

Final Land Protection Plan and Environmental Assessment

Middle Mississippi River National Wildlife Refuge Boundary Expansion

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Prepared by

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Land Protection Plan & Environmental Assessment for Middle Mississippi River National Wildlife Refuge Major Boundary Expansion

Date: June 1, 2023

This Land Protection Plan & Environmental Assessment is being prepared to evaluate the effects associated with the proposed action and complies with the National Environmental Policy Act in accordance with Council on Environmental Quality regulations (40 CFR 1500-1509) and Department of the Interior (43 CFR 46; 516 DM 8) and United States Fish and Wildlife Service (550 FW 3) regulations and policies. The National Environmental Policy Act requires examination of the effects of proposed actions on the natural and human environment. Appendix B outlines all law and executive orders evaluated through this Environmental Assessment.

Section A: Land Protection Plan

Introduction

Project Description

In accordance with U.S. Fish and Wildlife Service (Service) policy and the National Environmental Policy Act (NEPA), this Land Protection Plan (LPP) and Environmental Assessment (EA) has been prepared analyzing the effects and describing the priorities of acquiring additional acreage within the Middle Mississippi River National Wildlife Refuge (Refuge) in Missouri and Illinois. This Land Protection Plan identifies the expanded acquisition boundary for the Refuge encompassing portions of the following counties within the historic floodplain: Madison, St. Clair, Monroe, Randolph, Jackson, Union, and Alexander counties along the Illinois side of the Mississippi River, and St. Louis, Jefferson, Ste. Genevieve, Perry, Cape Girardeau, Scott, and Mississippi counties along the Missouri side of the Mississippi River (see Figures 19-21). Working with a multitude of partners, the Fish and Wildlife Service has mapped an approximate boundary in this area encompassing public and private lands along the Middle Mississippi River Corridor (Corridor) (Figure 8). This area was studied for restoration, enhancement, and management potential as part of an expansion of the Middle Mississippi River National Wildlife Refuge. The new recommended acquisition boundary within the Corridor and the proposed acreage limit of 90,000 within this boundary are described in Alternative 2 of the Final Environmental Assessment (Section B of this document) and its Finding of No Significant Impact (FONSI).

The purposes of this Land Protection Plan are to

- provide landowners and the public with a description of the Service’s priorities and protection methods for land within the proposed expanded acquisition boundary;
- assist landowners in making decisions about any property which may lie within the newly proposed expanded acquisition boundary;
- and inform landowners about the Service policies for acquiring land from willing sellers.

The following planning topics outline the options and methods that will be used to provide the minimum interests necessary to help conserve and protect the fish, wildlife, and plant resources in the area.

Refuge Vision

The existing Refuge was established as a standalone refuge on May 31, 2000 when the “divisions” of the Mark Twain National Wildlife Refuge Complex were converted to individually named and managed refuges. With that change, the Mark Twain Complex divisions south of St Louis, Missouri, extending from River Mile 156.5 to River Mile 32.5, collectively became known as the Middle Mississippi River National Wildlife Refuge. These original Refuge divisions were authorized for purchase by the Service in response to the “Great Flood of 1993.” The majority of these lands lie within the uncontrolled portion of the Mississippi River below the confluence with the Missouri River, where river levels are not regulated by a lock and dam system. Water levels may fluctuate greatly in this "open river" section of the Mississippi, and frequent flooding occurs on these lands. The existing Refuge, along with the other standalone refuges that were formerly part of the Mark Twain Complex, lie within an Important Bird Area by the National Audubon Society, used by thousands of migrant & wintering waterfowl using the Mississippi Flyway, and thousands of migrant shorebirds and breeding & migrating passerines.

The proposed expansion of the Refuge to a limited number of acres within the proposed new expanded acquisition boundary extending from River Mile 195 south to River Mile 1 would provide for the protection and restoration of large, connected areas of floodplain hardwood forest; critical habitat for migratory birds and resident threatened and endangered species; and land and river access for sportspersons and outdoor enthusiasts. These priorities all contribute to fulfilling the mission of the National Wildlife Refuge System which 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”.

In order to meet these priorities, Refuge staff worked with the Middle Mississippi River Partnership (Partnership) to establish several goals that would be in place for the expanded Refuge to help meet the natural resource conservation needs in this landscape (please see the “Coordination” section of this document for a description of the Partnership). The goals identified would act to:

1. Protect forested riverine habitat and healthy forests across wide stretches of the floodplain that contain sufficient diversity of tree species, size, and age to provide diverse habitat structure and food resources;
2. Restore and enhance floodplain forest to meet the need of migratory and nesting neotropical birds and other forest dependent wildlife;
3. Restore or enhance riparian corridors along the open river off-channel areas;
4. Protect existing wetland resources to provide diverse habitat for waterfowl, shorebirds, wading birds, and other wetland dependent species; and
5. Increase resource compatible recreation opportunities on public lands.

Resources

Resources To Be Protected

The existing Refuge was created under mandates from five legislative authorities: the Migratory Bird Conservation Act, Fish and Wildlife Coordination Act, Refuge Recreation Act, Emergency Wetlands Resources Act of 1986, and the National Wildlife Refuge System Administration Act. It is managed for migratory birds, fish, threatened, and endangered species. The existing Refuge provides important resting, feeding, and wintering areas for migratory bird species using the Mississippi Flyway. Thousands of ducks, geese, and neotropical migrants funnel through this important river corridor during their spring and fall migration. The aquatic resources of the existing Refuge offer diverse habitats that fish and other aquatic species use for spawning, shelter during high flow, and completing stages of their life cycle. It is also important habitat for many other resident wildlife species.

The existing Refuge supports a limited variety of riverine, forest, wetland, and seral natural communities. Many community types have been degraded, damaged, or eliminated as a result of numerous impacts. Most notably, the construction of levees to protect vast floodplain developments, the in-channel river training structures, climate change, and the extensive tile and ditch system installed over the years to facilitate agricultural drainage in the upper watershed. Despite these alterations, natural communities on lands within the current and proposed expanded Refuge boundary have the potential to be restored through various management actions and site-specific restoration projects. Although restoration targets may not fully mimic historical conditions, they will provide a more functional ecological system that can support healthy and thriving wildlife populations. Because the proposed expanded Refuge is located outside or on the riverside of the major levee systems, these floodplain communities have the opportunity to be hydrologically connected through the natural flood pulse that drives the ecological dynamics in a large river floodplain system.

The Corridor is subdivided into three ecoregions (Figures 1-3) (Heitmeyer 2008). The first ecoregion, the American Bottoms, extends from the confluence of the Mississippi and Missouri rivers (River Mile 195) south to the Kaskaskia River-Mississippi River confluence near Chester,

Illinois (River Mile 117). The second ecoregion extends from the Kaskaskia-Mississippi River confluence to the narrow floodplain constriction at Thebes Gap, immediately south of Cape Girardeau, Missouri (River Mile 44). The third ecoregion extends from Thebes Gap south to the confluence of the Mississippi and Ohio Rivers (River Mile 1). The seven current Refuge divisions are located in the upper two ecoregions in the Corridor, the American Bottoms and Kaskaskia Ecoregions. Currently, there are no Refuge holdings within the Thebes Ecoregion, although a small section of the current approved acquisition boundary exists on Powers Island that falls within that ecoregion.

Vulnerability & Resiliency

The climate surrounding the proposed expanded Refuge is characterized by seasonal variations of hot, humid summers and cold winters. There is some variation in temperatures and precipitation from the upper portions of the river corridor to the lower portions. The weather station at Anna, Illinois, represents one of the longest continuous weather records in the region. The average high summer temperature is approximately 88°F and the average winter temperature is 44°F, which is representative of the southern half of the river corridor (Heitmeyer 2008). In general, July is the warmest month, with an average high temperature of 89°F, whereas January is the coldest month, with lows averaging 41°F. Shallow water wetlands in the region are typically frozen from late November through mid-March; the first hard frosts and freezes usually occur in early to mid-October. Based on data collected by the Natural Resources Conservation Service using wetland climate stations in Sparta, Illinois, the growing season is approximately 200 days annually between early April and late October (NRCS 2003) (Figure 4).

Total annual precipitation in the region is slightly more than 37 inches (*www.weatherbase.com*). Precipitation generally is low in the winter. The area annually receives an average of 16.1 inches of snow, with January being the driest month (average of 3.0 inches of precipitation). May is typically the wettest month of the year and receives on average 5.3 inches of precipitation. Summer storms are relatively common, and daily rain totals of more than 3 to 4 inches occasionally occur (Figure 5).

Thomas and Eash (2016) evaluated data from a United States Historical Climatology Network station at Sparta, Illinois for the timeframe from 1950 to 2014 to assess climate trends in Middle Mississippi River regional corridor. Their evaluation was done by water year, which is defined as the 12-month period October 1, for any given year through September 30, of the following year. Their main conclusions, as illustrated in Figure 6 & 7, were:

- There was a significant increase in average water year temperatures ($p=0.002$).
- Average yearly temperatures (1950-2014) increased across all seasons with the greatest increase occurring during the cool season (Oct-March) and spring.

- There was a significant increase in average mean spring temperatures ($p=0.001$), minimum spring temperatures ($p<0.001$), and maximum spring temperatures ($p=0.014$). There was also a significant increase in minimum summer temperatures ($p<0.001$).
- Average mean ($p=0.017$) and minimum ($p<0.001$) cool season temperatures have increased significantly since the 1950s.
- Although not significant, there was a slight increase in total precipitation during the cool season (October-March) (1950-2014).

Future climate change is a concern that, depending on the accuracy of current assessments, could have major influences on the existing Refuge. Several reports indicate that the Midwest has already been affected by climate change. For example, heavy precipitation events are currently much more frequent and intense in the region than they were a century ago (Kunkel 1999, Kunkel et al. 2003, Kunkel et al. 2013), and the Midwest has experienced an increase in runoff, with expectations of more intense flood conditions in the future. Already at high flood risk, winters and springs are expected to be about 20% wetter toward the end of the century (UCS 2009). While average winter precipitation across the Midwest is expected to increase, summer precipitation is projected to remain the same or decrease (Wuebbles and Hayhoe 2003).

Toward the end of the 21st century, Illinois and Missouri could see upwards of 100 days per summer with temps over 90°F and approximately 30 days over 100°F (UCS 2009). In Illinois under a higher-emissions scenario, average summer temperatures are expected to increase by more than 3°F in the next few decades and by about 13°F toward the end of the century (UCS 2009). This, coupled with reduced precipitation during the summer could lead to reductions in soil moisture, causing drought-like conditions. Not surprisingly, the occurrence of temperatures below freezing are expected to decrease. Projections for the Midwest show that by mid-century about 15 fewer days will experience minimum temperatures below freezing (http://glisa.umich.edu/media/files/NCA/MTIT_Future.pdf).

If climate projections are realized, events such as flooding may increase mudflats and herbaceous vegetation cover in shrub habitats, benefitting some important conservation species. It is also suspected that increases in temperature and precipitation could increase the rate at which invasive species spread across the landscape. All of these risks could affect the existing Refuge's biological diversity, integrity, and environmental health.

Relationship of Proposal to Conservation Goals

The defined corridor study area developed by the Partnership included the Mississippi River and its associated floodplain between the confluence with the Missouri River near St. Louis, Missouri and the confluence with the Ohio River near Cairo, Illinois (Figure 8). The study area included land in both Illinois and Missouri and encompassed approximately 550,000 acres. With a focus on ecosystem restoration, natural resources management, and the interaction between the natural resource community and other communities of practice which impact, or are impacted

by, natural resources planning and decision-making, the Partnership efforts were concentrated on a common goal of restoring and enhancing the natural resources within the Corridor.

In an update to a 2008 Middle Mississippi River Regional Plan authored by the Partnership, goals were developed surrounding the 11 inter-related resource concerns or issue areas identified by the Partnership in 2005 during its formative years. These eleven were distilled down to the three key resource concerns: wildlife habitat, aquatic habitat, and recreation, all which became the primary focus of the Partnership's plan. As a member of this partnership working on the Plan, the Service sought to ensure that its conservation and management efforts in this area remain a part of a larger, collaboratively developed conservation strategy. The participants recognized the importance of land acquisition to the implementation of their desired conservation actions, while acknowledging the key role that the Service could play in these efforts. The Plan subsequently identified several goals, five of which align with the mission of the U.S. Fish and Wildlife Service and the National Wildlife Refuge System and have been adopted by the Refuge.

As previously mentioned, five conservation goals have been identified which support the expansion of the Refuge. These include:

Goal 1) Protect forested riverine habitat and healthy forests across wide stretches of the floodplain that contain sufficient diversity of tree species, size, and age to provide diverse habitat structure and food resources.

Goal 2) Restore and enhance floodplain forest to meet the need of migratory and nesting neotropical birds and other forest dependent wildlife.

Goal 3) Restore or enhance riparian corridors along the open river off-channel areas.

Goal 4) Protect existing wetland resources to provide diverse habitat for waterfowl, shorebirds, wading birds, and other wetland dependent species.

Goal 5) Increase resource compatible recreation opportunities on public lands.

Both the Illinois and Missouri State Wildlife Action Plans mirror similar goals and objectives. The Middle Miss Forty-Six is an unpublished conceptual document produced by the Partnership describing forty-six opportunities for the partners to achieve significant success to the above-described goals and many include components of land acquisition. These items were an outcome of a series of meetings held throughout the basin in 2006 & 2007, and later updated in 2022, during which many groups, agencies, and local landowners identified where needs and opportunities to work together for the betterment of the Middle Mississippi River region existed. For example, some of the opportunities identified from River Mile 160-120 included the following (excerpt):

“Side channel restoration. There are seven major chutes within the reach. All were medium to high priority in the 1999 side channel report. One chute, Salt Lake Chute, already has a completed hydraulic sediment response (HSR) model.

Island creation and new secondary channel creation. There are 5 dikes in Reach 2. Two of the 5 reaches have HSR models completed. Reach 2 contains the entire prototype dike reach (limited or no dredging) which will potentially allow some of the best opportunities for dike modification and flow modification without impacts to navigation.

Bottomland prairie restoration. American Bottoms once had large tracts of bottomland prairie. Bottomland prairie restoration opportunities are now largely limited to Reach 2 and the lower American Bottoms due to urbanization. The greatest opportunities appear to be between River Mile 132-118. This area also continued one of few locations with slope savanna and mesic prairie within the Middle Mississippi River region. Through public and private programs, a concerted effort should be made to restore some sustainable prairie patches in this area.”

As the Middle Miss Forty-Six document continues to evolve, Refuge staff will be assessing the suggested conservation opportunities and their relationship to Refuge conservation goals, as well as working to acquire lands that are identified to provide said ecological opportunities. In the following Environmental Assessment document, multiple acquisition boundary alternatives are identified and measured against their ability to meet these conservation goals. We based the proposed land protection (Refuge acquisition) boundary on the biological importance of key habitats. The establishment of this proposed expanded Refuge boundary would give the Service the approval to negotiate with landowners who may be interested or may become interested in selling their land in the future. With this internal approval in place, the Service can react more quickly as important lands become available. Lands within this boundary do not become part of the Refuge unless their owners willingly sell or donate them to the Service.

Land Protection Strategy

Conservation and Protection Priorities

As previously stated, the Service would prioritize three categories of land within the historic floodplain boundary. Our preferred action alternative (Alternative B) would result in the protection, restoration, and management of up to 90,000 acres of habitat as an expansion of the currently existing Middle Mississippi River National Wildlife Refuge, through a combination of acquisition methods, with a focus on fee-title purchases from willing sellers. It is our policy to acquire the minimum interests necessary to conserve and protect the natural resources within the proposed expanded Refuge boundary. In order to acquire lands that will best help the Service meet the previously discussed conservation goals, lands within the boundary will be prioritized for acquisition using three distinct categories.

Priority Category I: Protection and restoration of large, connected areas of floodplain hardwood forest.

In addition to existing floodplain forest areas that are generally located adjacent to the river, lands within this category consist largely of frequently flooded agricultural lands. The bulk of these areas are adjacent to existing Refuge holdings and currently under private ownership. Acquisition of interests in these lands would allow the Refuge to greatly increase in size and would begin the process of linking the existing Refuge island divisions. Restoration of the bottomland forested habitat in these areas would provide benefits at a landscape level by reducing the chemical pollution, nutrient pollution, and sediment loads entering the Mississippi River and increasing the connected forest areas to provide habitat for migratory birds and other species of concern. A portion of these lands are located within the batture, or those lands between the levee and the Mississippi River, and are subject to frequent flooding. Any acquisition of lands in this area would provide protection against future land development in these highly flood prone area, with opportunities for restoration and public use.

Priority Category II: Identified habitat for migratory birds and resident threatened and endangered species.

Lands within this category are represented by a variety of land use areas, largely under private ownership. The acquisition and restoration of these lands within the migratory flyways would provide invaluable habitat for various species, especially those lands located inside a levee, and would provide similar landscape level benefits as those listed for Priority Category I.

Priority Category III: Land and river access for sportspersons and outdoor enthusiasts.

This category consists of those lands adjacent to the existing Refuge island divisions, as well as various points of potential access along the Mississippi River.

The Service, while focusing on these priority areas, reserves the right to be flexible, as these are not the only categories of land that can help reach the previously mentioned conservation goals, and opportunities outside of the priority list will be considered as they are presented. These outliers could include upland areas of biological significance, habitats with existing or potential threats, and areas that may contribute to the ease of Refuge management or administration by providing a physical delineation of a unit for example. Additionally, the Service must be flexible to identify the options that best align with the desires of individual landowners to conserve their land.

Land Use Protection Options

As the number of acquisition opportunities has slowed in recent years within the current approved acquisition boundary of the existing Refuge, an expansion could provide the Service with a larger pool of willing sellers. This LPP adds an expanded acquisition boundary beyond the current discrete Refuge divisions to include the entire historic floodplain. This “bluff to bluff” approach includes areas that are in the historic river floodplain but are now, in most cases, levee protected, generally for agriculture purposes. The rationale behind this decision is to put the Service in a position to act upon willing-seller or donated-land opportunities that may come up, in order to acquire interests in tracts of land that have largely intact habitats, have a high

potential for restoration, or involve situations where the seller has a strong desire to keep the land from being developed. When additional land is needed to achieve these conservation objectives, the Service seeks to acquire and protect the minimum interest necessary to meet the objectives. As defined in 341 FW 2, *Land Acquisition Planning Purchase*, this protection is implemented through various options, including, but not limited to the following:

Fee-title acquisition - This is the acquisition of most or all of the rights to a tract of land from an interested landowner, also known as a “willing” seller. There is a total transfer of property rights with the formal conveyance of a title. While a fee title acquisition involves most rights to a property, certain rights may be reserved or not purchased. Examples would include water rights, mineral rights, or a use reservation.

Lease - This is a short-term (usually 5 to 10 years) agreement with an interested landowner for full or specified use in return for a rental payment (usually annual) and generally includes occupancy rights. The rights revert back to the owner at the termination of the lease. This device is useful when the objectives are short term, or the owners are unable to provide other forms of land transfer. The property remains on the tax rolls during the term of the lease.

Easement - This is the acquisition of a limited right(s) (less-than-fee) from an interested landowner. The right to control access, grazing, timber harvest, hunting, and development of the property are some typical examples of rights acquired in easements. Easements are property rights and are usually perpetual. If a landowner sells his/her property, the easements continue as part of the title. Easements are especially useful when multiple uses for property can be developed. Properties subject to easements generally remain on the tax roll, although the assessment may be reduced by the reduction of market value.

Cooperative Agreement, Memorandum of Understanding or Memorandum of Agreement – Considered a method of acquiring secondary jurisdiction from a willing landowner, these agreements are usually with another public agency or with an organization for wildlife management purposes. These are often referred to as “overlays” and can be terminated in whole or in part, if necessary, by the agency having primary jurisdiction. In the majority of cases, wildlife management must be compatible with those uses for which the primary agency acquired the land.

License or Permit: This type of instrument is an acquired authorization for a specific activity on land of another party. They are temporary in nature, and no property rights are acquired. Their advantages are simplicity and ease to negotiate. An example would be a license or permit to conduct a wildlife inventory on property owned by a willing landowner.

Although all options for acquisition would be considered within a proposed expanded Refuge boundary, the Service has determined that fee title acquisition would best protect crucial terrestrial and aquatic habitats in areas that have proven to be unsuitable for farming due to increasingly more frequent flooding. In addition, lands being added to an expanded Refuge

would provide much needed public access to land where they can enjoy a variety of uses including hunting, fishing, environmental education, and other resource compatible recreation. This is another one of the five previously identified Refuge conservation goals.

Land Acquisition Methods

As indicated in the Service Manual, 341 FW 2, *Land Acquisition Planning Purchase*, protection options for lands acquired during this expansion could include the following:

Purchase - This is the most direct means of obtaining fee title or an interest in land. The Service negotiates the sale of one, some, or all rights to property from a willing seller. A willing seller also includes landowners agreeing to price settlement by court action requested by the landowner (“friendly condemnation”) in order to resolve the issue of just compensation. All purchases by the Federal Government must be based on fair market value as determined by qualified appraisers.

Exchange - Lands under Service or other Federal agency control can be exchanged for land having greater potential for achieving habitat protection objectives. Inherent in the exchange concept is the requirement to get dollar value for dollar value. Exchanges are attractive in that they usually decrease Federal land inholdings and do not require funds for purchase. However, they may be very labor intensive and take years to complete. A third party may at times be utilized to facilitate an exchange.

Donation - A citizen or group of citizens may wish to make a gift of land or interests in land to the Service for wildlife purposes. Aside from the cost factor, these acquisitions are no different than any other means of land acquisition. Gifts and donations have the same planning requirements that purchases do.

Service Acquisition Policy

It is the Service’s long-standing policy to acquire land from only willing sellers. Under this policy, landowners are under no obligation to sell unless they accept an offer made after a fair market value appraisal has been completed. The appraisal would be paid for and contracted by the Service. Appraisals conducted by Service or contract appraisers must meet Federal as well as professional appraisal standards. In all fee-title acquisition cases, the Service is required by Federal law to offer 100 percent of the property’s appraised market value, which is typically based on comparable sales of similar types of properties. It should be noted that the Refuge boundary does not preclude owners from developing their properties. They may choose to develop their land within the Refuge boundary. All such development would still be subject to local zoning and regulatory authorities.

Funding

Funding for land acquisition primarily comes from the Land and Water Conservation Fund Act and the Migratory Bird Conservation Fund, which are funded by royalties on offshore oil and gas leases, import duties collected on arms and ammunition, proceeds from permits for rights-of-way, and proceeds from the sale of the Federal Duck Stamp, respectively. These funds were established to benefit conservation of fish, wildlife, and habitats and enhance public recreation. In Fiscal Year 2022, the Refuge received \$1 million through the Land and Water Conservation Fund for land acquisition from interested sellers.

Within the study area, land purchase values range widely, but currently average in the \$1000 to \$1500 per acre range, however the per acre value varies widely based upon land use and tract size. It is extremely difficult to pre-determine the total acquisition cost for this Refuge expansion due to complexities associated with varying acquisition methods, consistently changing market values and the fact that the acquisition of the target acreage could take more than a decade to complete. It is important to note that these approximations, as well as the approximations made throughout the remainder of this document, are based on current market values at the time of the writing of this document. Land values are likely to fluctuate over time, resulting in a change to the actual costs associated with the expansion.

Coordination

Landscape Conservation Partners

In 2004, a number of regional agencies with responsibility or interest in natural resource management and conservation in Middle Mississippi River region recognized the need for better collaboration and cooperation between groups. What resulted was the formation of the Middle Mississippi River Partnership, a coalition of twenty-two state, federal and non-governmental agencies and organizations who joined together under a memorandum of understanding. The results of this Partnership, as well as the Service's contributions will be further discussed within this document.

The effort to engage in a landscape conservation design was initiated by the Middle Mississippi River Partnership. This effort resulted in the creation of a landscape conservation design document titled 'Middle Mississippi River Regional Plan: 2018 Update' for the Corridor that was finalized in early 2019 (hereafter referred to as the Design). The Partnership is a collaboration of organizations, including the Service, which have been working together on natural resource and cultural issues in the Middle Mississippi River Region since 2004. It consists of 22 partners including the United States Fish and Wildlife Service, United States Department of Agriculture Forest Service, The Nature Conservancy, Southern Illinois University, United States Geological Survey, Illinois Department of Natural Resources, Missouri Department of Natural Resources, Missouri Department of Conservation, American Land Conservancy, Ducks Unlimited, Illinois Society of American Foresters, United States

Department of Agriculture Natural Resources Conservation Service, Wildlife Forever, United States Army Corps of Engineers, Southwestern Illinois RC&D, United States Environmental Protection Agency, Southern Illinois Community Foundation, The Conservation Fund, Upper Mississippi River and Great Lakes Region Joint Venture, and the Illinois Forestry Development Council.

The Design document focuses efforts on a common goal of restoring and enhancing the natural resources within the Corridor. It is an update to a 2008 Middle Mississippi River Regional Plan (hereafter referred to as the 2008 Plan) authored by the Partnership that developed goals surrounding the 11 inter-related resource concerns or issue areas identified by the Partnership in 2005 during its formative years. In the Design, these eleven were distilled down to the three key resource concerns of wildlife habitat, aquatic habitat and recreation that became its primary focus. As a member of this partnership working on the Design, the Service sought to ensure that its conservation and management efforts in this area remain a part of a larger, collaboratively developed conservation strategy. Since 2019 a Land Protection Strategy has been developed and authorization from leadership to perform the detailed planning discussed in this land protection plan and environmental assessment was received.

In addition to the aforementioned documents, the Partnership produced a collection of spatial data (including land cover, access points, and other important resources), a compilation of implementation opportunities, and an assessment of the natural resource reach potential or all five river reaches within the corridor.

Project Scoping

Public scoping was conducted during August of 2022. The purpose of scoping was to gather input from the public regarding the intent to prepare documents for the expansion of the existing Refuge. This process sought to identify any present issues or potential roadblocks that could occur during the planning process.

On July 26, 2022, an information packet announcing the start of a public scoping period for the proposed expansion was released to the public, governmental partners, and interested tribes. It contained a map of the study area, as well as some commonly asked questions about refuge expansions. This announcement was delivered as a news release to various media outlets within the states of Illinois and Missouri, as well as being included in an email to various governmental agencies and organizations and was uploaded to the publicly accessible Refuge website. The announcement also included notice that information tables would be set up in three locations within the study area August 3, 2022 through August 16, 2022 to provide the public with an opportunity to speak with a Refuge manager or pick up hard copies of the same documents that were available on the website. These locations included the Audubon Center at Riverlands (301 Riverlands Way, West Alton, MO), the Chester Public Library (733 State Street, Chester, IL), and the Cape Girardeau Conservation Nature Center (2289 County Park Drive, Cape Girardeau, MO).

Public and governmental agency reaction to the proposed Refuge expansion received during the scoping period at the public information sessions and via regular mail and email was largely favorable. The existing Refuge and other preservation areas along the Mississippi River hold a large draw for outdoor enthusiasts, sportspersons, and conservation groups. During the public information sessions, support for the expansion was expressed by individuals, conservation groups, and state agencies. One concern was voiced about the loss of farmland in the area. In response to concerns of this nature, the Service will reiterate the Service policy of only acquiring land from willing sellers – for additional information regarding this topic, please see the section titled “Service Acquisition Policy”.

Section B: Environmental Assessment

Introduction

The existing Refuge has an office in Ste. Genevieve, Missouri and is managed in conjunction with Clarence Cannon and Great River National Wildlife Refuges which are both headquartered in Annada, Missouri. Currently the Middle Mississippi River National Wildlife Refuge has an authorized acquisition boundary of 27,746 acres, and is made up of seven divisions, mostly located on the outside, or riverside, of the Mississippi River levee in both Illinois and Missouri. These divisions are managed as outlined in the Comprehensive Conservation Plan and Environmental Assessment for the Mark Twain National Wildlife Refuge that was approved July 27, 2004 (U.S. Fish and Wildlife Service 2004). The Refuge is actively acquiring land and currently totals 8,215 acres in size consisting of a series of non-contiguous polygons within its seven divisions (Figures 9-18).

The existing Refuge currently protects and manages a mosaic of mainly floodplain forest with shrub swamp and side channel habitats within these batture lands that are defined as the alluvial land between the low tide of the Mississippi and the levee, from an area south of St. Louis, Missouri to an area north of Cape Girardeau, Missouri and serves as a critical component for migratory birds that rest, feed and winter along the Mississippi flyway. The existing Refuge boundary has units located within the Central Hardwoods and Upper Mississippi River/Great Lakes Region Joint Ventures. Additionally, the existing Refuge has close proximity to the Illinois Wetland Campaign’s Lower Mississippi River Bottomlands priority area, and three different Missouri Priority Forest Landscapes: Middle Mississippi, Cape Hills, and River Bends.

This Environmental Assessment and associated Landscape Protection Plan are written in accordance with Service policies and planning directives. Specifically, the process of landscape protection planning carried out by the Service includes three phases: 1) participation in landscape conservation design, 2) Director’s approval to move forward with detailed planning that outlines the role and impacts of the Service pursuing land conservation to meet the goals identified in the landscape conservation design, and 3) detailed planning that will result in the development of a

Landscape Protection Plan. The Service's participation in developing a landscape conservation design is intended to produce a natural resource conservation proposal which has been formed by a regional landscape conservation cooperative made up of multiple partners throughout the greater conservation community. The "Frequently Asked Questions" document in Appendix H provides further detail regarding this process.

Proposed Action

The Service proposes to expand the currently authorized 27,746-acre latest Director approved acquisition boundary for the Middle Mississippi River National Wildlife Refuge in order to acquire additional interest as directed and described in the landscape conservation Design document. The Service seeks to acquire, protect, and manage the identified lands through fee-title purchases, leases, donations, conservation easements, and/or cooperative agreements from willing landowners. All lands and waters acquired will be managed by the Service as the Middle Mississippi River National Wildlife Refuge.

It is anticipated that funding for the Refuge will be provided through the Land and Water Conservation Fund and Migratory Bird Conservation Fund. The authorities for the use of Land and Water Conservation Fund for land acquisition include the Fish and Wildlife Act of 1956; Endangered Species Act of 1973; Emergency Wetlands Resources Act of 1986; and National Wildlife Refuge System Improvement Act of 1997. The authority for the use of Migratory Bird Conservation Fund for land acquisition is the Migratory Bird Conservation Act of 1929. This document is intended to provide the public and agency decision makers with an analysis of the range of options to restore, enhance, and protect a variety of habitats within an expanded refuge boundary. A proposed action can evolve during the National Environmental Policy Act process as the agency refines its proposal and gathers feedback from the public, tribes, and other agencies. Therefore, the final proposed action may be different from the original. The proposed action was finalized at the conclusion of the public comment period for the Draft Environmental Assessment and is described in this Final Environmental Assessment.

Background

National wildlife refuges are guided by the mission and goals of the National Wildlife Refuge System, the purposes of an individual refuge, Service policy, and laws and international treaties. Relevant guidance includes the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations and Fish and Wildlife Service Manual.

Middle Mississippi River National Wildlife Refuge was established pursuant to the following laws. Establishing laws become primary purposes of the Refuge, they are:

- " ... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds ... ", 16 United States C.-715d (Migratory Bird Conservation Act)

- " ... shall be administered by [Secretary of the Interior] directly or in accordance with cooperative agreements ... and in accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon, ... ", 16 United States C. -662 (Fish and Wildlife Coordination Act)
- " ... suitable for - 1) incidental fish and wildlife-oriented recreational development, 2) the protection of natural resources, 3) the conservation of endangered species or threatened species ... ", 16 United States C.-460k-1 (Refuge Recreation Act)
- " ... 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 ... ", 16 United States C. -3901(b) 100 Stat. 3583 (Emergency Wetlands Resources Act of 1986)
- ... for conservation purposes", (1985 Food Security Act in conjunction with the transfer of Farm Service Agency, formerly Farmers Home administration, property)

The mission of the National Wildlife Refuge System, as outlined by the National Wildlife Refuge System Administration Act, as amended by the National Wildlife Refuge System Improvement Act (16 United States C. 668dd et seq.), 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"

Additionally, the National Wildlife Refuge System Administration Act mandates the Secretary of the Interior in administering the National Wildlife Refuge System (16 United States C. 668dd(a)(4)) to

- Provide for the conservation of fish, wildlife, and plants, and their habitats within the National Wildlife Refuge System;
- Ensure that the biological integrity, diversity, and environmental health of the National Wildlife Refuge System are maintained for the benefit of present and future generations of Americans;
- Ensure that the mission of the National Wildlife Refuge System described at 16 United States C. 668dd(a)(2) and the purposes of each refuge are carried out;
- 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 National Wildlife Refuge System are located;
- Assist in the maintenance of adequate water quantity and water quality to fulfill the mission of the National Wildlife Refuge System and the purposes of each refuge;

- Recognize compatible wildlife-dependent recreational uses as the priority general public uses of the National Wildlife Refuge System through which the American public can develop an appreciation for fish and wildlife;
- Ensure that opportunities are provided within the National Wildlife Refuge System for compatible wildlife-dependent recreational uses; and
- Monitor the status and trends of fish, wildlife, and plants in each refuge.

Purpose and Need for the Action

The purpose of this proposed action is to expand habitat conservation opportunities in the Mississippi River Corridor through land acquisition in Missouri and Illinois, to further the protection and management of species of concern, and to increase public access by acquiring land from willing sellers in both states.

The need of the proposed action is to meet the Service’s priorities and mandates as outlined by the National Wildlife Refuge System Administration Act to “provide for the conservation of fish, wildlife, and plants, and their habitats within the System...plan and direct the continued growth of the System in a manner that is best designed to accomplish the mission of the System, to contribute to the conservation of the ecosystems of the United States, to complement efforts of States and other Federal agencies to conserve fish and wildlife and their habitats, and to increase support for the System and participation from conservation partners and the public... provide increased opportunities for families to experience compatible wildlife-dependent recreation” (16 United States C. 668dd(a)(4)).

The proposed expansion would provide for: 1) the protection and restoration of large, connected areas of floodplain hardwood forest; 2) critical habitat for migratory birds and resident threatened and endangered species; and 3) land and river access for consumptive and non-consumptive recreational users. These all contribute to fulfilling the mission of the National Wildlife Refuge System which 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” and are described in more detail in the associated Land Protection Plan available in Section A of this document.

Alternatives

Alternative A – Continue Efforts Within the Current Latest Director Approved Acquisition Boundary

The National Environmental Policy Act requires that a “no action” alternative serve as a baseline to which all other alternatives are compared. Under Alternative A, there would be no additional

Service acquisition authority to augment the existing acquisition options within the current approximately 27,746-acre boundary. The Middle Mississippi River National Wildlife Refuge was established as an individual refuge on May 31, 2000 and consists of seven island divisions that lie within the uncontrolled portion of the Middle Mississippi River, below the confluence with the Missouri River. The Service currently owns and manages 8,215 acres of land within this boundary (Figures 9-18) and would continue the same activities that it has pursued under the existing Comprehensive Conservation Plan (USFWS 2004), including partnerships to restore impacted habitats, implementation of actions to control invasive species, and maintenance of public access to the Refuge, as well as the acquisition of lands within this boundary.

Alternative B – Acquire Additional Acreage, With a Focus on Habitat Restoration and Enhancement, Within the Floodplain Corridor Between River Mile 195 and River Mile 1 [Preferred Action Alternative]

Landscape Conservation Focus

Under the Proposed Action Alternative, the Service would undertake an expansion of the current Refuge boundary to encompass a portion of a limited floodplain boundary that would extend the extent of this Refuge along the Mississippi River from its confluence with the Missouri River (River Mile 195) to its confluence with the Ohio River at Cairo, Illinois (River Mile 1), covering a total distance of about 195 river miles. This alternative broadens the acquisition boundary from the discrete divisions to include the entire historic floodplain (Figures 19-21) with an acreage cap. This “bluff to bluff” approach includes areas that are in the historic river floodplain but may now be levee protected, generally for agriculture purposes. The rationale behind this decision is to put the Service in a position to act upon willing-seller or donated-land opportunities that may come up, in order to acquire tracts of land that 1) have largely intact habitats; 2) have a high potential for restoration, or 3) involve situations where the seller has a strong desire to keep the land from being developed. Acquisition would be focused on, but not limited to, high value forest and marsh restoration areas, high value forest enhancement areas, and high value marsh enhancement areas. Although not the priority, other opportunities to restore prairie wetlands or native grasslands would still be explored as they become available. Under this alternative, the Service would have the opportunity to acquire up to 112,493 additional acres using the Forest and Marsh Restoration and Enhancement Ranks as developed for the Middle Mississippi River Partnership Design (Tables 1-3), with the high value rankings of these index values (7 or greater). Based on staff capabilities and funding feasibility, we have chosen to reduce this to acquisition cap from 112,493 to 90,000 acres.

Land Protection Methods

In developing our proposed action, we considered several land protection options. Those options are as follows, in no specific order:

- 1) Management and/or land protection measures by others
- 2) Less-than-fee-title acquisition (easement, lease, management agreement) by the Service
- 3) Fee-title acquisition by the Service

This proposal would focus primarily on option 3. We feel that this approach allows for the most manageable and cost-effective acquisitions.

Costs

Fee title land purchase values range widely but average in the \$1000 to \$1500 per acre range. Taking an average of this range, the total projected cost, if all 90,000 acres were to be acquired in fee title at current appraised values, could reach approximately \$113 million dollars over the lifetime of this project.

Alternative C – Acquire Additional Acreage, With a Focus on Habitat Restoration, Within the Floodplain Corridor Between River Mile 195 and River Mile 1

Landscape Conservation Focus

Similar to Alternative B, this alternative would broaden the limited approved acquisition boundary to the Mississippi River’s historic floodplain corridor extending for 195 river miles from its confluence with the Missouri River south of St. Louis, Missouri to Cairo, Illinois (Figures 19-21). Alternative C, however, promotes a focus on high value forest and marsh restoration lands as determined by the high rankings (7 or greater) in the landscape conservation design “Middle Mississippi River Regional Plan: 2018 Update” document for the Middle Mississippi River Partnership (MMRP 2019). A focus on only the forest and marsh restoration areas, while still reserving the right to explore acquisition of other habitats as they become available. This would limit the total acquisition to approximately 22,971 acres within the larger corridor (Table 1).

Land Protection Methods

In developing this action, we considered several land protection options. Those options are as follows, in no specific order:

- 1) Management and/or land protection measures by others
- 2) Less-than-fee-title acquisition (easement, lease, management agreement) by the Service
- 3) Fee-title acquisition by the Service

This proposal would focus primarily on option 3. We feel that this approach allows for the most manageable and cost-effective acquisitions.

Costs

Fee title land purchase values range widely but average in the \$1000 to \$1500 per acre range. Taking an average of this range, the total projected cost, if all 22,971 acres were to be acquired in fee title at current appraised values, could reach approximately \$28 million dollars over the lifetime of this project.

Alternative D – Acquire Additional Acreage, With a Focus on Habitat Enhancement, Within the Floodplain Corridor Between River Mile 195 and River Mile 1

Landscape Conservation Focus

As with Alternatives B & C, Alternative D would broaden the limited approved acquisition boundary to the Mississippi River’s historic floodplain corridor extending for 195 miles from its confluence with the Missouri River south of St. Louis, Missouri to Cairo, Illinois (Figures 19-21). Alternative D, however, promotes a focus on high value forest and marsh enhancement lands as determined by high rankings (7 or greater) in the “Middle Mississippi River Regional Plan: 2018 Update” for Middle Mississippi River Partnership (MMRP 2019). A focus on only the enhancement areas, while still reserving the right to explore acquisition of other habitats as they become available, would limit the acquisition to approximately 89,522 acres within the larger landscape (Tables 2 & 3).

Land Protection Methods

In developing this action, we considered several land protection options. Those options are as follows, in no specific order:

- 1) Management and/or land protection measures by others
- 2) Less-than-fee-title acquisition (easement, lease, management agreement) by the Service
- 3) Fee-title acquisition by the Service

This proposal would focus primarily on option 3. We feel that this approach allows for the most manageable and cost-effective acquisitions.

Costs

Fee title land purchase values range widely but average in the \$1000 to \$1500 per acre range. Taking an average of this range, the total projected cost, if all 89,522 acres were to be acquired in fee title at current appraised values, could reach approximately \$112 million dollars over the lifetime of the project.

Alternative(s) Considered, But Dismissed from Further Consideration

There are additional alternatives or actions that have been considered or that were discussed internally but were ultimately not analyzed in detail. Below we will discuss why they were eliminated from further analysis.

The Service would only acquire lands located within the specific Landscape Conservation Focus Areas outlined in Alternatives B, C, and D.

Proposing an alternative that only allows us to acquire specific habitats could limit us from acquiring and restoring important grassland habitats and would not address the purpose and need of our proposal. As such, under the alternative B, C and D, the Service would maintain the flexibility needed to work with landowners to acquire whichever habitat types are needed to accomplish its management objectives, and whichever interest type the landowner is willing to sell.

The Service approved acquisition boundary would be expanded to include the bluffs along the historic floodplain.

The proposed expanded boundary was identified with the regional partnership and approved by Service leadership. The Service does not deny the need for protection along the bluff, but the floodplains will be our current area of focus based on the needs identified by the Partnership and the original intent of this Refuge. Consideration will be given to the bluffs when we explore future opportunities for the Middle Mississippi National Wildlife Refuge and other refuges within the Midwest Region that could potentially acquire lands in the region after completion of this expansion project.

Affected Environment and Environmental Consequences

This section is organized by affected resource categories and for each affected resource discusses both (1) the existing environmental and socioeconomic baseline in the action area for each resource and (2) the effects and impacts of the proposed action and any alternatives on each resource. The effects and impacts of the proposed action considered here are changes to the human environment, whether adverse or beneficial, that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives. This Environmental Assessment includes the written analyses of the environmental consequences on a resource only when the impacts on that resource could be more than negligible and therefore considered an “affected resource.” Direct, indirect, and cumulative impacts are evaluated in this environmental assessment. Direct effects are those which are caused by the action and occur at the same time and place. Indirect effects are those which are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Cumulative impacts result from the incremental impact of the action when added to other past, present, and reasonably foreseeable

future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Any resources that will not be more than negligibly impacted by the action have been dismissed from further analyses.

The existing Refuge has an authorized acquisition boundary of 27,746 acres and currently consists of approximately 8,215 acres, within seven island divisions, stretching 124 river miles in the un-impounded reach of the Mississippi River. The seven divisions are: Meissner Island Division, Monroe Co., IL; Harlow Island Division, Jefferson Co., MO; Beaver Island Division, Randolph Co., IL; Horse Island Division, Randolph Co., IL; Rockwood Island Division, Randolph Co., IL; Crains Island Division, Randolph Co., IL; and Wilkinson Island Division, Jackson Co., IL & Perry Co., MO. The existing Refuge is comprised of wetland and aquatic habitats (marsh and riverine), forest habitat (riverfront forest, wet bottomland forest, sFwamp, wet mesic bottomland woodland and streambank/riverbank), and other terrestrial habitats (wet bottomland prairie, shrub swamp and sandbar). The proposed action would encompass these habitats in addition to others found within the boundaries of the proposed alternatives. For more information regarding the affected environment, please see Chapter 3 of the existing Refuge's Comprehensive Conservation Plan, which is linked in Appendix D. Air quality has not been discussed in the following analysis of the affected environment because there are less than negligible impacts to Refuge air quality from the proposed action.

Natural Resources

Description of Affected Environment for the Affected Resource

Terrestrial Wildlife and Aquatic Species:

As noted in the unpublished Refuge's Habitat Management Plan, fish data for the existing Refuge is limited. Service staff from the Carterville Fish and Wildlife Conservation Office conducted a survey of seasonally flooded backwater areas on the Harlow Island Division and Wilkinson Division from 2005 to 2007 (Caswell et al. 2007). Results for the Wilkinson Island Division produced a total of 7,437 fish representing 29 species and 14 taxonomic families. The vast majority (92%) of the total catch were small-bodied and young-of-year fishes. Common species included silver carp, gizzard shad (*Dorosoma cepedianum*), mosquitofish (*Gambusia affinis*), orangespotted sunfish (*Lepomis humilis*), freshwater drum (*Aplodinotus grunniens*), and bluegill (*Lepomis macrochirus*). Harlow Island Division results provided 18,437 fish representing 36 species with 92% of the total catch being small-bodied and young-of-year fishes. Mosquitofish constituted for 76% of the total catch, and most of these were captured during October 2006. The next most abundant species were gizzard shad, silver carp, orangespotted sunfish, bluegill, and common carp.

Allen (2013) collected 778 fish samples in the Corridor from 240 reference sites, identifying a total of 44,501 fishes. This included 71 species and 19 families. The families comprising the

highest percentage of fishes collected were minnow (Cyprinidae), drum (Sciaenidae), catfish (Ictaluridae), and herring (Clupeidae).

The existing Refuge is managed for migratory birds, fish, threatened, and endangered species. Some inventories have been completed via partnership efforts and contracts or research work orders. Results of those efforts includes:

- Birds - In 2001, Knutson et al. (2005) conducted point count surveys at Harlow and Wilkinson Islands and documented 54 species. The most frequently observed species were the indigo bunting (*Passerina cyanea*), red-winged blackbird (*Agelaius phoeniceus*), and yellow-billed cuckoo (*Coccyzus americanus*). Knutson et al. (2005) divided their study sites into three habitat types: shrub/scrub, mature forest, and young forest. They found the common yellowthroat (*Geothlypis trichas*), song sparrow (*Melospiza melodia*), and yellow-breasted chat (*Icteria virens*) were associated with shrub/scrub habitats. While the red-winged blackbird, yellow-billed cuckoo, and downy woodpecker (*Picoides pubescens*) were commonly encountered in young forests, they were also occasionally detected in mature forest and shrub/scrub habitats. Eleven species showed strong affinity to mature forest and included: Gray catbird (*Dumetella carolinensis*) eastern wood-pewee (*Contopus virens*), northern cardinal (*Cardinalis cardinalis*), northern flicker (*Colaptes auratus*), red-eyed vireo (*Vireo olivaceus*), tufted titmouse (*Baeolophus bicolor*), house wren (*Troglodytes aedon*), white-eyed vireo (*Vireo griseus*), blue-gray gnatcatcher (*Polioptila caerulea*), great crested flycatcher (*Myiarchus crinitus*), and white-breasted nuthatch (*Sitta carolinensis*).

Sanderson (1985) studied waterfowl use of the Corridor and reported the results of aerial surveys conducted between 1973 and 1985. Nineteen (19) species of ducks were recorded with the mallard (51%), lesser scaup (*Aythya affinis*) (10%), common goldeneye (*Bucephala clangula*) (9%) being the most commonly detected species. All other detected duck species represented less than 5% of the detections. Sanderson (1985) also reported the detection of bald eagles, American coots (*Fulica americana*), double-crested cormorants (*Phalacrocorax auritus*), tundra swans (*Cygnus columbianus*), lesser snow geese (*Anser caerulescens caerulescens*), and Canada geese in the Corridor.

- Mammals - A report summarizing the results from mobile acoustical bat monitoring efforts from 2013 to 2018 (Richardson 2018) conducted on the Wilkinson Island Division indicated the big brown bat (*Eptesicus fuscus*) was the most frequently detected bat species. Other bat species detected include eastern red bat (*Lasiurus borealis*), evening bat (*Nycticeius humeralis*), hoary bat (*Lasiurus cinereus*), little brown bat (*Myotis lucifugus*), and tricolored bat (*Perimyotis subflavus*).

- Native Pollinators - Relatively little is known about the existing Refuge's native pollinators. Results of a 2012 Refuge bee survey (Watkins and Arduser 2012) produced 529 specimens, representing 40 different species from four different families including Megachilidae (Leafcutter, Mason, and Resin Bees), Halictidae (Sweat, Furrow, Nomiine, and Shortface Bees), Apidae (Cuckoo, Carpenter, Digger, Bumble, and Honey Bees) and Andrenidae (Miner, Bare-miner, Fairy, and Oxaeine Bees). The golden green-sweat bee (*Augochlorella aurata*) was the most commonly detected species (28% of all collected specimens) followed by another sweat bee species (*Lasioglossum hartii*) (12%), the ligated furrow bee (*Halictus ligatus*) (8%), the two-spotted longhorn (*Melissodes bimaculata*) (7%), another sweat bee species (*Augochloropsis fulgida*) (6%), the western honey bee (*Apis mellifera*) (6%), the common eastern bumble bee (*Bombus impatiens*) (6%), and another sweat bee species (*Lasioglossum nymphaearum*) (5%). All other species represented < 5% of the total specimen collection.

Threatened and Endangered Species and other Special Status Species:

The Service is involved in bat conservation across North America, as bat numbers have been declining for the past two decades. Bats species in Missouri and Illinois provide many benefits, including biological pest control which is vital to environmental health. A number of bat species roost in trees including the Indiana bat (listed as a Federally endangered species), the northern long-eared bat (listed as a Federally endangered species), the tricolored bat (Federally proposed for listing), and the gray myotis (listed as a Federally endangered species). While the previously mentioned mammalian species are a focus within the existing Refuge boundary, a complete list of the Federally listed, proposed listed, and candidate threatened and endangered species within the proposed expanded boundary is available in Appendix E of this document. This list includes two reptiles, one amphibian, two fishes, nine clams, one insect, three crustaceans, and two flowering plants. State listed species for Missouri and Illinois are provided in Appendix F.

Habitat and Vegetation:

Landcover maps for the proposed acquisition boundary and digital elevation models for the existing Refuge are included in Figures 22-31 for reference. As depicted in the landcover figures, approximately 253,000 acres or 46 percent of the lands within the proposed 550,000 acre expanded limited Refuge boundary have been developed as agricultural lands; however, there is no known data available to determine what percentage of these lands are being actively farmed. Apart from agricultural and other developed lands, the existing Refuge and the associated floodplains within the proposed expanded acquisition boundary can be broken down into five major natural habitats, which include:

1. Upland Forest: These are forests established above the elevation of floodplain influence. The General Wetland Vegetation Classification System describes upland forests as

growing on hills near the edge or outside of the river floodplain and characterized by oaks, hickories (*Carya* spp.), and elms (*Ulmus* spp.) (Dieck and Robinson 2004, Dieck et al. 2015). Tree species composition of upland forests in this region are driven by a history of fire-tolerance and soil moisture. South- and southwest-facing slopes, with exposure to solar radiation and summer winds, are typically characterized by species adapted to xeric conditions. Conversely, north- and northeast-facing slopes can be characterized by tree species adapted to more mesic conditions. The existing Refuge's limited upland habitat was historically subjected to frequent fires, resulting in fire-tolerant woody and herbaceous plant communities. Historically, frequent fires often resulted in upland forests characterized by a relatively open canopy composed of oaks and other fire-tolerant species (Parker and Ruffner 2004). Dey and Kabrick (2015) describe a continuum of tree density and crown canopy closure that differentiates between savanna, open oak woodland, and closed oak woodland. Canebrakes of giant cane (*Arundinaria gigantea*) were formerly associated with the lower slopes of the upland forests along the Mississippi River floodplain with the assistance of fire and beaver (*Castor canadensis*) disturbance.

Extensive areas of upland forest are present along the bluffs that demarcate the edge of the river floodplain. However, the existing Refuge owns only a minor tract of upland forest in the Rockwood Island Division. Decades of fire exclusion and overexploitation has likely resulted in most of these forests being characterized by a greater degree of canopy closure and a shift in species composition in both the overstory and understory vegetation (Nowacki and Abrams 2008). Upland forests of the region provide important habitat for transient neotropical migrant landbirds (Knutson et al. 2006). However, continued shifts in tree species composition of Midwestern forests from xeric-adapted species to mesic-adapted species may diminish the value of this habitat to migrant landbirds (Wood et al. 2012). Because the proposed boundary expansion is confined to the floodplain, there is little to no upland forest present within it

2. Bottomland Floodplain Forest: This is a common Refuge habitat type on both existing Refuge lands and within the proposed expansion area. It is characterized by areas subject to flooding where inundation length and frequency are short enough to allow for the establishment of trees. Soil texture, topography, inundation length and frequency, amount and size of canopy openings, and the position of the trees in relation to the floodplain elevation determine tree species composition.

Several vegetation sub-classes comprise the bottomland floodplain forest major habitat type including riverfront forest, floodplain forest, lowland forest, *Populus* (*Populus* spp.) communities, willow (*Salix* spp.) communities, and shrub-swamp. The structure (e.g.,

age, canopy gaps, species) of bottomland floodplain forest is a vital component of sustaining a healthy and resilient floodplain river ecosystem. Historically, floodplain forests were a transition between early succession riverfront forests consisting of silver maple, cottonwood, and willow, occurring on coarse sediment, to bottomland hardwood forests occurring on silt-clay type soils. Prior to European settlement, forest communities had a higher proportion of hard mast, i.e., nut producing tree species such as oaks and hickories (Nelson et al 2010). In the Middle Mississippi River region, the bottomland hardwood forest was widely dispersed and interconnected. The forest community of the Middle Mississippi River region first became altered during the steamboat era in the 1800s, where large portions of the bankline were logged for fuel (Norris 1997) and early snagging operations that removed trees hundreds of feet back from the river to prevent future snags. The bottomland hardwood forest component continued to disappear in the 1900s, when large expanses were cleared for agriculture (Theiling 2000). The lowland forest class is found on elevations slightly higher than the floodplain forest class and is flooded less frequently. Species that characterize the lowland or bottomland hardwood forest subtype include oak, hickory, and a diverse herbaceous understory, and are presently commonly found outside of Refuge lands on levee-protected lands.

Bottomland floodplain forest provides valuable resting, nesting, foraging, and breeding habitat for resident and migrant wildlife species. Bottomland floodplain forests serve as some of the most densely populated and diverse avian habitat in North America. Many neotropical migrant birds feed on insects and nest in the forest canopy, branches, bark, and snags. Knutson et al. (1998) found relative abundances of all birds and total numbers of neotropical migratory birds were almost twice as high in the Upper Mississippi River floodplain as in the adjacent uplands. Habitat loss is negatively impacting floodplain forest bird species (Best 1995, Knutson 1996, Twedt and Portwood 1997).

3. Nonforested Wetlands: This major habitat type is a broad classification of several community types found on current Refuge lands and within the proposed expansion area. It is dominated by non-woody herbaceous species, including bottomland lake, shallow marsh annual vegetation, wet meadow, and semi-permanent flooded emergent vegetation. This habitat type is generally characterized by low-lying topographic positions along the river and floodplain with fluctuating water levels where inundation occurs for a significant portion of the growing season to prevent tree establishment. These open wetlands are dominated by submerged, emergent, or seral old field-floodplain vegetation, and due to high sunlight and site history are consistently invaded by exotic, invasive species throughout the Upper Mississippi River System. This habitat type can also become established in new and developing canopy gaps in the bottomland floodplain

forest matrix. This habitat type is present on all current Refuge divisions and within the proposed expansion area, although usually as a minor component.

4. Sand and Mud on Islands, Bars, and Flats: This habitat type is unvegetated to sparsely vegetated areas associated with shallow areas near islands, bars, and flats. For at least a portion of the year, the area is inundated preventing the establishment of perennial vegetation. As water levels recede, bare substrate of deposited sand and mud remains, providing essential habitat for species dependent on this habitat type including migrating shorebirds, waterfowl, reptiles, and amphibians. Sandbars are the primary habitat component used for species such as the interior least tern nesting. When sandbars become covered in vegetation, they are no longer suitable for tern nesting. New habitat is formed when high water removes existing vegetation or deposits new sand along point bars near channel border areas (Kilgore et al. 2014). This habitat type is present within the existing Refuge and throughout areas of the proposed expanded Refuge, although it is difficult to map due to its dynamic nature.

5. Main Channel Border, Secondary Channel, Tertiary Channel: The main channel border is the area between the main navigational channel and the apparent shoreline. This area is a narrow band on all Refuge divisions, and a small percentage of total Refuge area, although it is more prevalent within the proposed expanded boundary. Substrates are typically a mix of sand, silt, and clay, but areas of gravel and placed rock also occur. Submerged plants, logs, and channel training structures provide habitat for many aquatic organisms. Secondary channels are large channels similar to the main river channel, but they carry less flow. The navigational channel may be located in a secondary channel. Habitat in secondary channels is variable and is a function of connectivity to the main channel, secondary channel age, size, and substrate. When a secondary channel is large or has a strong connection to the main channel, habitat and water quality characteristics are similar to the main channel. Lower current velocity, finer sediments, and more logjams and aquatic plants are typically present in secondary channels that are either smaller or have less connection to the main channel. Tertiary channels are smaller channels that branch off secondary channels. Tertiary channel habitat and water quality is dependent on their connectivity with other aquatic areas and tree cover. Some tertiary channels can have high current velocity with sand and gravel substrates and few plants. Other tertiary channels can have low current velocity and are similar to backwater areas with silt-clay substrates and submersed aquatic plants. Tributary channels are the small feeder streams and channels that flow into the main, secondary, and tertiary channels. Tributary channel habitat can be variable but is important for providing Refuge for fish during high flows (Dieck and Robinson 2004).

In summary, bottomland hardwood forested habitat (habitat type 2 above) provides the Refuge with its best opportunity to manage for its aforementioned conservation goals including transient neotropical migrant passerines, tree-roosting bats, and native invertebrate pollinators. Illinois and Missouri's State Wildlife Action Plans specifically identify species of high conservation concern to include cerulean warbler, Bell's vireo, prothonotary warbler, Indiana bat, and northern long-eared bat. Several dabbling duck species not only have high conservation and economic value to the States but are also focal species in the Great Lakes Joint Venture.

Geology and Soils:

The Mississippi River has a significant influence on the soils and their distribution within the Corridor. Heitmeyer (2008) summarized the work by Saucier 1994, Hajic 2000, and Woerner et al. 2003, which described eight geomorphic surfaces present in the Corridor. The composition of sand, silt, clay, or a combination of one or more groups within each surface is the direct result of the river and its capacity to carry and distribute sediments across its floodplain. The eight geomorphic surfaces within the Corridor include the following:

- Main channel and tributaries
- Abandoned river channels (paleochannels) - Partly or entirely filled segments of ancient river channels. Recent abandoned channels are deeper than older sections. Upper sections are usually filled with sand or silty sand while lower sections fill with fine-grained material such as clay and silty clay.
- Point bars - Areas of deposition as a result of river and stream channel lateral movement. Alternating ridges of sand with silt and clay-filled depressions are common to point bars. Soil can be 5 to 25 feet deep.
- Chute and bars - Form in similar fashion to point bars; however, they are subject to frequent inundation and high velocity floodwaters that scour and redistribute sediment, which results in a less developed top stratum that can be viewed as a thin, temporary veneer. Chutes are typically composed of sand/gravel at the base near the river, silty sand ridges, and moderately deep silty clay and clay-filled river chutes (20-30 feet).
- Back swamp - Usually located on the edge of the floodplain, the surface is composed of fine-grained sediments on broad, low elevation basins. Soils are almost entirely clay and silty clay, between 15 to 30 feet deep.
- Alluvial fans and colluvial aprons - Located at the mouth of tributaries, composed of loose, well-drained re-deposited loessial silts with lenses of sand and clay.
- Natural levees - Found on one or both sides of the river or stream channels, levees are low wedge-shaped ridges composed of sandy silts, silts, or silty clay. The highest levees have the most amount of coarse material and are located closest to the channel. Levee height decreases away from the channel and the amount of fine-grained material increases.

- Tributary valley alluvium - Alluvium derived from the local watershed with sand and gravel grading upward to silty clay.

Floodplains:

The Mississippi River is the primary natural disturbance factor affecting habitats of the existing Refuge. Periods of flooding and drought provide a process that results in dynamic community types based on hydrologic needs or tolerances. The ability of the river to scour and deposit sediment on the floodplain creates and modifies new habitats. Fire, which historically was an important disturbance for maintaining prairies of the American Bottoms ecoregion, is largely absent from the Refuge's current and proposed expanded boundary due to past conversion of these areas to agriculture.

Water Quality:

A water resource inventory and assessment for the existing Refuge and Middle Mississippi River Corridor was completed in 2016 (Thomas and Eash, 2016) and noted that sedimentation, nutrients, and other pollutants are several of the water quality issues in the Corridor. Suspended sediments and sedimentation rates have increased over time as the watershed has been impacted by agricultural development, land use change, channelization, and levee construction (Theiling et al. 2000). The Upper Mississippi River portion of the watershed has seen an overall increase in sediment loads, whereas the Missouri River watershed has seen sediment loads decrease. However, the Missouri River still contributes between 75 and 95% of the suspended sediments to the Mississippi River in this region (Davinroy 2006). High turbidity and reduced water clarity reduces aquatic plant beds in floodplain wetlands and causes more open water conditions where winds were less dampened by vegetation. Nutrient levels have increased due to land use practices, resulting in concentrations above recommended guidelines for much of the region (Johnson and Haggerty 2008). Increased nutrient levels have resulted in the "dead zone" in the Gulf of Mexico, where nutrients have caused a large area of anoxic conditions.

Wilderness or other Special Designations:

Within the existing Director approved acquisition boundary, there are no Wilderness or other Special Designation areas; however, if the expansion of the acquisition boundary is approved to expand to the historic floodplain, it would envelop portions of special designation areas such as the Bald Knob Wilderness and Clear Springs Wilderness in Illinois. Additionally, the expanded boundary would cover portions of several Important Bird Areas as designated by the Audubon Society. While the Service would not target any lands for acquisition that were already protected by our conservation partners, such designations speak to the value of the lands surrounding those protected areas. The Important Bird Area designations within the proposed extended boundary include the Great Rivers Confluence, Cape Hills, Mississippi River Sandbars and Islands, and St. Louis Urban Oases in Missouri, as well as Granite City-Wilson Park, Horseshoe Lake State Park, Oakwood Bottoms, Pomona Nongame Bird Management Area, LaRue-Pine Hills, Union County State Conservation Area, and Trail of Tears State Forest in Illinois.

Description of Environmental Trends and Planned Actions

Terrestrial Wildlife and Aquatic Species:

Global climate change has long presented risks to various economic resources, such as agriculture, forestry, fisheries, and water, which in turn can cause secondary impacts on terrestrial wildlife and aquatic species. Warmer temperatures, more severe droughts and floods, and sea level rise could have a wide range of impacts – all of which add to existing influences on species, such as population growth, land-use changes, and pollution.

Since the completion of the Mark Twain Comprehensive Conservation Plan in 2004, the Refuge has added lands in four divisions and effectively doubled in size. There is a need to complete inventory and monitoring efforts to identify the presence and abundance of Refuge-specific resources of concern. With limited on-site Refuge staff, documenting current wildlife on the Refuge has and will continue to rely on partnerships to provide additional resources.

Threatened and Endangered Species and other Special Status Species:

Many bat species are currently or potentially impacted by white-nose syndrome outbreaks in their overwintering habitat of caves. Tree-roosting bats are representative of mature, floodplain or bottomland forests with large trees that are alive, dead, or dying and provide loose peeling, or sloughing bark. With threats to overwintering habitat, providing forests for breeding and roosting will be critical to help conserve these bat populations.

Habitat and Vegetation:

If climate projections are realized, events such as flooding may increase mudflats and herbaceous vegetation cover in shrub habitats, benefitting some important conservation species. It is also suspected that increases in temperature and precipitation could increase the rate at which invasive species spread across the landscape. All of these risks could affect the Refuge's biological diversity, integrity, and environmental health.

As noted in the unpublished Habitat Management Plan for the existing Refuge, exotic and invasive species are currently a common management issue across the existing Refuge; however, the species requiring management actions are limited and varies among locations. New exotic invasive species are a constant threat and will need to be monitored for early detection and rapid response. Refuge management will respond when new invasive species are found, following the National Strategy for Management of Invasive Species (USFWS 2003). This required management of invasive species will likely continue within the corridor with continued development and other human activities such as freight shipping, recreational boating, and movement of firewood.

Additionally, the Refuge is an active partner in the Upper Mississippi River Restoration program which is authorized by Congress and implemented by the U.S. Army Corps of Engineers. This systemic program provides a well-balanced combination of habitat restoration activities, along with monitoring and research. It has pioneered many new and innovative engineering and planning techniques for ecosystem restoration in large river systems. The restoration component of the program is called the Habitat Rehabilitation and Enhancement Project - some of this work, which is funded by the U.S. Army Corps of Engineers St. Louis District, is currently in progress on the Crains Island Division and another is slated for the Harlow Island Division in 2023.

Geology and Soils:

Land uses within the river corridor today, as well as those anticipated in the future are quite closely coupled with the changes in geology and soils. As described in the United States Army Corps of Engineers' Regional Plan (2008) "...the Middle Mississippi River and its associated floodplain have been extensively modified for navigation, agriculture, urban development, flood control, and other human activities. Since the early 1800's the region has experienced a significant shift from a landscape dominated by forest, water, wetlands, and grasslands to one dominated by agriculture and urban development. Nearly 80% of the Middle Mississippi River region floodplain is behind levees. The area continues to experience land use changes. Over the last twenty years there has been an increase in both wetlands and forests in the corridor. Much of this change can be attributed to land use changes as a result of the floods of 1993 and 1995 and the impacts of conservation programs. There has been a similar increase in developed land over the last twenty years. Most of these recent changes appear to have come from land use shifts away from agriculture."

Floodplains:

River modification through dredging and training structures have significantly altered the historical dynamics of the Corridor. However, riverfront forest and floodplain forest habitat in the existing Refuge are relatively intact or regenerating. Divisions that were formerly in row crop production have succeeded to early successional forest. Historic habitats such as chutes, side channels, swales, and scours are currently limited in their restoration potential, because either the river lacks the opportunity to naturally restore them due to structural constraints, or land use adjacent to the Refuge (largely agricultural) limits what can be done. Levees, although initially constructed to prevent flooding on adjacent lands, can be viewed as an anthropogenic disturbance because the decrease in frequency of low intensity flooding has severed the natural process between the river and its full floodplain.

Water Quality:

As noted in a water resource inventory and assessment for the existing Refuge (Thomas and Eash, 2016), within the Mississippi River, there exists legacy contamination from metals and organic compounds, including lead, Polychlorinated biphenyls, and Polycyclic aromatic hydrocarbons. However, of greater concern may be the increased introduction of emerging contaminants, such as pesticides and pharmaceuticals. Legacy contaminants have been studied more extensively than emerging contaminants and already are present in the environment. Emerging contaminants primarily pose chronic threats to an ecosystem and are more difficult to study because there is continuous input of these from nonpoint sources. In the presence of other chemicals, they can cause unpredictable mixed effects. The potential for runoff from primarily agricultural land and some smaller urban areas is great along the corridor. Also, with the abundance of tributaries feeding the Mississippi River, the presence of emerging contaminants is likely high, especially during flood events.

A wide variety of contaminants are hydrophobic and therefore adhere onto or are absorbed into sediments. Thus, areas in the Refuge where sediment is deposited can become “hot spots” for a mix of toxic substances (National Research Council 2008). High fecal bacteria counts were once a greater concern in the Mississippi River when there was no ban on raw sewage discharge. This water quality issue has been greatly reduced with the implementation of secondary sewage treatment plants, however excess fecal bacteria counts can still exist, primarily around larger urban areas (National Research Council 2008). The location of both the existing and proposed expanded Refuge downstream of St. Louis, Missouri puts the Refuge at risk of increased fecal bacteria counts at times.

Wilderness or other Special Designations:

The batture lands provide significant habitat for migrating songbirds as well as wintering waterfowl. Current and future planned actions to encourage the conservation of these lands through the establishment and expansion of refuges, designations such as Wilderness and Important Bird Areas, and restoration efforts have been, and will continue to be, very beneficial for forest bird management. Acquisition of lands at national wildlife refuges and subsequent reforestation will provide a link between the previously noted Wilderness areas and Important Bird Areas and increase the core forest area available for forest interior nesting birds.

Impacts on Affected Resource

Alternative A:

Acquisition opportunities within the current Director approved boundary would continue to become available at the current rate. With a current lack of willing sellers, it is likely that any beneficial change or impacts to the natural resources within the existing Refuge would be

negligible. However, we anticipate that under this alternative, existing natural habitats would continue to be lost to urban development, which would fragment remaining natural lands and waters, which would have adverse impacts for all facets of the existing natural resources.

Alternatives B, C & D:

With the implementation of the preferred alternative or either of the additional action alternatives, floodplain habitats would be afforded additional protection by creating larger blocks of habitats and connections between habitats, which would result in moderate benefits to natural habitats. Protecting these waterway buffer areas would be critical to large scale conservation along the Mississippi River, as these forested, marsh and grassland areas help protect water resources through natural processes such as water retention, prevention of sedimentation, nutrient exchange, and limiting flash floods. State and federally listed priority species would benefit from multiple direct and indirect impacts under an expansion. The Service believes that through the additional protection and conservation of forested bottomlands, and implementation of habitat management practices, current recovery efforts for these species could see moderate positive effects. Additionally, there are non-listed terrestrial and aquatic species present within the proposed expanded boundary that could benefit from habitat conservation and would potentially see a reduction in mortality resulting from habitat loss and infrastructure interference. We anticipate that these beneficial impacts would be most visible over the long term, with the implementation of management plans intended both to conserve native habitats and assess threats such as invasive species, wildlife disease, and pathogens.

Alternatively, some adverse impacts to natural resources may also be realized through any level of expansion of the existing Refuge boundary. In the short-term, restoration efforts could potentially have localized, short-term consequences to both listed and un-listed species, but with the use of best management practices, the long-term benefits would certainly outweigh those impacts. Flora and fauna within the existing and expanded Refuge may also be impacted by an increase in visitor use due to trampling and disturbance of the habitats of individual species. Impacts to game species would include increased take by anglers and hunters, and this is already occurring, and hunting and fishing on sites where these activities would be permitted would be regulated according to state and Refuge guidelines. Overall, adverse effects on game species are expected to be negligible.

While these impacts are common to Alternatives B, C, & D, it can be assumed that the beneficial impacts will be seen to the greatest extent with Alternative B, as the focus on both restoration and enhancement will give Refuge staff more acquisition options and more opportunities to connect the various habitat types previously discussed. A focus on only restoration (Alternative C) or only enhancement (Alternative D) would significantly limit acquisition options.

Visitor Use and Experience

Description of Affected Environment for the Affected Resource

Middle Mississippi River National Wildlife Refuge division lands offer to visitors, all six of the wildlife-dependent uses which are fishing, hunting, wildlife observation, photography, environmental education, and interpretation. There were approximately 1,650 visitors to the existing Refuge in 2021 with roughly 725 of those visitors engaging in the various wildlife-dependent uses (USFWS 2021b). Due to the frequency of flooding by the Mississippi River, Refuge visitor facilities and associated infrastructure are generally limited to information kiosks, seasonally mowed primitive trails, and vehicle parking areas. Some Refuge lands also have very limited access available by boat, from the mainstem river channel, into side chutes. This activity is not common except when the river is at higher water level stages.

The majority of visitor use-days are for taking advantage of hunting opportunities. It is a priority of the Service to provide for wildlife-dependent recreation opportunities, including hunting, when those activities are compatible with the purposes for which the existing Refuge was established and the mission of the National Wildlife Refuge System. In 2020 and again in 2021, the existing Refuge hunt plan was revised to reflect and to be more consistent where possible with Missouri and Illinois hunt seasons and regulations (USFWS 2020 and USFWS 2021a). At present, 8,205.5 acres are open to hunting which is 99.9% of current Refuge acreage. Hunting may expand on future acquired Refuge lands since adding hunting opportunities is consistent with the Service policy on wildlife-dependent recreation and hunting as mandated by the National Wildlife Refuge System Improvement Act of 1997, and Secretarial Order 3356 (Hunting, Fishing, Recreational Shooting, and Wildlife Conservation Opportunities and Coordination with States, Tribes, and Territories). Additional hunting opportunities will be analyzed and offered on a case-by-case basis following the Service's hunt and fish rulemaking procedures.

Description of Environmental Trends and Planned Actions

The previously described Habitat Rehabilitation and Enhancement Project contracts involve heavy equipment mobilization, dirt excavation, side-channel cleanout, set back levee and wetland construction, tree planting and other associated habitat work and generally cause localized noise and disturbance during the work periods of mainly the late spring through early fall months, depending on weather, river levels and site conditions. By nature of the work period, winter hunting seasons are seldom affected. But as required per contract, active work sites are signed and cordoned off accordingly for visitor safety when workers are present. Short term disturbance (3-5 years) for Refuge visitors is expected and planned for but the long-term benefits to wildlife and habitat more than make up for the temporary inconvenience.

As described in the Design document (USFWS 2019), urbanization and development of adjacent lands will naturally increase with population growth, especially in Reach 1 (St. Louis and Jefferson counties) and would reasonably cause a modest increase of visitor-use days over time as people seek out public lands for recreational opportunities. Refuge lands have generally always been “self-regulating” as far as visitor numbers, meaning that when visitors find opportunities being actively utilized by others, they go somewhere else. Because of the overall lack of visitor facilities and infrastructure, it is expected that pattern will continue into the future.

Impacts on Affected Resource

Alternative A:

As acquisition opportunities within the current Director approved boundary have been limited due to lack of funding and interest within recent years, it is unlikely that there would be any change or impacts to the visitor use of the existing Refuge under the no-action alternative. Visitor use would likely continue as previously described in this section.

Alternatives B, C & D:

Spending associated with recreational visits to national wildlife refuges generates significant economic activity; however, with no knowledge of which lands would be acquired under these alternatives, it is difficult to place a numeric value on the incremental benefits that may be experienced.

Although local communities may benefit from an increase in visitor use experiences and recreational opportunities that will inevitably be presented with a Refuge expansion, there are also potential minor negative impacts that may result from an increase in visitor use. Secondary activities related to increasing visitor use may contribute negligibly to stressors regionally affecting climate change, including but not limited to the use of vehicles and equipment to manage habitat and administer the Refuge for visitor use, and visitor use of motorized vehicles on the Refuge. Various wildlife dependent public use opportunities (photography, hunting, fishing, observation) could also cause temporary impacts to the habitats and disturbance or survival of individual wildlife noted in previous sections. These risks could be offset by possibly limiting access during certain times of the year to particular sites, making some sites off-limits to the public, and following the required step-down plans that would designate conditions intended to minimize impacts. For larger projects associated with visitor use, additional analysis under the National Environmental Policy Act may be necessary. The Refuge would also develop or update Visitor Services Plans, Hunt Plans, and Fishing Management Plans to outline Refuge uses, their goals and objective and how they contribute to the Refuge’s mission and how to mitigate any potential negative impacts from visitation.

Cultural Resources

Description of Affected Environment for the Affected Resource

The cultural history of the region encompasses a wide range of Native American, American settler, and modern American societies. Prior to European contact, diverse societies of Native Americans inhabited the fertile Mississippi River valley, with the evidence of their communities visible in historic villages, monuments and mounds that are unearthed as development in the valley continues. Towns along the river also bare signs of the architectural history that was created post-European contact, as it reflects Spanish, French, British, German, and early American influences that have withstood deep floods and various wars. Many towns along the floodplain celebrate the history of such architecture, like the French colonial era structures found in the historical center of Ste. Genevieve and blufftop overlook of Fort Kaskaskia. Modern American societies, including urban development near the northern end of the proposed limited acquisition boundary, as well as production facilities, transportation facilities, and a prevalent agricultural industry throughout the entirety of the floodplain, have been established on lands which may contain any number of cultural or historic sites.

Description of Environmental Trends and Planned Actions

As many industries and practices along the Mississippi River are dependent upon transportation and hydrology sources provided by the river system, it is likely that the practices of agriculture, industrial development and dredging will continue in the area. These actions often require the disturbance of soils, which can alter or reveal cultural resource sites which have not been previously identified. If such sites are revealed or impacted the Refuge would confer with the Regional Historic Preservation Officer and State Historic Preservation Officer to identify necessary actions to protect or document these cultural resources.

Impacts on Affected Resource

Impacts Common to All Alternatives:

The National Register of Historic Places (Register), established by Congress in 1966, is the nation's official list of significant historic properties. The Register recognizes five basic types of historic properties: historic buildings, historic structures, historic districts, historic sites, and historic objects. In order to be considered significant for the purposes of Register listing, properties must fall under one of the following categories: be closely associated with an important person, event, or development; represent an important example of a particular style or method of construction; or yield information about the nation's history or prehistory. Generally, properties are not placed on the Register if they are less than 50 years old or if they have been significantly altered.

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and Section 14 of the Archaeological Resources Protection Act, the Service is required to evaluate the effects of its actions on cultural resources. Those historic, architectural, or archaeological resources that are listed or eligible for listing in the National Register of Historic Places must be identified and assessed by the station with the assistance of the Service Regional Historic Preservation Officer as identified in Service policy 614 FW 3. In accordance with these regulations, the Service will coordinate the review of this proposal with the Missouri & Illinois State Historic Preservation Offices. The Service anticipates that the acquisition of lands for expansion of the Refuge would have no adverse effect on any cultural resources that currently are, or would be, designated as eligible for listing on the National Register of Historic Places. However, in the future, if the Service plans or permits any actions that have the potential to affect eligible cultural resources, it would carry out appropriate site identifications, evaluations, and protection measures as specified in existing regulations and Service policy.

Refuge Management and Operations

Description of Affected Environment for the Affected Resource

Middle Mississippi River National Wildlife Refuge is administered as a part of a three-refuge complex which includes Great River and Clarence Cannon National Wildlife Refuges. Although some positions are currently vacant, permanent full-time staff currently assigned for the complex includes a project leader, deputy project leader, administrative assistant, maintenance mechanic, biologist, and a biological technician. The deputy project leader serves in the dual role of wildlife Refuge manager for Middle Mississippi River National Wildlife Refuge and is stationed at Ste. Genevieve, Missouri. The wildlife biologist and biological technician positions for the complex are presently vacant. A Federal wildlife K-9 officer is stationed at Clarence Cannon National Wildlife Refuge and covers Great River National Wildlife Refuge as well. The position is supervised and funded separately as a part of a larger law enforcement zone with responsibilities, as needed, to other refuges in northern Missouri and western Illinois. Middle Mississippi River National Wildlife Refuge receives limited law enforcement coverage from a federal wildlife officer stationed out of Crab Orchard National Wildlife Refuge in Marion, Illinois. The position is also funded and supervised through the law enforcement zone. General management activities include management for various habitat types, sedimentation and water quality management, floodplain management, Refuge infrastructure management, and invasive species management, along with other considerations such as public fishing, hunting, and trapping – these management activities will likely continue to occur within the proposed expanded Refuge.

As of Fiscal Year 2022, general budget allocations for the complex total approximately \$614K not including any special appropriations or funding for land acquisition. In Fiscal Year 2021, allocations totaled \$756K with that figure representing a higher staffing level of permanent full-time positions during that year.

Description of Environmental Trends and Planned Actions

The land acquisition boundary expansion project has been and remains important moving forward, for both the Refuge as well as for the Service. Staff made the Land Protection Plan a top priority in Fiscal Year 2022 and will again in Fiscal Year 2023 in order to achieve success towards a completed and approved document. Refuge staff time for the planning process, for research, document preparation & editing, and for appropriate analysis under the National Environmental Policy Act, including public & cooperative agency input and outreach has taken approximately 2% of the project leader and deputy project leader's time during Fiscal Year 2022 with an estimated cost of \$5K including travel. The public meetings and document writing efforts for this project in Fiscal Year 2023, doubled that percentage of time and cost. Additionally, an increased Refuge acreage as proposed will require an increase in the management activities noted above. The time, cost, and staff required to complete management activities within an expanded Refuge boundary depends heavily on the amount, location, and habitat value of acquisitions.

Impacts on Affected Resource

Alternative A:

As acquisition opportunities within the current boundary have slowed within recent years, it is likely that there would be minimal change or impacts to the management of the existing Refuge under the no-action alternative.

Alternatives B, C & D:

Because no actual lands have been acquired as of yet, it is difficult to discuss specifics of facilities and improvements that may be appropriate to effectively manage the proposed expanded Refuge. As such, the Service would expand facilities when and where appropriate and compatible. However, it can be estimated that if an expansion is approved, successive years will see almost an immediate interest from willing sellers and will require at least 1 additional full time staff equivalent on the complex to assist in time spent researching potential acquisitions, document preparation and eventually boundary posting and maintenance of properties after they come into the National Wildlife Refuge System. This staffing cost and increased maintenance budget for an active land acquisition program is estimated at \$75-110K annually.

Any newly acquired parcels within an expanded Refuge would likely already have access via state and local roads. Certain private roads on acquired parcels may be retained and improved, while others may be abandoned or removed dependent upon the presence of sensitive species, public use, or potential future needs. Roads and trails on acquired parcels may have restrictions to protect wildlife resources or to provide access for visitor programs, such as hunting activities, but any legal access to existing inholdings and homes would be maintained. Similarly, any buildings or other facilities for Refuge use would be established with the consideration of

existing facilities available for reuse (i.e., using an existing house or lodge for a refuge office or an existing shed for equipment storage), whether there are potential shared facility options, and whether the construction or maintenance of a new facility would cause any adverse effects.

Socioeconomics

Description of Affected Environment for the Affected Resource

Local and Regional Economies:

A majority of the land within the proposed expanded boundary is in private ownership. Specifically, within the counties along the floodplain corridor, to include St. Louis, Jefferson, Ste. Genevieve, Perry, Cape Girardeau, Scott, and Mississippi on the Missouri side of the Mississippi River, and Madison, St. Clair, Monroe, Randolph, Jackson, Union and Alexander on the Illinois side of the Mississippi River, all of the counties combined have a total of 94.7% of lands in private ownership, with 3.2% of lands being in federal ownership, and 0.2% being in state, city, or county ownership. The Middle Mississippi River region corridor also contains a diverse combination of interests, including major metropolitan areas, a nationally significant waterway transportation system, and some of the nation's most productive agricultural ground. Major metropolitan areas within the basin include the cities of St. Louis, Missouri and East St. Louis, Illinois and their surrounding communities, and the cities of Cape Girardeau, Missouri, and Cairo, Illinois. These socioeconomic indicators are broken down by county within the Headwaters Economics profile (<https://headwaterseconomics.org/tools/usfws-indicators/>) located in Appendix C.

Environmental Justice:

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities.

Within the counties along the floodplain corridor, to include St. Louis, Jefferson, Ste. Genevieve, Perry, Cape Girardeau, Scott, and Mississippi in Missouri, and Madison, St. Clair, Monroe, Randolph, Jackson, Union and Alexander in Illinois, the median household income varies widely amongst the total of 975,542 total households (as indicated by the socioeconomic profiles found on the Headwaters Economics profile tool at <https://headwaterseconomics.org/tools/usfws-indicators/>). This indicator is lowest in Mississippi County, Illinois with a median household income of \$34,354 in 2020 and highest in Monroe County, Illinois with a median household income of \$89,648 in 2020. For comparison, the entire United States median household income in 2020 was \$64,994. These counties combined saw a population change of -1.4% from 2000-

2020 in comparison with the 16.8% population change of the United States, and a per capita income change of 28.1% within the same time period, in comparison with the 29.1% change seen within the entire United States. Additionally, while 39.91% of the population within the United States is represented by minorities, all counties within the proposed expanded boundary except for St. Louis County, Missouri have a lower percent of population represented by minorities. This indicator ranges from 56.07% St. Louis County, Illinois to 3.74% in Monroe County, Illinois. There are numerous other indicators that can be used to explore socioeconomics as they relate to minority and low-income Populations. These indicators can be explored more thoroughly by individual county in Appendix C.

Description of Environmental Trends and Planned Actions

Local and Regional Economies:

Currently, large swaths of privately held acreage along the Corridor are in the unprotected, non-leveed area and are frequently inundated with water. A recent event (March-November 2019) caused catastrophic damage to agricultural areas when smaller interior levees did not hold. With every flood event, there is renewed interest and desire by landowners to sell their property as land is no longer profitable to farm because of too-frequent inundation and sand deposition. Refuge staff, along with other land conservation partners are ready to move into a position to become active once again in acquiring land along the Corridor. Our Design partners support land conservation efforts. The Dog-Tooth Bend Area of the lower Middle Mississippi River is one such example of sellers wishing to divest of land, simply because of the river's unpredictable hydrology and economic uncertainty of farming. The Nature Conservancy is one partner who is currently very active in assisting these landowners in Wetland Reserve Enhancement Partnership enrollments, is a great example of how the partners in the Corridor do not necessarily compete for the same limited resources (fee title vs. conservation easement, etc.) but rather look for ways to complement each other's efforts. This proposal for expansion of the Refuge would target acquisition of tracts in this area from willing sellers as well as potential acquisition of residual interests of property enrolled in the Wetland Reserve Enhancement Partnership as a partnership with The Nature Conservancy.

Environmental Justice:

As stated in the Refuge's Land Protection Strategy (USFWS 2022), the Refuge has begun a commitment, through action, to work with communities to ensure environmental justice principles are addressed, especially in the area of providing recreational opportunities for underserved, elderly and low-income individuals. For example, a recent (2019) Memorandum of Understanding between the Service, the City of Ste. Genevieve, Missouri and the Ste. Genevieve County Levee District #3 has a stated purpose of "...bringing a conservation message and increasing awareness of the importance of habitat conservation and restoration along the Middle

Mississippi River Corridor.” A product of this partnership has been the recent dedication of 1.5 miles of hiking trails, education signage and a proposed fishing access on a property owned by Ste. Genevieve. Such facilities provide minimal to no cost opportunities for low-income individuals to recreate on public land. Facilities such as these allow the Refuge, cities, local community leaders and individuals to work cooperatively for not only habitat conservation goals but for relationship-building to identify opportunities of outdoor recreation & education. Local community and partner involvement will continue to be important in future acquisition efforts and resulting visitor opportunities.

Impacts on Affected Resource

Alternative A:

As acquisition opportunities within the current Director approved boundary have slowed within recent years, it is unlikely that there would be any change or impact to the local socioeconomics under the no-action alternative.

Alternatives B, C & D:

Each action alternative would have relatively similar impacts to socioeconomics, dependent upon the number of willing sellers. In comparison with the current land use patterns described above, it is likely that the local and regional economies will see an increase in the total area of federally protected lands used for habitat and wildlife conservation as well as an increase in lands used for wildlife-dependent recreation. However, unprotected lands would continue to be converted for development, agriculture, and other private uses. Taking into account the small existing percentage of federal land ownership within the region, as well as the small percentage of land acquisition allowable under the alternatives (a maximum of 90,000 acres within the total 4,718,194 acres of the 10 counties that would be included within the proposed boundary), it is anticipated that the effects on land use patterns would be moderate.

Along these same lines, any beneficial or adverse effects on the local tax revenues is expected to be moderate but will depend heavily on the number of willing sellers. Lands acquired in fee by the Service are removed from the local tax rolls. The Refuge Revenue Sharing Act, as amended, requires the Service to make payments annually to counties and other units of local government to help offset lost tax revenues. Because of ecotourism, national wildlife refuges often generate tax revenue for communities far in excess of what was lost from federal acquisition of the land. Refuge lands also provide many public benefits, including wildlife-dependent recreation and environmental education opportunities, while placing few demands on local services such as schools, fire, and police, compared to developed lands. Please see the “Frequently Asked Questions” in Appendix H for more information regarding tax revenues.

Other potential impacts include the broader scale impact to regional economics from wildlife dependent recreation. While these impacts are expected to be minimal, the beneficial changes could include additional contributions to the region's economy from visiting public who would spend money at area hotels, restaurants, gas stations, and equipment/supply stores. As land development continues and the number of opportunities to enjoy wildlife decreases, refuge lands often become important to the local community by providing recreational opportunities and attracting tourists from outside the area. If an increase in visitors were to occur, it could also create the negative impact of added congestion on area roadways. While any stress to local transportation resources is not expected, if it were to occur, it would be expected to be a minimal effect.

Finally, within the counties along the floodplain corridor, to include St. Louis, Jefferson, Ste. Genevieve, Perry, Cape Girardeau, Scott, and Mississippi on the Missouri side of the Mississippi River, and Madison, St. Clair, Monroe, Randolph, Jackson, Union and Alexander on the Illinois side of the Mississippi River, the farming industry has experienced a 9.8% decrease in the number of farming jobs reported from 2010 to 2020, or the loss of approximately 977 jobs (Appendix C). While this loss could be due to a variety of reasons (loss of agricultural land, advancements in technology, economic shifts), a refuge expansion may adversely affect the farming sector if agricultural lands are removed from availability. In addition, this proposed expansion could provide owners of agricultural lands that have been repeatedly and negatively impacted by flood waters with an option to sell those lands and pursue other opportunities. However, as the Refuge acquisitions are dependent upon willing sellers, it is unlikely that prime agricultural lands will be sold or donated to the Service, and any purchase of substantial acreage of land by the Service will take decades to accomplish, therefore any long-term impact will be gradual and considered minimal.

Monitoring

Monitoring of wildlife, habitat and public use on the proposed expanded Refuge will follow the planning actions outlined in the completed Comprehensive Conservation Plan for the Mark Twain National Wildlife Refuge Complex, as it accomplishes several purposes: "it allows for evaluation of current land use and management practices, it can provide early warning of problems in the system, and it provides the foundation for future management decisions. Service policy on refuges (701 FW 2) is to (1) collect baseline information on plants, fish, and wildlife, (2) monitor, as resources permit, critical parameters and trends of selected species and species groups on and around Service units, and (3) base management on biologically and statistically sound data derived from such inventory and monitoring. When operating with limited budgets and personnel, the monitoring program will focus on a few reliable surveys designed to evaluate and improve specific management actions. Priority surveys will focus on the Refuge's species of concern and their preferred habitats" (Appendix D).

Additionally, operating under Service Policy 601 FW 6, refuge managers will inspect and monitor conservation easements every 1-3 years to ensure compliance with the easement language and conditions. For each conservation easement, a baseline report will be created to describe the existing conditions of the site at the time the Refuge acquires the easement. The type and frequency of subsequent monitoring needed will be determined on a case-by-case basis, dependent upon the results of the baseline report, content of the easement document, and the needs of the habitat.

Summary of Cumulative Effects

A cumulative impact is defined as an impact on the natural or human environment, which results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such other actions (40 Code of Federal Regulations, 1508.7). Cumulative impacts are the overall, net effects on a resource that arise from multiple actions. Impacts can accumulate when different actions affect different areas of the same resource. They can also accumulate over the course of time, from actions in the past, the present, and the future. Occasionally, different actions counterbalance one another, partially canceling out each other's effect on a resource. But more typically, multiple effects add up, with each additional action contributing an incremental impact on the resource.

Alternative A – No Action Alternative

As described above, the no action alternative is not likely to result in any major impacts in the long or short term, whether beneficial or adverse. The lack of acquisition opportunities within the current Director approved acquisition boundary does not allow the Service to meet the project's stated purpose and need.

Alternative B, C and D – Action Alternatives

As described above, the action alternatives will result in various beneficial and adverse impacts in both the long and short term. The Service is not aware of any past, present, or future planned actions within the Mississippi floodplain that would result in a significant adverse cumulative impact when added to the Refuge's proposed expansions, as outlined in the proposed alternative. The action does not involve highly uncertain, unique, or unknown environmental risks to the human environment, nor are these effects expected to be controversial. The project would not significantly affect any unique characteristics of the geographic area, nor would the action have a significant effect on public health and safety. While all of the action alternatives have the same proposed Refuge boundary, the larger acquisition limit available under Alternative B gives the Service more opportunities to meet the project's purpose and need, while also providing an

enhanced ability to diversify habitats, increase habitat connectivity, and diversify and support public wildlife-dependent uses at a higher level due to its focus on both habitat restoration and enhancement.

List of Sources, Agencies and Persons Consulted

- Sabrina Chandler – USFWS, Region 3, Area 1 Supervisor
- Jeanne Holler – USFWS, Region 3, Conservation Planning Lead
- James Myster – USFWS, Region 3, Historic Preservation Officer/Archaeologist
- Allison Smart – USFWS, Region 3, Native American Liaison
- United States Department of Agriculture Forest Service
- The Nature Conservancy
- Southern Illinois University
- United States Geological Survey
- Illinois Department of Natural Resources
- Missouri Department of Natural Resources
- Missouri Department of Conservation
- American Land Conservancy
- Ducks Unlimited
- Illinois Society of American Foresters
- United States Department of Agriculture Natural Resources Conservation Service
- Wildlife Forever
- United States Army Corps of Engineers
- Southwestern Illinois RC&D
- United States Environmental Protection Agency
- Southern Illinois Community Foundation
- The Conservation Fund
- Upper Mississippi River and Great Lakes Region Joint Venture
- Illinois Forestry Development Council

List of Preparers

- Floyd Truetken – USFWS, Division of Refuges
- Jared Nance – USFWS, Division of Refuges
- Ashley Kraetsch – USFWS, Division of Natural Resources & Conservation Planning
- Ryan Theel – USFWS, Division of Natural Resources & Conservation Planning

Local and State Governmental Coordination

As part of its outreach efforts, the Service used a variety of tools, including direct mailings to interested landowners, elected officials, tribes, and natural resource non-governmental organizations. A publicly available project website was set up which includes contact information for the Refuge and planning team, as well as draft copies of this document. The review of this proposal was coordinated with the Illinois and Missouri State Historic Preservation Offices, Illinois and Missouri State Elected Officials, regional United States Army Corps of Engineers offices, regional United States Forest Service offices, Illinois Department of Natural Resources, Missouri Department of Conservation, and various non-governmental natural resource organizations.

Tribal Consultation

The Tribal Directory Assessment Tool provides contact information for tribal leaders and Tribal Historic Preservation Officers, along with counties where the tribes have current and ancestral interest. Tribes identified using this tool consisted of the Apache Tribe of Oklahoma, Cherokee Nation, Delaware Nation (Oklahoma), Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, Miami Tribe of Oklahoma, Osage Nation, Peoria Tribe of Indians of Oklahoma, Quapaw Tribe of Indians, Seneca-Cayuga Nation, Kickapoo Tribe of Oklahoma, and Menominee Indian Tribe of Wisconsin. These tribes and their associated natural resources staff were sent a notice of the initial scoping period, as well as a link to the draft copy of this land protection plan and environmental assessment with an invitation to provide comments.

Public Outreach

As part of its outreach efforts, the Service used a variety of methods, including direct mailings, emails, the Refuge website, local news media announcements, physical announcement postings, and in-person information stations to relay information about the proposed project and the project timeline during the initial scoping period. The Service also coordinated with the local, state, tribal and conservation partners identified previously in this document. The purpose of the public scoping and outreach was to seek input from the public regarding the proposed expansion of the Middle Mississippi River National Wildlife Refuge and to identify the issues that needed to be addressed throughout various stages of the planning process. The Service received 25 comments during the initial scoping period.

The public also had an opportunity to comment on the draft Land Protection Plan and Environmental Assessment from January 17, 2023, through March 10th, 2023. During this time the Service hosted open houses followed by public meetings at four different locations throughout the project area. Dates, times, and locations of these open houses were posted to the

Refuge website and the national Twitter feed for the Service. Notice of the comment period and open houses were also sent to federal and state agencies with an interest in the project, representatives of 12 tribes that had indicated interest within the boundary, Missouri and Illinois State Senate and House of Representative contacts, Missouri and Illinois State governors, commission boards for the 14 counties within the proposed boundary, private and non-profit conservation partners, individuals who requested updates during the initial scoping period, as well as local news media sources. The Service's response to substantive comments received during the comment period have been included as Appendix G within this final document.

Appendix A: Figures & Tables

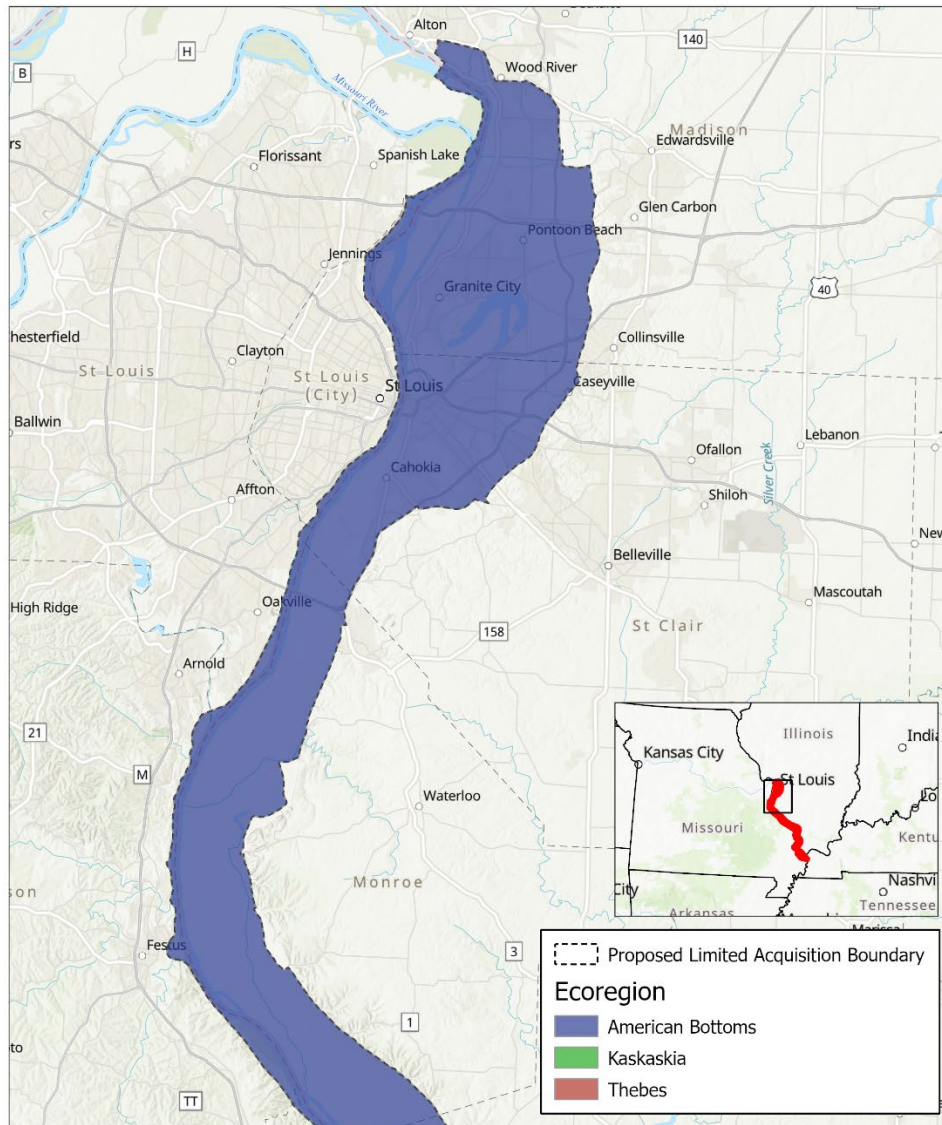
Figure 1: Middle Mississippi River American Bottoms Ecoregion extending from the confluence of the Mississippi and Missouri rivers (River Mile 195) south to the Kaskaskia River-Mississippi River confluence near Chester, Illinois (River Mile 117)



U.S. Fish & Wildlife Service

Middle Mississippi River NWR

Proposed Limited Acquisition Boundary and Ecoregion Map 1 of 3



Produced in the Division of Conservation Planning
Bloomington, MN
Produced: 1 December 2022
Base map: ESRI Topography

The USFWS makes no warranty for use of this map and cannot be held liable for actions or decisions based on map content.
This map depicts the proposed Limited Acquisition boundary and Ecoregions of the Middle Mississippi River NWR.
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Figure 2: Middle Mississippi River Kaskaskia Ecoregion extending from the Kaskaskia-Mississippi River confluence to the narrow floodplain constriction at Thebes Gap, immediately south of Cape Girardeau, Missouri (River Mile 44)

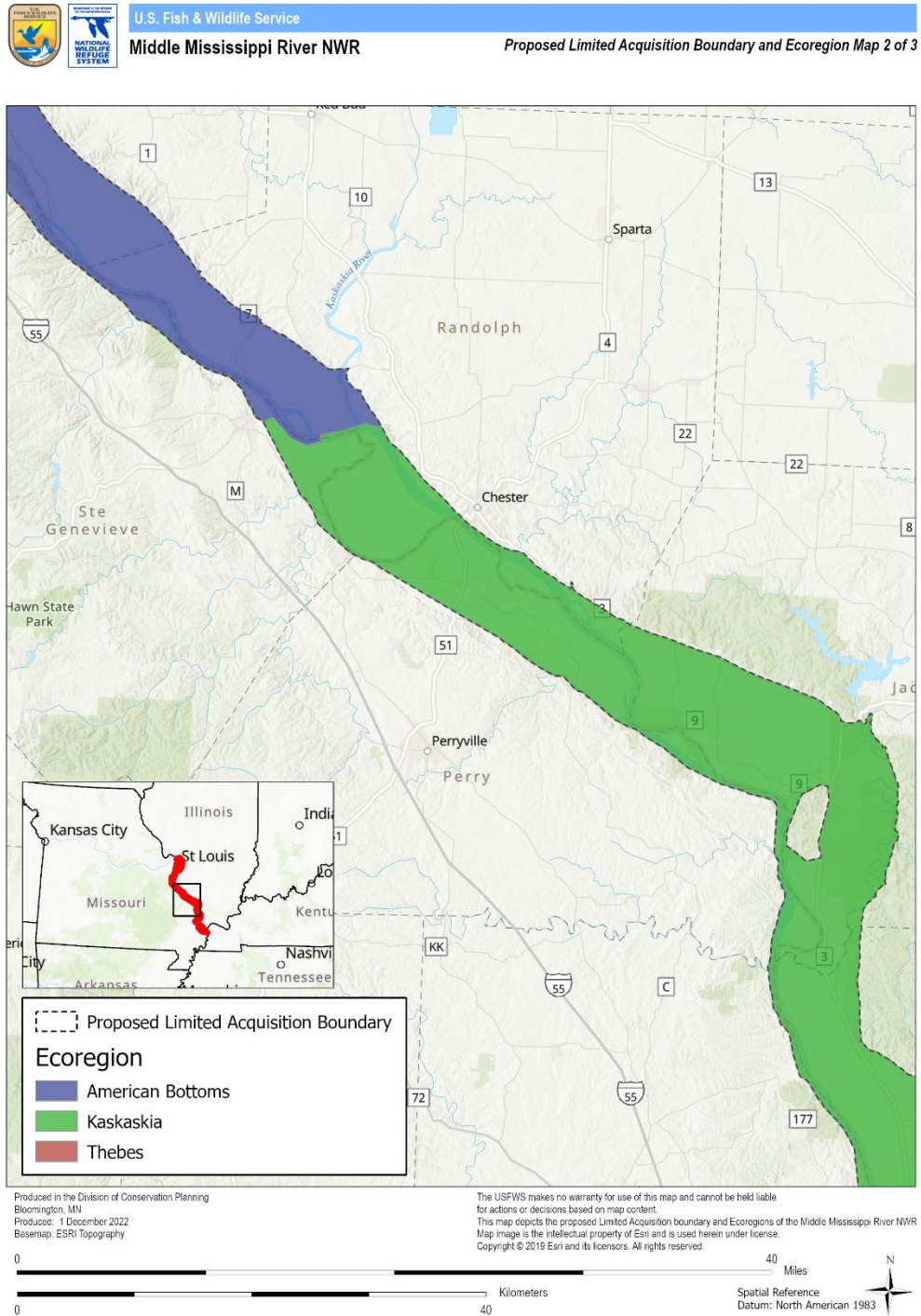


Figure 3: Middle Mississippi River Thebes Gap Ecoregion extending from Thebes Gap south to the confluence of the Mississippi and Ohio Rivers (River Mile 1)

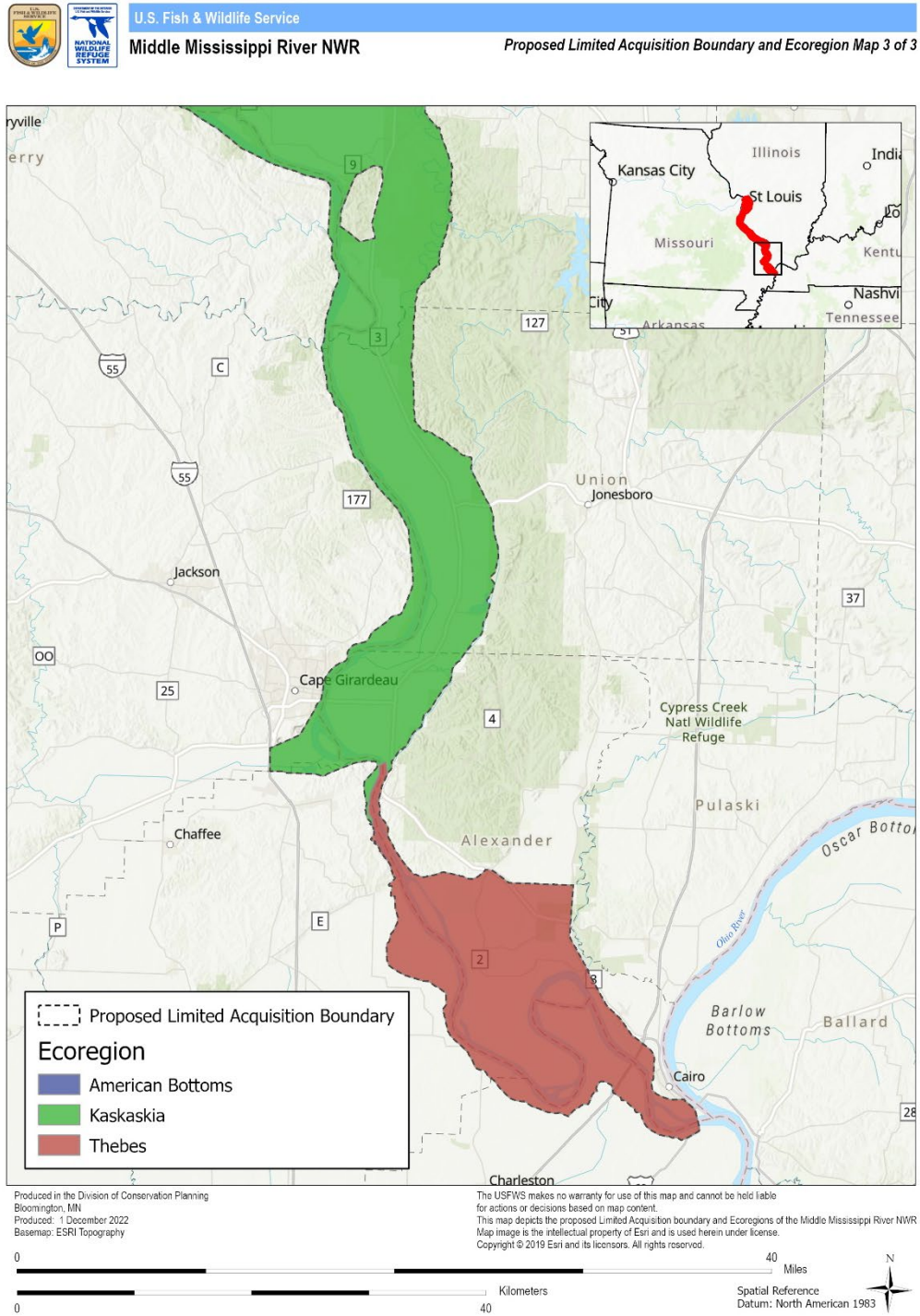
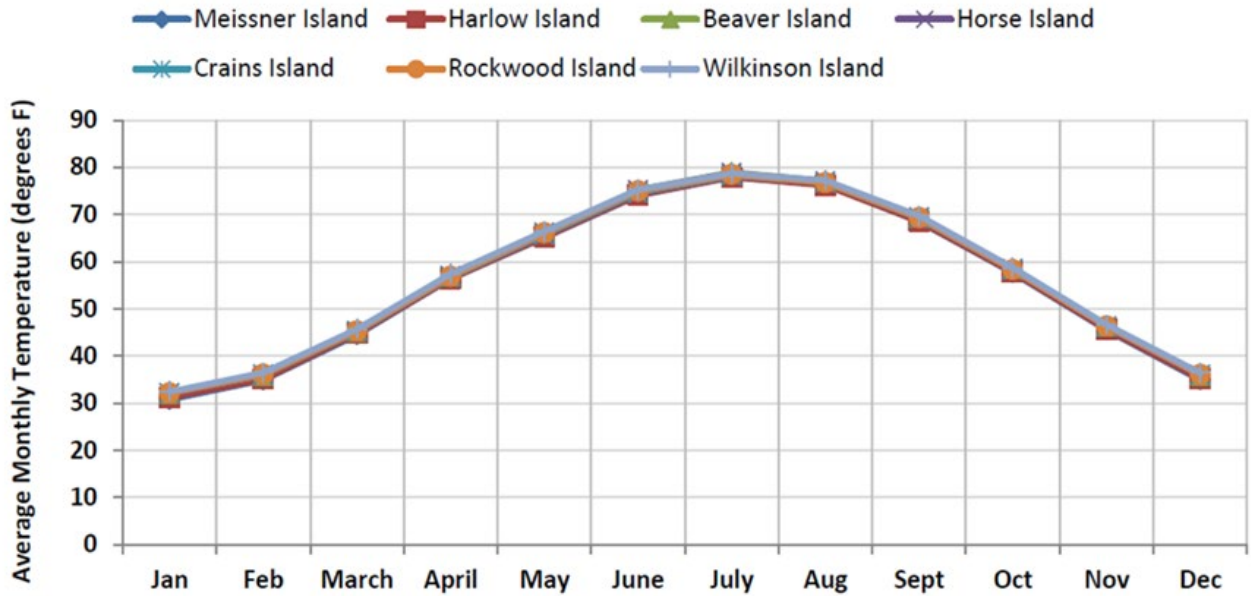
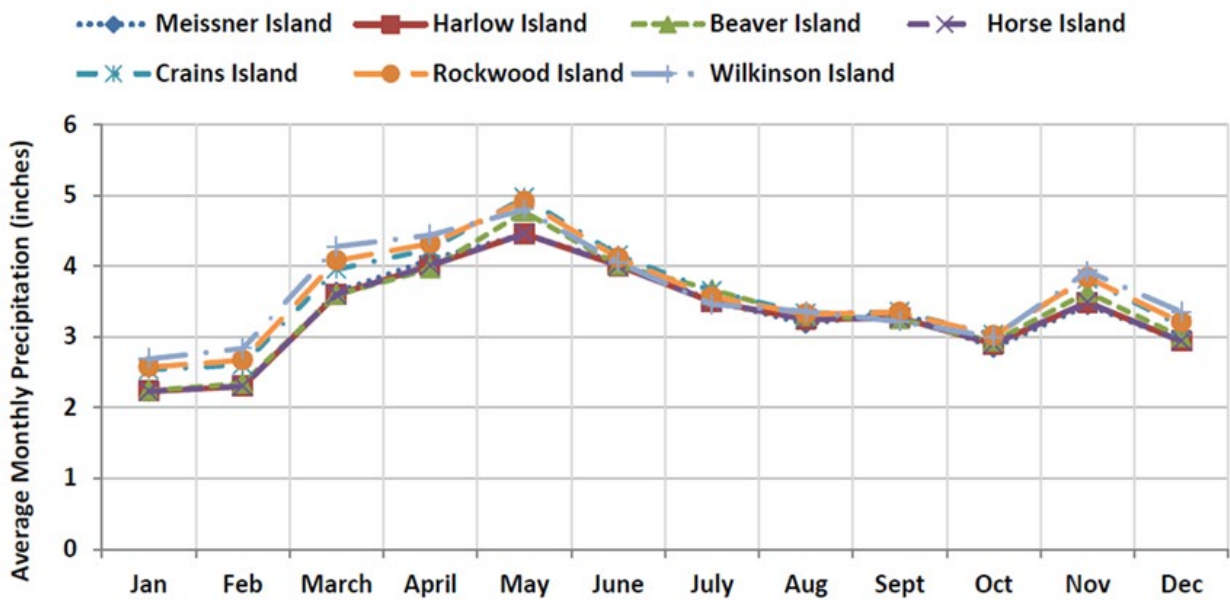


Figure 4: Average monthly temperature by Middle Mississippi River NWR Division.



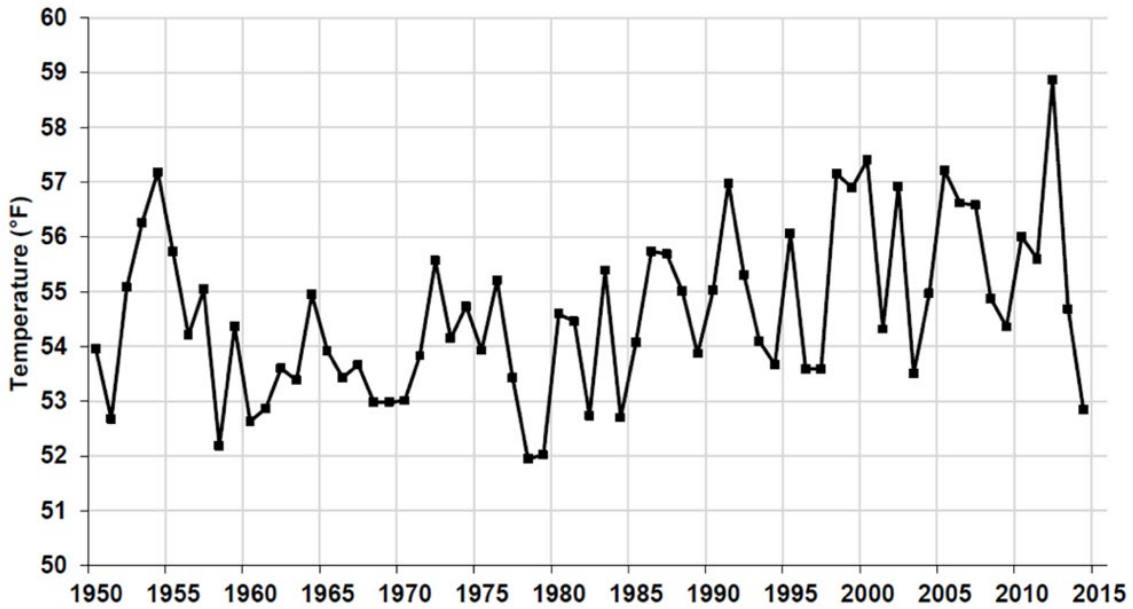
Source: Middle Mississippi River NWR Water Resource Inventory and Assessment Summary Report (2016)

Figure 5: Average monthly precipitation by Middle Mississippi River NWR Division



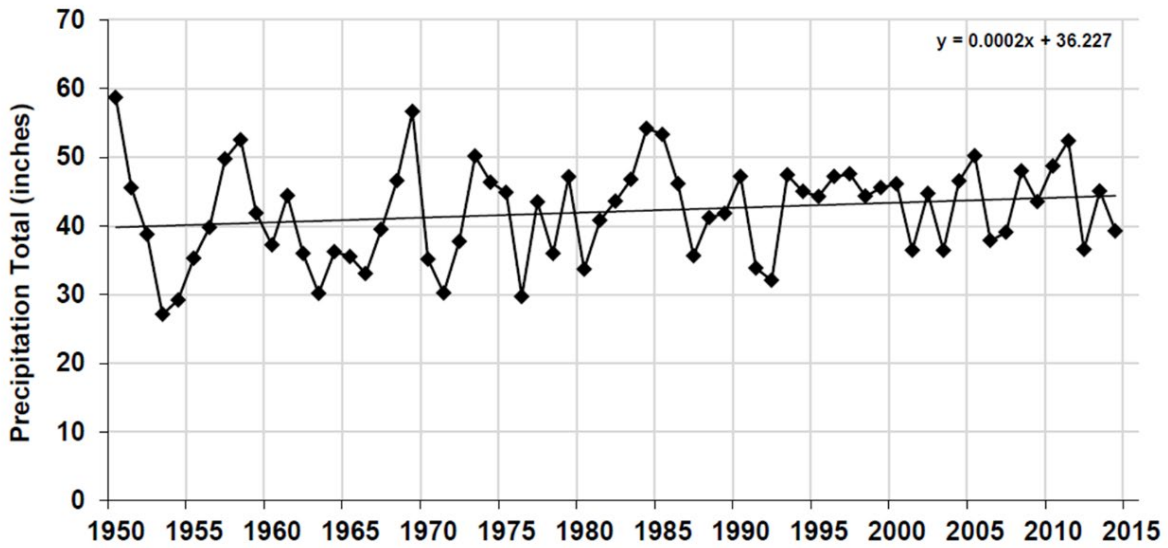
Source: Middle Mississippi River NWR Water Resource Inventory and Assessment Summary Report (2016)

Figure 6: Average annual water temperatures for Sparta, IL (1950-2014).



Source: Mississippi River NWR Water Resource Inventory and Assessment Summary Report (2016)

Figure 7: Average annual precipitation for Sparta, IL (1950-2014)



Source: Middle Mississippi River NWR Water Resource Inventory and Assessment Summary Report (2016)

Figure 8: Study Area for the Middle Mississippi River Landscape Conservation Design (MMRP 2019) with the 1996-1997 Refuge boundary and 2023 land ownership identified

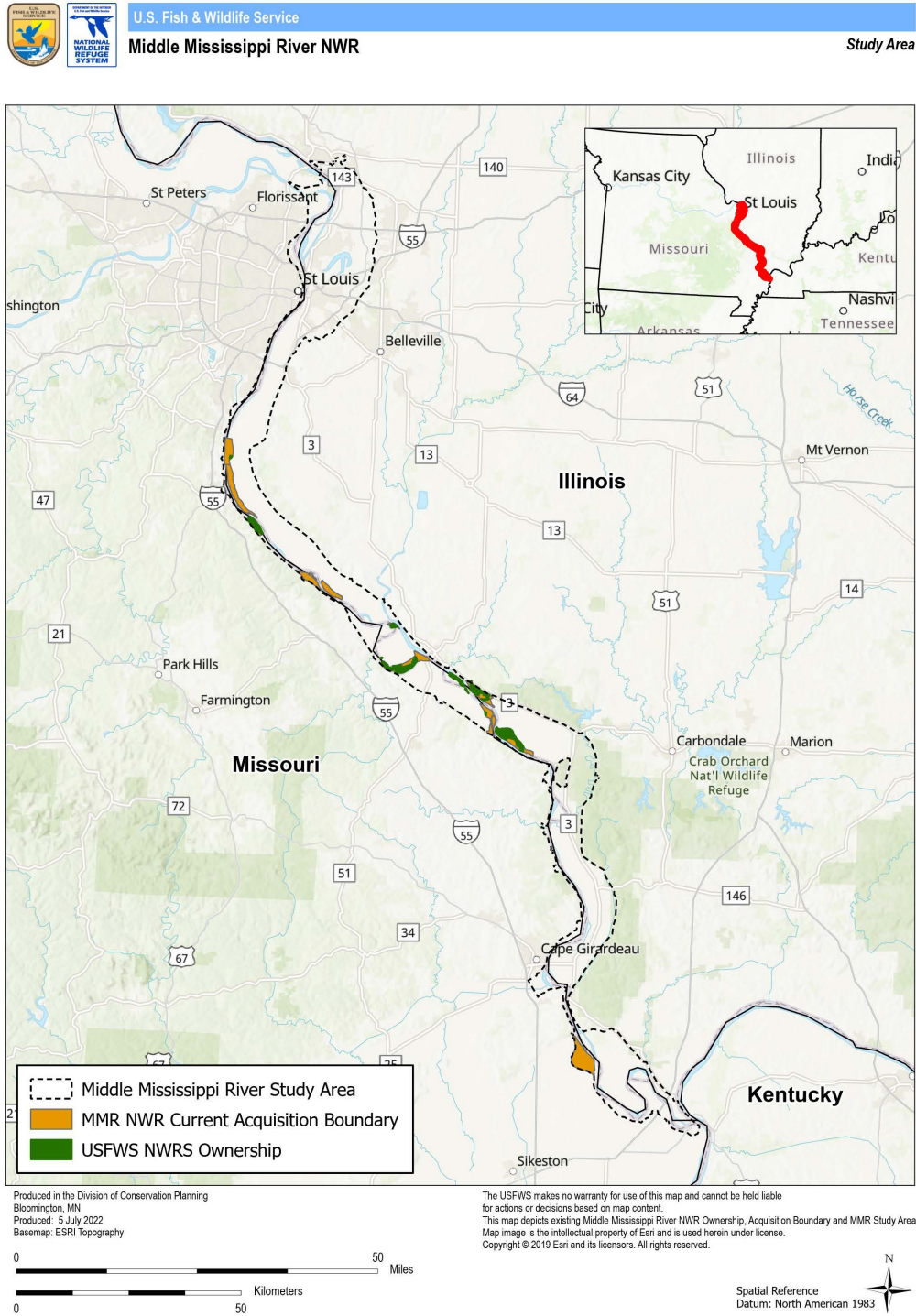


Figure 9: Current Land Status Map of the current Middle Mississippi River National Wildlife Refuge, Index Map. Source: U.S. Fish and Wildlife Service, Division of Realty (2022)

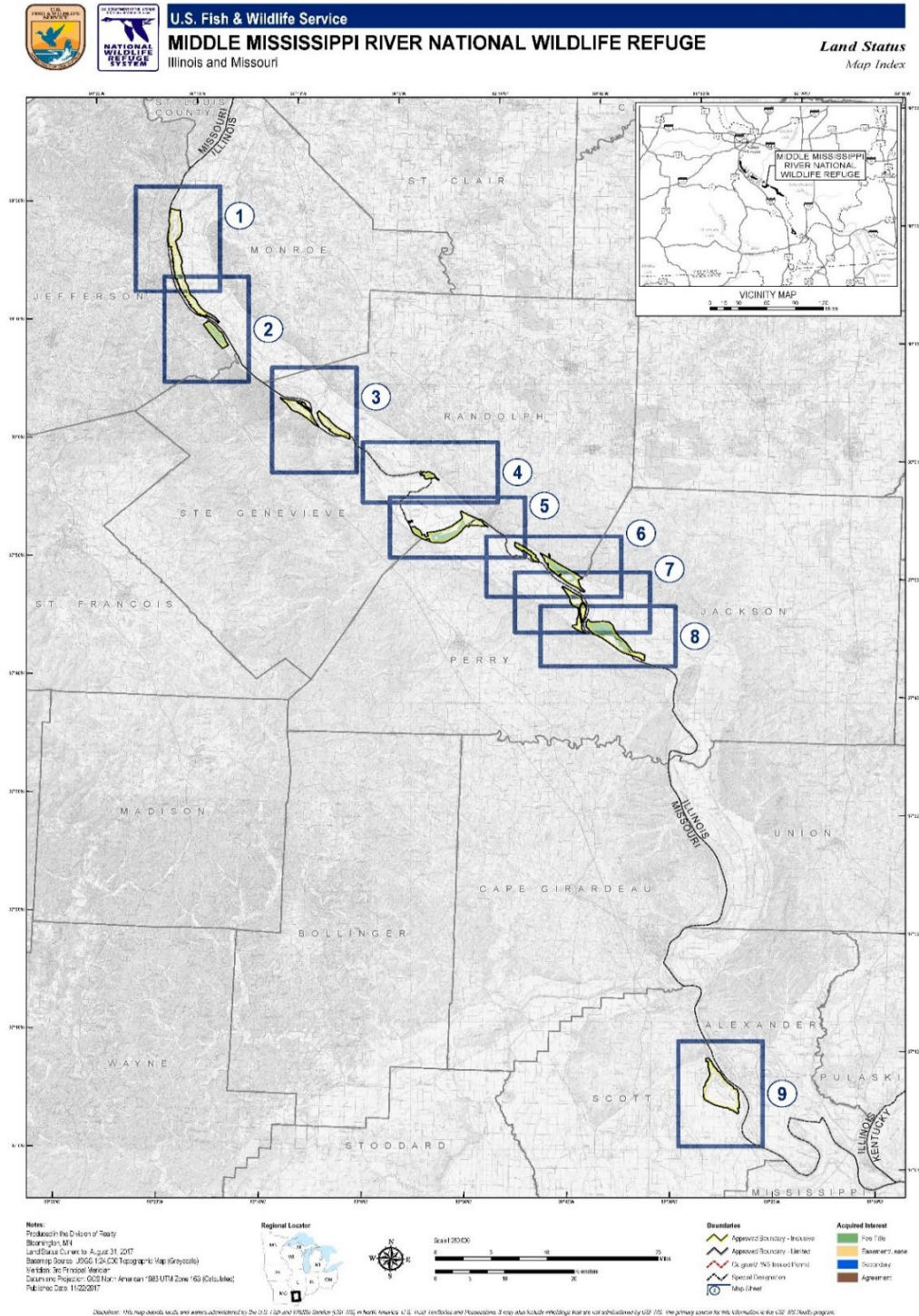


Figure 10: Current Land Status Map of the Middle Mississippi River National Wildlife Refuge, North to South, Sheet 1 of 9. Source: U.S. Fish and Wildlife Service, Division of Realty (2022)

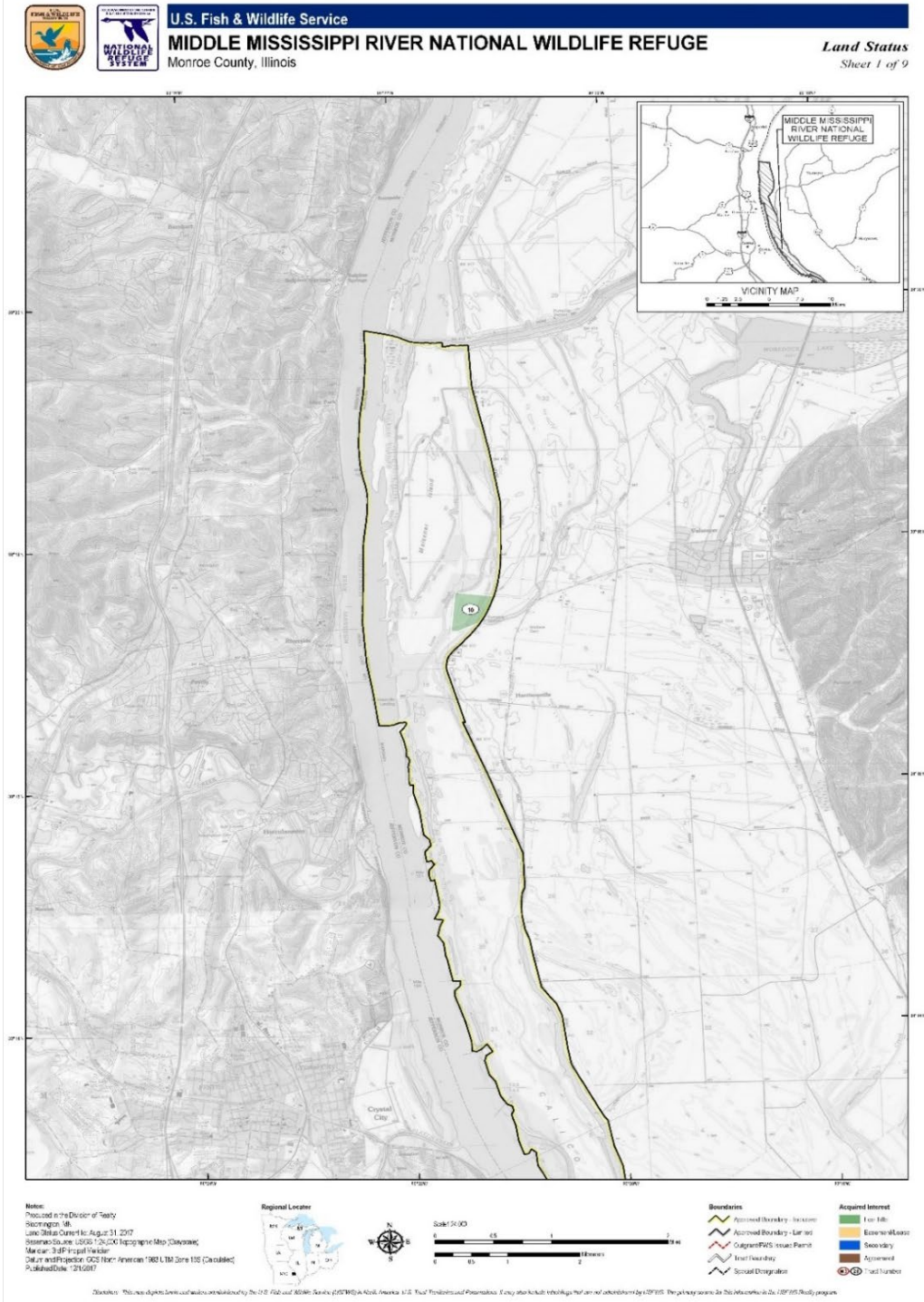


Figure 11: Current Land Status Map of the Middle Mississippi River National Wildlife Refuge, North to South, Sheet 2 of 9. Source: U.S. Fish and Wildlife Service, Division of Realty (2022)

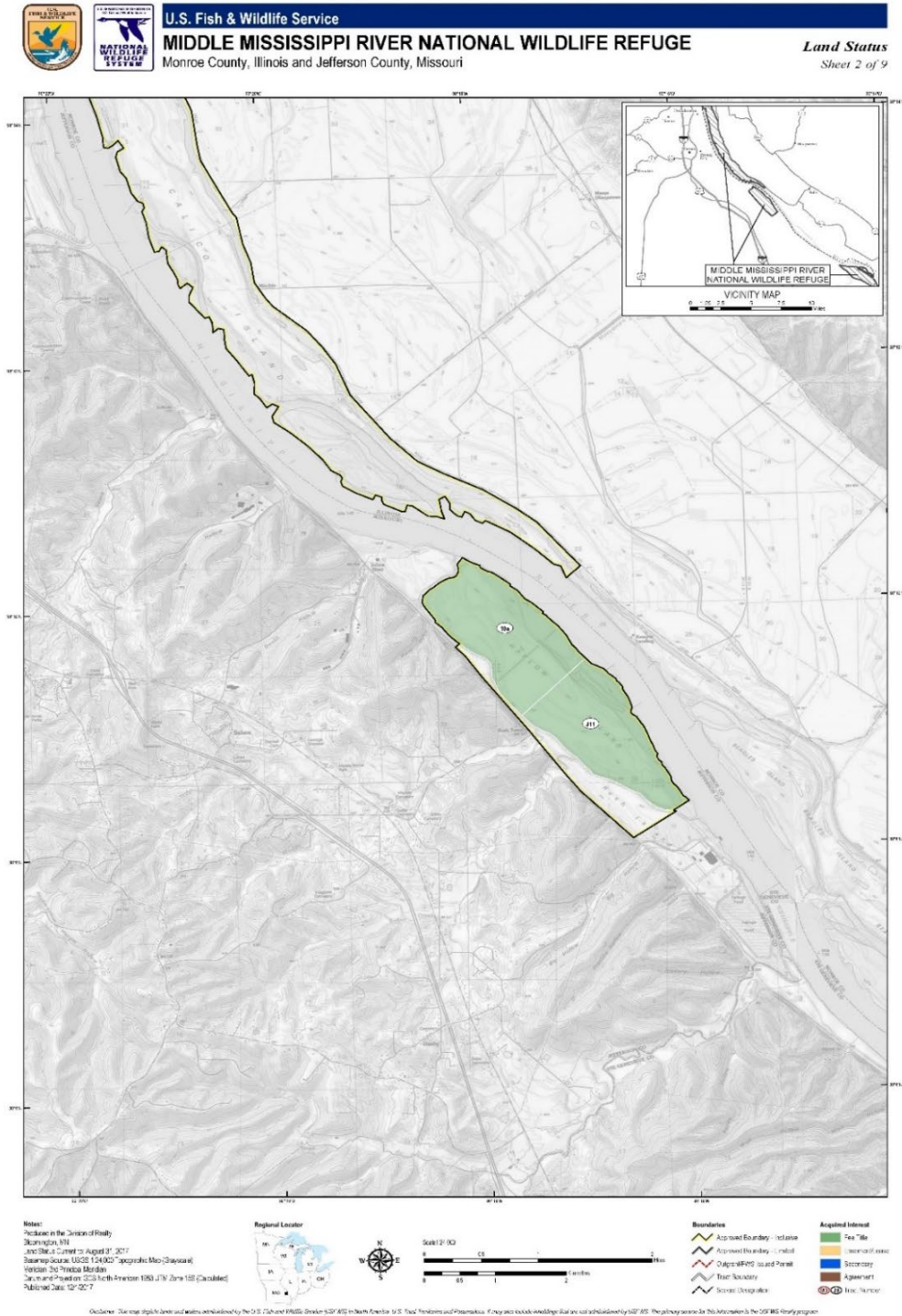


Figure 12: Current Land Status Map of the Middle Mississippi River National Wildlife Refuge, North to South, Sheet 3 of 9. Source: U.S. Fish and Wildlife Service, Division of Realty (2022)

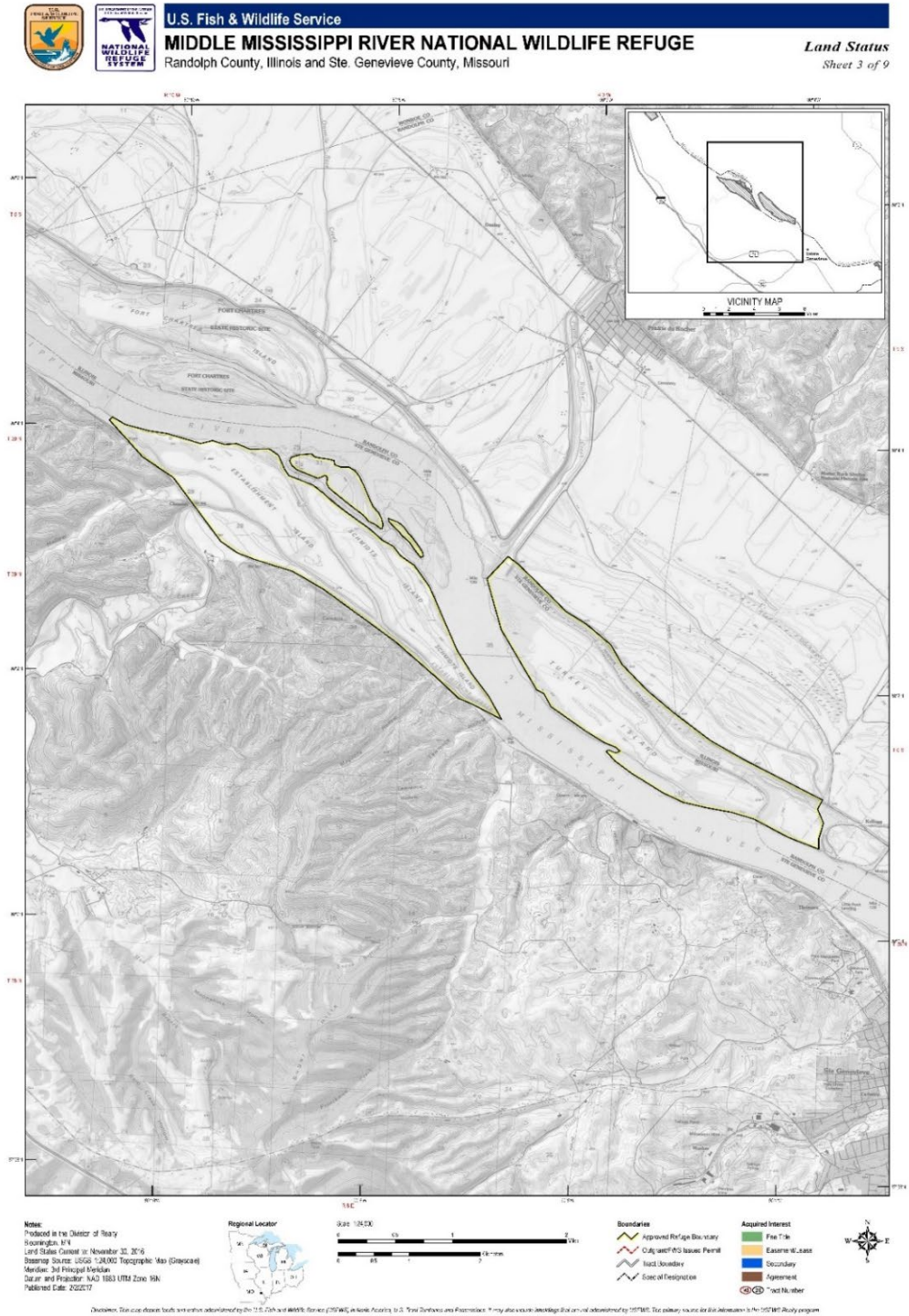


Figure 13: Current Land Status Map of the Middle Mississippi River National Wildlife Refuge, North to South, Sheet 4 of 9. Source: U.S. Fish and Wildlife Service, Division of Realty (2022)

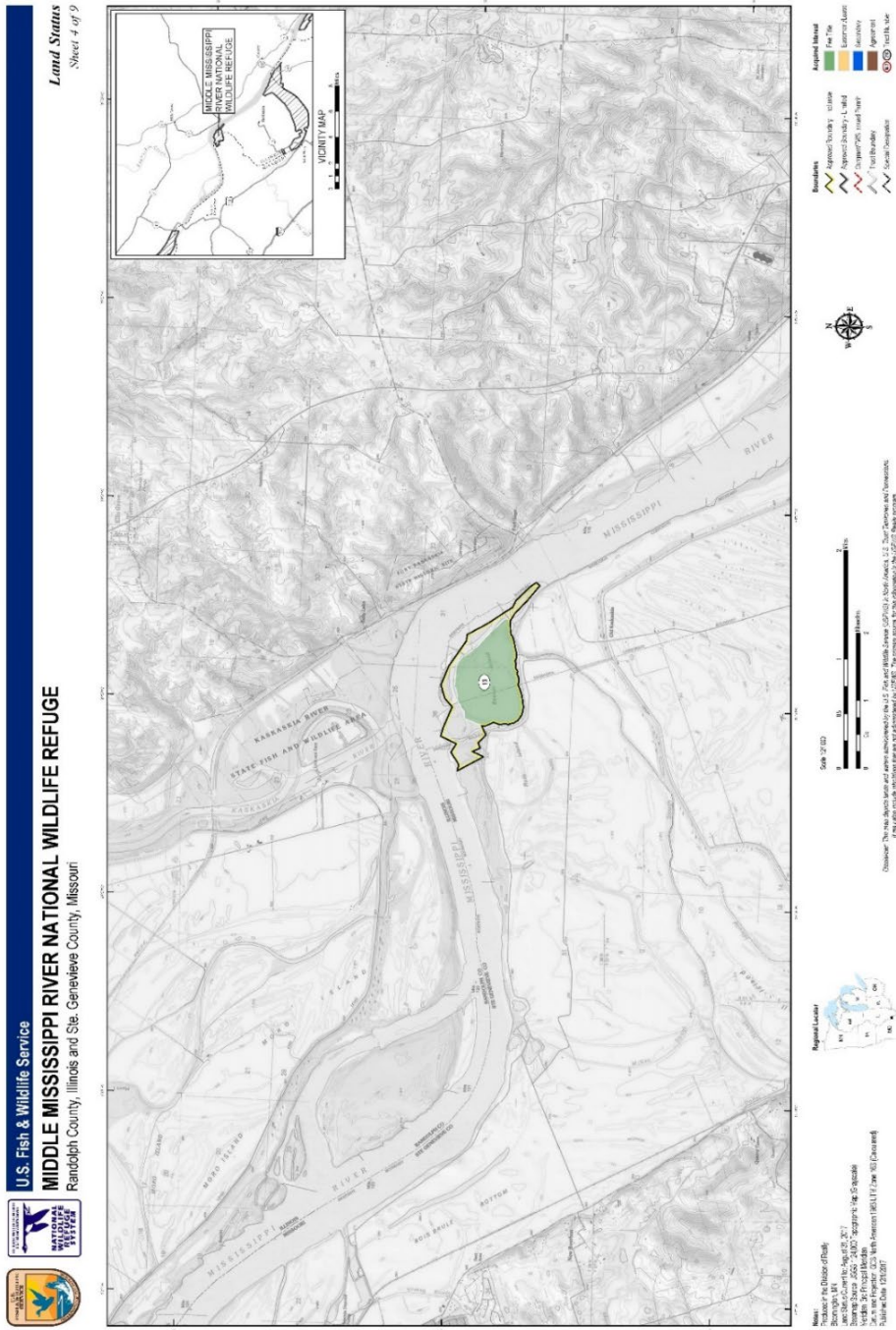


Figure 14: Current Land Status Map of the Middle Mississippi River National Wildlife Refuge, North to South, Sheet 5 of 9. Source: U.S. Fish and Wildlife Service, Division of Realty (2022)

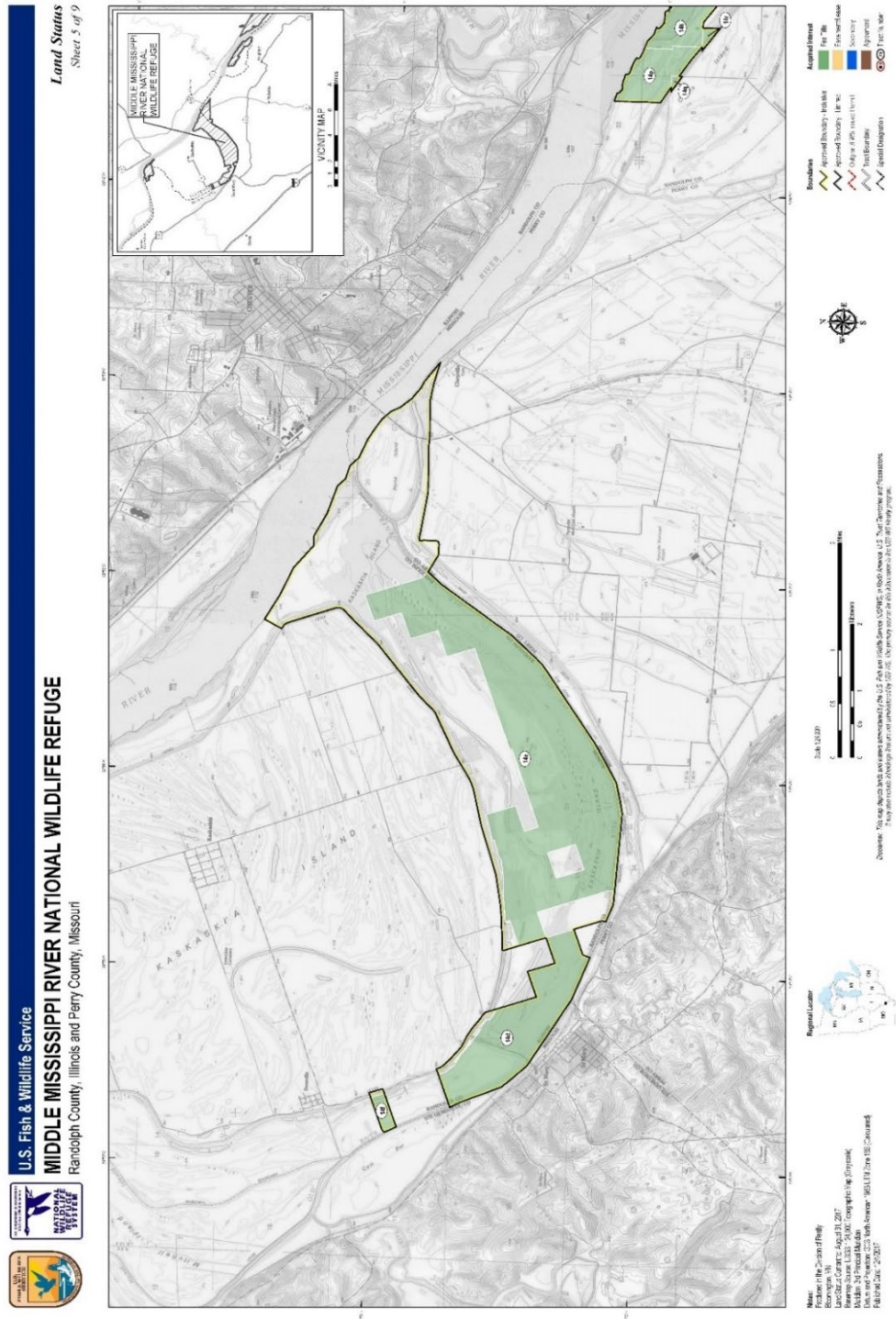


Figure 15: Current Land Status Map of the Middle Mississippi River National Wildlife Refuge, North to South, Sheet 6 of 9. Source: U.S. Fish and Wildlife Service, Division of Realty (2022)

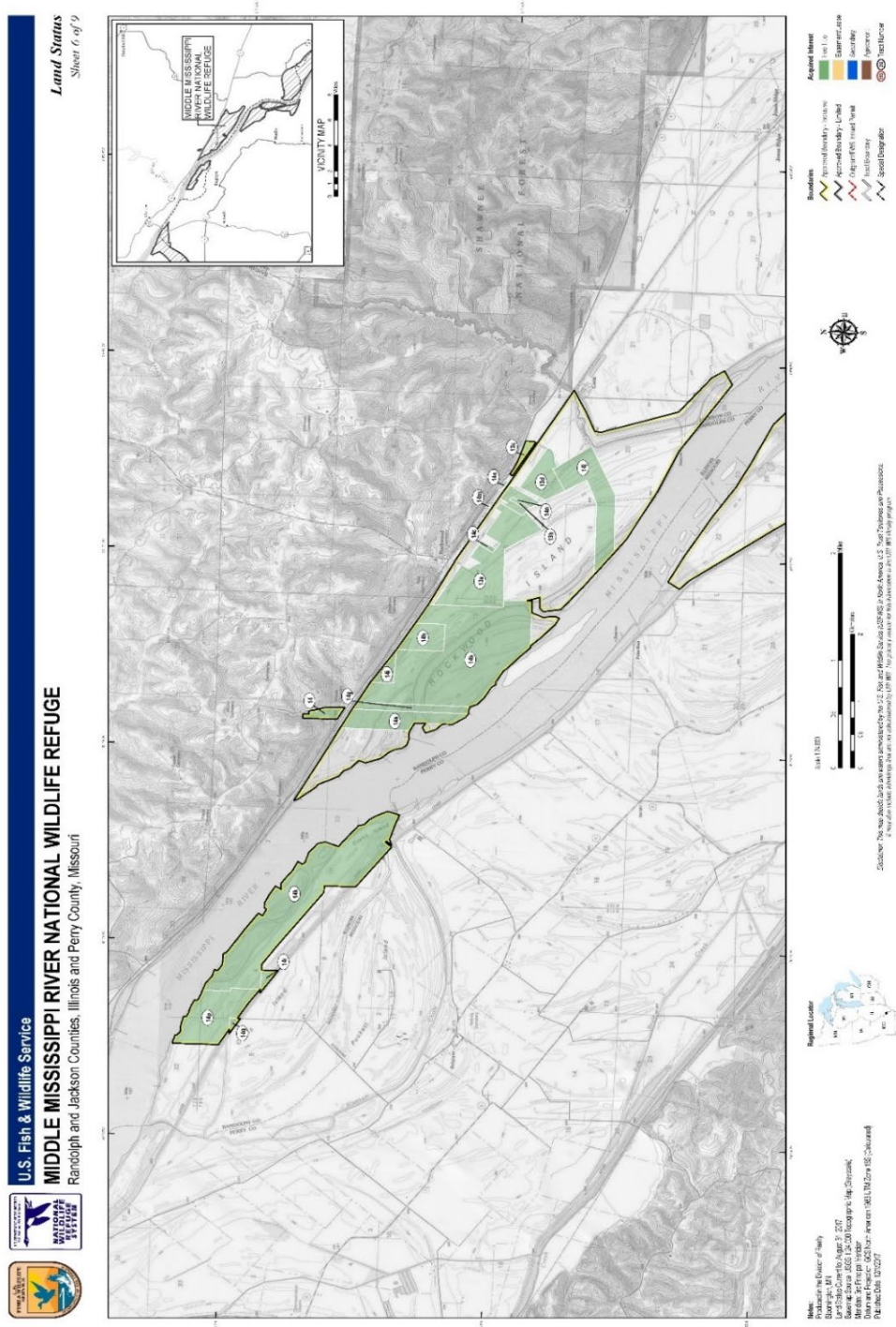


Figure 16: Current Land Status Map of the Middle Mississippi River National Wildlife Refuge, North to South, Sheet 7 of 9. Source: U.S. Fish and Wildlife Service, Division of Realty (2022)

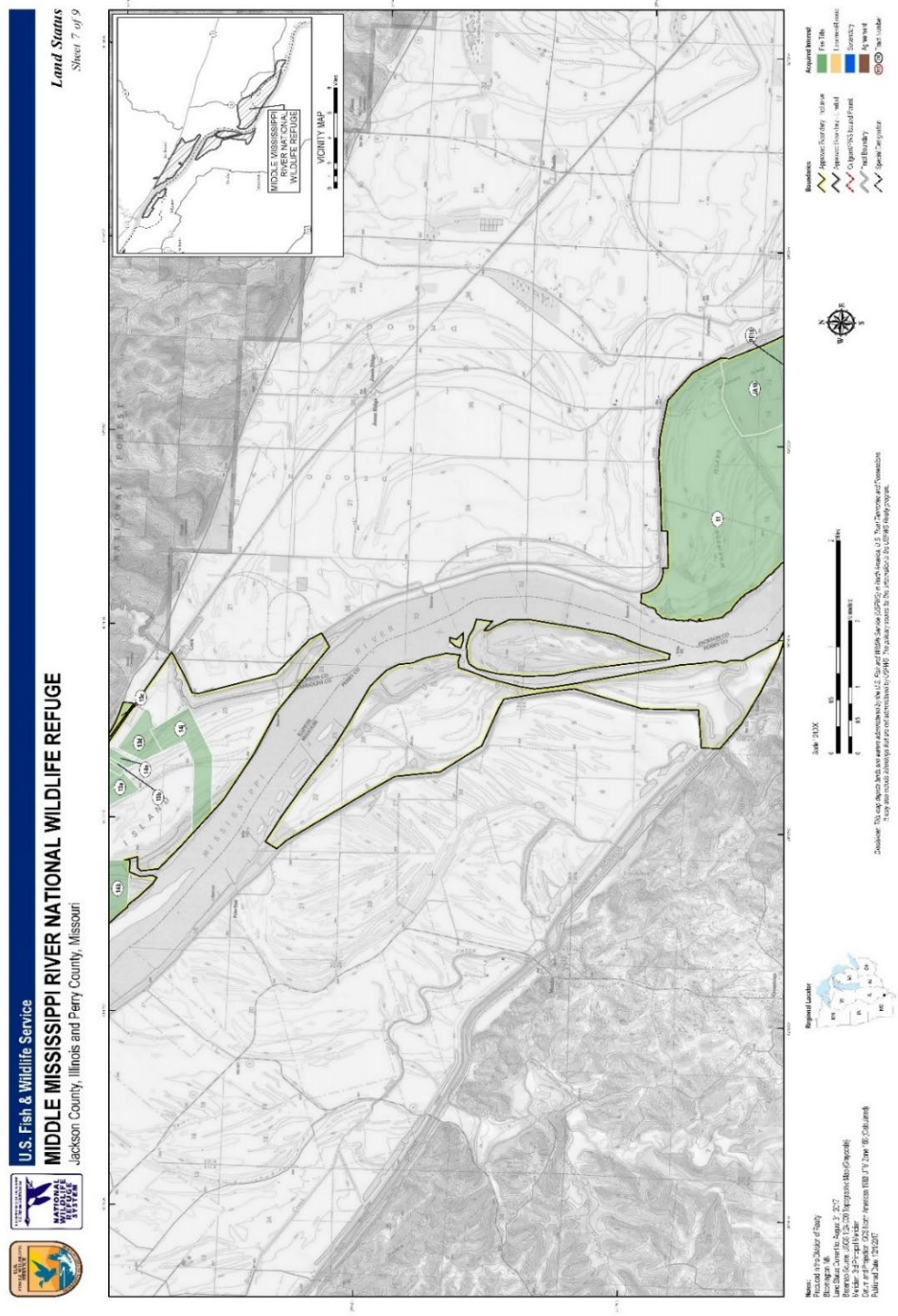


Figure 17: Current Land Status Map of the Middle Mississippi River National Wildlife Refuge, North to South, Sheet 8 of 9. Source: U.S. Fish and Wildlife Service, Division of Realty (2022)

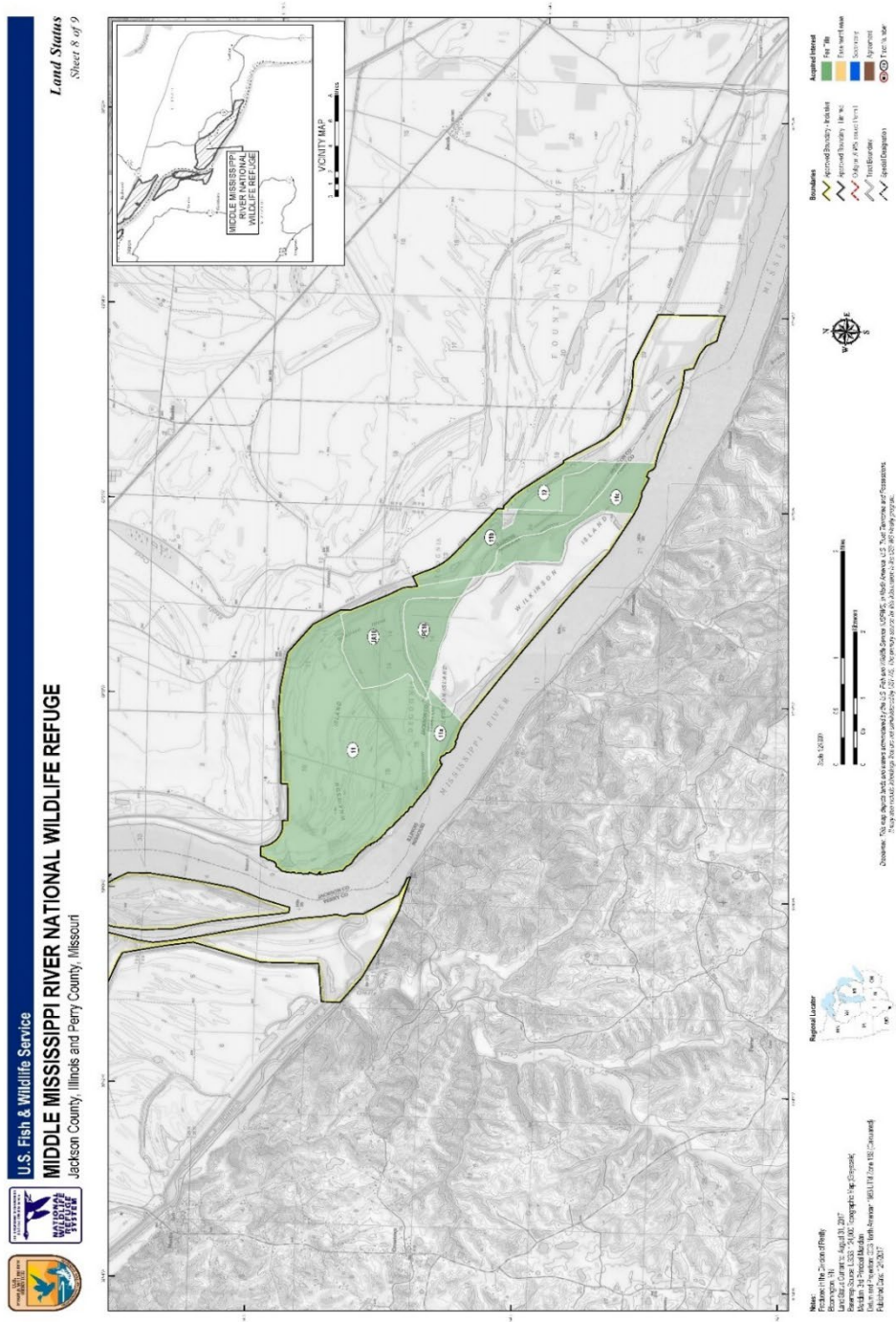


Figure 18: Current Land Status Map of the Middle Mississippi River National Wildlife Refuge, North to South, Sheet 9 of 9. Source: U.S. Fish and Wildlife Service, Division of Realty (2022)

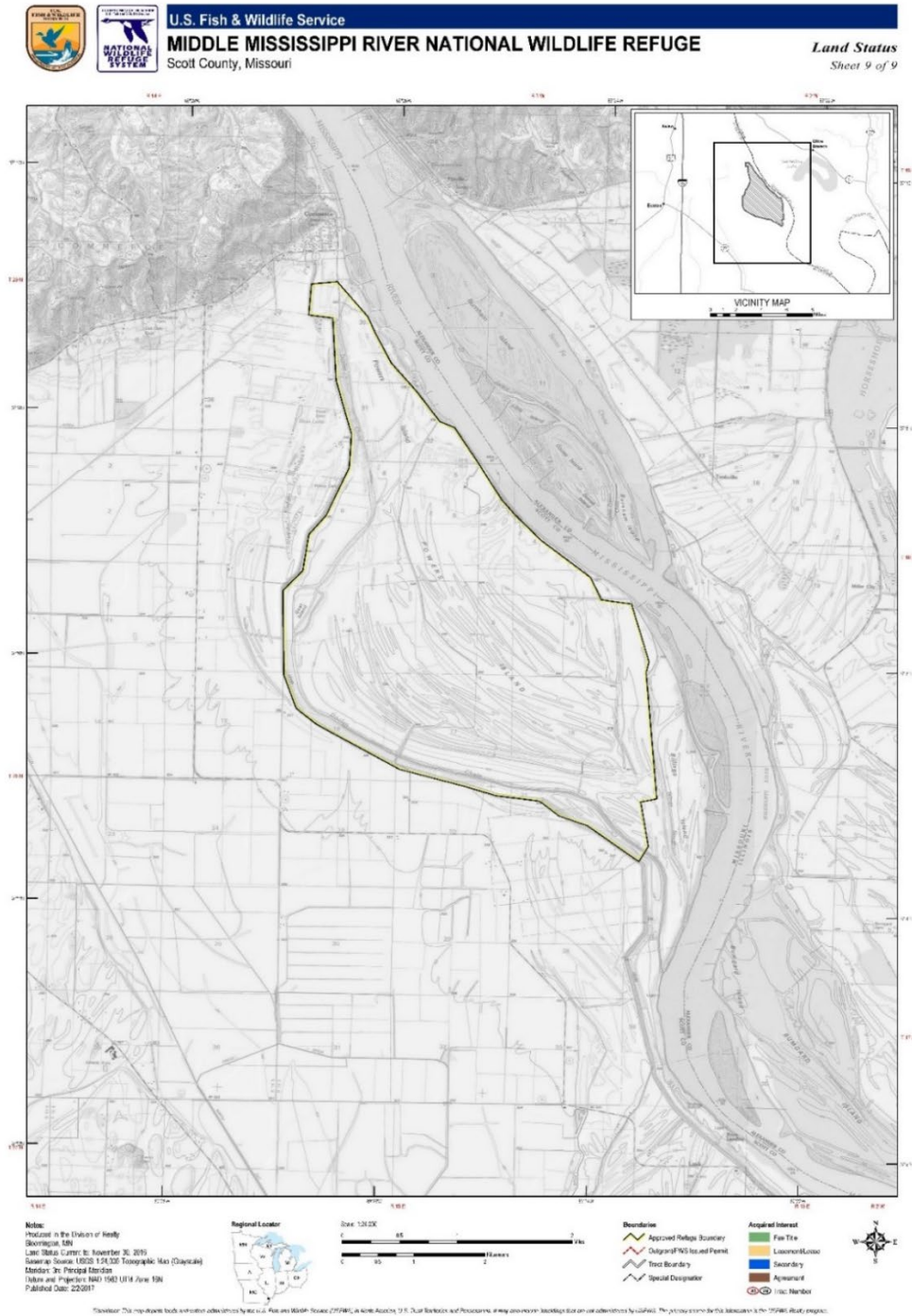


Table 1: Acreage and proportional area for each index value in the forest and marsh restoration tool

| Value | Restoration Ranks | | | | HGM Forest |
|-------------|-------------------|---------|------------------|--------------|------------|
| | Acres | Percent | Cumulative Acres | Cumulative % | |
| 11 | 29 | 0.0% | 29 | 0.0% | 73.5% |
| 10 | 44 | 0.0% | 73 | 0.0% | 98.7% |
| 9 | 2,229 | 0.4% | 2,302 | 0.9% | 91.1% |
| 8 | 561 | 0.1% | 2,863 | 1.1% | 98.6% |
| 7 | 20,108 | 4.0% | 22,971 | 8.5% | 77.5% |
| 6 | 2,239 | 0.4% | 25,210 | 9.3% | 93.2% |
| 5 | 90,239 | 17.8% | 115,449 | 42.8% | 74.5% |
| 4 | 9,503 | 1.9% | 124,952 | 46.3% | 73.0% |
| 3 | 112,354 | 22.1% | 237,306 | 87.9% | 81.2% |
| 2 | 32,477 | 6.4% | 269,783 | 100.0% | 67.6% |
| 1 | 111 | 0.0% | 269,894 | 100.0% | 100.0% |
| 0 | 237,481 | 46.8% | | | 71.0% |
| Total Acres | 507,375 | | 53.19% | | |

Source: Table extracted from (MMRP 2019)

Table 2: Acreage and proportional area for each index value in the forest enhancement tool

| Value | Forest Enhancement Ranks | | | |
|-------------|--------------------------|---------|---------------|--------------|
| | Acres | Percent | Cumulative Ac | Cumulative % |
| 12 | 0 | 0.0% | 0 | 0.0% |
| 11 | 1,573 | 1.5% | 1,573 | 1.5% |
| 10 | 5,474 | 5.1% | 7,047 | 6.5% |
| 9 | 1,223 | 1.1% | 8,270 | 7.7% |
| 8 | 11,915 | 11.0% | 20,185 | 18.7% |
| 7 | 53,296 | 49.3% | 73,481 | 68.0% |
| 6 | 0 | 0.0% | 73,481 | 68.0% |
| 5 | 65 | 0.1% | 73,546 | 68.1% |
| 4 | 156 | 0.1% | 73,702 | 68.2% |
| 3 | 189 | 0.2% | 73,891 | 68.4% |
| 2 | 6,281 | 5.8% | 80,172 | 74.2% |
| 1 | 27,849 | 25.8% | 108,021 | 100.0% |
| Total Acres | 108,021 | | 100.0% | |

Source: Table extracted from (MMRP 2019)

Table 3: Acreage and proportional area for each index value in the marsh enhancement tool

| Marsh Enhancement Ranks | | | | | |
|-------------------------|--------|---------|---------------|--------------|--|
| Value | Acres | Percent | Cumulative Ac | Cumulative % | |
| 12 | 2,327 | 2.2% | 2,327 | 8.7% | |
| 11 | 3,648 | 3.4% | 5,975 | 22.3% | |
| 10 | 358 | 0.3% | 6,333 | 23.7% | |
| 9 | 4,655 | 4.3% | 10,988 | 41.0% | |
| 8 | 4,572 | 4.2% | 15,560 | 58.1% | |
| 7 | 481 | 0.4% | 16,041 | 59.9% | |
| 6 | 518 | 0.5% | 16,559 | 61.8% | |
| 5 | 331 | 0.3% | 16,890 | 63.1% | |
| 4 | 456 | 0.4% | 17,346 | 64.8% | |
| 3 | 2,932 | 2.7% | 20,278 | 75.7% | |
| 2 | 2,579 | 2.4% | 22,857 | 85.4% | |
| 1 | 3,917 | 3.6% | 26,774 | 100.0% | |
| Total Acres | 26,774 | | | 100.0% | |

Source: Table extracted from (MMRP 2019)

Figure 19: Acquisition Boundary Map of Middle Mississippi River National Wildlife Refuge, North to South, Sheet 1 of 3

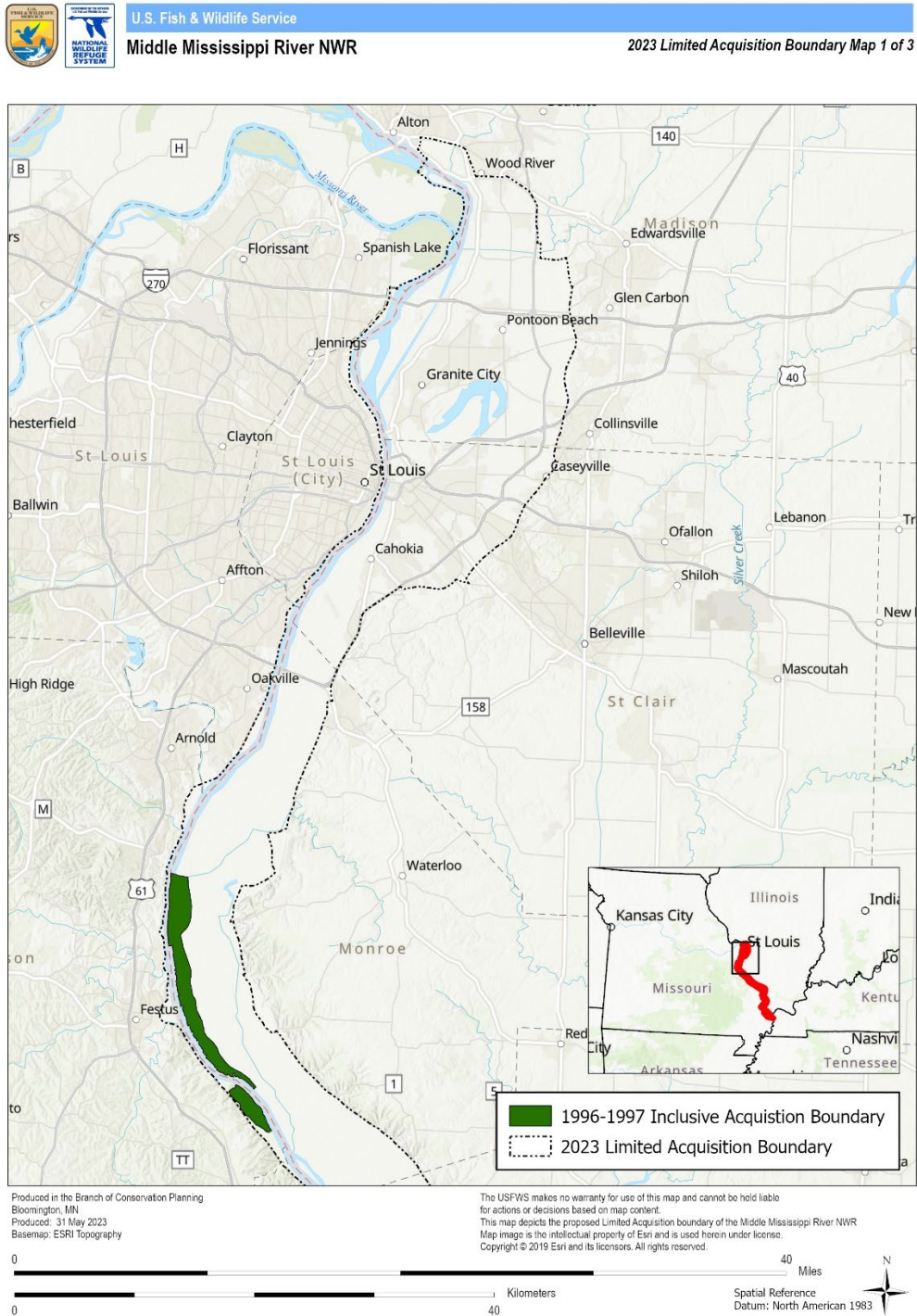


Figure 20: Acquisition Boundary Map of Middle Mississippi River National Wildlife Refuge, North to South, Sheet 2 of 3

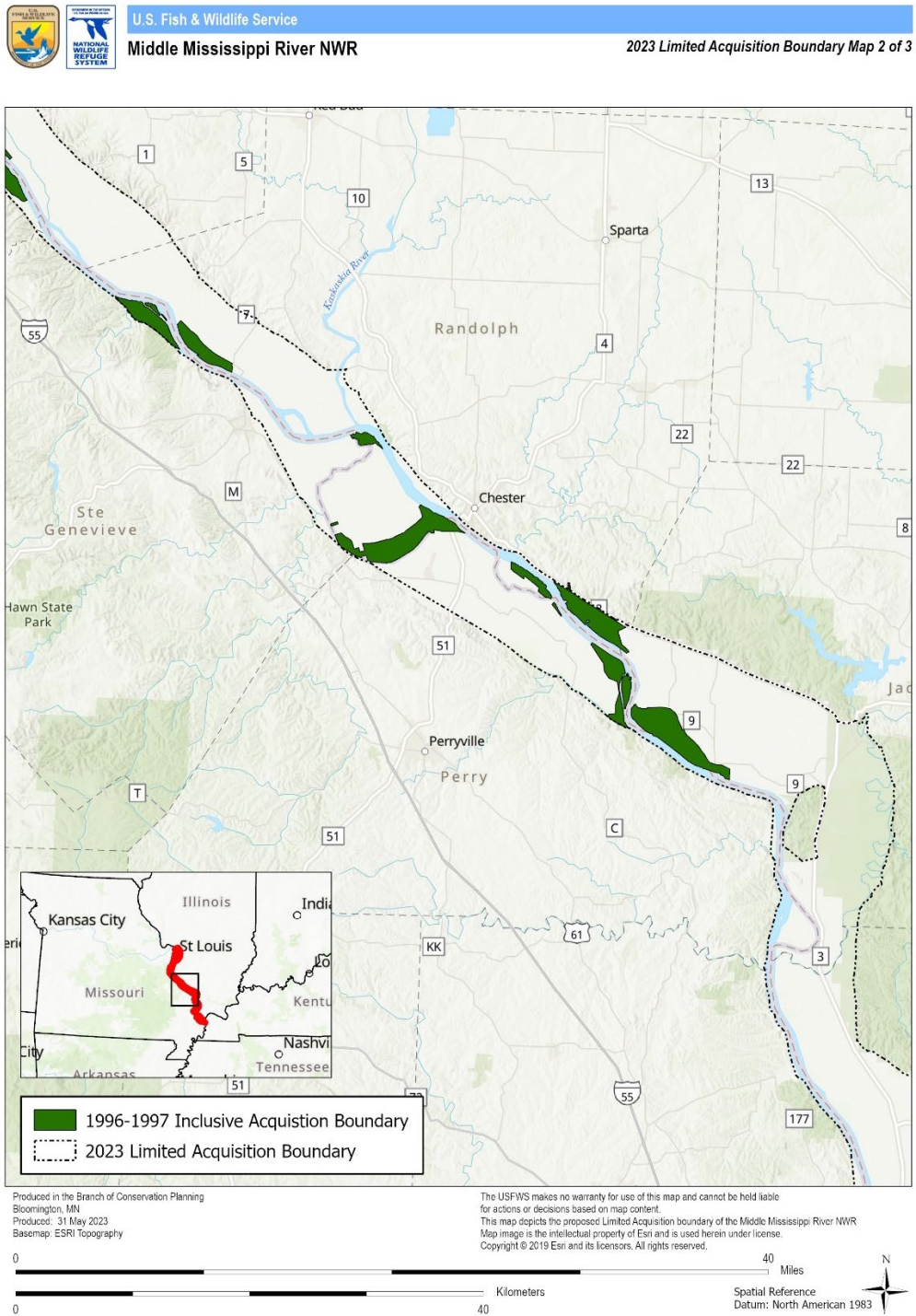


Figure 21: Acquisition Boundary Map of Middle Mississippi River National Wildlife Refuge, North to South, Sheet 3 of 3

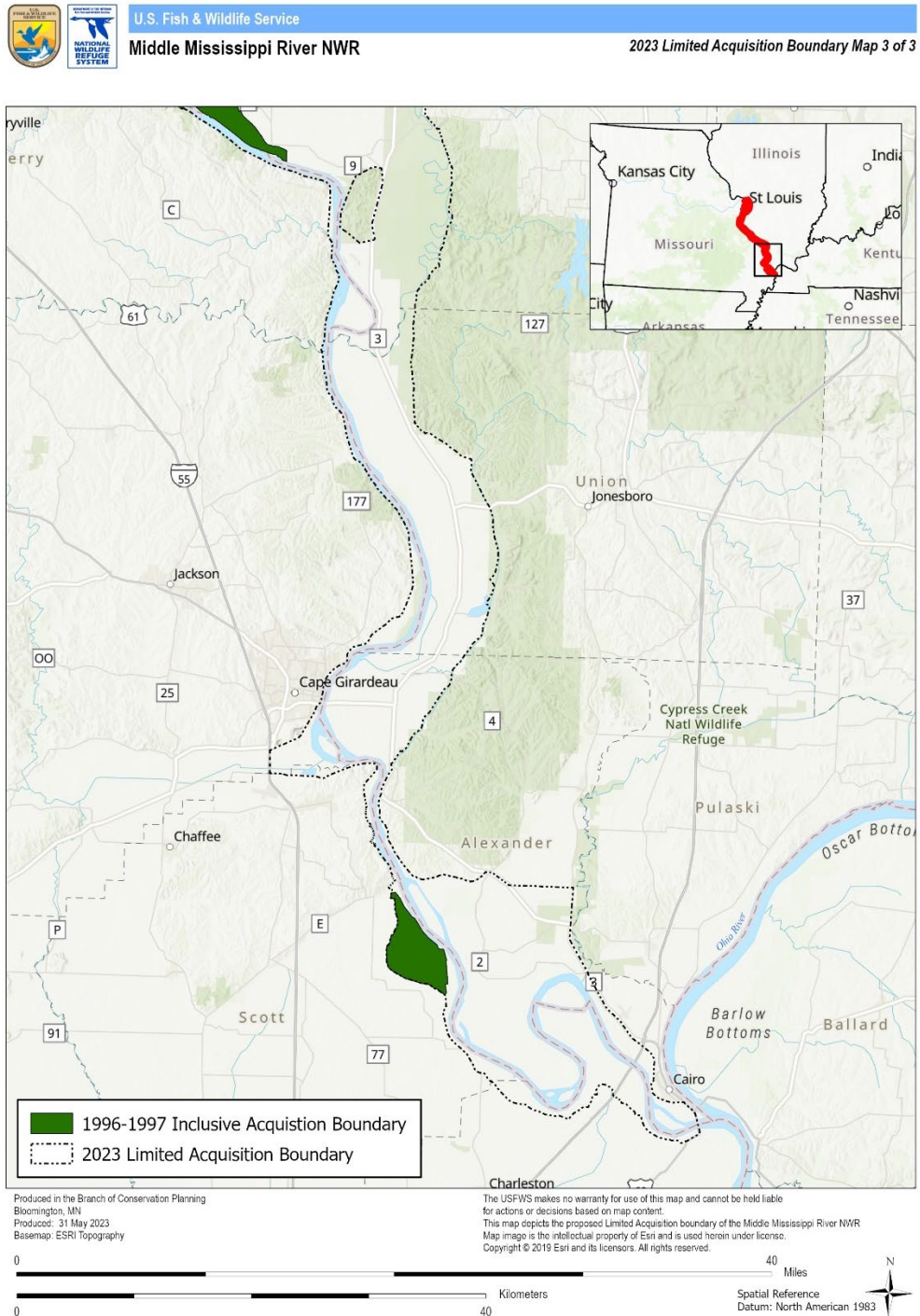


Figure 22: Landcover Map of 2023 Limited Acquisition Boundary of Middle Mississippi River National Wildlife Refuge, North to South, Sheet 1 of 3

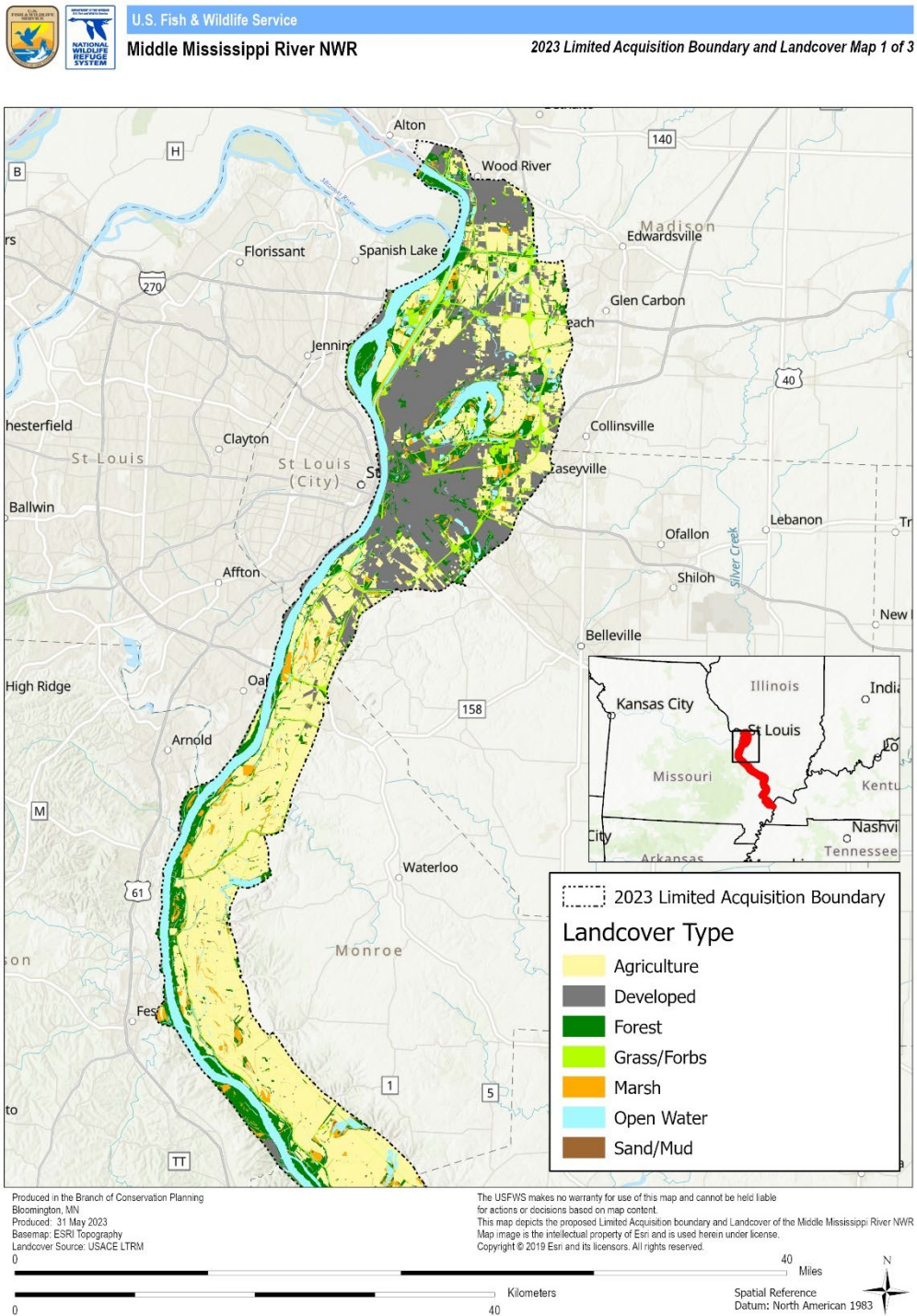


Figure 23: Landcover Map of 2023 Limited Acquisition Boundary of Middle Mississippi River National Wildlife Refuge, North to South, Sheet 2 of 3

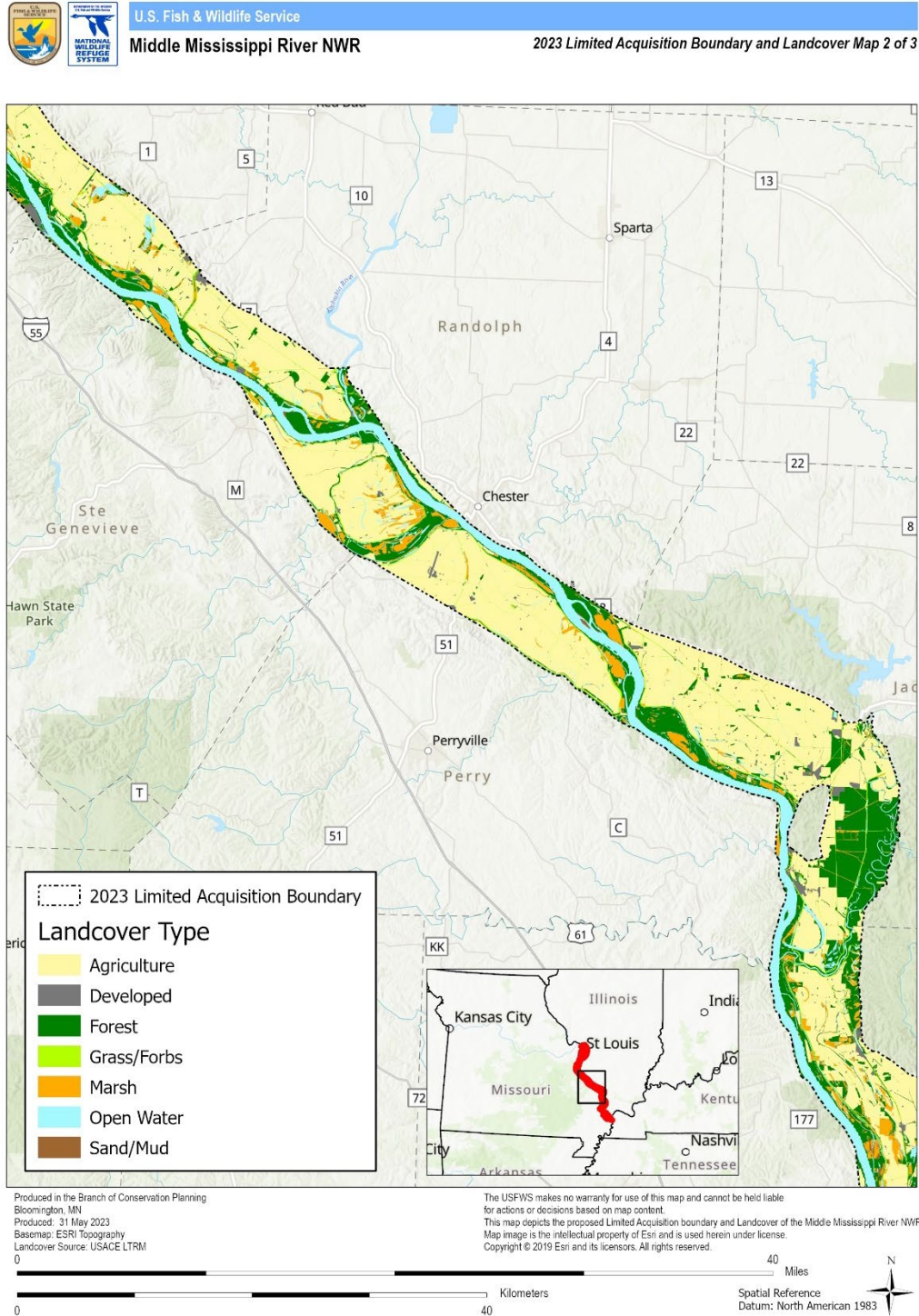


Figure 24: Landcover Map of 2023 Limited Acquisition Boundary of Middle Mississippi River National Wildlife Refuge, North to South, Sheet 3 of 3

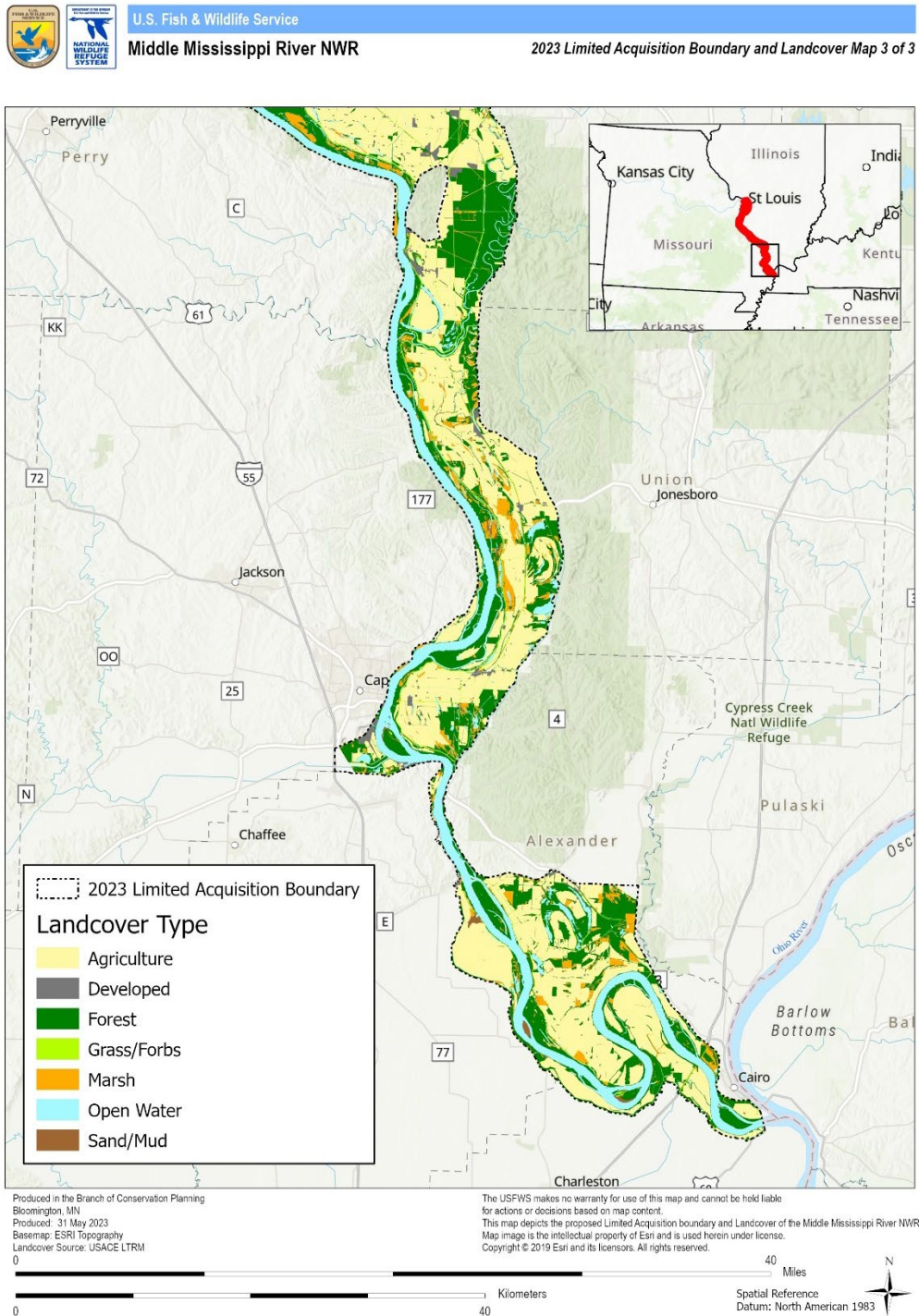


Figure 25: Meissner Island Division Digital Elevation Model (DEM) Map.

Source: Middle Mississippi River NWR Water Resource Inventory and Assessment Summary Report (2016)

Figure 26: Harlow Island Division Digital Elevation Model (DEM) Map.

Source: Middle Mississippi River NWR Water Resource Inventory and Assessment Summary Report (2016)

Figure 27: Beaver Island Division Digital Elevation Model (DEM) Map.

Source: Middle Mississippi River NWR Water Resource Inventory and Assessment Summary Report (2016)

Figure 28: Horse Island Division Digital Elevation Model (DEM) Map.

Source: Middle Mississippi River NWR Water Resource Inventory and Assessment Summary Report (2016)

Figure 29: Crains Island Division Digital Elevation Model (DEM) Map.

Source: Middle Mississippi River NWR Water Resource Inventory and Assessment Summary Report (2016)

Figure 30: Rockwood Island Division Digital Elevation Model (DEM) Map.

Source: Middle Mississippi River NWR Water Resource Inventory and Assessment Summary Report (2016)

Figure 31: Wilkinson Island Division Digital Elevation Model (DEM) Map.

Source: Middle Mississippi River NWR Water Resource Inventory and Assessment Summary Report (2016)

Appendix B: Reviewed Statutes, Regulations, and Executive Orders

Cultural Resources

- American Indian Religious Freedom Act, as amended, 42 United States C. 1996 - 1996: 43 CFR Part 7
- Antiquities Act of 1906, 16 United States C. 431-433; 43 CFR Part 3
- Archaeological Resources Protection Act of 1979, 16 United States C. 470aa-470mm; 18 CFR Part 1312; 32 CFR Part 229; 36 CFR Part 296; 43 CFR Part 7
- National Historic Preservation Act of 1966, as amended, 16 United States C. 470-470x-6; 36 CFR Parts 60, 63, 78, 79, 800, 801, and 810
- Paleontological Resources Protection Act, 16 United States C. 470aaa-470aaa-11
- Native American Graves Protection and Repatriation Act, 25 United States C. 3001-3013; 43 CFR Part 10
- Executive Order 11593 – Protection and Enhancement of the Cultural Environment, 36 Fed. Reg. 8921 (1971)
- Executive Order 13007 – Indian Sacred Sites, 61 Fed. Reg. 26771 (1996)

There will be no impacts to cultural resources under any of the proposed alternatives. Buildings, structures, and historic sites will be identified and subjected to a Section 106 review on a case-by-case basis as land is acquired.

Fish and Wildlife

- Bald and Golden Eagle Protection Act, as amended, 16 United States C. 668-668c, 50 CFR 22
- Endangered Species Act of 1973, as amended, 16 United States C. 1531-1544; 36 CFR Part 13; 50 CFR Parts 10, 17, 23, 81, 217, 222, 225, 402, 450
- Fish and Wildlife Act of 1956, 16 United States C. 742a-m
- Migratory Bird Treaty Act, as amended, 16 United States C. 703-712; 50 CFR Parts 10, 12, 20, and 21
- Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds, 66 Fed. Reg. 3853 (2001)

There is no anticipated disturbance or displacement of wildlife as a result of the proposed plan.

Natural Resources

- Clean Air Act, as amended, 42 United States C. 7401-7671q; 40 CFR Parts 23, 50, 51, 52, 58, 60, 61, 82, and 93; 48 CFR Part 23
- Wilderness Act, 16 United States C. 1131 et seq.
- E.O. 11990 - Wetland Protection
- E.O. 11988 - Floodplain Management
- E.O. 12372 - Intergovernmental Review of Federal Programs

Natural resources will not be impacted under any of the alternatives proposed to meet the purpose and need of the action. State partners have been invited to review this proposal for potential impacts to natural resources. No additional compliance will be required.

Appendix C: USFWS Socioeconomic Indicators

This appendix is not included with the final document – please contact the refuge manger for a copy of the appendix.

Appendix D: Comprehensive Conservation Plan & Conceptual Management Plan

Comprehensive Conservation Plan:

Developed in 2004 the Comprehensive Conservation Plan for the Mark Twain National Wildlife Refuge includes what is the current boundary of the Middle Mississippi River National Wildlife Refuge. As mentioned in the body of this document, a Comprehensive Conservation Plan is designed to guide the management and administration of the Refuge, while adhering to the National Wildlife Refuge System and Refuge specific vision and purpose(s). The Comprehensive Conservation Plan that includes the current Refuge can be found in the Service's electronic library called ServCat (<https://ecos.fws.gov/ServCat/Reference/Profile/103392>).

Conceptual Management Plan:

This conceptual management plan for the proposed expansion of the Middle Mississippi River National Wildlife Refuge presents a general outline on how the expanded Refuge lands would be operated and managed. Because it is impossible to predict which lands would be brought into the National Wildlife Refuge System, this plan does not provide restoration or long-term management details, identify where facilities would be located, or where future public uses would be allowed. Much of the information in this Conceptual Management Plan comes directly from the Comprehensive Conservation Plan for the Mark Twain Complex (USFWS 2004), which created individual refuges from its former divisions, of which Middle Mississippi River National Wildlife Refuge is one. This is because the Refuge specific vision and purpose outlined in the Comprehensive Plan remain the same.

Refuge Administration: Lands acquired in an expanded Middle Mississippi River National Wildlife Refuge would become part of the Refuge System, administered by the Refuge manager headquartered at Ste. Genevieve Missouri. The Refuge is located in the Midwest Region (Region 3) of the U.S. Fish and Wildlife Service and administered in conjunction with Great River National Wildlife Refuge and Clarence Cannon National Wildlife Refuge. The Regional Office is located in Bloomington, Minnesota, and would provide oversight of Refuge administration and management. The Regional Office would also provide technical assistance on matters such as engineering, planning, and habitat and wildlife management. Permanent full-time staff currently assigned for the Great River/Clarence Cannon/Middle Mississippi River complex includes a project leader, deputy project leader, administrative assistant, maintenance mechanic, biologist, and a biological technician. As lands are acquired over time it would be expected that some level of additional field staff, equipment, and supplies would be needed to manage new lands. Approval of large construction projects, water control structures, new infrastructure, or the need for additional staff would be completed through new or amended planning documents.

Facilities Management: If purchase of buildings on newly acquired lands cannot be avoided, these facilities may be used as administrative offices or necessary Refuge facilities such as workshops and storage. If the buildings are not suitable for Refuge use, they may be transferred or sold to other refuges, agencies, or the public. Structures in poor condition would likely be demolished after being surveyed for historical significance.

Habitat Management: In addition to management for the specific habitat types as described in the existing Comprehensive Conservation Plan (wetland and aquatic, other terrestrial habitats, forests, and floodplains), the Refuge will continue managing water quality, sedimentation, and invasive species. Additionally, any croplands on newly acquired lands have the potential for short-term cooperative farming or grazing agreements as a means to restore natural habitats.

Public Use: The Service will continue to encourage wildlife oriented public uses (hunting, fishing, wildlife observation, photography, environmental education, and interpretation) on the expanded Refuge, provided that they are determined to be appropriate and compatible with the purposes of the Refuge as required under Service Policy (603 FW 2). Any additional public uses not covered in the existing Comprehensive Conservation Plan would require an appropriateness and compatibility assessment, which includes public review and comment.

Other Actions: The Service may engage in other management activities to include inventory and monitoring, prescribed fire, law enforcement, cultural resource management, state and tribal coordination, Refuge revenue sharing, and trash or debris removal. These activities are described in further detail in the existing Comprehensive Conservation Plan (USFWS 2004).

Appendix E: Federal Species List

This appendix is not included with the final document – please contact the refuge manger for a copy of the appendix.

Appendix F: Missouri & Illinois State Species Lists

This appendix is not included with the final document – please contact the refuge manger for a copy of the appendix.

Appendix G: Summary of Public Comments on Draft LPP/EA

The draft Land Protection Plan & Environmental Assessment for the proposed expansion was made available to the public on January 17, 2023, for a 52-day comment period ending on March 10, 2023. The comment period notice summarized the proposal, invited comments from the public, and gave pertinent dates for open houses and other information necessary for public review and comment on the proposal. These notices were posted to the Refuge website and the national Twitter feed for the Service, as well as being sent to federal and state agencies with an interest in the project, representatives of 12 tribes that had indicated interest within the boundary, Missouri and Illinois State Senate and House of Representative contacts, Missouri and Illinois State governors, commission boards for the 14 counties within the proposed boundary, private and non-profit conservation partners, individuals who requested updates during the initial scoping period, as well as local news media sources.

The Service received letters or email comments from two state agencies (attached), and 3,129 members of the public, which included multiple non-government conservation partners. During the open houses and public meetings, 10 verbal comments were submitted from the public. The Service also received two responses to the tribal coordination completed concurrently with the public comment period. This included 1 comment (attached). In general, 99 percent of all comments received were supportive of the proposed expansion, less than one percent were neutral or comprised of questions, and less than one percent were in opposition of the proposal.

In accordance with the requirements of the National Environmental Policy Act, the Service has responded to substantive comments below. For the purposes of this Final Environmental Assessment, a substantive comment is one that was submitted during the public review and comment period which is within the scope of the proposed action (and the other alternatives outlined), is specific to the proposed action, has a direct relationship to the proposed action, and includes reasons for the Service to consider it. For example, a substantive comment might be that “the document referenced species found in previous surveys, but more recent surveys have been completed which found additional species”. In such a case, the Service would likely update the plan and respond to the comment. On the other hand, a comment such as “we agree/disagree with the proposed action” would not be considered substantive. In response to all comments, we made a number of minor edits to the final document.

Comment 1: The Cherokee Nation Tribal Historic Preservation Office submitted the following comment (summarized, complete comment attached): This office does not object to the project proceeding as long as the following stipulations are observed: 1) the Service will re-contact this Office for additional consultation if there are changes to the scope of activities; 2) the Service will halt all project activities immediately if items of cultural significance are discovered during

the course of this project; and 3) the Service will conduct appropriate inquiries with other pertinent Historic Preservation offices

Service Response: Concur. This document will act to assess the impacts of the boundary expansion for the Middle Mississippi River National Wildlife Refuge. Additional coordination with tribes and/or pertinent Historic Preservation Offices will be completed as needed when parcels are acquired, or when ground disturbing activities are proposed on the Refuge in the future.

Comment 2: Several individual commenters indicated that they felt the estimated increase in management and maintenance costs was low. Additionally, The East Ozarks Audubon Society submitted the following comment (summarized): This chapter strongly supports the expansion plan under preferred Alternative B. We are concerned about the funding for increase management and maintenance costs mentioned of an estimated \$75-100k per year as this seems very modest. Additionally, all bats in Missouri and Illinois are insectivores – you should remove the reference to pollination and seed dispersal. We recommend adding *Myotis lucifugus* to the list of bats likely to benefit from forest preservation and restoration.

Service Response: The figure estimated within the “Affected Environment – Refuge Management and Operations” section is simply a representative of immediate/short term future needs within a refuge with an active acquisition program. The Conceptual Management Plan (Appendix D) describes the Service’s acknowledgement that funding needs will be dependent upon the number of willing sellers and size of acquisitions, and the planning for additional staff would be completed through new or amended planning documents. We have edited the “Natural Resources – Threatened and Endangered Species and Other Special Status Species” section to clarify that Missouri and Illinois bat species are insectivores. Little brown bat has been included in the list of mammals managed within the Refuge under the “Affected Environment – Natural Resources” section.

We did not make any changes to the proposal as a result of these comments.

Comment 3: The Illinois Department of Natural Resources and multiple individual commenters submitted a comment encouraging the Service to consider expanding the proposed boundary from solely a focus on the historic floodplain, to including the bluff corridor as a transition to the uplands along the river.

Service Response: Acknowledged. The Service agrees that there is a need for protection along the bluff, but the floodplains will be our current area of focus based on the needs identified by the Partnership and the original intent of this Refuge. Consideration will be given to the bluffs when we explore future opportunities for the Middle Mississippi National Wildlife Refuge and other refuges within the Midwest Region that could potentially acquire lands in the region after completion of this expansion project.

We did not make any changes to the proposal as a result of these comments.

Comment 4: One written comment and multiple verbal comments at the public meetings indicated a desire to restrict motorized vehicle use on the Refuge.

Service Response: Motorized vehicles on national wildlife refuges are generally permitted only on designated roads during specified times of the year. Off-road vehicle use, including ATVs and UTVs, is generally not permitted due to impacts on vegetation, disturbance to wildlife and other Refuge users, and safety and liability issues. However, the Service's objective is not to eliminate or interrupt existing UTV trails. It is possible that at some time in the future a landowner would offer land for sale to the Refuge that contains a portion of an existing off-road vehicle trail. We do not expect this situation to occur very often. The Service would work with the landowner and interested parties to either reroute the trail or encourage a third party to obtain a permanent trail easement prior to the federal purchase. The Department of Natural Resources in Illinois and Missouri, respective county governments, or local clubs may choose to be involved to secure an existing trail. Restrictions to motor vehicle use within the current Refuge boundary are broadly discussed in the existing Comprehensive Conservation Plan (Appendix D).

We did not make any changes to the proposal as a result of these comments.

Comment 5: Multiple individual commenters indicated a desire to provide resources to engage marginalized communities with resources to learn about and benefit from the Refuge.

Service Response: Concur. The Service has attempted to take such communities into consideration while planning this proposal (see "Affected Environment – Socioeconomics" section); however, we invite interested parties to reach out to the station manager, as we are always looking for opportunities to provide outreach and partnerships within local communities.

We did not make any changes to the proposal as a result of these comments.

Comment 6: An individual commenter noted that it may be the Service's policy to forbid the public to install bird houses on National Wildlife Refuge lands and questioned why hunting would be allowed on a refuge, but the installation of bird houses would not be allowed. The commenter also stated that if an area allows hunting, it should be called a hunting area, not a refuge.

Service Response: There is no nationwide Service policy forbidding installation of bird houses or bird boxes on refuge lands. There are many refuges throughout the nation that have placed bird feeding stations on the refuge to encourage bird watching by members of the public. Multiple refuges within the same complex as Middle Mississippi River National Wildlife Refuge have put bird houses and bird boxes up on refuge lands with scout groups, school groups, and individuals, but this action (as with every action on refuge lands) is subject to refuge authorized use policy. The refuge manager must agree to it, and there would need to be assurances that the structures are constructed properly in the correct habitat and maintained. We encourage you to contact the manager at your local refuge if you have any questions about whether you can install a birdhouse in a specific area.

Most refuge hunt programs have established refuge-specific regulations to improve the quality of the hunting experience as well as provide for quality wildlife-dependent experiences for other users. Refuge visitor use programs are adjusted, as needed, to eliminate or minimize conflicts between users. Virtually all of the refuges open to hunting and other wildlife-dependent recreational uses use time and space zoning as an effective method to reduce conflicts between hunting and other uses. Eliminating or restricting overlap between hunt areas and popular areas for other wildlife-dependent recreation allows opportunity for other users to safely enjoy the refuge in non-hunted areas during hunting seasons. Restrictions on the number of hunters and the time periods in which they may hunt are also frequently used to minimize conflicts between user groups. Public outreach accompanying the opening of hunting seasons is frequently used to make other wildlife-dependent recreational users aware of the seasons and minimize conflicts.

We did not make any changes to the proposal as a result of this comment.



Illinois Department of Natural Resources

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JB Pritzker, Governor
Colleen Callahan, Director

12 August 2022

Attn: Ashley Kraetsch
U.S. Fish & Wildlife Service
National Wildlife Refuge System
5600 American Blvd West, Suite 990
Bloomington, MN 55437-1458

The Illinois Department of Natural Resources (IDNR) hopes that you find the information below helpful in the development of a Land Protection Plan and Environmental Assessment for the proposed expansion of the Middle Mississippi River National Wildlife Refuge (MMRNWR). Conservation at the landscape level can be complicated and requires supportive partnerships to be successful. The map provided in the EA&LPP info packet appears to consider expanding the current acquisition boundary to now include all of the 100-year floodplain of the Mississippi River south of the confluence with the Missouri River to the Ohio River confluence. This is commendable and would alter the scope of the NWR and provide a benefit to many valuable resources in need of conservation. However, the IDNR requests that the MMRNWR consider expanding from being focused solely on the floodplain to also encompassing the bluff corridor along this stretch of the river and the transition to the upland as well. This would be a more holistic and ecologically sound approach as well as providing more partnership opportunities. The main advantage of including the bluff corridor as the transition from the floodplain to the uplands is that it would provide better connectivity, allow ecological processes across systems, and provide buffer to the floodplain. Ecologically, these two systems while distinct are inexplicitly linked with impacts to one having effects on the other.

The shared tabular data represent high-quality natural resources that would be within the Illinois portion of the 100-year floodplain of the Mississippi River. These include Illinois Natural Areas Inventory (INAI) sites, sites permanently protected by the Illinois Nature Preserves Commission (INPC), Species listed as Endangered or Threatened by the Illinois Endangered Species Protection Board (ESPB) and existing Conservation Areas. INAI sites are sites that contain aspects of the state's biological heritage that represent what Illinois looked like prior to European settlement and may include high-quality natural communities, specific suitable habitat for listed species, unique geological features of statewide importance and designated unique assemblages of species. A category of sites within the INAI also includes INPC sites so some acreage could be duplicative. INPC sites are parcels of land that are permanently protected through programs established by the Illinois Nature Preserves Commission such

as Nature Preserves (NP) where everything is protected by law and Land and Water Reserves (LWR) which allows some consumptive use of resources if they are consistent with the preservation of the natural feature for which the site was Registered. INPC programs are authorized by the states Natural Areas Preservation Act. State Endangered or Threatened species subject to the Illinois Endangered Species Protection Act include Federally listed species by definition. Conservation Areas are defined herein as those either owned outright or under conservation easement by state, federal, municipal, or non-government organizations.

Within the approximate area under consideration for expansion proposal are (Tables 1 – 4):

- 22 INAI sites totaling around 12,800 acres
- 5 NPs totaling 846.09 acres
- 109 occurrences of Endangered species (2 invertebrate animals, 24 vertebrate animals and 20 vascular plants)
- 93 occurrences of Threatened species (16 vertebrate animals and 11 vascular plants)
- 98 conservation sites totaling approximately 49,040 acres.

A bluff corridor buffer of 5 miles, on the Illinois side of the proposed expansion, contains the important ecotone transition area between the floodplain and the uplands. Including this area within the NWR expansion would create a broader vision and assist in the conservation of many more sites containing high-quality natural resources and habitats for endangered and threatened species. In addition to sites and species contained within the proposed expansion area, conserving the overlooking bluff corridor 5-mile buffer would include (Tables 5 – 8):

- 71 additional INAI sites totaling around 54,645 acres
- 30 NPs totaling 2,443.48 acres (including Dedicated buffers)
- 16 Land and Water Reserves totaling 1935.66 acres
- 152 additional occurrences of Endangered species (9 invertebrate animals, 16 vertebrate animals and 36 vascular plants)
- 103 occurrences of Threatened species (15 vertebrate animals and 16 vascular plants)
- 51 additional conservation sites totaling approximately 181,406 acres.

The Illinois Wildlife Action Plan identifies Conservation Opportunity Areas (COAs) and establishes goals associated with each COA and identifies conservation priorities and threats. There are five such COAs within the proposed expansion and potential 5-mile bluff corridor buffer. These are the Illinois Ozarks, Hill Prairie Corridor – South Section, Lower Kaskaskia River Bottomlands, Sinkhole Plain, Middle Mississippi River COAs. The expanded and buffered MMRNWR would be beneficial in the implementation of these goals as a partner.

Other justifications to include the bluff corridor buffer:

- The stretch of bluffs paralleling the current proposed boundary of the MMR on the Illinois side contain some of the state's larger remaining contiguous or nearly contiguous forested land.
 - A suite of area-sensitive avian species are dependent on these spatial attributes.
- The former federal candidate species, and current state-threatened species, cerulean warbler, is a documented breeder at locations within the bluff system.
 - Other species requiring large forest blocks have been documented within the breeding season, including black and white warbler and the hooded warbler.
- These bluffs are a stronghold for a suite of Species of Greatest Need of Conservation in Illinois, such as worm-eating warbler, Kentucky warbler, yellow-billed cuckoo, and ovenbird.
- This bluff area provides important maternity and summer foraging habitat for several federally listed bats that winter in caves within the 5-mile radius of the floodplain including the Indiana bat, northern long-eared bat, and gray bat.
- The bluff corridor is immensely abundant with cultural resources. Numerous burial mounds and other Native American use areas are documented up and down the bluffs.
- The bluffs south of St. Louis to Prairie du Rocher are a hotspot of new entomological discoveries in IL.
 - In recent years several species new to Illinois have been found in hill prairies/glades in this bluff region such as, a prairie cicada, a native bee, and a long-horn beetle.
 - Hill prairies found along these bluffs have been documented to host dozens of native bee species in addition to providing important pollinator habitat for Monarchs and other butterflies.
 - The hill prairies and glades found in these bluffs harbor 6 different species of milkweed. The abundance of milkweed species along with the expansive undisturbed habitat in this bluff corridor make it critical habitat for the imperiled Monarch.

Table 1. Illinois Nature Preserves within the proposed expansion of the MMRNWR

| Illinois Nature Preserve Sites | Number | Acreage |
|---|----------|---------------|
| Nature Preserve | 5 | 846.09 |
| Horseshoe Lake Nature Preserve | 1 | 336 |
| Horseshoe Lake Nature Preserve Addition | 1 | 208.7 |
| LaRue Swamp Nature Preserve | 1 | 144.6 |
| Lovets Pond Nature Preserve | 1 | 94.4 |
| Lovets Pond Nature Preserve Addition | 1 | 62.39 |
| Grand Total | 5 | 846.09 |

Table 2. Illinois Natural Areas within the proposed expansion of the MMRNWR

| Illinois Natural Areas Inventory Sites | Number | ACRES |
|--|--------|---------|
| Backbone South Geological Area | 1 | 4.56 |
| Bake Oven - Backbone North Geological Area | 1 | 7.59 |
| Brown's Bar | 1 | 701.62 |
| Bumgard Island | 1 | 1856.85 |
| Burnham Island | 1 | 1153.07 |
| Clear Creek | 1 | 1435.77 |

| | | |
|--|-----------|----------------|
| Clear Creek Swamp | 1 | 95.13 |
| Fountain Bluff Geological Area | 1 | 2.51 |
| Fountain Bluff North | 1 | 14.47 |
| Horseshoe Forest | 1 | 580.41 |
| Horseshoe Lake | 1 | 353.25 |
| Horseshoe Lake Botanical Area | 1 | 0.16 |
| Horseshoe Lake South | 1 | 1.3 |
| Horseshoe Lake State Conservation Area | 1 | 73.98 |
| Lake Creek | 1 | 60.21 |
| Lindsay's Natural Area | 1 | 1266 |
| Lovets Pond | 1 | 172.82 |
| Mississippi River - Grand Tower | 1 | 368.17 |
| Mississippi River - Mudds Landing | 1 | 4132 |
| Reilly Lake Area | 1 | 164.72 |
| Union County State Conservation Area | 1 | 327.03 |
| Unity Area | 1 | 31.08 |
| Grand Total | 22 | 12802.7 |

Table 3. Occurrences of Endangered and Threatened species within the proposed expansion of the MMRNWR

| Element Occurrence Records | Number |
|-----------------------------|------------|
| Endangered | 109 |
| Invertebrate Animal | 6 |
| Bigclaw Crayfish | 4 |
| Shrimp Crayfish | 2 |
| Vascular Plant | 38 |
| Arkansas Mannagrass | 5 |
| Black-stem Spleenwort | 2 |
| Blue Jasmine Leatherflower | 2 |
| Broadwing Sedge | 1 |
| Butternut | 1 |
| Crested Coralroot | 1 |
| Cypress-knee Sedge | 1 |
| Finger Dog-shade | 3 |
| Greater Bladder Sedge | 2 |
| Kidneyleaf Mud-plantain | 4 |
| Long-bract Spiderwort | 1 |
| Nuttall's Mock Bishopweed | 2 |
| Nuttall's Oak | 2 |
| One-flower False Fiddleleaf | 2 |
| Pale Manna Grass | 2 |
| Prostrate Eryngo | 2 |
| Shining Indigobush | 1 |
| Sparse-lobe Grapefern | 2 |
| Yellow Honeysuckle | 1 |
| Vertebrate Animal | 65 |
| Alligator Snapping Turtle | 4 |
| American Bittern | 1 |
| Bigeye Shiner | 7 |
| Black-crowned Night-Heron | 1 |
| Common Gallinule | 4 |
| Crystal Darter | 4 |
| Cypress Minnow | 2 |
| Gray Myotis | 1 |
| Great Plains Ratsnake | 2 |
| Indiana Myotis | 10 |
| Least Tern | 2 |
| Little Blue Heron | 3 |
| Loggerhead Shrike | 5 |

| Element Occurrence Records | Number |
|------------------------------|------------|
| Northern Harrier | 1 |
| Pallid Sturgeon | 3 |
| Rafinesque's Big-eared Bat | 2 |
| River Cooter | 1 |
| Snowy Egret | 1 |
| Southeastern Myotis | 3 |
| Sturgeon Chub | 2 |
| Swainson's Warbler | 2 |
| Weed Shiner | 1 |
| Western Sand Darter | 2 |
| Yellow-crowned Night-Heron | 1 |
| Threatened | 93 |
| Vascular Plant | 28 |
| American Snowbell | 2 |
| Basil Beebalm | 1 |
| Cluster Fescue | 1 |
| Creeping Cucumber | 6 |
| Decurrent False Aster | 1 |
| Hall's Bulrush | 1 |
| Planertree | 2 |
| Sharp-scale Sedge | 1 |
| Water Hickory | 2 |
| Weak Nettle | 9 |
| Willow Oak | 2 |
| Vertebrate Animal | 65 |
| Agassiz's Spring Cavefish | 5 |
| Bantam Sunfish | 10 |
| Bird-voiced Treefrog | 2 |
| Common Mudpuppy | 1 |
| Eastern Narrow-mouthed Toad | 7 |
| Flat-headed Snake | 1 |
| Illinois Chorus Frog | 11 |
| Least Bittern | 3 |
| Mississippi Green Watersnake | 1 |
| Northern Long-eared Bat | 4 |
| Osprey | 2 |
| Redspotted Sunfish | 5 |
| River Redhorse | 2 |
| Smooth Softshell Turtle | 1 |
| Starhead Topminnow | 3 |
| Timber Rattlesnake | 7 |
| Grand Total | 202 |

Table 4. Conservation Areas within the proposed expansion of the MMRNWR

| Conservation Areas | Number | Acreage |
|---|-----------|--------------------|
| Federal | 85 | 27839.92 |
| ACEP-WRE | 11 | 1604.3 |
| EWRP | 30 | 7362.82 |
| Middle Mississippi River National Wildlife Refuge | 1 | 7631.9 |
| WRP | 43 | 11240.9 |
| Municipal | 1 | 62.79999924 |
| Unnamed Property | 1 | 62.79999924 |
| NGO | 1 | 57.34000015 |
| Shawnee National Forest Addition | 1 | 57.34000015 |
| State | 10 | 21077.85 |
| Cape Bend State Fish and Wildlife Area | 1 | 1389.3 |
| Devil's Island Wildlife Management Area | 1 | 2556.8 |
| Fort de Chartres State Historic Site | 1 | 1590.19 |

| Element Occurrence Records | Number |
|------------------------------|------------|
| Northern Harrier | 1 |
| Pallid Sturgeon | 3 |
| Rafinesque's Big-eared Bat | 2 |
| River Cooter | 1 |
| Snowy Egret | 1 |
| Southeastern Myotis | 3 |
| Sturgeon Chub | 2 |
| Swainson's Warbler | 2 |
| Weed Shiner | 1 |
| Western Sand Darter | 2 |
| Yellow-crowned Night-Heron | 1 |
| Threatened | 93 |
| Vascular Plant | 28 |
| American Snowbell | 2 |
| Basil Beebalm | 1 |
| Cluster Fescue | 1 |
| Creeping Cucumber | 6 |
| Decurrent False Aster | 1 |
| Hall's Bulrush | 1 |
| Planertree | 2 |
| Sharp-scale Sedge | 1 |
| Water Hickory | 2 |
| Weak Nettle | 9 |
| Willow Oak | 2 |
| Vertebrate Animal | 65 |
| Agassiz's Spring Cavefish | 5 |
| Bantam Sunfish | 10 |
| Bird-voiced Treefrog | 2 |
| Common Mudpuppy | 1 |
| Eastern Narrow-mouthed Toad | 7 |
| Flat-headed Snake | 1 |
| Illinois Chorus Frog | 11 |
| Least Bittern | 3 |
| Mississippi Green Watersnake | 1 |
| Northern Long-eared Bat | 4 |
| Osprey | 2 |
| Redspotted Sunfish | 5 |
| River Redhorse | 2 |
| Smooth Softshell Turtle | 1 |
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| Shawnee National Forest Addition | 1 | 57.34000015 |
| State | 10 | 21077.85 |
| Cape Bend State Fish and Wildlife Area | 1 | 1389.3 |
| Devil's Island Wildlife Management Area | 1 | 2556.8 |
| Fort de Chartres State Historic Site | 1 | 1590.19 |

| Illinois Nature Preserve Sites | Number | Acreage |
|---|-----------|----------------|
| William A. DeMint Memorial Hill Prairie Nature Preserve | 1 | 28.6 |
| Nature Preserve Buffer | 6 | 88.82 |
| Brickey-Gonterman Memorial Hill Prairie Nature Preserve | | |
| Buffer | 1 | 3.4 |
| Eagle Cliff Prairie Nature Preserve Buffer | 1 | 0.25 |
| Illinois Ozarks Nature Preserve Buffer | | |
| | 1 | 3.4 |
| Mahe's Woods Nature Preserve | 1 | 16.49 |
| Piney Creek Ravine Nature Preserve Buffer | 1 | 62.9 |
| Renault Karst Nature Preserve Buffer | 1 | 2.38 |
| Grand Total | 52 | 4379.14 |

Table 6. Illinois Natural Areas within the bluff corridor buffer (5-miles) for the proposed expansion of the MMRNWR

| Illinois Natural Areas Inventory Sites | Number | ACRES |
|--|--------|---------|
| Atwood Ridge | 1 | 1002.39 |
| Ava Cave | 1 | 238.37 |
| Bald Knob Forest and Geologic Area | 1 | 121.63 |
| Berryville Shale Glade | 1 | 84.17 |
| Big Brushy Ridge | 1 | 168.98 |
| Black Cave | 1 | 10.94 |
| Black Powder Hollow Geological Area | 1 | 3.93 |
| Britten Spring | 1 | 41.53 |
| Brown Barrens | 1 | 31.21 |
| Castle Rock - Randolph County | 1 | 1.41 |
| Cave Spring Cave | 1 | 246.96 |
| Chalfin Bridge Hill Prairie | 1 | 279.39 |
| Chester South Geological Area | 1 | 3.45 |
| Coles Mill Geological Area | 1 | 2.51 |
| Columbia Hill Prairie | 1 | 679.39 |
| Conant Sites | 1 | 429.07 |
| Cooper Creek Hollow Mine | 1 | 10.33 |
| Degonia Canyon | 1 | 1665.89 |
| Demint Prairie / Prairie Du Rocher Herpetological Area | 1 | 479.86 |
| Dongola Hollow Geological Area | 1 | 5.73 |
| Dug Hill | 1 | 1277.57 |
| Dupo Prairie | 1 | 9.82 |
| Dutch Creek Chert Woodlands | 1 | 154.48 |
| Falling Spring | 1 | 787.54 |
| Frog Karst System | 1 | 963.36 |
| Fults Hill Prairie - Kidd Lake Marsh | 1 | 1684.19 |
| Gale Geological Area | 1 | 1.06 |
| Gale North Geological Area | 1 | 0.74 |
| Horse Creek Glade | 1 | 2.09 |
| Kinkaid Bluff | 1 | 41.63 |
| Lake Murphysboro Hill Prairies | 1 | 96.42 |
| Lake Murphysboro Site | 1 | 7.23 |
| LaRue - Pine Hills Research Natural Area | 1 | 4420.99 |
| Little Grand Canyon - Cedar Creek | 1 | 3942.73 |
| Madonnaville Cave | 1 | 502.14 |
| Magazine Mine Hollow | 1 | 2549.37 |
| McClure Shale Glade | 1 | 78.06 |
| Miles Prairie | 1 | 94.53 |
| Miller Creek | 1 | 41.97 |
| Miller Hills | 1 | 1205.68 |
| Modoc Northwest Geological Area | 1 | 3.57 |
| Monroe City Hill Prairie | 1 | 341.71 |
| Mounds West Geological Area | 1 | 9.43 |
| Murphysboro Seep | 1 | 13.32 |

| Illinois Natural Areas Inventory Sites | Number | ACRES |
|--|-----------|-----------------|
| North Kinkaid | 1 | 2162.42 |
| Opossum Trot Trail | 1 | 48.95 |
| Ozark Hill Prairies | 1 | 469.62 |
| Ozark Hills | 1 | 236.02 |
| Pautler - Annbriar Karst System | 1 | 7786.78 |
| Piney Creek Ravine | 1 | 207.82 |
| Potato Hill Natural Area | 1 | 842.66 |
| Prairie Du Rocher - South | 1 | 117.12 |
| Provo Cemetery Barrens | 1 | 87.79 |
| Rahe's Woods | 1 | 45.67 |
| Reeds Creek Canyon East | 1 | 42.01 |
| Reeds Creek Canyon North | 1 | 126.9 |
| Renault Cave System | 1 | 1079.13 |
| Renault Geological Area | 1 | 75.15 |
| Renault Herpetological Area | 1 | 406.13 |
| Salt peter Cave Area | 1 | 157.62 |
| South Tamms Marsh | 1 | 11.95 |
| Southwest Kinkaid Route 3 | 1 | 7172.03 |
| Stemler Karst Area | 1 | 4539.1 |
| Stormont Haus: Woods | 1 | 75.56 |
| Sugar Loaf Hill Prairie | 1 | 87.95 |
| Suterville Sinkhole | 1 | 545.39 |
| Swayne Hollow | 1 | 207.45 |
| Thebes Area | 1 | 884.92 |
| Tripps Lane | 1 | 2817.02 |
| Weaver's Woods | 1 | 29.13 |
| Wolf Creek Area | 1 | 646.65 |
| Grand Total | 71 | 54645.71 |

Table 7. Occurrences of Endangered and Threatened species within the bluff corridor buffer (5-miles) for the proposed expansion of the MMRNWR

| Element Occurrence Records | Number |
|--------------------------------|------------|
| Endangered | 152 |
| Invertebrate Animal | 17 |
| Common Striped Scorpion | 3 |
| Ebonyshell | 1 |
| Elephantear | 1 |
| Enigmatic Cavesnail | 1 |
| Illinois Cave Amphipod | 6 |
| Madonna Cave Springtail | 1 |
| Ohio Pigtoe | 1 |
| Orangefoot Pimpleback | 1 |
| Ozark Forestfly | 2 |
| Vascular Plant | 81 |
| American Yellow Lady's-slipper | 3 |
| Arkansas Mannagrass | 1 |
| Bellow's-beak Sedge | 3 |
| Bigleaf Snowbell | 1 |
| Black-edge Sedge | 3 |
| Black-stem Spleenwort | 4 |
| Blue Jasmine Leatherflower | 2 |
| Bradley's Spleenwort | 2 |
| Butternut | 1 |
| Crested Coralroot | 4 |
| Cypress-knee Sedge | 1 |
| Few-flower Nutrush | 1 |
| Few-flower Stickleaf | 5 |
| Greater Bladder Sedge | 1 |

| Element Occurrence Records | Number |
|-----------------------------|------------|
| Green Trillium | 1 |
| Gum Bumelia | 3 |
| Heartleaf Plantain | 2 |
| Hispid False Mallow | 1 |
| Kidneyleaf Mud-plantain | 1 |
| Large Sedge | 1 |
| Large-Flower Fameflower | 2 |
| Old-field Milkvine | 3 |
| Ovate Water-willow | 1 |
| Reticulate-seed Spurge | 1 |
| Sand Hickory | 5 |
| Shortleaf Pine | 4 |
| Slender Heliotrope | 3 |
| Small Whorled Pogonia | 1 |
| Southwestern Bedstraw | 3 |
| Sparse-lobe Grapefern | 4 |
| Trailing Yellow Loosestrife | 1 |
| Twisted Ladies'-tresses | 1 |
| Wedgeleaf Whitlow-grass | 4 |
| White-wand Beardtongue | 3 |
| Yellow Honeysuckle | 3 |
| Yellow-wood | 1 |
| Vertebrate Animal | 54 |
| Alligator Snapping Turtle | 4 |
| Bigeye Shiner | 10 |
| Coachwhip | 2 |
| Gray Myotis | 1 |
| Indiana Myotis | 10 |
| Lake Sturgeon | 1 |
| Least Tern | 2 |
| Little Blue Heron | 2 |
| Loggerhead Shrike | 3 |
| Pallid Sturgeon | 1 |
| Rafinesque's Big-eared Bat | 1 |
| Southeastern Myotis | 4 |
| Spotted Dusky Salamander | 7 |
| Sturgeon Chub | 2 |
| Swainson's Warbler | 3 |
| Western Sand Darter | 1 |
| Threatened | 103 |
| Vascular Plant | 39 |
| American Snowbell | 1 |
| American Strawberry-bush | 1 |
| Bluehearts | 4 |
| Buffalo Clover | 1 |
| Chestnut Oak | 3 |
| Creeping Cucumber | 6 |
| Eastern Featherbells | 1 |
| French's Shootingstar | 3 |
| Guyandotte Beauty | 2 |
| Harvey's Buttercup | 2 |
| Missouri Orange Coneflower | 5 |
| Pale False Foxglove | 1 |
| Planertree | 2 |
| Sharp-scale Sedge | 4 |
| Weak Nettle | 1 |
| Willdenow's Sedge | 2 |
| Vertebrate Animal | 64 |

| Element Occurrence Records | Number |
|-----------------------------|------------|
| Agassiz's Spring Cavefish | 3 |
| Bird-voiced Treefrog | 1 |
| Black-billed Cuckoo | 1 |
| Cerulean Warbler | 4 |
| Chuck-will's-widow | 1 |
| Eastern Narrow-mouthed Toad | 7 |
| Eastern Ribbonsnake | 1 |
| Flat-headed Snake | 5 |
| Gravel Chub | 1 |
| Illinois Chorus Frog | 2 |
| Least Bittern | 1 |
| Northern Long-eared Bat | 8 |
| Osprey | 1 |
| River Redhorse | 2 |
| Timber Rattlesnake | 26 |
| Grand Total | 255 |

Table 7. Occurrences of Endangered and Threatened species within the bluff corridor buffer (5-miles) for the proposed expansion of the MMRNWR

| Conservation Areas | Number | Acreage |
|---|-----------|--------------------|
| Federal | 6 | 164289.6 |
| ACEP-WRE | 2 | 85.1 |
| Shawnee National Forest | 1 | 163899 |
| WRP | 3 | 305.5 |
| Municipal | 4 | 78.10000312 |
| General John A. Logan Museum | 1 | 0.89999976 |
| Longfellow Park | 1 | 3.40000095 |
| Parkview Park | 1 | 1.5 |
| Riverside Park | 1 | 72.30000305 |
| NGO | 12 | 1374.969995 |
| 777013-381 | 1 | 14.10000038 |
| 777014-301 | 1 | 53.70000076 |
| 777020-301 | 1 | 50.40000153 |
| Fogelpole Cave | 1 | 534.4199829 |
| Hartman Spring | 1 | 41.5 |
| Holy Boulders | 1 | 45.09999847 |
| NLI Easement St-1 | 1 | 12 |
| Pautler Cave | 1 | 3.18000067 |
| Shawnee National Forest Addition | 1 | 62.20000076 |
| Stormont Hauss Nature Preserve | 1 | 83.80000305 |
| White Rock North | 1 | 168.0700073 |
| White Rock South | 1 | 306.5 |
| State | 29 | 15663.33 |
| Annbnriar Karst State Natural Area | 1 | 157.1 |
| Berryville Shale Glade State Natural Area | 1 | 40.7 |
| Brown Barrens State Natural Area | 1 | 28.5 |
| Cahokia Courthouse State Historic Site | 1 | 1.4 |
| Fogelpole Cave State Natural Area | 1 | 27.71 |
| Fort Defiance State Park | 1 | 79.27 |
| Fort Kaskaskia State Historic Site | 1 | 248.4 |
| Fults Hill Prairie State Natural Area | 1 | 810.3 |
| Governor Bond Memorial | 1 | 0.5 |
| Jarrot Mansion State Historic Site | 1 | 1.6 |
| Kaskaskia Bell Memorial | 1 | 0.38 |
| Kincaid Lake State Fish and Wildlife Area | 1 | 1067.5 |
| Lake Murphysboro State Park | 1 | 947.8 |
| Martin-Boismenu House State Historic Site | 1 | 0.5 |

| Conservation Areas | Number | Acreage |
|--|-----------|---------------|
| McClure School Shale Glades State Natural Area | 1 | 61.9 |
| Miscellaneous Property | 1 | 3 |
| Piney Creek Ravine State Natural Area | 1 | 207.81 |
| Randolph County State Recreation Area | 1 | 1082.16 |
| Ren-Dill Shale Glade State Natural Area | 1 | 43.4 |
| Stemler Cave Woods State Natural Area | 1 | 385.5 |
| Swayne Hollow State Natural Area | 1 | 200.1 |
| Trail of Tears State Forest | 1 | 5345.4 |
| Turkey Bluffs State Fish and Wildlife Area | 1 | 2354.8 |
| Unnamed Property | 6 | 2567.6 |
| Grand Total | 51 | 181406 |

The data conveyed indicates there is very good biological justification for the inclusion of a 5-mile buffer to include the entire bluff corridor as a buffer to the floodplain and an ecological transition zone to the uplands. The important concept presented is the vast potential that this buffer would present to the MMRNWR, if the Fish & Wildlife Service would choose to adopt. However, any buffer would be better than none, and the IDNR could provide additional analysis breaking out the information above in 1-mile concentric rings from the floodplain if that would be desirable.

Sincerely,



John Wilker
 Field Section Manager, Division of Natural Heritage
 One Natural Resources Way
 Springfield, IL 62702



Ashley Kraetsch
U.S. Fish & Wildlife Service National Wildlife Refuge System
5600 American Blvd West, Suite 990
Bloomington, MN 55437-1458

March 3, 2023

Dear Ashley,

Thank you for the opportunity to comment on the draft plan to expand the acquisition boundary of the Middle Mississippi River National Wildlife Refuge. The Illinois Department of Natural Resources supports the expansion of the acquisition boundary through Preferred Option B.

By including the maximum number of acres in the Mississippi River floodplain (Option B), ecological and environmental benefits of protecting and restoring the river's floodplain can be maximized.

Additional benefits include:

- Flood hazard reduction by protecting flood-prone lands.
- Natural Carbon Storage and Sequestration through reforestation.
- Creating large blocks of habitat that contribute towards national and state 30x30 goals.
- Reduction in fertilizer nutrient loss and sedimentation.
- Contribution towards the goals of the Illinois Wildlife Action Plan.
- With most land within the proposed expanded boundary in private ownership, the Department appreciates the U.S. Fish and Wildlife Service's commitment to acquiring property only from willing sellers.

The IDNR is grateful for its continued partnership with the USFWS, and other entities helping manage the Mississippi River and its floodplain and tributaries. IDNR also would like to thank USFWS for the opportunity to comment on earlier versions of this proposal.

Sincerely,

Chris Young
Director: Office of Resource Conservation
Illinois Department of Natural Resources
Springfield, IL 62702



MISSOURI DEPARTMENT OF CONSERVATION

Headquarters

2901 West Truman Boulevard, P.O. Box 180, Jefferson City, Missouri 65102-0180
Telephone: 573-751-4115 ▲ www.MissouriConservation.org

SARA PARKER PAULEY, Director

March 2, 2023

Ashley Kraetsch
U.S. Fish and Wildlife Service National Wildlife Refuge System
5600 American Blvd West, Suite 990
Bloomington, MN 55437

Ms. Kraetsch:

Thank you for the opportunity to review and provide comment on the Draft Land Protection Plan and Environmental Assessment for the Middle Mississippi River National Wildlife Refuge Boundary Expansion (Plan). The Missouri Department of Conservation (Department) is the state agency responsible for forest, fish, and wildlife resources in Missouri.

The Department supports the Preferred Action Alternative, Alternative B, which calls for an expansion of the current refuge boundary by 90,000 acres within the entire historic floodplain of the Mississippi River from its confluence with the Missouri River to its confluence with the Ohio River. As a longstanding and signatory member of the Middle Mississippi River Partnership (MMRP), the Department is encouraged by the outgrowth from MMRP efforts to develop the Plan and identify the Preferred Alternative. Not only would this benefit the fish, forest, and wildlife resources, but it would also contribute to benefiting a range of ecological services that have a history of diminished capacity.

Planning efforts within the Department and with partners led to the development of Missouri's Comprehensive Conservation Strategy (CCS), encompassing the State Wildlife Action Plan, State Forest Action Plan, and Missouri Wetland Planning Initiative, among other important planning efforts. The CCS recognizes the entirety of the Mississippi River as a Conservation Opportunity Area (COA) and its floodplain as a significant resource affecting the overall health of the system. Refuge expansion furthers Department goals for this COA, which have significant overlap and nexus to the five conservation goals in the Plan.

The Department appreciates our long-standing relationship and the mutual success coming from our shared conservation mission. Department staff are at the ready to

COMMISSION

MARGARET F. ECKELKAMP
Washington

STEVEN D. HARRISON
Rolla

MARK L. McHENRY
Kansas City

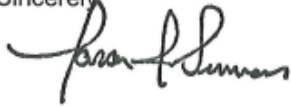
WM. L. (BARRY) ORSCHELN
Columbia

Ms. Kraetsch
March 2, 2023
Page 2

assist with coordination and development of restoration recommendations as expansion.

If you have any questions, please contact Matt Vitello at 573-522-4115 extension 3191 or by email at matt.vitello@mdc.mo.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Jason Sumners". The signature is fluid and cursive, with the first name "Jason" and last name "Sumners" clearly distinguishable.

JASON SUMNERS
DEPUTY DIRECTOR

c: Aaron Jeffries, Brian Canaday, Joel Porath, Nate Muenks, Matt Bowyer, Matt Vitello



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Bryan Warner
Deputy Principal Chief
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January 31, 2023

Charles Wooley
United States Fish and Wildlife Service
5600 American Boulevard West, Suite 990
Bloomington, MN 55437-1458

Re: FWS/R3/RD/NWRS, Proposed Expansion of the Middle Mississippi River National Wildlife Refuge

Mr. Charles Wooley:

The Cherokee Nation (Nation) is in receipt of your correspondence about **Proposed Expansion of the Middle Mississippi River National Wildlife Refuge**, and appreciates the opportunity to provide comment upon this project. Please allow this letter to serve as the Nation's interest in acting as a consulting party to this proposed project.

The Nation maintains databases and records of cultural, historic, and pre-historic resources in this area. Our Historic Preservation Office (Office) reviewed this project, cross referenced the project's legal description against our information, and found instances where this project intersects or adjoins such resources, including the CHEROKEE TRAIL OF TEARS. The proposed project, however, is limited to boundary expansion of the Middle Mississippi River National Wildlife Refuge and does not include ground disturbance. Thus, this Office does not object to the project proceeding as long as the following stipulations are observed:

- 1) The Nation requested that the United States Fish and Wildlife Service (USFWS) re-contact this Office for additional consultation if there are any changes to the scope of or activities within the Area of Potential Effects;
- 2) The Nation requests that USFWS halt all project activities immediately and re-contact our Office for further consultation if items of cultural significance are discovered during the course of this project; and
- 3) The Nation requests that USFWS conduct appropriate inquiries with other pertinent Historic Preservation Offices regarding historic and prehistoric resources not included in the Nation's databases or records.

Proposed Expansion of the Middle Mississippi River National Wildlife Refuge
January 31, 2023
Page 2 of 2

If you require additional information or have any questions, please contact me at your convenience.
Thank you for your time and attention to this matter.

Wado,



Elizabeth Toombs, Tribal Historic Preservation Officer
Cherokee Nation Tribal Historic Preservation Office
elizabeth-toombs@cherokee.org
918.453.5389

Appendix H: National Wildlife Refuge System Frequently Asked Questions

1) What is the Land Protection Planning (LPP) process?

The LPP process is an evaluation, planning, and compliance process, with public input encouraged at key milestones. It is used by the U.S. Fish and Wildlife Service (Service) to study land protection opportunities for wildlife conservation with our partners and the public, including the possibility of adding lands to the National Wildlife Refuge System.

The LPP process is initiated when wildlife habitat areas of interest are identified. The Service evaluates an area in conjunction with other natural resource partners through development of a landscape conservation design document to determine if detailed planning is appropriate. The Director of the U.S. Fish and Wildlife Service (Director) must approve the start of detailed planning for a potential new refuge establishment or a major boundary expansion of an existing refuge.

If detailed planning is approved, a Planning Team will gather information, develop alternatives, and publish the following documents: 1) A document required by the National Environmental Policy Act - either an Environmental Assessment (EA) or Environmental Impact Statement (EIS) that evaluates the effects different alternatives would have on the physical, biological, social, and economic environment; 2) A Land Protection Plan that describes resource protection needs and a proposed refuge boundary, and identifies priority lands that may be acquired from willing sellers. It also describes other conservation opportunities including easements and cooperative management agreements with willing landowners; 3) A Conceptual Management Plan (CMP) describes potential refuge management needs, activities, and public uses, and determines which public uses would be compatible with the purpose of the proposed refuge.

2) How is it determined what lands will be included within the approved boundary?

After the public comment period for the draft National Environmental Policy Act (NEPA) document and LPP has ended, the Planning Team reviews and addresses comments received, develops a final preferred alternative that identifies the preferred refuge boundary and habitat protection measures in a Final NEPA document. These final decision documents are submitted to the Director for approval. The Director determines the course of action, if any, the Service will take. The Director's approval is required to establish an approved refuge boundary. The public is notified of the final decision.

3) What does an approved refuge boundary mean?

An approved refuge boundary identifies important and sensitive resource areas that the Service is looking to conserve for a long period of time. After the Director approves a refuge boundary and funding is secured, the Service can make offers to purchase land, or enter into management agreements with landowners within this boundary that wish to add their lands to the National Wildlife Refuge System. Lands do not become part of the National Wildlife Refuge System unless they are purchased from a willing seller or are placed under a management agreement with an interested landowner.

4) How will a refuge boundary affect my private property rights?

Private property rights are not affected. Landowners within a refuge boundary retain all the rights, privileges, and responsibilities of private land ownership including the rights to access, control trespass, sell to any party, and develop their properties, even if the Service has acquired interest in the land surrounding them. Development of land continues to be subject to local and state regulations and land use zoning.

5) Does land use regulation increase within a refuge boundary?

No, landowners within a refuge boundary retain all the rights, privileges, and responsibilities of private land ownership, even if the Service has acquired interest in the land surrounding them. Private lands remain in control of the owner and subject to local land use regulations. Service management of access, land-use practices, water management, hunting, fishing, and general use within a refuge boundary is limited to the lands that the Service has acquired from willing sellers.

6) What if I don't want to sell my property to the Service?

Landowners within a refuge boundary are under no obligation to sell their property to the Service. It is the Service's long-standing policy to acquire land from only willing sellers. Additionally, the refuge boundary does not preclude owners from developing their properties. If you choose to develop your land within the refuge boundary it, would be subject to local zoning and regulatory authorities.

7) Does the Service use the power of condemnation (eminent domain) to acquire property?

It is the Service's long-standing policy to only acquire land for refuges from willing sellers. Under this policy, you are under no obligation to sell unless you accept an offer made after a fair

market value appraisal has been completed. The appraisal would be paid for and contracted by the Service.

8) How will the surrounding community benefit if a refuge is established?

Refuges enhance the quality of life for local residents by preserving the region's ecological value and aesthetic beauty. Communities also benefit from open space that does not burden the municipal infrastructure, but still provides revenues under the Refuge Revenue Sharing Act. Landowners within a refuge boundary wishing to sell their properties may benefit from our Acquisition Program. Other benefits include increased opportunities for wildlife-dependent recreation which may attract visitors to the area, increasing tourism revenues earned by local businesses.

9) Does the Service intend to acquire all the lands within a refuge boundary?

Willing sellers and available funding may help determine the amount of land to be acquired within an approved refuge boundary. Additionally, some refuges like the expansion being proposed for the Middle Mississippi River have an acreage cap within a larger approved boundary. The Service's goals for wildlife conservation and management goals can sometimes be fulfilled by working with landowners to acquire only a partial interest such as conservation easements, long-term leases, cooperative agreements, or memorandum of agreements. Another factor that can determine Service acquisition is development. Properties in different stages of development may no longer be suitable to meet refuge purposes as development occurs and habitat is lost. Increasing land costs and limited acquisition funding can also limit additions to the Refuge System.

10) What types of interests in lands does the Service acquire?

Often, the Service acquires full ownership of the property through fee-simple purchase or donation from an interested landowner. In this instance all rights of the property, subject to existing rights of way, are transferred to the Service. There are other options for the Service to acquire interests in private properties to conserve key natural resources through a conservation easement, long-term lease, cooperative agreement, memorandum of agreement. In this instance the interested landowner continues to own the land and donates or is paid by the Service protect a resource such as a wetland or grassland from development or alteration.

11) How is land acquisition funded?

Funding for land acquisition comes from appropriations under the Land and Water Conservation Fund Act and the Migratory Bird Conservation Fund. These are public funds and programs that were established to benefit conservation of fish, wildlife, and habitats. They do not involve Federal income taxes. Landowners also sometimes choose to donate all or a portion of their land as a lasting memorial or for tax purposes.

12) Does the Fish and Wildlife Service buy land at fair market value?

Yes, Federal law requires the Service to offer current fair market value for all land purchases. The Service cannot speculate on the future value of a property. The value that is offered to an interested seller is based upon a professional appraisal completed by an independent third-party appraiser in accordance with the Uniform Standards for Federal Land Acquisitions.

13) Are property tax revenues affected when land is acquired by the Service?

National Wildlife Refuges, like other Federal, State, and County-owned lands are not subject to property taxes. However, under provisions of the Refuge Revenue Sharing Act, the Service annually reimburses counties for revenue lost as a result of the acquisition of private property. Payments are based on the highest value as determined by one of the following three equations—three-fourths of 1 percent of the fair market value of the land; 25 percent of net receipts; or \$.75 per acre, whichever is greater. Congress may appropriate supplemental funds to ensure full payment. The Act also requires a reappraisal of acquired lands every five years to ensure payments to local governments are based on current land values.

Appendix I: Boundary Delineation

Generally speaking, the proposed boundary will run bluff to bluff, following the floodplain along the levee system. Due to gaps in the National Flood Insurance Program’s USA “Flood Hazard Area Map” 100-year floodplain data, and to create a more specified boundary line, we have developed a delineation that aligns with existing infrastructure where possible. For the purpose of this physical description, it will be located along the eastern edge of road/railroad rights-of-ways on the eastern side of the Mississippi River and will follow along the western edge of various road/railroad rights-of-ways on the western side of the Mississippi River (thus encompassing all rights-of-way along the boundary). In areas where no infrastructure exists, the delineated boundary will be following the National Flood Insurance Program’s 100-year floodplain data.

The shapefile and kmz for the boundary delineation is available at:

<https://ecos.fws.gov/ServCat/Reference/Profile/149664>

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Appendix K: Glossary of Terms and Abbreviations Used

Appropriate Use - A proposed or existing use on a refuge that meets at least one of the following three conditions: the use is a wildlife-dependent use, the use contributes to fulfilling the refuge purpose(s), the National Wildlife Refuge System mission, goals, or objectives described in a refuge management plan, or the use has been determined to be appropriate as specified in section 1.11 of the National Wildlife Refuge System Improvement Act.

Compatible Use - “The term ‘compatible use’ means a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Director [of the U.S. Fish and Wildlife Service], will not materially interfere with or detract from the fulfillment of the mission of the [National Wildlife Refuge] System or the purposes of the refuge.” – National Wildlife Refuge System Improvement Act of 1997 [Public Law 105-57; 111 Stat. 1253]

Compatibility Determination - The process in which a wildlife-dependent use or any other public use on a refuge is found to be compatible or incompatible with the fulfillment of the National Wildlife Refuge System mission or the purposes of the refuge. This determination is a requirement for wildlife-dependent uses or any other public uses on a refuge.

Compatibility Policy - “The refuge manager will not initiate or permit a new use of a national wildlife refuge or expand, renew, or extend an existing use of a national wildlife refuge unless the refuge manager has determined that the use is a compatible use.” [Service Manual 603 FW 2.3]

Comprehensive Conservation Plan (CCP) - Mandated by the National Wildlife Refuge System Improvement Act of 1997, a document that provides a description of the desired future conditions and long-range guidance for the refuge manager to accomplish purposes of the Refuge System and the refuge. CCPs establish management direction to achieve refuge purposes. [Public Law 105-57; Service Manual 602 FW 1.6]

Cumulative Impact - According to NEPA, the impact on the environment which results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Easement - An agreement by which landowners give up or sell one of their rights on their property. It is a non-possessory interest in a real property owned by another imposing limitations or affirmative obligations with the purpose of returning or protecting the property’s conservation values.

Endangered - The classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.

Environmental Assessment (EA) - A concise public document, prepared in compliance with the National Environmental Policy Act (NEPA), that discusses the purpose and need for an action, alternatives that were considered, and provides sufficient evidence and analysis of the action's effects to determine whether it is necessary to prepare an Environmental Impact Statement (see immediately below) or a Finding of No Significant Impact (FONSI) [40 CFR 1508.9].

Environmental Impact Statement (EIS) - A detailed, written analysis of the environmental effects 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 1508.1 1]

Fee-title - Is a real estate term that means the type of ownership giving the owner the maximum interest in the land, and entitling the owner to use the property in any manner consistent with federal, state, and local laws and ordinances.

Finding of No Significant Impact (FONSI) - Supported by an environmental assessment, a document that briefly presents why a federal action will have no significant effect on the human environment, and for which an environmental impact statement, therefore, will not be prepared [40 CFR 1508.13]

Land Protection Plan (LPP) - A document that identifies and prioritizes lands for potential U.S. Fish and Wildlife Service acquisition from a willing seller, and also describes other methods of providing protection (e.g., easements). This document is released with environmental assessments.

Land and Water Conservation Fund (LWCF) - One of several federal funds that may be used to purchase refuge lands. The primary source of income to this fund is fees paid by companies drilling offshore for oil and gas, as well as oil and gas lease revenues from federal lands. Additional sources of income include the sale of surplus federal real estate and taxes on motorboat fuel.

National Environmental Policy Act of 1979 (NEPA) - Requires all agencies, including the U.S.

Fish and Wildlife Service, to examine the environmental impacts of their actions, incorporate environmental information and utilize public participation in the planning and implementation of all actions. Federal agencies must integrate NEPA with other planning requirements and prepare appropriate NEPA documents to facilitate better environmental decision-making. NEPA requires federal agencies to review and comment on federal agency environmental plans and

documents when the agency has jurisdiction by law or special expertise with respect to the environmental impacts involved (42 U.S.C. 4321-4327) (40 CFR 1500-1508).

National Wildlife Refuge (refuge) - A designated area of land, water, or an interest in land or water within the Refuge System, but does not include Coordination Areas (Service Manual 603 FW 2.5 N).

National Wildlife Refuge System (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, coordination areas, and other areas for the protection and conservation of fish and wildlife including those that are threatened with extinction as determined in writing by the Director or so directed by Presidential or Secretarial order. The determination by the Director may not be delegated” (Service Manual 603 FW 2.5 I).

Threatened - Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Appendix L: FONSI

FINDING OF NO SIGNIFICANT IMPACT AND DECISION FOR MAJOR BOUNDARY EXPANSION

MIDDLE MISSISSIPPI RIVER NATIONAL WILDLIFE REFUGE *Ste. Genevieve, Missouri*

The U.S. Fish and Wildlife Service (Service) is proposing a major expansion of the existing approved acquisition boundary of the Middle Mississippi River National Wildlife Refuge. An Environmental Assessment was prepared to identify and publicly disclose the possible environmental consequences that expansion of the Refuge and implementation of the Land Protection Plan and Conceptual Management Plan could have on the quality of the physical, biological, and human environment as required by the National Environmental Policy Act of 1969. The Environmental Assessment evaluated three action alternatives for restoration and protection of a significant ecosystem within the historic floodplain of the Mississippi River from its confluence with the Missouri River (River Mile 195) to its confluence with the Ohio River at Cairo, Illinois (River Mile 1). The Environmental Assessment also evaluated the consequences of no action by the Service.

Selected Action

Alternative B – Acquire Additional Acreage, With a Focus on Habitat Restoration and Enhancement, Within the Floodplain Corridor Between River Mile 195 and River Mile 1

Under the Proposed Action Alternative, the Service would undertake an expansion of the current refuge boundary by up to 90,000 acres within the historic floodplain. The expanded boundary would extend along the Mississippi River from its confluence with the Missouri River (River Mile 195) to its confluence with the Ohio River at Cairo, Illinois (River Mile 1), covering a total distance of about 195 river miles. This alternative broadens the acquisition boundary from the discrete divisions to include the entire historic floodplain with an acreage cap. This “bluff to bluff” approach includes areas that are in the historic river floodplain but may now be levee protected, generally for agriculture purposes. Acquisition would be focused on, but not limited to, high value forest and marsh restoration areas, high value forest enhancement areas, and high value marsh enhancement areas. Although not the priority, other opportunities to restore prairie wetlands or native grasslands would still be explored as they become available. Under this alternative, the Service would have the opportunity to acquire up to 112,493 additional acres, but based on staff capabilities and funding feasibility, we have chosen to reduce this acquisition cap from 112,493 to 90,000 acres.

The preferred alternative was selected over the other alternatives because:

1. This alternative best meets the purpose and need for action as described in the environmental assessment and the Service’s priorities and mandates as outlined by the National Wildlife Refuge System Administration Act (NWRSA) to “provide for the conservation for fish, wildlife, and plants, and their habitats within the System” in addition to “ensuring the biological integrity, diversity, and environmental health of refuges is maintained” (16 U.S.C. 668dd(a)(4)).
2. The preferred alternative would allow the refuge to expand its acquisition potential by putting the Service in a position to act upon willing-seller or donated-land opportunities that may come up, in order to acquire tracts of land that have largely intact habitats, a high potential for restoration, or involve situations where the seller has a strong desire to keep the land from being developed.
3. The preferred alternative supports implementation of the purpose for which the Refuge was established.
4. This proposal does not initiate widespread controversy or litigation.
5. There are no conflicts with local, state, regional, or federal, law, plans or policies.

Other Alternatives Considered and Analyzed

Alternative A – Continue Efforts Within the Current Latest Director Approved Acquisition Boundary

Under Alternative A, there would be no additional Service acquisition authority to augment the existing acquisition options within the current approximately 27,746-acre boundary. The current Middle Mississippi River National Wildlife Refuge consists of seven island divisions that lie within the uncontrolled portion of the Middle Mississippi River, below the confluence with the Missouri River. The Service currently owns and manages 8,215 acres of land within this boundary and would continue the same activities that it has pursued under the existing Comprehensive Conservation Plan, including partnerships to restore impacted habitats, implementation of actions to control invasive species, and maintenance of public access to the refuge.

Alternative C – Acquire Additional Acreage, With a Focus on Habitat Restoration, Within the Floodplain Corridor Between River Mile 195 and River Mile 1

This alternative would broaden the limited approved acquisition boundary to the Mississippi River’s historic floodplain corridor extending for 195 river miles from its confluence with the Missouri River south of St. Louis, Missouri to Cairo, Illinois. Alternative C promotes a focus on high value forest and marsh restoration lands. A focus on only the forest and marsh restoration areas, while still reserving the right to explore acquisition of other habitats as they become available. This would limit the acquisition cap to approximately 22,971 acres within the larger corridor (Table 1).

Alternative D – Acquire Additional Acreage, With a Focus on Habitat Enhancement, Within the Floodplain Corridor Between River Mile 195 and River Mile 1

Alternative D would broaden the limited approved acquisition boundary to the Mississippi River's historic floodplain corridor extending for 195 miles from its confluence with the Missouri River south of St. Louis, Missouri to Cairo, Illinois. This alternative promotes a focus on high value forest and marsh enhancement lands. A focus on only the enhancement areas, while still reserving the right to explore acquisition of other habitats as they become available, would limit the acquisition cap to approximately 89,522 acres within the larger landscape (Tables 2 & 3).

These alternatives were not selected, because:

1. The alternatives would limit the refuges acquisition opportunities.
2. The proposed project lands would remain in private ownership and current land uses would continue. Protection of the fish and wildlife habitats and natural resource values of these lands would be contingent upon the enforcement of existing federal, state, and local environmental regulations (i.e., Clean Water Act and state water quality and pollution laws, and the discretion of the private landowners).

Summary of Effects of the Selected Action

An Environmental Assessment was prepared in compliance with the National Environmental Policy Act to provide decision-making framework that 1) explored a reasonable range of alternatives to meet project objectives, 2) evaluated potential issues and impacts to the refuge, resources, and values, and 3) identified mitigation measures to lessen the degree or extent of these impacts. The Environmental Assessment evaluated the effects associated with the alternatives outlined above. The Environmental Assessment and all other compliance documentation is incorporated as part of this finding.

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

The preferred alternative as outlined and analyzed in the Environmental Assessment will have minimal negative impacts and substantial but not significant positive impacts effects on the natural environment and social and economic human environment. The Environmental Assessment provides a comprehensive summary of impacts to affected resources, including, terrestrial wildlife and aquatic species, threatened and endangered species and other special status species, habitat and vegetation, water quality, refuge management and operations, visitor use and experience, and local and regional socioeconomics. The proposed project is not expected to have any significant effects on any of the aforementioned resources.

Through the expansion of the existing approved acquisition boundary at the Refuge, as described in Alternative B, threatened and endangered species within any acquired parcels will receive additional management attention. Additionally, connectivity between existing conservation lands will be enhanced, and wildlife movement corridors will be protected. Water quality and hydrological benefits are also anticipated. Opportunities for wildlife-dependent recreational

activities will be increased. Further, any cultural resources found within the proposed refuge will be afforded protection by the Service. Although the anticipated environmental effects of implementation of the Preferred Alternative are beneficial, there may be minimal or negligible negative impacts to soils, climate change, water quality, hydrology, habitats, wildlife, and cultural resources, due to refuge operations and visitor uses. These negative impacts are anticipated to be temporary and not significant.

Measures to mitigate and/or minimize adverse effects have been incorporated into the selected action. These measures include:

As any new refuge lands are acquired, the Refuge would develop or update their plans, such as Visitor Services Plans, Hunt Plans, and Fishing Management Plans to outline refuge uses, their goals and objective and how they contribute to the Refuge's mission and how to mitigate any potential negative impacts from visitation and other uses.

While refuges, by their nature, are unique areas protected for conservation of fish, wildlife and habitat, the proposed action will not have a significant impact on refuge resources and uses for several reasons above and those enumerated below. As defined in 40 CFR §1508.27 significance is determined by examining the context (including duration) of an impact, and its intensity, including a consideration of the criteria that follow. Based on the analysis in the Environmental Assessment, which is summarized in these sections, the Service has determined that the preferred alternative can be implemented without significant adverse effects.

1. Both beneficial and adverse effects have been considered and this action will not have a significant effect on the human environment. The actions will not have a significant effect on public health and safety (Environmental Assessment, page 24).
2. The project will not significantly affect any unique characteristics of the geographic area such as proximity to historical or cultural resources, wild and scenic rivers, or ecologically critical areas (Environmental Assessment, page 24).
3. The effects on the quality of the human environment are not likely to be highly controversial (Environmental Assessment, page 24).
4. The actions do not involve highly uncertain, unique, or unknown environmental risks to the human environment (Environmental Assessment, page 24).
5. The actions will not establish a precedent for future actions with significant effects nor does it represent a decision in principle about a future consideration (Environmental Assessment, page 48).
6. There will be no cumulative significant impacts on the environment. Cumulative impacts have been analyzed with consideration of other similar activities on adjacent lands, in

past action, and in foreseeable future actions (Environmental Assessment, page 48).

7. The actions will not significantly affect any site listed in, or eligible for listing in, the National Register of Historic Places, nor will they cause loss or destruction of significant scientific, cultural, or historic resources (Environmental Assessment, page 40).
8. The action is not likely to adversely impact any threatened or endangered species; or any Federally designated critical habitat; Best management practices have been identified that will minimize any potential negative impacts to these species and result in little to no impact. Concurrence with this determination and mitigating measures associated with the proposed action was received through an Intra-Service Consultation for Section 7 of the Endangered Species Act (Environmental Assessment, page 25; Intra-Service Consultation on file).
9. The actions will not lead to a violation of federal, state, or local laws imposed for the protection of the environment (Environmental Assessment, page 80).
10. The action will have no positive or negative impacts to wilderness or other special designation areas (Environmental Assessment, pages 33 and 36).
11. There is no scientific controversy over the impacts of this action and the impacts of the proposed action are relatively certain (Environmental Assessment, pages 50 and 86).
12. The proposal is not expected to have any substantial short- or long-term adverse effects on wetlands and floodplains, pursuant to Executive Orders 11990 and 11988 (Environmental Assessment, page 25).

Public Review

The draft environmental assessment was made available for public review starting January 17 – March 10, 2023, for fifty-two days. Members of the public and various non-governmental natural resource organizations were notified of the availability of the documents through hard copy letters, emails, a press release sent to news media outlets and posted on the refuge website <https://www.fws.gov/refuge/middle-mississippi-river>. A hard copy of the draft environmental assessment was made available at the refuge headquarters. Comments were able to be submitted in person or in writing via email or hardcopy mail.

State and Tribal Coordination

As part of its outreach efforts, the Service used a variety of tools, including direct mailings to elected officials, tribes, and state natural resource organizations. The review of this proposal was coordinated with the Illinois and Missouri State Historic Preservation Offices, Illinois and Missouri State Elected Officials, regional United States Army Corps of Engineers offices, regional Forest Service offices, Illinois Department of Natural Resources, Missouri Department

of Conservation. Tribes identified using the Tribal Directory Assessment Tool consisted of the Apache Tribe of Oklahoma, Cherokee Nation, Delaware Nation (Oklahoma), Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, Miami Tribe of Oklahoma, Osage Nation, Peoria Tribe of Indians of Oklahoma, Quapaw Tribe of Indians, Seneca-Cayuga Nation, Kickapoo Tribe of Oklahoma, and Menominee Indian Tribe of Wisconsin. These tribes and their associated natural resources staff were sent a notice of the initial scoping period, as well as a link to the draft copy of this land protection plan and environmental assessment with an invitation to provide comments. Comments were able to be submitted in person or in writing via email or hardcopy mail.

Finding of No Significant Impact

Based upon a review and evaluation of the information contained in the Environmental Assessment as well as other documents and actions of record affiliated with this proposal, the Service has determined that the proposal to expand the existing acquisition boundary of the Middle Mississippi River National Wildlife Refuge by adding a limited boundary with an acreage cap of 90,000 acres does not constitute a major Federal action significantly affecting the quality of the human environment under the meaning of section 102 (2) (c) of the National Environmental Policy Act of 1969 (as amended). As such, an environmental impact statement is not required.

Decision

The Service has decided to expand the existing approved acquisition boundary of the Middle Mississippi River National Wildlife Refuge by adding a limited acquisition boundary with an acreage cap of 90,000 acres as described under the Alternative B and analyzed in the Environmental Assessment. This action is compatible with the purpose of the refuge and the mission of the National Wildlife Refuge System and is consistent with applicable laws and policies.

Signature

CHARLES TRAXLER Digitally signed by
CHARLES TRAXLER
Date: 2023.06.15
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Regional Director Signature and Date

Supporting Documents

- Environmental Action Statement
- Land Protection Plan & Environmental Assessment
- Section 106 Midwest RHPO Clearance
- Intra-Service Section 7 determination

- Statement of Compliance