. Equipment used for harvest may range from chainsaws and axes, to

traditional logging equipment such as feller-bunchers and log skidders, or machines that mow and bale. Access may be by car and trailer, pick-up truck, farm tractor, ATV, or larger traditional logging equipment, and must be approved by the Refuge Manager. Differences in scope and necessary equipment will occur depending on the amount and type of wood available for removal. Firewood cutters will be issued a special use permit with conditions under which they can operate. Commercial harvesting will be awarded through a bidding process unless it is a small acquisition. Most use will be removal of a few down trees for firewood. The number of people participating in this activity will vary from year to year depending on management need and weather cycles.

Why is the use being proposed? This activity will only occur where the Service has determined that a management need exists to remove trees and brush. Although felled trees are often left in place in forestry practices, there are situations where it is desirable to remove the wood from the site to facilitate growth of desirable plants species, create fire breaks, or for public safety on trails, or near parking areas and buildings. In some cases, trees may be cut or girdled, but not removed. Wood removal may be desirable where trees are encroaching on hiking trails, fire breaks or roads, open marshes, grassland areas, or degrading earthen water impoundment structures. Most tree removal will be a small number of trees (<10), or trees already down from a management activity. Some timber stand improvement activities may include harvest of more trees. Tree harvests serve the purpose of improving forest diversity and health through thinning, creating openings for desirable tree regeneration, removal of invasive tree species, suppressing the transmission of oak wilt and other diseases, and, in certain areas restoring oak savanna or grassland habitat.

Availability of Resources:

Periodic and small-scale harvest operations can be adequately administered with existing staff resources. Planning, issuing permits, and monitoring a wood product harvest program would require a minimal commitment of staff hours. In the past, the Refuge has issued approximately two permits annually for this activity. All harvest sites are noted on maps and marked with flagging tape or paint by Refuge staff. Based on past activity, we estimate that administering a small timber harvest program will require from $500 to $1000 in staff salary costs. Large-scale operations affecting many acres may have to be deferred until staff and funding are available.

Anticipated Impacts of Use:

Short-term impacts: Many wildlife species may be affected by tree harvest activities. Key waterfowl species using tree cavities for nesting include wood duck and hooded merganser. Many other bird species use forested habitat for nesting, roosting, protective cover, or feeding. Examples of important species include: bald eagle, red-shouldered hawk, barred owl, several woodpecker species, and many passerine bird species. The forests are also important to a variety of mammals, reptiles and amphibians, insects, and flowering plants. The federally endangered Indiana bat (*Myotis sodalis*) uses the bark of trees for maternity roosts. They use a variety of species and sizes of trees.

During harvest activities, wildlife would be displaced to adjacent areas, though this disturbance is not likely to have a measurable impact and would be mitigated by timing and duration of harvest, i.e., larger harvests conducted during winter months when most avian species and bats have migrated. Potential adverse impacts include: short-term loss of site-specific habitats; short-term fragmentation of the landscape with resulting impact to bird use and productivity; loss of dead whole trees on the ground; soil disturbance that may increase exotic plant invasion and

erosion; damage to roads and wetlands from equipment; reduced visual aesthetics; and disturbance to wildlife and visitors from cutting operations. These impacts are generally short-term in nature and on relatively small areas, and can be controlled to a large extent by permit conditions and management oversight. In addition, many of these impacts can be avoided by the timing of the activity in accordance with site specific characteristics and requiring equipment be cleaned prior to entering the Refuge to minimize the potential spread of invasive species.

Required cultural resource surveys and actions would be conducted as determined in consultation with the Service's Regional Historic Preservation Officer prior to the initiation of any mechanized logging operation. Minor tree felling can occur outside of the dates specified for breeding Indiana bats of April 15 to September 16. Smooth barked trees that do not provide habitat for bats can be removed anytime. The Service requirements for avoiding impacts to Indiana bats will be followed and an IntraService Section 7 consultation will be completed for these activities.

Long-term impacts: Carefully managed harvest would provide long-term benefits to wildlife and plants by improving overall forest structure, composition, and health. Potential positive impacts include: restoration, maintenance and enhancement of forest grassland, and floodplain habitats; maintained or increased forest diversity (age, species, and structure), and provision of essential habitat requirements for declining forest-dependent plant and animal species.

The removal of woody vegetation facilitates native habitat restoration efforts on the IRCP. While habitat transition from forest to savanna or grassland will displace species which depend on dense forest cover, forested areas thinned to oak savanna densities would restore a threatened and declining habitat, and support associated savanna or grassland wildlife species. Timber stand improvement activities in forested areas of the IRCP will improve tree species diversity and size classes and improve forest health for migratory birds and other wildlife.

Cumulative impacts: Much of the land adjacent to the IRCP was cleared for agriculture over the past century and a half. Tree harvest may continue to occur on lands adjacent to the IRCP, which would cause cumulative disturbance or changes in broader regional forest habitat. However, most current harvest on adjacent lands is done under a management plan with the state forester and typically benefits forest health. Most tree removal on refuge lands is in a very small, localized area.

Timber stand improvement activities will benefit forest habitats for migratory birds. Implementing tree harvest in addition to prescribed fire as forest management tools will benefit the floodplain and upland habitats by setting back succession and maintaining native species. These restoration efforts will also benefit many declining migratory birds and other wildlife species dependent on open, diverse habitats.

Potentially negative cumulative impacts within the IRCP and its associated watersheds downstream may include water quality issues associated with deforestation – particularly sedimentation, erosion, and pollution resulting from tree removal near wetlands, rivers, or creeks; and the spread of invasive/exotic species and tree diseases resulting from equipment use and transport of wood. However, these impacts could be mitigated through controlling the timing, frequency, and duration of the harvest activities in accordance with forest management planning, and by applying best management practices. Most harvest and tree removal areas will be small enough that impacts would be minimal.

Public Review and Comment:

This compatibility determination was included in the Draft Comprehensive Management Plan with Environmental Assessment and was available for public review for 30 days. News releases were sent to all local newspapers about the public comment period. It was available on the Refuge website at www.fws.gov/refuge/port_louisa. It was available at the Port Louisa NWR office, the IADNR office in Chelsea, IA and the libraries in Belle Plaine, IA and Wapello, IA. No comments were received.

Determination:

___ Use is Not Compatible
_X_ Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

To ensure compatibility with National Wildlife Refuge System and IRCP purposes, goals and objectives the activity can only occur under the following stipulations:

1. Any tree cutting must meet specific habitat or maintenance objectives. A site plan outlining special conditions for the site and restoration plans for biofuels harvest will be completed prior to harvest.
2. A special use permit will be issued so that refuge management goals are met, and to reduce or eliminate site specific impacts to habitat, fish and wildlife resources, cultural resources, and the visiting public.
3. When possible, vehicle access for wood removal will be limited to existing roads, trails, or fire breaks. In addition, timing of removal activities will be restricted to prevent excessive damage to actively growing vegetation, disturbance to wildlife, and the spread of tree disease. Appropriate timing (i.e. late summer which is typically dry following the growing season or during winter when the ground is frozen) is also necessary to prevent unnecessary site damage such as soil rutting.
4. Commercial equipment must be cleaned prior to entering the Refuge.
5. Standing cavity trees which are actively being used by wildlife will be marked and protected. Guidelines for protection of Indiana bat roost and maternity trees will be followed.

Justification:

Tree harvest has been determined to be compatible because the activity will be done for habitat management purposes and beneficial impacts would outweigh any foreseeable negative impacts. The activity can be controlled by permits and tree harvest will ultimately benefit habitats and wildlife species on the IRCP. Indirect impacts of tree harvest are generally considered positive and thus do not materially interfere with or detract from the purpose of the Refuge or the Refuge System mission. Individuals participating in the wood harvest program will be guided by a special use permit, and thus, site specific stipulations will ensure resource protection and achievement of management goals. Most tree removal activities are on a very small scale and are often for removal of trees along trails or other public use areas, or along fire breaks.

The removal of trees at strategic locations will benefit habitat restoration objectives in bottomland forests. Furthermore, control of woody species encroachment on wetland, grassland, and floodplain habitats is a necessary management activity and directly supports the mission of the National Wildlife Refuge System.

The removal of some dead trees reduces fuel buildup and the severity of potential wildfires. Openings created by woodcutting allows light to penetrate and stimulate the understory growth which increases woodland diversity. Impacts to the habitat as a result of access for wood removal purposes are easily avoided via permit stipulations. Any direct impacts on wildlife production and survival can be largely avoided by timing the activity so that it does not coincide with the breeding/production season. Adverse impacts from harvest would be short-term and more than offset by the long-term benefits for wildlife and plants. Tree removal would follow the guidelines for the protection of Indiana bats.

References:

U.S. Fish and Wildlife Service. 1995. Final Environmental Assessment and Finding of No Significant Impact for U.S. Fish and Wildlife Service Proposed Land Acquisition in the Iowa River Corridor Project, dated July 20, 1995.

Refuge Manager: Catherine J. Henry 5/29/13
Catherine J. Henry, Refuge Manager — Date

Concurrence: 6/4/13
Kevin Foerster, Refuge Supervisor Area 1 — Date

Regional Chief: 6-24-13
Charles Blair, Refuge Chief — Date

Mandatory 10 or 15 year Re-evaluation Date: 2028

Compatibility Determination

Use: Food Plot Cultivation for Wildlife

Refuge Name: Iowa River Corridor Project, Port Louisa National Wildlife Refuge

Establishing and Acquisition Authorities:

The Iowa River Corridor Project (IRCP) is a partnership between the U.S. Fish and Wildlife Service (Service), Iowa Department of Natural Resources (IADNR), and the USDA Natural Resources Conservation Service (NRCS). The partnership was established in 1993 following the Midwest Flood. Authority for land acquisition was provided under the Emergency Wetland Resources Act of 1986 (P.L. 99-645).

Authority for this partnership is provided under Chapters 107.24 and 107.30, Code of Iowa; the Migratory Bird Conservation Act of 1929 as amended (16 U.S.C. 715-715r); Migratory Bird Hunting and Conservation Stamp Act of 1934 (48 Stat. 451), as amended (16 U.S,C. 718 et seq.); the Fish and Wildlife Act of 1956 (708 Stat. 1119), as amended (16 U.S.C 742a-742j); the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 460 et seq.); National Wildlife Refuge System Administration Act of 1966, as amended (16 U.S.C. 668dd – 668ee); the Emergency Wetland Resources Act of1986 (PL 99-645); the Emergency Supplemental Appropriations Act of 1994; and the National Wildlife Refuge System Improvement Act of 1997 (PL 105–57).

Refuge Purpose(s):

The partnership focus area is a 45 mile section of the Iowa River floodplain in Tama, Benton, and Iowa Counties in east central Iowa that encompasses about 50,000 acres. Within this focus area the Service owns approximately 9300 acres managed under the Port Louisa National Wildlife Refuge.

The authority for acquisition of these lands was the Emergency Wetland Resources Act of 1986 (16 U.S.C. 3901). The purpose of these refuge lands is therefore the conservation of the wetlands of the nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions.

The 1995 Environmental Assessment and Finding of No Significant Impact (U.S. Fish and Wildlife Service) for Land Acquisition in the Iowa River Corridor Project noted four management purposes: (1) Providing habitat for migratory birds and endangered species; (2) Improving the natural diversity of the ecosystem through restoration and protection of floodplain habitat; (3) Providing an alternative to levee reconstruction and reclaiming damaged farmland; and (4) Increasing public opportunities for outdoor recreation, such as hunting or fishing, and environmental education compatible with the preceding purposes.

The 2004 Memorandum of Understanding between the Service and IADNR describes six specific goals for the IRCP: (1) Provide corridor landowners with a broad menu of assistance options that represent sound floodplain management including fee-title and easement acquisition; (2) Manage public lands and easements to provide for the natural diversity and functions of the Iowa River System; (3) Utilize the characteristics of the floodplain to improve the Iowa River water quality for fish and wildlife; (4) Provide an interpretive opportunity to illustrate floodplain system management; (5) Demonstrate and illustrate the economic outcomes of

alternative floodplain management and land uses; and (6) Utilize private and public partnerships to the fullest extent of each agency's resources to accomplish the objectives.

National Wildlife Refuge System Mission:

"The mission of the 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:

Establishment of wildlife food plots on IRCP lands to provide food and cover resources for resident wildlife and migratory birds. Most years, about 200 acres, or two percent of refuge lands have been put into food plots. Some of the acres are planted in row crops of corn or soybeans by a cooperative farmer and some smaller food plots of corn, soybean, sorghum, rape, or sunflowers are planted by the IADNR or by a cooperator. Grain is used as a food source by waterfowl, Sandhill Cranes, turkeys, deer, pheasants, and other wildlife. Restoration of grassland and forest habitat in the IRCP has met with limited success on the lowest elevations of the IRCP lands where invasive reed canary grass dominates and flooding often prevents establishment of seedings. Subsequently, native foods are not as abundant as desired. Although waste grain is available on nearby private row crop acres, more efficient harvesting equipment has sometimes reduced the amount available. In addition, crops on refuge lands may help to reduce depredation of adjacent private crops and promote good relationships with neighboring landowners. Food plots are particularly used by wildlife in harsh winter conditions. Food plots and cooperative farming are addressed in the Service/IADNR MOU which authorizes the IADNR. Some refuge lands overlay USDA wetland easements. Food plots for wildlife and habitat purposes are allowed on USDA easements with their Compatible Use Authorization. However, food plots would generally be planted outside of easement areas.

Food plots are small agriculture fields typically ranging in size from 3 to 20 acres consisting mainly of corn, soybeans, sunflowers, rape, wheat, barley, oats, rye, buckwheat, millet, and sorghum. Crops will typically be planted in spring and may be harvested in early spring the following year. Placement and movement of individual food plots within the IRCP will vary based on factors such as food plot availability on neighboring properties, best conservation practices, shape and arrangement of other habitat types, invasive species control, neighboring crop damage complaints, and wildlife disturbance factors. Establishment of food plots will provide winter cover and food resources to resident wildlife during harsh weather conditions, and to migrating waterfowl, Sandhill Cranes, and other birds. Food plots are generally planted and maintained by either private individuals (cooperative farmers) or the IADNR. Cropping activities are controlled through a habitat management agreement between the cooperator and the IADNR, however the Service provides guidelines such as herbicide/pesticide use and use of non-genetically modified organisms.

Food plots are not a priority public use as identified in the Refuge Improvement Act of 1997. Food plots are a nonessential but helpful tool to facilitate other priority public uses including hunting, wildlife observation, and photography. These plots may help provide desirable densities of wildlife for public viewing, hunting and photography.

Availability of Resources:

The staff time required for this use is already committed through partnership efforts with IA DNR under the MOU. Responsibilities for the agriculture program are the responsibility of the IADNR. Service staff time will only be for planning effort to evaluate the need for food plots on newly acquired properties and reviewing management plans for food plot use.

Anticipated Impacts of the Use:

The proposed use will positively impact wintering ring-necked pheasants by providing reliable food resources near high quality cover, thus reducing exposure to predators and harsh weather conditions. Food plots also make high energy grains available to waterfowl, mourning doves and other migratory birds during spring and fall migration. The borders of food plots often contain annual forbs which provide forage for a variety of sparrows and other songbirds. Some species of wildlife, such as white-tailed deer, will benefit from the type of habitat produced by the creation of a food plot.

Food plots help facilitate priority public uses that engage the public with wildlife such as hunting, wildlife observation and photography. Food plots can be used to divert foraging white-tailed deer from adjacent cropland, consequently reducing conflicts with neighboring farmers. Good neighbors and an engaged public provide positive long-term support for the conservation of waterfowl and other migratory birds, as well as their habitats.

Minimal negative impacts are anticipated due to the fact that food plots will typically be smaller than 20 acres in size. Also food plots will be limited to only two percent of IRCP refuge lands. With this said, food plots will reduce the available nesting cover for waterfowl, migratory birds and other wildlife. Grassland bird research suggests that birds will utilize crop fields for nesting; however, the disturbance common with farming practices may be detrimental to nest success (Warner 1994 and Best 1986). Many grassland nesting birds and some waterfowl species have better nesting success in larger contiguous blocks of grassland habitat (Winter and Faaborg 1999 and Winter et.al. 2000) and food plots may cause fragmentation of habitats. Many declining grassland songbirds have very specific habitat needs that are not met by food plots. Careful placement of food plots can lessen the impacts of edge and the fragmentation of habitat. The Comprehensive Management Plan for the IRCP calls for the reduction of food plot acres as native habitats are restored and the diversity of native foods increases.

Impacts to nesting waterfowl may be lessened by placing food plots strategically in the best locations for critical resident wildlife needs. The public uses associated with food plots may increase wildlife disturbance somewhat. However, the beneficial aspects of food plots for these uses are typically realized outside of the breeding season, and food plots can be used to concentrate these uses to areas where the associated disturbance is less detrimental (Korschgen and Dahlgren 1992). Since IRCP lands are open to hunting, any increases in the white-tailed deer population related to food plots will be controlled. Soils will be impacted through the placement and management of food plots. Farming practices that disturb the soil by tilling create the potential for soil erosion. Chemical usage on food plots could potentially have negative effects on adjacent waters, vegetation and associated wildlife. Food plot farming practices will use best management practices to lessen the effects of soil erosion and chemical usage and the amount of food plot area is very small.

The stipulations listed later in this document will address the criteria needed for food plot placement and management.

Public Review and Comment:

This compatibility determination was included in the Draft Comprehensive Management Plan with Environmental Assessment and was available for public review for 30 days. News releases were sent to all local newspapers about the public comment period. It was available on the Refuge website at www.fws.gov/refuge/port_louisa. It was available at the Port Louisa NWR office, the IADNR office in Chelsea, IA and the libraries in Belle Plaine, IA and Wapello, IA. No comments were received.

Determination:

___ Use is Not Compatible
_X_ Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. No greater than 2% of IRCP refuge lands may be in food plots at any one time. Food plot acres will be reduced as native habitats are restored.
2. Placement of food plots will consider surrounding habitats and minimize fragmentation of large blocks of grassland or forest habitat.
3. Food plot farming and maintenance will comply with the Migratory Bird Treaty Act 16 USC 703-712 P.L. 105-31 and 50 CFR 20.11-21, and not constitute baiting.
4. Crop seeds used in food plots will be from a non-genetically modified seed source according to Service policy.
5. Chemicals used on food plots must be approved through the Service Pesticide Use Proposals. No insecticides will be allowed on food plots.
6. Planting practices for food plots will follow best management practices to reduce impacts to soil and water resources.
7. New land acquisitions requesting food plot placement will need refuge project leader approval.

Justification:

Food plot use on IRCP refuge lands is a compatible practice when the above stipulations are in place. This use as proposed will not materially detract from the purposes of IRCP lands. Allowing the use of food plots will assist the IADNR in reaching their resident wildlife goals and provide the public with opportunities to recreate on refuge properties. A Memorandum of Understanding between the Service and IADNR establishes that food plots are an acceptable practice on IRCP lands. Any negative impacts to wildlife habitat will be lessened by following the stipulations and evaluating the effects of the program.

References:

Best, L. B. 1986. Conservation tillage: ecological trap for nesting birds? Wildlife Society Bulletin 14:308-317.

Korschgen, C. E. and R. B. Dahlgren, 1992. Human Disturbances to Waterfowl: Causes, Effects, and Management. Section 13.2.15 *in* Fish and Wildlife Leaflet 13, United States Department of the Interior, U. S. Fish and Wildlife Service, Washington, D. C.

U.S. Fish and Wildlife Service. 1995. Final Environmental Assessment and Finding of No Significant Impact for U.S. Fish and Wildlife Service Proposed Land Acquisition in the Iowa River Corridor Project, dated July 20, 1995.

Warner, R. E. 1994 Agricultural Land Use and Grassland Habitat in Illinois: Future Shock for Midwestern Birds, Conservation Biology, 8:147-156.

Winter, M., and J. Faaborg, 1999. Patterns of area sensitivity in grassland nesting birds. Conservation Biology 13: 1424-1436.

Winter, M., D. H. Johnson, and J. Faaborg, 2000. Evidence for edge effects on multiple levels in tallgrass prairie. Condor 102:256-266.

Refuge Manager: Catherine J. Henry 5/29/13
Catherine J. Henry, Refuge Manager — Date

Concurrence: 6/4/13
Kevin Foerster, Refuge Supervisor, Area 1 — Date

Regional Chief: 6-24-13
Charles Blair, Refuge Chief — Date

Mandatory 10 or 15 year Re-evaluation Date: 2023

Compatibility Determination

Use: Trapping

Refuge Name: Iowa River Corridor Project, Port Louisa National Wildlife Refuge

Establishing and Acquisition Authorities:

The Iowa River Corridor Project (IRCP) is a partnership between the U.S. Fish and Wildlife Service (Service), Iowa Department of Natural Resources (IADNR), and the USDA Natural Resources Conservation Service (NRCS). The partnership was established in 1993 following the Midwest Flood. Authority for land acquisition was provided under the Emergency Wetland Resources Act of 1986 (P.L. 99-645).

Authority for this partnership is provided under Chapters 107.24 and 107.30, Code of Iowa; the Migratory Bird Conservation Act of 1929 as amended (16 U.S.C. 715-715r); Migratory Bird Hunting and Conservation Stamp Act of 1934 (48 Stat. 451), as amended (16 U.S,C. 718 et seq.); the Fish and Wildlife Act of 1956 (708 Stat. 1119), as amended (16 U.S.C 742a-742j); the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 460 et seq.); National Wildlife Refuge System Administration Act of 1966, as amended (16 U.S.C. 668dd – 668ee); the Emergency Wetland Resources Act of1986 (PL 99-645); the Emergency Supplemental Appropriations Act of 1994; and the National Wildlife Refuge System Improvement Act of 1997 (PL 105–57).

Refuge Purpose(s):

The partnership focus area is a 45 mile section of the Iowa River floodplain in Tama, Benton, and Iowa Counties in east central Iowa that encompasses about 50,000 acres. Within this focus area the Service owns approximately 9300 acres managed under the Port Louisa National Wildlife Refuge.

The authority for acquisition of these lands was the Emergency Wetland Resources Act of 1986 (16 U.S.C. 3901). The purpose of these refuge lands is therefore the conservation of the wetlands of the nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions.

The 1995 Environmental Assessment and Finding of No Significant Impact for Land Acquisition in the Iowa River Corridor Project noted four management purposes: (1) Providing habitat for migratory birds and endangered species; (2) Improving the natural diversity of the ecosystem through restoration and protection of floodplain habitat; (3) Providing an alternative to levee reconstruction and reclaiming damaged farmland; and (4) Increasing public opportunities for outdoor recreation, such as hunting or fishing, and environmental education compatible with the preceding purposes.

The 2004 Memorandum of Understanding between the Service and IADNR describes six specific goals for the IRCP: (1) Provide corridor landowners with a broad menu of assistance options that represent sound floodplain management including fee-title and easement acquisition; (2) Manage public lands and easements to provide for the natural diversity and functions of the Iowa River System; (3) Utilize the characteristics of the floodplain to improve the Iowa River water quality for fish and wildlife; (4) Provide an interpretive opportunity to illustrate floodplain system management; (5) Demonstrate and illustrate the economic outcomes of

alternative floodplain management and land uses; and (6) Utilize private and public partnerships to the fullest extent of each agency's resources to accomplish the objectives.

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? Allow IRCP visitors to trap certain wildlife species, consistent with State of Iowa regulations. This Compatibility Determination does not apply to "commercial" trapping activities where the Refuge awards a contract, or permit, for the removal of a species to facilitate management (i.e. nuisance beaver control).

Is the use a priority public use? Trapping is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997; however, trapping is a traditional recreational activity throughout the Midwest.

Where is the use conducted? Public trapping for certain species is an existing use that occurs throughout the IRCP on Service fee title land, adjacent federal easement property, state land, and private property. The IRCP lies within the state's Iowa River Wildlife Unit.

How would the use be conducted? Bag limits and harvest methods for authorized species are consistent with Iowa State regulations, except when more restrictive Refuge regulations apply. Trapping is allowed for the following species: Coyote, mink, muskrat, weasel, striped skunk, badger, opossum, fox (red and gray), raccoon, beaver, otter, and bobcat. Currently 100% of the IRCP is open to trapping for these species. Trappers must report otter and bobcat harvest to the IDNR to receive CITES tags.

Trappers may use leghold traps and body-gripping ("conibear" type) traps for the purpose of trapping various furbearers and unprotected species of wildlife. Each method is qualified under State regulations as to trap size and types of allowable sets in order to protect non-target species, and to provide for the safe use of the Refuge by others. The use of exposed flesh or carcass baits, including fish, is prohibited on the Refuge.

When is the use conducted? Season dates, bag limits, and harvest methods are consistent with state regulations. Seasons generally run from early November to the end of January with trapping for some species ending in March or April.

Why is the use being proposed? To promote consistent regulation of recreational activities across the patchwork of public and private lands in the Iowa River Corridor. Trapping is a general public use of the Refuge System that is also an important wildlife management tool. Some furbearers are predators on waterfowl and other nesting birds, and some can cause damage to infrastructure and desirable habitat features. The Service recognizes trapping as a healthy, traditional outdoor pastime, deeply rooted in the American heritage (USFWS 2006). Trapping can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs. Trapping can also promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System. Recreational trapping is an existing use on the IRCP. Trapping for wildlife management was determined a compatible use on several divisions of Port Louisa National Wildlife Refuge in 2005.

Availability of Resources:

Administrative costs to implement the trapping program are insignificant, sufficient staff exists to issue the required permits, collect data as necessary, and oversee the program. Facilities and staff are currently available to provide access, maintain roads, parking lots, and secondary access roads. The designated areas open to public trapping are open in accordance with state and Refuge regulations and do not require special preparation or administration. Trappers residing next to the Refuge boundary are often able to access suitable trap sites from their property. Law enforcement is provided by a refuge officer at Neal Smith NWR and by the IADNR conservation officers assigned to the IRCP counties.

Special equipment, facilities, or improvements necessary to support the use: None

Maintenance costs: None

Monitoring costs: None

Offsetting revenues: License revenues to the state of Iowa. Adequate resources are available to manage the existing trapping program at the current level of participation. However, funding for law enforcement staff time and printing of a Refuge (IRCP) Regulations brochure is lacking, and would require redirection of existing Refuge funding. Such redirection would be at the expense of other Refuge programs such as monitoring, maintenance, and other public use programs. Proposals in the IRCP Comprehensive Management Plan should help address these funding concerns.

Anticipated Impacts of the Use:

Short-term impacts: Because of the temporal separation of trapping activities and breeding wildlife using the Refuge, direct impacts to these resources by trappers is negligible. Trappers using the IRCP in March may disturb individual early nesting waterfowl on occasion, and cause temporary displacement from specific and limited areas. Impacts may include displacing migratory birds during the pair bonding/nesting season or destruction of nests by trampling. These impacts are occasional, temporary, and isolated to small geographic areas. Indirect impacts may include catch of target and non-target species that are predators on migratory birds and/or nests, or removal of species that induce habitat change (i.e. beaver). Bald eagles initiate nesting in Iowa as early as February, but there is no evidence that trapping has impacted bald eagle nest success.

There are potential impacts on habitat by trappers walking through vegetation or using willow cuttings to mark their traps, however it is normally undetectable and insignificant. The creation of openings in heavy stands of aquatic vegetation can enhance habitat use by fish and wildlife.

As an ongoing activity throughout the IRCP, accommodating this wildlife-dependent use is expected to result in minimal impacts. Although trapping causes mortality to wildlife, season dates and bag limits are set with the long-term health of populations in mind. Populations of certain species, for example otter and bobcat, are monitored by the Iowa DNR. Survey information indicates that a limited harvest will not adversely affect the overall otter or bobcat population levels. Disturbance to wildlife may also result from trapping activity. This disturbance is expected to be limited in scope and duration. All motor vehicle use on Refuge and State

ground is restricted to designated roads, trails, and parking areas which reduces disturbance to wildlife. Disturbance to habitat is minimal given the nature of this use.

Long-term impacts: Trapping may provide the long-term impact of controlling animals that cause damage to IRCP infrastructure and that impact nesting waterfowl and other birds. There are expected to be no long-term population impacts from trapping on the Refuge.

Indirect impacts to wildlife nesting and breeding success can result from the removal of animals under a trapping program. In many instances, these impacts are positive. Reductions in populations of nest predators such as raccoon, skunk, and mink have a limited positive impact on nesting birds. The degree to which predator management, through a public trapping program, benefits migratory bird production can vary widely depending on the timing of the removal of predators, size of the habitat block, habitat isolation (for example islands) and adjacent land use.

The removal of plant-eating species such as beaver and muskrat can have both positive and negative impacts on IRCP resources. Muskrats will dig dens into dikes of water management facilities causing considerable damage and add costs to operations of the Refuge. Beaver will sometimes plug culverts or water control structures causing damage, limiting access and compromising the IRCP partners' habitat management capabilities. Managing beaver and muskrat populations at reasonable levels through a public trapping program can reduce costs to the Refuge in wildlife management activities.

Habitat management can be enhanced, however, by these same animals. Muskrats build houses and dens using aquatic vegetation, thus creating openings available for fish, waterfowl, and other migratory birds. Beaver dams create wetlands and their lodges are also associated with openings in aquatic vegetation beds. These benefits minimize the need to commit Refuge resources to achieve these habitat conditions.

When considering impacts to IRCP purposes, impacts of the trapping program obviously include those to the furbearer populations themselves. The IADNR monitors furbearer population trends through the use of annual fur harvest reports, April spotlight surveys, and the Iowa Bowhunter Observation Survey (IADNR 2012). The results of this monitoring are published annually in *Trends in Iowa Wildlife Populations and Harvest* (IADNR, 2012). Recognizing the myriad of factors affecting harvest numbers, review of harvest data for all furbearers collected since initiation of otter harvest in 2006 – 2007 suggests that populations are relatively stable or increasing (IA DNR 2012).

The infra-structure to provide access for trapping is already in place on the Refuge. Although trapping causes mortality and temporary disturbance to wildlife, harvesting populations to the carrying capacity of existing habitat insures long-term health and survival of the species and even subsequent benefits to other wildlife species.

With continued population monitoring by Federal and state agencies, no long-term negative impacts to wildlife are anticipated. By maintaining this priority public use over the long-term, state and local economic benefits would be expected to be stable or improve.

Cumulative impacts: There are no anticipated cumulative negative impacts. Cumulative positive impacts include wildlife population stability, and in particular, a positive response from Refuge plant communities with harvest. Within the entire IRCP area, harvest on the Refuge would be

limited and would fall within the state's population management goals which are based on the best available information each year.

This activity has shown no assessable environmental impact to the Refuge, its habitats or wildlife species. Concerns primarily center on the possibility of impacting sensitive non-target species through excessive disturbance. Visitor safety and law enforcement issues are also important. Providing restrictions that limit access to specific locations on the Refuge will minimize disturbance and unsafe vehicle access. Disturbance to wildlife is limited to occasional flushing of non-target species during the open trapping season. Trapping will follow all applicable laws, regulations and policies; including 50 CFR, National Wildlife Refuge System Manual, National Wildlife Refuge System mission, goals and objectives, and the purposes for which the IRCP was established.

Public Review and Comment:

This compatibility determination was included in the Draft Comprehensive Management Plan with Environmental Assessment for the IRCP and was available for public review for 30 days. News releases were sent to all local newspapers about the public comment period. It was available on the Refuge website at www.fws.gov/refuge/port_louisa. It was available at the Port Louisa NWR office, the IADNR office in Chelsea, IA and the libraries in Belle Plaine, IA and Wapello, IA.

Determination:

___ Use is Not Compatible
_X_ Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

To ensure compatibility with IRCP and Refuge purposes and the mission of the National Wildlife Refuge System, trapping can occur on the Refuge if the following stipulations are met:

1. This use must be conducted in accordance with state and federal regulations, and special Refuge regulations.
2. This use is subject to modification if on-site monitoring by Refuge or IADNR personnel or other authorized personnel results in unanticipated negative impacts to natural communities, wildlife species, or their habitats.

Justification:

Furbearer trapping on the IRCP and the Refuge is a useful tool in maintaining balance between furbearers and habitat, and safeguarding Refuge infrastructure. Trapping raccoon, striped skunk, and mink benefits migratory birds including waterfowl. Trapping benefits Refuge management programs by providing additional data on furbearer populations. Trapping also benefits management programs by reducing beaver and muskrat populations which sometimes cause problems with water management activities and damage roads and water management facilities by burrowing and flooding.

Trapping supports a secondary purpose of providing incidental fish and wildlife oriented recreation. Allowing this use furthers the mission of the National Wildlife Refuge System by

providing renewable resources for the benefit of the American public while conserving fish, wildlife, and plant resources on the Refuge.

Overall, managed furbearer trapping contributes to the purposes of the IRCP by maintaining vigor and health of furbearer populations and by safeguarding Refuge infrastructure critical to habitat for scores of fish and wildlife species.

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/litreview.pdf

Iowa Department of Natural Resources. 2012. Trends in Iowa Wildlife Populations and Harvest 2010. Iowa Department of Natural Resources, Roger Lande, Director, October 2011.

U.S. Fish and Wildlife Service. 1995. Final Environmental Assessment and Finding of No Significant Impact for U.S. Fish and Wildlife Service Proposed Land Acquisition in the Iowa River Corridor Project, dated July 20, 1995.

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

Refuge Manager: Catherine J. Henry 5/29/13
Catherine J. Henry, Refuge Manager — Date

Concurrence: 6/4/13
Kevin Foerster, Refuge Supervisor, Area 1 — Date

Regional Chief: 6-24-13
Charles Blair, Refuge Chief — Date

Mandatory 10 or 15 year Re-evaluation Date: 2028

Compatibility Determination

Use: Wildlife Observation and Photography

Refuge Name: Iowa River Corridor Project, Port Louisa National Wildlife Refuge

Establishing and Acquisition Authorities:

The Iowa River Corridor Project (IRCP) is a partnership between the U.S. Fish and Wildlife Service (Service); Iowa Department of Natural Resources (IADNR); and the USDA Natural Resources Conservation Service (NRCS). The partnership was established in 1993 following the Midwest flood. Authority for land acquisition by the Service is provided under the Emergency Wetland Resources Act of 1986 (P.L. 99-645).

Authority for this partnership is provided under Chapters 107.24 and 107.30, Code of Iowa; the Migratory Bird Conservation Act of 1929 as amended (16 U.S.C. 715-715r); Migratory Bird Hunting and Conservation Stamp Act of 1934 (48 Stat. 451), as amended (16 U.S,C. 718 et seq.); the Fish and Wildlife Act of 1956 (708 Stat. 1119), as amended (16 U.S.C 742a-742j); the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 460 et seq.); National Wildlife Refuge System Administration Act of 1966, as amended (16 U.S.C. 668dd – 668ee); the Emergency Wetland Resources Act of1986 (PL 99-645); the Emergency Supplemental Appropriations Act of 1994; and the National Wildlife Refuge System Improvement Act of 1997 (PL 105–57).

Refuge Purpose(s):

The partnership focus area is a 45 mile section of the Iowa River floodplain in Tama, Benton, and Iowa Counties in east central Iowa that encompasses about 50,000 acres. Within this focus area the Service owns approximately 9,300 acres, managed under Port Louisa National Wildlife Refuge. The authority for acquisition of these lands was the Emergency Wetland Resources Act of 1986 (16 U.S.C. 3901). The purpose of these refuge lands is therefore the conservation of the wetlands of the nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions.

The 1995 Environmental Assessment and Finding of No Significant Impact (U.S. Fish and Wildlife Service) for land acquisition in the Iowa River Corridor Project noted four management purposes: (1) Providing habitat for migratory birds and endangered species; (2) Improving the natural diversity of the ecosystem through restoration and protection of floodplain habitat; (3) Providing an alternative to levee reconstruction and reclaiming damaged farmland; and (4) Increasing public opportunities for outdoor recreation, such as hunting or fishing, and environmental education compatible with the preceding purposes.

The 2004 Memorandum of Understanding between the Service and IADNR describes six specific goals for the IRCP: (1) Provide IRCP landowners with a broad menu of assistance options that represent sound floodplain management including fee-title and easement acquisition; (2) Manage public lands and easements to provide for the natural diversity and functions of the Iowa River System; (3) Utilize the characteristics of the floodplain to improve the Iowa River water quality for fish and wildlife; (4) Provide an interpretive opportunity to illustrate floodplain system management; (5) Demonstrate and illustrate the economic outcomes of alternative floodplain management and land uses; and (6) Utilize private and public partnerships to the fullest extent of each agency’s resources to accomplish the objectives.

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? The use is general public access to observe and/or photograph wildlife and their habitats on Refuge lands within the IRCP. This CD also discusses the means of access for wildlife observation and photography.

Is the use a priority public use? Wildlife observation and photography are priority public uses, as defined by the National Wildlife Refuge System Improvement Act of 1997.

Where is the use conducted? The use is conducted on Refuge lands throughout the IRCP. Wildlife observation and photography can occur anywhere on the refuge units but primarily occurs along state, county, and township roads in addition to trails, mowed or disked firebreaks, parking lots, and observation decks. The DNR and FWS lands are not developed and therefore attract users that prefer more primitive conditions.

Entry on all, or portions of designated routes, may be temporarily suspended by posting upon occasions of unusual or critical conditions affecting land, water, vegetation, wildlife populations, or public safety. For example, flooding may limit or suspend access to IRCP refuge lands for wildlife observation and photography.

When is the use conducted? These activities will be allowed during daylight hours throughout the year. Most wildlife observation and photography occurs during the spring, summer, and fall seasons. Less use of the IRCP occurs in the winter due to the cold weather and lack of wildlife activity.

How is the use conducted? All priority public uses, including wildlife observation and photography, will be developed and conducted with the Service's mission and the Refuge's purposes, goals, and objectives as guiding principles. Mindful of these considerations, the Refuge can provide safe, high-quality visitor experience opportunities and still accomplish its management goals. The number of people participating in these activities will vary from year to year. Access for wildlife observation and photography includes walking, skiing, or snowshoeing on open terrain, established trails, and mowed or disked firebreaks to observe and/or photograph the natural environment. Biking may only occur on established service roads and parking lots. Visitors may also access the refuge by canoe or boat on the Iowa River. A recently constructed viewing platform is available for this use as well. Additional kiosks, observation platforms, blinds, or parking lots may be constructed in the future as the need and funding arises.

Why is the use being proposed? Priority public uses on National Wildlife Refuge System lands are identified in the Refuge Improvement Act of 1997. Opportunities for the general public, as well as for organized groups such as schools, clubs, scouting organizations, etc., further the goals of the Refuge, as well as the National Wildlife Refuge System.

Availability of Resources:

Wildlife observation and photography occur through the use of existing staff, resources, and facilities. Existing resources for wildlife observation include trails, parking lots, and an observation deck. The amount and character of these opportunities will be a direct reflection of the refuge's staff and funding levels. On average, approximately $5,000 is spent each year to maintain these IRCP facilities and these costs are shared by the refuge and the IADNR. Maintenance and upkeep of these facilities are implemented as necessary.

Anticipated Impacts of Use:

Short-term impacts: Disturbance of wildlife is the primary concern regarding these uses. Disturbance to wildlife, such as the flushing of feeding, resting, or nesting birds, is inherent to these activities. Wildlife observation and photography poses minimal impacts on the purposes for which the Refuge was established. 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.

Long-term impacts: Increased facilities and visitation would cause some displacement of habitat and increase some disturbance to wildlife, although this is expected to be minor given the size of the Refuge and avoidance or minimal intrusion into important wildlife habitat.

Cumulative impacts: Fishing, hunting, and environmental education and interpretation also occur on IRCP lands where visitors may be conducting wildlife observation and photography. However, these uses are sporadic and often separated by area and season so that cumulative impacts to wildlife or habitat would be minimal.

Priority uses such as wildlife observation and photography have shown no measurable environmental impacts to the Refuge, its habitat, or wildlife species. There is some temporary disturbance to wildlife due to human activity on the land. The most likely impacts will be during spring and early summer when many animals are nesting and brood rearing, and during spring and fall migration. Visitor access is typically by individuals or small groups for short durations and occurring over a very large area, thereby lessening the damage or negative impacts to habitat and associated vegetation. Additionally, much public use is confined to state, county, and township roads further reducing the size of the impacted area. Winter activities pose little to no impact on vegetation, and winter disturbance to resident wildlife is temporary and minor.

The activities follow all applicable laws, regulations and policies, including: Migratory Bird Conservation Act, Title 50 Code of Federal Regulations, National Wildlife Refuge System Manual, National Wildlife Refuge System goals and objectives, and Refuge goals and objectives. These activities are compliant with the purpose of the Refuge and the National Wildlife Refuge System Mission. Operating this activity does not alter the Refuge's ability to meet habitat goals and it helps support several of the primary objectives of the Refuge.

Public Review and Comment:

This compatibility determination was included in the Draft Comprehensive Management Plan with Environmental Assessment for the IRCP and was available for public review for 30 days. News releases were sent to local newspapers about the public comment period. It was available

on the Refuge website at www.fws.gov/refuge/port_louisa. It was available at the Port Louisa NWR office, the IADNR office in Chelsea, IA and the libraries in Belle Plaine, IA and Wapello, IA.

Determination:

___ Use is Not Compatible
_X_ Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

To ensure compatibility with National Wildlife Refuge System and Port Louisa NWR goals and objectives, the activity can only occur under the following stipulations:

1. Use is confined to daylight hours.
2. Camping and fires are prohibited.
3. No photo or viewing blinds may be left overnight.
4. Harassment of wildlife or excessive damage to vegetation is prohibited.
5. Commercial photography is subject to a special use permit and commercial photographers may be charged a fee. The fee is dependent on size, scope and impact of the proposed activity.
6. Periodic evaluations will be conducted to assess visitor impacts on the habitat. If evidence of unacceptable adverse impacts appears, these uses will be curtailed, relocated or discontinued. Refuge regulations will be posted and enforced. The known presence of any threatened or endangered species likely to be disturbed by this activity will preclude use of that location.
7. Use will be directed to public use facilities (both existing and in the future), which are not in or near sensitive areas.
8. Any future trail layout and design will continue to ensure adequate adjacent cover for wildlife and avoid sensitive wildlife areas or habitat.
9. Interpretive signs will include messages on minimizing disturbance to wildlife.
10. Certain modes of access such as motorized vehicles and bicycles will be limited to designated trails, public roads and parking lots.

Justification:

Wildlife observation and photography are priority public uses listed in the National Wildlife Refuge System Improvement Act (1997). By facilitating these uses on the Refuge, we will increase visitors' knowledge and appreciation of fish and wildlife, which will potentially lead to increased public stewardship of fish and wildlife and their habitats on the Refuge and elsewhere. Increased public stewardship will support and complement the Service's actions in achieving the Refuge's purposes, and the mission of the National Wildlife Refuge System. Wildlife observation and photography are compatible uses of the IRCP lands of Port Louisa NWR.

References:

U.S. Fish and Wildlife Service. 1995. Final Environmental Assessment and Finding of No Significant Impact for U.S. Fish and Wildlife Service Proposed Land Acquisition in the Iowa River Corridor Project, dated July 20, 1995.

Refuge Manager: Catherine J. Henry 5/29/13
Catherine J. Henry, Refuge Manager — Date

Concurrence: 6/4/13
Kevin Foelster, Refuge Supervisor Area 1 — Date

Regional Chief: 6-24-13
Charles Blair, Refuge Chief — Date

Mandatory 10 or 15 year Re-evaluation Date: 2028

Appendix E: Final Environmental Assessment for Iowa River Corridor Project

In this appendix:

Department of the Interior
U.S. Fish and Wildlife Service

FINAL ENVIRONMENTAL ASSESSMENT
For
Iowa River Corridor Project Comprehensive Management Plan
Port Louisa National Wildlife Refuge

Regional Director
Region 3, U.S. Fish and Wildlife Service
5600 American Blvd West, Suite 990
Bloomington, MN 55437-1458

May 2013

Abstract: The U.S. Fish and Wildlife Service (FWS, Service) is proposing to implement a Comprehensive Management Plan (CMP) for the Iowa River Corridor Project (IRCP) of Port Louisa National Wildlife Refuge (NWR, Refuge) located in east central Iowa. This Final Environmental Assessment (EA) considers the biological, environmental and socioeconomic effects of implementing any of the alternatives considered in detail, including the no action and the preferred alternative (or CMP). The purpose of the proposed action is to establish the management direction for the IRCP for the next 15 years. The management action will be achieved by implementing a detailed set of goals, objectives, and strategies described in the CMP.

Responsible Agency and Official:

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Chapter 1: Purpose and Need for Action

1.1 Background

The Iowa River Corridor Project (IRCP) in east central Iowa was created following the Great Flood of 1993 to provide options to landowners plagued by increased flooding and to reduce the recovery costs from floods. For decades, landowners in the Iowa River floodplain responded to floods by repairing levees and fields, because no other options were available. But when the 1993 flood caused an estimated 6.9 million dollars in damages to land levees in the corridor, landowners responded enthusiastically to alternatives that would provide a permanent solution to chronic flood damage. The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) provided an alternative to field and levee repair through the Emergency Wetland Reserve Program (EWRP). Through the EWRP, landowners with wet, flood-damaged crop ground were offered a one-time payment that was roughly equal to the value of their crop rights. In return, they agreed to grant a permanent easement and to restore their crop ground to its original wetland condition.

The U.S. Fish and Wildlife Service (FWS, Service) evaluated the wildlife and recreational potential of the IRCP and agreed to buy the residual value of the land where landowners desired a total buyout. Lands acquired by the Service became part of the National Wildlife Refuge System (NWRS, Refuge System) managed under Port Louisa National Wildlife Refuge (NWR, Refuge) in Wapello, Iowa. The Iowa Department of Natural Resources (DNR) entered into a Memorandum of Understanding (MOU) with the Service to manage these public lands as a state wildlife management area (WMA) on behalf of the Service (appendix A). The lands are therefore managed as part of the DNR's Iowa River Wildlife Unit.

An Environmental Assessment (EA) for land acquisition was completed in 1995 (FWS) and lands were subsequently acquired through the late 1990s. The acquisition boundary surrounds the floodplain area from just west of Tama, Iowa east to Amana, Iowa (figure E-1). The authority for acquisition of these lands was the Emergency Wetland Resources Act of 1986 (16 U.S.C. 3901). The purposes of these refuge lands are therefore the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions. The 1995 EA also outlines the purposes of:

- Providing habitat for migratory birds and endangered species.
- Improving the natural diversity of the ecosystem through restoration and protection of floodplain habitat.
- Providing an alternative to levee reconstruction and reclaiming damaged farmland.
- Increasing public opportunities for outdoor recreation, such as hunting or fishing, and environmental education compatible with the preceding purposes.

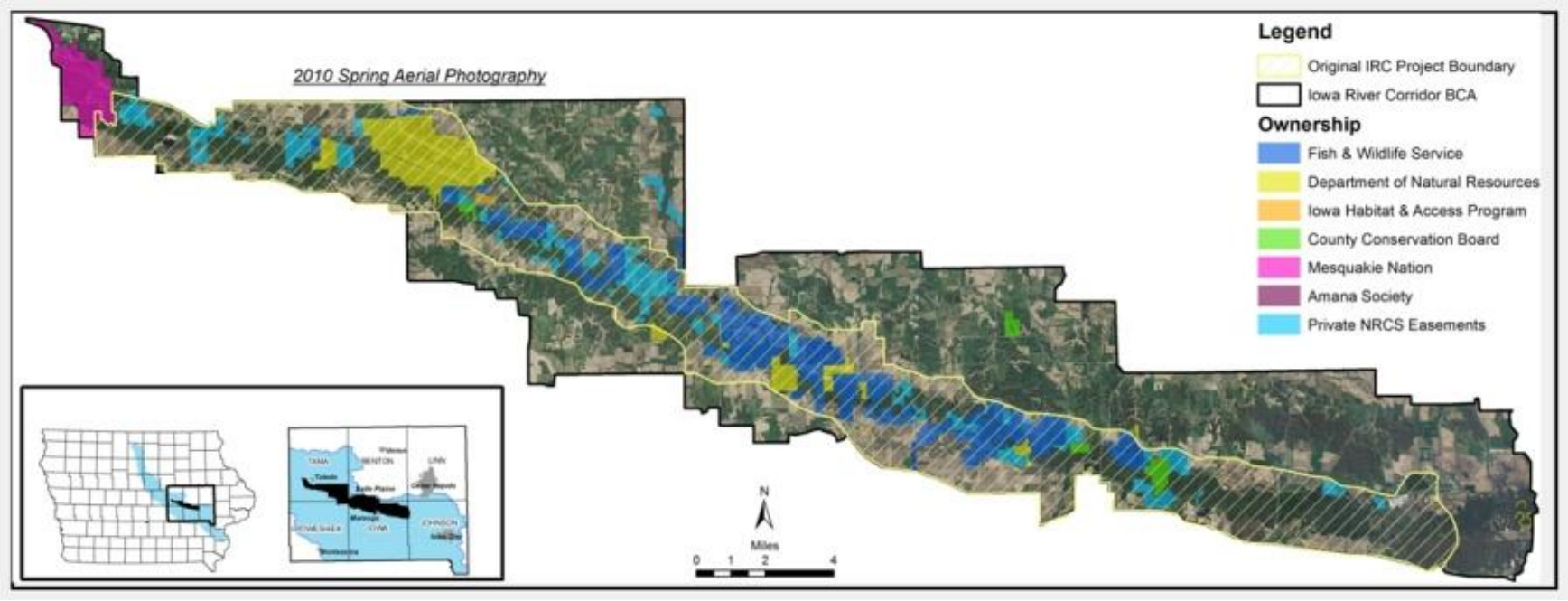
The IRCP acquisition boundary is approximately 50,000 acres and stretches along 45 miles of the Iowa River, from the city of Tama to the Amana Colonies in Benton, Iowa, and Tama Counties. Additional USDA easements have been enrolled since the inception of the IRCP. There are currently 105 USDA easements in the IRCP, totaling about 12,886 acres, including a combination of EWRP, Wetland Reserve Program (WRP) and Emergency Watershed Program easements. The Service has purchased fee title on 7,775 acres of these easements, as well as

an additional 1,558 acres of unencumbered county owned land. Iowa DNR owns 4,226 acres in the IRCP, some also overlaying easements. Figure E-1 shows all public ownership in the IRCP. In this document, IRCP will be used to refer to the Service acquisition boundary. Easements that have remained in private ownership are also shown in Figure E-1 and make up 5,111 acres with 52 easements.

Much restoration work has been completed since lands were acquired and more remains to be done. Wetlands have been restored, native prairie has been planted, forest resources have been rejuvenated, and fire has been returned to the land as a natural management tool. The IRCP provides a relatively large block of habitat in a largely agricultural area and contributes to many wildlife population goals. It also provides a place of recreation, flood protection, and aesthetic values for its citizens.

The National Wildlife Refuge System Improvement Act of 1997 amended the National Wildlife Refuge System Administration Act of 1966 and became a true organic act for the Refuge System by providing a mission, policy direction, and management standards. Among other provisions, the act directed the Secretary of the Interior to plan and direct the continued growth of the Refuge System and recognized compatible wildlife-dependent recreational uses as the priority general public uses of the Refuge System, ensured that opportunities for compatible wildlife-dependent recreation are provided, and ensured that wildlife-dependent recreation received enhanced consideration over other uses. The act also provided compatibility of uses standards and procedures and required that each unit of the Refuge System complete a Comprehensive Conservation Plan (CCP) by 2012.

Figure E-1: Location of the IRCP and land ownership within



1.2 Proposed Action

The Service proposes to prepare and implement a Comprehensive Management Plan (CMP) for the Iowa River Corridor Project. According to the MOU with the DNR, the CMP describes the overall habitat objectives and public use program, as well as specific management strategies. It should also discuss how the refuge lands fit into the larger complex of state lands, USDA easements, and private lands. The plan is to describe development and maintenance activities required to achieve and support Refuge System goals and IRCP objectives. The MOU states the following about project plans:

- Plans will not significantly affect river hydrology;
- Wildlife and habitat objectives will be based on migratory bird and indigenous wildlife habitat needs; and
- Public use objectives will be wildlife-dependent activities consistent with Refuge System policies.

This EA evaluated three alternatives, conveyed information to the public, and provided a basis for public review and comment. Implementation of the preferred alternative will be consistent and compatible with the Refuge Recreation Act, Refuge Administration Act, and the EA for the establishment of the IRCP.

1.3 Purpose of Action

The purpose of this EA is to specify management direction for the Iowa River Corridor Project of Port Louisa NWR over the next 15 years. More specifically, this EA documents the process to select a management direction for the refuge that best achieves the refuge's purposes, vision and goals; contributes to the mission of the Refuge System; is consistent with principles of sound fish and wildlife management; and addresses relevant mandates and major issues identified during scoping. The final management direction will be described in detail through a set of goals, objectives, and strategies in a CMP.

1.4 Need for Action

Refuge lands in the IRCP are administered from Port Louisa NWR in Wapello, Iowa. Typically, plans for refuge lands are completed under the CCP framework for refuges. A CCP was completed for Port Louisa NWR in 2004 but did not include the IRCP in its identified Area of Ecological Concern encompassed by the plan (FWS). The MOU between the Service and DNR states that Iowa DNR will prepare and maintain a CMP that considers the NRCS tract plans. This CMP is now needed to establish long-term management direction, and to clarify habitat goals, agency roles, and public use opportunities. There have been increasing stressors on the Iowa River watershed with ongoing changes to hydrology, potential climate change impacts, and human uses that have increased the need to review and plan management of these lands. In addition, new habitat management strategies may be available that were not considered in the 1990s. The IRCP will be included in the next Port Louisa NWR CCP revision.

1.5 Decision Framework

The refuge manager will review the analysis of the three alternatives described in this assessment and the comments received during the 30-day public comment period. Based on this review, the refuge manager will select an alternative to be implemented. The regional director, U.S. Fish and Wildlife Service, Region 3 (Midwest Region), will review the refuge manager's selection of one of three alternatives analyzed in detail and will determine, based on the facts and recommendations contained herein, whether this EA is adequate to support a Finding of No Significant Impact (FONSI) decision, or whether an Environmental Impact Statement (EIS) will need to be prepared.

Alternative A (No action) – Current management would continue.

Alternative B – Focus on grassland management to increase acres and diversity of native grassland. Manage reed canarygrass (RCG) invasion and encroachment of willows to restore native grasslands. Current wetland and forest management continues. Clarify public uses.

Alternative C (Preferred) – Focus on all habitat types, with restoration and management strategically focused on irregularly and intermittently flooded areas. Habitat objectives are developed in the context of the larger Bird Conservation Area (BCA) to provide connectivity. Outreach and information for visitors would increase.

1.6 Overview of the Planning Process

Scoping of the issues was conducted in a meeting with DNR and NRCS in January 2012. Issues for the larger BCA were also discussed at a meeting with partners that was held by the Audubon Society in April 2012.

Planning issues were identified as follows:

- Altered hydrology of the Iowa River and watershed
- Invasive species impacts, primarily RCG
- Invasion of early successional woody species, primarily willow, into grasslands
- Low diversity floodplain forests
- Runoff from surrounding agricultural lands
- Potential new management tools such as biofuels harvest
- Clarification of public uses allowed
- Lack of specific or extensive data on biological resources

Alternatives were then developed to address these issues that would result in a new CMP. Public input was sought on the draft EA and the preferred alternative in a CMP.

1.7 Authority, Legal Compliance, and Compatibility

The Refuge Recreation Act of 1962 (16 U.S.C 460k) authorizes the Secretary of the Interior to administer refuges for public recreation as an appropriate incidental or secondary use (1) to the

extent that is practicable and consistent with the primary objectives for which an area was established, and (2) provided that funds are available for the development, operation, and maintenance of permitted recreation. The National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 688dd-ee) authorizes the Secretary of the Interior to permit the use of any area within the Refuge System for any purpose, including but not limited to hunting, fishing, and public recreation whenever those uses are determined to be compatible with the purposes for which the area was established. The Improvement Act of 1997 is the latest amendment to the National Wildlife Refuge System Administration Act. It supports the National Wildlife Refuge System Administration Act's language concerning the authorization of hunting and other recreational uses on refuge lands. The Improvement Act substantiates the need for the Refuge System to focus first and foremost on the conservation of fish, wildlife, and plant resources and their habitats and states that other uses will only be authorized if they are determined to be compatible with this mission statement and the purposes for which the refuge was established.

The IRCP lands were acquired under the authority of the Emergency Wetlands Resources Act of 1986 and its purpose is therefore the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions. The 1995 final EA developed for the establishment of the refuge stated one of the acquisition objectives for the expressed purposes of increasing public opportunities for outdoor recreation, such as hunting or fishing, and environmental education compatible with the other purposes listed.

Final Compatibility Determinations have been completed for hunting and fishing, and for trapping, wildlife observation and photography, environmental education and interpretation, wood cutting, and food plot cultivation (appendix D).

Grain crop production methods have been used since the 1990s as a habitat management tool on both DNR and Service lands in the IRCP. Food plots for wildlife and habitat purposes are allowed on USDA easements with their Compatible Use Authorization. In 2011, the Midwest Region of the Service completed an EA for row crop farming and the use of genetically modified glyphosate tolerant (GMGT) corn and soybeans on refuge lands (FWS, 2011). The Service has used row crop farming on refuge lands as a tool in restoring native habitats, controlling noxious weeds, and providing food for migratory birds and resident wildlife for many years. For the past several years, the Service has been reducing the number of acres farmed on Refuge System lands. Farming policy and changes in agricultural practices, such as the increased use of genetically-modified crops, prompted a need to reevaluate farming on Service lands in the Midwest Region.

Under the selected alternative in the 2011 EA, beginning in calendar year 2012, the use of GMGT corn and soybeans on Refuge System lands in the Midwest Region would continue only for the purpose of habitat restoration (FWS, 2011). The use of GMGT corn and soybeans would be limited to five years for any individual tract in preparation for habitat restoration. Farming could continue to be used as a management tool for achieving multiple objectives; however, it would be limited to non-GMGT crops only for objectives other than habitat restoration. Multiple objectives include but are not limited to the following:

- habitat restoration
- habitat management
- supplemental food for wildlife

- attracting wildlife for viewing and photography

The Service's biological integrity policy specifies that GMGT crops cannot be used on Refuge System lands unless they are "essential to accomplishing refuge purposes." Habitat restoration is a core objective of most refuges and wetland management districts (district) to achieve purposes, and the use of GMGT crops could be essential in some circumstances. However, habitat management, providing supplemental food, and wildlife viewing objectives can more readily be accomplished without the use of GMGT corn and soybeans, and thus the use of GMGT crops would not be essential.

Refuge and district managers would be required to demonstrate that their proposed use of GMGT crops is essential for habitat restoration. The Service has established an approval process for the use of GMGT corn and soybeans that includes completion of an Eligibility Questionnaire for Genetically Modified Crops. When managers propose to use GMGT corn and soybeans, they are required to complete this questionnaire as part of the approval process. The regional chief of refuges approved the request for authorization to use GMGT corn and soybeans on refuge lands in the IRCP (appendix D).

Currently, planting of food plots involve either DNR staff and equipment or a third party who farms under the terms and conditions of a cooperative habitat management agreement. The DNR has been developing and managing the agreements to establish how long planting of food plots is allowed on a specific tract and establish the crops and crop rotation that will be used. The terms and conditions typically include a provision for leaving some percentage of the crops in the field as food for wildlife, primarily migrating birds. The farming activities have to be found compatible through a refuge compatibility determination before they can be allowed. A farming compatibility determination was completed in 2011 (appendix D). A food plot compatibility determination has also been completed (appendix D). Food plots for wildlife and habitat purposes are allowed on USDA easements with their Compatible Use Authorization.

Wilderness Review

As part of the planning process, lands within the legislative boundaries of the refuge were reviewed for wilderness suitability. The Wilderness Act of 1964 defines and outlines the requirements for a wilderness area as follows:

"A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined . . . (as) an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

No lands in the IRCP were found suitable for designation as wilderness as defined by the Wilderness Act. The refuge does not contain 5,000 contiguous roadless acres, nor does it have

any units of sufficient size to make preservation practicable as wilderness. Lands and waters within the defined acquisition boundary have been substantially affected by humans, particularly through agriculture, transportation infrastructure, and water control.

1.8 Scoping of the Issues

A meeting was held in January 2012 with the DNR and NRCS to identify and define the issues. Planning issues were identified as follows:

- Altered hydrology of the Iowa River and associated floodplain
- Invasive species impacts, primarily from RCG
- Invasion of early successional woody species, primarily willow, into grasslands
- Low diversity floodplain forests
- Runoff from surrounding agricultural lands
- Potential new management tools such as biofuels harvest
- Clarification of public uses allowed
- Lack of adequate biological baseline data (e.g., bird populations, vegetation classifications)

Hydrology Issues

As noted in the introduction, the Iowa River has experienced major floods in the last couple of decades. 2008 was the new flood of record subsequent to 1993. Although the IRCP was established to return floodplain lands to a naturally vegetated state, flooding and altered hydrology make restoration and management challenging. Although about 18,670 acres of the floodplain within the IRCP is in WRP or public ownership for conservation, it is still affected by surrounding land uses. Land use and land cover in the Iowa-Cedar watershed is primarily agricultural with about 93 percent of the total area used for cropland or pasture (http://iowacedarbasin.org/). Land is mostly within private ownership within the watershed. The principal crops are corn, soybeans, hay, and oats. The remaining land area consists of about four percent forests, about two percent urban, and about one percent water and wetlands (http://iowacedarbasin.org/). This land use greatly affects the hydrology and habitats within the IRCP. The Service regional hydrologist completed a water resources inventory and assessment for the IRCP in 2012 that is summarized in the hydrology section in chapter 3 of this CMP and provides information that assisted with planning.

Wildlife Issues

More information and assessment of migratory bird use is needed in the IRCP. Little is known about songbird or waterbird populations in the IRCP or the larger BCA. Additional inventory information would aid in development of management objectives and strategies. Many of the Species of Greatest Conservation Need (SGCN) identified in Iowa's state wildlife action plan (SWAP) and as Fish and Wildlife Conservation Priorities for FWS Region 3 (FWS, 2002) use the IRCP. Of concern to the Iowa DNR and hunters is that local pheasant populations have declined along with the state population (Iowa DNR, 2012) .

Habitat Issues

Although much of the IRCP has been successfully restored to native prairie species, grassland and forest restoration efforts in the IRCP have often been unsuccessful due to flooding and inundation before plants could become established or because of competition from RCG. The largest habitat challenge is RCG invasion. RCG is widespread in floodplains in the Midwest and is an aggressive perennial grass. Approximately 2,050 acres of the IRCP have been invaded by this species, predominantly in the lowest elevations (figure 2-1). RCG is present in most of the Iowa River watershed, and seed is spread through flooding so that there is a continual input of seed. RCG can be set back for two to four years with mowing and chemical treatment to provide annual plant growth that provides an interim food source for wildlife and improved habitat. Some RCG dominated fields have been treated with herbicide and seeded with native prairie species with success. Planting container trees to add species diversity to the floodplain forest has been used with some success, but is more labor intensive.

Much of the grassland acres are also undergoing succession with woody species due to lack of disturbances. Sandbar willow, cottonwood, ash, and dogwood are the predominant successional species. Although some percentage of this habitat, especially with heterogeneous heights and structure, is desirable for many bird species, if left unmanaged it will become the dominant habitat type. Willow and early successional species are currently estimated to be 15 to 20 percent of the habitat in the IRCP. Flooding and wet conditions have made access for management difficult during many years, which exacerbates the problem. Fire, mowing, and chemical treatment have all been used successfully to provide at least short-term control, but it is difficult to treat the desired acres due to funding, staffing, weather and seasonal constraints, and flooding. Recent interests in the harvest of grass or woody material for biofuels may be a new tool for treating larger areas of both RCG and woody successional species. A determination of how much of this habitat exists and where it could be treated is needed.

The prolonged duration of the 1993 flood killed many of the oaks and walnuts in the floodplain forest along the Iowa River. Continued wet conditions and RCG have made it difficult to reestablish these trees on a large-scale to improve forest diversity. Planting root production method (RPM) containerized trees appears to be the most promising method for reestablishing these species. A determination of the best methods to achieve optimum survival for tree plantings is needed.

Floodplain partnerships and context of IRCP lands

IRCP refuge lands consist of tracts intermixed with state lands, private lands, and lands with conservation easements. They are within a larger area designated by the State as a BCA (described in chapter 3 of the CMP), and they are part of a watershed that has received considerable attention because of large floods. Refuge habitats must be viewed in the context of surrounding land uses and combined habitat potentials. Larger blocks of some habitat types are important for certain bird species, and connectivity of habitats is important for wildlife movements. Partnerships with other agencies, non-governmental organizations, and landowners will be key to a working floodplain that benefits wildlife and people.

Public Use Issues

The IRCP lands are managed jointly with the provisions of the National Wildlife Refuge System Administration Act and DNR Wildlife Management Area code. Some uses allowed on WMAs may not be appropriate or compatible under Refuge System policy. A clarification of what public uses are allowed on refuge lands is needed.

Chapter 2: Description of the Alternatives

2.1 Formulation of Alternatives

The planning team developed management alternatives for the refuge lands in the IRCP based on the issues, concerns, and opportunities raised during a scoping meeting with the Iowa DNR and NRCS and from talking individually with conservation organizations and refuge and FWS Regional Office staff. Summaries of the three alternatives are provided in concise narrative form in this chapter. A complete set of objectives by alternative is provided in tabular form (table E-1).

The management alternatives were developed to generally fit within the current refuge and DNR budget and were formulated under the assumption that a large budget increase for operations is unlikely during the life of the plan. Concerns the planning team attempted to address related to habitats, wildlife, invasive species, hydrology, visitor services, and partnerships. The general premise of the IRCP is to restore and maintain floodplain habitats with the existing partnership framework with NRCS and DNR for the benefit of migratory birds. The patchwork of refuge lands adjacent to DNR lands and USDA easements necessitates viewing wildlife habitat as a whole and working together to manage them. The IRCP is one of the largest protected habitat complexes in Iowa and important for SCGN identified in Iowa's SWAP.

Alternatives were developed to address specific habitat management issues in the context of the partnerships and floodplain landscape of the IRCP. Features of the Iowa River watershed were considered in developing alternatives. Habitat management alternatives were formulated with the refuge purposes of wetland and migratory bird protection as an overall goal. Resident wildlife needs were also considered. Historical vegetation, an assessment of water resources, feasible management options, potential climate change impacts, and land use were used to help develop alternatives.

Disturbance regimes related to fire frequency and intensity are a key factor in the maintenance of grasslands in the IRCP. Fire not only determines the abundance and geographic distribution of habitats but is essential to a number of biological processes and life cycle stages for both plants and animals on the refuge. Prescribed fire will be used to manage habitats under all of the alternatives.

Water resources, watershed health, and their relationship to local plant and animal species and the mosaic of associated habitats are essential components of refuge management. However, specific data on migratory birds and other target wildlife use is lacking and indicate a need for additional inventory and monitoring. A more comprehensive survey of the plant and animal species on the refuge, and adjacent lands with substantial wildlife habitat, can help identify areas of high biodiversity, inform the selection of focal species, and help determine management priorities in this dynamic landscape.

The public has been using refuge lands for hunting, fishing, bird watching, hiking, canoeing, trapping, and environmental education and interpretation since its establishment and these uses continue under all alternatives.

2.2 Selecting the Preferred Alternative

The Preferred Alternative (Alternative C) was chosen primarily because of the benefits to migratory birds and coincident benefits to resident wildlife. The preferred alternative will meet the lifecycle needs of grassland, forest, and wetland birds and would meet refuge purposes. While the other action alternatives are all reasonable, some of the other components of this alternative make it more comprehensive in providing the most wildlife diversity for the long-term.

The refuge lands that are the subject of this planning are located in a dynamic floodplain, and current management is flexible in order to take advantage of appropriate conditions for completing management actions. For example, prescribed burning can only be effective when vegetation is dry enough to carry fire. However, management action locations could be refined with specific attention to elevations and the relationship of one habitat parcel to another. More preference can be placed on locations that will create larger blocks of grassland habitat or provide more contiguous forest corridors. Although a large part of the IRCP lands are managed to provide grassland habitat, and grassland birds are among the most imperiled species in the State, the refuge purposes are better met by providing quality habitat of all types to facilitate bird breeding and migration. Habitats in Iowa are greatly fragmented. The IRCP provides an important intact corridor for many types of migrant birds. In addition, IRCP lands only contribute a portion of the habitat within the larger BCA. Providing all of the major habitat types will contribute to improved connectivity and heterogeneity in the larger landscape. Refining how refuge habitats fit with surrounding habitats will improve habitat quality overall.

Providing all of the major habitat types also benefits resident wildlife such as Ring-necked Pheasants, white-tailed deer, Wild Turkeys, and furbearers important to the ecological function of the area and important for recreation. Forest, grassland, and wetland resources combined are also important for flood retention and watershed health. A focus on only one of these resources may diminish those benefits.

Finally, while the IRCP refuge lands are generally open to hunting, fishing ,and trapping; the Improvement Act of 1997 declared wildlife-dependent recreational use as a priority and generally compatible for units within the Refuge System. Uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation are generally considered “wildlife-dependent” under the Improvement Act. Furthermore, recommendation number 18 in the Service’s vision document, *Conserving the Future: Wildlife Refuges and the Next Generation* (FWS, 2011) states that we should “support and enhance appropriate recreation opportunities on national wildlife refuges ” and encourages the Refuge System to provide opportunities to the public without “traditional links to wild lands and wildlife.” This suggests that at least some non-wildlife-dependent public uses may be appropriate and compatible as well. Alternative C would allow for many of these uses to occur. The appropriate use designations and compatibility determinations in appendices D and E detail the uses that would be allowed.

2.3 Elements Common to All Alternatives

2.3.1 Coordination with State Natural Resource Agencies

In accordance with the National Wildlife Refuge Administration Act as amended by the 1997 Refuge Improvement Act, the Service will, " . . . ensure effective coordination, interaction , and cooperation with owners of land adjoining refuges and the fish and wildlife agency of the states in which the units of the System are located." The IRCP is unique in its relationship to the State of Iowa since the State manages IRCP lands under an MOU. The CMP is required of the State under the MOU and was written in close consultation with the State and NRCS.

The refuge will also consider known populations of state-listed threatened and endangered species in management actions under every alternative.

2.3.2 Prescribed Fire

Prescribed fire will be used under all alternatives to control encroachment of woody vegetation into grasslands, to periodically rejuvenate native grassland stands and to aid in restoration of habitats. Fire not only determines the abundance and geographic distribution of habitats, but is essential to a number of biological processes and life cycle stages for both plants and animals on the refuge. The team recognized the need to plan for routine prescribed burns and coordinate with other entities, both public and private, to safely and effectively implement a fire program. A Fire Management Plan was completed in 2007 for Port Louisa NWR. It describes how the fire program on the refuge and the IRCP is administered and identifies goals of the program.

2.4 Summary of Individual Alternatives

The following sections describe the current management (no action) alternative and two action alternatives drafted by the planning team to address the issues raised during scoping, to meet the charge outlined by the Service mission, and to address the establishing purposes of the refuge. The narratives summarize individual management issues and themes by alternative, and table E-1 provides a complete list of the objectives proposed under each alternative. Table E-2 and chapter 4 of this EA describe the consequences that would likely result from the actions proposed under each alternative.

2.4.1 Alternative A (No Action)

Alternative A is a continuation of the current management. The Iowa DNR manages the lands under an MOU and a strong partnership exists with the Service and NRCS. In addition, coordination with other partners such as the Audubon Society and others related to the BCA is ongoing. The primary focus of current management has been to restore and maintain grassland and wetland habitat and provide food sources for waterfowl and resident wildlife such as Ring-necked Pheasants. Forest management and restoration also occur under current management but are not the primary focus.

Grasslands are managed with prescribed fire to set back willow and other encroaching woody vegetation. Acres treated each year vary depending on river levels and weather but often exceed 2,000 acres. The Service oversees the fire program in cooperation with the DNR. The forest resource is sometimes enhanced by direct nut seedings or planting of RPM trees

dependent on funding and personnel available. About 200 acres of food plots are planted each year as supplemental food for resident wildlife and some migratory waterbirds. Some RCG dominated areas (50 to 200 acres) are chemically treated each year to temporarily set back this invasive species and provide annual plants. This method provides a food source and improved habitat for two to three years before RCG again dominates.

The majority of wetlands are part of the floodplain and are allowed to be dynamic with river conditions. There are some dikes and water control structures where water levels are manipulated to provide aquatic vegetation when possible. Woody vegetation is encroaching on some wetlands.

About 200 acres, or two percent of the IRCP refuge lands, would remain in food plots as a food source for resident wildlife and migratory waterbirds. Cultivation and row crops may also be used on a temporary basis to control invasive plants and restore native vegetation.

There is still potential for land acquisition to meet IRCP goals, and it is a potential tool to meet habitat goals. Land acquisition by the Service has not occurred since the late 1990s. The DNR has acquired lands in recent years, and more USDA easements were established after the 2008 flood. The acquisition goal under the 1995 EA for IRCP lands was for 15,000 acres.

Visitor uses currently occurring are hunting, fishing, trapping, wildlife observation and photography, and environmental education and interpretation. Compatibility determinations for these uses were previously captured under those completed for Port Louisa NWR but were not specific to the IRCP. New compatibility determinations have been completed (appendix D). Facilities for visitors currently include parking lots and an observation deck. Visitor information is distributed through the local DNR office.

The refuge is responsible for protecting the resources within its boundaries and for providing a safe environment for people. The refuge law enforcement program is a critical tool in protecting trust resources, wildlife habitat, public facilities, employees, and the visiting public. Primary law enforcement is provided by local DNR officers. The refuge shares officers from other refuges nearby and cooperates with DNR officers and local law enforcement authorities.

2.4.2 Alternative B

This alternative puts an emphasis on grassland habitat to increase acres and quality of native grassland for SGCN species that rely on grassland for migration and breeding. This alternative would better define the quality and quantity of desired grasslands, including control of invasive RCG. Under this alternative, native grassland would be increased to about 35 percent of the IRCP with 50 percent of those grasslands having a minimum of 25 forbs species to improve from some of the current low diversity native grasslands. Prescribed fire would continue to be used to manage grasslands.

Control of invasive RCG would be emphasized on irregularly and intermittently flooded areas where there is the most chance of success. Although RCG will still be present, the goal is to reduce its dominance on more acres. The locations of control efforts for early successional growth in grasslands would be more strategic to create larger blocks of open grassland habitat. Grassland habitat needs in relation to bird populations in the larger BCA would be determined so that restoration work could be expanded to private lands under the voluntary FWS Partners for Fish and Wildlife Program and other partner agency programs. Management of forest

resources would remain the same as under current management. More work would be done to remove woody vegetation from wetlands where it has encroached on the habitat.

About 200 acres, or two percent of the IRCP refuge lands, would remain in food plots as a food source for resident wildlife and migratory waterbirds. Cultivation and row crops may also be used on a temporary basis to control invasive plants and restore native vegetation.

There is still potential for land acquisition to meet IRCP goals, and it is a potential tool to meet habitat goals. Land acquisition by the Service has not occurred since the late 1990s. The DNR has acquired lands in recent years, and more USDA easements were established after the 2008 flood. The acquisition goal under the 1995 EA for IRCP lands was for 15,000 acres.

Visitor uses and facilities would remain the same as under current management.

2.4.3 Alternative C (Preferred)

Alternative C is aimed at a more ecological, holistic approach to address restoration and enhancement of all habitat types based on elevational differences and in the context of the surrounding landscape and the BCA. It includes a more specific identification of the elevational influences on habitat types in relation to inundation. For example, tree plantings will have less chance of success at the lowest elevations where they will be more frequently inundated. RCG is hard to treat also at the lowest elevations and efforts may be better spent on the higher elevations. The lowest elevations have value for the floodplain purposes of the IRCP, but may have lower quality habitat due to the difficulty in restoring vegetative diversity. Therefore, management to improve native grassland amounts and diversity, reduce the dominance of invasive RCG, and control early successional growth will be more strategically focused at irregular and intermittently flooded elevations. Forest restoration and management will also be targeted for these elevations.

This alternative includes objectives for grassland (30 percent), forest (30 percent), early successional (25 percent or less), and wetland habitats (10 percent or more) to create a diverse mix of habitats with varying structure for migratory birds. Wetlands will continue to be restored where feasible. Resident wildlife will also benefit under this alternative. The objectives focus on refuge fee title lands but also include habitat work on private lands within the BCA as feasible under the Service or other partner agency programs.

About 200 acres, or two percent of the IRCP refuge lands, would remain in food plots as a food source for resident wildlife and migratory waterfowl. However, food plot acreage would be reduced as restorations of native habitat are completed. As mast trees are added to forest, and diverse forbs to grassland, the food sources for resident wildlife will improve. Cultivation and row crops may also be used on a temporary basis to control invasive plants and restore native vegetation.

There is still potential for land acquisition to meet IRCP goals, and it is a potential tool to meet habitat goals. Land acquisition by the Service has not occurred since the late 1990s. The DNR has acquired lands in recent years, and more USDA easements were established after the 2008 flood. The acquisition goal under the 1995 EA for IRCP lands was for 15,000 acres.

The infrastructure and information necessary for visitors to locate and recreate in the IRCP will increase with kiosks at parking lots and the availability of brochures.

2.5 Alternatives Considered but not Developed

Two additional alternatives were initially considered but were not analyzed in detail. This section includes rationale for why these alternatives were not considered in detail.

Breeding and Migrating Forest Dependent Birds Focus

This alternative was not considered in detail, because it is too narrowly focused for the purposes of the refuge. Although forest is an important component of IRCP and BCA habitats and does need management, it is currently functioning as bird habitat. Furthermore, all of the solutions to the issues for an alternative with this focus were captured in other alternatives.

Bird Conservation Area or Watershed Focus

This approach would have focused management primarily on areas outside of the refuge in order to complement refuge habitats. While the Service does have a program to work with private landowners and some of this work currently takes place, the Service does not have control over these other lands in order to make this a primary focus. Developing an alternative to manage refuge lands in the context of this setting was deemed a more appropriate approach. Furthermore, most of the solutions to the issues for an alternative with this focus were captured in other alternatives.

Table E-1: Summary of alternatives

Goal	Issue	Alternative A: Current Management	Alternative B:	Alternative C:Preferred Alternative
Wildlife: In partnership, restore a natural diversity and abundance of migratory birds and other native fauna on refuge land within the IRCP and contribute to maintaining bird populations listed as SCGN in Iowa.	migratory birds	Over the life of the plan, maintain stable or increasing populations of migrating waterfowl and resident birds utilizing IRCP refuge land.	Over the life of the plan, maintain the existing diversity and abundance of migratory birds, with particular focus on increasing grassland nesting bird SCGN, utilizing IRCP refuge land.	Over the life of the plan, maintain or increase the existing diversity of grassland nesting birds, migrant forest birds, and migrant waterbirds, particularly SCGN, utilizing IRCP refuge land.
Habitat: In partnership, maintain, restore and enhance the wetland and upland habitat on refuge land within the IRCP to emulate a naturally functioning, dynamic floodplain emphasizing a variety of habitat conditions that were present prior to European settlement, but that can withstand flooding.	low diversity forest	Over the life of the plan, maintain current amount (approximately 28%) of forest within IRCP refuge land.	Same as Alt. A.	Over the life of the plan, maintain approximately 30% forest, within IRCP refuge land. 10% of these forests will contain a dominant component of oak/hickory/walnut. Plantings and timber stand improvements will be prioritized using elevations with irregular to intermittently flooded elevations the highest priority for improvements.
	native grassland	Over the life of the plan, maintain current amount (approximately 27%) native grassland within IRCP refuge land.	Over the life of the plan, increase native grassland to approximately 35% with 50% having a minimum of 25 forb species on IRCP refuge lands. Add 200 acres of native grassland on private lands within the BCA as feasible under FWS programs.	Over the life of the plan, increase native grassland to 30% with an increase to a minimum of 25 forb species on 30% of IRCP refuge grasslands. Native grasslands targeted for diversification, or newly planted grasslands will be prioritized based on the likelihood of inundation with irregular or intermittently flooded elevations the highest priority. Add 200 acres of native grassland on private lands within the BCA as feasible under FWS programs.

	reed canarygrass (RCG)	Annually treat at least 50 acres of RCG to promote annual herbaceous plant growth and limit spread when and where feasible on IRCP refuge land.	Over the life of the plan, RCG dominated fields do not exceed 20% of irregularly flooded areas and 20% of intermittently flooded areas within IRCP refuge lands.	Same as Alt. B
	willow encroachment	Annually manage at least 1,000 acres of early successional woody cover wherever logistically feasible within IRCP refuge land.	Over the life of the plan, set back at least 1,000 acres of early successional woody cover annually within and adjacent to large and/or diverse native grasslands.	Over the life of the plan, maintain 15–25% early successional woody cover with heterogeneous structure/height, primarily at the frequently flooded elevations within IRCP refuge land. The preference is for the lower percentage target.
	wetlands	During the life of the plan, maintain all possible dynamic wetland habitats per natural flood regimes.	During the life of the plan, maintain and restore all possible dynamic wetland habitats per natural flood regimes, manage invasive or undesirable vegetation, and add 100 acres of wetlands on private lands within the BCA as feasible under FWS programs.	Same as Alt. B.
	BCA/floodplain restoration	Over the life of the plan, management and restoration efforts of all habitat types are focused on refuge fee title land within the IRCP.	Over the life of the plan, management and restoration efforts are focused on grassland and wetland habitats on refuge fee title land within the IRCP with additional grassland restoration on private lands within the greater BCA as feasible under FWS programs.	Over the life of the plan, management and restoration efforts are focused on all habitats (grassland, wetland, forest) on refuge fee title land within the IRCP and private land within the greater BCA as feasible under FWS programs
People: In partnership for collaborative conservation, provide quality visitor services to preserve cultural heritage and promote understanding, appreciation, and support for the IRCP as a whole.	appropriate recreational opportunities	Over the life of the plan, allow current public uses deemed compatible for the IRCP	Same as Alt. A.	Same as Alt. A.
	awareness and understanding	Over the life of the plan, continue current outreach activities with information available at the DNR office and DNR and refuge websites.	Same as Alt. A.	Within five years of plan approval, provide and expand the infrastructure and information necessary for visitors to locate and recreate in the IRCP.

2.6 Summary of Environmental Consequences

The following table compares and contrasts the various environmental effects that are expected to result from implementation of the three alternatives. The environmental consequences of each impact topic were defined on the basis of type of effect, intensity, context, and duration for the following resources: Climate Change, Soil Resource, Water Resources, Air Quality, Habitat, Ecosystems, Wildlife, Socio-economics, Visitor Services, and Cultural Resources. Further description of the effects can be found under each resource in chapter 4 of this EA.

Type refers to an effect being either *adverse* or *beneficial* for the topic being analyzed. Some resources may not be affected by a given activity; therefore the type of effect is *none*. Effects also can be direct or indirect. Direct effects are caused by an action and occur at the same time and place as the action. Indirect effects are caused by the action and occur later or farther away, but they still are reasonably foreseeable.

Duration refers to how long an impact would last. The planning horizon for this plan is approximately 15 years. Unless otherwise specified, in this document the following terms are used to describe the duration of the impacts: *Short-term (ST)*: The effect would be temporary, lasting only while the management activity is occurring. *Long-term (LT)*: The effect is expected to persist beyond the life of the plan.

Intensity refers to the degree or magnitude to which a resource would be positively or negatively affected. Each effect was identified as *minor*, *moderate*, or *major* in conformance with the criteria for the classifications established for each impact topic. The planning team qualitatively evaluated the intensities of effects on all the resources.

Context refers to the setting within which an effect is analyzed, such as the affected region or locality. In this document most effects would be either *local* (site-level where the action is occurring) or regional (BCA, watershed, or larger).

Table E-2: Summary of environmental consequences by alternative

Element	Alternative A (No Action)				Alternative B				Alternative C (Preferred)			
	Type	***Duration***	***Intensity***	***Context***	***Type***	***Duration***	***Intensity***	***Context***	***Type***	***Duration***	***Intensity***	***Context***
Climate Change	Beneficial: Carbon sequestration Adverse: fire	Long-term Short-term	Moderate Minor	Local and regional Local	Beneficial: carbon sequestration, buffer changes in precipitation Adverse: fire	Long-term Short-term	Moderate Minor	Local and regional Local	Beneficial: carbon sequestration, buffer changes in precipitation Adverse: fire	Long-term Short-term	Moderate Minor	Local and regional Local
Water Resources	Beneficial: flood retention, soil holding capabilities, water quality	Long-term	Moderate	Local and regional	Beneficial: flood retention, soil holding capabilities, water quality	Long-term	Moderate	Local and regional	Beneficial: flood retention, soil holding capabilities, water quality	Long-term	Moderate	Local and regional
Soil Resources	Beneficial: soil building and nutrients Adverse: disturbance from restoration	Long-term Short-term	Moderate Minor	Local Local	Beneficial: soil building and nutrients Adverse: disturbance from restoration	Long-term Short-term	Moderate Minor	Local Local	Beneficial: soil building and nutrients Adverse: disturbance from restoration	Long-term Short-term	Moderate Minor	Local Local
Air Quality	Beneficial: natural vegetation Adverse: smoke, allergens	Long-term Short-term	Minor Minor	Local Local	Beneficial: natural vegetation Adverse: smoke, allergens	Long-term Short-term	Minor Minor	Local Local	Beneficial: natural vegetation Adverse: smoke, allergens	Long-term Short-term	Minor Minor	Local Local
Wildlife	Beneficial for all wildlife populations Adverse: no increase to some bird populations	Long-term Long-term	Major Moderate	Local and regional Local and regional	Beneficial for all wildlife populations, increase in grassland birds. Adverse: no increase in forest birds	Long-term Long-term	Moderate Moderate	Local and regional Local and regional	Beneficial for all wildlife populations.	Long-term	Major	Local an d regional

Element	Alternative A (No Action)				Alternative B	Alternative C (Preferred)			Element	Alternative A (No Action)		
	Type	***Duration***	***Intensity***		***Type***	***Duration***	***Intensity***		***Type***	***Duration***	***Intensity***	
Vegetation / Habitat	Beneficial but no change. Adverse: increase in non-native grass. Plant diversity not increased. habitat block size and connectivity not optimized Adverse: vegetation removed by fire	Long-term Long-term Short-term	Moderate Moderate Minor	Local and regional Local and regional Local	Beneficial: Native grassland amount and quality increase. Non-native grassland decreased. Adverse: forest diversity declines Adverse: vegetation removed by fire	Long-term Long-term Short-term	Moderate Moderate Minor	Local and regional Local and regional Local	Beneficial: Overall amount and quality of all habitats increased Adverse: vegetation removed by fire.	Long-term Short-term	Major Minor	Local and regional Local
Ecosystems	Beneficial: biological diversity	Long-term	Moderate	Regional	Beneficial: biological diversity.	Long-term	Moderate	Regional	Beneficial : biological diversity	Long-term	Major	Regional
Socio-economic	Beneficial: local tourism, ecosystem services	Long-term	Moderate	Local	Beneficial: local tourism, ecosystem services	Long-term	Moderate	Local	Beneficial: increase in local tourism, ecosystem services	Long-term	Moderate	Local
Visitor Services	Beneficial: wildlife-dependent recreation. Adverse: no increase in understanding or appreciation	Long-term Long-term	Moderate Moderate	Local Local	Beneficial: wildlife-dependent recreation. Potential increase in pheasant hunting. Adverse: no increase in understanding or appreciation	Long-term Long-term	Moderate Moderate	Local Local	Beneficial: wildlife-dependent recreation, increase in awareness and appreciation by the public.	Long-term	Moderate	Local and regional
Cultural Resources	No effect				No effect				No effect			

Chapter 3: Affected Environment

3.1 Location and Local Conservation Landscape

The 50,000 acre IRCP is an approximate 45 mile stretch of the Iowa River in Benton, Iowa, and Tama Counties in east central Iowa (figure E-1). The majority of lands in the floodplain of the Iowa River within this boundary are considered part of the Service approved acquisition area for the IRCP. The Iowa DNR also owns lands, and many private lands are under conservation easements to protect wetlands. The IRCP is managed under a unique partnership between the Service, Iowa DNR, and NRCS. Other partners also contribute significantly to the management of the IRCP. The DNR retains the majority of day-to-day, on-the-ground management with some assistance from the other agencies. The DNR has staff at the Iowa River Wildlife Unit dedicated to managing Service and DNR lands in the IRCP. NRCS has provided restoration funding and technical assistance. The Service provides fire management oversight and assistance, shares equipment, and provides funding when possible for seed, trees, sign posts, etc. This partnership has been successful and will hopefully continue well into the future.

The Iowa River Corridor BCA was the first Iowa BCA centered on a river corridor. Extending 45 miles from near Montour in Tama County to the Homestead area in Iowa County, the BCA includes a wealth of habitats including forest, wetland, grassland, woodland, and savanna (figure E-1).

This diverse landscape provides habitat for 87 percent of Iowa's 85 Bird SCGN. Bald Eagle, Least Bittern, Grasshopper Sparrow, Cerulean Warbler, Black-crowned and Yellow-crowned Night-Herons, Bobolink, Loggerhead Shrike, and Red-headed Woodpecker are examples of bird species that rely on this area for nesting or migration. Sandhill Cranes have nested in the area since 1992. A wide variety of other wildlife species are provided for by the diversity of habitat that is present, including the ornate box turtle, river otter, and regal fritillary butterfly.

Because of the nationwide importance of this area for birds, and especially the waterbirds that depend on the IRCP for nesting and as a migratory rest area, it has also been designated as one of the Audubon Society's Important Bird Areas (IBA). This program is a global effort to identify and conserve areas that are vital to birds and other wildlife. Designated IBAs include sites for breeding, wintering, and/or migrating birds. By working to identify and implement conservation strategies, the IBA program hopes to minimize the effects of habitat degradation and loss on birds and other wildlife. The IBA program is a starting point for site-based conservation efforts in the Iowa River Corridor. Partners and stakeholders met in 2012 to identify needs in the BCA. Education and more information on wildlife species, particularly birds, were identified as needs. The Audubon Society is another important partner in the IRCP.

3.2 Geomorphic/Physiographic

The IRCP lies near the northern border of the geologic landform region known as the Southern Iowa Drift Plain. It is adjacent to the Iowan Surface, which was formerly a part of the pre-Illinoisan Southern Iowa Drift Plain but redefined in subsequent glaciations. The Iowa River is flat and winding through the IRCP, with a wide floodplain that is abundant with wetlands, sloughs, and backwater oxbows. The Iowa River rises in Hancock County, Iowa, and drains about 4,375 square miles above the confluence of the Cedar River in southeastern Iowa. The Basin is covered by deposits from two of the earliest glacial sheets, the Nebraskan and Kansan.

3.3 Local Socioeconomic Conditions

The refuge is located near the towns of Belle Plaine, Marengo, and Tama and is approximately 75 miles east of Des Moines and 31miles west of Iowa City, Iowa. The Service owns about 9,300 acres and the DNR owns about 4200 acres in Benton, Iowa, and Tama Counties. Figure E-1 shows public ownership in the IRCP. Easements that have remained in private ownership are also shown on figure E-1 and make up 5,111 acres with 52 easements.

The most recent U.S. Census Bureau data for IRCP counties is shown in table E-3. Important industry types in Tama, Benton, and Iowa Counties include agriculture, manufacturing and health care.

Table E-3: Data from U.S. Census Bureau websites

	Benton County	Iowa County	Tama County
Population	26,076	16,355	17,767
Race	97% white non-Hispanic	96% white non-Hispanic	84% white, 7.5% American Indian, 7.8% Hispanic or Latino
Per Capita Income	39,066	37,797	35,046

The IRCP provides outdoor recreation opportunities including several wildlife-dependent activities: wildlife observation, photography, hiking, hunting, and fishing. The IRCP is also a valuable location for conducting outdoor environmental education activities.

The financial impact of refuges is reported in the *Banking on Nature* report (FWS, 2007). Based on findings from 80 national wildlife refuges considered typical in terms of the Nation's recreation interests and spending habits, the report analyzed recreational participation in, and expenditures for freshwater fishing, saltwater fishing, migratory bird hunting, small game hunting, big game hunting, and non-consumptive activities including wildlife observation. Calculation of the total economic activity included money spent for food, lodging, and transportation. Trempealeau NWR, a refuge on the Mississippi River, similar to Port Louisa NWR in size and recreational opportunities but with more visitations, was included in the report. Economists found total visitor recreation expenditures were $804,600 with non-residents accounting for $476,200 or 59 percent of total expenditures. Expenditures on non-consumptive activities accounted for 99 percent of all expenditures. Recreational activities included birding and other non-consumptive uses, hunting, and fishing. In addition, local economic effects associated with recreation were estimated at about $1,000,000.

Economic benefits from wildlife-associated recreation, including hunting, are reported every five years by the Service. The *2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* (FWS, 2012) found $277,999,000 in fishing, $405,451,000 in hunting, and $711,168,000 in wildlife-watching total expenditures in Iowa for residents and non-residents. The 2011 survey found that 1.25 million Iowa residents and nonresidents 16 years old and older fished, hunted, or watched wildlife in Iowa. Of the total number of participants 473,000 fished, 253,000 hunted, and 837,000 participated in wildlife watching activities, which include observing, feeding, and photographing wildlife. The IRCP provides an important place in Iowa for these recreational economic expenditures. For Iowa, total expenditures for hunting increased from $288,324,000 in 2006 to $405,451,000 in 2011.

The refuge receives visits for the six priority wildlife-dependent public uses as well as other recreational uses such as boating that are not dependent on the presence of fish and wildlife. There are no visitation data currently recorded specifically for the IRCP.

3.4 Climate

The Iowa River Basin has a typical humid continental climate. At Toledo, Iowa, near the upper end of the planning area, the average daily high temperatures vary from the low 80 degrees Fahrenheit during the summer months to the mid- twenties during the winter. Annual precipitation at Toledo averages 34 inches.

A recently completed Water Resources Inventory and Assessment (WRIA) reviewed available climate information (FWS, 2012). The WRIA was not intended to address the question of climate change or to evaluate the numerous climate models available under a variety of emission scenarios, relevant to the refuge. However, the WRIA process included a review of the literature to determine the relevant water resources data and monitoring sites directly applicable to the refuge lands. In 2010, a report to the Iowa Governor and general assembly provided recommendations for addressing climate change and documented the current impacts of changing climate on lowlands in Iowa over the last 50 years (Berendzen et al., 2010). This report suggests Iowa is experiencing warmer winters, warmer nighttime temperatures, and changes in precipitation regularity and intensity. Hydrologically, these types of changes suggest increased evaporation, evapotranspiration, peak and mean streamflow change, and variability in ice-in/ice-out dates. For example, an approximately 31 percent change in very heavy precipitation events in Iowa has taken place in the last 50 years, which likely has led to flashier streamflow and greater levels of erosion (Karl et al., 2009).

Climate information for the IRCP was gathered from the weather station at Belle Plaine, Iowa, which is near the western edge of the acquired units within the IRCP. This information suggests that monthly precipitation will typically peak in June, varying from one to five inches per month and monthly temperature will typically peak in July or August, based on information from 1975 to 2010. From 1950 to 2010, for a water year (WY is Oct. 1 to Sept. 31) the temperature and precipitation did not show a statistically significant pattern. However, it does appear that the last 10 years have been warmer and the last five years have been wetter than what is typical for this area.

3.5 Hydrologic Resources

The WRIA for the IRPC describes and summarizes current hydrologic information, provides an assessment of water resource needs, identifies issues of concern, and makes recommendations regarding refuge water resources (FWS, 2012). The WRIA is a reconnaissance-level effort intended to inventory and assess water rights, water quantity, water quality, water management, climate, and other water resource issues for each refuge.

The IRPC is located within the Middle Iowa River Hydrologic Unit Code (0780208). Entering the IRCP at the upstream boundary, the drainage area is 1,896 square miles The mean annual discharge at this point is 1,034.3 cubic feet per second (ft^3/s) , varying from 381 ft^3/s to 1,890 ft^3/s (Littin & McVay, 2008). A brief evaluation of the flow lines available from the National Hydrologic Dataset within the acquired units indicated roughly 57 km of streams, rivers, or artificial flow paths. The Iowa River was approximately 11.3 km of this total. The new flood of record occurred in 2008.

Wetland identification and categorization for this area was completed using color infrared aerial photography from 2002 (1:40,000). The primary wetland types were identified from the National Wetlands Inventory (NWI) for the acquired units within the IRCP. The NWI uses the Cowardin et al. (1979) wetland classification system. The most common wetland types included: freshwater emergent (2,500 acres), freshwater forested or shrub (1,950 acres), freshwater pond (177 acres) and riverine (250 acres). The calculated acreage of wetlands (45 percent) was slightly higher than the acreage calculated from the 2006 National Land Cover Data (NLCD) (34 percent). These discrepancies are a function of the methods used to define the wetlands within the NWI versus the remote sensing methods used for the NLCD.

The University of Iowa Hygienic Laboratory monitored water quality and benthic macroinvertebrate community structure in 1996 and 1997 (Shueller, 1997). This monitoring indicated that the overall quality of the surface water in the Iowa River was fair to good. The U.S. Geological Survey (USGS) also monitored groundwater in the project area in 1996 and found detectable levels of some agricultural chemicals (USGS ,1996).

A water quality and biological assessment was performed by the USGS in 2006 and 2007. That assessment included three sites on the Iowa River. Results of that assessment indicated that nitrates exceeded the U.S. Environmental Protection Agency's (EPA) primary drinking water Maximum Contaminant Level of 10 mg/L; however, none of the samples analyzed for pesticides, trace metals, wastewater, or fuel contaminants were found to exceed drinking water regulations for the EPA or State of Iowa targeted constituents (Littin & McVay, 2008). The periphyton community was sampled to provide an indicator of nutrient enrichment or trophic condition. Results indicated that the surface water could be considered nutrient enriched. This would not be unexpected given the agricultural land use throughout the Iowa River Basin.

Peak flood recurrence intervals were received from the Iowa USGS water center for the Iowa River at Marengo. A 10-year return interval would be approximately 25,000 cubic feet per second (cfs) (gage height of approximately 19.16 feet.), which means that there is a one in ten chance of seeing flows equal or exceeding this discharge in any given year. Additional recurrence intervals, flood hydrographs and flood elevations are available in the WRIA (FWS, 2012) for site-specific planning.

Based on the National Oceanic and Atmospheric Administration (NOAA) National Weather Service site, flood stage is generally when the height of the gage exceeds approximately 14 feet (approximately 5,900 cfs). However, starting at 11 feet up to 16 feet, the river is primarily inundating only low-lying non-urban areas adjacent to the river. From 1975 to 2010, the river exceeded this flow (5,900 cfs) approximately nine percent, based on daily values, which suggest that some areas are inundated as much as 20 percent of the time during a typical growing season.

Flooding in the fee title Service tracts in the IRCP will tend to happen as soon as the Iowa River or tributaries begin topping the banks. Determining the regularity and extent of flooding is difficult for units that are within a flat floodplain. This difference between the Iowa River being within its banks and widespread inundation can have a relatively narrow range of several feet, due to the relatively large area of the floodplain. Therefore, there will not be a significant change in elevation of water surface between the different recurrence intervals. However, the gage information does not suggest that there is a long-term trend in increasing peak discharge, despite the relatively recent large flood events in 1993, 2008, and 2010. During these types of large events, flood peak elevations will increase by approximately 1.1 feet for every mile of the

Iowa River upstream from Marengo, Iowa. For example, adjacent to the town of Marengo, any point above 740 feet is unlikely to see flood inundation. Elevations between 740 and 738 will see extremely irregular flooding. Elevations below 738 will tend to see intermittent flooding (one out of every 10 to 20 years). This type of information can be roughly extrapolated upstream in lieu of a hydrologic flood inundation model to qualitatively understand flooding on the units.

3.6 Geology and Soils

The floodplain within the Iowa River Corridor is part of the Colo-Bremer-Nevin-Nodaway association. Slopes range from zero to two percent, and drainage ranges from very poorly drained to well drained soils. Much of the area is subject to frequent or occasional flooding and is also subject to sedimentation. Based on rough estimates, about 60 percent of the IRCP floodplain is comprised of hydric soils and soils with hydric inclusions (FWS, 2012). There are no known minable deposits of energy or mineral resources within the Iowa River Corridor area. Some riverine sand deposits may be economically recoverable.

3.7 Land Cover and Habitat

The Government Land Office survey data shows that historical vegetation in the 1800s within the IRCP consisted of about 67,775 acres of prairie, 52,048 acres of timber, and 2208 acres of scattering trees. Scattering trees are often interpreted as savanna habitat. The WRIA completed by the Service (2012) identified historic vegetation based on the soil survey geographic database (SSURGO). This analysis shows largely prairie with significant forest close to the river in the southeastern part of the IRCP. Historically, trees were largely confined to the riparian corridor, with a combination of mesic and hydric grasslands filled with temporary and seasonal wetlands (Benson et al., 2006). Historic vegetation within the BCA is estimated at 51 percent prairie and 39 percent forest. There likely was not the amount of early successional willow/cottonwood growth that occurs now.

Detailed and complete vegetation mapping for the IRCP is not currently available. The 2009 High Resolution Land Cover (HRLC) is the most current land cover information, but it did not include ground truthing and has its limitations for determining habitat types (figure E-2) (Iowa DNR, 2009). There are differences in quality of data across the State due to variability in Light Detection and Ranging (LiDAR) data. See the metadata for this data set for an explanation of each classification (Iowa DNR, 2009). The information below does not include all classifications, but only the ones of interest for determining habitat types relevant to the IRCP (tables E-4 and E-5). Percentages of habitat types of interest were calculated from the total land cover that included other cover types not discussed here. Therefore, the percentages shown may not equal 100 percent. Other cover types are crops, structures, roads, and no data.

In addition, the DNR recently completed cover mapping for most of the State WMAs with general cover classes (table E-4, figure E-3). More precise vegetation mapping would be needed to determine specific acres of vegetation or habitat classes. Therefore, the available data given below is used to give a coarse idea of land cover and habitat in the IRCP.

Figure E-2: 2009 High resolution land cover (Iowa DNR)

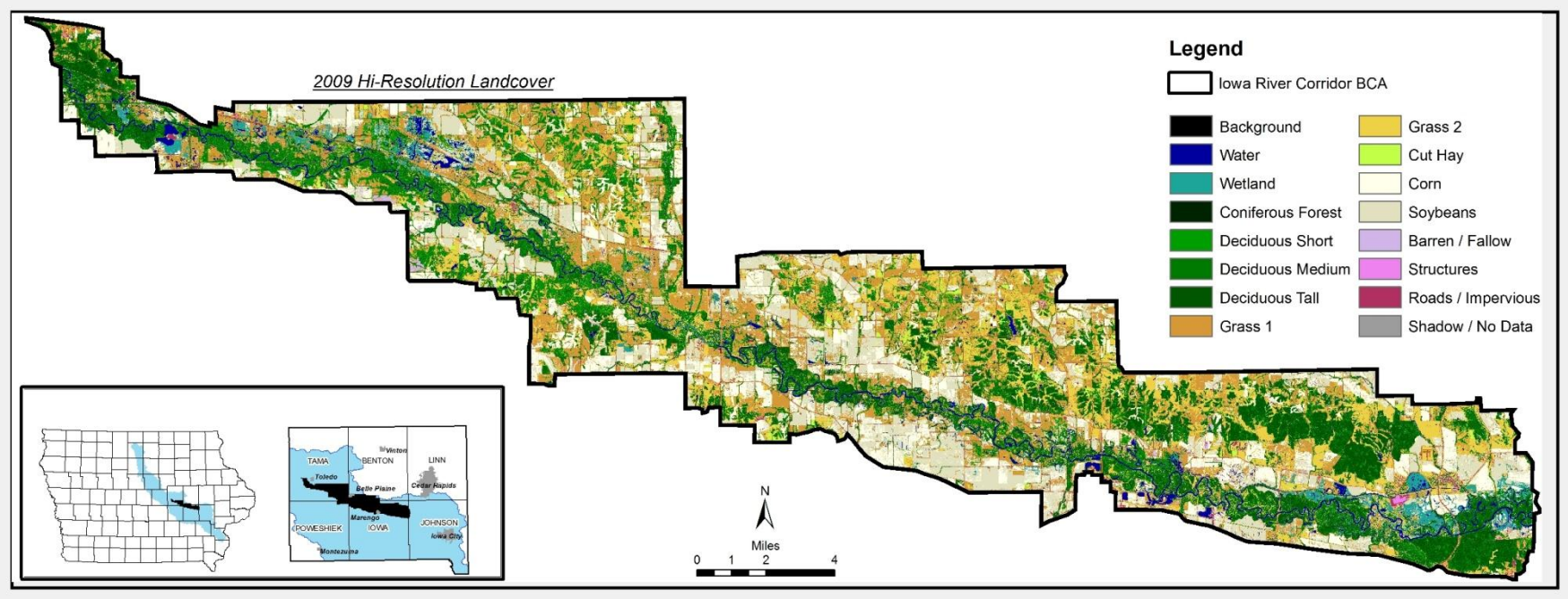
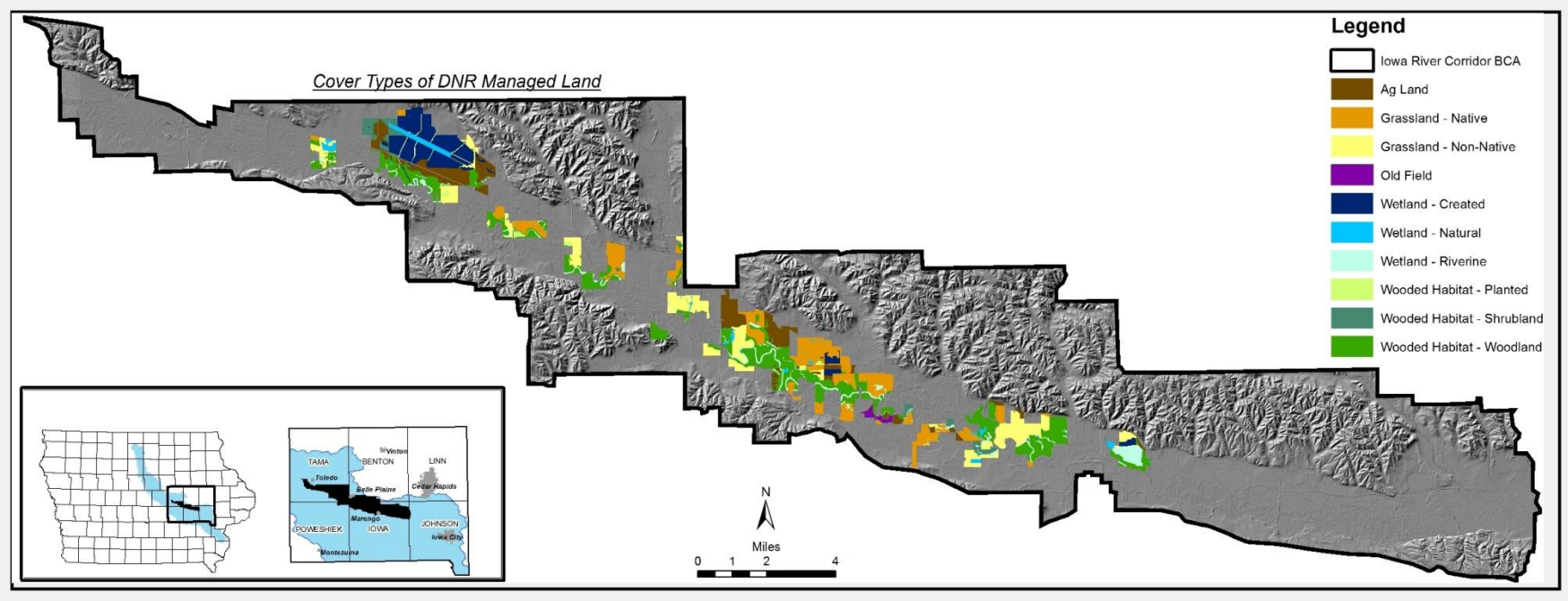


Figure E-3: Current land cover types on DNR and Service lands as determined by Iowa DNR staff, 2012



Based on the 2009 HRLC, the land cover within the IRCP acquisition boundary is approximately 10 percent wetlands, 17 percent forest, and 28 percent grassland (Iowa DNR) (table E-5). The HRLC did not differentiate native and non-native grass. The NWI shows a higher amount of wetlands on Service acquired lands in the IRCP likely due to classifying much of the floodplain as inundated seasonally or temporarily, depending on river levels. The NWI uses the Cowardin et al. (1979) wetland classification system. Those acres likely include much of the wetlands classified as forested and shrub wetlands. If some classes are removed to be more representative of temporary, semipermanent, and permanent wetlands in an average water level year, then there are about 2,685 acres of wetlands (29 percent) on Service lands in the IRCP. DNR cover typing measured created, natural, and riverine wetlands and recorded 981 acres.

Early successional habitat was derived from the 2009 HRLC deciduous short classification, which includes trees or shrubs less than 3.5 meters. The spatial extent of this class is a good estimation, but height classes were dependent on LiDAR data, and this may include other vegetation besides willow/cottonwood. This land cover layer only gives a rough estimate of areas that may have been in woody early successional habitat at the time of the photography. The DNR shrub class was strictly shrub lands and did not include willow early successional areas, and some early successional vegetation was captured in the wooded habitat category. Therefore, DNR cover typing was not used to estimate early successional habitat. For the purposes of determining objectives, numbers from the HRLC were used for early successional habitat.

Forest acres from the 2009 HRLC were determined from the deciduous medium and deciduous tall cover types, which included a variety of woodlands and forest types. There were 2,786 acres of forest on Service and DNR lands (table E-5). DNR cover typing showed 2,693 acres of forest on Service lands (table E-4). For the purposes of determining forest habitat objectives, numbers from the DNR cover types were used.

The 2009 HRLC shows 5,832 acres of grass on Service and DNR lands. Grassland is likely overestimated in the HRLC, because it includes road ditches, grassland/forest edges, lawns, and other features that might not be considered grassland in the habitat sense. DNR cover typing identified about 2,692 acres of native grass on Service lands and 2,313 acres of non-native grassland, which is predominantly RCG (table E-4). Therefore, there is about 27 percent native grass on refuge lands in the IRCP and about 19 percent on Service and DNR lands combined. For the purposes of developing grassland habitat objectives, numbers from the DNR cover types were used.

For comparison, cover types for the BCA are also given in table E-5 as determined from the 2009 HRLC (figure E-2). The entire BCA contains approximately six percent wetlands, 10 percent early successional habitat, 19 percent forest, and 34 percent grassland. There are an additional 1,135 acres of hay land identified in the BCA that may also be considered grassland. These percentages are similar to the Service/DNR IRCP lands; however, there is likely more native grass on the IRCP lands. The IRCP acres and BCA acres include lands in private ownership that also have cropland, pasture, residential areas and others. There are 18,964 acres of corn and soybeans in the IRCP and 37,152 acres of corn and soybeans in the BCA (Iowa DNR, 2009).

Land use and land cover in the entire Iowa-Cedar watershed is primarily agricultural with about 93 percent of the total area used for cropland or pasture (http://iowacedarbasin.org/). Land is largely privately owned in the watershed. The principal crops are corn, soybeans, hay, and oats.

The remaining land area consists of about four percent forests, about two percent urban, and about one percent water and wetlands (http://iowacedarbasin.org/). This land use greatly affects the hydrology and habitats within the IRCP.

Table E-4: Land cover types within the IRCP from different classification systems

DNR cover typing distinguished between native and non-native grassland, but HRLC did not. Percentage is taken from the entire acres of all cover classes that are not all shown here; therefore, percentages in the table do not add up to 100 percent.

	Wetland/water acres (percent)	Shrub/woody early successional acres (percent)	Forest acres (percent)	Grassland acres (percent)
High Resolution land cover class FWS/DNR lands	1,648 (11)	2,253 (15)	2,786 (18)	5,832 (38) all types
DNR cover typing DNR and FWS lands	2,914 (21)	Not classified	3,884 (27)	2,692 (19) native 2,313 (16) non-native
DNR cover typing FWS lands only	981 (10)	Not classified	2,693 (28)	2,588 (27) native 2,050 (22) non-native
NWI	2,685 (29)	NA	NA	NA

Table E-5: Acres and percentage of selected land cover types within fee title lands, IRCP boundary, and BCA

Percentage is taken from the entire acres of all cover classes that are not all shown here; therefore, percentages in the table do not add up to 100 percent.

High Resolution land cover class	FWS/DNR fee title lands acres (percent)	IRCP Acquisition Boundary acres (percent)	BCA acres (percent)
Water/wetland	1,648 (11)	6,444 (10)	7,906 (6)
Early successional (deciduous short trees)	2,253 (15)	7,229 (12)	14,533 (10)
Forest (deciduous medium/tall trees)	2,786 (18)	10,699 (17)	26,980 (19)
Grass (both native and non-native)	5,832 (38)	17,448 (28)	47,508 (34)

Most of the forest is located in a band along the Iowa River near washes and oxbows. Much of the forested area consists of tracts of former crop and pastureland, which is now dominated by silver maples, with cottonwood as a minor species. Silver maples have diameters up to 30 cm and seem to be arranged in age classes. A few small burr oak groves, remnants perhaps of the "groves" reported in pre-settlement times, remain throughout the IRCP. The flood of 1993 caused immense damage to mast producing hardwoods, such as the oaks and walnuts. In 1994, following the flood of 1993, timber harvesting was active in the Iowa River Corridor to recover any marketable wood. A Forest Wildlife Habitat Plan was completed in 2011 for the northwest unit of the IRCP that includes forest inventory information and goals. Current

management includes some timber stand improvement and tree planting with maintenance of new tree plantings. Additional forest inventory is needed.

Much of the native grassland was planted in the first ten years after acquisition. Initial seed mixes did not include a high number of species, and forbs were sometimes excluded to allow chemical control of weeds during establishment. Consequently, many of the native grasslands are predominantly warm season grasses. Restoration is still occurring with more diverse seed mixes and there is more potential for grassland restoration. Efforts are being made to find native species more tolerant to flooding. Additional acres have been planted in the last few years. Current management includes prescribed fire and mowing to reduce encroaching woody vegetation and promote diversity.

Some wetlands were restored with dikes and water control structures, and many are natural floodplain wetlands restored with ditch plugs. Water levels naturally fluctuate with river levels. Some wetland basins contain encroaching willows or other woody vegetation. Submergent and emergent wetland vegetation is typical of the area.

Most years, about 200 acres, or two percent of refuge lands, have been put in food plots by the Iowa DNR. Crop production methods may be used to control weeds and prepare lands for restoration to native grasslands but also to provide supplemental food for both migrating and resident wildlife. Restoration of grassland and forest habitat has met with limited success on the lowest elevations of the corridor lands where invasive RCG dominates. Subsequently, native foods are not as abundant as desired.

3.8 Fish and Wildlife

Otters are common on the Iowa River

The fisheries resource is primarily restricted to the river and a few shallow oxbow ponds. The Iowa River in the IRCP is one of the more productive portions of this river due to the absence of channelization. Channel and flathead catfish are the dominant game fish in this section of the river. Northern pike, walleye, saugeye (a walleye/sauger hybrid), white and black crappie, white bass, and black bullhead are species of moderate abundance. Bluegill, yellow bass, and largemouth and smallmouth bass are not as common. Non-game species are dominated by common carp, bigmouth and smallmouth buffalo, river carpsucker, gizzard shad, brassy minnow, bluntnose minnow, suckermouth minnow, spotfin, common shiner, and creek and silver chub. Other species include yellow bullhead, wiper, green sunfish, orangespotted sunfish, freshwater drum, white amur, quillback carpsucker, highfin carpsucker, shorthead redhorse, golden redhorse, white sucker, common shiner, spotfin shiner, river shiner, sand shiner, bigmouth shiner, fathead minnow, creek chub, silver chub, central stoneroller, and johnny darter. The river also contains mussel species common to Iowa's interior rivers.

The Iowa River floodplain wetlands, grasslands, and woodlands provide an important interior corridor for migrating birds. There are 268 bird species within the Iowa River Corridor BCA. Fifty-eight of these birds are identified as nesting SGCN and 16 as migratory SGCN. Mammals include white-tailed deer, red fox, coyotes, raccoons, beavers, mink, river otter, bobcat, squirrels, cottontail rabbits, opossum, skunks, weasels, bats, and other small rodents. SGCN mammals include the federally endangered Indiana bat. There are two active heronries in the IRCP with a Great-Blue Heron one in Tama County, and an Egret one in Iowa County. Additional SGCN species include six reptiles and amphibians, 12 odonates, and 13 butterflies.

3.9 Rare, Endangered, or Unique Plant and Animal Species

The project area may support the following federally listed species: Indiana bat, fat pocketbook mussel, prairie bush-clover, eastern prairie fringed orchid and western prairie fringed orchid; however, there are no known populations of these species in the IRCP, except for a recent Indiana bat location in Tama County that was not on refuge lands. In 1986, the Iowa DNR released 20 river otters on the Iowa River at Chelsea. Since that time, otters have moved up and down the river and are now common. In 1992, the first successful nesting of Sandhill Cranes in Iowa since the early 1900s occurred at Otter Creek Marsh. Sandhill Cranes have successfully reared young every year since.

Refuge lands lie in Tama, Benton, and Iowa Counties in Iowa, and occurrences of federally listed threatened or endangered species and their habitats in these counties were reviewed. There is a recent occurrence of the Indiana bat in Tama county. The endangered Indiana bat (*Myotis sodalis*) is considered to potentially occur in any area of the refuge with forested habitat.

Indiana bats migrate seasonally between winter hibernacula and summer roosting habitats. Winter hibernacula include caves and abandoned mines. Females form nursery colonies under the loose bark of trees (dead or alive) and/or cavities, where each female gives birth to a single young in June or early July. A single colony may utilize a number of roost trees during the summer, typically a primary roost tree and several alternates. The species or size of tree does not appear to influence whether Indiana bats utilize a tree for roosting provided the appropriate bark structure is present.

During the summer, the Indiana bat frequents the corridors of small streams with riparian woods as well as mature upland forests. It forages for insects along stream corridors, within the canopy of floodplain and upland forests, over clearings with early successional vegetation (old fields), along the borders of croplands, along wooded fencerows, over farm ponds, and in pastures.

Suitable summer habitat in Iowa is considered to have the following characteristics within a one-half mile radius of a project site:

- forest cover of 15 percent or greater;
- permanent water;
- one or more of the following tree species: shagbark and shellbark hickory that may be dead or alive; and dead bitternut hickory, American elm, slippery elm, eastern cottonwood, silver maple, white oak, red oak, post oak, and shingle oak with slabs or plates of loose bark;

- potential roost trees with 10 percent or more peeling or loose bark

The prairie bush clover (*Lespedeza leptostachya*) is listed as threatened and considered to potentially occur statewide in Iowa based on historical records and habitat distribution, although there is no record of occurrences in IRCP counties. It occupies dry to mesic prairies with gravelly soil. There is no critical habitat designated for this species. This species should be searched for whenever prairie remnants are encountered. No native prairie remnants are present on the IRCP.

The western prairie fringed orchid (*Platanthera praeclara*) is listed as threatened and considered to potentially occur statewide in Iowa based on historical records and habitat distribution, although we have no record of occurrences in IRCP counties. It occupies wet to mesic grassland habitats. There is no critical habitat designated for this species. This species should be searched for whenever wet prairie remnants are encountered. No native prairie remnants are present on the IRCP.

The eastern prairie fringed orchid (*Platanthera leucophaea*) is listed as threatened for IRCP counties in Iowa. It occupies wet grassland habitats. There is no critical habitat designated for this species. This species should be searched for whenever wet prairie remnants are encountered. There are no native wet prairie remnants on the IRCP.

The endangered fat pocketbook mussel prefers sand, mud, and fine gravel bottoms of large rivers. It buries itself in these substrates in water ranging in depth from a few inches to eight feet, with only the edge of its shell and its feeding siphons exposed. This mussel is not currently known to occur in Iowa.

The endangered Higgins eye pearlymussel (*Lampsilis higginsii*) is listed for the Mississippi River north of Lock and Dam 20 and does occur in some lower stretches of the Iowa River, but has not been found in the IRCP section of the river. This mussel has been reintroduced to some sections of the Iowa River downstream of the IRCP. This species prefers sand/gravel substrates with a swift current and is most often found in the main channel border or an open, flowing side channel.

The project lies within the range of the eastern massasauga (*Sistrurus c. catenatus*), a docile rattlesnake that is declining throughout its national range and is currently a federal candidate species. The snake is currently listed as endangered by the State of Iowa. The massasauga is often found in or near wet areas, including wetlands, wet prairie, or nearby woodland or shrub edge habitat. This often includes dry goldenrod meadows with a mosaic of early successional woody species such as dogwood or multiflora rose. Wet habitat and nearby dry edges are utilized by the snakes, especially during the spring and fall. Dry upland areas up to 1.5 miles away are utilized during the summer, if available. Although there is potential habitat for massasaugas on the refuge, there are no known records.

The project lies within the range of the freshwater sheepnose mussel (*Plethobasus cyphyus)* that is declining throughout its national range and is currently a federal candidate species. Significant declines relative to its historical distribution, its small isolated remaining populations, and habitat loss and degradation continue to threaten this species . This species is currently going through the listing process and may be included in the list of threatened and endangered species in the near future.

The sheepnose mussel is primarily a larger-stream species occurring mainly in shallow shoal habitats with moderate to swift currents over coarse sand and gravel but includes mud, cobble, and boulders as well. Its habitat includes larger rivers with deep runs, while mussel specimens found in streams occur mainly in stable flow areas with little sediment turbidity. There is no known mussel habitat for this species in the project area.

The federal candidate spectaclecase mussel (*Cumberlandia monodonta*) is primarily a large river species occurring most often in riverine microhabitats sheltered from main currents. Substrates include mud to boulders in shallow riffles and shoals with slow to swift currents. Occurrences tend to be aggregated, especially under slabs and bedrock shelves protected from the current. The spectaclecase mussel seldom moves, and when found in streams, occurs mainly in flow refuges with little sediment turbidity. This species is currently going through the listing process and may be included in the list of threatened and endangered species in the near future.

3.10 Threats to Natural Resources

Agriculture is the primary land use and leading economic activity in IRCP counties. More natural areas have been converted to cropland in these counties than to any other cover type. Refuge resources can be adversely affected by the application of pesticides, herbicides, and fertilizers on neighboring and upstream lands. Some agricultural practices may lead to increased erosion, sedimentation, and eutrophication in the watershed and refuge wetlands. A contaminant assessment was completed in 2012 (FWS, 2012) that investigated potential contaminant sources and inputs in the vicinity of refuge lands. There are no impaired water listings within the IRCP. There are many unregulated drainage ditches and waterways that have the potential to release nitrates, dissolved phosphates, and pesticides into refuge waters or tributaries. These inputs can contribute to poor water quality and algal blooms. There is also the potential for pesticide drift from nearby agricultural fields.

Other threats to resources posed by agriculture include animal confinements that pose threats from undesirable nutrient levels, wastes, and contaminants in surface waters. Tiling and channelizing waterways for agriculture threatens the natural function of the Iowa River floodplain and associated wetlands by affecting the amount of drainage and water entering the river and floodplain. Land use and the potential for more extreme weather events creates increased likelihood of flooding. Although floods are part of the natural cycle of the river and have benefits to the floodplain ecosystem, changes in the extremes of inundation stages, frequency, and duration may affect water quality, vegetation, and habitat management.

RCG is the primary invasive species of concern and is an aggressive invasive species that competes with and displaces native vegetation. This species can reduce the quality of habitat for grassland and wetland-dependent wildlife species. It forms dense monotypic stands that birds will seldom use for nesting or other parts of their life cycle. It does provide some cover for mammals and other wildlife, but is less preferred than less dense vegetation. Routine monitoring is needed to understand and prevent the spread of this and other invasive species on the refuge.

3.11 Archeological and Cultural Resources

No national historic landmarks are located within the IRCP boundaries. The Iowa Historic Preservation Officer has identified 76 know archaeological sites within the floodplain of the Iowa River. A few of these sites occur within the boundary of the IRCP.

Cultural resources (e.g., archaeological sites, historic structures, and Native American traditional cultural properties) are important parts of the Nation's heritage. The Service strives to preserve evidence of these human occupations, which can provide valuable information regarding not only human interactions with each other but also with the natural environment. Protection of cultural resources is accomplished in conjunction with the Service's mandate to protect fish, wildlife, and plant resources.

The Service is charged with the responsibility, under Section 106 of the National Historic Preservation Act of 1966, of identifying historic properties (cultural resources that are eligible for listing on the National Register of Historic Places) that may be affected by our undertakings. An undertaking is defined as an action funded in whole or in part under the direct or indirect jurisdiction of the Service, including those carried out by or on behalf of the Service; those carried out with federal financial assistance; and those requiring a federal permit, license, or approval.

The Service is required to consult with the State Historic Preservation Office, Native American tribal governments, local governments, and other interested parties on those undertakings that have the potential to cause an effect on a historic property. Cultural resource 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 archaeological permits, and for Indian tribal consultation. As the federal agency official, the regional director makes determinations of eligibility and findings of effect. The Regional Historic Preservation Officer (RHPO) advises the regional director about procedures, compliance, and implementation of these and other cultural resource laws.

The Archaeological Resources Protection Act of 1979 (ARPA) Section 14 requires plans to survey lands and a schedule for surveying lands with "the most scientifically valuable archaeological resources." This act also affords protection to all archaeological and historic sites more than 100 years old (not just sites meeting the criteria for the National Register) on federal land, and requires archaeological investigations on federal land be performed in the public interest by qualified persons.

The responsibility of the refuge manager is to identify undertakings that could affect historic properties and coordinate the subsequent review process as early as possible with the RHPO and state, tribal, and local officials. The refuge manager is ultimately responsible that the Section 106 process is completed for each undertaking under their control. Also, the refuge manager assists the RHPO by protecting archaeological sites and historic properties on Service managed and administered lands by monitoring archaeological investigations by contractors and permittees and by reporting ARPA violations.

3.12 Visitor Services

The IRCP provides ample area for wildlife-dependent recreation such as hunting, fishing, birdwatching, and wildlife interpretation and education. Other activities that may be appropriate

and compatible as a means of engaging in wildlife-dependent recreation include canoeing and hiking. Wildlife is abundant and those who are willing to hike through tall prairie vegetation and wade the river banks will be rewarded with a quality nature experience. The DNR and Service lands are not developed and therefore attract users that prefer more primitive conditions. Hunting and fishing are the most prevalent uses with bird watchers also common. A bird list for the BCA has been developed.

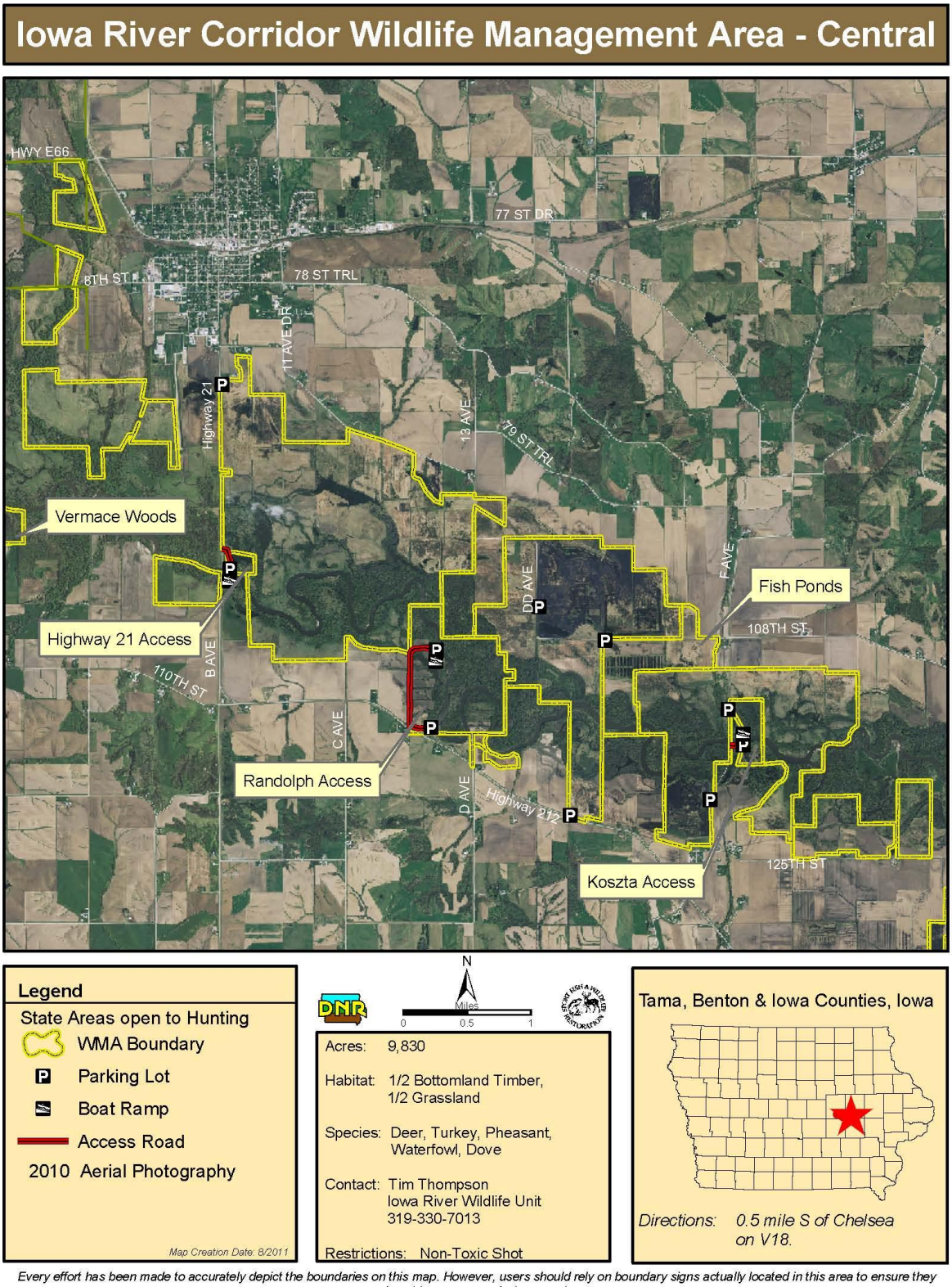
Facilities include one observation deck, parking lots, boat ramps, and mowed service roads or fire breaks that serve as trails, although they are not formally designated as such. There are currently 19 parking areas providing access to most of the IRCP between Marengo and Chelsea. These areas are considered designated access areas based on road conditions, the ability to maintain them, and boundaries. Boat ramps are available on adjacent DNR lands. Accessible locations include areas known as: Big Bend, Burr Oak, Simmons Timber Cottonwood Banks, Fish Ponds, Koszta Access, Randolph Access, Highway 21 Access, and unnamed areas south and southeast of Chelsea (figures E-4, E-5, and E-6). Primitive camping is allowed on state WMAs, but is not allowed on federal refuge lands or easements. Motorized vehicles are prohibited. Law enforcement is provided by the DNR conservation officers for those counties as well as a Service refuge officer located at Neal Smith NWR. The point of contact for visitors is the DNR's Otter Creek Wildlife Unit office near Chelsea, Iowa.

The IRCP is managed jointly with the provisions of the National Wildlife Refuge System Administration Act, Code of Federal Regulations (CFR) and the provisions of the Iowa code for WMAs. The MOU states that public use objectives will be consistent with those authorized in 50 CFR and Refuge System guidelines. Uses are to be wildlife-dependent activities in the areas of hunting, fishing, wildlife observation, photography, wildlife and habitat interpretation, and environmental education, unless otherwise approved.

Facilities include one observation deck

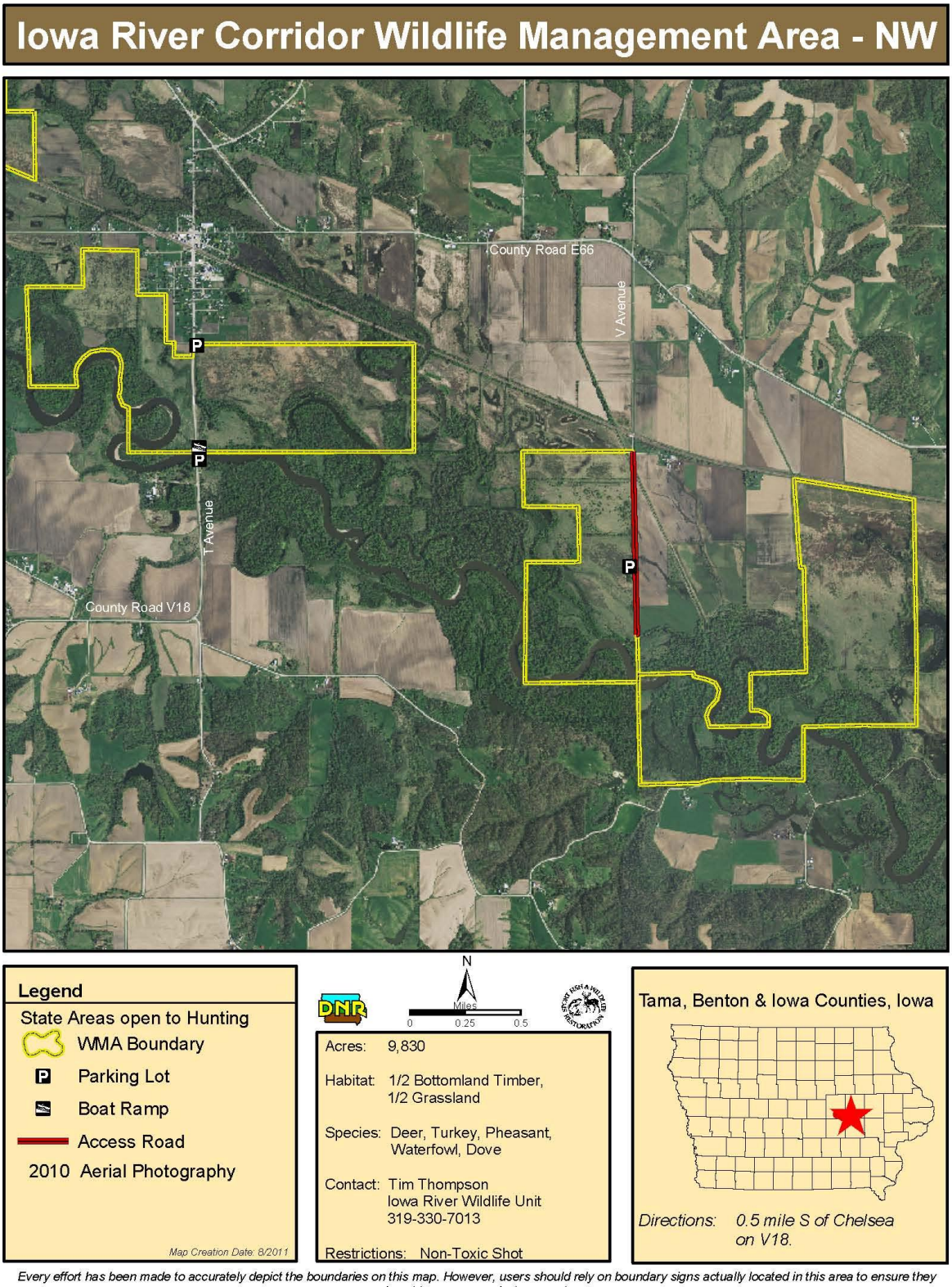
Facilities such as parking lots, interpretive signs, and hiking trails are appropriate where compatible. Uses such as horseback riding, ATV use, snowmobiles, and camping are not wildlife-dependent and are generally incompatible activities. Public uses allowed on refuge lands are determined by the compatibility standards under the National Wildlife Refuge System Improvement Act of 1997. The primary objective on state WMAs is developing and restoring wildlife habitat for breeding, resting, and feeding. Wildlife dependent recreational activities such as those listed above are allowed. Hunting, fishing, and educational activities are allowed on USDA easements, which overlay DNR and Service lands.

Figure E-4: Iowa River Corridor public access facilities and locations



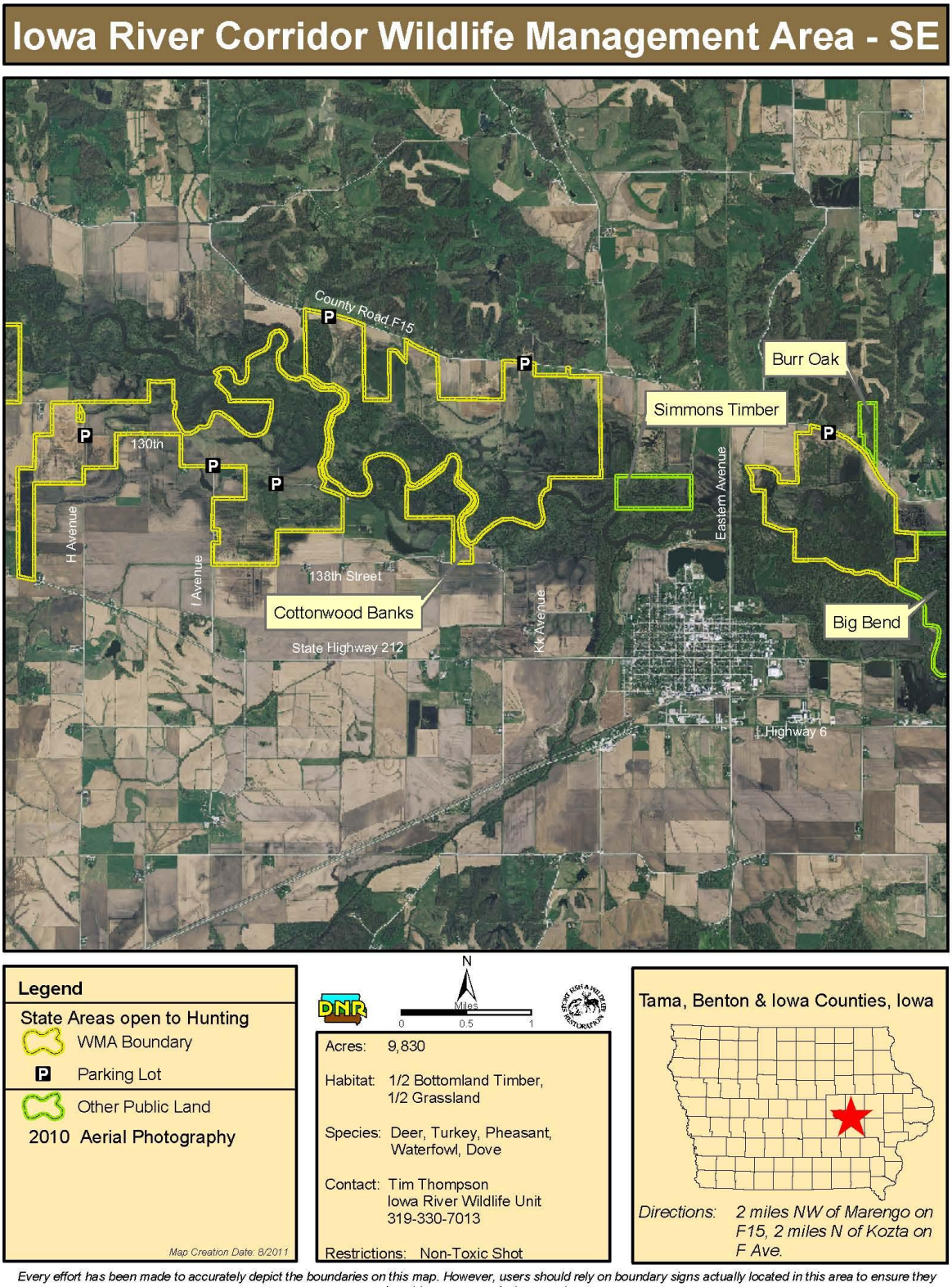
Every effort has been made to accurately depict the boundaries on this map. However, users should rely on boundary signs actually located in this area to ensure they do not trespass on private property.

Figure E-5: Iowa River Corridor public access facilities and locations



Every effort has been made to accurately depict the boundaries on this map. However, users should rely on boundary signs actually located in this area to ensure they do not trespass on private property.

Figure E-6: Iowa River Corridor public access facilities and locations



Every effort has been made to accurately depict the boundaries on this map. However, users should rely on boundary signs actually located in this area to ensure they do not trespass on private property.

Chapter 4: Environmental Consequences

This chapter describes the foreseeable environmental consequences of implementing the management alternatives identified in chapter 2 of this EA.

4.1 Effects Common to all Alternatives

4.1.1 Fire

All alternatives call for an active prescribed burning program to control habitat succession and mimic the historic fire regimes on which many of the refuge species and habitats depend. Fires are beneficial in controlling invasive and exotic species from taking over native plant communities, and they help prevent woody encroachment in grasslands and wetlands. Additionally, fire disturbance creates colonization sites for native prairie plants to take root and creates favorable conditions for growth. Prescribed fires also reduce fuel buildup thereby reducing the potential for wildfires, and reducing the intensity of any wildfires that may occur. Historically, the IRCP grasslands likely burned on the higher elevations where conditions were typically dry enough. Most of the prairie species planted in the IRCP are adapted to fire, and in fact, respond positively to fire.

Prescribed fire on refuge lands is closely controlled according to Service policies with specific burn unit plans, trained personnel, and appropriate personal protective and suppression equipment. A Fire Management Plan was completed for Port Louisa NWR in 2007 that describes wildfire and prescribed fire management including IRCP lands (FWS, 2007). The Service and DNR have been conducting prescribed burns on an average of 2,000 acres per year on refuge lands in the IRCP.

The prescribed burning program will have a visible short-term and direct impact on vegetation and the land. Immediately after a fire much of the land will be blackened. There will be few grasses or understory forbs remaining and most of the brush will be scorched. Trees may be scorched and scarred thereafter. Because of wet ground conditions or patchy fuels, there are often areas within the burn unit that are untouched by fire, resulting in a patchy, mosaic burn that leaves some vegetation.

Prescribed fire on refuge lands is closely controlled

Units are generally burned on a rotation once every three to four years to give sufficient recovery time for existing plant communities and time for new plants to establish. However, due to unpredictable flooding and rapid growth of willow during wet years, some areas are burned in consecutive years to take advantage of drier conditions that will lead to desired fire effects. After a spring burn, native grasses and forbs will begin to grow within a few days. The enriched soil will promote rapid growth such that after two or three weeks the ground will be covered with fresh sprouts of green

vegetation. Some of the less fire resistant trees will show signs of wilting and may succumb. After one season of regrowth, most signs of prescribed burning will be difficult to detect without close examination, except for tree scarring. Other signs of the burn will remain for longer periods. For instance, firebreaks will be maintained for use in containing wildland fires and future prescribed burns, and vehicle tracks through the burn area may remain if the vehicle created ruts in the ground. Travel across the burn area will be kept to a minimum where possible.

The effect of fires on soil is dependent largely on fire intensity and duration. In areas with high fuel loads, a slow backing fire is usually required for containment and to achieve the desired burn results. The intense heats generated by a slow backing fire will have a greater effect on the soils than fast, cooler head fires. The cool, moist soils of wetter areas in the burn units or areas with little fuel will be minimally affected by the fire. The degree of impact to the soil is a function of the thickness and composition of the organic mantle. In cases where only the top layer of the mantle is scorched or burned, there will be no effect on the soil. Minimal effects usually occur in the forested areas with leaf litter. On open grassland sites, the blackening of the relatively thin mantle will cause greater heat absorption and retention from the sun. This will encourage earlier germination during the spring growing season.

Nutrient release occurs as a result of burning as well as from the normal decomposition process, but fire will accelerate nutrient release. The rate and amount of nutrients released will be dependent on the fire duration and intensity as well as the amount of humus, duff, and other organic materials present in the mantle. The increase, immediately after a burn, of calcium, potash, phosphoric acid, and other minerals will give the residual and emergent vegetation a short-term boost. There is no evidence to show that the direct heating of soil by a fire of low intensity has any adverse effect.

The majority of the prescribed fires will take place in early spring prior to the hatching and birthing periods for most species (i.e., deer fawns, song bird broods, etc.) and in late fall when the young animals have matured enough to avoid the fire. Prior to European settlement and wildfire suppression, fires played a major role in shaping the historic landscapes of the region and the refuge's native plant and animal communities. Animals and plants associated with these fire dependent habitat types have evolved with fire and through time, developed adaptations to endure fire's effects. The immediate impact of fire on animals is generally less severe, as both vertebrates and invertebrates have shown to be fairly successful at avoiding fire. Many small mammal species, amphibians, reptiles, and invertebrates will survive burns by retreating into underground burrows or by going underwater until the burn passes through. Healthy large mammals and birds have the ability to escape. During spring burns some birds may lose their nests, but if the prescribed burn is early enough in the breeding season the majority of these animals will re-nest. Also, prescribed fires tend to burn in a mosaic fashion leaving some areas unburned and providing refugia for less mobile wildlife species. Prescribed burns on the IRCP units are rotated and separated such that there are not large contiguous areas burned, which leaves large areas of habitat unburned. The majority of individual burns are 25 to 200 acres with occasional larger burns up to 500 or 1,000 acres. Changes in the plant community following a fire have long-term benefits on the animal communities that inhabit these ecosystems.

The long-term survival of wildlife species depends on the health of the plant community, which is enhanced by intermittent prescribed burns in a fire-dependent ecosystem. Fire programs also create a diverse mosaic of habitat conditions that support a wide array of native wildlife species. These prescribed burns may result in the mortality of some individuals but will benefit the species at the population level by creating and maintaining highly productive habitat.

Prescribed burning on the refuge will benefit the public by improving some recreational opportunities. For example, the improved habitat conditions created by fire will increase food resources for native wildlife populations and improve visibility and access by suppressing woody encroachment and reducing shrub abundance in open landscapes. Also, visitor safety is enhanced by controlled burning. If a wildland fire occurs on or near the refuge, previously burned areas on the refuge and existing fire-breaks will help suppress these wildfires. Smoke from a refuge fire could impair visibility on roads and become a hazard. All efforts will be made during prescribed burning activities to assure that smoke does not impact smoke sensitive areas such as roads and local residences. The impacts of smoke can be reduced through management actions including the use of traffic controls and signage, altering ignition techniques and sequence, halting ignition, or even suppression as needed. Burning activities will only be conducted when the prerequisite weather conditions are met and refuge staff are able to prevent heavy smoke concentrations from occurring in nearby communities.

Prescribed fire operations may temporarily impact air quality, but the impacts are mitigated by selecting the appropriate prescription window, limiting burn unit size, monitoring wind direction, and gauging the distance from nearby population centers. In the event of wind direction change, mitigation measures will be taken to assure public safety and comfort. Refuge staff will work with partner agencies and state air quality personnel to address smoke issues that require additional mitigation. In addition, the Fire Management Plan (FWS, 2007) describes specific measures to deal with smoke management problems. Each burn unit plan also has contingency plans for smoke management.

Public concern will be reduced through a concerted effort by refuge staff to inform local citizens about the prescribed burning program, the benefits of fire to wildlife, and the safety precautions taken during all refuge burns. Interpretive programs explaining the prescribed burning program will also be a component of refuge outreach and education. It is possible that a prescribed fire may escape a planned burn zone and into a neighboring area. An escape can be caused by factors that may or may not be preventable. Inadequate firebreaks, too few personnel, unpredicted changes in weather conditions, peculiar fuel types, and insufficient knowledge of fire behavior are factors that can lead to a loss of control. An escaped fire can turn into a very serious situation, where buildings, equipment, and people’s lives could be endangered. A wildfire on the refuge would be less harmful than one on private lands. Extreme care, careful planning, and adherence to the burn unit prescription will occur as all prescribed burns are conducted. Additional precautions will be taken when burn areas are near developed areas, private property, and/or a refuge boundary.

In the event that a prescribed fire does jump a firebreak and burn into unplanned areas, there is a high probability of rapid control with minimal adverse impacts. In general, prescribed burns will have light fuel loads (0.25 to 3 tons of fuel per acre), will be burned under low fuel moisture conditions, and burned under specific climatic conditions. The network of firebreaks and roads will greatly assist in rapid containment of escaped prescribed burns or in the event of a wildfire. All nearby water sources and escape routes will be documented, and in most cases, refuge and DNR firefighting equipment will be immediately available at the scene. The local fire departments will always be notified of prescribed burns. Thus, maximum numbers of experienced personnel and equipment are immediately available for wildfire suppression activities.

4.1.2 Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," was signed by President Bill Clinton on February 11, 1994. This executive order focuses federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The executive order directs federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The executive order is also intended to promote non-discrimination in federal programs substantially affecting human health and the environment and to provide minority and low-income communities with access to public information and participation in matters relating to human health or the environment.

This EA has not identified any adverse or beneficial effects for any of the alternatives unique to minority or low-income populations in the affected area. The alternatives will not disproportionately place any adverse environmental, economic, social, nor health impacts on minority or low-income populations.

4.1.3 Climate Change

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 efforts. Several impacts of climate change on natural systems, habitat, and wildlife have been identified that may need to be considered and addressed in the future. The following are examples of these predicted impacts relevant to east central Iowa:

- The upward trend in precipitation and average temperature is expected to continue. Precipitation seasonality has changed as well with increased precipitation coming in the first half of the year, leading to wetter springs and drier autumns (Takle, 2009). Increased precipitation in turn results in higher seasonal streamflow, flooding, and nutrient runoff.
- Plant and animal communities may change as species' ranges shift northward with less adaptable species becoming threatened by the changing conditions and by competition for resources (water, food, shelter and space) from other more tolerable species.
- Animal and insect species historically found farther south may colonize new areas to the north as winter climatic conditions become more moderate.
- Plant species that are most tolerant to variable environmental conditions and are often invasive in nature (sometimes exotic), will likely outcompete native plants for resources.
- Water birds and waterfowl could lose breeding habitat due to more extreme and frequent droughts that change wetland and grassland conditions.
- Changes in the timing of migration and nesting may result in potential conflict with the natural life cycles of food plants or prey species.

Managers and resource specialists on the IRCP need to be aware of the possible changes associated with climate change. When feasible, documentation of long-term vegetation,

species, and hydrologic changes should become a part of research and monitoring programs on the IRCP. Adjustments in IRCP management direction may be necessary over time to adapt to changes in climate. The following points are excerpted from the 2013 NOAA Technical Report NESDIS 142-3 *Regional Climate Trends and Scenarios for the U.S. National Climate Assessment, Part 3. Climate of the Midwest U.S*.:

- Seasonal temperature trends indicate warmer winters and springs, with no overall trends in summer or fall.
- The overall annual trend in precipitation is upward and statistically significant.

The following 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 U.S. 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 four degrees Fahrenheit (two degrees Celsius), while the southern portion, along the Ohio River Valley has cooled by about one degree Fahrenheit (0.5 degree Celsius). Annual precipitation has increased up to 20 percent in some areas, with much of this coming from more heavy precipitation events (NAST, 2000).

Scenarios of Future Climate

During the 21st century, it is highly likely that temperatures will increase throughout the region, likely at a rate faster than that observed in the 20th century, with models projecting a warming trend of five to 10 degrees Fahrenheit (three degrees to six degrees Celsius) over 100 years. Precipitation is likely to continue its upward trend, with 10 to 30 percent increases across much of the region. Increases in the frequency and intensity of heavy precipitation events are likely to continue in the 21st century. Despite the increase in precipitation, rising air temperatures 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 many areas (NAST, 2000).

Midwest Issues related to Climate Change

Water Resources

Floodplain habitats reflect the effects of seasonal flows within their tributaries and primary stream. The Iowa River through the IRCP drains a highly agricultural landscape. Thirty-nine percent of Iowa's crop ground has been tiled to improve soil conditions during the growing season (Baker et al, 2004 in Singh et al., 2009). Regional climatic models predict an increase of 24 to 32 percent in the average annual precipitation and warming by 2.3 to 2.7 degrees Celsius in the vicinity of Perry, Iowa in the decade of the 2040s (Singh et al., 2009). Takle et al. (2009, 2011) reported that a 21 percent change in precipitation would result in a 50 percent increase in streamflow in the Mississippi Basin. These studies suggest that floodplain habitats will be subject to greater annual variability in discharge and associated overbank flooding.

Adaptations: Increases in flood frequency may require adaptations such as re-engineering of boat ramps and parking areas for IRCP visitors. Vegetation patterns may be altered, stressing native species, particularly trees, and increasing potential for invasive non-native species to expand. The frequency of management actions such as prescribed fire will be impacted by flood frequency, timing, and duration such that those actions may need to occur during non-traditional times of year such as fall. Improved forecasting of extreme precipitation events could help reduce some related impacts.

Agriculture

Agriculture is of vital importance to this region, the Nation, and the world. Agricultural systems have exhibited a capacity to adapt to moderate differences in growing season climate, and it is likely that agriculture will 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 in a single year after the first is harvested) is likely to become more prevalent. The fertilization effects of carbon dioxide are 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. Consumers may pay lower prices due to increased yields, while producers are likely to suffer reduced profits because of declining prices. Increased use of pesticides and herbicides are very likely to be required, presenting additional challenges. With agriculture as the major economic activity in Iowa, and affecting lands within and adjacent to the IRCP, many of these effects could have direct implications on land protection and water quality on the IRCP.

Adaptations: Plant breeding programs can use climate prediction models to direct research to breeding new varieties for new growing conditions. Farmers can then choose varieties better suited to the expected climate. It is likely that plant breeders will need to use all tools available in adapting to climate change, including genetic engineering. Modifying planting and harvest dates, planting densities, and using integrated pest management, conservation tillage, and new farm technologies are additional options. There may be opportunities to shift or expand 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 would help farmers adjust their practices from year-to-year to respond to such events.

Changes in Semi-natural and Natural Ecosystems

Forests: Different U.S. forest types are expected to expand (oak-hickory), contract (maple-beech-birch), or disappear altogether (spruce-fir) (Ryan et al., 2008). The Upper Midwest has a unique combination of soil and climate conditions that favor the growth of conifer forests. 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, not to mention increased competition from other land use pressures. However, warmer weather (coupled with beneficial effects of increased carbon dioxide on vegetation) is 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 reduce soil moisture, a situation conducive to forest fires. Increased temperatures

and longer growing seasons may also speed up decomposition rates and nutrient cycling, depending on water availability. As the 21st century progresses, there will be an increased likelihood and intensity of environmental stress on both deciduous and coniferous trees, making them susceptible to disease, pest infestation, and ultimately, mortality.

Aquatic Habitats: As precipitation increases, runoff of excess nutrients (such as nitrogen and phosphorus from fertilizer) into lakes and rivers is likely to increase due to an increase in heavy precipitation events. This, coupled with warmer lake temperatures, is likely to stimulate the growth of algae, depleting dissolved oxygen content in the water to the detriment of other living organisms. Reduced lake levels will likely impact the current distribution of wetlands. There is a chance that some wetlands could migrate gradually over time, but in areas where their migration is limited by the topography or anthropogenic land change, 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. As a predominantly floodplain system, the seasonal changes in water quantity and quality could greatly alter aquatic species structure and could have serious implications for management, habitat availability, and species conservation on the IRCP.

Outdoor Recreation

The climate change impacts on environmental systems will have direct consequences to humans. In the context of Service management responsibilities, this may result in effects on appropriate and compatible refuge uses. Popular activities on the IRCP included fishing and paddle sports, which could be compromised by changes in stage-discharge relationships due to increased precipitation and subsurface drainage on agricultural lands, as well as reductions in sport fish populations. Other recreational activity seasons could lengthen, but changing life cycles and distributions of wildlife may alter opportunities for hunting, wildlife viewing, and photography. Changes in activities not only affect refuge management, but it also affects the local and regional economy.

Carbon Sequestration

The increase of carbon dioxide within the earth's atmosphere has been linked to the gradual rise in surface temperature, a phenomenon commonly referred to as global warming. In relation to comprehensive conservation planning for national wildlife refuges, carbon sequestration constitutes one of the primary climate-related management strategies that can be considered despite uncertainty surrounding site-specific climate change effects. The U.S. Department of Energy defines carbon sequestration as " . . . the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere."

Terrestrial vegetation is a tremendous factor in global carbon sequestration. Terrestrial biomes of all types—grasslands, forests, wetlands, tundra, and deserts; and their soil and plant communities—are capable of capturing and storing carbon thereby removing a portion of the atmospheric carbon dioxide. The Department of Energy report's conclusions note that ecosystem protection has important implications for the global carbon balance, and that efforts should be made to reduce or prevent the release of carbon currently stored in the terrestrial biosphere (U.S. DOE, 1999). Conserving natural habitat with the intention of capturing and storing carbon also has benefits for wildlife. The actions proposed in this CMP, under all alternatives, would conserve or restore land and habitat from degraded or non-natural conditions and would thus provide certain carbon sequestration benefits. The endeavors of the Refuge System are positive contributions in ongoing efforts to mitigate human-induced global

climate change and also benefit populations of wildlife species. The preferred alternative, Alternative C, increases the percent forest cover on the IRCP to approximately 30 percent total land cover and increases the grassland cover type approximately 10 percent from 25 to 30 percent native grassland. We expect that, although seemingly minor in the context of the entire region, the IRCP will provide a net increase in carbon sequestration over the life of the CMP.

One IRCP management practice in particular, prescribed burning, releases carbon dioxide directly to the atmosphere from the biomass consumed during combustion and soil disturbance. However, there is no net loss of carbon in grassland systems, since the vegetation would eventually have died and nearly equivalent carbon dioxide quantities would have been released through the process of decay. Also, shortly after the burn, new vegetation quickly germinates and sprouts to replace the burned biomass, and sequesters or assimilates an approximately equal amount of carbon as was lost to the air. Over multiple years of burns, an increasing root network develops below the soil surface in prairies, effectively capturing large quantities of carbon. Overall, there should be little or no net change in the amount of carbon sequestered on the IRCP from prescribed burning activities. However, the restoration of lands previously cleared for agriculture will increase the total quantity of sequestered carbon on the IRCP. Trees and grasses characteristic of the floodplain habitats found on the IRCP are effective at capturing and storing carbon both above and below the ground surface.

4.1.4 Cultural Resources

Any activity that might cause an effect to a historic property would be subject to a case-by-case Section 106 review. There may be a minor increase in facilities with information kiosks added under Alternative C, but these would be reviewed on a case-by-case basis such that there is no effect on cultural resources under all alternatives.

4.1.5 Other Common Effects

None of the alternatives would have more than negligible, or at most minor, effects on topography, noise levels, land use patterns, transportation and traffic, waste management, human health and safety, or visual resources in and around the refuge.

4.2 Summary of Effects by Management Alternative

4.2.1 Alternative A (Current Management Direction)

4.2.1.1 Water Resources

This alternative will have moderate, long-term, beneficial impacts on water resources at the local and regional levels. The amount of acres in perennial vegetation on IRCP lands is substantial in the area. The acquisition, protection, and restoration of additional land will benefit rivers, streams, and wetlands in the vicinity and downstream of the refuge. Perennial vegetation prevents soil erosion and absorbs and filters water to lead to improved water quality and flood protection in the Iowa River. Wetlands also filter water and provide flood protection benefits. Grasslands, wetlands, and forests will continue to buffer the Iowa River to help improve water quality and flooding. There may be negligible effects to water resources where there is bare soil that has been disked or plowed in preparation for planting food plots. This temporary lack of vegetation may allow runoff and sediment transport into nearby wetlands or waterways. Because this alternative has no water monitoring component, the refuge will have little

information on water resource conditions, issues, and changes on the refuge or in the larger watershed. Preventing nitrates and other nutrients from reaching the Iowa River also reduces inputs to the Mississippi River and ultimately to the Gulf of Mexico.

4.2.1.2 Soil Resources

This alternative will have beneficial, long-term, moderate impacts on soil resources at the local level. Perennial vegetation helps build and protect soil. Wetlands also catch sediment and prevent it from reaching the Iowa River. Prescribed fire increases nutrients in the soil to benefit vegetation and wildlife. Some habitat management and restoration activities such as planting food plots or disking areas for planting native vegetation temporarily disturb soil causing minor and local adverse impacts. Preparation for planting may cause temporary bare soil that could be impacted by heavy rains. Food plots are planted with best management practices, but repeated disking or chemical use may degrade soils over time.

4.2.1.3 Air Quality

This alternative provides beneficial, minor, and long-term effects at the local level. Native, perennial vegetation can remove some detrimental gases and pollutants from the atmosphere and release beneficial gases. Plants also provide cooling and evaporative properties that provide benefits to air quality. Adverse temporary and minor impacts may occur from the allergens that plants can release into the local area and from smoke from prescribed burning. See section 4.1.1 for more information on prescribed fire effects on air quality.

4.2.1.4 Wildlife

This alternative will provide beneficial, long-term, major impacts to wildlife at the local and regional level. The lands that have been restored and that are presently managed are of substantial acreage in the area and will continue to provide habitat for migratory waterfowl, grassland and forest songbirds, resident wildlife such as Wild Turkeys, Ring-necked Pheasants, white-tailed deer, and amphibians and reptiles. Current management is somewhat opportunistic, often by necessity, due to dynamic floodplain conditions. However, this results in a less cohesive view of habitat types such that habitat block size and connectivity may not be optimized under this alternative. Wildlife populations will be sustained at current levels under this alternative, but lack of plant diversity in both grasslands and forests may not provide optimum habitat for some SGCN. Therefore, an adverse and moderate effect of this alternative is the potential for no increase of migratory bird populations at both the local and regional level.

Wetland habitat will remain essentially the same under this alternative and will be allowed to be subject to floodplain influences. Wetland dependent wildlife populations will remain about the same as current.

This alternative does not address the long-standing need for baseline data of wildlife populations on the refuge. These inventories are necessary to determine the presence/absence of species, to detect changes within populations, to detect rare species, and to design and implement effective wildlife management strategies. This alternative does not address deficiencies regarding baseline data collection of the native plant species present on the refuge nor investigation of species that were historically present. Uplands remain susceptible to the spread of invasive species due to limited or reactive monitoring and control. This alternative contains little in the way of inventory, monitoring, or documentation necessary to observe

environmental change over space and time, leaving gaps in our understanding of ecological trends, including climate change.

The endangered Indiana bat is the only federally listed threatened/endangered/candidate species within the immediate vicinity of the IRCP. There is one confirmed location in Tama County, but that is not on refuge lands. There is the potential for this bat species to use refuge lands. There have not been extensive timber stand improvement activities under current management, but these practices do have the potential to affect Indiana bat habitat. However, these practices can be completed outside of the breeding time period for bats and during months when the bats are not present. Most habitat management activities to improve forest diversity would ultimately be beneficial for bats. Consultation with the appropriate Service office responsible for evaluating the effects of the proposed actions on threatened and endangered species was completed subsequent to this Environmental Assessment and will be completed for specific management actions in the future.

This alternative will not directly or indirectly affect (neither negatively nor beneficially) individuals of other listed/proposed/candidate species or designated/proposed critical habitat of such species.

4.2.1.5 Vegetation/Habitat

Vegetation and habitats under this alternative will provide beneficial long-term and moderate effects. The amount of land currently restored to native habitat in the IRCP is substantial for the area and will continue to provide habitat for many wildlife species. Current habitat management would continue under this alternative with about the same amount of acres treated with specific habitat management actions. While this management meets refuge purposes and many of the objectives of the IRCP and partners, there would be deficiencies in the long-term in the ability to adapt new management techniques and work in the context of the larger landscape. Plant diversity in both grasslands and forests would not be improved under this alternative thereby limiting biodiversity and habitat needs for some species.

Although much of the current management occurs in grassland habitat, there is not a clear strategy for which specific areas are treated and how. Much of this is because of the dynamic nature of the Iowa River floodplain and the unpredictability of where management activities can take place from year-to-year. Diversity of grasslands would remain relatively low under this alternative, which could affect breeding success of some grassland dependent birds. RCG would continue to be managed with annual treatments of limited acres to provide annual plants for a temporary time period. However, no coordinated RCG control would take place, potentially allowing this species to expand.

It is difficult to keep pace with willow growth due to varying conditions that allow this work to be completed. However, new tools and partners may be available to treat larger areas, and these would not be utilized under this alternative. Control of willow growth and other woody species invading grasslands would continue with the use of fire and mowing. However, there is not a clear strategy for which specific areas are treated and how. Although this management would continue to periodically set back succession, it may not be in the best configuration for bird species. Elevational differences play a role in determining how aggressive the growth is and what areas can be successfully treated. In addition, current management may not address the heterogeneity of structure needed to support a variety of bird species.

4.2.1.6 Ecosystems

IRCP lands provide long-term, moderate benefits to the local and regional area by increasing and maintaining biodiversity. IRCP lands and habitats provide many ecosystem functions such as cycling of nutrients, photosynthesis, energy flow, and habitat for fish and wildlife and contribute to the ecosystems of the Iowa River. The amount of acres in the IRCP and adjacent protected lands are a significant contribution to the region.

4.2.1.7 Socio-Economics

The Iowa River and associated public lands provide recreation and numerous ecosystem services such as improved air and water quality, flood control, carbon sequestration, preservation of biodiversity, aesthetic value, and habitat for pollinators. Many of these long-term benefits are intangible and difficult to enumerate but are of moderate value to local and regional citizens.

The number of visits to the refuge, and subsequent economic impact, would likely remain about the same under this alternative. The refuge currently contributes to the local economy from recreation such as hunting and fishing, but these visits will likely increase only slightly under this alternative. Without better visitor welcoming and information capabilities, public awareness and support of the IRCP will likely not increase.

According to the *2011 National Survey of Fishing, Hunting, and Wildlife Associated Recreation* (FWS, 2012), hunters spent $405 million in Iowa on hunting trip-related expenses. In addition, Iowa residents spent $711 million on wildlife watching activities in 2011. Municipalities and community organizations could bring additional tourism revenues into their economies by establishing partnerships with the Service and Iowa DNR to develop and promote the recreational opportunities that are available on the IRCP lands surrounding their communities.

A separate EA was recently completed for hunting and fishing on IRCP lands that assesses the effects of those activities (FWS, 2012).

4.2.1.8 Visitor Services

This alternative continues to provide the same wildlife-dependent recreation opportunities for moderate beneficial long-term effects in the local area. There will be no increase in awareness and understanding of IRCP habitats, wildlife, and floodplain protection which may create an adverse long-term, moderate, and local effect.

4.2.1.9 Cumulative Impacts

Grasslands and forest at current levels will continue to provide water retention and infiltration values for flood control and for improved water quality on the Iowa River in combination with other lands that provide these benefits. IRCP habitats at current levels will contribute to the overall amount of habitat in conjunction with DNR fee title lands, USDA easement lands, and areas of habitat on private lands within the BCA. Acres of habitat will not increase under this alternative and quality of habitat will remain about the same. Habitats on surrounding private land in the BCA or in the watershed will likely not increase given current trends in agricultural production. Therefore, lack of improved vegetation diversity or habitat quality on IRCP refuge lands will only compound the potential loss of habitat on private lands. Connectivity of habitats may continue to decline.

Prescribed fire will have short-term cumulative effects of temporary removal of vegetation and reduced air quality due to smoke. These effects are very short lived and result in long-term beneficial effects. Prescribed fires may temporarily limit visitor use but also benefit visitors by removing dense vegetation and by providing wildlife viewing opportunities in areas with a flush of vegetation after the fire. Most burns are done in the spring when the primary visitor activity is turkey hunting, and it does not generally interfere with most visitor activities.

Food plots and management activities that disturb the soil will temporarily add to disturbed soil and vegetation on adjacent agricultural lands; however, the IRCP proportion in the larger landscape would be very small. Grain is used as a food source by waterfowl, Sandhill Cranes, turkeys, deer, pheasants, and other wildlife to provide a temporary and local beneficial effect. Food plots are important for some species in years with a higher amount of snow cover or ice and provide a temporary beneficial effect. Only a small percentage of IRCP lands are planted to food plots to reduce fragmentation of habitats and to provide a predominance of native habitats. However, food may not be the limiting factor for wildlife in the IRCP. Food plots add to the loss of native habitat and can expose birds to more predation.

Global climate change and associated stressors have recently been recognized by the Service as the most pervasive and complex challenge to the Refuge System for the conservation of trust resources. The geographic isolation and small size of conservation land holdings, combined with anthropogenic physical barriers across the landscape compound the challenges of climate change. Nevertheless, individual symptoms of climate change can be addressed at smaller scales, such as the refuge level, to contribute to large-scale mitigation of climate change impacts. Habitat protection and restoration can be used to sequester and store carbon to offset the emission of greenhouse gases. Through habitat management and restoration, creative partnerships, and educational programs the Service will work to protect and restore habitat that safeguards and enhances the potential for carbon sequestration on lands that could otherwise be developed or farmed. These actions contribute to the Refuge System's goal of establishing a national strategic plan for mitigating human-induced impacts to climate change. They also support the Refuge System in meeting its legal mandate to maintain the biological integrity, diversity, and environmental health of the Refuge System and the species and habitats therein.

4.2.2 Alternative B

4.2.2.1 Water Resources

This alternative will have long-term, beneficial impacts on water resources. The amount of acres protected in perennial vegetation on IRCP lands is substantial in the area and provides moderate local and regional effects. The acquisition, protection, and restoration of additional land under this alternative will benefit rivers, streams, and wetlands in the vicinity, and downstream of the refuge. Perennial vegetation prevents soil erosion, absorbs and filters water to lead to improved water quality and flood protection in the Iowa River. Wetlands also filter water and provide flood protection benefits. Grasslands, wetlands, and forests will continue to buffer the Iowa River to help improve water quality and flooding. There may be negligible effects to water resources where there is bare soil that has been disked or plowed in preparation for planting food plots. This temporary lack of vegetation may allow runoff and sediment transport into nearby wetlands or waterways. Because this alternative has no water monitoring component, the refuge will have little information on water resource conditions, issues, and changes on the refuge or in the larger watershed. Preventing nitrates and other nutrients from

reaching the Iowa River also reduces inputs to the Mississippi River and ultimately to the Gulf of Mexico.

4.2.2.2 Soil Resources

This alternative will have beneficial, long-term, moderate impacts on soil resources at the local and regional level. Perennial vegetation helps build and protect soil. Wetlands also catch sediment and prevent it from reaching the Iowa River. Prescribed fire increases nutrients in the soil to benefit vegetation and wildlife. Some habitat management and restoration activities such as planting food plots or disking areas for planting native vegetation temporarily disturb soil causing minor and local impacts. Preparation for planting may cause temporary bare soil that could be impacted by heavy rains. Food plots are planted with best management practices, but repeated disking or chemical use may degrade soils over time.

4.2.2.3 Air Quality

This alternative provides beneficial, minor and long-term effects at the local level. Native, perennial vegetation can remove some detrimental gases and pollutants from the atmosphere and release beneficial gases. Plants also provide cooling and evaporative properties that provide benefits to air quality. However, plants can also input allergens into the local area. Prescribed burning will cause a temporary and minor adverse effect on air quality. See section 4.1.1 for more information on prescribed fire effects.

4.2.2.4 Wildlife

This alternative would have long-term, moderate beneficial effects on wildlife. This alternative would provide more focus on grassland bird SCGN and provide more benefits to wildlife because of the acres of habitat available. Some work to restore grasslands on private lands in the IRCP is included in this alternative. Work on private lands would be done under voluntary programs with the Service, NRCS, or DNR and would add to the grassland habitat in the IRCP. Many of these bird species are the most imperilled in the State and in the Midwest. A variety of grassland birds use the IRCP for nesting. These species have varying needs, but nearly all respond to a grassland that mimics native prairie with a diversity of forb and grass species that provide needed structure for breeding and nesting, and provide abundant insects and seeds for food. Aiming management activities at providing more diverse grasslands in larger blocks could increase breeding success for these birds. This alternative would also provide more nesting habitat for ring-necked pheasants as well as habitat for resident wildlife such as Wild Turkey, white-tailed deer, and small mammals. Pollinating insects would likely increase with increased forb diversity under this alternative.

This alternative would essentially put a priority on grassland habitats in order to make significant progress for these species while not conducting as much management on other habitats. This alternative may limit habitat management for other species such as forest migrating songbirds, and waterbirds, since available resources will be used for grassland management. This alternative may therefore have an adverse long-term and moderate effect on forest birds and forest associated wildlife at the local and regional level since the populations of these species will therefore likely not increase.

New management techniques may be used under this alternative such as harvest of RCG or other grasses, or woody material such as willow for biofuels for use by nearby facilities. Harvesting would be done by those facilities or their contractors, not by DNR or refuge staff.

Harvest would basically involve mowing and baling and may treat larger areas than can currently be treated with mowing. The treatment of larger areas may increase the amount of area that can be restored to quality grassland habitat and would benefit grassland birds and other wildlife in the long-term. Most mowing would occur in fall or winter so that it would not impact nesting birds. The type of equipment and time of year used would also be controlled to reduce impacts to soil. However, follow up treatments to restore desirable vegetation may leave some areas with reduced habitat value for one to three years. Treatment of larger areas with mowing equipment would be done as one step in a restoration plan to reach a specific habitat goal for that particular unit.

More progress may be made on RCG control and willow suppression under this alternative as most resources would be directed towards grassland goals. A reduction in RCG dominated fields will also provide more diverse structure and food for birds and other wildlife. This will increase habitat available for grassland birds and other grassland wildlife. However, some birds prefer a variety of shrub habitat and their populations may be reduced if willow is suppressed on a majority of the area. Willow is difficult to control and it is unlikely that it will be reduced below 20 percent of the IRCP. More strategic management of grassland to produce larger blocks of habitat and connectivity will improve habitat for grassland, area-sensitive birds, and improve migration corridors. This alternative includes restoration of native grassland on private lands where feasible under existing state and federal programs for habitat restoration. Although restorations on private lands likely will not be a large amount of acreage during the life of this plan, it will add to the amount of grassland habitat available and potentially improve connectivity of habitats.

On a more project-specific level, restoration activities may have direct, short-term adverse impacts (even mortality) on individuals, but such activities will benefit the population as a whole over the long-term. Visitation by 'non-consumptive' users may temporarily disrupt normal daily activities and/or temporarily stress animals. Consumptive refuge uses such as managed white-tailed deer and turkey hunts, and fishing will also negatively impact targeted species; but if the appropriate harvest regime and regulations are implemented, the impacts to the species' population will be negligible or beneficial depending on species' abundance. Hunting and fishing impacts have been previously assessed in a 2012 EA (FWS).

This alternative does not address the long-standing need for the collection of baseline data of wildlife populations on the refuge. These inventories are necessary to determine the presence/absence of species, and to detect changes within populations, and to design and implement effective wildlife management strategies. This alternative does not address deficiencies regarding baseline data collection of the native plant species present on the refuge, nor investigation of species that were historically present. This alternative contains little in the way of inventory, monitoring, or documentation necessary to observe environmental change over space and time, leaving gaps in our understanding of ecological trends - including climate change.

The endangered Indiana bat is the only federally listed threatened/endangered/candidate species known to use the area where the refuge lands are located, or proposed to be located. There is one confirmed location in Tama County, but it is not on refuge lands. Forestry practices to improve timber stands have the potential to affect Indiana bat habitat. However, little forestry work would occur under this alternative. Most habitat management activities would ultimately be beneficial for bats. Consultation with the appropriate Service office responsible for evaluating the effects of the proposed actions on threatened and endangered species was completed subsequent to this Environmental Assessment and will be completed for specific management

actions in the future. None of the alternatives will directly or indirectly affect (neither negatively nor beneficially) individuals of other listed/proposed/candidate species or designated/proposed critical habitat of such species.

4.2.2.5 Vegetation/Habitat

This alternative would create beneficial moderate long-term effects on the diversity and amount of native grassland in the local and regional area. The amount of fields with a dominance of RCG would decrease. The locations for most work to increase grassland species diversity would be at higher elevations where most native grasslands currently exist. Most work to reduce the amount of RCG dominated fields and plant native species would be at the intermittently and irregularly flooded areas with some work in frequently flooded areas when dry conditions exist.

This alternative includes improving the diversity in existing planted native stands by adding more forbs, or flowering plants. This diversity will benefit the plant community overall and add wildlife value. It also aims to decrease the amount of RCG dominated grasslands allowing native plants to compete and become established. RCG will not be eradicated, but its dominance can be reduced in strategic areas through various management techniques.

A potential adverse and moderate effect on forest vegetation under this alternative may be a continued decline in diversity. Current forests would remain, but tree species diversity would remain low. Wetland vegetation would remain about the same.

4.2.2.6 Ecosystems

IRCP lands provide long-term, moderate benefits to the local and regional area by increasing and maintaining biodiversity. IRCP lands and habitats provide many ecosystem functions such as cycling of nutrients, photosynthesis, energy flow, and habitat for fish and wildlife, and contribute to the ecosystems of the Iowa River. The large area of habitat in the IRCP provides one of the few contiguous areas in the region for ecosystem benefits.

4.2.2.7 Socio-Economics

The Iowa River and associated public lands provide recreation and numerous ecosystem services such as improved air and water quality, flood control, carbon sequestration, preservation of biodiversity, aesthetic value, and pollinators. Many of these long-term benefits are intangible and difficult to enumerate, but are of moderate value to local and regional citizens.

The number of visits to the refuge, and subsequent economic impact, would likely remain about the same. Increased amount of native grassland may increase game bird populations and subsequent hunting opportunities. A potential subsequent response of grassland songbirds may also increase the quality of bird watching in the IRCP. The refuge currently contributes to the local economy from recreation such as hunting and fishing. These visits will likely increase only slightly under this alternative. Visitor outreach and facilities remain the same under this alternative. Without better visitor welcoming and information capabilities, public awareness and support of the IRCP will likely not increase.

According to the *2011 National Survey of Fishing, Hunting, and Wildlife Associated Recreation* (FWS, 2012), hunters spent $405 million in Iowa on hunting trip-related expenses. In addition, Iowa residents spent $711 million on wildlife watching activities in 2011. Municipalities and

community organizations could bring additional tourism revenues into their economies by establishing partnerships with the Service and Iowa DNR to develop and promote the recreational opportunities that are available on the IRCP lands surrounding their communities.

A separate EA was recently completed for hunting and fishing on IRCP lands that assesses the effects of those activities (FWS, 2012).

4.2.2.8 Visitor Services

This alternative provides some increase in wildlife-dependent recreation opportunities thereby providing beneficial long-term effects in the local area. A corresponding increase in wildlife from management and restoration of grasslands would provide more opportunities for bird watching and hunting. Visitor facilities and services remain the same as current under this alternative and therefore result in little increase in public awareness or support of the IRCP, which is a long-term and moderate negative effect.

4.2.2.9 Cumulative Impacts

Increases in the amount and quality of native grassland habitat would add to this habitat type in the BCA and in the watershed. It would also add to the water retention and infiltration values for flood control and for improved water quality on the Iowa River in combination with other lands that provide these benefits. Acres of this type of habitat will increase under this alternative to add to grasslands in the BCA and improve connectivity of habitats among different ownerships. Although grassland already exists in the IRCP, improving quality and reducing RCG dominated grassland will increase its value for many wildlife species. RCG is an excellent grass for holding soil, providing water infiltration and retention, and withstanding flooding. Native grasses also have this capability due to extensive root systems. Replacing RCG with native grasses and forbs may temporarily reduce flood retention benefits but should be nearly equal once established and will provide other benefits that RCG does not. Although RCG will remain, its presence as a dominant species in some stands will decrease and help prevent further spread of the invasive species.

This alternative does not benefit all wildlife species in IRCP lands, and therefore some forest dependent birds or resident wildlife may decline or the diversity of bird species may be reduced over time. Habitat connectivity may be lost for certain species if habitats are not maintained or are lost due to agricultural use on adjacent private lands.

Prescribed fire will have short-term cumulative effects of temporary removal of vegetation and reduced air quality due to smoke. These effects are very short lived and result in long-term beneficial effects. Prescribed fires may temporarily limit visitor use but also benefit visitors by removing dense vegetation and by providing wildlife viewing opportunities in areas with a flush of vegetation after the fire. Most burns are done in the spring when the primary visitor activity is turkey hunting, and it does not generally interfere with most visitor activities.

Food plots and management activities that disturb the soil will temporarily add to disturbed soil and vegetation on adjacent agricultural lands; however, the IRCP proportion in the larger landscape would be very small. Grain is used as a food source by waterfowl, Sandhill Cranes, turkeys, deer, pheasants, and other wildlife to provide a temporary and local beneficial effect. Food plots can be important for some species in years with a higher amount of snow cover or ice and provide a temporary beneficial effect. Only a small percentage of IRCP lands are planted to food plots to reduce fragmentation of habitats and to provide a predominance of

native habitats. However, food may not be the limiting factor for wildlife in the IRCP. Food plots add to the loss of native habitat and can expose birds to more predation.

Global climate change and associated stressors have recently been recognized by the Service as the most pervasive and complex challenge to the Refuge System for the conservation of trust resources. The geographic isolation and small size of conservation land holdings, combined with anthropogenic physical barriers across the landscape compound the challenges of climate change. Nevertheless, individual symptoms of climate change can be addressed at smaller scales, such as the refuge level, to contribute to large-scale mitigation of climate change impacts. Habitat protection and restoration can be used to sequester and store carbon to offset the emission of greenhouse gases. Through habitat management and restoration, creative partnerships, and educational programs the Service will work to protect and restore habitat that safeguards and enhances the potential for carbon sequestration on lands that could otherwise be developed or farmed. These actions contribute to the Refuge System's goal of establishing a national strategic plan for mitigating human-induced impacts to climate change. They also support the Refuge System in meeting its legal mandate to maintain the biological integrity, diversity, and environmental health of the Refuge System and the species and habitats therein.

4.2.3 Alternative C (Preferred Alternative)

This alternative takes a holistic, ecological approach to manage for a diversity of habitats in a less opportunistic fashion than current management. This alternative proposes use of a more strategic approach that assesses floodplain elevation differences to determine the best locations for management actions. This alternative also considers the context of the IRCP within the larger BCA and includes partnership work outside of the IRCP refuge owned lands.

4.2.3.1 Water Resources

This alternative will have long-term, beneficial impacts on water resources. The amount of acres protected in perennial vegetation on IRCP lands is substantial in the area to provide moderate local and regional effects. The acquisition, protection, and restoration of additional land will benefit rivers, streams, and wetlands in the vicinity and downstream of the refuge. Perennial vegetation prevents soil erosion and absorbs and filters water to lead to improved water quality and flood protection in the Iowa River. Wetlands also filter water and provide flood protection benefits. Grasslands, wetlands, and forests will continue to buffer the Iowa River to help improve water quality and flooding. There may be negligible effects to water resources where there is bare soil that has been disked or plowed in preparation for planting food plots. This temporary lack of vegetation may allow runoff and sediment transport into nearby wetlands or waterways. Because this alternative has no water monitoring component, the refuge will have little information on water resource conditions, issues, and changes on the refuge or in the larger watershed. Preventing nitrates and other nutrients from reaching the Iowa River also reduces inputs to the Mississippi River and the Gulf of Mexico.

4.2.3.2 Soil Resources

This alternative would have beneficial, long-term, moderate impacts on soil resources at the local and regional level. Perennial vegetation helps build and protect soil. Wetlands also catch sediment and prevent it from reaching the Iowa River. Prescribed fire increases nutrients in the soil to benefit vegetation and wildlife. Some habitat management and restoration activities such as planting food plots or disking areas for planting native vegetation temporarily disturb soil

causing minor and local impacts. Preparation for planting may cause temporary bare soil that could be impacted by heavy rains. Food plots are planted with best management practices, but repeated disking or chemical use may degrade soils over time.

4.2.3.3 Air Quality

This alternative provides beneficial, minor, and long-term effects at the local level. Native, perennial vegetation can remove some detrimental gases and pollutants from the atmosphere and release beneficial gases. Plants also provide cooling and evaporative properties that provide benefits to air quality. However, plants can also input allergens into the local area. Prescribed burning will cause a temporary and minor adverse effect on air quality. See section 4.1.1 for more information on the effects of prescribed fire.

4.2.3.4 Wildlife

This alternative would maintain habitat for waterfowl and waterbirds and would improve habitat for grassland nesting birds and migrant forest songbirds. Some work to restore habitats on private lands in the IRCP is included in this alternative. Work on private lands would be done under voluntary programs with the Service, NRCS, or DNR and would add to the habitat in the IRCP. There would be long-term and major beneficial effects at the local and regional level with this alternative. A variety of grassland birds use the IRCP for nesting. These species have varying needs, but nearly all respond positively to a grassland that mimics native prairie with a diversity of forb and grass species that provide needed structure for breeding and nesting and provide abundant insects and seeds for food. Habitat for resident wildlife will also improve with more, or better, nesting habitat for game birds, and improved forest habitat with more mast producing trees for turkeys and deer. A more strategic view of the IRCP lands in the context of the BCA and its partners may help identify the best areas to improve habitat connectivity and create larger contiguous blocks of habitat. The amount and diversity of forest would increase under this alternative, and strategic placement of management actions would allow for more habitat connectivity for migrating birds.

Eastern Bluebird

By focusing management actions on irregularly or intermittently flooded areas, the chances of success are higher such that more value is gained for the input effort. The lowest elevations would receive little active management but still provide much value for flood control and habitat connectivity.

New management techniques may be used under this alternative such as harvest of RCG or other grasses, or woody material such as willow for biofuels for use by nearby energy generating facilities. Harvesting would be done by those facilities or their contractors, not by DNR or refuge staff. Harvest would basically involve mowing and baling and may treat larger areas than can currently be treated with mowing. The treatment of larger areas may increase

the amount of area that can be restored to quality grassland habitat and would benefit grassland birds and other wildlife in the long run. Most mowing would occur in fall or winter so that it would not impact nesting birds. The type of equipment and time of year used would also be controlled to reduce impacts to soil. However, follow up treatments to restore desirable vegetation may leave some areas with reduced habitat value for one to three years. Treatment of larger areas with mowing equipment would be done as one step to reach a specific habitat goal, and a restoration plan would be in place for that particular unit.

On a more project-specific level, restoration activities may have direct, adverse impacts (even mortality) on individuals, but such activities will benefit the population as a whole over the long-term. Increased visitation by 'non-consumptive' users may temporarily disrupt normal daily activities and/or temporarily stress animals. Consumptive refuge uses such as managed white-tailed deer and turkey hunts, and fishing, will also negatively impact targeted species; but if the appropriate harvest regime and regulations are implemented, the impacts to the species' population will be negligible or beneficial depending on species' abundance. Hunting and fishing were previously assessed in a 2012 EA (FWS).

This alternative addresses the long-standing need for the collection of baseline data of wildlife populations on the refuge. These inventories are necessary to determine presence/absence of species, and to detect changes within populations, and to design and implement effective wildlife management strategies. Although the priority needs for inventory and monitoring would need to be determined subsequent to the CMP, it would likely include vegetation and wildlife as the best indicators of habitat change. Monitoring resources will be limited to the highest priority needs and may leave gaps in data needed to observe environmental change over space and time, and in our understanding of ecological trends—including climate change.

The endangered Indiana bat is the only federally listed threatened/endangered/candidate species known to use the area where the refuge lands are located, or proposed to be located. There is one confirmed location in Tama County, but it is not on refuge lands. Forestry practices to improve timber stands have the potential to affect Indiana bat habitat. However, these practices can be completed outside of the breeding time period for bats and during months when the bats are not present. Most habitat management activities would ultimately be beneficial for bats, and working towards a more diverse forest will increase habitat for bats. Consultation with the appropriate Service office responsible for evaluating the effects of the proposed actions on threatened and endangered species was completed subsequent to this Environmental Assessment and will be completed for specific management actions in the future. Neither alternative will directly or indirectly affect (neither negatively nor beneficially) individuals of other listed/proposed/candidate species or designated/proposed critical habitat of such species.

4.2.3.5 Vegetation/Habitat

The diversity and amount of native grassland and forest would increase under this alternative for a long-term and major beneficial effect at the local and regional levels. The locations for most work to increase grassland species diversity would be at higher elevations where most native grasslands currently exist. Work to reduce the amount of RCG dominated fields would be at the intermittently and irregularly flooded areas. Tree plantings to improve forest diversity would also occur at the intermittently to irregularly flooded areas that also coincide with providing connectivity for forest migrant birds. Restoration work at these elevations will increase the chances for success.

This alternative includes improving the diversity in existing planted native grassland stands by adding more forbs, or flowering plants. Increased diversity will benefit the plant community overall and add wildlife value. It also aims to decrease the amount of RCG dominated grasslands allowing native plants to compete and become established. RCG will not be eradicated, but its dominance can be reduced in strategic areas through various management techniques.

The amount and diversity of forest would increase under this alternative. Migrating songbirds feed on insects provided by spring budding trees, and a better diversity of tree species such as oak will improve this habitat need. Wetland vegetation would remain about the same, but wetland acres may increase.

Some management actions like prescribed fire, mowing/baling, and timber stand improvement would temporarily remove vegetation but would improve its vitality in the long-term.

4.2.3.6 Ecosystems

IRCP lands provide long-term, major benefits to the local and regional area by increasing and maintaining biodiversity. IRCP lands and habitats provide many ecosystem functions such as cycling of nutrients, photosynthesis, energy flow, and habitat for fish and wildlife, and contribute to the ecosystems of the Iowa River. The large area of habitat in the IRCP provides one of the few contiguous areas in the region for ecosystem benefits. This alternative would provide more diversity of vegetation and habitats.

4.2.3.7 Socio-Economic

The Iowa River and associated public lands provide recreation and numerous ecosystem services such as improved air and water quality, flood control, carbon sequestration, preservation of biodiversity, aesthetic value, and pollinators. Many of these benefits are intangible and difficult to enumerate but are of value to local and regional citizens.

Visitation is expected to increase under this alternative with more outreach and information proposed. Public demand for natural areas and associated recreation has generally increased. This alternative calls for more public outreach and opportunities for wildlife-dependent recreation that may increase uses and associated economic benefits for local communities. Habitat improvements may also increase hunting and wildlife observation opportunities.

According to the *2011 National Survey of Fishing, Hunting, and Wildlife Associated Recreation* (FWS, 2012), hunters spent $405 million in Iowa on hunting trip-related expenses. In addition, Iowa residents spent $711 million on wildlife watching activities in 2011. Municipalities and community organizations could bring additional tourism revenues into their economies by establishing partnerships with the Service and Iowa DNR to develop and promote the recreational opportunities that are available on the IRCP lands surrounding their communities.

A separate EA was recently completed for hunting and fishing on IRCP lands that assesses the effects of those activities (FWS, 2012).

4.2.3.8 Visitor Services

This alternative provides some increase in wildlife-dependent recreation opportunities with potential for beneficial long-term effects in the local area. A corresponding increase in wildlife

from management and restoration of all habitat types will provide more opportunities for bird watching and hunting. The increased services proposed under this alternative create more likelihood of an increase in awareness and understanding of IRCP habitats, wildlife, and floodplain protection. This will be a long-term, moderate, and local and regional effect.

4.2.3.9 Cumulative Impacts

Increased quantity and quality of grasslands and forest will provide water retention and infiltration values for flood control and for improved water quality on the Iowa River in combination with other lands that provide these benefits. Habitats on surrounding private land in the BCA or in the watershed will likely not increase given current trends in agricultural production. Therefore, improved vegetation diversity or habitat quality on IRCP lands will help to counteract other habitat loss in the BCA and watershed. Connectivity of habitats within the BCA will be improved under this alternative.

Increases in the amount and quality of native grassland habitat would add to this habitat type in the BCA. Although grassland already exists in the IRCP, improving quality and reduction of RCG dominated grassland would increase its value for many wildlife species. RCG is an excellent grass for holding soil, providing water infiltration and retention, and withstanding flooding. Native grasses also have this capability due to extensive root systems. Replacing RCG with native grasses and forbs may temporarily reduce flood retention benefits but should be nearly equal once established and would provide other benefits that RCG does not. Although RCG will remain, its presence as a dominant species in some stands will decrease and help prevent further spread of the species.

Trees are also excellent for holding soil. Increased amount of forest and additional tree species will only add to the existing value of erosion and flood control.

The potential for increased public use may impact habitats or disturb wildlife; however, these impacts are expected to be minor since uses are typically spread over space and time. Increased public understanding and support for the IRCP will provide long-term benefits. Conflicts between user groups are also expected to be minimal due to uses spread over space and time.

The larger BCA and watershed will benefit from the management under this alternative that conserves and improves all habitat types. Habitats on refuge lands will add to those on DNR lands and easement lands. A larger area will benefit through increased partnerships. The Iowa River is dynamic, and some CMP objectives may take longer to achieve or be delayed because of floods or droughts. Management activities will need to be flexible, but this alternative will be more strategic than the others in order to deal with the dynamic system.

Prescribed fire will have short-term cumulative effects of temporary removal of vegetation and reduced air quality due to smoke. These effects are very short lived and result in long-term beneficial effects. Prescribed fires may temporarily limit visitor use but also benefit visitors by removing dense vegetation and by providing wildlife viewing opportunities in areas with a flush of new vegetation after the fire. Most burns are done in the spring when the primary visitor activity is turkey hunting, and it does not generally interfere with most visitor activities.

Food plots and management activities that disturb the soil will temporarily add to disturbed soil and vegetation on adjacent agricultural lands; however, the IRCP proportion in the larger landscape would be very small. Grain is used as a food source by waterfowl, Sandhill Cranes,

turkeys, deer, pheasants, and other wildlife. Food plots can be important for some species in years with a higher amount of snow cover or ice and provide a temporary beneficial effect. Only a small percentage of IRCP lands are planted to food plots to reduce fragmentation of habitats and to provide a predominance of native habitats. However, food may not be the limiting factor for wildlife in the IRCP. Food plots add to the loss of native habitat and can expose birds to more predation.

Acres in food plots would be reduced under this alternative as more diversity of native vegetation is restored that would provide the necessary habitat for migratory birds and most resident wildlife.

Global climate change and associated stressors have recently been recognized by the Service as the most pervasive and complex challenge to the Refuge System for the conservation of trust resources. The geographic isolation and small size of conservation land holdings, combined with anthropogenic physical barriers across the landscape compound the challenges of climate change. Nevertheless, individual symptoms of climate change can be addressed at smaller scales, such as the refuge level, to contribute to large-scale mitigation of climate change impacts. Habitat protection and restoration can be used to sequester and store carbon to offset the emission of greenhouse gases. Through habitat management and restoration, creative partnerships, and educational programs the Service will work to protect and restore habitat that safeguards and enhances the potential for carbon sequestration on lands that could otherwise be developed or farmed. These actions contribute to the Refuge System's goal of establishing a national strategic plan for mitigating human-induced impacts to climate change. They also support the Refuge System in meeting its legal mandate to maintain the biological integrity, diversity, and environmental health of the Refuge System and the species and habitats therein.

Chapter 5: List of Preparers and Contributors

This Environmental Assessment was prepared by staff of the Port Louisa NWR in consultation with the Iowa DNR. It was reviewed by Area 1 Refuge Supervisor, Kevin Foerster; Regional Planner, Connie Rose; and Refuge Biologist, Robert Clevenstine.

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Chapter 6: Consultation and Coordination with Stakeholders

Refuge staff coordinated with Iowa DNR and USDA NRCS throughout development of this EA. The general public was made aware of the document along with an invitation to provide comments through a news release issued March 20, 2013 that identified a comment period beginning April 1, 2013. An open house was held on April 2, and the document was available for review at the refuge office, the DNR office, and local libraries in Belle Plaine, Iowa. It was also available on the Port Louisa NWR website at http://www.fws.gov/refuge/port_louisa. Comments were accepted for 30 days.

Chapter 7: Public Comment on the Draft Environmental Assessment and Service Response

One comment was received from The Nature Conservancy in Iowa in support of the CMP and as a contribution to protecting floodplain habitat and providing recreational opportunities.

Chapter 8: References and Literature Cited

Hayhoe, K., J. VanDorn, V. Naik, and D. Wuebbles. Climate *change in the Midwest. Projections of future temperature and precipitation*. http://www.ucsusa.org/assets/documents/global_warming/midwest-climate-impacts.pdf.

Kunkel, K.E., L.E. Stevens, S.E. Stevens, L. Sun, E. Janssen, D. Wuebbles, S.D. Hilberg, M.S. Timm, L. Stoecker, N.E. Westcott, and J. G. Dobson (2013). *Regional Climate Trends and Scenarios for the U.S. National Climate Assessment, Part 3*. Climate of the Midwest U.S. NOAA Technical Report NESDIS. pp.142–3.

Schueller, M. 1997. *Iowa River Corridor Project Progress Report: a summary of baseline water quality assessment. 1996-97*. Unpubl. Report to the U.S. EPA submitted by the University of Iowa Hygienic Laboratory, Iowa City, Iowa.

Singh, R., M.J. Helmers, A.L. Kaleita, and E.S. Takle (2009). *Potential Impact of climate change on subsurface drainage in Iowa's subsurface drained landscapes*. J of Irrigation and Drainage Engineering, July/August 2009, pp. 459–466. DOI:10.1061/ASCE IR. 1943-4774.0000009.

Takle, Eugene S. (2009). *Assessment of potential impacts of climate changes on Iowa using current trends and future projections*. http://climate.engineering.iastate.edu/Document/Climate_Changes_for_Iowa_18.pdf.

Takle, Eugene S. (2011). *Assessment of potential impacts of climate changes on Iowa using current trends and future projections*. http://climate.engineering.iastate.edu/Document/Climate_Changes_for_Iowa_18.pdf.

U.S. Census Bureau. 2009. http://quickfacts.census.gov/qfd/states/19/19115.html.

U.S. Department of Energy (1999). *Carbon Sequestration Research and Development*. Office of Science, Office of Fossil Energy, U.S. Department of Energy. p. 289. Available online at: http://www.osti.gov/energycitations/servlets/purl/810722/810722.pdf.

U.S. Fish and Wildlife Service. 1995. *Final Environmental Assessment and Finding of No Significant Impact*. Proposed Land Acquisition in the Iowa River Corridor Project. Fort Snelling, MN.

U.S. Fish and Wildlife Service. 2007. *Banking on Nature 2006: The economic benefits to local communities of National Wildlife Refuge visitation*. Washington D.C. pp. 372.

U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2011 *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*.

U.S. Department of Commerce, Bureau of Economic Analysis. 2009a. *Annual State Personal Income*. http://www.bea.gov/bea/regional/spi/.

U.S. Department of Commerce, Bureau of Economic Analysis. 2009b. *Local Area Personal Income*. http://www.bea.gov/regional/reis/action.cfm.

U.S. Fish and Wildlife Service. 2004. *Mark Twain National Wildlife Refuge Complex Comprehensive Conservation Plan and Environmental Assessment*. U.S. Fish and Wildlife Service. p. 441.

U.S. Fish and Wildlife Service. 2007. *Wildland Fire Management Plan*. Port Louisa National Wildlife Refuge. p. 86.

U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2012. *2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*.

U.S. Fish and Wildlife Service. 2012. *Water Resources Inventory and Assessment for the Iowa River Corridor*.

U.S. Fish and Wildlife Service. 2012. *Final Environmental Assessment Hunt Program for the Iowa River Corridor Project Port Louisa National Wildlife Refuge.* p. 49.

U.S. Fish and Wildlife Service. 2012. *Final Environmental Assessment Fishing Program for the Iowa River Corridor Project Port Louisa National Wildlife Refuge*. p. 49.

U.S. Geological Survey. 1996. *Herbicides and Nitrates in the Iowa River Alluvial Aquifer Prior to Changing Land Use, Iowa County, Iowa*. 1996. USGS Fact Sheet FS-085-97. Iowa City, Iowa.

U. S. Global Change Research Program (2009). *Global climate change in the United States, Midwest*. http://downloads.globalchange.gov/usimpacts/pdfs/midwest.pdf.

U. S. Global Change Research Program (2000). Clim*ate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change. National Assessment Synthesis Team*.

Appendix F: Finding of No Significant Impact

Environmental Assessment and Comprehensive Management Plan for the Iowa River Corridor Project, Port Louisa National Wildlife Refuge, Iowa

An Environmental Assessment (EA) has been prepared to identify management strategies to meet the conservation goals of national wildlife refuge lands in the Iowa River Corridor Project. 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 presented and evaluated three alternatives for the Iowa River Corridor Project for managing fish, wildlife, and plant habitats, as well as visitor services, over the next 15 years.

Alternative A (No action) – Current management would continue. The Iowa Department of Natural Resources (DNR) manages the lands under a Memorandum of Understanding (MOU) and a strong partnership exists with the U.S. Fish and Wildlife Service (FWS, Service). The primary focus of current management has been to restore and maintain grassland and wetland habitat and provide food sources for waterfowl and resident wildlife such as Ring-necked Pheasants. Forest management and restoration also occur under current management but are not the primary focus.

Alternative B – Management by the Iowa DNR under the MOU would continue. This alternative focuses on grassland management to increase acres and diversity of native grassland. It would include management of reed canarygrass (RCG) invasion and encroachment of willows to restore native grasslands. Current wetland and forest management would continue and it would clarify public uses.

Alternative C (Preferred) – Management by the Iowa DNR under the MOU would continue. This alternative focuses on all habitat types, with restoration and management strategically focused on irregularly and intermittently flooded areas. Habitat objectives were developed in the context of the larger Bird Conservation Area (BCA) to provide connectivity. Outreach and information for visitors would increase.

The alternative selected for implementation is Alternative C. Managing for all habitats types and managing strategically with inundation levels will benefit wetlands and migratory birds according to refuge purposes. It will also benefit a variety of wildlife species identified by the Service as Resource Conservation Priority Species and identified by the State of Iowa as Species of Greatest Conservation Need. Visitors to the refuge will also benefit from increased recreational opportunities and visitor services.

For reasons presented above and based on an evaluation of the information contained in the EA, we have determined that the action of adopting Alternative C for the Iowa River Corridor Project, Port Louisa NWR as the management alternative 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. An Environmental Impact Statement will, accordingly, not be prepared.

Additional Reasons:

1. No threatened or endangered species will be affected by this action and they will generally benefit under Comprehensive Management Plan (CMP) implementation.
2. The CMP ensures that management actions and programs are consistent with the mandates of the National Wildlife Refuge System.
3. No cultural or historic resources will be negatively impacted by this action.
4. Future management actions will have a neutral or positive impact on the local economy.

Supporting References:

1. Iowa River Corridor Final Comprehensive Management Plan and Environmental Assessment
2. Environmental Action Statement
3. Intra-Service Section 7 Biological Evaluation Form

ACTING Christopher P. Jensen
Regional Director, FWS, Region 3

6/25/2013
Date

Appendix G: Acronyms and Glossary

Acronyms

The following is a quicklist of the most frequently used acronyms in this document. More detail on some of them is in the Glossary below.

BCA: Bird Conservation Areas
BCC: Birds of Conservation Concern
BCR: Bird Conservation Region
CCP: Comprehensive Conservation Plan (also Plan)
CD: Compatibility Determination
CFR: Code of Federal Regulations
CRP: U.S. Department of Agriculture's Conservation Reserve Program
DNR: Department of Natural Resources (usually preceded by state abbreviation)
DOI: U.S. Department of the Interior
DU: Ducks Unlimited
EA: Environmental Assessment
EAS: Environmental Action Statement
EE: Environmental Education
EIS: Environmental Impact Statement
EO: Executive Order
EPA: U.S. Environmental Protection Agency
ESA: Endangered Species Act
FONSI: Finding of No Significant Impact
FR: Federal Register
FTE: Full-time equivalent
FWS: U.S. Fish and Wildlife Service (also USFWS and Service)
FY: Fiscal Year
GAP: Gap Analysis Program
GIS: Geographic Information System
HAPET: U.S. Fish and Wildlife Service's Habitat and Population Evaluation Team
IBA: Audubon Society's Important Bird Area
IPCC: Intergovernmental Panel on Climate Change
LCC: Landscape Conservation Cooperative
MOA: Memorandum of Agreement
MOU: Memorandum of Understanding
NABCI: North American Bird Conservation Initiative
NAI: Natural Areas Inventory
NEPA: National Environmental Policy Act
NRHP: National Register of Historic Places
NWR: National Wildlife Refuge (also Refuge)
NWRS: National Wildlife Refuge System (also Refuge System)
PFT: Permanent full-time
PPJV: Prairie Pothole Joint Venture
PPR: Prairie Pothole Region
R3: Region 3 (Midwest) of the U.S. Fish and Wildlife Service (Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin)
ROD: Record of Decision

SGCN: Species of (in) Greatest Conservation Need
SHC: Strategic Habitat Conservation
TFT: Temporary full-time
UMR/GLR JV: Upper Mississippi River & Great Lakes Region Joint Venture
USC: United States Code
USDA: U.S. Department of Agriculture
USGS: U.S. Geologic Survey
WMA: Wildlife Management Area (usually State owned)
WMD: Wetland Management District (also District)
WPA: Waterfowl Production Area
WRP: U.S. Department of Agriculture's Wetland Reserve Program
WSA: Wilderness Study Areas

Glossary

Adaptation: Adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation.

Adaptive Management: The rigorous application of management, research, and monitoring to gain information and experience necessary to assess and modify management activities. A process that uses feedback from refuge research and monitoring and evaluation of management actions to support or modify objectives and strategies at all planning levels (FWS, 602 FW1 1.6).

Alternatives: Different sets of objectives and strategies or means of achieving refuge purposes and goals, helping fulfill the National Wildlife Refuge System mission, and resolving issues (FWS, 602 FW1 1.6).

Appropriate Use: A proposed or existing use on a refuge that meets at least one of the following four conditions (FWS, 603 FW1 1.6):

- The use is a wildlife-dependent recreational use as identified in the Fish and Wildlife Improvement Act of 1978.
- The use contributes to fulfilling the refuge purpose(s), the National Wildlife Refuge System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997, the date the National Wildlife Refuge System Improvement Act of 1997 was signed into law.
- The use involves the take of fish and wildlife under state regulations.
- The use has been found to be appropriate as specified in section 1.11.

Approved Acquisition Boundary: A project boundary that the Director of the U.S. Fish and Wildlife Service approves upon completion of the planning and environmental compliance process. An approved acquisition boundary only designates those lands that the Service has authority to acquire and/or manage through various agreements. Approval of an acquisition boundary does not grant the Service jurisdiction or control over lands within the boundary, and it

does not make lands within the refuge boundary part of the National Wildlife Refuge System. Lands do not become part of the Refuge System until they are purchased or are placed under an agreement that provides for management as part of the Refuge System.

Biological Control: The use of organisms or viruses to control weeds or other pests.

Biological Diversity: The variety of life, including the variety of living organisms, the genetic differences among them, and the communities in which they occur (FWS, 602 FW1 1.6).

Biological Integrity: Biotic composition, structure, and functioning at the genetic, organism, and community levels consistent with natural conditions, including the natural biological processes that shape genomes, organisms, and communities (FWS, 602 FW1 1.6).

Candidate Species: 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.

Carbon Sequestration: The uptake and storage of carbon. Trees and plants, for example, absorb carbon dioxide, release the oxygen, and store the carbon. Fossil fuels were at one time biomass and continue to store the carbon until burned.

Climate Change: Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from 1) natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun; 2) natural processes within the climate system (e.g., changes in ocean circulation); 3) human activities that change the atmosphere's composition (e.g., through burning fossil fuels) and the land surface (e.g., deforestation, reforestation, urbanization, desertification, etc.).

Code of Federal Regulations (CFR): The codification of the general and permanent rules published in the *Federal Register* by the departments and agencies of the Federal Government. It is divided into 50 titles that represent broad areas subject to federal regulation. The 50 subject matter titles contain one or more individual volumes, which are updated once each calendar year, on a staggered basis.

Council on Environmental Quality (CEQ): An Executive Office of the President whose members are appointed by the President. CEQ recommends national policies to promote the improvement of the quality of the environment.

Compatible Use: A proposed or existing wildlife-dependent recreational use or any other use of a national wildlife refuge that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the national wildlife refuge (FWS, 603 FW 2 2.6).

Compatibility Determination (CD): A written determination signed and dated by the refuge manager and the U.S. Fish and Wildlife Service regional chief signifying that a proposed or existing use of a national wildlife refuge is a compatible use or is not a compatible use. The director of the Service makes this delegation through the regional director (FWS, 603 FW 2 2.6).

Comprehensive Conservation Plan (CCP): A document that describes the desired future conditions of a refuge or planning unit and provides long-range guidance and management direction to achieve the purposes of the refuge; helps fulfill the mission of the Refuge System; maintains and, where appropriate, restores the ecological integrity of each refuge and the National Wildlife Refuge System; helps achieve the goals of the National Wilderness Preservation System; and meets other mandates (FWS, 602 FW1 1.6).

Consumptive Use: Use of a refuge resource that removes the resource from the refuge (e.g., killing an animal to eat, catching and keeping fish, harvesting berries or plants, or removal of mineral or other specimens).

Cultural Resource Inventory: A professionally conducted study designed to locate and evaluate evidence of cultural resources present within a defined geographic area. Inventories may involve various levels, including background literature search, comprehensive field examination to identify all exposed physical manifestations of cultural resources, or sample inventory to project site distribution and density over a larger area. Evaluation of identified cultural resources to determine eligibility for the National Register of Historic Places follows the criteria found in 36 CFR 60.4.

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.

Easement: A privilege or right that is held by one person or other entity in land owned by another.

Ecological Integrity: The integration of biological integrity, natural biological diversity, and environmental health; the replication of natural conditions (FWS, 602 FW1 1.6).

Ecosystem: A biological community together with its environment, functioning as a unit. For administrative purposes, 53 ecosystems covering the United States and its possessions have been designated. These ecosystems generally correspond with watershed boundaries, and their sizes and ecological complexity vary (FWS, 602 FW1 1.6).

Effects (Impacts): Effects include:

- Direct effects, which are caused by the action and occur at the same time and place.
- Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.
- Cumulative effects, which result from past, present, and reasonably foreseeable future actions that, collectively, become significant over time.

Effects and impacts as used in these regulations are synonymous. Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of

affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial (40 CFR 1508.8).

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*.

Endangered Species Act (ESA): Through federal action and by encouraging the establishment of state programs, the Endangered Species Act of 1973 provided for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend. The act authorizes the determination and listing of species as endangered and threatened; prohibits unauthorized taking, possession, sale, and transport of endangered species; provides authority to acquire land for the conservation of listed species, using land and water conservation funds; authorizes establishment of cooperative agreements and grants-in-aid to states that establish and maintain active and adequate programs for endangered and threatened wildlife and plants; authorizes the assessment of civil and criminal penalties for violating the act or regulations; and authorizes the payment of rewards to anyone furnishing information leading to arrest and conviction for any violation of the act or any regulation issued thereunder.

Section 7 of the Endangered Species Act requires federal agencies to insure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitat.

Environmental Action Statement (EAS): The decision document for an environmental assessment for the U.S. Fish and Wildlife Service. The EAS will consist of a one-page document indicating the proposal, the Service decision, references to supporting documents (if any), and a signature block. The purposes of the EAS are to establish a process for internal review of National Environmental Policy Act-related decision documents and to provide an appropriate administrative record of NEPA-related decisions at all management levels of the Service (FWS, 550 FW3 3.3 C).

Environmental Analysis: The process associated with preparing documents such as environmental assessments and environmental impact statements and the decision whether to prepare an environmental impact statement. It is an analysis of alternative actions and their predictable short-term and long-term effects, which include physical, biological, economic, and social factors and their interactions.

Environmental Assessment (EA): A systematic analysis to determine if proposed actions would result in a significant effect on the quality of the environment.

Environmental Consequences: The scientific and analytic basis for the comparison of alternatives. The environmental impacts of the alternatives including the proposed action, any adverse environmental effects that cannot be avoided should the proposal be implemented, the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitments of resources that would be involved in the proposal should it be implemented (40 CFR 1502.16).

Environmental Health: Abiotic composition, structure, and functioning of the environment consistent with natural conditions, including the natural abiotic processes that shape the environment (FWS, 602 FW1 1.6).

Environmental Impact Statement (EIS): A detailed written statement, required by section 102(2)(C) of the National Environmental Policy Act, analyzing the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources (40 CFR 1508.11).

Environmental Justice: The fair treatment and meaningful involvement of all people in the development, implementation, and enforcement of environmental laws regardless of race, color, national origin, or income.

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

Finding of No Significant Impact (FONSI): A document prepared in compliance with the National Environmental Policy Act and supported by an environmental assessment that briefly presents why a federal action will have no significant effects on the human environment and for which an Environmental Impact Statement will not be prepared (40 CFR 1508.13).

Global Warming: Global warming is an average increase in the temperature of the atmosphere near the Earth's surface and in the troposphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced. In common usage, "global warming" often refers to the warming that can occur as a result of increased emissions of greenhouse gases from human activities.

Goal: A descriptive, open-ended, and often broad statement of desired future conditions that conveys purposes but does not define measurable units (FWS, 602 FW1 1.6).

Greenhouse Gas (GHG): Any gas that absorbs infrared radiation in the atmosphere. Greenhouse gases include, but are not limited to, water vapor, carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), ozone (O3), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6).

Habitat: The physical and biological resources required by an organism for its survival and reproduction; these requirements are species-specific. Food and cover are major components of habitat and must extend beyond the requirements of the individual to include a sufficient area capable of supporting a viable population.

Incompatible: Any use (recreational or nonrecreational) of a refuge that, in the sound professional judgment of the Director of the U.S. Fish and Wildlife Service, will materially interfere with or detract from the fulfillment of the mission of the National Wildlife Refuge System or the purposes of the refuge. Incompatible uses are not allowed to occur on Service areas.

Indicator: In effects analysis, a way for measuring effects from management alternatives on a particular resource or issue.

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.

Invasive Species: Invasive species are organisms that are introduced into a non-native ecosystem and that cause, or are likely to cause, harm to the economy, environment, or human health.

Inventory: Accepted biological methods to determine the presence, relative abundance, and/or distribution of species (FWS, 702 FW2 2.6).

Issue: Any unsettled matter that requires a management decision—that is, a U.S. Fish and Wildlife Service initiative, opportunity, resource management problem, a threat to the resources of the unit, conflict in uses, public concern, or the presence of an undesirable resource condition (FWS, 602 FW1 1.6).

Major Federal Action: Includes action with effects that may be major and that are potentially subject to federal control and responsibility. "Major" reinforces but does not have a meaning independent of significantly. "Actions" include new and continuing activities. Federal actions include adoption of official policy, formal plans, programs, and approval of specific projects (40 CFR 1508.18).

Memorandum of Understanding or Agreement (MOU or MOA): A legal document outlining the terms and details of an agreement between parties (often U.S. Fish and Wildlife Service and a state natural resource agency), including each party's requirements and responsibilities. It sets forth the basic principles and guidelines under which the parties will work together to accomplish their goals. A memorandum of understanding or agreement are generally recognized as binding, even if no legal claim could be based on the rights and obligations laid down in them.

Migratory Birds: Birds that follow a seasonal movement from their breeding grounds to their wintering grounds. Waterfowl, shorebirds, raptors, and songbirds are all migratory birds.

Monitoring: Accepted biological methods to determine the status and/or demographics of species over time (FWS, 702 FW2 2.6).

National Environmental Policy Act (NEPA): This act, promulgated in 1969, requires all federal agencies to disclose the environmental effects of their actions, incorporate environmental information, and use public participation in the planning and implementation of all actions. Federal agencies must integrate NEPA with other planning requirements and must prepare appropriate NEPA documents to facilitate better environmental decision making (40 CFR 1500). The law also established the Council on Environmental Quality to implement the law and to monitor compliance with the law.

National Wilderness Preservation System: A network of federally owned areas designated by Congress as wilderness and managed by one of four federal agencies: the U.S. Fish and Wildlife Service, Bureau of Land Management, National Park Service, or the U.S. Forest Service. Includes over 600 areas and more than 105 million acres. The National Wildlife Refuge System includes over 20 million acres of wilderness in more than 60 refuges (FWS, 610 FW1 1.9).

National Wildlife Refuge (NWR, Refuge): A designated area of land, water, or an interest in land or water within the National Wildlife Refuge System, but does not include Coordination Areas. A complete listing of all units of the Refuge System is located in the current Report of Lands Under Control of the U.S. Fish and Wildlife Service (FWS, 602 FW1 1.6).

National Wildlife Refuge System (NWRS, 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.

National Wildlife Refuge System Improvement Act of 1997 (Improvement Act): Sets the mission and administrative policy for all refuges in the National Wildlife Refuge System. 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, and environmental education and interpretation); establishes a formal process for determining compatibility; establishes the responsibilities of the Secretary of the Interior for managing and protecting the Refuge 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.

Native Species: A species, subspecies, or distinct population that occurs within its natural range or natural zone of potential dispersal (i.e., the geographic area the species occupies naturally or would occupy in the absence of direct or indirect human activity or an environmental catastrophe).

No Action Alternative: In the context of a Comprehensive Conservation Plan, this refers to the current management direction. With this alternative, no change from the current CCP would be implemented.

Non-consumptive Uses: Recreational activities (e.g., hiking, photography, and wildlife observation) that do not involve the taking or catching of fish, wildlife, or other natural resources.

Non-native Species: A species, subspecies, or distinct population that has been introduced by humans (intentionally or unintentionally) outside its natural range or natural zone of potential dispersal.

Objective: 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. Objectives are to be attainable, time-specific, and measurable (FWS, 602 FW1 1.6).

Ozone (O3): Ozone, the triatomic form of oxygen (O3), is a gaseous atmospheric constituent. In the troposphere, it is created both naturally and by photochemical reactions involving gases resulting from human activities (photochemical smog). In high concentrations, tropospheric ozone can be harmful to a wide range of living organisms. Tropospheric ozone acts as a greenhouse gas. In the stratosphere, ozone is created by the interaction between solar ultraviolet radiation and molecular oxygen (O2). Stratospheric ozone plays a decisive role in the stratospheric radiative balance. Depletion of stratospheric ozone, due to chemical reactions that may be enhanced by climate change, results in an increased ground-level flux of ultraviolet (UV) B radiation.

Planning Area: The area upon which the planning effort will focus. A planning area may include lands outside existing planning unit boundaries currently studied for inclusion in the National Wildlife Refuge System and/or partnership planning efforts. It also may include watersheds or ecosystems outside of our jurisdiction that affect the planning unit. At a minimum, the planning area includes all lands within the authorized boundary of the refuge (FWS, 602 FW1 1.6).

Planning Team: A planning team is interdisciplinary in membership and function. A team generally consist of a planning team leader, refuge manager, staff biologists, a state natural resource agency representative, and other appropriate program specialists (e.g., social scientist, ecologist, recreation specialist). Other federal and tribal natural resource agencies may also be asked to provide team members, as appropriate. The planning team prepares the Comprehensive Conservation Plan and appropriate National Environmental Policy Act documentation (FWS, 602 FW1 1.6).

Prescribed Burning: Controlled application of fire to the landscape that allows the fire to be confined to a predetermined area while producing the intensity of heat and rate of spread required to achieve planned management objectives.

Preferred Alternative: A proposed action in the National Environmental Policy Act document for the Comprehensive Conservation Plan identifying the alternative that the U.S. Fish and Wildlife Service believes best achieves planning unit purposes, vision, and goals; helps fulfill the National Wildlife Refuge System mission; maintains and, where appropriate, restores the ecological integrity of each refuge and the Refuge System; addresses the significant issues and mandates; and is consistent with principles of sound fish and wildlife management.

Priority Public Uses: Six uses authorized by the National Wildlife Refuge System Improvement Act of 1997 to have priority and are found to be compatible with the refuge purposes. This includes hunting, fishing, wildlife observation and photography, and environmental education and interpretation.

Proposed Action: In the context of a Comprehensive Conservation Plan, this is the same as the Preferred Alternative.

Public Involvement: A process that offers affected and interested individuals and organizations opportunities to become informed about, and to express their opinions on, U.S. Fish and Wildlife Service actions and policies. In the process, these public views are studied thoroughly and are thoughtfully considered in shaping decisions for refuge management.

Purposes of the Refuge: The purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge subunit. For refuges that encompass congressionally designated wilderness, the purposes of the Wilderness Act are additional purposes of the refuge (FWS, 602 FW1 1.6).

Record of Decision (ROD): A concise public record of a decision prepared by the federal agency, pursuant to National Environmental Policy Act, that contains a statement of the decision, identification of all alternatives considered, identification of the environmentally preferable alternative, a statement whether all practical means to avoid or minimize environmental harm from the alternative selected have been adopted (and if not, why they were

not), and a summary of monitoring and enforcement where applicable for any mitigation (40 CFR 1505.2).

Resident Species: A nonmigratory species inhabiting a given locality throughout the year. Examples include white-tailed deer, muskrat, raccoon, mink, and fox.

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.

Shorebird: Long-legged birds, also known as waders, belonging to the order Charadriiformes that use shallow wetlands and mud flats for foraging and nesting.

Significant Issue: A significant issue is typically: within Service jurisdiction, suggests different actions or alternatives, and will influence the decision (FWS, 602 FW3 3.4 3b).

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

Sound Professional Judgment: A finding, determination, or decision that is consistent with principles of sound fish and wildlife management and administration, available science and resources, and adherence to the requirements of the National Wildlife Refuge System Administration Act and other applicable laws.

Stakeholder: A person or group who has an interest in activities within the Planning Area.

Step-down Management Plan: A plan that provides specific guidance on management subjects (e.g., habitat, public use, fire, safety) or groups of related subjects. It describes strategies and implementation schedules for meeting Comprehensive Conservation Plan goals and objectives (FWS, 602 FW1 1.6).

Strategic Habitat Conservation (SHC): A structured, science-driven approach for making efficient, transparent decisions about where and how to expend Service resources for species, or groups of species, that are limited by the amount or quality of habitat. It is an adaptive management framework integrating planning, design, delivery, and evaluation.

Strategy: A specific action, tool or technique, or combination of actions, tools, and techniques used to meet unit objectives (FWS, 602 FW 1.6).

Threatened Species: Those plant or animal species likely to become endangered species throughout all of or a significant portion of their range within the foreseeable future. A plant or animal identified and defined in accordance with the Endangered Species Act of 1973 and published in the *Federal Register*.

Vision Statement: A concise statement of what the planning unit should be or hope to do, based primarily upon the National Wildlife Refuge System mission, specific refuge purposes, and other mandates. The vision statement for the refuge should be tied to the mission of the Refuge System; the purpose(s) of the refuge; the maintenance or restoration of the ecological integrity of each refuge and the Refuge System; and other mandates (FWS, 602 FW1 1.6).

Waterfowl: A group of birds that include ducks, geese, and swans (belonging to the order Anseriformes).

Waterfowl Production Area (WPA): Prairie wetlands with associated uplands managed to provide nesting areas for waterfowl and owned in fee title by the U.S. Fish and Wildlife Service. These lands are purchased from willing sellers with funds from federal Duck Stamp sales. They are open to public hunting, fishing, and trapping according to state and federal regulations.

Watershed: The entire land area that collects and drains water into a river/stream or river/stream system.

Wetland: A wetland is land transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For the purposes of this classification a wetland must have one or more of the following three attributes: 1) at least periodically, the land supports predominantly hydrophytes; 2) the substrate is predominantly undrained hydric soil; and 3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year (Cowardin et al., 1979).

Wetland Management District (WMD): An area covering several counties that acquires (with federal Duck Stamp funds), restores, and manages prairie wetland habitat critical to waterfowl and other wetland birds.

Wildlife-Dependent Recreational Use: A use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation. These are the six priority public uses of the National Wildlife Refuge System as established in the National Wildlife Refuge System Administration Act, as amended. Wildlife-dependent recreational uses, other than the six priority public uses, are those that depend on the presence of wildlife. These other uses will also be considered in the preparation of refuge Comprehensive Conservation Plans; however, the six priority public uses always will take precedence (FWS, 602 FW1 1.6).

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

Waterbirds: 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 H: Legal and Policy Guidance

Administrative Procedures Act of 1946
Outlines administrative procedures to be followed by federal agencies with respect to identification of information to be made public; publication of material in the *Federal Register*; maintenance of records; attendance and notification requirements for specific meetings and hearings; issuance of licenses; and review of agency actions.

American Indian Religious Freedom Act of 1978
Establishes as policy of the United States the protection and preservation for American Indians of their inherent right to freedom to believe, express, and practice their traditional religions. The act directs federal agencies to evaluate their policies and procedures, in consultation with native traditional religious leaders, in order to determine changes required to protect and preserve Native American religious cultural rights and practices.

Americans with Disabilities Act of 1990, as amended by the ADA Amendments Act of 2008
Prohibits discrimination of individuals based on disability. It requires that public transportation services be accessible to individuals with disabilities and prohibits discrimination in employment of qualified individuals with disabilities. It requires the Equal Employment Opportunity Commission to issue regulations relating to discrimination of disabled individuals, and requires the National Council on Disability to conduct a study of areas designated as wilderness to determine the effect of the designation on the ability of individuals to enjoy such areas. The ADA Amendments Act of 2008 restored the intent and protections of the original act.

Antiquities Act of 1906
Authorizes the President to designate as National Monuments objects or areas of historic or scientific interest on lands owned or controlled by the United States. The act requires that a permit be obtained for examination of ruins, excavation of archaeological sites, and the gathering of objects of antiquity on lands under the jurisdiction of the Secretaries of Interior, Agriculture, and Army; and provides penalties for violations.

Archaeological Resources Protection Act of 1979
Largely supplanted the resource protection provisions of the Antiquities Act for archaeological items. This act established detailed requirements for issuance of permits for any excavation for or removal of archaeological resources from federal or Indian lands. It also established civil and criminal penalties for the unauthorized excavation, removal, or damage of any such resources; for any trafficking in such resources removed from federal or Indian land in violation of any provision of federal law; and for interstate and foreign commerce in such resources acquired, transported or received in violation of any state or local law. This act also required the land managing agencies to establish public awareness programs regarding the value of archaeological resources to the Nation.

Archeological and Historic Preservation Act of 1960, as amended
This act carries out the policy established by the Historic Sites, Buildings and Antiquities Act of 1935 (known as the Historic Sites Act). It directs federal agencies to notify the Secretary of the Interior whenever they find a federal or federally assisted, licensed, or permitted project may cause loss or destruction of significant scientific, prehistoric, or archaeological data. The act authorizes use of appropriated, donated, and/or transferred funds for the recovery, protection, and preservation of such data.

Archeological and Historic Preservation Act of 1974
Directs the preservation of historic and archaeological data in federal construction projects.

Architectural Barriers Act of 1969
Ensures that certain buildings financed or leased by federal agencies are constructed (or renovated) so that they will be accessible to the physically handicapped.

Bald and Golden Eagle Protection Act of 1940, as amended
Prohibits the possession, sale, or transport of any bald or golden eagle, alive or dead, or part, nest, or egg except as permitted by the Secretary of the Interior for scientific or exhibition purposes or for the religious purposes of Indians.

Bankhead-Jones Farm Tenant Act of 1937
Directs the Secretary of Agriculture to develop a program of land conservation and utilization in order to correct maladjustments in land use and thus assist in such things as control of soil erosion, reforestation, preservation of natural resources, and protection of fish and wildlife. Some early refuges and hatcheries were established under authority of this act.

Clean Air Act of 1970
Regulates air emissions from area, stationary, and mobile sources. The act and its amendments charge federal land managers with direct responsibility to protect the “air quality and related values” of land under their control. These values include fish, wildlife, and their habitats.

Emergency Wetlands Resources Act of 1986
Authorized the purchase of wetlands from Land and Water Conservation Fund moneys, removing a prior prohibition on such acquisitions. Requires the Secretary of the Interior to establish a National Wetlands Priority Conservation Plan, requires the states to include wetlands in their comprehensive outdoor recreation plans, and transfers to the Migratory Bird Conservation Fund amounts equal to import duties on arms and ammunition. It established entrance fees at national wildlife refuges. It also extended the Wetlands Loan Act authorization through 1988 and required the Secretary to report to Congress on wetlands loss.
In addition, it directed the Secretary, through the U.S. Fish and Wildlife Service, to continue the National Wetlands Inventory; to complete mapping of the contiguous United States; and to produce at ten-year intervals reports to update and improve in the September 1982 "Status and Trends of Wetlands and Deepwater Habitat in the Coterminous United States, 1950s to 1970s." This act also increased the price of Duck Stamps.

Endangered Species Act of 1973, as amended
Directs federal agencies to take actions that would further the purposes of the act and to ensure that actions they carry out, authorize, or fund do not jeopardize endangered species or their critical habitat. The act also provides authority for land acquisition. Conservation of threatened and endangered species has become a major objective of both land acquisition and refuge management programs.

Endangered Species Conservation Act of 1969
This act expanded the provisions of the Endangered Species Preservation Act of 1966 to include the listing of species in danger world-wide and added mollusks and crustaceans to the animals that could be listed.

Endangered Species Preservation Act of 1966

This act was the predecessor to the Endangered Species Act of 1973 and directed the Secretary of the Interior to produce a list of native U.S. vertebrate species in danger of extinction for the limited protection of those animals.

Environmental Education Act of 1990
Established the Office of Environmental Education within the Environmental Protection Agency to develop and administer a federal environmental education program in consultation with other federal natural resource management agencies, including the U.S. Fish and Wildlife Service.

Executive Order 11593: Protection and Enhancement of the Cultural Environment (1971)
States that if the U.S. Fish and Wildlife Service proposes any development activities that may affect the archaeological or historic sites, the Service will consult with federal and state Historic Preservation Officers to comply with section 106 of the National Historic Preservation Act of 1966, as amended.

Executive Order 11644: Use of Off-road Vehicles on the Public Lands (1972)
Established policies and procedures to ensure that the use of off-road vehicles on public lands will be controlled and directed to protect the resources of those lands, to promote the safety of all users of those lands, and minimize conflicts among the various uses of those lands. EO 11989 (1977) amends section 2 of EO 11644 and directs agencies to close areas negatively impacted by off-road vehicles.

Executive Order 11988: Floodplain Management (1977)
Prevents federal agencies from contributing to the "adverse impacts associated with occupancy and modification of floodplains" and the "direct or indirect support of floodplain development." In the course of fulfilling their respective authorities, federal agencies "shall take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health, and welfare, and restore and preserve the natural and beneficial values served by floodplains.

Executive Order 11990: Protection of Wetlands (1977)
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 (1982)
Seeks to foster intergovernmental partnerships by requiring federal agencies to use the state process to determine and address concerns of state and local elected officials with proposed federal assistance and development programs.

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1994)
Mandates that each federal agency shall make achieving environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. This order also creates an Interagency Working Group on Environmental Justice to provide guidance to federal agencies in overcoming these issues.

Executive Order 12906: Coordinating Geographical Data Acquisition and Access: The National Spatial Data Infrastructure (1994), as amended by Executive Order 13286: Amendment of Executive Orders, and Other Actions, in Connection With the Transfer of Certain Functions to the Secretary of Homeland Security (2003)

Recommended that the executive branch develop, in cooperation with state, local, and tribal governments, and the private sector, a coordinated National Spatial Data Infrastructure to support public and private sector applications of geospatial data. Of particular importance to Comprehensive Conservation Plans is the National Vegetation Classification System (NVCS), which is the adopted standard for vegetation mapping. Using NVCS facilitates the compilation of regional and national summaries, which, in turn, can provide an ecosystem context for individual refuges.

Executive Order 12962: Recreational Fisheries (1995)
Directs federal agencies to improve the quantity, function, sustainable productivity, and distribution of United States aquatic resources for increased recreational fishing opportunities in cooperation with states and tribes.

Executive Order 12996: Management and General Public Use of the National Wildlife Refuge System (1996)
Defines a conservation mission for the National Wildlife Refuge System, six compatible wildlife-dependent recreational activities, and four guiding principles for management of the Refuge System. Directs the Secretary of the Interior to undertake several actions in support of management and public use and to ensure the maintenance of the biological integrity and environmental health of the Refuge System. It also provides for the identification of existing wildlife-dependent uses that will continue to occur as lands are added to the Refuge 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.

Executive Order 13061: Federal Support of Community Efforts Along American Heritage Rivers (1997)
Established the American Heritage Rivers initiative for the purpose of natural resource and environmental protection, economic revitalization, and historic and cultural preservation. The act directs federal agencies to preserve, protect, and restore rivers and their associated resources important to our history, culture, and natural heritage.

Executive Order 13084: Consultation and Coordination With Indian Tribal Governments (2000)
Provides a mechanism for establishing regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications.

Executive Order 13112: Invasive Species (1999)
Directs federal agencies to prevent the introduction of invasive species, detect and respond rapidly to and control populations of such species in a cost effective and environmentally sound manner, accurately monitor invasive species, provide for restoration of native species and habitat conditions, conduct research to prevent introductions, to control invasive species, and to promote public education on invasive species and the means to address them. This EO replaces and rescinds EO 11987: Exotic Organisms (1977).

Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds (2001)
Instructs federal agencies to conserve migratory birds by several means, including the incorporation of strategies and recommendations found in Partners in Flight Bird Conservation

plans, the North American Waterfowl Plan, the North American Waterbird Conservation Plan, and the United States Shorebird Conservation Plan, into agency management plans and guidance documents.

Executive Order 13443: Facilitation of Hunting Heritage and Wildlife Conservation (2007)
Directs federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management, including the Department of the Interior and the Department of Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.

Farmland Protection Policy Act of 1981, as amended
Minimizes the extent to which federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses. Federal programs include construction projects and the management of federal lands.

Federal Advisory Committee Act of 1972, as amended
Governs the establishment of and procedures for committees that provide advice to the federal government. Advisory committees may be established only if they will serve a necessary, nonduplicative function. Committees must be strictly advisory unless otherwise specified and meetings must be open to the public.

Federal-Aid Highways Act of 1968
Establishes requirements for approval of federal highways through wildlife refuges and other designated areas to preserve the natural beauty of such areas. The Secretary of Transportation is directed to consult with the Secretary of the Interior and other federal agencies before approving any program or project requiring the use of land under their jurisdiction.

Federal Aid in Sport Fish Restoration Act (Dingell-Johnson Act) of 1950
Authorizes the Secretary of the Interior to provide financial assistance for state fish restoration and management plans and projects. It is financed by excise taxes paid by manufacturers of rods, reels, and other fishing tackle.

Federal Aid in Wildlife Restoration Act (Pittman-Robertson Act) of 1937
Taxes the purchase of ammunition and firearms and earmarks the proceeds to be distributed to the states for wildlife restoration.

Federal Cave Resources Protection Act of 1988
Established requirements for the management and protection of caves and their resources on federal lands, including allowing the land managing agencies to withhold the location of caves from the public and requiring permits for any removal or collecting activities in caves on federal lands.

Federal Lands Recreation Enhancement Act (REA) of 2004
Allows the government to charge a fee for recreational use of public lands managed by the U.S. Fish and Wildlife Service and other agencies. The recreation fee program is a program by which fees paid by visitors to certain federal recreation sites are retained by the collecting site and used to improve the quality of the visitor experiences at those sites.

Federal Noxious Weed Act of 1975, as amended
The Secretary of Agriculture was given the authority to designate plants as noxious weeds and to cooperate with other federal, state, and local agencies; farmers associations, and private

individuals in measures to control, eradicate, prevent, or retard the spread of such weeds. The act requires each federal land-managing agency, including the U.S. Fish and Wildlife Service, to designate an office or person to coordinate a program to control such plants on the agency's land and implement cooperative agreements with the states, including integrated management systems to control undesirable plants.

Federal Records Act of 1950
Directs the preservation of evidence of the government's organization, functions, policies, decisions, operations, and activities, as well as basic historical and other information.

Federal Water Pollution Control Act of 1948, as frequently amended particularly by the Clean Water Act of 1977
This act and its amendments have as their objectives the restoration and maintenance of the chemical, physical, and biological integrity of the Nation's waters and, therefore, regulates the discharge of pollutants into waters of the United States. The act protects fish and wildlife, establishes operation permits for all major sources of water pollution, limits the discharge of pollutants or toxins into water, and makes it unlawful for any person to discharge any pollutant from a point source into navigable waters unless a permit is obtained under the Clean Water Act. Section 404 charges the U.S. Army Corps of Engineers with regulating discharge of dredge or fill materials into waters of the United States, including wetlands. The "Clean Water Act" became the common name with amendments in 1977.

Federal Water Project Recreation Act of 1965, as amended
Declares the intent of Congress that recreation and fish and wildlife enhancement be given full consideration as purposes of federal water development projects. The act also authorizes the use of federal water project funds for land acquisition in order to establish refuges for migratory waterfowl when recommended by the Secretary of the Interior, and authorizes the Secretary to provide facilities for outdoor recreation and fish and wildlife at all reservoirs under his control, except those within national wildlife refuges.

Fish and Wildlife Act of 1956, as frequently amended
Establishes a comprehensive national fish, shellfish, and wildlife resources policy with emphasis on the commercial fishing industry but also with a direction to administer the act with regard to the inherent right of every citizen and resident to fish for pleasure, enjoyment, and betterment and to maintain and increase public opportunities for recreational use of fish and wildlife resources. The 1998 amendments to the act modified the powers of the Secretary of the Interior in regard to volunteer service, community partnerships, and education programs.

Fish and Wildlife Conservation Act of 1980, as amended
Requires the Service to monitor non-gamebird species, identify species of management concern, and implement conservation measures to preclude the need for listing under the Endangered Species Act.

Fish and Wildlife Coordination Act of 1934
Promotes equal consideration and coordination of wildlife conservation with other water resource development programs by requiring consultation with the U.S. Fish and Wildlife Service and the state fish and wildlife agencies where the "waters of a stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted . . . or otherwise controlled or modified" by any agency under federal permit or license. This act also authorized use of surplus federal property for wildlife conservation purposes and authorized the Secretary of the Interior to provide public fishing areas and accept donations of lands and funds.

Fish and Wildlife Improvement Act of 1978
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 of the Interior 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.

Food Security Act of 1985 (Farm Bill), as amended
Known as the Farm Bill, this act contains several provisions that contribute to wetland conservation. The Swampbuster provisions state that farmers who convert wetlands for the purpose of planting after enactment of the law are ineligible for most farm program subsidies. The act also established the Wetlands Reserve Program to restore and protect wetlands through easements and restoration of the functions and values of wetlands on such easement areas.

Freedom of Information Act of 1966
Requires all federal agencies to make available to the public for inspection and copying administrative staff manuals and staff instructions; official, published and unpublished policy statements; final orders deciding case adjudication; and other documents. Special exemptions have been reserved for nine categories of privileged material. The act requires the party seeking the information to pay reasonable search and duplication costs.

Geothermal Steam Act of 1970, as amended
Authorizes and governs the lease of geothermal steam and related resources on public lands. Section 15(c) of the act prohibits issuing geothermal leases on virtually all U.S. Fish and Wildlife Service-administered lands.

Historic Sites, Buildings and Antiquities Act of 1935
Popularly known as the Historic Sites Act, as amended in 1965, declared it a national policy to preserve historic sites and objects of national significance, including those located on refuges. It provided procedures for designation, acquisition, administration, and protection of such sites. Among other things, National Historic and Natural Landmarks are designated under authority of this act.

Lacey Act of 1900, as amended
Originally designed to help states protect their native game animals and to safeguard U.S. crop production from harmful foreign species. The act prohibits interstate and international transport and commerce of fish, wildlife, or plants taken in violation of domestic or foreign laws. It regulates the introduction to the United States of foreign species into new locations.

Land and Water Conservation Fund Act of 1965
Provides funding through receipts from the sale of surplus federal land, appropriations from oil and gas receipts from the outer continental shelf, and other sources for land acquisition under several authorities. Appropriations from the fund may be used for matching grants to states for outdoor recreation projects and for land acquisition by various federal agencies including the Fish and Wildlife Service.

Migratory Bird Conservation Act of 1929
Establishes a Migratory Bird Conservation Commission to approve areas recommended by the Secretary of the Interior for acquisition with Migratory Bird Conservation Funds. Authorizes the

Secretary of the Interior to cooperate with local authorities in wildlife conservation and to conduct investigations, to publish documents related to North American birds, and to maintain and develop refuges. The act provides for cooperation with states in enforcement. It establishes procedures for acquisition by purchase, rental, or gift of areas approved by the Commission for migratory birds. This act includes acquisition authority for purchase or rental of a partial interest in land or waters and requires the Secretary of the Interior to consult with the appropriate units of local government and with the governor of the state concerned, or the appropriate state agency, before recommending an area for purchase or rental. This provision was subsequently amended in 1983, 1984, and 1986 to require that either the governor or the state agency approve each proposed acquisition. The role of the Commission was expanded by the North American Wetland Conservation Act to include approving wetlands acquisition, restoration, and enhancement proposals recommended by the North American Wetlands Conservation Council.

Migratory Bird Hunting and Conservation Stamp Act (Duck Stamp Act) of 1934
Known as the Duck Stamp Act, this act requires every waterfowl hunter 16 years of age or older to carry a stamp, and earmarks proceeds of 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.

Migratory Bird Treaty Act of 1918
Implements various treaties and conventions between the United States and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Except as allowed by special regulations, the act makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, barter, export, or import any migratory bird, part, nest, egg, or product.

Mineral Leasing Act for Acquired Lands of 1947, as amended
Authorizes and governs mineral leasing on acquired public lands.

Minerals Leasing Act of 1920, as amended
Authorizes and governs leasing of public lands for development of deposits of coal, oil, gas, and other hydrocarbons, sulphur, phosphate, potassium, and sodium. Section 185 of this act contains provisions relating to granting rights-of-way over federal lands for pipelines.

Mining Act of 1872, as amended
Authorizes and governs prospecting and mining for the so-called "hardrock" minerals (such as gold and silver) on public lands.

National and Community Service Act of 1990
Authorizes several programs to engage citizens of the United States in full and/or part-time projects designed to combat illiteracy and poverty, provide job skills, enhance educational skills, and fulfill environmental needs. Among other things, this law established the American Conservation and Youth Service Corps to engage young adults in approved human and natural resource projects, which will benefit the public or are carried out on federal or tribal lands.

National Environmental Policy Act of 1969 (NEPA), as amended
This act and the implementing regulations developed by the Council on Environmental Quality (40 CFR 1500 to 1508) require federal agencies to integrate the National Environmental Policy Act (NEPA) process with other planning at the earliest possible time to provide a systematic interdisciplinary approach to decision making; to identify and analyze the environmental effects of their actions; to describe appropriate alternatives to the proposed actions; and to involve the

affected state and federal agencies, tribal governments, and public in the planning and decision-making process. This act requires the disclosure of the environmental impacts of any major federal action significantly affecting the quality of the human environment.

National Historic Preservation Act of 1966
Repeatedly amended, the act provides for preservation of significant historical features (buildings, objects, and sites) through a grant-in-aid program to the states. It established a National Register of Historic Places and a program of matching grants under the existing National Trust for Historic Preservation (16 U.S.C. 468-468d). The act established an Advisory Council on Historic Preservation, which was made a permanent independent agency in 1976 (90 Stat. 1319). That act also created the Historic Preservation Fund. Federal agencies are directed to take into account the effects of their actions on items or sites listed or eligible for listing in the National Register. 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.

National Trails System Act of 1968
Established the National Trails System to protect the recreational, scenic, and historic values of some important trails. National Recreation Trails may be established by the Secretaries of the Interior or Agriculture on land wholly or partly within their jurisdiction, with the consent of the involved state(s) and other land managing agencies, if any. National scenic and national historic trails may only be designated by an act of Congress. Several national trails cross units of the National Wildlife Refuge System.

National Wildlife Refuge System Administration Act of 1966 (amended by the National Wildlife Refuge System Improvement Act of 1997)
This act consolidates the authorities relating to the various categories of lands for the conservation of fish and wildlife administered by the Secretary of the Interior through the U.S Fish and Wildlife Service by designating all such areas part of a single National Wildlife Refuge System. Areas include wildlife refuges, areas for the protection and conservation of fish and wildlife threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas. The law also prohibits knowingly disturbing any area within the system or the take of Refuge System wildlife without a permit. The act addresses the growing need for recreational opportunities by providing a decision framework for allowing appropriate and compatible uses of the Refuge System.

National Wildlife Refuge System Centennial Act of 2000
Establishes a commission to promote awareness by the public to develop a long-term plan to meet priority needs of the National Wildlife Refuge System, require an annual report on the needs, and improve public use programs and facilities.

National Wildlife Refuge System Improvement Act of 1997
This act, which amends the National Wildlife Refuge System Administration Act of 1966, serves as the "organic act" for the National Wildlife Refuge System. The act states first and foremost that the mission of the National Wildlife Refuge System is focused singularly on wildlife conservation. It establishes a unifying mission for the Refuge System, reinforces the importance of refuge purposes to guide management direction, articulates a process for determining compatible uses of refuges, identifies six priority wildlife-dependent recreation uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation),

and adds a requirement for preparing comprehensive conservation plans through a public planning process. The act requires the Secretary of the Interior to maintain the biological integrity, diversity, and environmental health of the Refuge System.

National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act of 1998
Amends the Fish and Wildlife Act of 1956 to encourage the use of volunteers to help in the management of refuges within the National Wildlife Refuge System; facilitates partnerships between the Refuge System and nonfederal entities to promote public awareness of the resources of the Refuge System and public participation in the conservation of the resources; and encourages donations and other contributions.

National Wildlife Refuge Volunteer Improvement Act of 2010
Maintains the current funding authorization level for the U.S. Fish and Wildlife Service's volunteer and community partnerships programs that are vital to national wildlife refuges but makes a number of important amendments. The law amends the National Wildlife Refuge Volunteer and Community Partnership Enhancement Act of 1998 to direct the Service to carry out a National Volunteer Coordination Program within the National Wildlife Refuge System. It also requires the Director of the Service to publish a national strategy for the coordination and utilization of volunteers within the Refuge System and provide at least one regional volunteer coordinator for each Service region to implement the strategy.

Native American Graves Protection and Repatriation Act (NAGPRA) of 1990
Requires federal agencies and museums to inventory, determine ownership of, and repatriate cultural items under their control or possession. This act imposes serious delays on a project when human remains or other cultural items are encountered in the absence of a plan.

Neotropical Migratory Bird Conservation Act of 2000
Establishes a matching grants program to fund projects that promote the conservation of neotropical migratory birds in the United States, Latin America, and the Caribbean.

North American Wetlands Conservation Act of 1989
Provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on wetlands between the United States, Canada, and Mexico. North American Wetlands Conservation Council is created to recommend projects to be funded under the act to the Migratory Bird Conservation Commission. Available funds may be expended for up to 50 percent of the United States' share cost of wetlands conservation projects in Canada, Mexico, or the United States (or 100 percent of the cost of projects on federal lands).

Partnerships for Wildlife Act of 1992
Established a Wildlife Conservation and Appreciation Fund to receive appropriated funds and donations from the National Fish and Wildlife Foundation and other private sources to assist the state fish and game agencies in carrying out their responsibilities for conservation of non-game species. The funding formula is no more than 1/3 federal funds, at least 1/3 foundation funds, and at least 1/3 state funds.

Refuge Recreation Act of 1962, as amended
Requires that any recreational use on areas of the National Wildlife Refuge System be "compatible" with the primary purpose(s) for which the area was acquired or established. This

act also requires that sufficient funding be available for the development, operation and maintenance of recreational uses that are not directly related to the area's primary purpose(s).

Refuge Revenue Sharing Act of 1935
Provides for payments to counties in lieu of taxes, using revenues derived from the sale of products from refuges. A major revision in 1964 requires all revenues received from refuge products be distributed to counties for public schools and roads (this stipulation later removed). Another revision in 1974 requires that any remaining funds be transferred to the Migratory Bird Conservation Fund for land acquisition. A 1978 amendment stated payments to counties were established as:

- on acquired land, the greatest amount calculated on the basis of 75 cents per acre, three-fourths of one percent of the appraised value, or 25 percent of the net receipts produced from the land, and
- on land withdrawn from the public domain, 25 percent of net receipts and basic payments.

This amendment also required counties to pass payments along to other units of local government within the county that suffer losses in revenues due to the establishment of U.S. Fish and Wildlife Service areas.

Rehabilitation Act of 1973, as amended
Prohibits discrimination on the basis of disability under any program or activity receiving federal financial assistance.

Rivers and Harbors Appropriations Act of 1899, as amended
Requires the authorization by the Chief of Engineers prior to any work in, on, over, or under navigable waters of the United States. The Fish and Wildlife Coordination Act provides authority for the U.S. Fish and Wildlife Service to review and comment on the effects on fish and wildlife activities proposed to be undertaken or permitted by the COE. Service concerns include contaminated sediments associated with dredge or fill projects in navigable waters.

Secretarial Order 3289 Amendment 1: Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources (2010)
Secretarial Order 3285, issued in March 2009, made production and transmission of renewable energy on public lands a priority for the Department of the Interior. This Secretarial Order, 3289A1, issued in February 2010 establishes a Department-wide approach for applying scientific tools to increase understanding of climate change and to coordinate an effective response to its impacts on tribes and on the land, water, ocean, fish and wildlife, and cultural resources that the Department manages.

Sikes Act of 1960, as amended
Provides for the cooperation by the U.S. Departments of the Interior and Defense with state agencies in planning, development, and maintenance of fish and wildlife resources and outdoor recreation facilities on military reservations throughout the United States. It requires the Secretary of each military department to use trained professionals to manage the wildlife and fishery resource under his jurisdiction and requires federal and state fish and wildlife agencies be given priority in management of fish and wildlife activities on military reservations.

Surface Mining Control and Reclamation Act of 1977

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.

Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 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 the Interior if the land has particular value for migratory birds or to a state agency for other wildlife conservation purposes.

Transportation Equity Act for the 21st Century of 1998
Established the Refuge Roads Program, requires transportation planning that includes public involvement, and provides funding for approved public use roads and trails and associated parking lots, comfort stations, and bicycle/pedestrian facilities.

Treasury and General Government Appropriations Act of 2000
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 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.

Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
Provides for uniform and equitable treatment of persons who sell their homes, businesses, or farms to the U.S. Fish and Wildlife Service. The act requires that any purchase offer be no less than the fair market value of the property.

Water Resources Planning Act of 1965
Established the Water Resources Council to be composed of Cabinet representatives, including the Secretary of the Interior. The Council reviews river basin plans with respect to agricultural, urban, energy, industrial, recreational, and fish and wildlife needs. The act also established a grant program to assist states in participating in the development of related comprehensive water and land use plans.

Wild and Scenic Rivers Act of 1968
Established a National Wild and Scenic Rivers System and prescribes the methods and standards through which additional rivers may be identified and added to the system. Section 5(d)(1) requires that in all planning by federal agencies for the use and development of water and related land resources, consideration be given to potential wild, scenic, and recreation rivers. Rivers are added to the national system based on their free-flowing character and their outstandingly remarkable scenic, recreation, geologic, fish and wildlife, historic, cultural, ecological, or other values. Rivers in the system are managed to maintain and protect these outstandingly remarkable values for present and future generations.

Wilderness Act of 1964
Defined the Wilderness resource and established the National Wilderness Preservation System. It directed the Secretary of the 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. This act also prescribes the management of new inclusions as wilderness.

Youth Conservation Corps Act of 1970
Established a permanent Youth Conservation Corps program within the Departments of the Interior and Agriculture. Within the U.S. Fish and Wildlife Service, YCC participants perform many tasks on refuges, fish hatcheries, and research stations.

Appendix I: Literature Cited

Akers, K.K.B, Montgomery, D.L., Christiansen, D.E., Savoca, M.E., Schnoebelen, D.J., Becher, K.D., and Sadorf, E.M. 2000. Wat*er-quality assessment of the Eastern Iowa Basins: Hydrologic and biologic data*, October 1996 through September 1998: U.S. Geological Survey Open-File Report 00-67, p. 359.

Andren. H. 1994. Effects of habitat fragmentation on birds and mammals in landscapes with different proportions of habitat – a review. Oikos. 71:355-366.

Benson, T.J., J.J. Dinsmore, W. I. Hohman. 2006. *Changes in land cover and breeding bird populations with the restoration of riparian habitats in east-central Iowa*. Journal Iowa Academy of Science 113 (1, 2): pp. 10–16.

Berendzen, P.B., R.M. Cruse, L.L Jackson, R. Mulqueen, C.F. Mutel, D. Osterberg, N.P. Rogovska, J.L. Schnoor, D. Swenson, E.S. Takle, P.S. Thorne. 2010. *Climate change impacts on Iowa*. www.water.iastate.edu/Documents/CompleteReport%final.pdf

Brown, S., C. Hickey, B. Harrington, and R. Gill, eds. 2001. *The U.S. Shorebird Conservation Plan*, 2nd ed. Manomet Center for Conservation Sciences, Manomet, MA.

Cowardin, L.M., V. Carter, F.C. Golet, E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Washington D.C.

Fitzgerald, J.A. and D.N. Pashley. 2000. Partners in Flight Bird Conservation Plan for the Dissected Till Plains (Physiographic Area 32).

Gleason, H.A. 1923. *The vegetational history of the middle west*. Annuls of the Association of American Geographers. 12: pp. 39–85.

Hayden, A. 1945. *The selection of prairie areas in Iowa which should be preserved. Proceedings of the Iowa Academy of Science*. 52: pp. 127–148.

Iowa Department of Natural Resources. 2009. *High resolution land cover of Benton county, Iowa County, and Tama counties*. Iowa Geological and Water Survey. Iowa City, Iowa.

Iowa Department of Natural Resources. 2011. Forest Wildlife Habitat Plan: Iowa River Corridor, State Wildlife Management Area – NW Unit. 16pp.

Iowa Department of Natural Resources. 2012. Trends in Iowa Wildlife Populations and Harvest 2010. Iowa Department of Natural Resources, Chuck Gipp, Director, October 2011.

Iowa Valley Resource Conservation and Development. 2009. *Birder's Guide to the Iowa and Cedar River Valleys*.

Kalkhoff, S.J., Barnes, K.K., Becher, K.D., Savoca, M.E., Schnoebelen, D.J., Sadorf, E.M., Porter, S.D., and Sullivan, D.J., 2001. W*ater quality in the Eastern Iowa Basins, Iowa and Minnesota, 1996-98*. U.S. Geological Survey Circular 1210. p. 37.

Karl, T.R., J.M. Melillo, and T.C. Peterson (Eds). 2009. *Global Climate Change Impacts in the United States*. Global Climate Change Research Program. Cambridge University Press and http://www.globalchange.gov/usimpacts.

Kushlan, James. A., Melanie J. Steinkamp, Katharine C. Parsons, Jack Capp, Martin Acosta Cruz, Malcolm Coulter, Ian Davidson , Loney Dickson, Naomi Edelson, Richard Elliot, R. Michael Erwin, Scott Hatch, Stephen Kress, Robert Milko, Steve Miller, Kyra Mills, Richard Paul, Roberto Phillips, Jorge E. Saliva , Bill Sydeman, John Trapp, Jennifer Wheeler, and Kent Wohl. 2002. *Waterbird Conservation for the Americas: The North American Waterbird Conservation Plan,* Version 1. Waterbird Conservation for the Americas, Washington, DC, U.S.A. p. 78.

Linhart, M.S., Eash, D. A. Flo*ods of May 30 to June 15, 2008, in the Iowa River and Cedar River Basins, eastern Iowa*, U.S. Geological Survey Open-File Report 2010-1190.

Littin, G.R., and McVay, J.C., 2008, *Water-quality and biological assessment of the Iowa River and tributaries within and contiguous to the Meskwaki Settlement of the Sac and Fox tribe of the Mississippi in Iowa*, 2006–07: U.S. Geological Survey.

Owen, D.D., J. Leidy, J.G. Norwood, C.C. Parry, H. Pratten, B.F. Shumard, C. Whittlesey. 1852. *Report of a geological survey of Wisconsin, Iowa, and Minnesota: an incidentally a portion of Nebraska Territory*. United States. General Land Office.; United States. Dept. of the Treasury.

Parker, N.H. 1855. *Iowa as it is in 1855: A Gazeteer for Citizens*. Chicago: Keen and Lee.

Potter, B. A., R. J. Gates, G. J. Soulliere, R. P. Russell, D. A. Granfors, and D. N. Ewert. 2007. *Upper Mississippi River and Great Lakes Region Joint Venture Shorebird Habitat Conservation Strategy*. U. S. Fish and Wildlife Service, Fort Snelling, MN. pp. 101.

Prior, J. 1991. *Landforms of Iowa*. University of Iowa Press, Iowa City, Iowa.

Rich, T. D., C. J. Beardmore, H. Berlanga, P. J. Blancher, M. S. W. Bradstreet, G. S. Butcher, D. W. Demarest, E. H. Dunn, W. C. Hunter, E. E. Iñigo-Elias, J. A. Kennedy, A. M. Martell, A. O. Panjabi, D. N. Pashley, K. V. Rosenberg, C. M. Rustay, J. S. Wendt, T. C. Will. 2004. *Partners in Flight North American Landbird Conservation Plan*. Cornell Lab of Ornithology. Ithaca, NY.

Sample, David W., and Michael J. Mossman. 1997. *Managing habitat for grassland birds – a guide for Wisconsin*. Wisconsin Department of Natural Resources, Madison, WI, PUBL-SS-925-97. p.154. Jamestown, ND: Northern Prairie Wildlife Research Center Online. http://www.npwrc.usgs.gov/resource/birds/wiscbird/index.htm (Version 03JUN2002).

Soulliere, G. J., B. A. Potter, D. J. Holm, D. A. Granfors, M. J. Monfils, S. J. Lewis, and W. E. Thogmartin. 2007. *Upper Mississippi River and Great Lakes Region Joint Venture Waterbird Habitat Conservation Strategy*. U.S. Fish and Wildlife Service, Fort Snelling, MN. p. 68.

USDA Soil Survey, Natural Resources Conservation Service, United States Department of Agriculture, Soil Survey Geographic (SSURGO) Database for Iowa. Available online at http://soildatamart.nrcs.usda.gov.

U.S. Fish and Wildlife Service. 1995. *Final Environmental Assessment and Finding of No Significant Impact for U.S. Fish and Wildlife Service Proposed Land Acquisition in the Iowa River Corridor Project*, dated July 20, 1995.

U.S. Fish and Wildlife Service. 2002. *Fish and Wildlife Resource Conservation Priorities Region 3*. p. 35.

U.S. Fish and Wildlife Service. 2004. *Comprehensive Conservation Plan and Environmental Assessment*. Mark Twain National Wildlife Refuge Complex. p. 441.

U.S. Fish and Wildlife Service. 2007. *Wildland Fire Management Plan, Port Louisa National Wildlife Refuge*. p. 86.

U.S. Fish and Wildlife Service. 2008. *Birds of Conservation Concern 2008*. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. p. 85. Available online at http://www.fws.gov/migratorybirds/.

U.S. Fish and Wildlife Service. 2011. *Conserving the Future, Wildlife Refuges and the Next Generation*. p. 93.

U.S. Fish and Wildlife Service, Midwest Region. 2011. *Environmental Assessment Use of Row Crop farming and Genetically-modified Glyphosate-tolerant Corn and Soybeans on National Wildlife Refuges and Wetland Management Districts*. p. 103.

U.S. Fish and Wildlife Service. 2012. *Final Environmental Assessment Fishing Program for Iowa River Corridor Project. Port Louisa National Wildlife Refuge*. p. 40.

U.S. Fish and Wildlife Service. 2012. *Final Environmental Assessment Hunt Program for Iowa River Corridor Project. Port Louisa National Wildlife Refuge*. p. 50.

U.S. Fish and Wildlife Service. 2012. *Water Resources Inventory and Assessment*. p. 32.

Weaver, J. E. 1968. *Prairie plants and their environment*. University of Nebraska Press, Lincoln, Nebraska, USA.

Wisconsin Reed Canary Grass Management Working Group. 2009. *Reed canarygrass (Phalaris arundinacea) management guide: recommendations for landowners and restoration professionals*.

Zohrer, James. J. E Resources Group. Revised 2006. *Securing a Future for Fish and Wildlife. A conservation legacy for Iowans*. The Iowa Wildlife Action Plan. p. 344.

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