
Abstract
Trempealeau National Wildlife Refuge

Final

Environmental Impact Statement and Comprehensive Conservation Plan

Type of Action: Administrative

Lead Agency: U.S. Department of the Interior, Fish and Wildlife Service

Responsible Official: Robyn Thorson, Regional Director, Twin Cities

For Further Information:

Victoria Hirschboeck
Refuge Manager
Trempealeau NWR
W28488 Refuge Road
Trempealeau, WI, 54661
(608) 539-2311

The U.S. Fish and Wildlife Service is proposing to adopt and implement a Comprehensive Conservation Plan (CCP) for Trempealeau National Wildlife Refuge. The Refuge was established by Executive Order in 1936 to provide a refuge and breeding ground for migratory birds and other wildlife. The Refuge encompasses 6,226 acres in western Wisconsin. The CCP will guide the management and administration of the Refuge for 15 years and help ensure that it meets the purposes for which established, and contributes to the mission of the National Wildlife Refuge System. Three alternatives for future management are described: A) no action or current direction, B) wildlife and habitat focus, and C) integrated public use, habitat, and wildlife focus. The preferred alternative is Alternative C. This Environmental Impact Statement considers the physical, biological, and socioeconomic effects that the three alternatives would have in terms of the issues and concerns identified during the planning process.

Trempealeau

National Wildlife Refuge

Final Environmental Impact Statement and Comprehensive Conservation Plan

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Reader's Guide

The U.S. Fish and Wildlife Service will manage the Trempealeau National Wildlife Refuge (NWR) in accordance with an approved Comprehensive Conservation Plan (CCP). The CCP provides long range guidance on Refuge expansion and management through its vision, goals, objectives, and strategies. The CCP also provides a basis for a long-term adaptive management process including implementation, monitoring progress, evaluating and adjusting, and revising plans accordingly. Additional step-down planning will be required prior to implementation of certain programs and projects.

This document combines both a Final Environmental Impact Statement and Comprehensive Conservation Plan (Final EIS/CCP). Publishing of the document will be followed by a Record of Decision (ROD) that identifies the alternative selected as the CCP. We will then publish a stand-alone CCP made up of Chapter 1, the selected alternative from Chapter 2, all of Chapters 3, 5, 6, and 8, and selected appendices. The following chapter and appendix descriptions are provided to assist readers in locating and understanding the various components of this combined document.

Chapter 1, *Introduction, Purpose and Need, and Issues*, includes the regional context, establishment, and purposes of Trempealeau NWR; vision and goals for future management; and the purpose of and need for a comprehensive conservation plan. This chapter also provides background on major planning issues identified by Refuge staff; federal, state, and local agencies; and the general public.

Chapter 2, *Alternatives*, describes three management alternatives. Each alternative represents a potential comprehensive conservation plan for Trempealeau NWR. Alternative A describes current management on the Refuge. Alternative C, the Preferred Alternative, is the proposed Comprehensive Conservation Plan for

Trempealeau NWR. Alternative A represents baseline conditions for the comparisons made in Chapter 4.

Chapter 3, *Affected Environment*, describes the existing physical and biological environment, public uses, cultural resources, and socioeconomic conditions.

Chapter 4, *Environmental Consequences*, describes the potential impacts of each of the three alternatives on the resources, programs, and conditions outlined in Chapter 3. This is perhaps the most important part of the Environmental Impact Statement component of this document.

Chapter 5, *List of Preparers*, contains the names, positions, education, and years of experience of persons involved in the preparation of this Final EIS/CCP.

Chapter 6, *Compliance, Consultation, and Coordination with Others*, provides details on public involvement and interagency coordination, along with a list of agencies, groups, and citizens contacted during the planning process.

Chapter 7, *Public Comments*, describes written comments received on the Draft EIS/CCP and our responses.

Chapter 8, *List of References*, This chapter provides bibliographic citations and references used in this document.

Appendix A, *Glossary of Terms*, contains definitions of terms used in this document.

Appendix B, *Acronyms and Abbreviations*, contains the meanings of these short-hand notations used in this document.

Appendix C, *Distribution List*, contains the list of federal, Tribal, state, and local agencies; non-government organizations; academic institutions; and individuals who received planning

updates, summaries, and other mailings associated with this planning effort.

Appendix D, *Applicable Laws and Executive Orders*, contains brief descriptions of some of the more pertinent laws and executive orders applicable to management of Trempealeau NWR.

Appendix E, *Executive Order 7437*, this is the executive order which established the Trempealeau NWR.

Appendix F, *Economic Analysis of Refuge Alternatives and Demographics*, contains tables generated in preparation of this document.

Appendix G, *Species Lists*, lists plants and animals that have been observed on Trempealeau NWR.

Appendix H, *Plan Implementation*, summarizes the actions to be taken for the Preferred Alternative.

Appendix I, *Compatibility Determinations (CDs)*, describe uses, anticipated impacts, stipulations, and a determination of compatibility for all existing and proposed public uses on Trempealeau NWR.

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Summary

Introduction

A Comprehensive Conservation Plan (CCP) is being prepared to guide the administration and management of Trempealeau National Wildlife Refuge (Refuge) for the next 15 years. This document integrates the components of a CCP, namely goals, objectives, and strategies; with the requirements of an Environmental Impact Statement, namely alternatives and consequences.

Comprehensive conservation plans are required by the National Wildlife Refuge System Improvement Act of 1997 to ensure that refuges are managed in accordance with their purposes and the mission of the National Wildlife Refuge System, which is part of the U.S. Fish and Wildlife Service. The CCP describes a desired future condition of the Refuge, and provides both long-term and day-to-day guidance for management actions and decisions. The CCP provides broad and specific policy on various issues, sets goals and measurable objectives, and outlines strategies for reaching the objectives.

Preparation of an Environmental Impact Statement (EIS) as part of the CCP planning process establishes scientific data on which to base a selection of a management direction and provides an opportunity for residents, communities, state agencies and governments, and non-government organizations to express their ideas on Refuge management. The EIS process assures that the direction set forth in the CCP best achieves the Refuge's purposes, vision and goals; contributes to the mission of the National Wildlife Refuge System; is consistent with principles of sound fish and wildlife management; and addresses relevant mandates and major issues developed during scoping.

The Refuge System is the largest collection of lands and waters in the world set aside for the conservation of wildlife, with over 540 units covering more than 95 million acres in the U.S. and its terri-



Aerial view of Trempealeau NWR pools adjacent to the Upper Mississippi River. Photo by Robert Hurt.

tories. Trempealeau NWR was established by Executive Order in 1936 as “a refuge and breeding ground for migratory birds and other wildlife.” The 6,226 acre Refuge is a backwater of the Mississippi River and is strategically located within an important migration corridor, providing resting and feeding habitat for thousands of waterfowl and other birds during spring and fall. The Refuge also includes more than 700 acres of native prairie and oak savanna, habitat types that are scarce in Wisconsin.

An estimated 70,000 visitors enjoy birding, hiking, biking, hunting, fishing, or photography at the Refuge. Over 2,000 young people learn about their environment each year through educational programs. A dedicated force of volunteers contributes to the quality of the visitor experience, as well as successful habitat management.

Staff offices are located at the Refuge near the City of Trempealeau, Wisconsin. The Refuge is a unit of the Upper Mississippi National Wildlife and Fish Refuge Complex with headquarters in Winona,

Minnesota. There are currently four full-time permanent employees and a base annual budget of \$400K.

Public Involvement and Decision Process

Scoping of issues began in September of 2002 with a public meeting in Centerville, Wisconsin to identify issues. Key issues identified at the meeting and by Refuge staff, were summarized in 12 “fact sheets” that provided the basis for discussion groups at an all-day workshop in March of 2003. Workshop participants were “managers for a day” making tough decisions about how to balance often conflicting Refuge uses. A website was maintained with up-to-date news about the process. Follow-up meetings with Wisconsin Department of Natural Resources and briefings with various commissions, associations, and Congressional offices occurred throughout the process.

The Draft EIS/CCP was released for public review in June 2007 with a 60-day comment period. Summaries were mailed to 250 people, and full copies were provided to 52 people, agencies, and non-

government organizations. Paper copies were also distributed to eight libraries in the area surrounding the Refuge.

The full EIS/CCP was posted on the Refuge’s planning website.

Twenty-six people participated in a public meeting hosted by the Refuge on June 28, 2007, in Trempealeau, Wisconsin. The purpose of the meeting was to give people an opportunity to comment in person on the Draft EIS/CCP. Comments were also accepted through the mail and via e-mail. Topics discussed included:

- # The history of Trempealeau NWR management and current land conditions.
- # The mission of the National Wildlife Refuge System and the purpose of Trempealeau NWR.
- # The comprehensive conservation planning process and development of alternatives.
- # Objectives and strategies of the preferred alternative, Alternative C .

In addition, on July 10, 2007, the Refuge hosted a workshop focused on the waterfowl hunting objective (Objective 3.5) in the preferred alternative. Two people not associated with the U.S. Fish & Wildlife Service attended the workshop.

Following the publication of the Final EIS/CCP, the Regional Director, U.S. Fish and Wildlife Service, Twin Cities, Minnesota, will make a decision on which alternative in the Final EIS will become the Final CCP. This decision will be recorded in a formal Record of Decision included in the final documents. Substantive comments from the public, agencies, and other groups that were received on the Draft EIS/CCP are included in the Final EIS, along with a Service response.

Refuge Vision and Goals

The Refuge vision provides a simple statement of the desired, overall future condition of the Refuge. Refuge goals are “stepped down” from the vision and provide a framework for more detailed, measurable objectives which are the heart of the CCP.



White sage, Trempealeau NWR

Refuge Vision:

“Trempealeau National Wildlife Refuge is enjoyed and appreciated by the people of America as a beautiful, scenic place where a diversity of native plants and animals thrive in healthy prairies, forests, and wetlands.”

Refuge Goals

Landscape

We will strive to maintain and improve the scenic and wild character, and environmental health of the Refuge.

Wildlife and Habitat

Our habitat management will support diverse and abundant native fish, wildlife, and plants.

Public Use

We will manage public use programs and facilities to ensure sustainable, quality hunting, fishing, wildlife observation, wildlife photography, interpretation, and environmental education opportunities for a broad cross-section of the public; and provide opportunities for the public to use and enjoy the Refuge for traditional and appropriate non-wildlife dependent uses that are compatible with the purposes for which the Refuge was established and the mission of the Refuge System.

Neighboring Landowners and Communities

We will communicate openly and work cooperatively with our neighbors and local communities to help all benefit from the aesthetic and economic values of the Refuge.

Administration and Operations

We will seek adequate funding, staffing, and facilities; and improve public awareness and support to carry out the purposes, vision, goals, and objectives of the Refuge.

Planning Issues, Concerns and Opportunities

Scoping and public involvement helped identify numerous issues facing the Refuge and formed the basis for crafting the EIS/CCP. These issues are summarized below by related Refuge goal.



Winter ice over a Refuge pool. USFWS

Landscape Issues

Land Acquisition

Only 340 acres within the acquisition boundary approved in the 1983 Refuge Master Plan have not been acquired. An additional 12 acres outside the current approved boundary would be added under the Regional Director’s authority. Acquiring these lands would alleviate issues with the entrance road flooding, and allow the Refuge to restore and protect bottomland forest and emergent marsh.

Refuge Boundary

Brush cutting, dumping, mowing, illegal hunting and fishing, and vehicle trespass all occur along areas of the boundary, often intruding onto Refuge lands. A clearly marked and maintained boundary would be a deterrent to encroachment and other illegal activities and would help to maintain positive relations with neighboring landowners.

Flood Protection

The Burlington Northern Sante Fe Railroad (BNSFR) dike separates the Refuge from the main channel of the Mississippi River. During the near-record flood in 2001, floodwaters put severe pressure against the river side of the dike. At the request of BNSFR the Service allowed floodwater to enter the Refuge. Severe damage occurred to Refuge habitats and infrastructure and offered insufficient protection for the railroad dike. The Refuge has no official policy for dealing with water management during flood events, making it vulnerable to impacts from emergency actions.

Natural Areas and Special Designations

In 1986, Black Oak Island was designated a Public Use Natural Area as an example of undisturbed, mature, eastern deciduous forest. A management plan is needed to ensure the future integrity of the area.

The Great River State Bike Trail passes through the Refuge with an estimated 20,000 cyclists riding through each year. Improved signing and interpretive materials, and alleviating the spring flooding of the entrance road are issues that need to be resolved to improve the bike trail.

Archeological Resources

The U.S. Fish and Wildlife Service has a responsibility for the protection of the many known and unknown cultural resources located on Refuge lands. Trempealeau NWR has been described as one of the most important archeological sites in the Midwest. Human use dates back 12,000 years. The majority of the Refuge has not had baseline surveys and the locations and extent of archeological resources are unknown. Protection of sites is difficult and the Refuge has a long history of illegal collecting. Habitat management is often delayed pending site surveys. The Refuge does not have an Archeological Resource Protection Plan or an inventory plan.

Wildlife and Habitat Issues

Forest Management

More than 85 percent of the forests are dominated by non-native trees and shrubs. Efforts to control invasive understory plants are limited by current staff and funding. Commercial harvest of pines and black locust, and firewood cutting are difficult because of pending archeological surveys. The Forest Management Plan is outdated.

Wetland Management

Stable, deep water and poor water clarity have led to a general declining trend in productivity in impounded wetlands on the Refuge. Wind, waves, and rough fish create poor conditions for aquatic plant growth by suspending bottom sediments. Invasive aquatic plants are increasing. Smaller management units, rough fish removal, and water control are needed to improve wetland productivity. Some areas, particularly those fed by the Trempealeau River are impacted by high sediment loads from upstream agricultural lands. Repairing these

streams at the top of the watershed is critical to keeping sediments on the land rather than flowing into the Refuge and the Mississippi River. Full implementation of the Partners for Wildlife Program is needed to address watershed concerns.

Grassland Management

Historically, much of the upland areas of the Refuge were dominated by prairies and oak savanna. Non-native pines, black locust, and other invasive shrubs threaten to take over prairie habitats on the Refuge. Control of invasive plants is an ongoing, labor intensive and costly management tool. Success is often limited. Prescribed fire is an essential component of grasslands and is used under prescriptions described in the Fire Management Plan, which was being prepared in 2007.

Invasive Plants and Animals

Invasive plants continue to pose a major threat to native plant communities and the wildlife that depend on them. All habitat types on the Refuge have invasive plants of some variety or another. Biological control is available for some species but, mechanical removal is the mainstay of the control program. While volunteers, school groups and staff have made some headway, labor is a limiting factor.

Years of impoundment and stable water have led to a fishery dominated by carp and other non-desirable rough fish. Invasion by Asian carp may be imminent. The Fishery Management Plan needs to be updated to aggressively manage non-native fish.

Monitoring Fish, Wildlife, and Plant Populations

Although monitoring has been a part of managing the Refuge for many years, gaps remain in baseline population data for many species. A Wildlife Inventory Plan was completed in 1987, but needs updating to reflect changes in habitat, the status of many species, and new policies, procedures, and technologies for monitoring and investigation as issues arise and change.

Threatened and Endangered Species

Increased attention is needed on listed species due to their often precarious population status and the need for special management consideration and protection.

Deer Management

Deer hunting is used to reduce vegetation browse impacts and to maintain populations in-line with State goals for adjoining lands. Accurate deer numbers are needed to determine the appropriate harvest in consideration of browse impacts.

Wildlife Disease Management

A wide range of issues are currently in the public eye regarding wildlife disease and potential impacts to human populations. A Disease Contingency Plan needs to be developed to identify available resources and procedures for responding to disease outbreaks in wildlife.

Public Use Issues

Wildlife Observation and Photography

The public desires more opportunities for wildlife observation and photography. There is a need to provide enhanced opportunities during all seasons and to improve facilities for people with disabilities. The Service needs to evaluate the pros and cons of an entrance fee program that may provide additional funds for visitor services.

Environmental Education

The demand for formal environmental education has been increasing and staff has few resources to accommodate requests. The Refuge would benefit from all-weather group teaching and restroom facilities.

Hunting

Waterfowl hunting is a priority public use and is a vital part of the cultural, social, and economic fabric of communities around the Refuge. The public desires more hunting opportunities, particularly in high quality habitats like those found on the Refuge. However, managers must balance hunting opportunities with the need to limit disturbance to wildlife and accommodate other visitor interests. The Refuge needs a Hunt Plan and a Visitor Services Plan that includes a detailed evaluation of the benefits of opening new areas to hunting.

Fishing

As habitats for fish improve demand for fishing may increase. Attention to support facilities (boat ramps, fishing platforms) is needed to improve access and quality of the fishing experience.



Waterfowl hunters with disabilities. USFWS

Harvesting Fruit, Nuts, and Other Plant Parts

Some plants growing on the Refuge produce edible parts such as fruit and nuts. In the past, harvest of some fruits and nuts was allowed, but new requests for medicinal plants, seeds, and wild rice have increased. There is a need to clarify the policy on harvest of plant part and what levels can be sustained without jeopardizing habitats or wildlife.

Horseback Riding

As more hobby farms become established in the vicinity, interest in the use of the Refuge for horseback riding has increased. The potential for conflicts with other visitors and damage to Refuge habitats necessitates careful consideration and review of Service policy.

Domestic Pets

Dogs on a leash are permitted on the Refuge. Requests for opening areas to unleashed pets during the winter, and for dog field trials necessitates a review of current regulations and careful consideration of the need to protect visitors and wildlife while taking into account the public's interest in training and exercising dogs.

Non-Refuge Sponsored Events

Scout jamborees, overnight camping by school groups, weddings, family reunions, and fund raising walks or runs by charities are examples of non-Refuge sponsored events that are considered non-wildlife dependent activities. Each of these activities must be considered individually to determine if they are compatible with the purposes of the Refuge and if they are likely to impact resources.

Non-Refuge Sponsored Research

At times, research projects, although interesting, do not further the management objectives of the Refuge. Clear guidelines need to be developed as to what research is compatible with the Refuge purposes and is in the best interest of staff and funding resources.

General Public Use Regulations

The current public use regulations (hours of operation, vehicle access, fires, camping, etc.) were updated in 1992. A general update is needed to reflect changing public use patterns and to provide clear guidance to visitors and law enforcement officers.

Neighboring Landowner and Community Issues

Community Outreach

Numerous opportunities exist to build connections between the Refuge and the community. Refuge planning must include a strong component of community outreach and participation.

Friends Group

Friends groups play a critical role in helping the public understand the importance of protecting and preserving refuges. The Refuge needs a Friends group that will provide an independent citizen voice for the protection, conservation, and enhancement of resources.

Volunteers

The Refuge has a core of dedicated volunteers who are committed to protecting the beauty and health of the Refuge. Volunteers perform many of the surveys and maintenance tasks that the staff can not. The Refuge needs to find ways to foster a sense of pride and ownership in the volunteers, while continuing to recruit new help.

Partnerships

The Refuge administers the Partners for Wildlife Program for two Wisconsin counties. Opportunities for watershed improvements and reductions in sedimentation abound. Funding and staff levels allow completion of only a few of these projects each year. Also, the Refuge could benefit from more coordination with Perrot State Park.

Private Property Rights

A variety of issues cross property lines and affect neighboring landowners. Likewise, farming operation and private hunting clubs may impact Refuge lands. There is a need to communicate more efficiently and frequently with Refuge neighbors.

Easement and Right-of Way Management

Work crews and equipment need to cross Refuge lands to access infrastructure on easements on the Refuge. The Refuge needs to develop a management plan for easements and right-of-ways that is consistent with current policies and management recommendations.

Administration and Operations Issues

Entrance Road Flooding

The main entrance road to the Refuge floods seasonally and is impassable for part of the year. The Refuge needs to develop a year-round access road for staff and visitors.



Girl Scouts learn about the land. USFWS



Bird identification program. USFWS

Facilities

Current office, maintenance, and public use facilities are inadequate to support many Refuge programs. Facilities need to be replaced and/or enlarged to accommodate current operations.

Staffing

Staffing levels are below essential staffing needs and reflect gaps between what should be done and what can be done. As public demand for educational programs, biological information, and resource protection increases adequate staffing becomes more critical.

Operations and Maintenance Needs

Plans and planning should articulate the need for staff and funding to manage and administer programs, facilities, and equipment. These needs must be represented in databases and other documents that are used in budget decision-making at the national and regional levels.

Summary of Alternatives Considered

Three reasonable alternatives were developed to address the variety of issues and opportunities facing the Refuge now and during the 15-year horizon of the CCP. These alternatives are summarized below in terms of the actions that would be undertaken in each alternative. Alternative C is the Service's preferred alternative. However, the final

decision can be any of the alternatives, and may reflect a modification of certain elements of any alternative based on consideration of public comment.

Alternative A: No Action (Current Direction)

This alternative assumes no change from past management programs and is considered the base from which to compare the other two alternatives.

Boundary issues would be addressed as time and funding allow. The remaining 340 acres within the approved acquisition boundary and 12 acres outside the boundary would be purchased as opportunities arose.

Habitat management would continue to remain a priority. Invasive plant control in prairie, forest, and wetlands would continue at its present level. The Refuge would maintain its present 335 acres of prairie and savanna using prescribed fire. Biological control of leafy spurge and purple loosestrife, and mechanical and chemical control of black locust, Siberian pea and exotic elm species would limit the spread of these invasive species. In upland forests, the Refuge would restore native species composition to both the understory and overstory by removing black locust, buckthorn, exotic elms, Siberian pea and honeysuckle.

Commercial fishing would continue to be used to manage carp and other rough fish in Pool A. A permitted deer hunt would continue for both the 9-day gun season and the late archery season in order to manage deer numbers. Trapping for raccoon, muskrat, beaver, mink, and opossum would continue.

Public use opportunities would remain at present levels. Limited school programs and programs for scouts and other organized groups would be conducted by staff. Limited waterfowl hunting opportunities would be available for hunters with disabilities. Bank fishing would continue along any shoreline, as well as boat fishing from hand-powered or electric motor powered craft. Hiking would continue on all roads and trails

The staff would remain at its current level of a permanent full-time refuge manager, park ranger, maintenance mechanic, and administrative technician. Volunteers would be used in a variety of programs including biological, public use, clerical, and maintenance. The Refuge would maintain its

present entrance road, which is open to all traffic except for an average of 6 weeks each year when the road is flooded.

The Refuge office would remain as is, but the 70-year-old shop would be replaced.

Alternative B: Wildlife and Habitat Focus

This alternative favors minimal disturbance to wildlife from public use and increased level of effort on fish and wildlife habitat management.

Boundary issues would be addressed with annual inspections, new surveying and installation of an automatic gate at the main entrance. The remaining 340 acres within the approved acquisition boundary and 12 acres outside the current boundary would be purchased as opportunities arose.

Habitat management would be a high priority. Invasive species control in the forested habitats would allow restoration of prairie and oak savanna. Pine plantations would be eliminated. Prescribed fire and mowing would be used to manage the resulting 11 prairie units totaling 585 acres.

Researchers would be actively sought to conduct research to determine effects of management strategies. Monitoring of grasslands, aquatic vegetation, and extent of invasive plant species would be conducted.

Additional dikes and water control structures would be placed within existing impoundments. The C2 impoundment would be divided into three separate units to allow for moist soil management. Three other impoundments would be carved out of Pool B to create manageable units as well as additional emergent habitat. Islands would be built in Pools A and B. Water level management in Pools A and E would continue on their present course. Rough fish would be intensively managed in all pools using commercial fishing and water level management.

The managed deer hunt would continue, but harvest levels would be regulated based on deer population and vegetation monitoring. Furbearer trapping would continue with harvest levels based on population estimates and habitat monitoring. No waterfowl hunting would be allowed. Public use opportunities would be reduced. Environmental education programs would be limited to those that explain Refuge regulations. To reduce disturbance to migrating

birds, all pools would be closed to water craft during fall migration (from September 15 through November 15).

The staff would include the addition of a permanent full-time biologist and a private lands biologist and a seasonal biological technician and tractor operator. The Refuge would maintain its present entrance road, which is open to all traffic except for an average of 6 weeks each year when the road is flooded. The Refuge office would remain as is, but the 70-year-old shop would be replaced.

Alternative C: Integrated Public Use and Wildlife and Habitat Focus (Preferred Alternative)

This alternative focuses on returning upland areas to pre-European settlement habitats, increasing flexibility in wetland management within impoundments, and increasing public use opportunities.

Boundary issues would be addressed with annual inspections, new surveying and installation of an automatic gate at the main entrance. The remaining 340 acres within the approved acquisition boundary and 12 acres outside the current boundary would be purchased as opportunities arose.

Prairie and oak savanna restoration would be a high priority. Increased efforts to control invasive species would be made using biological, mechanical, and chemical methods. Prescribed fire and mowing would be used to manage 11 prairie units totaling 435 acres. Half of the trees in the pine plantations would be removed through selective thinning.

Additional dikes and water control structures would be placed within existing impoundments. The C2 impoundment would be divided into three separate units to allow for moist soil management. The remaining three impoundments (Pools C1, D, and F) would reduce the size of Pool B to a manageable unit as well as create additional emergent habitat. Islands would be built in Pools A and B. Water level management in Pools A and E would continue on their present course. Rough fish, particularly carp, would be managed in specified pools using commercial fishing and water level management.

Researchers would be actively sought to conduct studies that would determine effects of management strategies. Grasslands, aquatic vegetation, and the extent of invasive plant species would be monitored.

The deer hunt would continue as in the past, except harvest levels would be based on population and habitat monitoring. Furbearer trapping would continue and the number of beaver and muskrat taken would be determined based on annual monitoring of harvest and of dike damage and interference with water control structures.

Public use opportunities would be expanded. Environmental education programs would be promoted at local schools and to community groups and the general public. A multi-purpose room would be added to the office/visitor contact station to accommodate larger groups and provide a place for orientation. Waterfowl hunting opportunities would be expanded by opening the area west of the Canadian National Railroad dike to a limited hunt. Ski trails would be maintained when conditions permit. Options to alleviate flooding of the entrance road to provide year-round access to the Refuge would be explored.

Use of volunteers would be expanded in all programs. A Trempealeau NWR Friends Group would be started. Outreach would be expanded to provide opportunities for awareness and understanding of Refuge management and the National Wildlife Refuge System. Traveling exhibits that bring the Refuge to the people would be developed.



Tree Swallow. USFWS

The staff would include the addition of three seasonal positions, including a biological technician, a tractor operator, and a park ranger. Law enforcement duties would be covered by a new position shared with Winona District. A private lands biologist would also be shared with Winona District.

Summary of Environmental Consequences

Consequences Common to All Alternatives

Under all alternatives, there would be no disproportionate adverse effect on minority or low-income populations. No significant changes are expected to climate, soils or environmental contaminants. Cultural and historical resource protection would be addressed in accordance with current laws, regulations, and policies. Prescribed fire would be used under all alternatives to maintain health and vigor of grassland habitat. Any negative effects would be short-term and mitigated by long-term habitat improvements and higher grassland species populations. Landowners adjacent to the Refuge would not see a significant effect on the use or value of their property since none of the alternatives radically change land management direction. Bottomland hardwood forests would increase in acreage under all alternatives. Furbearer populations would not be impacted and trapping would continue for all alternatives. All alternatives call for implementing a new flood policy that would protect refuge infrastructure and habitats from damaging flood waters.

Consequences, Alternative A: No Action

This alternative would cause little change in water quality, suspended sediments or nutrient loading. The quality of wetland habitats would continue to decline as carp and invasive aquatic plants continue to increase. Invasive plants would continue to spread over prairies, oak savannas, and upland forests.

Biologically, Alternative A would have a neutral impact on threatened and endangered species, reptiles and amphibians, and mammals. Wildlife use would continue at existing levels, although in general understory and grassland species would find poor quality habitat invaded by exotic species.

Socioeconomic impacts under Alternative A would be minimal. All current uses would continue with an estimated economic output of \$250,000. Hunting fishing, interpretation, environmental education, wildlife observation, and photography would continue at current levels. The annual economic impact to regional and local economies would remain at current levels.

Consequences, Alternative B: Fish and Wildlife Focus

Under this alternative, reduction of carp and construction of new dikes, islands and water control structures would result in improved water quality, a reduction in suspended sediments, and improved conditions for germination of wetland plants.

Biologically, the manipulations in water levels would improve wetland plant vigor and habitat for a wide range of wetland-dependent fish and wildlife. Alternative B would have a positive impact on threatened and endangered species, waterbirds, landbirds, reptiles and amphibians, and mammals. Upland habitats would benefit from more aggressive control of invasive species. Prairie and oak savanna habitats would expand. Diversity and abundance of native wildlife would increase.

Public use and recreation would be limited as resources are diverted to improving habitats for wildlife. Community involvement would decrease due to lack of public outreach, and less money would flow to local economies from wildlife-dependent recreation. An estimated \$11,000, or a 4 percent loss, of economic output would occur due to loss of visitation. Staffing levels would be better suited to meet demands for wildlife and habitat monitoring.

Consequences, Alternative C: Integrated Public Use and Wildlife Habitat Focus (Preferred)

Under this alternative, reduction of carp and construction of new dikes, islands and water control structures would result in improved water quality, a reduction in suspended sediments, and improved conditions for germination of wetland plants.

In general, habitat quality for wildlife would improve under this alternative. While invasive species would not be totally eliminated, their spread would be controlled and some upland habitats would be restored to historic conditions. Wildlife diversity

and abundance would increase. Alternative C would have a positive impact on waterbirds, landbirds, reptiles and amphibians, and mammals.

Opportunities for wildlife-dependent recreation would improve with additional area open to waterfowl hunting. More resources and staff would be devoted to environmental education and interpretation. Local communities would benefit as more people visited the refuge. Economic output would increase by \$28,000 or 11 percent as more opportunities became available for wildlife-dependent recreation. Staffing levels and facilities would be better suited to meet the needs of an overall program balanced between fish and wildlife monitoring, habitat management, and public use.

Chapter 1: Introduction, Purpose and Need, and Issues

1.1 Introduction

This document is an integrated Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS) for Trempealeau National Wildlife Refuge (NWR or Refuge). It follows the basic and accepted format for an EIS and each alternative presented contains the core of a CCP, namely goals, objectives, and strategies. Since it is an integrated document designed to meet the requirements for both an EIS and a CCP, some sections in the EIS were expanded (notably Chapter 1, Planning Background) to meet this dual function. In addition, various referenced appendices relate to either the EIS, CCP, or both, as applicable.

Trempealeau NWR is located within the Mississippi River Valley in southwestern Wisconsin (Figure 1). This 6,226-acre Refuge in Buffalo and Trempealeau Counties is managed by the U.S. Fish and Wildlife Service. The Refuge was established by Executive Order 7437 in 1936 as “a refuge and breeding ground for migratory birds and other wildlife” (Appendix E). Trempealeau NWR is part of the Upper Mississippi River NWR Complex with headquarters in Winona, Minnesota. The Complex includes Upper Mississippi River National Wildlife & Fish Refuge and Driftless Area NWR.

Trempealeau NWR lies adjacent to Navigation Pool 6 of the Mississippi River and is strategically located on this important migration corridor, providing resting and feeding habitat for thousands of waterfowl and other birds during spring and fall. The Refuge also includes more than 700 acres of rolling native prairie and oak savanna, habitat types that are scarce in Wisconsin.



Northern Shoveler Hen / USFWS

1.2 Purpose and Need for Action

1.2.1 Purpose

The purpose of this EIS is to adopt and implement a CCP for Trempealeau NWR. The Service is considering a range of alternatives of how best to manage the Refuge.

Comprehensive Conservation Plans are designed to guide the management and administration of National Wildlife Refuges for a period of 15 years and help ensure that each refuge meets the purpose for which it was established and contributes to the overall mission of the National Wildlife Refuge System (NWRS) (see Section 1.4.3 on page 6). The CCP helps describe a desired future condition of the Refuge, and provides both long-term and day-to-day

Figure 1: Location of Trempealeau NWR in Wisconsin



guidance for management actions and decisions. It provides both broad and specific policy on various issues, sets goals and measurable objectives, and outlines strategies for reaching these objectives. A CCP also helps communicate the Refuge's management direction to other agencies and the public.

The NWRS Refuge Improvement Act of 1997 (see Section 1.4.4 on page 6) mandates that the Secretary of the Interior, and thus the Service, prepare CCPs for all units of the National Wildlife Refuge System by October 2012. In addition to this mandate, there are several reasons why preparation of a CCP is needed at this time.

The last comprehensive plan (known as a Master Plan) was completed in 1983 (USFWS 1983). Since then, the Refuge environment has undergone change affecting habitat and wildlife, new laws and policies have been put in place, new scientific information is available, and levels of public use and interest have increased.

The National Environmental Policy Act of 1969 (NEPA) requires that federal agencies follow basic requirements for major actions significantly affecting the quality of the human environment. These requirements are:

- # Consider every significant aspect of the environmental impact of a proposed action.
- # Involve the public in its decision-making process when considering environmental concerns.
- # Use a systematic, interdisciplinary approach to decision making.
- # Consider a reasonable range of alternatives.

This EIS documents those requirements and provides the necessary information and analysis to the decision-maker.

Finally, the planning process is an excellent way to inform and involve the general public, state and federal agencies, and non-government groups that have an interest, responsibility, or authority in the management or use of certain aspects of the Trempealeau NWR.

1.2.2 Need

The CCP that ultimately arises from this EIS/CCP will help ensure that management and administration of the Refuge meet the mission of the Refuge System, the purpose for which the Refuge was established, and the goals for the Refuge. The mission, purpose, and goals are considered the needs or benchmarks for defining reasonable alternatives



American Coot, USFWS

presented in Chapter 2 and, along with an evaluation of consequences in Chapter 4, will form the basis for a decision. These needs are summarized below. More detail on issues related to these needs can be found in Section 1.4.8 on page 16, Planning Issues, Concerns and Opportunities.

Need I: Contribute to the Refuge System Mission

The mission of the National Wildlife Refuge System set forth in the Refuge Improvement Act of 1997 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.”

Need II: Help Fulfill the Refuge Purpose

The purpose of the Refuge comes from the authority under which it was established and in the case of Trempealeau NWR, from the authorities under which subsequent major land additions to the



Black-eyed Susan. USFWS

Refuge were made. Purposes for Trempealeau NWR are as follows:

“...a Refuge and breeding ground for migratory birds and other wildlife”

Executive Order 7437, dated August 21, 1936. (Appendix E)

“suitable for-(1) incidental fish and wildlife oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species ...”

Refuge Recreation Act of 1962 (16 U.S.C 460k-460k-4), as amended (Appendix D)

“...for the development, advancement, management, conservation, and protection of fish and wildlife resources.”

16 U.S.C. 742f(a)(4)(Fish and Wildlife Act of 1956.) (Appendix D)

Need III: Help Achieve Refuge Goals

Goal 1: Landscape – We will strive to maintain and improve the scenic and wild character, and environmental health of the Refuge.

Related needs are to:

- # Complete acquisition within the approved boundary with the addition of 12 acres under the Regional Director’s authority.
- # Maintain the integrity of the Refuge boundary.

- # Ensure integrity of lands designated as Natural Areas or with other special designations.
- # Protect archeological and cultural resources and ensure consideration of preservation of historic properties.
- # Protect Refuge habitats and facilities during flood events.

Goal 2: Wildlife and Habitat – Our habitat management will support diverse and abundant native fish, wildlife, and plants.

Related needs are to:

- # Evaluate and manage forest resources.
- # Manage non-native trees and downed fuel.
- # Restore and enhance wetlands.
- # Restore productivity to Refuge pools.
- # Prepare for quick response to contaminant spills from train derailments or roadway accidents.
- # Reduce sediment, nutrients, and contaminants in waters upstream of the Refuge.
- # Restore and enhance prairie and oak savanna habitat.
- # Understand and reduce invasive plants and animals.
- # Monitor the status of key fish and wildlife.
- # Protect and enhance federally listed threatened, endangered, and candidate species and their habitats.
- # Manage deer herds to prevent over-browsing and loss of plant diversity.
- # Manage beaver and muskrat populations to limit damage to dikes and structures.
- # Improve fishery conservation efforts.
- # Provide adequate undisturbed areas to meet the nesting, feeding and migration needs of waterfowl.
- # Protect and enhance habitat for forest birds.
- # Understand and be ready to respond to wildlife disease outbreaks.

Goal 3: Public Use – We will manage public use programs and facilities to ensure sustainable, quality hunting, fishing, wildlife observation, wildlife photography, interpretation, and environmental education opportunities for a broad cross-section of the public; and provide opportunities for the public to use and enjoy the Refuge for traditional and

appropriate non-wildlife dependent uses that are compatible with the purposes for which the Refuge was established and the mission of the Refuge System.

Related needs are to:

- # Improve opportunities for wildlife observation and photography.
- # Improve opportunities for interpretation.
- # Improve opportunities for environmental education.
- # Provide diverse, high quality, hunting and fishing opportunities for people of all abilities.
- # Provide opportunities for appropriate non-commercial harvest of plant parts.
- # Improve opportunities for non-motorized biking.
- # Respond to requests for other uses such as horseback riding, dog trials, camping, and special fundraising events.
- # Update general public use regulations for clarity and effectiveness.

Goal 4: Neighboring Landowners and Communities –

We will communicate openly and work cooperatively with our neighbors and local communities to help all benefit from the aesthetic and economic values of the Refuge.

Related needs are to:

- # Improve community outreach.
- # Establish a Refuge Friends group.
- # Promote an active and rewarding volunteer program.
- # Improve communication and cooperation with other agency partners.
- # Improve communication and cooperation with adjacent private landowners.
- # Coordinate with utilities and transportation departments to minimize impacts of easements and rights-of-way to habitats.

Goal 5: Administration and Operations – We will seek adequate funding, staffing, and facilities; and improve public awareness and support to carry out the purposes, vision, goals, and objectives of the Refuge.

Related needs are to:

- # Provide year-round access to the Refuge.
- # Provide adequate office and maintenance facilities.

- # Provide adequate staff to meet resource and public challenges and opportunities.
- # Identify operational and maintenance needs.

1.3 Decision Framework

The Service’s Regional Director in Minneapolis, Minnesota, is the responsible official for approving the Final EIS in a Record of Decision. The Record of Decision will identify the selected alternative which will become the Final CCP. The selected alternative will be one of the alternatives in this Final EIS, although the final decision may reflect modification of certain elements of the alternatives based on public review and comment. The Final EIS also contains individual substantive comments or a summary of like-comments, received from the public, agencies, and other interested parties, along with a Service response (see Chapter 7).

1.4 Planning Background

1.4.1 Legal and Policy Framework

Trempealeau NWR is managed and administered as part of the National Wildlife Refuge System within a framework of organizational setting, laws, and policy. Key aspects of this framework are outlined below. A list of other laws and executive orders that have guided preparation of the CCP and EIS, and guide future implementation, are provided in Appendix D.

1.4.2 The U.S Fish and Wildlife Service

The Refuge is administered by the U.S. Fish and Wildlife Service, Department of Interior. The Service is the primary federal agency responsible for conserving and enhancing the nation’s fish and wildlife populations and their habitats. Although the Service shares this responsibility with other federal, state, tribal, local, and private entities, the Service has specific trust responsibilities for migratory birds, threatened and endangered species, certain interjurisdictional fish and marine mammals, and the National Wildlife Refuge System. The mission of the Service is:

“Working with others to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people.”

1.4.3 The National Wildlife Refuge System

The Refuge System had its beginning in 1903 when President Theodore Roosevelt used an Executive Order to set aside tiny Pelican Island in Florida as a refuge and breeding ground for birds. From that small beginning, the Refuge System has become the world's largest collection of lands specifically set aside for wildlife conservation. The administration, management, and growth of the Refuge System are guided by the following goals (USFWS 2004, Section 601 FW1.8):

The Refuge System's goals are to:

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

1.4.4 National Wildlife Refuge System Improvement Act of 1997 and Related Policies

The Improvement Act of 1997 amended the National Wildlife Refuge System Administrative Act of 1966 and became a true organic act for the System by providing a mission, policy direction, and management standards. A summary of the key provisions of this landmark legislation and subsequent policies to carry out the Act's mandates follows:

Established Broad National Policy for the Refuge System:

- # Each refuge shall be managed to fulfill the mission and its purpose.
- # Compatible wildlife-dependent recreation is a legitimate and appropriate use.
- # Compatible wildlife-dependent uses are the priority public uses of the System.
- # Compatible wildlife-dependent uses should be facilitated, subject to necessary restrictions.

Directed the Secretary of the Interior to:

- # Provide for the conservation of fish, wildlife, and plants within the System.
- # Ensure biological integrity, diversity, and environmental health of the System for the benefit of present and future generations.
- # Plan and direct the continued growth of the System to meet the mission.
- # Carry out the mission of the System and purposes of each refuge; if conflict between, purposes takes priority.
- # Ensure coordination with adjacent landowners and states.
- # Assist in the maintenance of adequate water quantity and quality for refuges; acquire water rights as needed.
- # Recognize compatible wildlife-dependent recreational uses as the priority general public uses of the System.
- # Ensure that opportunities for compatible wildlife-dependent recreation are provided.



Bird Festival celebration of the Refuge's 70th birthday. USFWS

- # Ensure that wildlife-dependent recreation receives enhanced consideration over other uses of the System.
- # Provide increased opportunities for families to enjoy wildlife-dependent recreation.
- # Provide cooperation and collaboration of other federal agencies and states, and honor existing authorized or permitted uses by other federal agencies.
- # Monitor the status and trends of fish, wildlife, and plants in each refuge.

Provide Compatibility of Use Standards and Procedures:

- # New or existing uses should not be permitted, renewed, or expanded unless compatible with the mission of the System or the purpose(s) of the refuge, and consistent with public safety.
- # Wildlife-dependent uses may be authorized when compatible and not inconsistent with public safety.
- # The Secretary shall issue regulations for compatibility determinations.

Planning:

- # Each unit of the Refuge System shall have a Comprehensive Conservation Plan completed by 2012.
- # Plans must identify and describe the archaeological and cultural values found on the refuge.
- # Planning should involve adjoining landowners, state conservation agencies, and the general public.

1.4.4.1. Compatibility Policy

No uses for which the Service has authority to regulate may be allowed on a unit of the National Wildlife Refuge System unless it is determined to be compatible. A compatible use is a use that, in the sound professional judgment of the Refuge Manager, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the National Wildlife Refuge. Managers must complete a written compatibility determination for each use, or collection of like-uses, that is signed by the Manager and the Regional Chief of Refuges in the respective Service region. Draft compatibility determinations applicable to uses described in this document were included in the Draft EIS/CCP and were available for public review. Compatibility determinations are available for review at Refuge Headquarters.

1.4.4.2. Biological Integrity, Diversity, and Environmental Health Policy

The Service is directed in the Refuge Improvement Act to “ensure that the biological integrity, diversity, and environmental health of the NWRS are maintained for the benefit of present and future generations of Americans...” The biological integrity policy of 2001 helps define and clarify this directive by providing guidance on what conditions constitute biological integrity, diversity, and environmental health; guidelines for maintaining existing levels; guidelines for determining how and when it is appropriate to restore lost elements; and guidelines in dealing with external threats to biological integrity, diversity and health (66 CFRIO January 2004).

1.4.4.3. Public Use Natural Area Policy

The Refuge currently has one Public Use Natural Area, the Black Oak Island Public Use Natural Area. (See Section 3.10.2.2.1 on page 120). The Service’s Refuge Manual (USFWS 2004), Section 8 RM 11 provides guidance for management, administration and visitor use of Public Use Natural Areas and lists the following objectives of the designations:

- # Assure preservation of a variety of significant natural areas for public use which, when considered together, illustrate the diversity of the NWRS natural environments.
- # Preserve those environments that are essentially unmodified by human activity for future use.

1.4.5 Refuge History and Purposes

In the late 1800s a railroad was constructed along the Mississippi River. Today it forms the Refuge’s south boundary. In the early 1900s, a drainage district was formed with the intent of draining the area north of the railroad dike for farming. The district dug a channel diverting the Trempealeau River and Pine Creek into the Mississippi River about 3 miles downstream of the Trempealeau River’s original delta. Dredged material taken from the new channel was placed on the south bank to create barrier dikes to protect adjacent lands from flooding. Attempts to drain and farm within the dikes were largely unsuccessful and the drainage district eventually went bankrupt. Following the completion of Lock and Dam 6 at Trempealeau in the mid-1930s, water levels throughout Pool 6 were raised several feet and stabilized for navigation on the main river channel. Wetlands protected by the railroad and barrier



Dresser Farm, 1935. USFWS

dikes became part of a corporation known as Delta Fish and Fur Farm (Delta FFF).

Trempealeau NWR was established in 1936 when 706.9 acres were set aside by Executive Order 7437 (Appendix E) (Figure 2). The original Refuge consisted of an upland portion with open areas of former hay, pasture, and cropland. For more than 40 years the Refuge remained small in spite of several attempts to purchase more than 5,000 acres of the surrounding Delta FFF. The Delta FFF yielded a variety of incomes to its owners from farming, timber harvest, commercial fishing, furbearer trapping, and turtle and bait fish harvest. In addition, a group of local sportsmen leased the marshes for waterfowl hunting. Under private ownership the area remained relatively unchanged. Of significance was the major flood in 1965 which breached dikes, inundated Refuge buildings, and caused irreparable damage to wetland plant communities.

In 1975, Dairyland Power Cooperative acquired the Delta FFF. Dairyland wanted to construct a rail loop for a coal off-loading facility near their power generating plant at Alma, Wisconsin. The land they would need was part of the Upper Mississippi River NW&FR. As part of a land exchange Dairyland divested 132 acres of the Delta FFF and sold an additional 4,778 acres to the Service in 1979. This addition, plus other recent acquisitions, has brought Trempealeau NWR to its present 6,226 acres.

The 1936 Executive Order and subsequent legislation established the purposes of the Refuge as listed in Section 1.2.2 on page 3. These purposes remain valid to this day and guide the planning management, administration, and use of the Refuge.



1965 Flood, Trempealeau NWR. USFWS

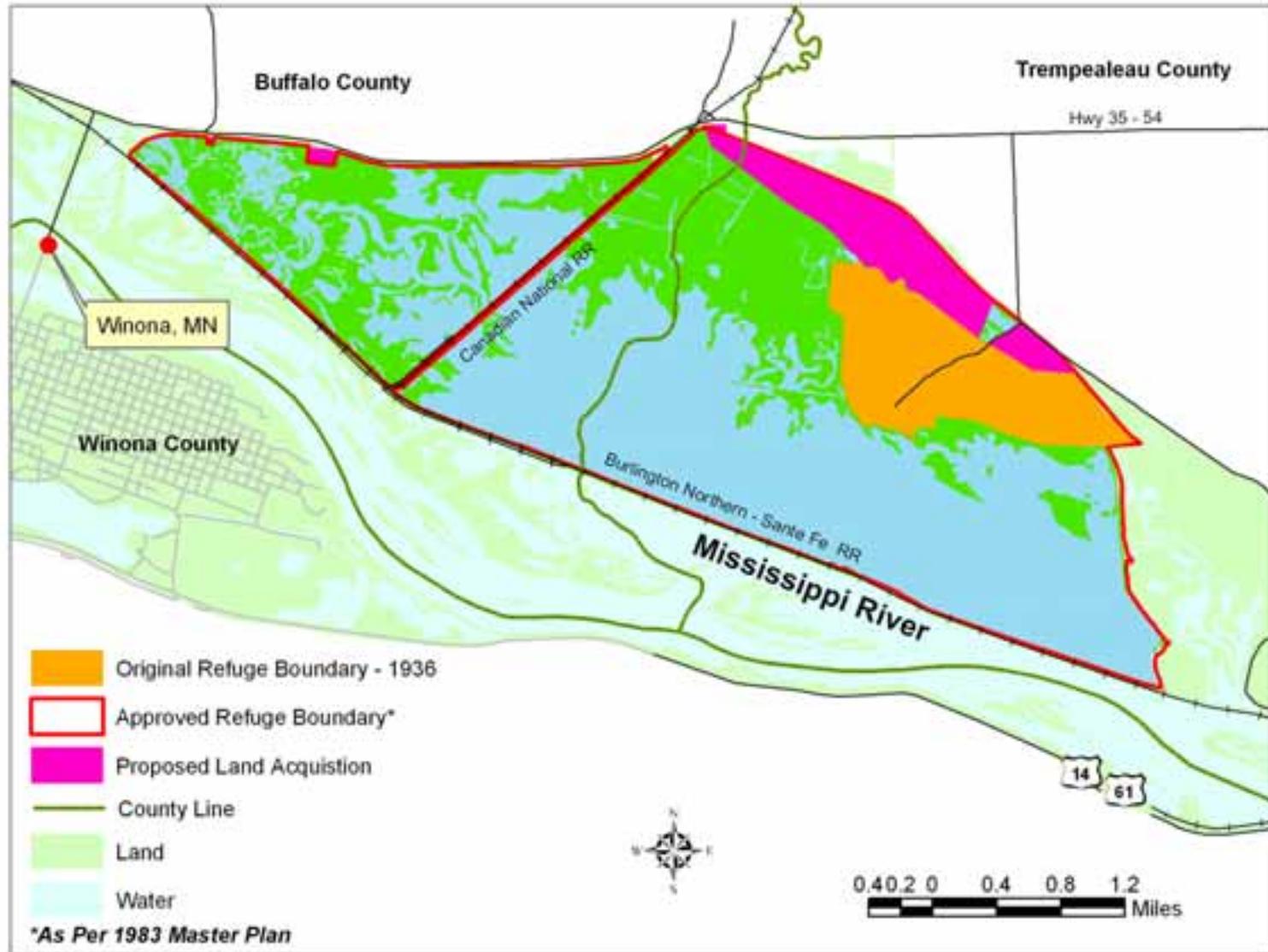
1.4.6 Relationships to Other Agencies, Partners and Other Initiative Planning

1.4.6.1. Partnerships

Partnerships with other federal agencies including state and local units of government and schools and private organizations are important in Refuge management. Wisconsin Waterfowl Association provides both funds and volunteer assistance in support of an annual waterfowl hunt for persons with disabilities on the Refuge. Ducks Unlimited has partnered with the Service on a major habitat project on the Refuge and additional work is planned. Major wetland habitat work was done on the Refuge in the mid-1990s under the Environmental Management Program (EMP) funded by the U.S. Army Corps of Engineers (Corps). The Corps, Wisconsin DNR and Minnesota DNR assist the Service with planning and project implementation under EMP.

Partnerships with Wisconsin DNR staff at nearby Perrot State Park include sharing of equipment and cooperative management of the Great River State Trail, which passes through Trempealeau NWR. The Wisconsin DNR Area Wildlife Manager for Trempealeau and Buffalo counties provides technical advice on Refuge hunting and trapping programs and has provided assistance and oversight on wetland restoration projects funded by the Service on private lands. The Refuge has negotiated cooperative agreements with Buffalo County Land Conservation Department to accomplish stream bank restoration and other habitat work in local watersheds.

Figure 2: Trempealeau NWR Boundary



A partnership with the Mississippi Archaeology Center aids in the management of Refuge collections. Under a cooperative agreement the Mississippi Archaeology Center curates collections from 9 investigations and other sources. The Refuge has 6,906 artifacts at repositories. The artifacts are owned by the Federal Government and can be recalled by the Regional Historic Preservation Officer for exhibits and other Refuge purposes.

1.4.6.2. Other Conservation and Planning Initiatives

1.4.6.2.1 Federal Government

Three federal agencies have jurisdictions over land in the vicinity of the Refuge: the U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers and the Federal Highway Administration. The Service's plans and policies are relevant to the Refuge since the Service owns and manages Trempealeau NWR and co-owns and manages the adjacent Upper Mississippi River NW&FR. Planning by the U.S. Army Corps of Engineers is relevant since the Corps administers the Environmental Management Program, manages the lock and dam navigation system on the adjacent Mississippi River, and owns a portion of lands within the UMRNWFR. The Federal Highway Administration planning is relevant since they designated and oversee the Great River Road which passes within a mile of Trempealeau NWR.

Fish and Wildlife Service Plans, Policies and Programs

Relevant plans involving the Service include the *Trempealeau National Wildlife Refuge Master Plan* and accompanying Environmental Assessment (EA) (USFWS 1982) and the *1987 Master Plan for the Upper Mississippi River National Wildlife and Fish Refuge* with accompanying EA (USFWS 1987). The *Trempealeau NWR Master Plan* was completed in 1983 following major expansion of the Refuge with the acquisition of the former Delta FFF. It provides a summary of Refuge resources, and a concept plan for future development and use of the Refuge with an accompanying public involvement process. This document has served as the Refuge's principal management guidance for over two decades and will be superseded by the CCP.

The Service is also involved in the development and implementation of a number of conservation plans for migratory bird species including the *North American Waterfowl Management Plan* (North American Waterfowl Management Plan 2004), *Blueprint for the Future of Migratory Birds* (USFWS 2003), *Partners in Flight Bird Conservation Plan*

(Knutson 2001), *U.S. Shorebird Conservation Plan* (Brown, et al. 2000), and the *North American Waterbird Conservation Plan* (Steering Committee 2001). These plans are discussed below with specific references to Region 3 where applicable.

The Upper Mississippi River and Great Lakes Joint Venture is the local component of the *North American Waterfowl Management Plan*. On a National level, this plan focused on partnering among agencies to secure, protect, restore, enhance and manage wetlands and associated uplands in priority landscapes; to conduct research and monitor specific waterfowl populations, and to provide environmental education and conservation planning with community involvement. Between 1986 and 1997, plan partners have invested over \$1.5 billion on projects in the United States. Specific habitat objectives for the Upper Mississippi River and Great Lakes Joint Venture include providing 9.1 million acres of wetlands and associated uplands in waterfowl production counties and 533,000 acres in waterfowl migration counties. Trempealeau NWR would fall under the latter category.

The *Blueprint for the Future of Migratory Birds* was drafted in July 2003 as a strategic plan to guide the Service's Migratory Bird Program. A number of implementation strategies were developed under the categories of Population Monitoring, Assessment and Management, Habitat Conservation, Permits and Regulations, and Consultation, Cooperation, Communication and Recreation.

The *Partners in Flight (PIF) Conservation Plan's* initial focus was on neotropical migrants, species that breed in North America but winter in Central and South America, but the focus has spread to include most landbirds. A series of Bird Conservation Plans are being developed for the entire continental United States. The U.S. Fish and Wildlife Service's Office of Migratory Bird Management serves as a technical advisory body to the PIF Federal Committee. A component of the Bird Conservation Plan (BCP) for the Upper Midwest is the Upper Great Lakes Plain, a physiographic area which includes the "Driftless" or unglaciated area in Southwest Wisconsin which encompasses Trempealeau NWR (Partners in Flight, 2004). This component of the BCP designates Priority Bird Populations and Habitats for the Upper Great Lakes Plain as follows:

Grasslands: Henslow's Sparrow, Sedge Wren and Bobolink

Shrub-scrub: Golden-winged Warbler

Deciduous forest/savannah: Cerulean Warbler, Black-billed Cuckoo, Red-headed Woodpecker

All of the above are Region 3 Fish and Wildlife Resource Conservation (USFWS) species. The Partners in Flight perspective on conservation recommendations and needs for the Upper Great Lakes Plain is noteworthy.

“There are many large urban centers in this area whose growth and sprawl will continue to consume land. The vast majority of the pre-settlement forest and oak savannah grasslands already have been converted to agriculture. The conversion of cropland may have benefited some grassland birds, and forest birds still persist. Rates of cowbird parasitism and nest predation in this heavily fragmented region, however, are extremely high and it is possible that only those bird communities in the few remaining expanses of contiguous habitat are self-sustaining. Forest habitat needs to be retained or restored so that a significant number of patches of sufficient size and quality each support a healthy population of cerulean warblers. It is assumed that each of these patches will then support the full range of forest birds. The total area of savannah habitat also should be increased, although the need for large blocks is not as apparent. These few areas of grassland that still exist should be retained.” (Knutson 2001)

The *U.S. Shorebird Conservation Plan* was developed to stabilize populations of declining shorebird species and ensure that common species remain so. This will be accomplished, in part, through implementation of 11 regional conservation plans that outline strategies to provide sufficient high-quality shorebird habitat and to overcome other shorebird limiting factors. This plan addresses shorebird conservation in the Upper Mississippi Valley/Great Lakes (UMVGL) planning region, which is a large, diverse area that provides important habitat for a variety of shorebirds, especially migrants. The purpose of the plan is to conserve shorebirds in the UMVGL region through a combination of habitat protection, restoration, and management, population monitoring, research, and education outreach.

The *North American Waterbird Conservation Plan* is currently under development. It is a collaborative effort by federal and state agencies, NGOs, researchers, and other experts to formulate a plan



Tundra Swan. USFWS

that provides an overarching framework for conserving and managing seabirds, and other aquatic birds throughout North America. The goal of the Plan is to ensure that the distribution, diversity and abundance of populations, habitats, and other important sites of seabirds and other waterbirds are sustained or restored and maintained throughout their ranges in North America.

Along with the Upper Mississippi River NW&FR, Trempealeau NWR was designated an Important Bird Area by the American Bird Conservancy. This designation in 1997 was based on the overall bird habitat values of both refuges specifically for the large numbers of Tundra Swans and Canvasbacks that use the refuges during migration.

Environmental Management Program

The Environmental Management Program (EMP) was established by Congress in 1986 coincident with the construction of a second lock and dam on the Mississippi River at East Alton, Illinois. Congress recognized the need for addressing environmental concerns in balance with the expansion of commercial navigation on the “Mississippi River”. The 1999 Water Resources Development Act (Appendix D) increased the annual funding authorized to \$33 million and established two main elements as continuing authorities:

- # Planning, construction, and evaluation of fish and wildlife habitat rehabilitation and enhancement projects (HREPs).
- # Long term resource monitoring, computerized data inventory and analysis, and applied research (LTRMP).

EMP is a coordinated ecosystem restoration program for the Upper Mississippi River system administered by the U.S. Army Corps of Engineers

in partnership with the U.S. Fish and Wildlife Service, U.S. Geological Survey, the states of Minnesota, Wisconsin, Iowa and Illinois, and non-governmental organizations. To date, 26 projects have been completed affecting more than 40,500 acres of habitat. A major HREP was completed on Trempealeau NWR in 1999 with construction of several miles of new dikes and four water control structures including one permanent and two seasonal pumping stations at a cost of over \$4 million.

Environmental Pool Planning

Environmental Pool Plans (EPPs) were developed through a cooperative effort among state and federal agencies and the public to develop common habitat goals and objectives for the Upper Mississippi River. EPPs were intended to serve as a communication tool and one of several guides for sequencing habitat management projects in the St. Paul District of the Corps of Engineers for Pools 1 through 10. Desired future habitat maps were developed for each pool, representing what river managers and the public have identified as the habitat and features necessary to reverse negative trends in habitat quality and move toward a more sustainable ecosystem (Fish and Wildlife Work Group, 2004).

U.S. Army, Corps of Engineers, Section 404 Permits

Projects proposed by the Refuge that may impact wetlands are required to be reviewed by the Corps of Engineers to determine whether or not a permit under Section 404 of the Clean Water Act is required. Projects subject to permit requirements could involve dredging, filling or replacement of a structure in wetlands in or adjacent to Trempealeau NWR.

Great River Road

Recently, the Federal Highway Administration designated that portion of the Great River Road in Wisconsin as a National Scenic Byway based on its cultural and scenic uniqueness. For most of its length in Wisconsin the road follows the Mississippi River and passes within a mile of the entrance to Trempealeau NWR. The National Scenic Byway designation will allow Buffalo and Trempealeau counties and individual communities to compete for funding for projects to help enhance and/or interpret cultural, historic, natural, scenic and recreational qualities along the route. Due to its proximity, Trempealeau NWR will likely receive

additional visitation due to the further development and expansion of public facilities along the Great River Road.

1.4.6.2.2 State of Wisconsin

State law, in particular, governing the use of navigable waters and removal or placement of fill within wetlands is relevant to Refuge planning. This is discussed in the remainder of this section along with a summary of planning efforts in process for the Wisconsin Land Legacy Report (WIDNR 2004) and Great River State Trail extension.

Chapter 30, Wisconsin State Statutes-Navigability

Under former private ownership, wetlands within the Delta FFF were closed to public entry. This was challenged in court on several occasions and the matter was finally settled at the Wisconsin State Supreme Court (WIDNR 2004). The court ruled that because the wetlands of the Delta FFF were completely surrounded by dikes and high grounds with no means for a boat to access the property by water, the wetlands within the Delta FFF were in fact, private. The Service has done nothing to modify the railroad or barrier dikes to permit public boat access from adjacent wetlands, and the agency will continue to provide public boat access to Trempealeau NWR waters from sites it designates within the Refuge.

Regarding Chapter 30 wetland impacts within Trempealeau NWR, it is questionable whether permits are required due to the “non-navigable” status of Refuge waters. However, in the past the Refuge has applied for, and received permits under Chapter 30 for projects including dike construction and rehabilitation, culvert replacement, rip-rapping, and so



Wild Bergamot. USFWS

on. It would seem to be in the public's best interest for the State of Wisconsin to review and authorize work of this type.

Wisconsin Land Legacy Report

In February 2003, the National Resources Board approved the Wisconsin Land Legacy Report (WIDNR 2004) and directed the Wisconsin Department of Natural Resources (WIDNR) to develop a plan describing how the report could be most effectively used to protect and maintain natural resources identified. An implementation strategy, currently in draft, will look at protecting lands through acquisition, conservation easements, cooperative agreements with landowners, and other techniques both by WIDNR and other agencies and non-governmental organizations such as the Nature Conservancy, Bluffland Alliance, Pheasants Forever and others. The Land Legacy Report identified open space lands between Trempealeau NWR and Perrot State Park as being very important for conservation and recreation purposes. Future consideration will be given to pursuing protection of natural resources and open space character of these lands. (Thompson, personal communication 2004).

Great River State Trail (GRST) Extension

In April 2004, the Wisconsin Department of Natural Resources submitted a grant proposal to the Wisconsin Department of Transportation requesting \$971,696 in funds to construct an extension to the GRST from Marshland, adjacent to the Trempealeau NWR, to the City of Winona's Aghaming Park. This would be accomplished by building a dedicated bicycle/pedestrian trail on State Highway 35/54 right-of-way, separated from the motor vehicle travelway, for approximately 3.9 miles (Miss. Riv. Reg. Plan Commission 2000). The trail, following the former Chicago & Northwestern Railway, would depart from the highway and cross over the Burlington-Northern Santa Fe Railroad grade via bicycle-pedestrian-snowmobile bridge to be constructed. The route would then connect up with "old" Highway 54 and continue on to Aghaming Park. The City of Winona has rehabilitated the former "wagon bridge" and will assume construction and maintenance responsibilities for the trail within Aghaming Park, and across the Minnesota Highway 43 bridge spanning the Mississippi River into the mainland of Winona. (See Figure 3)

The connector will provide a safe and segregated commuting facility for bicycle and pedestrian traffic passing in both directions across the Minnesota/Wisconsin borders. Proponents of the project



River Education Days at Trempealeau NWR. USFWS

believe it will enhance direct access to a variety of parks including the Town of Buffalo's Bluff Siding Park, two National Wildlife Refuges, a major state wildlife area, the City of Winona's Aghaming Park, and will provide a link to the Minnesota DNR Blufflands Trail System.

1.4.6.2.3 Town of Trempealeau Land Use Plan

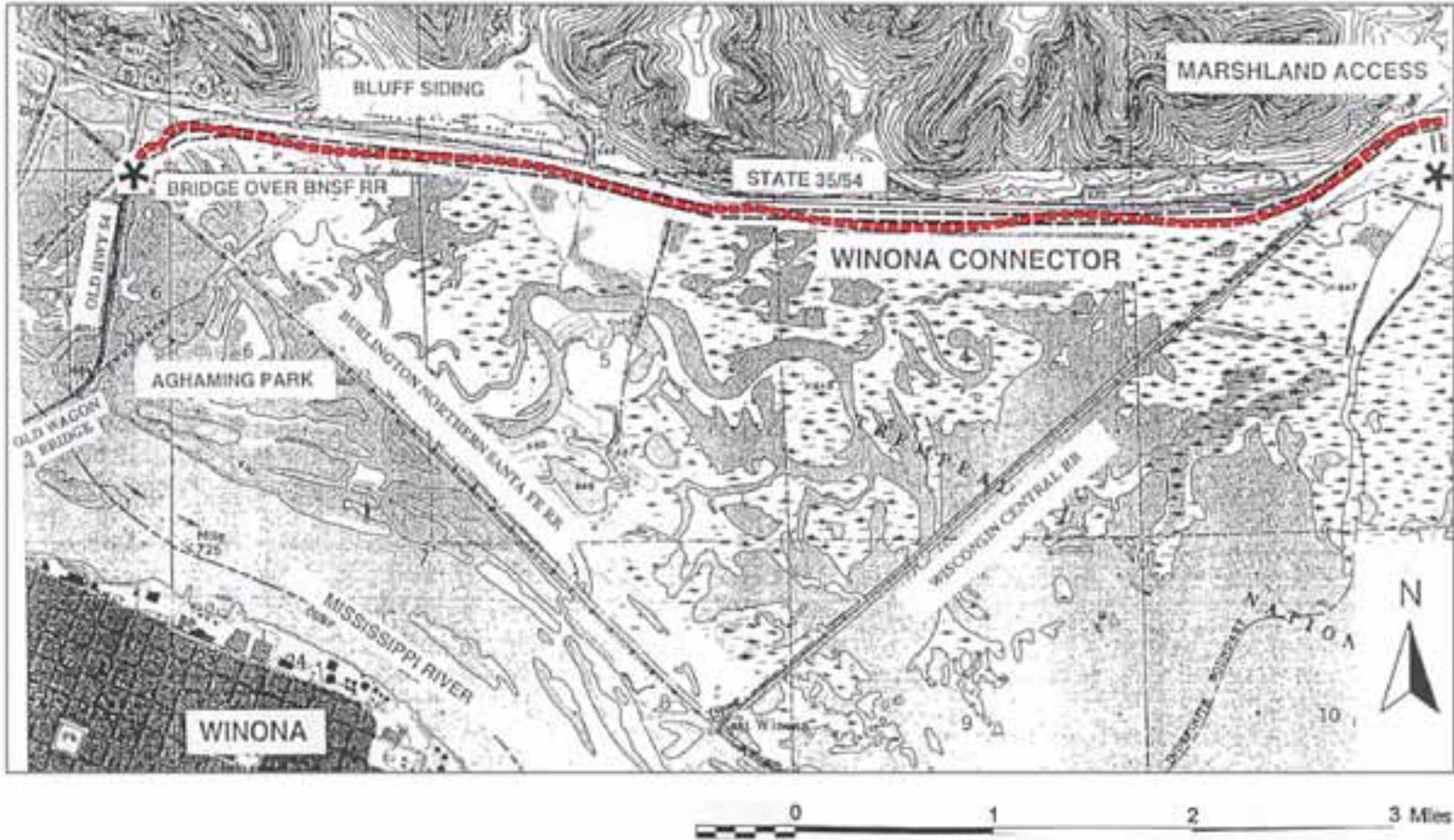
The Trempealeau County Planning and Zoning Department, under the direction of the Trempealeau County Zoning Committee, is working with individual towns within Trempealeau County to develop a land use plan that will ultimately guide future development of the towns in Trempealeau County. Details on this plan are included in Section 3.10.2.1.1 on page 120.

1.4.6.2.4 Buffalo County

Land and Water Resource Management Plan

Buffalo County's Land Conservation Committee, Land Conservation Department, and Land and Water Resource developed a "*Land and Water Integrated Management Plan*" in 2000 to meet the requirements of Act 27, Chapter 92 of the Wisconsin Statutes (Buffalo County 2000). Goals described in detail include: Agricultural Waste Manure Management for Water Quality; Reduction of Sediment Delivery to Water Systems; Preservation of Wetlands; Protection of Groundwater Sources, Woodland Management and Farmland Preservation. At the core of this plan are the goals that describe the ways the County will strive to meet state and federal water quality standards. Plans are to correct streambank cattle damage in watersheds including the Middle Trempealeau River Watershed in 2003. Additional emphasis will be placed on the tributaries

Figure 3: Great River State Trail, Winona Connector





Volunteer assisting with the Wood Duck banding program. USFWS

of the Lower Buffalo River which are major contributors to sedimentation at Rieck's Lake, a major migration rest stop for Tundra Swans (Buffalo County, 2000)

Buffalo County Outdoor Recreation Plan, 2002-2006 (Miss. Riv. Reg. Plan Commission 2000)

Buffalo County's *Outdoor Recreation Plan* provides a county-wide inventory of existing outdoor recreation facilities and opportunities. The plan sets a direction for county-wide recreation planning and guides local facility development and programming.

1.4.6.2.5 Aghaming Park-City of Winona, Minnesota

A Community Resources Plan for Aghaming Park was completed in 1999 and submitted to the City of Winona by the Aghaming Park Planning Team facilitated by the Resource Studies Center, of St. Mary's University, Minnesota (Drazkowski, 1999). Aghaming Park includes several hundred acres of floodplain forest with scattered emergent wetlands and old river channels. The property is unique in that it is owned by the City of Winona but located on the Wisconsin side of the Mississippi River, separated from Trempealeau NWR by the Burlington-Northern Santa Fe Railroad dike (Figure 3 on page 14). A multi-disciplinary planning team that includes Fish and Wildlife Service representation is looking at planning for resource management, public education and recreational use of Aghaming Park. With recent renovation of the Wagon Bridge from Latsch Island, Aghaming is again open to public vehicle access from Minnesota. As discussed in Section 1.4.6.2.2 on page 12 and Section 3.7.2.2 on page 112, there is also a proposal

to extend the Great River State Trail to provide access for hikers and bikers to Aghaming Park.

1.4.7 Refuge Vision and Goals

The Refuge vision provides a simple statement of the desired, overall future condition of the Refuge. Refuge goals are "stepped down" from the vision and provide a framework for more detailed, measurable objectives that are the heart of the CCP. The vision and goals are also important in developing alternatives, and are key reference points for keeping objectives and strategies meaningful, focused, and attainable.

1.4.7.1. Refuge Vision

"Trempealeau National Wildlife Refuge is enjoyed and appreciated by the people of America as a beautiful, scenic place where a diversity of native plants and animals thrive in healthy prairies, forests, and wetlands."

1.4.7.2. Refuge Goals

Goal 1: Landscape

We will strive to maintain and improve the scenic and wild character, and environmental health of the Refuge.

Goal 2: Wildlife and Habitat

Our habitat management will support diverse and abundant native fish, wildlife, and plants.

Goal 3: Public Use

We will manage public use programs and facilities to ensure sustainable, quality, hunting, fishing, wildlife observation, wildlife photography, interpretation, and environmental education opportunities for a broad cross-section of the public; and provide opportunities for the public to use and enjoy the Refuge for traditional and appropriate non-wildlife dependent uses that are compatible with the purposes for which the Refuge was established and the mission of the Refuge System.

Goal 4: Neighboring Landowners and Communities

We will communicate openly and work cooperatively with our neighbors and local communities to help all benefit from the aesthetic and economic values of the Refuge.

Goal 5: Administration and Operations

We will seek adequate funding, staffing, and facilities; and improve public awareness and support

to carry out the purposes, vision, goals, and objectives of the Refuge.

1.4.8 Planning Issues, Concerns, and Opportunities

Issues, which are often synonymous with concerns and opportunities, were identified through the scoping and public involvement process described in Chapter 6. The issues below represent input from the public, other agencies and organizations, and Refuge managers and staff as well as the mandates and guidance reflected in earlier sections of this chapter.

The issues were critical in framing the objectives and strategies for the various alternatives, and they form the basis for evaluating the environmental consequences of each alternative. Care has been taken to ensure that these issues track through the document, recognizing that required formats and contents for CCPs and EISs do not always present a perfect crosswalk to and from issues.

Also, while these issues do not represent every challenge facing the Refuge, they do represent a reasonable and comprehensive set of issues. When converted to measurable objectives in Chapter 2, they create a meaningful plan of action to help meet the mission of the Refuge System and the purposes and goals of the Refuge.

1.4.8.1. Goal 1: Landscape

1.4.8.1.1 Land Acquisition

Acquisition of land remains a key conservation tool for the well being of fish and wildlife resources, for providing public use opportunities, and for maintaining the wild and scenic character of the Refuge. Only 340 acres within the acquisition boundary approved in the 1983 Refuge Master Plan remain to be acquired. An additional 12 acres outside of the current approved boundary would be added under the Regional Director's authority. Most of these lands are adjacent to the Trempealeau River and include important examples of historic bottomland forests. Present land use includes hunting, fishing, and some farming. All of these lands are subject to frequent flooding. The entrance road to the Refuge is also subject to flooding where it crosses the Trempealeau River. Construction of a bridge at the crossing may alter flows on adjacent properties, and if so, purchase of flood easements would be required. Acquiring these lands would alleviate issues with the entrance road, and allow the Refuge to restore and protect bottomland forest and emergent

marshes. Additionally, the Trempealeau River could move freely within its floodplain regardless of land use issues.

1.4.8.1.2 Refuge Boundary

Maintaining an accurate and clearly marked Refuge boundary is a critical basic need of resource protection. Brush cutting, dumping, mowing, illegal hunting and fishing, and vehicle trespass all occur along areas of the boundary, often intruding onto Refuge lands. The north boundary along highway 35 is viewed by thousands of travelers daily, but its scenic beauty is sometimes compromised by illegal activities. While a good portion of the Refuge boundary is clearly delineated by dikes, other sections are less obvious and have missing, faded, or incorrectly placed signs. In addition, private landowners have complained about Refuge visitors crossing the boundary and trespassing on their lands. A clearly marked and maintained boundary would be a deterrent to encroachment and other illegal activities and would help to maintain positive relations with neighboring landowners.

1.4.8.1.3 Flood Protection

The Burlington Northern Sante Fe Railroad (BNSFR) dike separates the Refuge from the main channel of the Mississippi River. The dike, owned and maintained by the railroad, has been breached and overtopped by the Mississippi River only once in the 1965 flood. During the near-record flood in 2001, floodwaters rose to the bottom of the rails putting severe pressure against the Mississippi River side of the dike. The BNSFR requested that the Service reduce the pressure by allowing floodwater to enter Trempealeau NWR through several water control structures. However, the amount of water that could be diverted into Refuge pools was insufficient to offer protection for the railroad dike, but damage to Refuge infrastructure and habitats occurred. The Refuge has no official policy for dealing with water management issues during major flood events, making it vulnerable to impacts from "emergency" actions.

1.4.8.1.4 Natural Areas and Special Designations

In 1986, Black Oak Island (see Figure 6 on page 34) was designated a Public Use Natural Area as an example of undisturbed, mature, eastern deciduous forest. However, some of the biological characteristics on which the designation was based are threatened by invasive plants, especially European buckthorn. The site also contains important archeological resources that are not inventoried and are subject to shoreline erosion and potential theft. A



A volunteer pulling buckthorn. Trempealeau NWR

management plan is needed to ensure the future integrity of the area.

Refuge roads from the main entrance to the Marshland access are a designated part of the Great River State Trail. The popular bike trail traverses old railroad grades from La Crosse to Marshland, Wisconsin. Future plans are to continue the trail along the north boundary of the Refuge into Winona, Minnesota. Although more accurate counts are needed, an estimated 18,000 to 20,000 cyclists annually use the section of the trail that crosses the Refuge. However, little interpretation of the Refuge or its resources is available to this segment of the visiting public. In addition, cyclists are often confused due to lack of directional signing. Also, flooding at the main entrance road blocks the route for weeks each year, forcing cyclist to detour around the Refuge.

1.4.8.1.5 Archeological Resources

Federal laws, executive orders, and regulations, as well as policies and procedures of the Department of Interior and the Service protect cultural resources on federal lands. The Service has a responsibility to protect the many known and unknown cultural resources located on the Refuge. Trempealeau NWR has been described as one of the most important archeological sites in the Midwest.

Human use of the area dates back 12,000 years. Dozens of sites and more than 6,000 artifacts have been cataloged from various locations. However, most surveys have been conducted in a few areas on the east side of the Refuge. The majority of the lands have not had even baseline surveys conducted and the locations and extent of archeological resources are unknown. Habitat management activities that create any soil disturbance are delayed until archeological assessments can be completed. Additionally, protection of sites is difficult because of a lack of information about what resources are present. Trempealeau NWR has a history of looting and collectors are active in the area. While law enforcement efforts have been stepped-up over the years, problems persist. Opportunities to interpret the Refuge's cultural resources must be integrated with the need to protect them.

1.4.8.2. Goal 2: Wildlife and Habitat Issues

1.4.8.2.1 Forest Management

Forests are classified into either upland or bottomland on the Refuge. Over 85 percent of the upland forests are dominated by non-native tree species, planted decades ago in an attempt to provide additional wildlife habitat. However, these plantings encroach on and fragment rarer prairie habitats, and prevent growth of native, mast-producing hardwoods. Over the past years, nearly all upland forests have been invaded by a dense understory of European buckthorn, limiting growth of native hardwoods, shrubs, and wildflowers. Black locust trees, extremely invasive in sandy soils, are dominant in forest stands and would quickly take over most of the prairie areas if left uncontrolled. Efforts to control invasive or non-native forest plants are limited by current funding and staffing levels. In addition, clearing large areas of pine plantings would impact species which use the groves, such as owls. Some citizens have also voiced concern over removing pine plantations from the Refuge.

Bottomland forests lined most of the old river channels before impoundment. These forests, once abundant, were either cleared for farming or destroyed by prolonged flooding when Lock and Dam 6 went into operation. Much of the existing bottomland forest is degraded by reed canary grass or even-aged silver maple stands. Little of the bottomland forest is regenerating and large, old trees suitable for Bald Eagle nesting, Great Blue Heron rookeries, or Wood Duck nesting cavities are becoming less abundant. Some previously cleared and

farmed fields could be restored by tree planting and aggressive weed control, but funding and staff would need to be redirected from other activities.

Some areas of the Refuge are littered with dead and downed trees, especially oaks that died of oak wilt. Down timber presents a fuel hazard and creates difficulty in some burn units. Other standing, dead trees present safety hazards. There is a demand for firewood from local people and the Refuge allows some fire wood removal under special use permit. However, for safety, staff cut the trees down and move them to an area that is accessible with a pickup. Staff time limits the amount of wood that can be removed. Commercial harvest of black locust for fence posts and non-native pines from pine plantations is a viable management tool for restoring prairies. However, cutting trees and skidding them to a road for transport disturbs the soil and possible archeological artifacts. In the past, tree harvest activities have been restricted to times when the ground was frozen. Archeological surveys of the prairies and adjacent forests need to be completed so that habitat management can proceed. Also, potential stands for commercial harvest need to be identified in an updated forest management plan.

1.4.8.2.2 Forest Bird Management

The Mississippi River Valley is an important travel corridor for migrant songbirds. Little is known about the importance of protected stopover sites like Trempealeau NWR for migrating songbirds. How these birds are using the various habitats and the timing of different species groups moving through is a mystery. Likewise, management that alters habitats, like removal of invasive shrubs or conversion of forest to prairie, may have unintended impacts to some of these species. Some of these species may be slipping through the cracks simply because they are not being monitored or considered when management decisions are made. Much could be learned from long-term studies that focus on migrant forest birds.

1.4.8.2.3 Wetland Management

Stable, deep water, and poor water clarity have led to a general declining trend in productivity in impounded wetlands on the Refuge. Wind, waves and rough fish suspend bottom sediments, resulting in poor aquatic plant growth. Stands of emergent plants have declined dramatically over time. Invertebrate populations are especially poor, a consequence of poor plant growth. Invasive plants such as Eurasian milfoil and purple loosestrife are increasing. Cross dikes to break units into more manage-

able sizes, better water control and rough fish management would benefit most wetland areas.

1.4.8.2.4 Water Quality

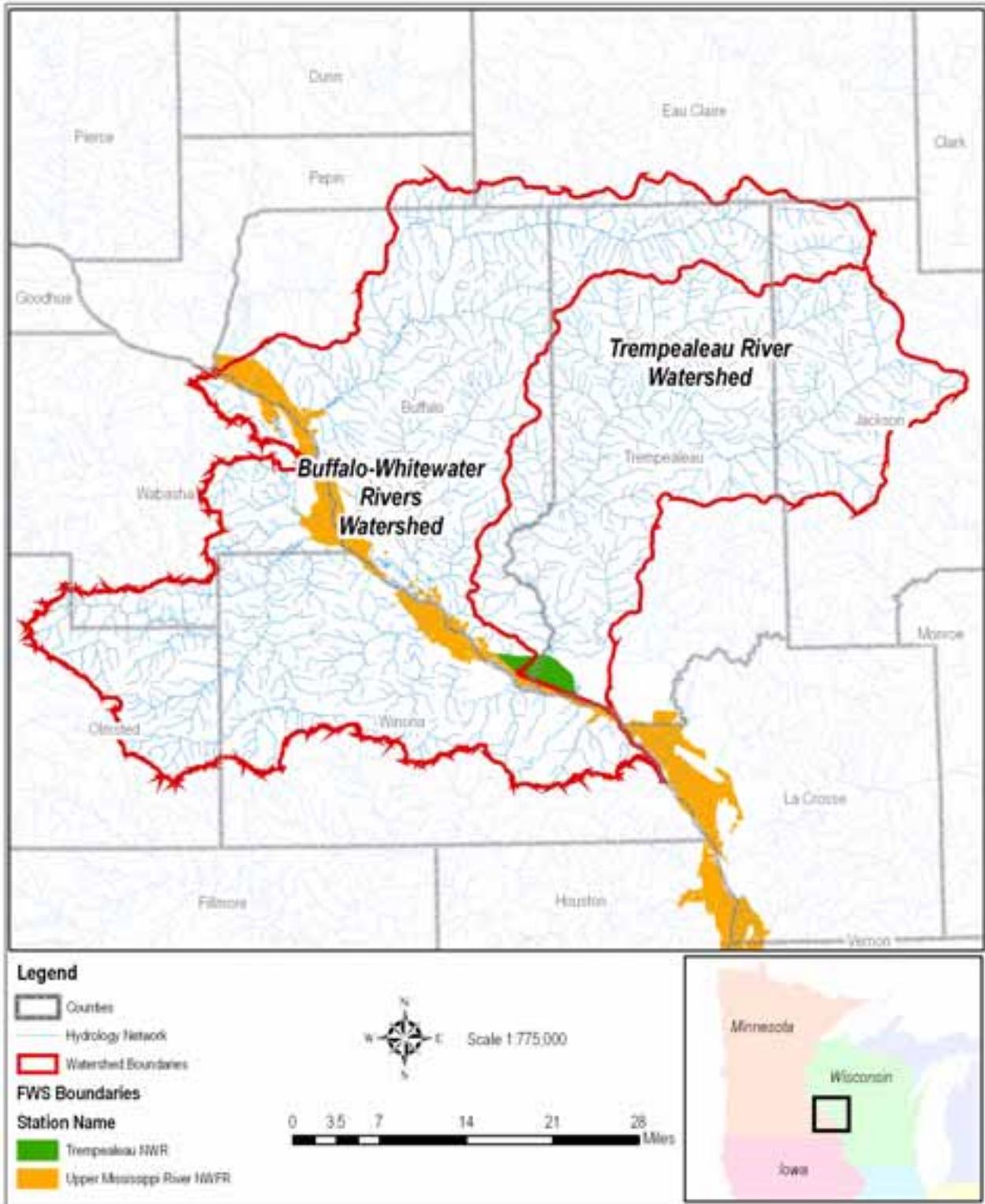
The Refuge Improvement Act of 1997 called upon the Secretary of the Interior to administer the Refuge System in a way that will “ensure that the biological integrity, diversity, and environmental health of the System are maintained for the benefit of present and future generations” and “assist in the maintenance of adequate water quantity and quality to fulfill the mission of the System and the purposes of each Refuge.” Water quality is a key to the overall health of the food chain that drives and sustains the multitude of fish, wildlife, and plant species that rely on the Refuge for critical parts, or all, of their life cycle requirements. Some areas of the Refuge, particularly areas directly fed by the Trempealeau River, are impacted by high sediment loads transported from upstream agricultural lands. Likewise, the habitats of the Mississippi River are degraded by sediments transported by the Trempealeau and Buffalo rivers (see Figure 4). The Service has programs to help restore eroding streams on private lands in Trempealeau and Buffalo Counties. Repairing these streams at the top of the watershed is critical to keeping sediments on the land rather than flowing into the Mississippi River. Staff and funding shortages preclude implementing a private lands program to fully address watershed concerns and potential benefits.

Water clarity during the growing season is essential for the germination of aquatic plants. Wind and wave action often suspend the sediments in the large open pools, keeping the water muddy. In addition, rough fish (carp and buffalo) are abundant in the slow moving, warm waters of the impoundments. These fish grub for roots, disturbing aquatic plants and churning up sediments. Aquatic plants have virtually disappeared from hundreds of acres. In addition, the Refuge has a history of fish kills during the winter when dissolved oxygen becomes critically low.

1.4.8.2.5 Water Level Management

The Refuge was once a backwater of the Mississippi River, but was essentially isolated in the early 1900s by the construction of the Burlington Northern Sante Fe Railroad dike and the diversion of the Trempealeau River. The hydrology was further altered in the 1930s by the construction of Lock and Dam 6 on the Mississippi River. The result is a deeper, relatively stabilized water system. Over time, stable water levels have adversely affected

Figure 4: Watershed of the Trempealeau and Buffalo Rivers



aquatic plant abundance, diversity and distribution. Fish and wildlife dependent on these plant communities have also declined. Shorebirds are particularly dependent on mudflats and sandbars during migration, but these habitats have been mostly eliminated by higher water levels. Recently, a series of dikes and pumps were installed that permit water level management on about 1,500 acres of the Refuge. The remaining 4,000 acres of wetland are essentially unmanageable, subject to the effects of wind, waves, and rough fish that keep the water too cloudy to be fully productive.

1.4.8.2.6 Waterbird Management

The Mississippi River is critical to the life history of many species of waterbirds including waterfowl, herons, rails, terns, pelicans, and egrets. Many of these species are sensitive to disturbance during the breeding season and require large marsh areas to nest. Others stage in large flocks in the fall, feeding to build up fuel reserves for migration. Trempealeau NWR plays an important role in providing relatively undisturbed resting and breeding space along Pool 6 of the Mississippi River. The Refuge is becoming increasingly important to migrating Tundra Swans as staging and feeding areas up river become silted in. However, some of the public would like to see more backwater marsh areas including the Refuge open to public hunting. In addition, non-motorized, electric motor-powered recreational boating is allowed during fall migration and sometimes disturbs large flocks of birds. Public use activities need to be reviewed in consideration of the larger role the Refuge plays as a part of the Mississippi River Flyway.

Black Terns are a species of special interest because of declines in some parts of the country. Populations are expanding at the Refuge and habitat conditions are generally good at this time. However, monitoring is difficult and the Refuge relies on volunteers to do it. While annual monitoring may not be warranted at this time, the wildlife inventory plan needs to be updated to include protocols that sufficiently monitor this species.

Wood Ducks and Hooded Mergansers were once more abundant on the Refuge and may be declining because of limited breeding habitat. These species need mature or over-mature trees near good brood habitats to successfully produce young. Mature forests are becoming less abundant on the Mississippi River as forests age and are replaced with invasive plants or silver maple. Many of the older forests on the Refuge are remnants from before the locks and

dams were constructed and replacing them may not be possible with current hydrologic conditions.

1.4.8.2.7 Furbearer Management

Trapping was implemented on the Refuge in 1981 to help control damage to dikes and water control structures from muskrats and beavers. The area has a long tradition of furbearer harvest dating to the time when the land was owned by the Delta Fish and Fur Farm. The existing trapping program is regulated by issuing special use permits to individuals who purchase trapping rights to specified units through an auction. The program is conducted within the framework of the Wisconsin State trapping regulations and according to special Refuge regulations. Occasionally, raccoons and skunks must be removed to safeguard ducks at banding sites. While the Trapping Plan is relatively current (1999) it needs review and updating to reflect recent national policy and regulation changes governing compatibility of commercial uses on Refuges, current furbearer population estimates, habitat changes, and new management needs.

1.4.8.2.8 Emergency Response to Spills

Mishaps with chemicals on adjacent lands could cause severe damage to Refuge resources, especially sensitive wetlands. The Refuge is bounded on three sides by train tracks and a state highway. Train derailments or tanker accidents involving chemical spills could have catastrophic impacts to Refuge habitats and wildlife. Emergency response would require specialized equipment (airboats, helicopters), trained personnel, and the coordination of many agencies. The Refuge needs to have a system for responding to spills and needs to ensure specialized and ongoing training for staff.

1.4.8.2.9 Grassland Management

Historical records indicate that the upland areas of the Refuge were once dominated by prairie and oak savanna habitats. Much of the uplands were converted to agriculture before the Refuge purchased the property in 1936. Under Refuge management in the 1940s through the 1960s, various pine species, black locust, Siberian pea, and honeysuckle were planted to reduce soil erosion and provide wildlife habitat in tune with the management practices of the time. In the 1970s, many of the oaks in the savanna were removed because of oak wilt disease. Today, forests on some uplands consist mostly of non-native pine trees, black locust, and shrubs. Grasslands are fragmented into small units surrounded by forest edge that support populations of species that prey on or parasitize grassland and for-

est birds. In addition, black locust saplings march across the prairies each year at an alarming rate. Control of invasive plants, especially black locust is limited by available staff, equipment, and restrictions on chemical use. Only remnant prairies still exist outside of the Refuge and these are likely to disappear as more private land is developed.

Prescribed fire is an important component of maintaining grassland vigor and health, and has been used at Trempealeau NWR for many years. About 335 acres are burned on a rotational system under prescriptions described in a Fire Management Plan (USFWS, in preparation in 2007).

1.4.8.2.10 Invasive Plants and Animals

Invasive plants continue to pose a major threat to native plant communities and the wildlife that depends on them. All habitats types on the Refuge have invasive plants of one variety or another. Biological control is available for some species, but mechanical removal is the mainstay of the control program. While volunteers, school groups and staff have made some headway, labor is a limiting factor. In addition, control has been hampered by funding for basic inventory, direct control, and research into species-specific biological control.

Years of impoundment and stable water conditions have contributed to a fishery dominated by carp and other non-desirable rough fish. Invasion by other species of Asian carp may be imminent. These species are destructive to aquatic vegetation and generally keep impounded pools turbid and unproductive for plants or other wildlife. Removal of rough fish is difficult because water management facilities are insufficient to lower water levels enough to cause wide spread mortality. Some years, particularly with heavy snowfall, low dissolved oxygen levels do result in large fish kills. Local com-



Prescribed burning, Trempealeau NWR. USFWS

mercial fishermen have an interest in harvesting rough fish and in the past have been instrumental in rough fish control. However, commercial fishing is closely tied to market price and often the management needs of the Refuge and the economic needs of the fisherman do not coincide. The Fishery Management Plan (USFWS 1980) needs to be updated in consultation with fishery biologists from the La Crosse Fishery Resource Office.

Zebra mussels have not been found in Trempealeau waters, but are common in the adjacent rivers. Trempealeau has little defense against these invaders once they become abundant in the river systems.

1.4.8.2.11 Monitoring Fish, Wildlife, and Plant Populations

One of the directives in the Refuge Improvement Act of 1997 was to monitor the status and trends of fish, wildlife, and plants on national wildlife refuges. Although monitoring has been a part of managing the Refuge for many years, gaps remain in baseline population data for many species. A Wildlife Inventory Plan was completed in 1987, but needs updating to reflect changes in habitat, the status of many species, and new policies, procedures, and technologies for monitoring. In addition, management in a changing environment must be adaptive, which requires ongoing monitoring and thoughtful investigation as issues arise and change. Meeting these needs has been hampered by biological staffing and funding levels.

1.4.8.2.12 Threatened and Endangered Species

Threatened or endangered species are issues due to their often precarious population status, and need for special management consideration or protection. The Bald Eagle was removed from the threatened list in 2007. However, they will continue to be monitored on the Refuge. One candidate species, the eastern Massasaugua rattlesnake, occurred as recently as the late 1970s, but is now found only at sites north and south of the Refuge. Suitable habitat may still be present for reintroduction. The State of Wisconsin lists 21 species of birds, one plant, two butterflies, and two turtles that occur on the Refuge as threatened, endangered or warranting special concern (see Table 5 on page 108).

1.4.8.2.13 Deer Herd Management

The landscape of southwestern Wisconsin supports very abundant populations of white-tailed deer, in some areas exceeding 75 deer per square mile. Recently, chronic wasting disease has been detected within 70 miles of the Refuge, and efforts

are under way by the State to reduce overabundant deer. Trempealeau NWR is bordered by agricultural lands along the length of its north boundary. Deer undoubtedly feed on these lands, then find shelter and safety from hunting pressure on the Refuge. The number of deer on the Refuge at any one time is unknown, and staff and funding shortfalls preclude intensive surveys. However, history has shown that when deer populations were estimated to be between 130-150 animals (1974), wintering populations depleted food resources on the Refuge. A clear browse line was visible and understory shrubs were absent in many areas. The Refuge gained the reputation of being a good place to see deer and even today there is some public interest in increasing deer to “viewable” numbers.

Presently, deer numbers are low and browse surveys indicate that deer are not adversely impacting vegetation. However, some questions exist as to whether low deer numbers have allowed invasive shrubs to become prolific in the forest under story. Grazing pressure may be one method of controlling invasive shrubs. Deer herd surveys using the most current methods and technologies should be included in an updated wildlife inventory plan. Accurate population numbers are needed to determine appropriate harvest and browse levels.

1.4.8.2.14 Deer Hunting

Deer hunting is an important form of wildlife-dependent recreation and is also used to manage over-browsing or disease. Deer numbers are controlled using special gun and archery hunts. A set number of permits are available for the gun hunt and over-the-counter permits are available for late season archery. The hunt is an important management tool for managing deer numbers. However, without better deer population data, the staff has difficulty determining the appropriate level of harvest. Historically, gun permits have been capped at 60, with 10 to 20 deer harvested each year. Recently, with the popularity of birding on the increase, conflicts have arisen over the use of the Refuge by hunters and non-hunters at the same time. Both activities occur in the same areas and visitor safety is a concern. The gun hunt occurs over the Thanksgiving holiday (regulated by State law), the time when many visitors from outside the local area are coming to the Refuge to view wildlife. The Refuge hunt plan is out of date and should include options for addressing time and space concerns among various user groups.

Finally, because of the proximity of chronic wasting disease (CWD), close coordination with the State of Wisconsin and the creation of a CWD plan are warranted. Staff also need additional training and specialized equipment to deal with any outbreaks.

1.4.8.2.15 Wildlife Disease Management

A wide range of issues are currently in the public eye regarding wildlife disease and potential impacts to human populations. Wild animals play a role in the spread of west Nile virus, Lyme disease, meningitis, chronic wasting disease and avian influenza to name a few. The role wildlife plays in the transmission of these diseases to humans is not always clear. Even more unclear are the long-term impacts of diseases on wildlife populations. Recently waterfowl mortality from ingestion of an introduced faucet snail is of grave concern to managers of the Upper Mississippi River NW&FR. The public desires information about how they may be impacted by these emerging diseases. In addition, staff needs to be trained in the most current and best management practices for handling not only diseased animals, but also banding birds or participating in other hands-on wildlife management operations. A disease contingency plan needs to be developed in conjunction with other land management agencies.

The management of mosquito populations may emerge as a future concern given the increased incidence of mosquito-borne illnesses in parts of the Midwest. The Service has a national policy on mosquito abatement on national wildlife refuges that allows control only in cases of documented human health emergencies. Mosquito control must be species specific, based on population sampling and identified population thresholds, and use the least intrusive means possible (USFWS 2005).

1.4.8.3. Goal 3: Public Use Issues

1.4.8.3.1 Wildlife Observation and Photography

Wildlife observation and photography are very popular activities for visitors, and a source of economic growth for local communities. As priority public uses of the Refuge System, these uses are to be encouraged when compatible with the purposes of the Refuge. The Refuge provides outstanding wildlife viewing opportunities year round from many miles of trails and roads. The Great River Road and the Great River State Trail pass by the Refuge, making it highly visible and accessible to the public. However, access is generally restricted to able-bodied individuals. Some trails and observation



Waterfowl hunter with visual disability. USFWS

points need to be improved to accommodate people with disabilities including those with hearing or vision impairments. While most of the Refuge habitats are easily accessible, emergent marsh presents a challenge. Access to an area of emergent marsh would provide opportunities to view wildlife in all representative habitat types. Also, winter is a unique opportunity to observe wildlife, but access to most of the refuge is limited by snowfall for 4 to 5 months each year. The public and communities desire more opportunities for wildlife observation, while managers must balance opportunities with the need to limit disturbance to wildlife and archeological resources, and ensure safety of visitors.

Wildlife photography opportunities are abundant along roads, trails and observation points without special facilities. In the past the staff has had little formal communication with area photography organizations. The needs of this user group are not known and efforts to develop facilities or programs should be predicated on consultation and partnering with area photographers. The Refuge needs to update the visitor services plan to establish clear guidelines for these programs.

The Federal Lands Recreation Enhancement Act (HR 4818) passed Dec. 8, 2004, and became effective in 2006. It authorizes the Secretary of the Interior to collect entrance fees, and requires that the funds be spent on visitor services and facilities. With one entrance point, the Refuge is situated to collect fees. While the legislation does not mandate fee collection it does encourage the agency to review potential sites. Service guidance will be forthcoming.

1.4.8.3.2 Interpretation

Many signs and kiosks currently in place are outdated, not up to current Service standards, and do not interpret the mission of the Refuge System. Interpretive signs do not clearly communicate Refuge regulations to the public. There are no facilities

for formal interpretive programming such as staff led talks or other special events. The visitor contact station has limited restroom facilities open only during business hours. A rented portable toilet must be used after hours, on weekends or for special events. Vehicle pull-outs and boat launches are in need of upgrading and maintenance. Funding is generally not available to purchase interpretive supplies like binoculars, field guides or media equipment. An overall visitor services plan is needed to establish detailed guidelines for interpretive programming.

Biking is a popular activity because the Refuge connects with the Great River State Trail. Thousands of bicyclists pass through every year. Generally this activity is not disruptive and is a low impact way of observing plants and animals. The State has secured funding to extend the trail to Winona. The Refuge will become a stop along the trail, rather than an endpoint. This may change the way cyclists use the Refuge, with increased traffic and demand for more bike-friendly facilities. In addition, requests may arise for motorized use of the trail by ATVs or snowmobiles. The visitor services plan needs to address the needs of this user group and the potential for increased bike traffic.

1.4.8.3.3 Environmental Education

Trempealeau NWR is ideally situated to provide curriculum based programming. The demand for formal environmental education has been increasing and staff has few resources to accommodate the requests. Current programs are funded through partnerships and grants, but are difficult to continue year after year. Wisconsin has inclement weather many months of the year and the Refuge has no all-weather group facilities for teaching. Additionally, there are no restroom facilities that can accommodate groups. Although the staff has worked with many area educators, more outreach and networking is needed to formally develop Refuge-specific programs tailored to state and national curriculum standards. Training for teachers and volunteers, as well as teaching materials that could be used at the schools, would expand opportunities for environmental education.

1.4.8.3.4 Hunting

Waterfowl hunting is one of the priority public uses of the Refuge System and remains a vital part of the cultural, social, and economic fabric of the communities around the Refuge. As habitats and wildlife decline and hunting pressure increases on surrounding lands, potential hunting opportunities within the Refuge become more valued. Within the

context of a larger river system, the Refuge provides important sanctuary for migratory birds. Navigation Pool 6 on the adjacent Mississippi River has no areas closed to hunting where birds may find respite. With the exception of a limited hunt for people with disabilities, the Refuge has been closed to waterfowl hunting. The public desires more hunting opportunities, particularly in high quality habitats like those found on the Refuge. However, managers must balance hunting opportunities with the need to limit disturbance to wildlife and accommodate other visitor interests such as wildlife observation or photography.

Opportunities to hunt other species may be available. Small game (rabbits and squirrels), upland game birds (grouse, pheasant, partridge, crow), migratory game birds (Snipe, Sora, Mourning Doves, Woodcock, Virginia Rail) Turkey, coyote, raccoon and red fox have legal hunting seasons in Wisconsin and occur on the Refuge. Information on population size, habitat use and life requirements of most of these species is not known specifically for the Refuge. While hunting some of these animals may be feasible, there may be little management need to control these populations. More information needs to be collected, and some of these species may warrant an addition to the wildlife inventory plan. Likewise, if areas are to be open to new hunting programs the hunt plan and visitor services plan should include detailed review of the program's benefits.

1.4.8.3.5 Fishing

Over the years, the quality of the fishery has declined. Northern pike and yellow perch, popular sport fish, are no longer present in numbers that support recreational fishing. The sport fishery could be improved, however there may be conflicts with water drawdowns to promote growth of aquatic plants. Also, sediments have likely filled many overwintering holes needed by sport fish. Rough fish (carp and buffalo) and bullheads dominate the fishery and are not popular sport fish. The demand for fishing in the Refuge pools is relatively low. There is one fishing platform in Pool A, but the area around the platform is relatively poor fish habitat. The platform does not meet accessibility guidelines. The Trempealeau River may be more popular for fishing, but access can be difficult because of the steepness of the bordering dike and downed trees. Bow fishing for carp is allowed in Wisconsin, but not on the Refuge. Bow fishermen want to access the Trempealeau River from the Refuge and a conflict arises over allowing people with projectile weapons on the Refuge. Policy has been inconsistent in the



Northern pike. USFWS

past. The staff needs to update the fishing plan and investigate potential options for improving fishing access along the Trempealeau River.

1.4.8.3.6 Harvesting Fruit, Nuts, and Other Plant Parts

Some plants growing on the Refuge produce edible products such as fruit and nuts. In the past the Refuge has allowed the harvest of berries, nuts, mushrooms, and asparagus for personal consumption. Harvest is typically light. Recently, requests have been received for other plants like wild rice, sage and cone flower. Some of these requests are for personal consumption, others are for ceremonial or medicinal purposes. Other requests have been made to collect native grass and wildflower seeds. The Refuge needs to develop a clear policy on what the harvest policy is and what levels of harvest can be sustained without jeopardizing habitats or wildlife.

1.4.8.3.7 Horseback Riding

As more and more hobby farms become established in the vicinity, interest in the use of the Refuge for horseback riding has increased. Horseback riding is considered a non-wildlife dependent activity and is subject to more scrutiny than other wildlife-dependent uses. Conflicts with other Refuge visitors, the need for larger parking facilities for trailers, maintenance of trails, and introduction of invasive plants are potential drawbacks that need careful consideration.

1.4.8.3.8 Domestic Pets

Unless specifically authorized, national wildlife refuges are closed to dogs, cats, livestock, and other domestic animals per federal regulations (50 CFR 26). Domestic animals can harass and kill wildlife, and at times become a direct threat to people engaged in recreation. Dogs on a leash are permitted on the Refuge. Requests for opening areas to unleashed pets during the winter and for dog field trials necessitate careful consideration.

1.4.8.3.9 Non-Refuge Sponsored Events

Boy Scout jamborees, over night camping by school groups, weddings, family reunions, and fund-raising walks or runs by charities are examples of non-refuge sponsored events that are considered non-wildlife dependent activities. Requests for hosting these events come in a few times each year. Each of these activities must be considered individually to determine if they are likely to impact Refuge resources and can be adapted to include some aspect of resource interpretation. Staff availability and scheduling are likely to limit these activities.

1.4.8.3.10 Non-Refuge Sponsored Research

Refuges are interesting places and have many resources that are worthy of investigation. Requests for research projects by universities, other agencies, or individuals need to be considered. At times research projects, although interesting, do not further the management objectives of the Refuge and sometimes are disturbing to habitats and wildlife. Staff time is required to permit and monitor these activities. Clear guidelines need to be developed as to what research is in the best interest of the Refuge and how much staff resources should be committed.

1.4.8.3.11 General Public Use Regulations

General public use regulations include things like hours of operation, vehicle restrictions, use of fires, parking and other administrative or safety rules. The current public use regulations were last reviewed and updated in 1992. Regulations need to be reviewed to address new laws and policy and to help correct problems not specifically covered in current regulations governing the National Wildlife Refuge System (50CFR, subchapter C part 26). Refuge Officers and the public need to clearly understand what is and is not allowed on the Refuge.

1.4.8.4. Goal 4: Neighboring Landowner and Community Issues

1.4.8.4.1 Community Outreach

There is a general lack of awareness of the goals of the Refuge and the mission of the Refuge System. Citizen support is critical to a successful resource management program. Rebuilding society's connection with its environment is an important component of long-term resource protection. Numerous opportunities exist to build connections between the Refuge and the community. However, staff shortages and other priorities have limited efforts to work within the community. Refuge planning must include a strong component of community outreach and participation by Refuge staff.

1.4.8.4.2 Friends Groups

Friends groups play a critical role in helping the public understand the importance of protecting and preserving refuges. They provide critical support by volunteering, raising funds, and educating the public. Trempealeau NWR has not had its own Friends group, but instead has been a part of the Bob Pohl Chapter of the Friends of the Upper Mississippi River Refuge based in Winona, Minnesota. Trempealeau NWR does not have a presence in the local community and needs to establish its own Friends group that will provide an independent citizen voice for the protection, conservation, and enhancement of Refuge resources.

1.4.8.4.3 Volunteers

Volunteers are a valuable asset providing thousands of hours of labor, completing tasks that otherwise would not be accomplished. Volunteers conduct biological surveys, lead interpretive programs, maintain equipment and facilities, and assist with special events. The Refuge has a core of dedicated volunteers who are committed to protecting the beauty of the Refuge. Staffing is unlikely to increase in the future and volunteers may be called upon to perform more of the surveys or maintenance tasks that go undone. Refuge staff must find ways to foster a sense of pride and ownership in the volunteers, while continuing to recruit new people.

1.4.8.4.4 Partnerships

The Refuge administers the Partners for Wildlife Program for Trempealeau and Buffalo Counties. Opportunities for upper watershed improvement abound in the northern portions of these counties. These projects are immensely important to reducing sediments flowing to the Mississippi River. Expertise is available to assist landowners with con-

trol of invasive plants, and to restore and enhance wetlands and grasslands. Unfortunately, limited funding and staffing allow only a few of these projects to be completed each year. Projects are on a waiting list and landowners are continuing to request more assistance.

The Refuge shares its east boundary with Perrot State Park. The Refuge and the Park occasionally coordinate activities, but a stronger partnership would support both public facilities. Coordinating interpretive programming and recreational activities would benefit visitors that use both areas. There may also be opportunities to share staff and equipment for habitat management projects.

1.4.8.4.5 Private Property Rights

Adjacent landowners have a variety of concerns about how their lands or their farming operations may be impacted by Refuge habitat, wildlife and recreation management. Crop damage by deer and waterfowl, flooding, trespass by hunters, and access across the Refuge to private land are issues that are frequently contentious.

1.4.8.4.6 Easement and Right-of-Way Management

Two major dikes that are owned by the railroads cross the Refuge. Several power lines cross or border Refuge land, and State Highway 35/54 borders the Refuge on the north. All of these easements or right-of-ways present management challenges. Work crews and equipment need to cross Refuge lands for access to repair facilities, unknown numbers of wildlife collisions and bird strikes occur, accidental contaminant spills are a threat, and the need for road or power line expansion is imminent. The Refuge needs to develop a management plan for easement and rights-of-way that is consistent with current policies and management recommendations.

1.4.8.5. Goal 5: Administration and Operations Issues

1.4.8.5.1 Entrance Road Flooding

The main Refuge entrance road, which is also part of the Great River State Trail, is a low-lying gravel road in the floodplain of the Trempealeau River. The entrance road floods frequently and is closed for 5-6 weeks each year, usually during the spring when songbird viewing is at its best. Ice-jams close the road for months during some winters. An alternate, unimproved access for staff is available through the Marshland gate. The Wisconsin Department of Transportation has requested that



Canada Goose banding program at Trempealeau NWR. USFWS

this access not be promoted to the public because of safety concerns with its location on a curve, adjacent to a train crossing. The Refuge needs to develop a year-round access road for staff and visitors.

1.4.8.5.2 Facilities

Office facilities are too small to meet the needs of full staffing and especially summer hires and volunteers. Maintenance facilities that were constructed in 1936 are scheduled for replacement. Visitors need to have year-round access to restrooms, and there are no facilities to conduct formal interpretation or education programs.

1.4.8.5.3 Staffing

Current staffing levels are below essential staffing needs and reflect gaps between what should be done and what can be done. The Refuge is fortunate to have a cadre of talented and giving volunteers who fill in some of the gaps in staffing. However, long-term programs are difficult to manage with short-term volunteer resources. Adequate staffing becomes more critical as public demand for recreation programs, biological information, and resource protection increases.

1.4.8.5.4 Operations and Maintenance Need

Plans and planning need to articulate the needs for staff and funding to manage and administer programs, facilities, and equipment. These needs must be represented in databases and other documents that are used in budget decision-making at the national and regional level.

Chapter 2: Alternatives, Including the Proposed Action

2.1 Introduction

The Service proposes to adopt and implement a CCP to guide the management and administration of the Refuge for the next 15 years. This chapter presents and compares a range of reasonable alternatives for this proposed action, including a preferred alternative. It also includes information on the development of the alternatives, alternatives or components considered but dropped from further analysis, and elements or actions common to all alternatives. Table 4 on page 86 compares and contrasts the alternatives.

2.2 Development of Alternatives

The National Environmental Policy Act requires federal agencies to evaluate a full range of reasonable alternatives to a proposed action. The alternatives should meet the purpose and need of the proposal while minimizing or avoiding detrimental effects. The NEPA alternative development process allows the Service to work with the public, stakeholders, interested agencies, and tribes to formulate alternatives that respond to identified issues.

Since January 2002, the Service has been working with various agencies including Wisconsin Department of Natural Resources and the U.S. Army Corps of Engineers. During the initial public scoping period from May 30, 2002, (Notice of Intent), to April 30, 2003, a public meeting was held on September 26, 2002, to determine issues and concerns. Another public meeting was held on March 15, 2003, to further draw out issues and concerns



Prothonotary Warbler. USFWS

and assist with alternatives development. Two written comments were received from the public during the process as well as additional input from outside agencies and Refuge staff. This process ultimately resulted in three management alternatives that are presented in this EIS/CCP. These include a “no action” as required under NEPA and two “action” alternatives, each describing a different option for managing Trempealeau NWR over the next 15 years. Each alternative describes a combination of habitat and public use management prescriptions designed to achieve the Refuge purpose, goals, and vision. These alternatives provide different ways to address and respond to major public issues, management concerns, and opportunities identified during the planning process. The major issues,

activities, and management concerns were evaluated and addressed for each alternative. The three alternatives are listed below and described in detail in Section 2.4.

Alternative A. No Action (Current Direction): Continue current level of effort on fish and wildlife and habitat management. Public use programs would remain virtually unchanged.

Alternative B. Wildlife and Habitat Focus: Increase level of effort on fish and wildlife and habitat management. Some public use opportunities and programs would remain the same, others reduced in favor of wildlife and habitat protection.

Alternative C. Integrated Public Use and Wildlife and Habitat Focus (Preferred Alternative): Increase level of effort on fish and wildlife and habitat management. Take a more proactive approach to public use management to ensure a diversity of opportunities for both wildlife-dependent uses and traditional and appropriate non-wildlife-dependent uses.

These alternatives represent broad, thematic approaches to management and administration of the Refuge, within the latitude managers have in focusing human and fiscal resources within the framework of Refuge System laws and policy.

The alternatives reflect the Refuge Improvement Act of 1997, Service policy for administration and management of refuges, and other ongoing initiatives affecting Trempealeau NWR. The alternatives were also developed to address a suite of issues, and are structured to track the issues, challenges, and opportunities presented in Chapter 1. As an integrated EIS and CCP, the details of the alternatives are described in terms of the main components of a CCP, namely measurable objectives and strategies to achieve those objectives.



Red-winged Blackbird. USFWS

Most importantly, these alternatives are designed to help the Refuge contribute to the mission of the Refuge System, meet the purposes for which the President established the Refuge in 1936, and help achieve the Refuge vision, goals, and related needs. The degree to which each alternative meets these needs (Table 4 on page 86), along with the environmental consequences of each alternative (Chapter 4), will provide the basis for a final decision and a CCP for the Refuge.

2.3 Alternative Components Not Considered for Detailed Analysis

The alternatives development process under NEPA is designed to allow consideration of the widest possible range of issues and potential management approaches. Many different ideas and solutions were presented, explored, and debated throughout the development of the EIS. The following components were considered but not selected for further analysis in this EIS/CCP for the reasons described.

Expand Research Natural Areas and Establish Wilderness: It is a requirement in Service policy to review a refuge for special designation during the planning process. No areas were deemed suitable for Research or Public Use Natural Areas or for Wilderness status due to habitat conditions and current development or human use. Thus, this alternative component was not analyzed further.

Horseback Riding: Under this component some form of horse recreation would have been allowed either by using existing trails or developing a trail exclusively for horses. Additional facilities would have been needed to allow for parking horse trailers and as staging areas. A number of factors played into the decision not to pursue this component. The presence of horses often conflicts with wildlife-dependent uses since visitors on foot may find horses disturbing, intimidating, and unpredictable. Horses can have severe physical impacts on trails and habitats due to their size and weight and introduction of invasive seeds in their hay and feces. The state maintains a trail in the northern parts of Buffalo and Trempealeau Counties along the Buffalo River that accommodates horses and could be used by those desiring a place off of their own property to ride. In addition, the prohibition of horses on the Refuge is consistent with long-standing policy and

practice to not allow horseback riding on refuges in the Midwest Region of the Service. Thus, this component was not analyzed further.

Domestic Pets: Unless specifically authorized, national wildlife refuges are closed to unconfined dogs, cats, livestock, and other domestic animals per federal regulations (50 CFR 26). Domestic animals can harass and kill wildlife, and at times become a direct threat to people engaged in recreation. Dogs on a leash are permitted on the Refuge. Under this component an area would be established where pets did not have to be leashed in the winter. In the winter, energy conservation is critical for wildlife since food resources are not easy to come by. Unleashed pets may chase wildlife and at a minimum cause the animals to expend calories needlessly, which can be a matter of life or death during the winter. Field trials and commercial or organized dog training is prohibited in keeping with long-standing Refuge policy. Thus no changes are proposed in the existing policy for domestic pets on the Refuge and this component was not analyzed further.

Other Hunting: During scoping meetings, suggestions were made to consider opening the Refuge to hunting of upland game such as squirrels or Turkey. Upland game populations are rather limited on the Refuge since wetland and open grassland habitat predominates, and ample and better opportunities for this type of public hunting are available nearby on the Upper Mississippi River National Wildlife and Fish Refuge and several state wildlife management areas. Also, it was felt that increased hunting would, to some degree, negate the important “sanctuary” benefits the Refuge provides for waterfowl and other waterbirds during migration. Finally, fall use of upland areas of the Refuge by the general public is relatively high due to existing tour routes and trails, and additional upland hunting could increase safety concerns and conflicts between user groups. For these reasons, opening the Refuge to additional upland game hunting was not deemed appropriate at this time and was not considered further.



Painted turtle, USFWS

2.4 Alternatives Carried Forward for Detailed Analysis

2.4.1 Elements Common to All Alternatives

National Environmental Policy Act Compliance: Since this EIS and CCP are programmatic in many issues areas, it may not contain the necessary detail on every future action to adequately present and evaluate all physical, biological, and socioeconomic impacts. For example, although the EIS and CCP alternatives may show the number and location of constructed features such as trails, boat ramps and observation decks, exact sites, design, and other features would be determined at a later date depending on funding and implementation schedules. Another example is the various sub or “step-down” plans required for various management actions such as forestry, biological monitoring, fisheries, hunting and trapping. Thus, before certain objectives or actions are implemented, a decision will be made in coordination with the Regional NEPA Coordinator on whether this EIS was adequate for each specific project, or whether separate step-down NEPA compliance (categorical exclusions or environmental assessments) is needed.

Threatened and Endangered Species Protection: Although different levels of monitoring for threatened and endangered species is proposed in the alternatives, protection of these species is common across all alternatives. The protection of feder-

ally-listed species is the law of the land through the Endangered Species Act of 1973. It is also Service policy to give priority consideration to the protection, enhancement, and recovery of these species on national wildlife refuges (USFWS 2004, 7RM 2). To ensure adequate protection, the Refuge is required to review all activities, programs, and projects occurring on lands and waters of the Refuge to determine if they may affect listed species. If the determination is “may effect,” a formal consultation with the responsible Ecological Services office of the Service is required.

Archeological and Cultural Resource Protection: Cultural resources on federal lands receive protection and consideration that would not normally apply to private or local and state government lands. This protection is through several federal cultural resources laws, executive orders, and regulations, as well as policies and procedures established by the Department of the Interior and the Service. Although different approaches to protection are proposed in the alternatives, protection of these resources is common across all alternatives. The Refuge will seek to protect cultural resources whenever possible.

During early planning of any projects, the Refuge will provide the Regional Historic Preservation Officer (RHPO) a description and location of all projects and activities that affect ground and structures, including project requests from third parties. Information will also include any alternatives being considered. The RHPO will analyze these undertakings for potential to affect historic properties and enter into consultation with the State Historic Preservation Officer and other parties as appropriate. The Refuge will also notify public and local government officials to identify any cultural resource impacts or concerns. This notification is generally done in conjunction with the review required by NEPA or Service regulations on compatibility of uses.

Archaeological investigations and collecting are performed only in the public interest under an Archaeological Resources Protection Act permit issued by the Regional Director and a special use permit issued by the refuge manager. Archaeological investigations have been determined to be a compatible use. Refuge personnel take steps to prevent unauthorized collecting.

The objective for archaeological and cultural values is to meet the requirements of Section 14 of the

Archaeological Resources Protection Act and Sections 106 and 110(a)(2) of the National Historic Preservation Act. To accomplish this objective the refuge will pursue the following strategies: ensure archeological and cultural values are described, identified, and taken into consideration prior to implementing undertakings; with the assistance of the RHPO, develop a step-down plan for surveying lands to identify archaeological resources and for developing a preservation program; develop and implement a plan for inspecting the condition of known cultural resources on the Refuge and reporting changes in conditions to the RHPO; initiate budget requests or otherwise obtain funding from the 1 percent Operations & Maintenance program base provided for the Section 106 process compliance; inventory, evaluate, and protect all significant cultural resources located on lands controlled by the FWS, including historic properties of religious and cultural significance to Indian tribes; identify and nominate to the National Register of Historic Places all historic properties including those of religious and cultural significance to Indian tribes; cooperate with Federal, state, and local agencies, Native American tribes, and the public in managing cultural resources on the Refuge; integrate historic preservation with planning and management of other resources and activities, including the rehabilitation and adaptation for reuse of historic buildings when feasible; recognize the rights of Native American to have access to certain religious sites and objects on Refuge lands within the limitations of the FWS mission.

Fire Management: The suppression of wildfires and the use of prescribed or controlled fire are a long-standing part of resource protection, public safety, and habitat management on national wildlife refuges. In 2001, a comprehensive Fire Management Plan was approved for the Refuge and provides detailed guidance for the suppression or use of fire. The plan was updated and was awaiting approval as the Final EIS/CCP was completed in 2007. The plan outlines wildfire response and prescribed fire objectives, strategies, responsibilities, equipment and staffing; burn unit descriptions; implementation; monitoring; and evaluation. A section on the environmental consequences of prescribed fire is included in Chapter 4. Once approved, the complete Fire Management Plan will be available at the Refuge office.

Prescribed fire will be used every 3-5 years on approximately 740 acres of Refuge grasslands. This area is divided into 17 burn units ranging in size

from 1 acre to 100 acres. These units for the most part are within the central core of the Refuge and are generally flat or gradually sloping and isolated from private property. Most burns occur during April and May.

Each prescribed burn is governed by a specific prescribed burn plan that dictates the criteria or prescription for air temperature, fuel moisture, wind direction and velocity, soil moistures, relative humidity, and other environmental factors. Burns are not conducted unless these prescriptions are met, and possible impacts to archeological resources or endangered species avoided or mitigated. Each plan also outlines required staffing and equipment including contingency actions for smoke management and escaped fire. Coordination with local and state fire management officials, as well as adjacent landowners, is done prior to conducting a burn. A strict chain-of-command and “burn-no burn” protocol is followed.

Mosquito Management: The management of mosquito populations may emerge as a future concern given the increased incidence of mosquito-borne illness in parts of the Midwest. Due to the possible harmful effects to wildlife, mosquito control will only be allowed in cases of a documented human health emergency by the State Department of Health or similar disease control agencies. Control efforts would be species and location specific, based on population sampling and identified population thresholds, and use the least intrusive means possible. The Service has a draft national policy on mosquito abatement on national wildlife refuges that specifies when and how mosquitos may be controlled (USFWS 2005).

Fish and Wildlife Disease Management: A wide range of issues are currently in the public eye regarding wildlife disease and potential impacts to human populations. Wild animals play a role in the spread of west Nile virus, Lyme disease, meningitis, chronic wasting disease and avian influenza, to name a few. The role wildlife plays in the transmission of these diseases to humans is not always clear. Even more unclear are the long-term impacts of diseases on wildlife populations. Periodically, the Refuge may experience threats to fish and wildlife from a variety of ongoing or sporadic outbreaks of diseases such as chronic wasting disease in deer, or avian botulism, trematode infestations, and avian cholera in waterfowl. Regardless of alternative, appropriate control efforts will be undertaken if warranted, feasible, and effective, to limit the

impacts on fish, wildlife, and human populations. By 2010, the Refuge will develop a Disease Contingency Plan with the State and other partners to identify response methods, available resources, and potential health threats. Refuge staff will be trained to safely handle diseased animals, carcass disposal, and decontamination procedures. Staff also will be trained to safely handle and transport live raptors, especially eagles.

Emergency Response to Contaminant Spills: Mishaps with chemicals on adjacent lands could cause severe damage to Refuge resources, especially sensitive wetlands. The Refuge is bounded on three sides by train tracks and a state highway. Train derailments or tanker accidents involving chemical spills could have catastrophic impacts to Refuge habitats and wildlife. Emergency response would require specialized equipment (airboats, helicopters), trained personnel, and the coordination of many agencies. By 2009, the staff will develop a Refuge specific Spill Response Plan that includes contingencies for protecting sensitive wildlife and habitats. Key resources for response, such as equipment, chemical information, and special response teams, would be identified. All Refuge staff would be trained to initiate the spill response plan and a “mock spill” practice session would be held once every 5 years.

Harvesting Fruit, Nuts, and other Plant Parts: Some plants growing on the Refuge produce edible products such as fruit and nuts. In the past the Refuge has allowed the harvest of berries, nuts, mushrooms, and asparagus for personal consumption. Harvest is typically light. Recently, requests have been received for other plants like wild rice, sage and cone flower. Some of these requests are for personal consumption, others are for ceremonial or medicinal purposes. Other requests have been made to collect native grass and wildflower seeds. The



Coyote. USFWS

Refuge will clarify the regulations to specifically allow the collection of raspberries, blackberries and mushrooms for personal consumption. Collection of all other plants or plant parts will be prohibited in accordance with existing regulations governing uses on refuges.

Private Property Rights: Adjacent landowners have a variety of concerns about how their lands or their farming operations may be impacted by Refuge habitat, wildlife, and recreation management. The Refuge Manager and other staff will meet frequently with adjacent landowners to listen to their concerns and discuss Refuge management issues that may be impacting their lands. Where practical the Refuge will work to reduce flooding and crop depredation. When considering actions that may impact adjacent lands, the Refuge will consult with landowners and provide ample time for commenting and discussion of potential solutions to conflicts. Refuge law enforcement officers will work with individual landowners to resolve issues of access and trespass on private land.

Easements and Rights-of-Way Management: Two major dikes, owned by the railroads, cross the Refuge. Several power lines cross or border Refuge land, and State Highway 35/54 borders the Refuge on the north. All of these easements or rights-of-way present management challenges. Work crews with equipment need to cross Refuge lands for access to repair facilities, unknown numbers of wildlife collisions and bird strikes occur, accidental contaminant spills are a threat, and the need for road or power line expansion is imminent. As part of the Habitat Management Plan, Refuge staff will develop an Easement and Rights-of-way Management Plan that conforms with current Service policy. As part of the plan, a GIS database with locations, owners, and conditions of agreements will be developed and updated regularly. Staff will develop a standardized special use permit that can be used to authorize access while minimizing impacts. All easement and rights-of-way holders will be notified of Service policy on use of herbicides on Refuge lands.

General Public Use Regulations: General public use regulations include hours of operation, restrictions on vehicle or boat use, areas of entry, use of fires, collecting of plants or animals, and other administrative rules that protect resources or visitors. Public use regulations not only protect wildlife, but enhance the quality of the visitor experience. The current regulations were last reviewed

in 1999. However, the resources and public use of the Refuge are dynamic, and a yearly review would ensure that regulations are clear and effective. In addition, new regulations may be required to safeguard resources or to address new or emerging problems recognized by managers and law enforcement officers. An annual review would provide a systematic process for updating and clarifying regulations. By 2009 the Refuge staff would update *Title 50 of the Code of Federal Regulations (50CFR)* to include Refuge specific regulations, review verbiage on all interpretive materials for clarity, begin conducting annual reviews, and allow ample public and state opportunity for comment on any changes. Staff would seek to improve compliance by providing proactive law enforcement that informs and educates the public on regulations. An informational telephone line and website with current regulations would be maintained and individual brochures for hunting, fishing, trapping, and general public use would be produced. Regulation panels would be added to all trailheads and kiosks.

2.4.2 Alternative A: No Action (Current Direction)

Goal 1 Landscape

We will strive to maintain and improve the scenic and wild character, and environmental health of the Refuge.

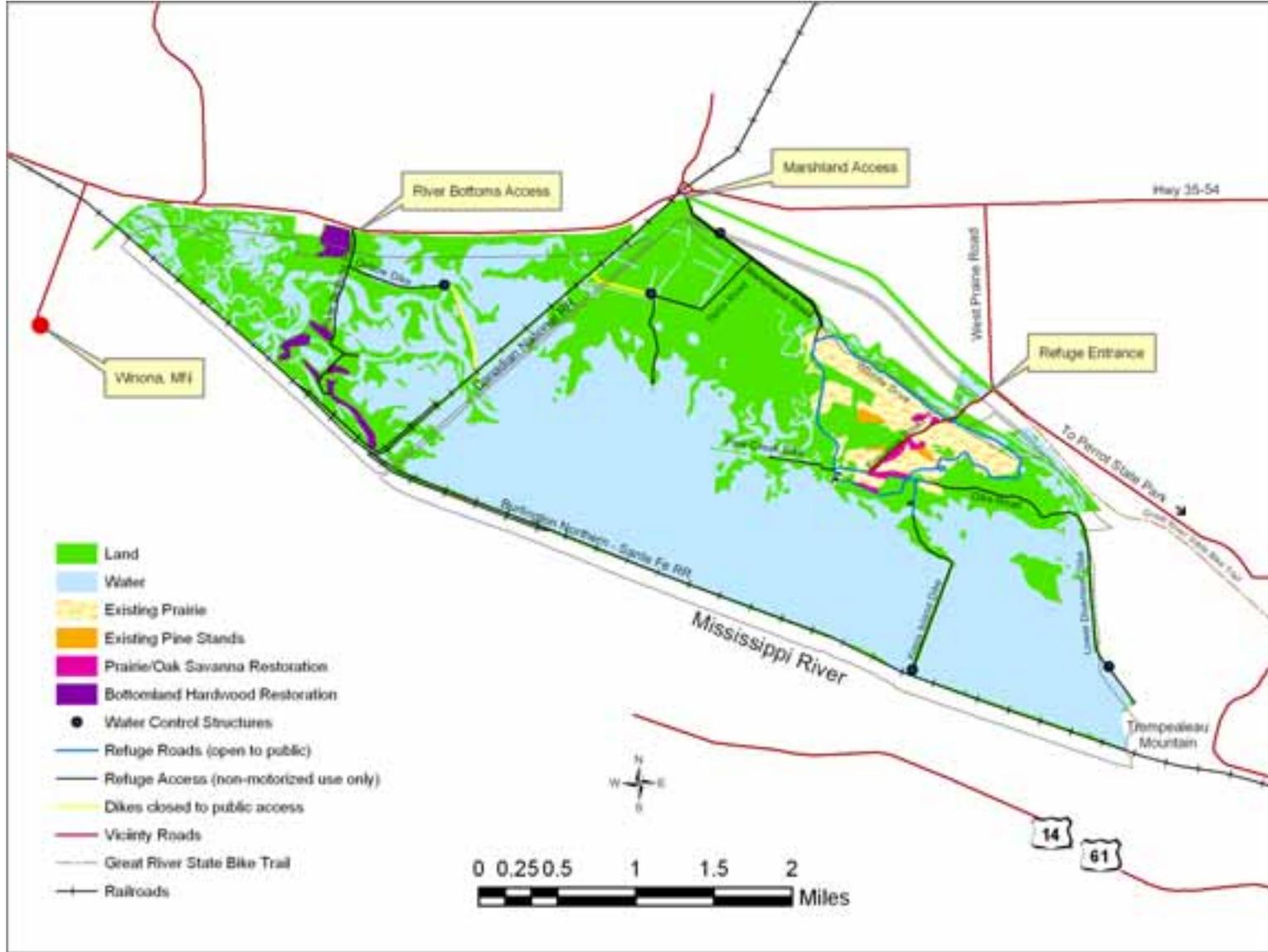
Figure 5 represents habitat management under Alternative A and Figure 6 on page 34 represents public use under this alternative.

Objective 1.1: Land Acquisition

By 2022, acquire from willing sellers the remaining 340 acres within the approved boundary as delineated in the 1983 Master Plan (USFWS 1983). The proposed acquisition includes 340 acres within the approved boundary of the Refuge and approximately 12 acres outside of the current approved boundary. These latter acres would be added under the Regional Director's authority. (See acquisition boundary, Figure 2 on page 9.)

Rationale: Land acquisition can be a cost effective tool to ensure protection of important fish and wildlife habitat and to close gaps in the existing boundary. All of the properties in question are in the floodplain and subject to sporadic flooding. The system of dikes, constructed in the early 1900s to divert the Trempealeau River and now part of the

Figure 5: Alternative A (Current Management), Habitat



Alternative A: No Action (Current Management)

Refuge, tend to exacerbate flooding on adjacent properties. Acquiring these lands would alleviate conflicts with flooding on adjacent private property and allow the Trempealeau River to move more freely within its existing floodplain. Additionally, some of these lands are remnants of pre-lock and dam floodplain forest, a rare resource worthy of protection.

Strategies:

1. Maintain contact with landowners within approved boundary to keep them informed of the Refuge's interest in acquiring their property.
2. Keep Regional Realty Specialist informed of any changes to property status.
3. Seek Land and Water Conservation Fund appropriations (approximately \$510,000 at \$1,500 per acre)

Objective 1.2: Refuge Boundary

Maintain the integrity of the Refuge boundary; inspect problem areas as time and staffing permits.

Rationale: Current funding and surveying capabilities limit systematic surveying of the Refuge boundary. This objective would address problems on a case-by-case basis as they occur.

Strategies:

1. Inspect problem boundary areas as needed.
2. Replace worn or damaged signs as time and other priorities permit.

Objective 1.3: Flood Protection

Manage flooding on an annual basis as needs arise. Coordinate flood protection with partners on a case-by-case basis.

Rationale: In the past, the Refuge has worked cooperatively with the Burlington-Northern Santa Fe Railroad (BNSFR) to discuss options and coordinate actions during flood events. The Refuge will continue to consider strategies to protect the railroad dike, but will place emphasis on maintaining the integrity of Refuge habitats.

Strategies:

1. Meet with BNSF officials to explore alternatives to protect their dike.

Objective 1.4: Natural Area Management

Conduct yearly visits to Black Oak Island to document condition.

Rationale: This objective represents the current level of management that is expected to continue under this alternative.

Strategies:

1. Ensure yearly visits are a part of the annual work plan.

Objective 1.5: Archeological Resources

Inventory potential sites on a project-by-project basis as needed to facilitate habitat management. Continue on-call law enforcement response.

Rationale: Federal laws, executive orders, and regulations, as well as policies and procedures of the Department of Interior and the Service, protect cultural resources on federal lands. Trempealeau NWR has been described as one of the most important archeological sites in the Midwest. Human use of the area dates back 12,000 years. Dozens of sites and over 6,000 artifacts have been cataloged from various locations. However, the majority of the lands need baseline surveys to document the locations and extent of archeological resources. Habitat management activities involving soil disturbance are often delayed until archeological assessments can be completed.

Strategies:

1. Ensure that funding needs for archeological surveys are incorporated in budget needs databases.
2. Use seasonal administrative closures to limit public access to known sites.

Goal 2: Wildlife and Habitat

Our habitat management will support diverse and abundant native fish, wildlife, and plants.

Objective 2.1: Forest Management

By 2010 develop a Habitat Management Plan incorporating forest management. By 2022 enhance 50 acres of upland hardwood forest and 500 acres of floodplain hardwood forest in three separate blocks.

Rationale: Hardwood forests on the Refuge have been altered by a number of factors including invasion by non-native species, oak wilt, and

agriculture. The forest canopy in many areas is dominated by black locust, and the native shrub component that should include species such as dogwoods, hazel, viburnums and others, has been replaced by European buckthorn, black locust, Siberian pea, and Tartarian honeysuckle. Bottomland forests are not regenerating and large nesting trees and cavities are becoming less abundant. A Habitat Management Plan is needed to integrate forest and wildlife objectives, and to identify management prescriptions such as harvest, planting, fire and invasive plant control.

Strategies:

1. Survey upland forest stands for archeological resources.
2. Continue restoration of River Bottoms Road sites by planting new age classes of swamp white oak seedlings every 3 years until natural regeneration is occurring.
3. At River Bottoms Road sites inter-plant other native seedlings as available, focusing on mast-producing species. Coordinate seed collection from local floodplain sites and seedling production with Army Corps of Engineers foresters.
4. Annually treat 1 acre each of upland and floodplain forest using mechanical and chemical means as appropriate, to remove black locust and European buckthorn. By 2022, black locust and European buckthorn will occupy <20 percent of the canopy in upland and floodplain forests.
5. Protect swamp white oak in Pool C2 by lowering water level during the growing season to avoid prolonged flooding.

Objective 2.2: Wetland Management

Maintain infrastructure to allow management of 3,350 acres of wetlands as described below:

Two out of every 5 years, provide an average of 275 acres of moist soil/mudflat habitat primarily for shorebirds, waterfowl, and wading birds.

By 2020, provide an average of 1,725 acres of emergent marsh habitats on the Refuge. This habitat will be characterized by water depths ranging from 3 to 30 inches interspersed with stands of cattail, bulrush, phragmites, arrowhead, pickerelweed, water lily and American lotus. Submerged aquatic plants such as coontail and sago pondweed will usually be



Great Egrets. USFWS

present. Emergent marsh habitat will be apportioned among the refuge pools as follows:

- # Pool A –250 acres
- # Pool B – 1,050 acres
- # Pool C1 – 125 acres
- # Pool E –300 acres

Continue to provide approximately 1,350 acres of deepwater marsh habitat among Refuge pools. This habitat will generally consist of open water greater than 30 inches in depth. Submersed vegetation such as coontail, sago pondweed, and wild celery is desired. These habitats will provide open water rafting areas for diving ducks and foraging habitat for pelicans, cormorants, Bald Eagles, and other fish-eating birds. Deepwater habitat would be distributed among Refuge pools roughly as follows:

- # Pool A –350 acres
- # Pool B – 1,000 acres

Rationale: Trempealeau NWR includes 6,226 acres, of which about 5,550 acres are wetlands. These wetlands have benefited from many years of protection afforded by railroad and barrier dikes that exclude damaging floods so devastating to aquatic plants in adjacent Mississippi River backwaters. As a result, wild rice, cattail, and other plants important to marsh wildlife have flourished in many areas.

Construction of a series of locks and dams on the Mississippi River in the 1930s created a deeper, relatively stable water system, especially during the summer. Although flooding was not a serious problem at Trempealeau NWR because of barrier dikes, the low water cycle, so important to aquatic plants dependent on mud flats and sandbars for their reproduction, was virtually eliminated. With stable and higher water levels, wind and wave action

gradually eliminated aquatic plant beds, particularly in the lower Refuge pools. Additionally, rough fish, primarily common carp, are present throughout the pool system. Carp have a major impact on aquatic plant growth by rooting out plants and suspending sediments while feeding.

Strategies:

1. By 2010, write a Habitat Management Plan that includes strategies for managing water levels in each impoundment.
2. Once every 5 years, when funding for pumping is available, reduce water levels in pool A by pumping to expose 50 percent (350 acres) of the bottom. Drawdown would begin in May, coinciding with shorebird migration, and continue through the fall until freeze-up. Low water conditions would create conditions for a partial kill of rough fish. Water levels would return to full pool over the winter through dike and groundwater seepage.
3. Once every 5 years (alternating with Pool A) when funding for pumping is available, reduce water elevations in Pool E when wild rice has reached the floating leaf stage in late May or early June. Maintain water level as low as possible through late August, and then gradually restore levels to maximize food availability for waterfowl, rails, and wading birds.
4. Avoid prolonged flooding of swamp white oaks in unit C2 by lowering water level below the root mass of these trees during the growing season.
5. Maintain stable or declining water levels in pools B and E, June through August to accommodate over-water nesting species, especially Black Terns.
6. When conditions allow, drawdown Pool B using gravity flow through Pool A into the Trempealeau River.
7. When feasible, use commercial fishing and winter draw-downs to reduce populations of rough fish in Pool A.

Objective 2.3: Grassland Management

Maintain existing 335 acres of prairie and oak savanna. Prairie component will have native cool and warm season grasses and wild flowers typical of undisturbed sand prairie in western Wisconsin. Oak savanna will comprise 20 to 40

percent of the prairie area with an open canopy of native, uneven aged oaks.

Rationale: The Fish and Wildlife Service is interested in maintaining and restoring ecological diversity to the lands managed in the National Wildlife Refuge System. The goal for many refuges is to restore habitats to pre-European settlement conditions, understanding that modern day circumstances or Refuge purposes may preclude this in many areas. Native vegetation that was originally in place prior to various attempts at habitat improvement is likely the vegetation that will do best on the land. Historical records (1895-1976) and records from the U.S. General Land Office (1840s and 50s), indicate that prior to settlement, upland areas within the Refuge were predominantly prairie and oak savanna (see Figure 9 on page 53). Much of the upland area had been converted to agriculture before the Refuge purchased the property in 1936. Under Refuge management in the 1940s through 1960s, various pine species, Siberian and Chinese elms, black locust, Siberian pea, and honeysuckle were planted to reduce soil erosion and provide wildlife habitat in tune with the wildlife management practices of that era. In the 1970s, many of the oaks in the savanna were removed when oak wilt disease killed them.

Today the invasive nature of black locust and the addition of other invasives such as buckthorn have created forested areas on the upland sections of the Refuge consisting primarily of non-native species. Three hundred acres of the original 700 acres of prairie/oak savanna remain today. The mature black locusts in the forested areas provide a continual seed source, resulting in a continuous invasion of black locusts on the prairie. Oak wilt disease is still present and has killed many of the mature oaks remaining in the uplands. Likewise, prairies and oak savannas on private lands are becoming scarce as land is rapidly developed. The remnant prairies on the Refuge may soon be the only examples in southern Wisconsin.

Prairie and oak savanna restoration in these areas will benefit many species listed as Regional Resource Conservation Priority (RRCP) (USFWS 2002) species including Mallards, Blue-winged Teal, Grasshopper Sparrow, Orchard Oriole, Red-headed Woodpecker, and Eastern Meadowlark. Many species of birds, mammals, reptiles, and amphibians will forage in, and meet all or part of their life requirements in prairie and oak savanna habitats.

Table 1: Management Strategies for Invasive and Non-indigenous Plant Species Under Alternative A

Non-indigenous Plant Species	Prairie and Oak Savanna	Upland Forest	Floodplain Forest	Wetlands
Leafy Spurge	Allow flea beetles to expand naturally. Reduce infestation to 20% or less of prairie habitats by 2022.			
Black Locust	Prevent any new spread into existing prairie areas.	Remove Black Locust from canopy and understory. Reduce occurrence to 20% or less of upland forest.		
European Buckthorn, Siberian Pea, Tartarian Honeysuckle	Use school groups and volunteers to remove understory of these species from oak stands targeted for oak savanna restoration using appropriate mechanical means. Reduce occurrence to 20% or less of oak savanna habitat by 2022.	Use school groups and volunteers to remove these species from understory using appropriate mechanical and chemical means. Reduce occurrence to 20% or less of understory by 2022.	Use school groups and volunteers to remove understory of European Buckthorn from stands using appropriate mechanical. Target 1 acre a year for treatment.	
Scotch Pine	No action.	No action.		
Red and White Pine	No action.	No action.		
Purple Loosestrife			Raise 100 pots of defoliating beetles annually for release at 5 new sites on the Refuge. Use volunteers when available.	Same as for Floodplain Forest.

Strategies:

1. Use prescribed fire as described in the Fire Management Plan (in preparation in 2007) to control encroachment by cool season exotic grasses, forbs and woody shrubs. Modify existing firebreaks where necessary to incorporate timber stands targeted for restoration to oak savanna.
2. Maintain populations of flea beetles and allow natural expansion to reduce leafy spurge in all prairie/oak savanna habitats. Leafy spurge will occupy <20 percent of any prairie/oak savanna unit by 2022.
3. Remove black locust invading along edges of existing prairies.

4. Remove understory of invasive shrubs from oak savanna habitats. By 2022, invasive plants will occupy <20 percent of oak savannas.
5. Use volunteers and school groups to collect and redistribute native grass and wildflower seed.

Objective 2.4: Invasive Plants and Animals

Reduce abundance of invasive and non-indigenous plants as specified in Table 1. If conditions allow, once every 5 years prior to drawdown of Pool A, remove invasive carp and other rough fish using commercial fishing.

Rationale: Invasive plants continue to pose a major threat to native plant communities on the Refuge and beyond. Invasive plants displace native species

and often have little or no food or habitat value for wildlife. The result is a decline in the carrying capacity of the Refuge for native fish, wildlife and plants, and a resulting decline in the quality of wildlife-dependent recreation. This objective addresses invasive plants through mechanical and biological control. Invasive plant control is labor intensive and costly. The current direction relies on volunteers to implement mechanical and biological control. Invasive animals such as zebra mussels and Asian carp pose a threat to native aquatic ecosystems, however these species have not yet been found on the Refuge.

Strategies:

1. Use volunteers to undertake mechanical removal of invasive plants.
2. As part of a Habitat Management Plan, write an invasive plant control and management step-down plan (Integrated Pest Management Plan) that identifies priority areas and methods of control. Emphasize mechanical and biological control.
3. Seek seasonal staff and funding to accelerate current control and applied research through interagency partnerships, volunteer programs, and public education.
4. Continue to work with the Department of Agriculture, other agencies, the state, and other refuges in securing insects for release on the Refuge and on private lands within the Trempealeau and Buffalo River Watersheds.
5. Seek grants, cost-sharing, or special funding opportunities for invasive plant removal.
6. If conditions allow, permit commercial fishing for rough fish in Pool A prior to each drawdown.
7. Continue to serve as a source of flea beetles for other agencies and landowners who have infestations of leafy spurge.

Objective 2.5: Monitor and Investigate Fish, Wildlife and Plants and their Habitats

By 2010 update the Wildlife Inventory Plan to include all federally listed species, species of regional conservation concern, furbearers, and deer. Increase partnerships with agencies and universities and encourage applied research on the Refuge.



Sandhill Crane. USFWS

Rationale: Monitoring is essential to understanding the status and trends of selected species groups and habitats. This in turn provides some indication of overall biological integrity, diversity, and environmental health of the Refuge, and is critical in planning habitat management and public use programs. This objective reflects the current direction of the biological program and would help meet directives in the Refuge Improvement Act of 1997 requiring monitoring of the status of fish, wildlife, and plant species. Better biological information is also critical to making sound and integrated resources and public use management decisions. The Refuge would continue to support, use, and contribute to monitoring done by the state, U.S. Geological Survey (USGS), the Corps of Engineers, neighboring refuges and others to help fill the gaps in status and trends information for fish, reptiles, amphibians, birds, invasive plants, land cover and other environmental factors like water quality.

Strategies:

1. Engage other experts and partners to develop and implement a Wildlife Inventory Plan that includes all federally listed and state-listed species, regional conservation species, furbearers, and deer.
2. Work with partners, volunteers, students and staff to store, summarize and, as appropriate, analyze survey data annually.
3. Continue to work with universities, states, USGS, and the COE to share data on species and habitats.

4. Participate in formal coordination meetings with USGS to share biological data and monitoring expertise.
5. Work with the Upper Mississippi NWFR GIS biologist and the Winona District biologist to coordinate equipment, staff, survey schedules, and data analysis.
6. Foster partnerships with colleges and universities to encourage graduate research projects.
7. Continue to use volunteers to complete certain surveys like waterbird counts, and deer surveys.
8. By 2010, complete a Habitat Management Plan that integrates habitat monitoring with management actions.

Objective 2.6: Threatened and Endangered Species Management

Continue to monitor Bald Eagles.

Rationale: It is Service policy to give priority consideration to the protection, enhancement, and recovery of threatened and endangered species on national wildlife refuges. Even though they were delisted in 2007, the Service will continue monitoring Bald Eagles as specified in the delisting order.

Strategies:

1. Consider the needs of threatened, endangered, and candidate species in all habitat and public use management decisions.
2. Continue to consult with the Service’s Ecological Services Office on all actions which may affect listed species.
3. Continue to monitor Bald Eagle nesting and success.
4. Where feasible, protect large nest trees from prolonged flooding and erosion.
5. Continue education and outreach targeting threatened and endangered species and their needs.

Objective 2.7: Deer Management

By 2010, update the Wildlife Inventory Plan and Habitat Management Plan to include management and monitoring of white-tailed deer and related browse impacts. Continue to

coordinate the Refuge deer hunt with Wisconsin Department of Natural Resources.

Rationale: In general, Refuge management practices emphasize the protection of plants and wildlife to ensure a diversity of species that naturally or historically occurred. White-tailed deer present a special situation in that harvest and the vast expanses of agricultural lands around the Refuge greatly influence population levels and resulting vegetation impacts on the Refuge. Deer tend to move on and off the Refuge in response to hunting pressure and food availability on surrounding lands. Browse impacts have been severe on the Refuge especially prior to the 1980s, after which expanded Refuge hunts were implemented to reduce deer and allow the vegetation to recover. Deer numbers are unnaturally high in surrounding lands and the State of Wisconsin has been in an active herd reduction program since the discovery of chronic wasting disease in 2002. The special interests of the State in the management of resident big game animals are recognized and management actions are coordinated with State objectives where possible. Harvest on surrounding lands would be hampered if coincident pressure did not occur on the Refuge. This objective reflects the current approach to



White-tailed deer. Manley Dahler

limiting over-browsing and assisting the State in managing the distribution of hunting pressure and harvest rates in the area.

Strategies:

1. Update Wildlife Inventory Plan to include white-tailed deer monitoring, including fawn counts.
2. Work closely with Wisconsin DNR to coordinate information exchange, planning, and management of CWD on nearby lands.
3. Continue to use a managed public hunt of white-tailed deer to maintain acceptable levels of browse.
4. Update the Hunt Plan to include white-tailed deer hunting.
5. Improve signage and develop a Refuge-specific hunting safety brochure.
6. Continue issuing over-the-counter permits for late season archery.
7. Continue to operate a check station on opening weekend.
8. Require mandatory reporting of hunter success or loss of 1 year hunting privileges.
9. Continue to follow Wisconsin guidelines for season dates and times.

Objective 2.8: Furbearer Management

Update the Furbearer Management Plan by 2009 and continue to manage muskrat, beaver, and raccoon populations at levels that limit damage to dikes and interference with water management and bird banding operations.

Rationale: A furbearer trapping program is in place for muskrat, mink, raccoon, opossum, and beaver. The Refuge is divided into 15 muskrat units and four beaver units. Trapping units are awarded to the highest bidder at an auction held in October. The entire Refuge is open to trapping with the exception of an area inside and immediately adjacent to the wildlife drive. Harvest of muskrats by trappers helps reduce damage to Refuge dikes from tunneling and den building. Beaver trapping reduces plugging of culverts and water control structures and prevents excessive damage to desirable trees adjacent to wetlands.

Strategies:

1. Work with the public to update the Furbearer Management Plan by 2009.



Wildlife photography. USFWS

2. Update the Wildlife Inventory Plan to include muskrats, beavers, and otters.
3. Use harvest data to determine appropriate harvest levels to minimize damage to dikes and structures.
4. As needed, adjust trapping activities to avoid conflicts with other hunts or Refuge management.
5. Remove problem animals from banding sites as needed to meet banding objectives.

Goal 3: Public Use

We will manage public use programs and facilities to ensure sustainable, quality, hunting, fishing, wildlife observation, wildlife photography, interpretation, and environmental education opportunities for a broad cross-section of the public, and provide opportunities for the public to use and enjoy the Refuge for traditional and appropriate non-wildlife dependent uses that are compatible with the purposes for which the Refuge was established and the mission of the Refuge System.

Objective 3.1: Wildlife Observation and Photography

Provide year-round opportunities to observe and photograph wildlife and habitat by maintaining two existing hiking trails, a 4.5-mile auto tour route, and the existing observation deck.

Rationale: Wildlife observation and photography are priority public uses of the Refuge System and are to be encouraged when compatible with the purposes of the refuge. The Refuge provides outstanding wildlife observation opportunities. Maintaining existing facilities will provide opportunities for people to view wildlife throughout

the year. Opportunities for wildlife photography are abundant without special facilities. Finally, an entrance fee may help to provide resources for improving visitor services, but careful consideration must be given to the cost and benefits for both the Refuge and visitors. This objective reflects the current management direction.

Strategies:

1. Develop a Visitor Services Plan by 2009.
2. Provide a general brochure with maps and information for all trails.
3. Enhance website information for compatible wildlife-dependent recreational opportunities.
4. Maintain and enhance the 4.5-mile auto tour loop.
5. Allow cross-country skiing and snowshoeing, but do not designate or maintain trails.
6. Monitor and maintain existing Woods Trail.
7. Maintain the Prairie View Trail.
8. Continue to prohibit all ATVs and snowmobiles from Refuge lands.
9. Investigate the cost/benefit ratio of implementing an entrance fee program.

Objective 3.2: Great River State Trail (Bicycling)

Maintain the existing portion of the Great River State Trail that traverses the Refuge.

Rationale: The Great River State Trail is a popular bike trail and is likely to become more popular as the public eye turns more toward health and fitness activities. The current use of the trail would continue, but no additional efforts would be undertaken to improve or expand the trail.

Strategies:

1. Maintain existing gravel road surface.

Objective 3.3: Interpretation

Maintain existing interpretive signs, brochures and other materials for the public. Annually, provide two events for the public. Provide staffed interpretive programming on an as requested basis when staff is available.

Rationale: Interpreting the resources and challenges of the Refuge to the general public is important to influencing the future well-being of the Refuge and the natural world. This objective

reflects the current direction of informing and educating visitors, and helping them make the most of their Refuge visit while protecting sensitive resources.

Strategies:

1. By 2009, include interpretation in a Visitor Services Plan.
2. Continue to host a Migratory Bird Festival each spring, and a Refuge Week celebration each fall.
3. Include Refuge regulations on all kiosks.
4. Update signs on all trails and along the wild-life drive auto tour.
5. Continue to issue news releases on special events or temporary changes to regulations.
6. Participate in local area expos, sportsman shows, and other outdoor events to promote the Refuge when staff is available.

Objective 3.4: Environmental Education

Annually host one environmental education event and conduct minimal in-school programs as requested.

Rationale: Environmental education is labor intensive and staff provide programs as time and funds permit. This objective represents the current direction for environmental education programming.

Strategies:

1. Continue to work with partners to host River Education Days for 5th graders.
2. Encourage high schools and universities to utilize the Refuge facilities for curriculum based programs.
3. Participate in educational programs as requested, and as time and staffing permit.

Objective 3.5: Waterfowl Hunting

Continue the managed waterfowl hunt west of the Canadian Pacific Railroad dike for people with disabilities.

Rationale: The managed hunt offered to people with disabilities began in 1989 and has continued for the past 17 years. It is a managed hunt with a limited number of hunters and days assigned on a first-

come-first served basis. The hunt is popular and all slots are filled each year. This objective reflects a continuation of the current hunt program.

Strategies:

1. Continue to allow 14 hunters with disabilities and their helpers to hunt on the first weekend of the hunt. Allow two hunters with helpers on 6 days for the following 2 weeks.
2. Clearly sign boundaries of areas closed to hunting.

Objective 3.6: Fishing

Continue current fishing program. Maintain existing facilities.

Rationale: Fishing is one of the priority uses of the National Wildlife Refuge System and is to be encouraged when compatible with refuge purposes. The demand for fishing at Trempealeau NWR is small because the sport fishery is mainly comprised of bullheads and excellent fishing can be found just off the Refuge on the Mississippi River. Rough fish and management of shallow water impoundments precludes the development of a viable sport fishery in the interior units. The objective reflects the current direction for the fishing program on the Refuge.

Strategies:

1. Consult with the La Crosse Fishery Resource Office to update the Fishery Management Plan by 2010.
2. Maintain the existing fishing platform, but enhance it to meet accessibility standards.

Goal 4: Neighboring Landowners and Communities

We will communicate openly and work cooperatively with our neighbors and local communities to help all benefit from the aesthetic and economic values of the Refuge.

Objective 4.1: Community Outreach

Continue limited community outreach, informing public with news releases of changes in regulation or other events of interest. Attend career fairs and sportsmen events as time and staffing permit.

Rationale: Rebuilding society's connection with the environment is an important component of long-term resource protection and citizen support is critical to a successful resource management



Volunteers at Trempealeau NWR. USFWS

program. This objective reflects the current direction focusing staff resources on keeping the public informed of happenings and events.

Strategies:

1. Continue to issue news releases to local newspapers, radio and television stations for public events, environmental education programs, changes to Refuge regulations, management activities of interest to the public and special wildlife viewing opportunities.
2. Attend career fairs and sportsmen shows as time and staffing permit.

Objective 4.2: Friends Group

Continue the current relationship with the Bob Pohl Chapter of the Friends of the Upper Mississippi River Refuge.

Rationale: The Refuge staff is tasked with managing resources within the laws, policies, guidelines and goals set forth for the Refuge. Citizens who have concerns about issues impacting the Refuge are free to voice their opinions and are often in a better position to do so when they come together as a Friends group. A relationship currently exists with the Bob Pohl Chapter of Friends of the Upper Mississippi River Refuge. Under this alternative, Trempealeau NWR would continue to promote and foster the current relationship.

Strategies:

1. Attend Bob Pohl Chapter and Friends of the Upper Mississippi River board meetings.
2. Continue to operate the bookstore for the Bob Pohl Chapter.
3. Seek assistance from the Bob Pohl Chapter and the Friends of Upper Mississippi River for public events and habitat management projects.

Objective 4.3: Volunteers

Continue to support an active volunteer program and increase the number of volunteers and hours by an average of 5 percent per year through 2022. Recruit volunteers from a variety of backgrounds. Keep volunteers active in all Refuge programs.

Rationale: Volunteers are a valuable asset and provide thousands of hours of labor, completing tasks that would otherwise go undone. The Refuge has a corps of dedicated volunteers that is committed to protecting and enhancing the Refuge. Staff is unlikely to increase in the future and volunteers may be called upon to perform more of the public use, biological surveys, and habitat work that the staff can not accomplish. This objective reflects an increase in recruiting, retaining and rewarding volunteers.

Strategies:

1. Keep volunteer contact information current. Contact each volunteer at least once annually whether they participated that year or not.
2. Have clear expectations and instructions for each volunteer and each task.
3. Train volunteers to effectively conduct biological surveys, and habitat management. Ensure that volunteers receive the same safety training as paid staff.
4. Provide an identity for volunteers with uniforms and standard nametags.
5. Recruit volunteers with a range of backgrounds and match their skills with appropriate tasks.
6. Recognize and thank volunteers for their efforts. Ensure that they feel they are a contributing part of the staff team.



Culvert replacement at Trempealeau NWR. USFWS

7. Hold an annual volunteer appreciation banquet.
8. Keep a current volunteer news and recognition bulletin board in the office building.

Objective 4.4: Partnerships

Continue to fund two to three projects each year to reduce sedimentation in the upper Trempealeau and Buffalo River watersheds. Meet with landowners as requested and as staff and time permits. Coordinate with Perrot State Park as issues arise.

Rationale: Opportunities for upper watershed improvements in northern Trempealeau and Buffalo Counties are abundant. These projects are important to reducing sediments flowing into the Trempealeau and Buffalo Rivers and ultimately the Mississippi River. Landowners are supportive and many are on a waiting list of projects.

Strategies:

1. Meet as needed with Perrot State Park staff to coordinate land management and public use issues.
2. Monitor three conservation easements annually for compliance and to assess habitat management needs.
3. Maintain a waiting list of private landowners with interest in participating in programs.

Goal 5: Administration and Operations

We will seek adequate funding, staffing, and facilities; and improve public awareness and support to carry out the purposes, vision, goals, and objectives of the Refuge.

Objective 5.1: Entrance Road Flooding

Maintain the existing road and continue to use the Marshland access when the main road is impassable.

Rationale: Staff have access to the Refuge when the main road is flooded. Access for the public is limited. This objective reflects the current management direction.

Strategies:

1. Maintain and repair existing roads as needed to provide year-round staff access.
2. Continue to close the main entrance road when it is flooded.

Objective 5.2: Facilities

By 2009, replace the existing shop with a similar sized building.

Rationale: The shop facility is 70 years old, is inadequate for current operations and presents some safety concerns.

Strategies:

1. Replace existing shop with a similar sized facility that includes a tornado shelter, fully accessible rest room, lockers for staff, storage, office, workshop, and vehicle maintenance facilities.
2. Ensure that Refuge office and maintenance needs are reflected in budget needs databases.
3. Continue to maintain Service-owned facilities using annual maintenance budget allocations.

Objective 5.3: Staffing

Maintain current permanent, full-time staffing of four people.

Rationale: This objective reflects the no action or current direction alternative. Like all land management, Refuge management is labor intensive and labor costs represent over 95 percent of the base operations funding received each year. Thus, staffing levels are tied to budget

appropriations from Congress and budget allocations from the national and regional offices of the Service and could remain the same or go down.

Strategies:

1. Ensure that staffing needs are incorporated in budget needs databases

Objective 5.4: Operations and Maintenance Needs

Complete annual review of Refuge Operations Needs (RONS) and Service Assessment and Maintenance Management System (SAMMS) databases to ensure they reflect needs of the current direction.

Rationale: The RONS and SAMMS databases are the chief mechanisms for documenting ongoing and special needs for operating and maintaining a national wildlife refuge. These databases are part of the information used in the formulation of budgets at the Washington and Regional levels, and for the allocation of funding to the field. It is important that the databases be updated periodically to reflect the needs of the Refuge and in particular the objectives and strategies elsewhere in this alternative.

Strategies:

1. Update databases as needed or at least once annually.

2.4.3 Alternative B: Wildlife and Habitat Focus**Goal 1: Landscape**

We will strive to maintain and improve the scenic and wild character, and environmental health of the Refuge.

Figure 7 represents habitat under Alternative B and Figure 8 on page 47 represents public use under this alternative.

Objective 1.1: Land Acquisition

By 2022, acquire from willing sellers the remaining 340 acres within the approved boundary as delineated in the 1983 Master Plan (USFWS 1983). The proposed acquisition includes 340 acres within the approved boundary of the Refuge and approximately 12 acres outside of the current approved boundary. These latter acres would be added under the Regional Director's authority. (See Figure 2 on page 9.)

Figure 7: Alternative B (Wildlife and Habitat Focus), Habitat

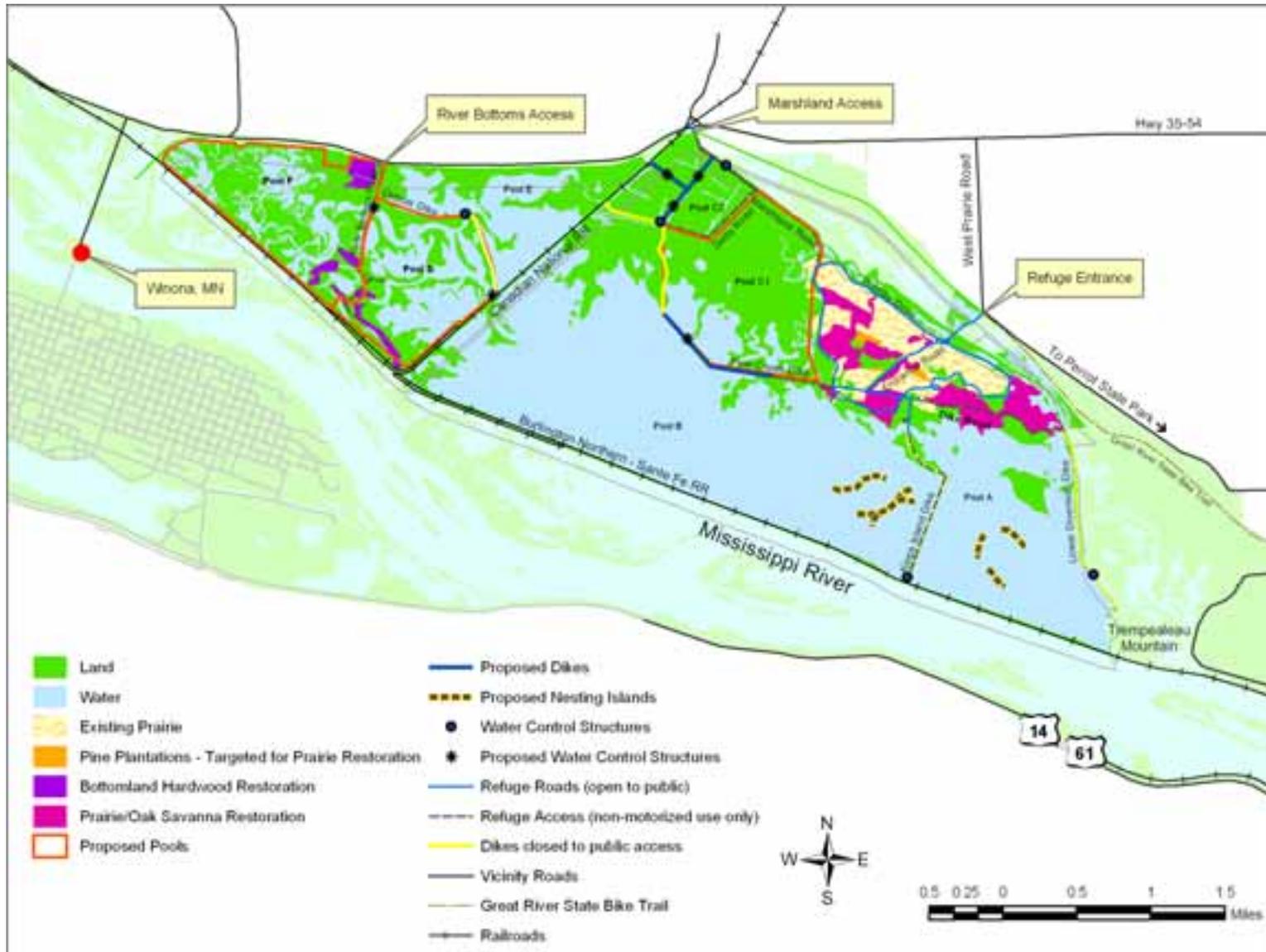
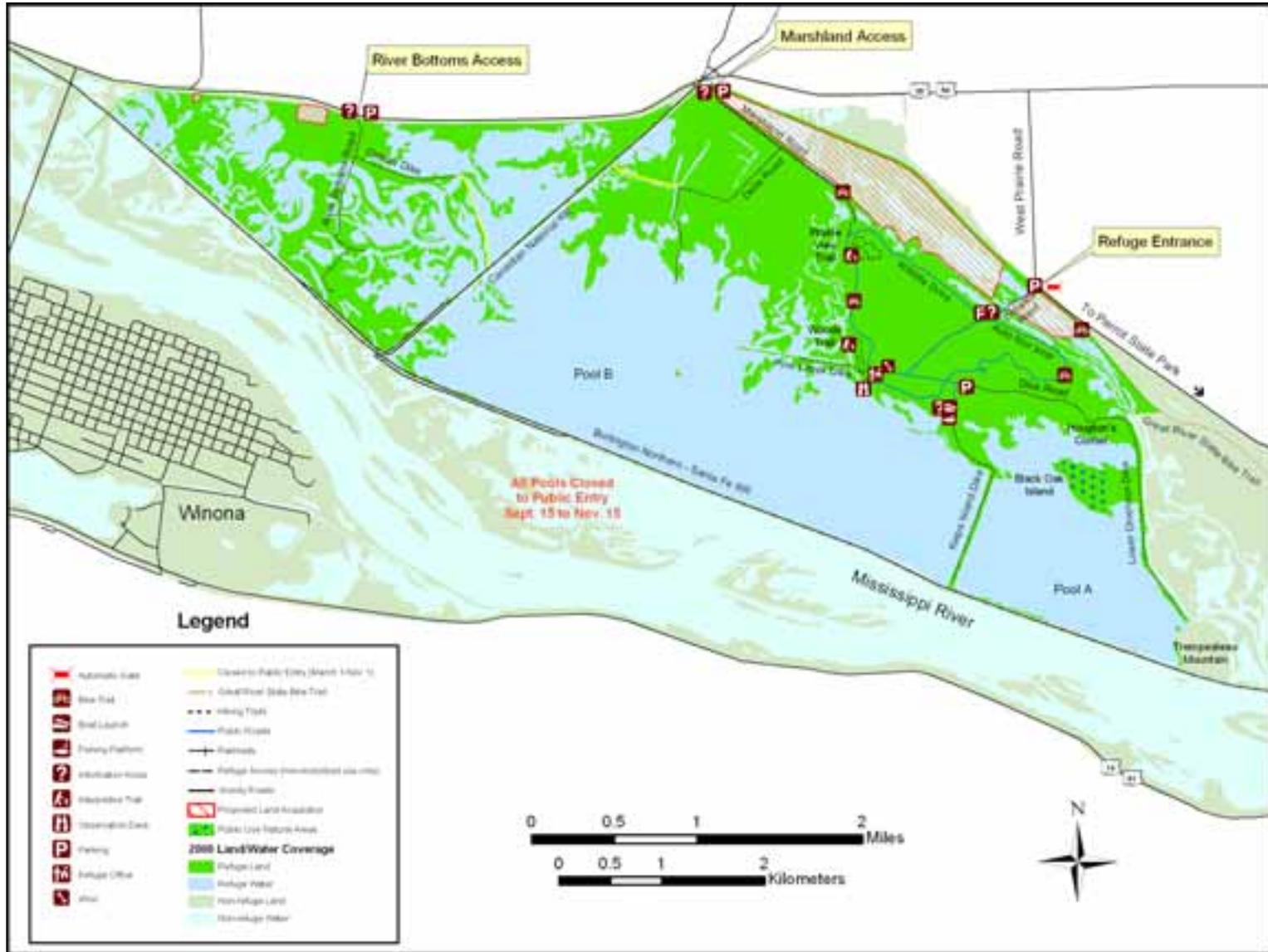


Figure 8: Alternative B (Wildlife and Habitat Focus), Public Use



Alternative B: Wildlife and Habitat Focus

Rationale: Land acquisition can be a cost effective tool to ensure protection of important fish and wildlife habitat and to close gaps in the existing boundary. All of the properties in question are in the floodplain and subject to sporadic flooding. The system of dikes, constructed in the early 1900s to divert the Trempealeau River and now part of the Refuge, tend to exacerbate flooding on adjacent properties. Acquiring these lands would alleviate conflicts with flooding on adjacent private property and allow the Trempealeau River to move more freely within its existing floodplain. Additionally, some of these lands are remnants of pre-lock and dam floodplain forest, a rare resource worthy of protection.

Strategies:

1. Maintain contact with landowners within approved boundary to keep them informed of the Refuge's interest in acquiring their property.
2. Keep Regional Realty Specialist informed of any changes to property status.
3. Seek Land and Water Conservation Fund appropriations (approximately \$510,000 at \$1,500 per acre)

Objective 1.2: Refuge Boundary

Maintain the integrity of the Refuge boundary by inspecting signs annually, correcting deficiencies in signage, and installing an automatic gate at the main entrance.

Rationale: Maintaining and enforcing a boundary is one of the basic and critical components of Refuge management to ensure the integrity of an area over time. Without attention to this basic task, there is a tendency for adjacent development and use to creep onto Refuge lands and waters. This encroachment includes tree cutting, dumping, construction, storing equipment and materials, and mowing. In addition, there are a few boundaries that remain unclear creating confusion by the public using these lands especially for hunting and trapping.

Strategies:

1. Travel the boundary every year to inspect signs and correct deficiencies.
2. Request a survey of the north boundary along Highway 35 between Marshland and River Bottoms Road. Correctly post the boundary.



Prairie cone flower. USFWS

3. Correctly post west boundary of River Bottoms property, surveying if necessary.
4. Install an automatic gate that will close and open at sunset and sunrise to protect facilities and discourage illegal, after-hours activities.

Objective 1.3: Flood Protection

By 2008, implement the following flood management policy: "When the Mississippi River is in flood stage, do not allow water to enter Refuge pools through the lower diversion dike structure, the Marshland Road inlet or any other facilities.

Rationale: The BNSFRR dike forms an integral part of the barrier dike system that impounds water within Trempealeau NWR. This dike was breached and over-topped in 1965 and was repaired by the railroad. During the near-record flood in the spring of 2001, floodwaters rose to the bottom of the rails at several points, but the dike held. Additional rock was added at several points. Railroad personnel were concerned about the large head of water against their dike and requested that the Service let water into the Refuge to equalize the pressure. In response, gates on the water control structure in the lower diversion dike near Trempealeau Mountain were opened as well as gates on the Marshland Road inlet structure, allowing water from the Trempealeau River to enter the Refuge pools. Water elevations on the Trempealeau River were several feet lower than on the Mississippi River at points upstream where pressure on the dike was greatest. As a result, the quantity of water that could be let

into the Refuge pools was insufficient to offer protection for the railroad dike at the critical locations.

Opening the gates and allowing floodwaters to enter the Refuge caused serious damage to biological resources and infrastructure as follows:

1. High inflows damaged the electric weir and one lift gate on the lower diversion dike water control structure.
2. Higher water levels in Refuge pools coupled with strong winds caused bank erosion.
3. Without the electric weir, carp and other rough fish entered the Refuge pools.
4. Floodwaters uprooted and destroyed beds of emergent wetland.
5. Interior Refuge roads and dikes suffered damage from high water.
6. Kiep's Island spillway was damaged and required extensive repairs.

This incident clearly demonstrated that the water management infrastructure at Trempealeau NWR affords little opportunity for management actions that can reduce Mississippi River flood impacts on the BNSFRR dike. Letting flood waters into Pool A through the lower diversion structure damaged emergent vegetation, and may have accentuated bank erosion on the railroad and interior dikes while offering virtually no additional protection to the BNSFR dike.

Strategies:

1. Meet with BNSFRR officials to explain the policy and explore other alternatives to protect their dike.

Objective 1.4: Natural Area Management

By 2010 develop a management plan, including a habitat survey for Black Oak Island. By 2022, remove all invasive plants from Black Oak Island.

Rationale: The Refuge has done little in the way of monitoring or research of the existing Public Use Natural Area on Black Oak Island. Although the main goal of the area is the preservation of mature, eastern deciduous forest, preservation is a form of management. A management plan needs to be written to guide monitoring and research of current habitat conditions and changes since the area was designated 20 years ago. Completing a plan would identify monitoring protocols, identify any habitat

management needed to retain original biological values or address threats, address special public use considerations, and identify ways to foster public awareness and appreciation of this unique area.

Strategies:

1. Map vegetation on Black Oak Island
2. Remove all invasive plants from Black Oak Island.

Objective 1.5: Archeological Resources

Inventory potential sites on a project-by-project basis as needed to facilitate habitat management. Continue on-call law enforcement response.

Rationale: Federal laws, executive orders, and regulations, as well as policies and procedures of the Department of Interior and the Service protect cultural resources on federal lands. Trempealeau NWR has been described as one of the most important archeological sites in the Midwest. Human use of the area dates back 12,000 years. Dozens of sites and more than 6,000 artifacts have been cataloged from various locations. However, the majority of the lands need baseline surveys to document the locations and extent of archeological resources. Habitat management activities involving soil disturbance are often delayed until archeological assessments can be completed.

Strategies:

1. Ensure that funding needs for archeological surveys are incorporated in budget needs databases.
2. Use seasonal administrative closures to limit public access to known sites.

Goal 2: Wildlife and Habitat

Our habitat management will support diverse and abundant native fish, wildlife, and plants.

Objective 2.1: Forest Management

By 2010 develop a Habitat Management Plan incorporating forest management. By 2022 enhance 50 acres of upland hardwood forest and 500 acres of floodplain hardwood forest in three separate blocks. Remove all Scotch pine and pine plantings.

Rationale: Hardwood forests on the Refuge have been altered by a number of factors including invasion by exotic species, oak wilt, and agriculture.

The forest canopy in many areas is dominated by black locust and the native shrub component, which should include species such as dogwoods, hazel, viburnums and others, has been replaced by European buckthorn, black locust, Siberian pea, and Tartarian honeysuckle. Bottomland forests are not regenerating and large nesting trees and cavities are becoming less abundant. A Habitat Management Plan is needed to integrate forest and wildlife objectives, and to identify management prescriptions such as harvest, planting, fire and invasive plant control. This objective calls for an aggressive program to remove invasive plants and replant appropriate native vegetation.

Strategies:

1. Survey upland forest stands for archeological resources.
2. Continue restoration of River Bottoms Road sites by planting new age classes of swamp white oak seedlings every 3 years until natural regeneration is occurring.
3. At River Bottoms Road sites, inter-plant other native seedlings as available, focusing on mast-producing species. Coordinate seed collection from local floodplain sites and seedling production with Army Corps of Engineers foresters.
4. Annually treat 5 acres each of upland and floodplain forest using mechanical and chemical means as appropriate to remove black locust and European buckthorn. By 2022, black locust and European buckthorn will occupy <10 percent of the canopy in upland forest and <20 percent in floodplain forest.
5. Work with Army Corps of Engineers foresters to identify stands and prescriptions for timber sales. Permit commercial harvest of black locust and pine.
6. By 2010, clear down timber from burn units by permitting firewood cutting.
7. Protect swamp white oak in pool C2 by lowering water level during the growing season to avoid prolonged flooding.
8. With others, seek research on floodplain forest regeneration and restoration of forest habitats to benefit cavity dependent species.

Objective 2.2: Wetland Management

Working with others and through a more aggressive Refuge program, seek a continuous improvement in the quality of water flowing into and out of the Refuge in terms of long-term monitoring of dissolved oxygen, major plant nutrients, suspended material, turbidity, pH, temperature, sedimentation and contaminants. By 2022, develop and maintain infrastructure to allow management of 5,500 acres of wetlands as described below:

Two out of every 5 years, provide an average of 275 acres of moist soil/mudflat habitat primarily for shorebirds, waterfowl, and wading birds.

By 2022, provide an average of 2,750 acres of emergent marsh habitats on the Refuge. This habitat will be characterized by water depths ranging from 3 to 30 inches interspersed with stands of cattail, bulrush, phragmites, arrowhead, pickerelweed, water lily and American lotus. Submerged aquatic plants such as coontail and sago pondweed will usually be present. Emergent marsh habitat will be apportioned among the refuge pools as follows:

- # Pool A –250 acres
- # Pool B – 1,050 acres
- # Pool C1 –500 acres
- # Pool C2 – 150 acres
- # Pool D –300 acres
- # Pool E –300 acres
- # Pool F – 200 acres.

Continue to provide approximately 1,550 acres of deepwater marsh habitat among Refuge pools. This habitat will generally consist of open



Wetland habitat at Trempealeau NWR. USFWS

water greater than 30 inches in depth. Submerged vegetation such as coontail, sago pondweed, and wild celery is desired. These habitats will provide open water rafting areas for diving ducks and foraging habitat for pelicans, cormorants, Bald Eagles, and other fish-eating birds. Deepwater habitat would be distributed among Refuge pools roughly as follows:

- # Pool A – 350 acres
- # Pool B – 1,000 acres
- # Pool D – 150 acres
- # Pool F – 50 acres.

Rationale: Trempealeau NWR includes 6,226 acres, of which about 5,500 acres, or 90 percent, are wetlands. These wetlands have benefited from many years of protection afforded by railroad and barrier dikes that exclude damaging floods so devastating to aquatic plants in adjacent Mississippi River backwaters. As a result, wild rice, cattail, and other plants important to marsh wildlife have flourished in many areas.

Construction of a series of locks and dams on the Mississippi River in the 1930s created a deeper, relatively stable water system, especially during the summer. Although flooding was not a serious problem at Trempealeau NWR because of barrier dikes, the low water cycle, so important to aquatic plants dependent on mud flats and sandbars for their reproduction, was virtually eliminated. With stable and higher water levels, wind and wave action gradually eliminated aquatic plant beds, particularly in the lower Refuge pools. Additionally, rough fish, primarily common carp, are present throughout the pool system. Carp have a major impact on aquatic plant growth by rooting out plants and suspending sediments while feeding.

Strategies:

1. By 2010, write a Habitat Management Plan that includes strategies for managing water levels in each impoundment.
2. Once every 5 years when funds for pumping are available, reduce water levels in pool A by pumping to expose 50 percent (350 acres) of the bottom. Drawdown would begin in May, coinciding with shorebird migration, and continue through the fall until freeze-up. Low water conditions would create condi-



Lead plant. USFWS

tions for a partial kill of rough fish. Water levels would return to full pool over the winter through dike and groundwater seepage.

3. Once every 5 years when funds for pumping are available, (alternating with pool A) reduce water elevations in Pool E when wild rice has reached the floating leaf stage in late May or early June. Maintain water level as low as possible through late August, and then gradually restore levels to maximize food availability for waterfowl, rails, and wading birds.
4. Avoid prolonged flooding of swamp white oaks in Unit C2 by lowering water level below the root mass of these trees during the growing season.
5. Maintain stable or declining water levels in pools B and E, June through August to accommodate over-water nesting species, especially Black Terns.
6. Construct a dike with a spillway and water control structure between Delta Point and Pine Creek dike. Raise and widen Delta and Pine Creek roads to serve as dikes for a new sub-impoundment C1 totaling about 375 acres.

7. Construct a water control structure in the former “Green Bay culvert” thereby creating Impoundment D, about 450 acres.
8. Construct a water control structure in the River Bottoms Road dike to create Impoundment F of about 450 acres. Raise and widen River Bottoms Road south of its junction with Oxbow dike.
9. Subdivide C2 into three manageable units.
10. When conditions allow, drawdown Pool B using gravity flow through Pool A into the Trempealeau River. Once every 7 years pump Pool B as low as possible with existing pumps to improve aquatic plant growth.
11. Hire one permanent seasonal tractor operator to perform annual maintenance of dikes, pumps and water control structures.
12. Hire a Private Lands Biologist to fully implement the Partners for Wildlife Program in the Trempealeau and Buffalo River Watersheds to improve water quality entering the Refuge.
13. Construct five islands each, in the eastern portion of pools A and B. Material for the islands would be dredged from within each pool or from the Mississippi River and pumped through the BNSFRR dike. In addition to providing nesting habitat for various species, islands would break wind and wave energy and decrease turbidity
14. Continuously monitor water quality at six locations using dataloggers.
15. When feasible, use commercial fishing and winter drawdowns to reduce populations of rough fish in pools A and B.
16. Work with USGS and the National Weather Service to re-establish a permanent weather station.

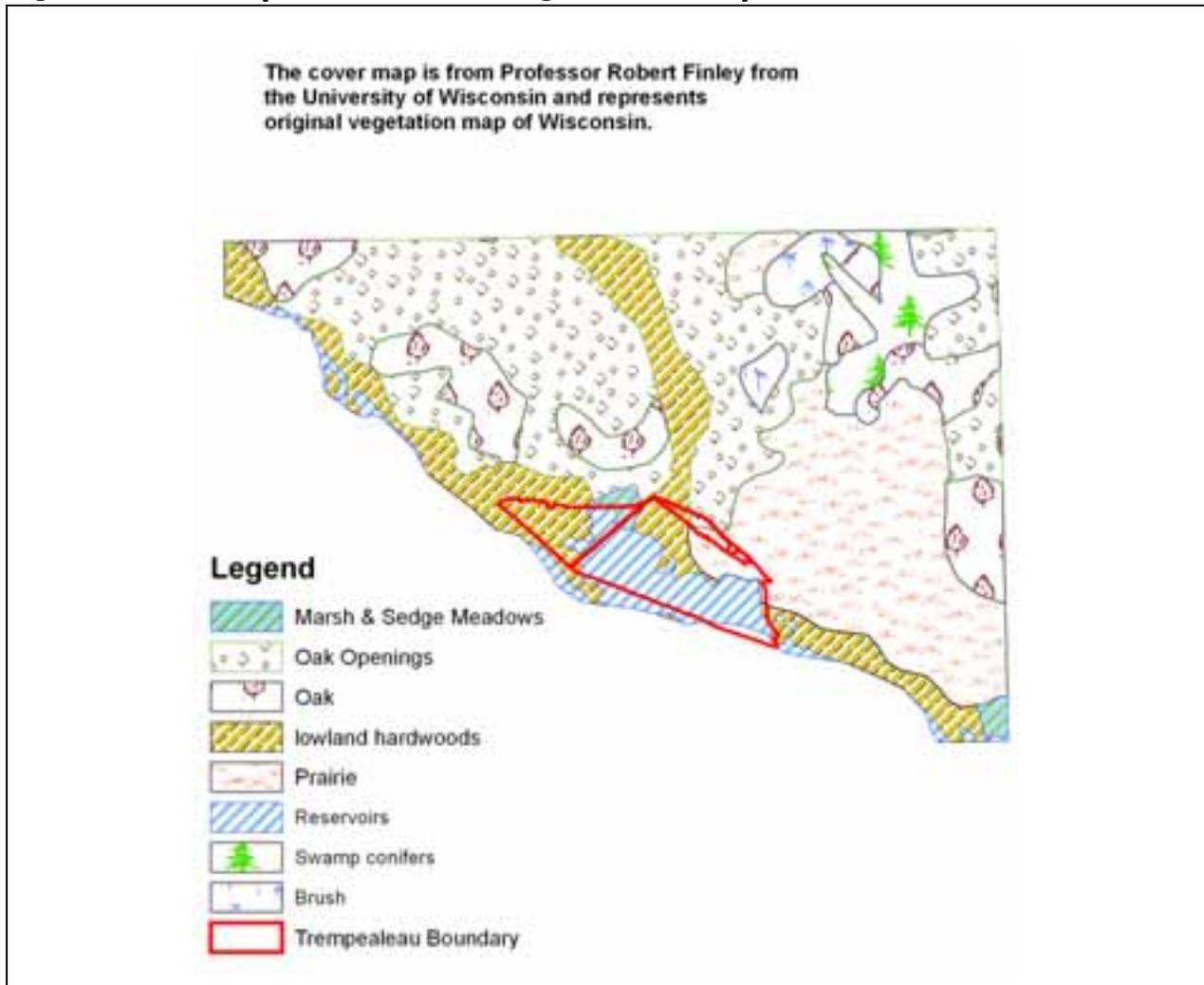
Objective 2.3: Grassland Management

Maintain existing 335 acres of prairie, and by 2022 restore 250 acres of prairie/oak savanna habitat. Prairie component will have native cool and warm season grasses and wild flowers typical of undisturbed sand prairie in western Wisconsin. Oak savanna will comprise 20 to 40 percent of the prairie area with an open canopy of native, uneven aged oaks.

Rationale: The Fish and Wildlife Service is interested in maintaining and/or restoring ecological diversity to the lands managed in the National Wildlife Refuge System. The goal for many refuges is to restore habitats to pre-European settlement conditions, understanding that modern day circumstances or refuge purposes may preclude this in many areas. Native vegetation that was originally in place prior to various attempts at habitat improvement is likely the vegetation that will do best on the land. Historical records (1895-1976) and records from the U.S. General Land Office (1840s and 50s), indicate that prior to settlement, upland areas within the Refuge were predominantly prairie and oak savanna (see Figure 9). Much of the upland area had been converted to agriculture before the Refuge purchased the property in 1936. Under Refuge management in the 1940s through 1960s, various pine species, Siberian and Chinese elms, black locust, Siberian pea, and Tartarian honeysuckle were planted to reduce soil erosion and provide wildlife habitat in tune with the wildlife management practices of that era. In the 1970s, many of the oaks in the savanna were removed when oak wilt disease killed them.

Today the invasive nature of black locust and the addition of other invasives such as buckthorn have created forested areas on the upland sections of the Refuge consisting primarily of non-native species. Three hundred acres of the original 700 acres of prairie/oak savanna remain on the Refuge today. The mature black locust in the forested areas provide a continual seed source, resulting in a continuous invasion of black locusts on the prairie. Oak wilt disease is still present and has killed many of the mature oaks remaining in the uplands. Likewise, prairies and oak savannas on private lands are becoming scarce as land is rapidly developed. The remnant prairies on the Refuge may soon be the only examples in southern Wisconsin.

Prairie and oak savanna restoration in these areas will benefit many species listed as Regional Resource Conservation Priority (RRCP) species including Mallards, Blue-winged Teal, Grasshopper Sparrow, Orchard Oriole, Red-headed Woodpecker, and Eastern Meadowlark. Many species of birds, mammals, reptiles, and amphibians will forage in, and meet all or part of their life requirements in prairie and oak savanna habitats.

Figure 9: Pre-European Settlement Vegetation, Trempealeau NWRStrategies:

1. Use prescribed fire as described in the Fire Management Plan (USFWS, in preparation in 2007) to control encroachment by cool season exotic grasses, forbs and woody shrubs. Modify existing firebreaks where necessary to incorporate timber stands targeted for restoration to oak savanna.
2. Expand flea beetle release program to reduce leafy spurge in all prairie/oak savanna habitats. Leafy spurge will occupy <10 percent of any prairie/oak savanna unit by 2022.
3. Annually, convert a minimum of 5 acres of black locust to prairie using mechanical and chemical means as appropriate. Use commercial harvest to remove merchantable trees where practical. If necessary plant native grasses and forbs to enhance restoration.
4. Remove understory of invasive shrubs from oak savanna habitats. By 2022, invasive plants will occupy <10 percent of oak savannas.
5. By 2022, plant at least 5 acres of oaks and other hardwood seedlings where natural regeneration is insufficient to restore oak savanna. Emphasize bur oaks over red and black oaks to minimize further losses from oak wilt.
6. By 2022, decrease “edge” habitat by removing all pine plantings from within prairie units.

7. Hire a permanent, full-time seasonal biological technician to oversee prairie/oak savanna restoration including monitoring and invasive plant control.
8. Use volunteers and school groups to collect and redistribute native grass and wildflower seed.

Objective 2.4: Invasive Plants and Animals

Reduce abundance of invasive and non-indigenous plants as specified in Table 2. If conditions allow, once every 5 years prior to drawdown of Pool A, remove invasive carp and other rough fish using commercial fishing.

Rationale: Invasive plants continue to pose a major threat to native plant communities on the Refuge and beyond. Invasive plants displace native species and often have little or no food or habitat value for wildlife. The result is a decline in the carrying capacity of the Refuge for native fish, wildlife and plants, and a resulting decline in the quality of wildlife-dependent recreation. This objective addresses invasive plants through mapping and monitoring, and through mechanical and biological control. Invasive plant control is labor intensive and potentially costly. New staff are proposed in addition to relying on volunteers and outside funding. Invasive animals such as zebra mussels and Asian carp pose a looming threat to native aquatic ecosystems. These species are not yet found on the Refuge, but careful monitoring, maintenance of the electric weir, installation of additional fish barriers and commercial fishing are tactics to slow down their introduction.

Strategies:

1. Hire a permanent, full-time biologist to conduct an inventory and prepare baseline maps of invasive plant infestations, and to undertake mechanical removal of invasive plants.
 2. As part of a Habitat Management Plan, write an invasive plant control and management step-down plan (Integrated Pest Management Plan) that identifies priority areas and methods of control. Emphasize mechanical and biological control.
 3. Seek seasonal staff and funding to accelerate current control and applied research through interagency partnerships, volunteer programs, and public education.
4. Continue to work with the Department of Agriculture, other agencies, the state, and other refuges in securing insects for release on the Refuge and on private lands within the Trempealeau and Buffalo River Watersheds.
 5. Seek grants, cost-sharing, or special funding opportunities for invasive plant removal.
 6. Build a GIS database of invasive plants and update it every 3 years.
 7. When feasible, permit commercial fishing for rough fish in Pool A prior to each drawdown.
 8. Monitor all pools for invasive fish, aquatic plants and mollusks.
 9. Investigate the feasibility of implementing an exchange program for gardeners with loosestrife planted in ornamental gardens.
 10. Secure outside funding to set up rearing cages on private lands and begin distribution of beetles to landowners within the Trempealeau and Buffalo River Watersheds.
 11. Continue to serve as a source of flea beetles for other agencies and landowners who have infestations of leafy spurge.
 12. Explore the installation of fish barriers at all water control structures.

Objective 2.5: Monitor and Investigate Fish, Wildlife and Plants and their Habitats

By 2010, update the Wildlife Inventory Plan to include all federal and state listed species, species of regional conservation concern, furbearers, and deer. Increase partnerships with agencies and universities and encourage applied research on the Refuge.

Rationale: Monitoring is essential to understanding the status and trends of selected species groups and habitats. This in turn provides some indication of overall biological integrity, diversity, and environmental health of the Refuge, and is critical in planning habitat management and public use programs. This objective represents a more aggressive biological program on the Refuge and will help meet directives in the Refuge Improvement Act requiring monitoring the status of fish, wildlife, and plant species. Better biological information is also critical to making sound and integrated resources and public use management decisions. The Refuge would continue to support, use, and contribute to monitoring done by the state, U.S. Geological Survey, the Army

Table 2: Management Strategies for Invasive and Non-indigenous Plant Species Under Alternative B

Non-indigenous Plant Species	Prairie and Oak Savanna	Upland Forest	Floodplain Forest	Wetlands
Leafy Spurge	Expand flea beetle release program. Reduce infestation to 10% or less of prairie habitats by 2022.			
Black Locust	Convert a minimum of 5 acres of black locust to prairie using mechanical and chemical methods. Prevent any new spread into existing prairie areas.	Remove black locust from canopy and understory. Reduce occurrence to 10% or less of upland forest.		
European Buckthorn, Siberian Pea, Tartarian Honeysuckle	Remove understory of these species from oak stands targeted for oak savanna restoration using appropriate mechanical and chemical means. Reduce occurrence to 10% or less of oak savanna habitat by 2022.	Remove these species from understory using appropriate mechanical and chemical means. Reduce occurrence to 10% or less of understory by 2022.	Remove understory of European buckthorn from stands using appropriate mechanical and chemical means. Treat 5 acres per year.	
Scotch Pine	Remove all trees.	Remove all trees.		
Red and White Pine	Remove all trees from prairie and oak savanna habitats.	Remove all pine plantations using commercial harvest where appropriate. Restore landscape to oak savanna.		
Purple Loosestrife			Raise 200 pots of defoliating beetles annually for release at 5 new sites on the Refuge. Use volunteers when available.	Same as for Floodplain Forest.

Corps of Engineers, neighboring refuges and others to help fill the gaps in status and trends information for fish, reptiles, amphibians, birds, invasive plants, land cover and other environmental factors like water quality.

Strategies:

1. Engage other experts and partners to develop and implement a Wildlife Inventory Plan that includes all federal and state listed species, regional conservation species, furbearers, and deer.
2. Hire a permanent, full-time biologist to conduct surveys and process data.
3. Work with partners, volunteers, students and staff to store, summarize and, as appropriate, analyze survey data annually.
4. Continue to work with universities, states, USGS, and the COE to share data on species and habitats.
5. Participate in formal coordination meetings with USGS to share biological data, monitoring and monitoring expertise.
6. Work with the Upper Mississippi NWFR GIS biologist and the Winona District biologist to coordinate equipment, staff, survey schedules, and data analysis.

7. Foster partnerships with colleges and universities to encourage graduate research projects.
8. Continue to use volunteers to complete certain surveys like waterbird counts, and deer surveys.
9. By 2010, complete a Habitat Management Plan that integrates monitoring results with habitat management actions
8. Work with Wisconsin DNR to assess the potential for reintroduction of Massassagua rattlesnakes.
9. Increase education and outreach targeting threatened and endangered species and their needs.

Objective 2.6: Threatened and Endangered Species Management

Continue to monitor Bald Eagles. By 2009, evaluate all state listed species for potential occurrence on the Refuge and the need for monitoring or management action.

Rationale: It is Service policy to give priority consideration to the protection, enhancement, and recovery of threatened and endangered species on national wildlife refuges. This objective represents a more aggressive approach to achieving this policy, and also reflects the high public interest in these species. Currently there are no listed species occurring on the Refuge. Efforts would be expanded to determine the status of Massasagua rattlesnakes (candidate) and appropriate state listed species.

Strategies:

1. Consider the needs of threatened, endangered, and candidate species in all habitat and public use management decisions.
2. Continue to consult with the Service’s Ecological Services Office on all actions that may affect listed species.
3. In the Wildlife Inventory Plan address monitoring for all listed or candidate species, and other species of management concern to help preclude listing.
4. In the Habitat Management Plan, identify steps needed to ensure populations of listed or candidate species are sustained in support of delisting or to preclude listing.
5. Continue to monitor Bald Eagle nesting and success.
6. Close 100 meter radius around active Bald Eagle nests to public entry February 1 to July 1.
7. Where feasible, protect large nest trees from prolonged flooding and erosion.

Objective 2.7:Deer Management

By 2010, update the Wildlife Inventory Plan and Habitat Management Plan to include management and monitoring of white-tailed deer and related browse impacts. Base harvest levels of deer on annual population monitoring and evaluation of habitat quality.

Rationale: In general, Refuge management practices emphasize the protection of plants and wildlife to ensure a diversity of species that naturally or historically occurred. White-tailed deer present a special situation in that harvest and the vast expanses of agricultural lands around the Refuge greatly influence population levels and resulting vegetation impacts on the Refuge. Deer tend to move on and off the Refuge in response to hunting pressure and food availability on surrounding lands. Browse impacts have been severe on the Refuge especially prior to the 1980s, after which expanded Refuge hunts were implemented to reduce deer and allow the vegetation to recover. Deer numbers are unnaturally high in surrounding lands and the State of Wisconsin has been in an active herd reduction program since the discovery of chronic wasting disease in 2003. The special interests of the State in the management of resident big game animals are recognized and management actions are coordinated with State objectives where possible. Harvest on surrounding lands would be hampered if coincident pressure does not occur on the Refuge. This objective represents a balanced approach to limiting over-browsing and assisting the State in managing the distribution of hunting pressure and harvest rates.

Strategies:

1. Update the Wildlife Inventory Plan to include white-tailed deer monitoring, including fawn counts.
2. Include monitoring of browse impacts in Habitat Management Plan.
3. With partners, investigate the most current, efficient and appropriate technologies and protocols to monitor browse and herd size.



Observation deck at sunset, Trempealeau NWR. USFWS

4. Investigate funding mechanisms and partnerships to contract aerial, forward looking infra-red (FLIR) surveys to count deer once every 5 years.
5. Model percent change in browse impacts over time.
6. Encourage research by universities and partner agencies on deer-habitat interactions including implications to invasive plant abundance.
7. Work closely with Wisconsin DNR to coordinate information exchange, planning, and management of CWD on nearby lands.
8. Continue to use a managed public hunt of white-tailed deer to maintain acceptable levels of browse.
9. Update the Hunt Plan to include white-tailed deer hunting.
10. Seek expert advice to model white-tailed deer population dynamics to determine appropriate harvest levels.
11. Base sex and age ratio of harvest requirements on population modeling and advice from Wisconsin DNR.
12. Update Visitor Service Plan to improve safety and require all pedestrians to wear blaze orange during the gun hunt.
13. Investigate options for closing the Refuge to non-hunting visitors during key hunting times.
14. Improve signage and develop a Refuge-specific hunting safety brochure.
15. Continue issuing over-the-counter permits for late season archery.
16. Continue to operate a check station on opening weekend.

17. Require mandatory reporting of hunter success or loss of 1 year hunting privileges.
18. Continue to follow Wisconsin guidelines for season dates and times.

Objective 2.8: Furbearer Management

Update the Furbearer Management Plan by 2009 and continue to manage muskrat, beaver, and raccoon populations at levels where damage to dikes and interference with water management and bird banding operations is limited.

Rationale: A furbearer trapping program is in place for muskrat, mink, raccoon, opossum, and beaver. The Refuge is divided into 15 muskrat and four beaver units. Trapping units are awarded to the highest bidder at an auction held in October. The entire Refuge is open to trapping with the exception of an area inside and immediately adjacent to the wildlife drive. Harvest of muskrats by trappers helps reduce damage to Refuge dikes from tunneling and den building. Beaver trapping reduces plugging of culverts and water control structures and prevents excessive damage to desirable trees adjacent to wetlands.

Strategies:

1. Work with public to update the Furbearer Management Plan by 2009.
2. Update the Wildlife Inventory Plan to include muskrats, beavers, and otters.
3. Use harvest data to determine appropriate harvest levels to minimize damage to dikes and structures.
4. As needed adjust trapping activities to avoid conflicts with other hunts or Refuge management.
5. Remove problem animals from banding sites as needed to meet banding objectives.
6. Work with Wisconsin Trapping Association to provide training for all trappers using the Refuge. Encourage communication and cooperation among trappers.

Goal 3: Public Use

We will manage public use programs and facilities to ensure sustainable, quality, hunting, fishing, wildlife observation, wildlife photography, interpretation, and environmental education opportunities for a broad cross-section of the public; and provide opportunities for the public to use and enjoy the Refuge for traditional and appropriate non-wildlife dependent uses that are compatible with the purposes for which the Refuge was established and the mission of the Refuge System.

Objective 3.1: Wildlife Observation and Photography

Provide year-round opportunities to observe and photograph wildlife and habitat by improving and maintaining two existing hiking trails, a 4.5-mile auto tour route, and the existing observation deck. Close pools to public access September 15 to November 15 to limit disturbance to rest areas for migratory waterfowl.

Rationale: Wildlife observation and photography are priority public uses of the Refuge System and are to be encouraged when compatible with the purposes of the Refuge. The Refuge provides outstanding wildlife observation opportunities. Maintaining existing facilities will provide opportunities for people to view wildlife throughout the year. Opportunities for wildlife photography are abundant without special facilities. Finally, an entrance fee may help to provide resources for improving visitor services, but careful consideration must be given to the cost and benefits for both the Refuge and visitors.

Strategies:

1. Develop a Visitor Services Plan by 2009.
2. Provide a general brochure with maps and information for all trails.
3. Enhance website information for compatible wildlife-dependent recreational opportunities.
4. Maintain and enhance the 4.5-mile auto tour loop.
5. Monitor and maintain existing Woods Trail.
6. Maintain the Prairie View Trail.
7. Continue to prohibit all ATVs and snowmobiles from Refuge lands.
8. Investigate the cost/benefit ratio of implementing an entrance fee program.

Objective 3.2: Great River State Trail (Bicycling)

Maintain the existing portion of the Great River State Trail that traverses the Refuge.

Rationale: The Great River State Trail is a popular bike trail and is likely to become more popular as the public eye turns more toward health and fitness activities. In keeping with the wildlife and habitat focus of this alternative, the current use of the trail would continue, but no additional efforts would be undertaken to improve or expand the trail.

Strategies:

1. Maintain existing gravel road surface.

Objective 3.3: Interpretation

Maintain existing interpretive signs, brochures and other materials for the public. Provide minimal staff-led interpretive programming on an as-requested basis. Emphasize invasive plant and habitat management in all interpretive materials and programs.

Rationale: Interpreting the resources and challenges of the Refuge to the general public is important to influencing the future well-being of the Refuge and the natural world. This alternative would provide for the basic needs necessary to inform and educate visitors, and help them make the most of their Refuge visit while protecting sensitive resources. Interpretive materials and programming would be reduced in favor of allowing more staff emphasis on habitat management.

Strategies:

1. By 2009, include interpretation in a Visitor Services Plan.



Cyclists using the Great River State Trail. USFWS



Environmental Education Days presented on the observation deck. USFWS

2. Include Refuge regulations on all kiosks.
3. Update signs on all trails and along the wildlife drive auto tour.
4. Continue to issue news releases on special events or temporary changes to regulations.
5. Participate in local area expos, sportsman shows, and other outdoor events to promote the Refuge as requested.

Objective 3.4: Environmental Education

Conduct minimal environmental education programs, focusing staff and resources on wildlife and habitat management.

Rationale: This objective reflects a priority toward wildlife-related management activities versus public use activities and programs. Environmental education is labor intensive and limited staff resources would be focused on habitat and wildlife objectives rather than environmental education.

Strategies:

1. Encourage high schools and universities to utilize the Refuge facilities for curriculum based programs.
2. Participate in educational programs as requested, and as time and staffing permit.

Objective 3.5: Waterfowl Hunting

Maximize resting habitat for migratory birds by closing the Refuge to all waterfowl hunting.

Rationale: Within the context of a larger river system, the Refuge provides important sanctuary for migratory birds. Navigation Pool 6 on the adjacent

Mississippi River has no areas closed to hunting where birds may find respite. Trempealeau NWR functions as the rest area for Pool 6. A system of areas closed to hunting was established on the Upper Mississippi River NW&FR in 1957-58. The system included 14 closed areas, including Trempealeau NWR. Considering the importance of the Mississippi Flyway migration corridor, the closed area system was established to provide migrating waterfowl a network of feeding and resting areas, and to disperse hunting opportunities. After nearly 45 years, declines in habitat quantity and quality, and increased use of the river by people have limited the effectiveness of the existing closed areas making Trempealeau NWR even more critical as a rest stop for migrating birds.

Strategies:

1. Clearly sign boundaries of areas closed to hunting.

Objective 3.6: Fishing

Continue current low-key fishing program. Maintain existing facilities.

Rationale: Fishing is one of the priority uses of the National Wildlife Refuge System and is to be encouraged when compatible with refuge purposes. The demand for fishing at Trempealeau NWR is small because the sport fishery is mainly comprised of bullheads and excellent fishing can be found just off the Refuge on the Mississippi River. Rough fish and management of shallow water impoundments precludes the development of a viable sport fishery in the interior units. The objective reflects the need to direct funds towards wildlife and habitat management rather than public use.

Strategies:

1. Consult with the La Crosse Fishery Resource Office to update the Fishery Management Plan by 2010.
2. Remove sediment and milfoil from around existing fishing platform to improve habitat for fish.
3. See Objective 2.4: Invasive Plants and Animals on page 38 for additional fishery management objectives.

Goal 4: Neighboring Landowners and Communities

We will communicate openly and work cooperatively with our neighbors and local communities to help all benefit from the aesthetic and economic values of the Refuge.

Objective 4.1: Community Outreach

Continue limited community outreach, informing the public with news releases of changes in regulations or other events of interest. Focus staff time on biological surveys and habitat management, but attend career fairs and sportsmen events as time and staffing permit.

Rationale: Rebuilding society's connection with their environment is an important component of long-term resource protection and citizen support is critical to a successful resource management program. This objective reflects an emphasis focusing staff resources on wildlife and habitat management, while keeping the public informed of happenings and events.

Strategies:

1. Continue to issue news releases to local newspapers, radio and television stations for public events, environmental education programs, changes to Refuge regulations, management activities of interest to the public and special wildlife viewing opportunities.
2. Attend career fairs and sportsmen shows as time and staffing permit.

Objective 4.2: Friends Group

By the end of 2008 help establish a "Friends of Trempealeau Refuge" group to provide an independent citizen voice for the protection, conservation, and enhancement of Refuge resources.

Rationale: The Refuge staff is tasked with managing resources within the laws, policies, guidelines and goals set forth for the Refuge. Citizens who have concerns about issues impacting the Refuge are free to voice their opinions and are often in a better position to do so when they come together as a Friends group. Friends groups also provide support by volunteering, fund raising, and educating the public. Friends can be an effective voice for the Refuge within the community. This objective focuses on assisting local citizens in forming an effective Friends group for the Refuge.

Strategies:

1. Invite key individuals to coordinate establishment of a Friends group by setting goals, writing bylaws and establishing 501C3 tax exempt status.
2. Assist new members with mentoring and applications for start-up grants with the National Fish and Wildlife Foundation.
3. Suggest a list of membership and team building projects that would benefit the Refuge.
4. Assist Friends with contacts and introduction to state and federal legislative staffs.
5. Assist Friends group with inventory, set up, and operation of a Refuge bookstore.

Objective 4.3: Volunteers

Continue to support an active volunteer program and increase number of volunteers and hours by an average of 5 percent per year through 2022. Recruit volunteers from university biology and wildlife programs. Focus volunteer efforts on habitat restoration and wildlife surveys.

Rationale: Volunteers are a valuable asset providing thousands of hours of labor completing tasks that would otherwise go undone. The Refuge has a corps of dedicated volunteers that is committed to protecting and enhancing the Refuge. Staff is unlikely to increase in the future and volunteers may be called upon to perform more of the biological surveys and habitat work that the staff can not accomplish. This objective reflects an increase in recruiting, retaining and rewarding volunteers.

Strategies:

1. Keep volunteer contact information current. Contact each volunteer at least once annually whether they participated that year or not.
2. Have clear expectations and instructions for each volunteer and each task.
3. Train volunteers to effectively conduct biological surveys, and habitat management. Ensure that volunteers receive the same safety training as paid staff.
4. Provide an identity for volunteers with uniforms and standard nametags.



Bottomland hardwood reforestation project, swamp white oak planting at Trempealeau NWR. USFWS

5. Recruit volunteers with a background in wildlife biology and focus their efforts on biological work.
6. Recognize and thank volunteers for their efforts. Ensure that they feel they are a contributing part of the staff team.
7. Hold an annual volunteer appreciation banquet.
8. Keep a current volunteer news and recognition bulletin board in the office building.

Objective 4.4: Partnerships

By 2010, hire a private lands biologist to work on reducing erosion on private land in Buffalo and Trempealeau Counties. Coordinate with universities to secure funding for at least one graduate research project every 3 years. Strengthen partnerships with local sportsman and conservation groups by contacting them or attending one meeting annually. Meet twice yearly with Perrot State Park.

Rationale: Opportunities for upper watershed improvements in northern Trempealeau and Buffalo Counties are abundant. These projects are important to reducing sediments flowing into the Trempealeau and Buffalo Rivers and ultimately the Mississippi River. Landowners are supportive and many are on a waiting list of projects. Adding a position to focus on private land projects would improve the ability to complete more projects and provide assistance on other land management issues like control of invasive plants. The objective also would focus on better communication and coordination with partners and would result in sharing expertise, labor, funds, and equipment.

Strategies:

1. Hire a permanent full-time private lands biologist to work on Upper Mississippi River tributary headwaters in Buffalo and Trempealeau Counties to reduce sediment inputs.
2. Meet twice a year with Perrot State Park staff to coordinate land management, and public use issues.
3. Develop partnerships with Universities of Wisconsin and Minnesota, and other local colleges to share resources and to implement graduate level, adaptive management research.
4. Improve coordination and communication with local sportsman and conservation groups.
5. Develop a program for invasive plant control, especially purple loosestrife, on private lands.
6. Monitor three conservation easements annually for compliance and to assess habitat management needs.

Goal 5: Administration and Operations

We will seek adequate funding, staffing, and facilities; and improve public awareness and support to carry out the purposes, vision, goals, and objectives of the Refuge.

Objective 5.1: Entrance Road Flooding

Maintain the existing road and continue to use the Marshland access when the main road is impassable.

Rationale: Staff have access to the Refuge when the main road is flooded. Access for the public is limited. This objective reflects the goal of directing funds towards wildlife and habitat management rather than funding projects that improve public use.

Strategies:

1. Maintain and repair existing roads as needed to provide year-round staff access.
2. Continue to close the main entrance road when it is flooded.

Objective 5.2: Facilities

By 2009, replace the existing shop with a similar sized building.

Rationale: The shop facility is 70 years old, is inadequate for current operations and presents some safety concerns.

Strategies:

1. Replace existing shop with a similar sized facility that includes a tornado shelter, fully accessible rest room, lockers for staff, storage, office, workshop, and vehicle maintenance facilities.
2. Ensure that Refuge office and maintenance needs are reflected in budget needs databases.
3. Continue to maintain Service-owned facilities using annual maintenance budget allocations.

Objective 5.3: Staffing

By 2022, add two seasonal and two permanent full-time positions in a range of disciplines which would benefit the wildlife and habitat management objectives in this alternative .

Rationale: This objective reflects a balanced approach to Refuge management by providing operations and maintenance-funded staffing deemed necessary to meet the goals and objectives of this alternative. Like all land management, Refuge management is labor intensive and labor costs represent over 95 percent of the base operations funding received each year. As public demand for biological information, and resource protection increases adequate staffing becomes more critical. These staffing needs are documented in the strategies for various objectives in this alternative.

Strategies:

1. Ensure that staffing needs are incorporated in budget needs databases
2. Hire a permanent-seasonal biological technician, and tractor operator.
3. Hire a permanent, full-time biologist.
4. Hire a permanent full-time private lands biologist.

Objective 5.4: Operations and Maintenance Needs

Complete annual review of Refuge Operations Needs (RONS) and Service Assessment and

Maintenance Management System (SAMMS) databases to ensure they reflect needs of the wildlife and habitat focus alternative.

Rationale: The RONS and SAMMS databases are the chief mechanisms for documenting ongoing and special needs for operating and maintaining a national wildlife refuge. These databases are part of the information used in the formulation of budgets at the Washington and Regional levels, and for the allocation of funding to the field. It is important that the databases be updated periodically to reflect the needs of the Refuge, and in particular the objectives and strategies elsewhere in this alternative.

Strategies:

1. Update databases as needed or at least once annually.

2.4.4 Alternative C: Integrated Public Use and Wildlife and Habitat Focus (Preferred Alternative)

Goal 1 Landscape

We will strive to maintain and improve the scenic and wild character, and environmental health of the Refuge.

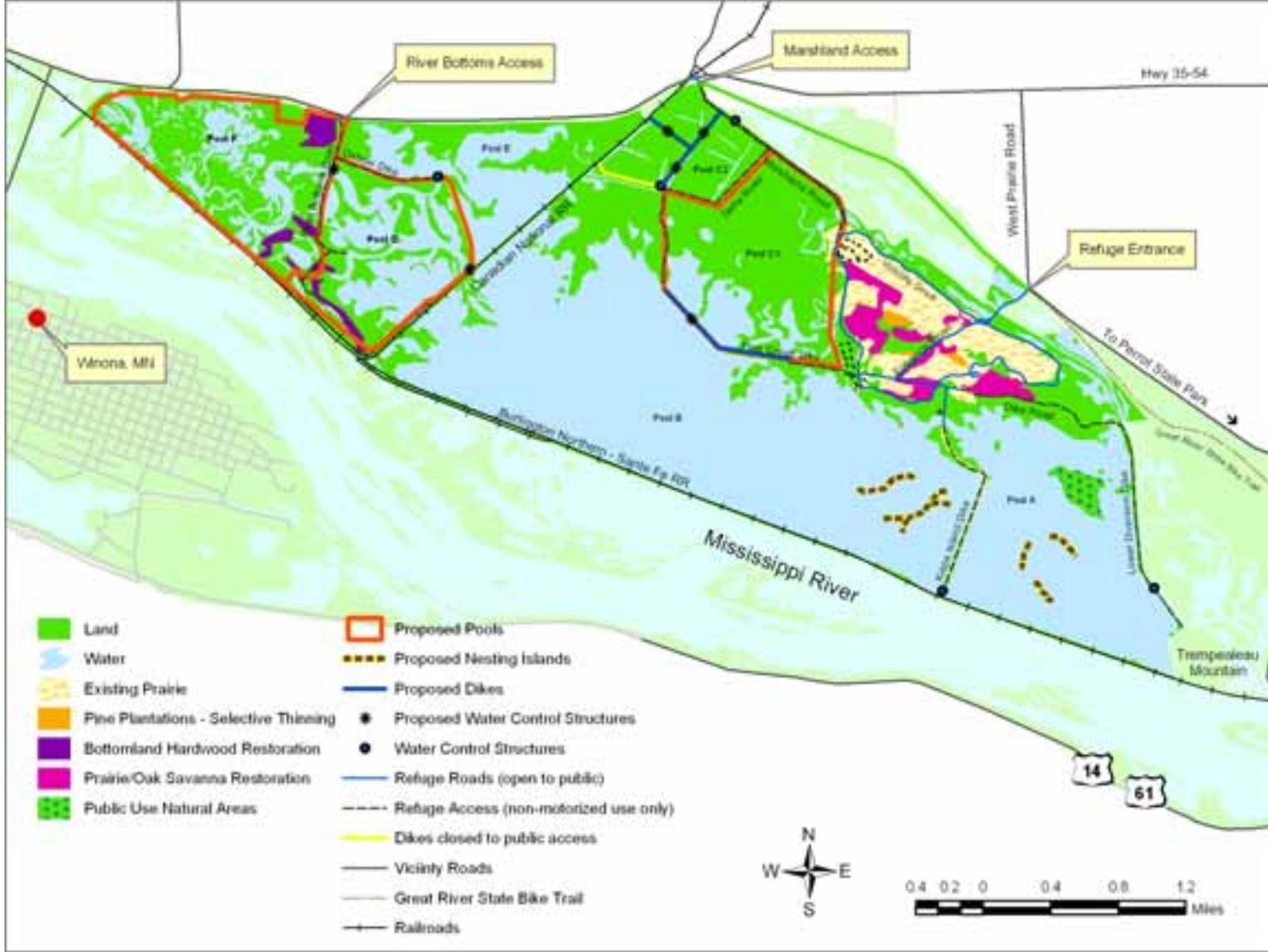
Figure 10 represents habitat under Alternative C and Figure 11 on page 64 represents visitor services. Figure 12 on page 65 represents a closer view of visitor services under Alternative C.

Objective 1.1: Land Acquisition

By 2022, acquire from willing sellers the remaining 340 acres within the approved boundary as delineated in the 1983 Master Plan (USFWS 1983). The proposed acquisition includes 340 acres within the approved boundary of the Refuge and approximately 12 acres outside of the current approved boundary. These latter acres would be added under the Regional Director's authority. (See acquisition boundary Figure 2 on page 9.)

Rationale: Land acquisition can be a cost effective tool to ensure protection of important fish and wildlife habitat and to close gaps in the existing boundary. All of the properties in question are in the floodplain and subject to sporadic flooding. The system of dikes, constructed in the early 1900s to divert the Trempealeau River and now part of the Refuge, tend to exacerbate flooding on adjacent properties. Acquiring these lands would alleviate conflicts with flooding on adjacent private property and allow the

Figure 10: Alternative C (Integrated Public Use and Wildlife and Habitat Focus), Habitat



Alternative C: Integrated Public Use and Wildlife and Habitat Focus (Preferred Alternative)

Figure 11: Alternative C (Integrated Public Use and Wildlife and Habitat Focus) Public Use

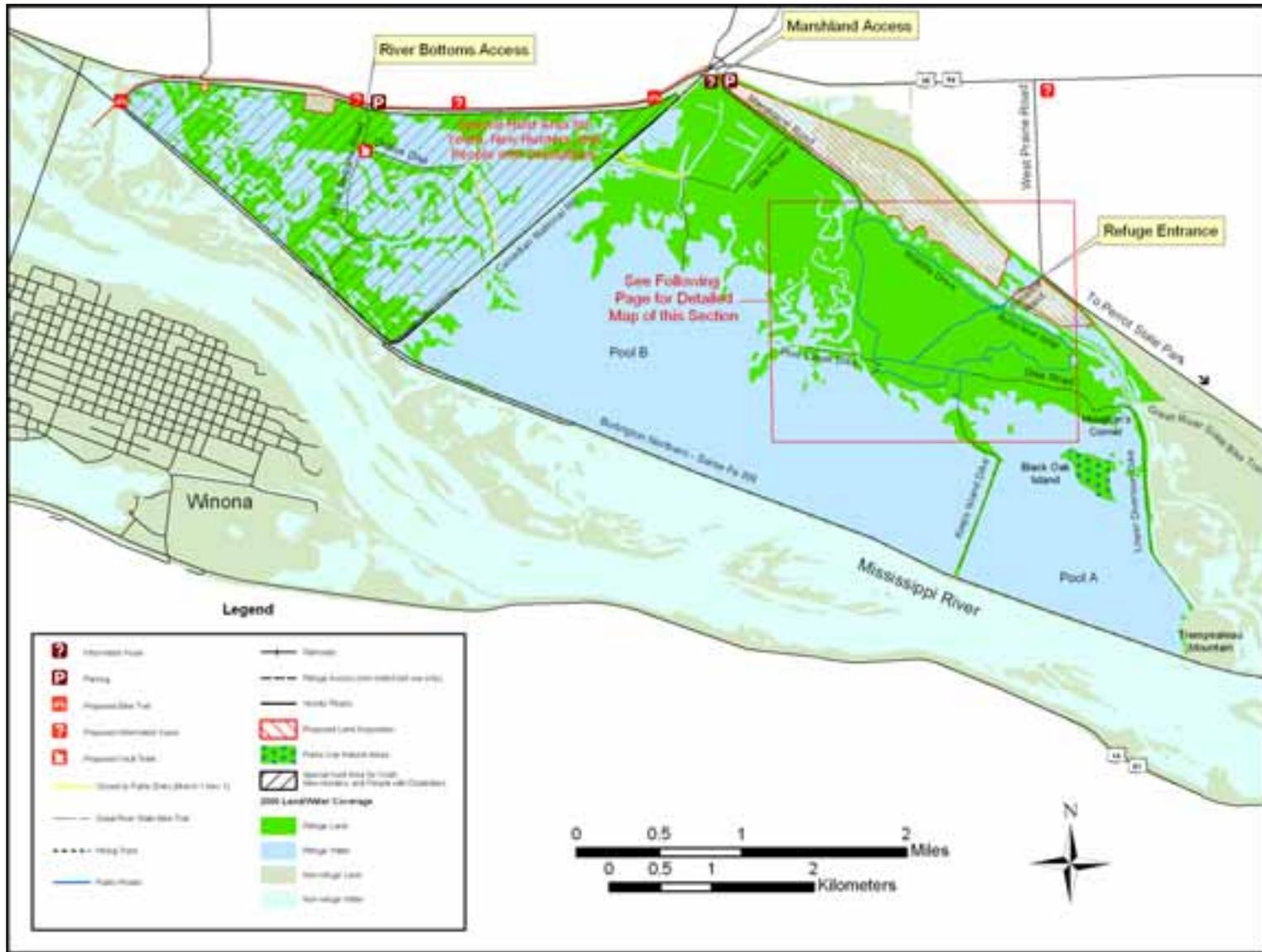


Figure 12: Alternative C (Integrated Public Use and Wildlife and Habitat Focus) Public Use Close Up



Alternative C: Integrated Public Use and Wildlife and Habitat Focus (Preferred Alternative)



Blazing star. USFWS

Trempealeau River to move more freely within its existing floodplain. Additionally, some of these lands are remnants of pre-lock and dam floodplain forest, a rare resource worthy of protection.

Strategies:

1. Maintain contact with landowners within approved boundary to keep them informed of the Refuge’s interest in acquiring their property.
2. Keep Regional Realty Specialist informed of any changes to property status.
3. Seek Land and Water Conservation Fund appropriations (approximately \$510,000 at \$1,500 per acre)

Objective 1.2: Refuge Boundary

Maintain the integrity of the Refuge boundary by inspecting signs bi-annually, and by 2010 correct deficiencies in signage, and install an automatic gate at the main entrance.

Rationale: Maintaining and enforcing a boundary is one of the basic and critical components of Refuge management to ensure the integrity of an area over time. Without attention to this basic task, there is a tendency for adjacent development and use to creep onto Refuge lands and waters. This encroachment

includes tree cutting, dumping, construction, storing equipment and materials, and mowing. In addition, there are a few boundaries that remain unclear creating confusion by the public using these lands especially for hunting and trapping.

Strategies:

1. Travel the boundary every other year to inspect signs and correct deficiencies.
2. Request a survey of the north boundary along Highway 35 between Marshland and River Bottoms Road. Correctly post.
3. Correctly post west boundary of River Bottoms property, surveying if necessary.
4. Install an automatic gate that will close and open at sunset and sunrise to protect facilities and discourage illegal, after-hours activities.

Objective 1.3: Flood Protection

In 2008, implement the following flood management policy: “When the Mississippi River is in flood stage, do not allow water to enter Refuge pools through the lower diversion dike structure, the Marshland Road inlet or any other facilities.”

Rationale: The BNSFRR dike forms an integral part of the barrier dike system which impounds water within Trempealeau NWR. This dike was breached and over-topped in 1965 and was repaired by the railroad. During the near-record flood in the spring of 2001, floodwaters rose to the bottom of the rails at several points, but the dike held. Additional rock was added at several points. Railroad personnel were concerned about the large head of water against their dike and requested that the Service let water into the Refuge to equalize the pressure. In response, gates on the water control structure in the lower diversion dike near Trempealeau Mountain were opened, as well as gates on the Marshland Road inlet structure, allowing water from the Trempealeau River to enter the Refuge pools. Water elevations on the Trempealeau River were several feet lower than on the Mississippi River at points upstream where pressure on the dike was greatest. As a result, the quantity of water that could be let into the Refuge pools was insufficient to offer protection for the railroad dike at the critical locations.

Opening the gates and allowing floodwaters to enter the Refuge caused serious damage to biological resources and infrastructure as follows:

1. High inflows damaged the electric weir and one lift gate on the lower diversion dike water control structure.
2. Higher water levels in Refuge pools coupled with strong winds caused bank erosion.
3. Without the electric weir, carp and other rough fish entered the Refuge pools.
4. Floodwaters uprooted and destroyed beds of emergent wetland.
5. Interior Refuge roads and dikes suffered damage from high water.
6. Kiep's Island spillway was damaged and required extensive repairs.

This incident clearly demonstrated that the water management infrastructure at Trempealeau NWR affords little opportunity for management actions that can reduce Mississippi River flood impacts on the BNSFRR dike. Letting flood waters into Pool A through the lower diversion structure damaged emergent vegetation, and may have accentuated bank erosion on the railroad and interior dikes while offering virtually no additional protection to the BNSFRR dike. Portions of the Mississippi River floodplain have been isolated from the main river by the construction of dikes and other structures that maintain the navigation channel. During floods, water can no longer spread across the floodplain as it once did. Rising water sometimes results in severe damage to structures and properties. Enhanced public information programs about the function and importance of floodplains would facilitate support for restoring connections between the main stem of the river and its backwaters.

Strategies:

1. Meet with BNSFRR officials to explain the policy and explore other alternatives to protect their dike.
2. Incorporate information on the importance of flood plains to the Mississippi River system into interpretive and educational programs.

Objective 1.4: Natural Area Management

By 2010 develop a management plan, including a habitat survey and archeological resource inventory and protection for Black Oak Island.

Rationale: The Refuge has done little in the way of monitoring or research of the existing Public Use Natural Area on Black Oak Island. Although the main goal of the area is the preservation of mature,

eastern deciduous forest, preservation is a form of management. A management plan needs to be written to guide monitoring and research of current habitat conditions and changes since the area was designated 20 years ago. The plan would identify monitoring protocols; any habitat management needed to retain original biological values or address threats; address special public use considerations; and identify ways to foster public awareness and appreciation of these unique areas.

Strategies:

1. By 2010 develop a Management Plan for Black Oak Island.
2. Map vegetation on Black Oak Island.
3. Remove all invasive plants from Black Oak Island.
4. Solicit an archeologist to inventory and document archeological resources present on Black Oak Island.
5. Determine if further shoreline protection is needed to prevent erosion of artifacts from Black Oak Island.
6. Protect archeological resources on Black Oak Island by increasing law enforcement surveillance and closing the island to unsupervised public access.

Objective 1.5: Archeological Resources

By the end of 2008, improve protection of cultural resources by developing an Archeological Resource Protection Plan and implementing a variety of administrative changes to protect known sites.

Rationale: Federal laws, executive orders, and regulations, as well as policies and procedures of the Department of Interior and the Service protect cultural resources on federal lands. Trempealeau NWR has been described as one of the most important archeological sites in the Midwest. Human use of the area dates back 12,000 years. Dozens of sites and over 6,000 artifacts have been cataloged from various locations. However, the majority of the lands need baseline surveys to document the locations and extent of archeological resources. Habitat management activities involving soil disturbance are often delayed until archeological assessments can be completed. Additionally, protection of sites is difficult because of a lack of information about what resources are present. Trempealeau NWR has a history of looting and collectors are active in the area.

While law enforcement efforts have been stepped-up over the years, problems persist. Opportunities to interpret the Refuge's cultural resources must be integrated with the need to protect them.

Strategies:

1. Hire a permanent, full-time law enforcement officer (shared with Winona District) to increase law enforcement surveillance of known sites and suspicious activities.
2. Provide Archeological Resource Protection Act training for all staff.
3. Improve the relationship and coordination with the Mississippi Valley Archeology Center.
4. Inventory resources on shoreline and upland sites subject to disturbance
5. Restrict public access to the top of the road on Kiep's Island.
6. Work with Wisconsin DNR and Perrot State Park to close access to Trempealeau Mountain from the Refuge.
7. Close unsupervised access to Black Oak Island.
8. Develop an interpretive program about the ancient people of the area and the need to protect their historic sites.

Goal 2: Wildlife and Habitat

Our habitat management will support diverse and abundant native fish, wildlife, and plants.

Objective 2.1: Forest Management

By 2010 develop a Habitat Management Plan incorporating forest management. By 2015 enhance 50 acres of upland hardwood forest; and 500 acres of floodplain hardwood forest in three separate blocks. Remove all Scotch pine and selectively thin all pine plantings by 50 percent.

Rationale: Hardwood forests on the Refuge have been altered by a number of factors including invasion by exotic species, oak wilt, and agriculture. The forest canopy in many areas is dominated by black locust, and the native shrub component which should include species such as dogwoods, hazel, viburnums and others, has been replaced by European buckthorn, black locust, Siberian pea, and Tartarian honeysuckle. Bottomland forests are not regenerating and large nesting trees and cavities

are becoming less abundant. A Habitat Management Plan is needed to integrate forest and wildlife objectives, and to identify management prescriptions such as harvest, planting, fire and invasive plant control. This objective calls for an aggressive program to remove invasive plants and replant appropriate native trees.

Strategies:

1. Survey upland forest stands for archeological resources.
2. Continue restoration of River Bottoms Road sites by planting new age classes of swamp white oak seedlings every 3 years until natural regeneration is occurring.
3. At River Bottoms Road sites inter-plant other native seedlings as available, focusing on mast-producing species. Coordinate seed collection from local floodplain sites and seedling production with Army Corps of Engineers foresters.
4. Annually treat 5 acres each of upland and floodplain forest using mechanical and chemical means as appropriate, to remove black locust and European buckthorn. Black locust and European buckthorn will occupy <10 percent of the canopy in upland forest and <20 percent in floodplain forest.
5. Work with Army Corps of Engineers foresters to identify stands and prescriptions for timber sales. Permit commercial harvest of black locust and pine.
6. By 2010, clear down timber from burn units by permitting firewood cutting.



European buckthorn in understory, Trempealeau NWR. USFWS

7. Protect swamp white oak in pool C2 by lowering water level during the growing season to avoid prolonged flooding.
8. With others, seek research on floodplain forest regeneration and restoration of forest habitats to benefit cavity dependent species.

- # Pool A –350 acres
- # Pool B – 1,000 acres
- # Pool D – 150 acres
- # Pool F –50 acres

Objective 2.2: Wetland Management

Working with others and through a more aggressive Refuge program, seek a continuous improvement in the quality of water flowing into and out of the Refuge in terms of long-term monitoring of dissolved oxygen, major plant nutrients, suspended material, turbidity, pH, temperature, sedimentation and contaminants. By 2022, develop and maintain infrastructure to allow management of 5,500 acres of wetlands as described below:

Two out of every 5 years, provide an average of 275 acres of moist soil/mudflat habitat primarily for shorebirds, waterfowl, and wading birds.

By 2022, provide an average of 2,750 acres of emergent marsh habitats on the Refuge. This habitat will be characterized by water depths ranging from 3 to 30 inches interspersed with stands of cattail, bulrush, phragmites, arrowhead, pickerelweed, water lily and American lotus. Submerged aquatic plants such as coontail and sago pondweed will usually be present. Emergent marsh habitat will be apportioned among the Refuge pools as follows:

- # Pool A –250 acres
- # Pool B – 1,050 acres
- # Pool C1 –500 acres
- # Pool C2– 150 acres
- # Pool D –300 acres
- # Pool E –300 acres
- # Pool F – 200 acres

Continue to provide approximately 1,550 acres of deepwater marsh habitat among Refuge pools. This habitat will generally consist of open water greater than 30 inches in depth. Submerged vegetation such as coontail, sago pondweed, and wild celery is desired. These habitats will provide open water rafting areas for diving ducks and foraging habitat for pelicans, cormorants, Bald Eagles, and other fish-eating birds. Deepwater habitat would be distributed among Refuge pools roughly as follows:

Rationale: Trempealeau NWR includes 6,226 acres, of which about 5,500 acres, or 90 percent, are wetlands. These wetlands have benefited from many years of protection afforded by railroad and barrier dikes which exclude damaging floods so devastating to aquatic plants in adjacent Mississippi River backwaters. As a result, wild rice, cattail, and other plants important to marsh wildlife have flourished in many areas.

Construction of a series of locks and dams on the Mississippi River in the 1930s created a deeper, relatively stable water system, especially during the summer. Although flooding was not a serious problem at Trempealeau NWR because of barrier dikes, the low water cycle, so important to aquatic plants dependent on mud flats and sandbars for their reproduction, was virtually eliminated. With stable and higher water levels, wind and wave action gradually eliminated aquatic plant beds, particularly in the lower Refuge pools. Additionally, rough fish, primarily common carp, are present throughout the pool system. Carp have a major impact on aquatic plant growth by rooting out plants and suspending sediments while feeding.

Strategies:

1. By 2010, write a Habitat Management Plan that includes strategies for managing water levels in each impoundment.
2. Once every 5 years when funding for pumping is available, reduce water levels in Pool A by pumping to expose 50 percent (350 acres) of the bottom. Drawdown would begin in May, coinciding with shorebird migration, and continue through the fall until freeze-up. Low water conditions would create conditions for a partial kill of rough fish. Water levels would return to full pool over the winter through dike and groundwater seepage.
3. Once every 5 years when funding for pumping is available (alternating with Pool A), reduce water elevations in Pool E when wild rice has reached the floating leaf stage in late May or early June. Maintain water level as low as possible through late August, and then gradually restore levels to maximize food availability for waterfowl, rails, and wading birds.



Swamp white oak tree planting area, Trempealeau NWR. USFWS

4. Avoid prolonged flooding of swamp white oaks in Unit C2 by lowering water level below the root mass of these trees during the growing season.
5. Maintain stable or declining water levels in pools B and E, June through August to accommodate over-water nesting species, especially Black Terns.
6. Construct a dike with a spillway and water control structure between Delta Point and Pine Creek dike. Raise and widen Delta and Pine Creek roads to serve as dikes for a new sub-impoundment C1 totaling about 375 acres.
7. Construct a water control structure in the former "Green Bay culvert" thereby creating impoundment D, about 450 acres.
8. Construct a water control structure in River Bottoms Road dike to create impoundment F of about 450 acres. Raise and widen River Bottoms Road south of its junction with Oxbow dike.
9. Subdivide C2 into three manageable units.
10. When conditions allow, drawdown Pool B using gravity flow through Pool A into the Trempealeau River. Once every 7 years pump Pool B as low as possible with existing pumps to improve aquatic plant growth.
11. Hire one permanent seasonal tractor operator to perform annual maintenance of dikes, pumps and water control structures.
12. Hire a Private Lands Biologist (shared half time with Winona District) to fully implement the Partners for Wildlife Program in the Trempealeau and Buffalo River Watersheds to improve water quality entering the Refuge.
13. Construct five islands each, in the eastern portion of Pools A and B. Material for the islands would be dredged from within each pool or from the Mississippi River and pumped through the BNSFRR dike. In addition to providing nesting habitat for various species, islands would break wind and wave energy and decrease turbidity
14. Continuously monitor water quality at six locations using dataloggers.
15. When feasible, use commercial fishing and winter drawdowns to reduce populations of rough fish in pools A and B.
16. Work with USGS and the National Weather Service to re-establish a permanent weather station.
17. Continue to stress the importance of water quality in public information and interpretation, and environmental education programs.

Objective 2.3: Grassland Management

Maintain existing 335 acres of prairie and by 2022 restore 100 acres of prairie /oak savanna habitat. Prairie component will have native cool and warm season grasses and wild flowers typical of undisturbed sand prairie in western Wisconsin. Oak savanna will comprise 20 to 40 percent of the prairie area with an open canopy of native, uneven aged oaks.

Rationale: The Fish and Wildlife Service is interested in maintaining and/or restoring ecological diversity to the lands managed in the National Wildlife Refuge System. The goal for many refuges is to restore habitats to pre-European settlement conditions, understanding that modern day circumstances or refuge purposes may preclude this in many areas. Native vegetation that was originally in place prior to various attempts at habitat improvement is likely the vegetation that will do best on the land. Historical records (1895-1976) and records from the U.S. General Land Office (1840s and 50s), indicate that prior to settlement, upland areas within the Refuge were predominantly prairie and oak savanna (see Figure 9 on page 53). Much of the

upland area had been converted to agriculture before the Refuge purchased the property in 1936. Under Refuge management from the 1940s through 1960s, various pine species, Siberian and Chinese elms, black locust, Siberian pea, and honeysuckle were planted to reduce soil erosion and provide wildlife habitat in tune with the wildlife management practices of that era. In the 1970s, many of the oaks in the savanna were removed when oak wilt disease killed them.

Today the invasive nature of black locust and the addition of other invasives such as buckthorn, have created forested areas on the upland sections of the Refuge consisting primarily of non-native species. Three hundred acres of the original 700 acres of prairie/oak savanna remain on the Refuge today. The mature black locusts in the forested areas provide a continual seed source, resulting in a continuous invasion of black locusts on the prairie. Oak wilt disease is still present and has killed many of the mature oaks remaining in the uplands. Likewise, prairies and oak savannas on private lands are becoming scarce as land is rapidly developed. The remnant prairies on the Refuge may soon be the only examples in southern Wisconsin.

Prairie and oak savanna restoration in these areas will benefit many species listed as Regional Resource Conservation Priority (RRCP) species including Mallards, Blue-winged Teal, Grasshopper Sparrow, Orchard Oriole, Red-headed Woodpecker, and Eastern Meadowlark. Many species of birds, mammals, reptiles, and amphibians will forage in, and meet all or part of their life requirements in prairie and oak savanna habitats.

Strategies:

1. Use prescribed fire as described in the approved Fire Management Plan (USFWS, in preparation in 2007) to control encroachment by cool season exotic grasses, forbs and woody shrubs. Modify existing fire-breaks where necessary to incorporate timber stands targeted for restoration to oak savanna.
2. Expand flea beetle release program to reduce leafy spurge in all prairie/oak savanna habitats. Leafy spurge will occupy <10 percent of any prairie/oak savanna unit by 2022.
3. Annually, convert a minimum of 5 acres of black locust to prairie using mechanical and chemical means as appropriate. Use com-



Invasive black locust taking over prairie, Trempealeau NWR. USFWS

- mercial harvest to remove merchantable trees where practical. If necessary plant native grasses and forbs to enhance restoration.
4. Remove understory of invasive shrubs from oak savanna habitats. By 2022, invasive plants will occupy <10 percent of oak savannas.
5. By 2022, plant at least 2 acres of oaks and other hardwood seedlings where natural regeneration is insufficient to restore oak savanna. Emphasize bur oaks over red and black oaks to minimize further losses from oak wilt.
6. By 2022, decrease “edge” habitat by removing all pine plantings from within prairie units.
7. Hire a permanent, full-time seasonal biological technician to oversee prairie/oak savanna restoration including monitoring and invasive plant control.
8. Use volunteers and school groups to collect and redistribute native grass and wildflower seed.
9. Develop interpretive and education programs on prairies and invasive plants.

Objective 2.4: Invasive Plants and Animals

Reduce abundance of invasive and non-indigenous plants as specified in Table 3. If conditions allow, once every 5 years prior to drawdown of Pool A, remove invasive carp and other rough fish using commercial fishing.

Table 3: Management Strategies for Invasive and Non-indigenous Plant Species Under Alternative C

Non-indigenous Plant Species	Prairie and Oak Savanna	Upland Forest	Floodplain Forest	Wetlands
Leafy Spurge	Expand flea beetle release program. Reduce infestation to 10% or less of prairie habitats by 2022.			
Black Locust	Convert a minimum of 5 acres of Black Locust to prairie using mechanical and chemical methods. Prevent any new spread into existing prairie areas.	Remove Black Locust from canopy and understory. Reduce occurrence to 10% or less of upland forest.		
European Buckthorn, Siberian Pea, Tartarian Honeysuckle	Remove understory of these species from oak stands targeted for oak savanna restoration using appropriate mechanical and chemical means. Reduce occurrence to 10% or less of oak savanna habitat by 2022.	Remove these species from understory using appropriate mechanical and chemical means. Reduce occurrence to 10% or less of understory by 2022.	Remove understory of European Buckthorn from stands using appropriate mechanical and chemical means. Treat 5 acres per year.	
Scotch Pine	Remove all trees.	Remove all trees.		
Red and White Pine	Remove all trees from prairie and oak savanna habitats.	Conduct selective thinning using commercial harvest where appropriate. Manage stands for natural appearance.		
Purple Loosestrife			Raise 200 pots of defoliating beetles annually for release at 5 new sites on the Refuge. Use volunteers when available.	Same as for Floodplain Forest.

Rationale: Invasive plants continue to pose a major threat to native plant communities on the Refuge and beyond. Invasive plants displace native species and often have little or no food or habitat value for wildlife. The result is a decline in the carrying capacity of the Refuge for native fish, wildlife and plants, and a resulting decline in the quality of wildlife-dependent recreation. This objective addresses invasive plants through mapping and monitoring, and through mechanical and biological control. Invasive plant control is labor intensive and potentially costly. New staff are proposed in addition to relying on volunteers and out-side funding. Invasive animals such as zebra mussels and Asian carp pose a looming threat to native aquatic ecosystems. These species are not yet found on the Refuge, but careful

monitoring, maintenance of the electric weir; installation of additional fish barriers and commercial fishing are tactics to slow down their introduction.

Strategies:

1. Conduct an inventory and prepare baseline maps of invasive plant infestations, and to undertake mechanical removal of invasive plants.
2. As part of a Habitat Management Plan, write an invasive plant control and management step-down plan (Integrated Pest Management Plan) that identifies priority areas and methods of control. Emphasize mechanical and biological control.

3. Seek seasonal staff and funding to accelerate current control and applied research through interagency partnerships, volunteer programs, and public education.
4. Continue to work with the Department of Agriculture, other agencies, the state, and other refuges in securing insects for release on the Refuge and on private lands within the Trempealeau and Buffalo River watersheds.
5. Seek grants, cost-sharing, or special funding opportunities for invasive plant removal.
6. Conduct public information efforts including media, brochures, signs, and programs to increase awareness of the threats posed by invasive plants and what citizens can do to minimize the introduction or spread of invasive species.
7. Build a GIS database of invasive plants and update it every 3 years.
8. If conditions allow, permit commercial fishing for rough fish in Pool A prior to each drawdown.
9. Monitor all pools for invasive fish, aquatic plants and mollusks.
10. Investigate feasibility of implementing an exchange program for gardeners with loosestrife planted in ornamental gardens.
11. Secure outside funding to set up rearing cages on private lands and begin distribution of beetles to landowners within the Trempealeau and Buffalo River Watersheds.
12. Continue to serve as a source of flea beetles for other agencies and landowners who have infestations of leafy spurge.
13. Explore the installation of fish barriers at all water control structures.
14. Determine the distribution of reed canary grass and phragmites and investigate methods of control.

Objective 2.5: Monitor and Investigate Fish, Wildlife and Plants and their Habitats

By 2010 update the Wildlife Inventory Plan to include all federal and state listed species, species of regional conservation concern, furbearers, and deer. Increase partnerships with agencies and universities and encourage applied research on the Refuge.

Rationale: Monitoring is essential to understanding the status and trends of selected species groups and habitats. This in turn provides some indication of overall biological integrity, diversity, and environmental health of the Refuge, and is critical in planning habitat management and public use programs. This objective represents a more aggressive biological program on the Refuge and will help meet directives in the Refuge Improvement Act requiring monitoring the status of fish, wildlife, and plant species. Better biological information is also critical to making sound and integrated resources and public use management decisions. The Refuge would continue to support, use, and contribute to monitoring done by the state, U.S. Geological Survey, the Army Corps of Engineers, neighboring refuges and others to help fill the gaps in status and trends information for fish, reptiles, amphibians, birds, invasive plants, invertebrates, land cover and other environmental factors like water quality.

Strategies:

1. Engage other experts and partners to develop and implement a Wildlife Inventory Plan that includes all federal and state listed species, regional conservation species, furbearers, and deer. Also include “species of greatest conservation need” as identified in the Wisconsin Comprehensive Wildlife Conservation Plan.
2. Work with partners, volunteers, students and staff to store, summarize and, as appropriate, analyze survey data annually.
3. Continue to work with universities, states, USGS, and the COE to share data on species and habitats.
4. Participate in formal coordination meetings with USGS to share biological data, monitoring and monitoring expertise.
5. Work with the Upper Mississippi NWFR GIS biologist and the Winona District biologist to coordinate equipment, staff, survey schedules, and data analysis.
6. Foster partnerships with colleges and universities to encourage graduate research projects.
7. Continue to use volunteers to complete certain surveys like waterbird counts, and deer surveys.

8. By 2010, complete a Habitat Management Plan that integrates monitoring results with habitat management actions.
9. Working with partners, develop a Herptile Management Plan by 2010.
9. Increase education and outreach targeting threatened and endangered species and their needs.
10. Work with partners to assess the potential for reintroduction of Karner blue butterflies.

Objective 2.6: Threatened and Endangered Species Management

Continue to monitor Bald Eagle use of the Refuge. Complete an evaluation of state-listed species using the Refuge.

Rationale: It is Service policy to give priority consideration to the protection, enhancement, and recovery of threatened and endangered species on national wildlife refuges. This objective represents a more aggressive approach to achieving this policy, and also reflects the high public interest in these species. Currently there are no federally listed species occurring on the Refuge. Efforts would be expanded to determine the status of Massasagua rattlesnakes (candidate) and appropriate state listed species.

Strategies:

1. Consider the needs of threatened, endangered, and candidate species in all habitat and public use management decisions.
2. Continue to consult with the Service's Ecological Services Office on all actions which may affect listed species.
3. In the Wildlife Inventory Plan address monitoring for all listed or candidate species, and other species of management concern to help preclude listing.
4. In the Habitat Management Plan, identify steps needed to ensure populations of listed or candidate species are sustained in support of delisting or to preclude listing.
5. Continue to monitor Bald Eagle nesting and success.
6. Close 100 meter radius around active Bald Eagle nests to public entry February 1 to July 1.
7. Where feasible, protect large nest trees from prolonged flooding and erosion.
8. Work with Wisconsin DNR to assess the potential for reintroduction of Massasagua rattlesnakes.

Objective 2.7: Deer Management

By 2010, update the Wildlife Inventory Plan and Habitat Management Plan to include management and monitoring of white-tailed deer and related browse impacts. Base harvest levels of deer on annual population monitoring and evaluation of habitat quality.

Rationale: In general, Refuge management practices emphasize the protection of plants and wildlife to ensure a diversity of species that naturally or historically occurred. White-tailed deer present a special situation in that harvest and the vast expanses of agricultural lands around the Refuge greatly influence population levels and resulting vegetation impacts. Deer tend to move on and off the Refuge in response to hunting pressure and food availability on surrounding lands. Browse impacts have been severe on the Refuge especially prior to the 1980s after which expanded Refuge hunts were implemented to reduce deer and allow the vegetation to recover. Deer numbers are unnaturally high in surrounding lands and the State of Wisconsin has been in an active herd reduction program since the discovery of chronic wasting disease (CWD) in 2003. The special interests of the State in the management of resident big game animals are recognized and management actions are coordinated with State objectives where possible. Harvest on surrounding lands would be hampered if coincident pressure does not occur on the Refuge. This objective represents a balanced approach to limiting over-browsing and assisting the State in managing the distribution of hunting pressure and harvest rates.

Strategies:

1. Update Wildlife Inventory Plan to include white-tailed deer monitoring, including fawn counts.
2. Include monitoring of browse impacts in Habitat Management Plan.
3. With partners, investigate the most current, efficient and appropriate technologies and protocols to monitor browse and herd size.



White-tailed deer. Copyright Sandra Lines

4. Investigate funding mechanisms and partnerships to contract aerial, forward looking infra-red (FLIR) surveys to count deer once every 5 years.
5. Model percent change in browse impacts over time.
6. Encourage research by universities and partner agencies on deer-habitat interactions including implications to invasive plant abundance.
7. Work closely with Wisconsin DNR to coordinate information exchange, planning, and management of CWD on nearby lands.
8. Continue to use a managed public hunt of white-tailed deer to maintain acceptable levels of browse.
9. Update the Hunt Plan to include white-tailed deer hunting.
10. Seek expert advice to model white-tailed deer population dynamics to determine appropriate harvest levels.
11. Base sex and age ratio of harvest requirements on population modeling and advice from Wisconsin DNR.
12. Update Visitor Service Plan to improve safety and require all pedestrians to wear blaze orange during the gun hunt.
13. Investigate options for closing the Refuge to non-hunting visitors during key hunting times.
14. Improve signage and develop a Refuge-specific hunting safety brochure.
15. Continue issuing over-the-counter permits for late season archery.
16. Continue to operate a check station on opening weekend.
17. Require mandatory reporting of hunter success or loss of 1 year hunting privileges.
18. Continue to follow Wisconsin guidelines for season dates and times.

Objective 2.8: Furbearer Management

Update the Furbearer Management Plan by 2009 and continue to manage muskrat, beaver, and raccoon populations at levels where damage to dikes and interference with water management and bird banding operations is limited.

Rationale: A furbearer trapping program is in place for muskrat, mink, raccoon, opossum, and beaver. The Refuge is divided into 15 muskrat and four beaver units. Trapping units are awarded to the highest bidder at an auction held in October. The entire Refuge is open to trapping with the exception of an area inside and immediately adjacent to the wildlife drive. Harvest of muskrats by trappers helps reduce damage to Refuge dikes from tunneling and den building. Beaver trapping reduces plugging of culverts and water control structures and prevents excessive damage to desirable trees adjacent to wetlands. The trapping plan needs to be updated to include proper harvest reporting procedures and to clarify unclear boundary descriptions and procedures for using data to regulate harvest.

Strategies:

1. Work with public to update Furbearer Management Plan by 2009.
2. Update Wildlife Inventory Plan to include muskrats, beavers, and otters.
3. Use harvest data to determine appropriate harvest levels to minimize damage to dikes and structures.
4. As needed adjust trapping activities to avoid conflicts with other hunts or Refuge management.
5. Remove problem animals from banding sites as needed to meet banding objectives.

6. Work with Wisconsin Trapping Association to provide training for all trappers using the Refuge. Encourage communication and cooperation among trappers.

Goal 3: Public Use

We will manage public use programs and facilities to ensure sustainable, quality, hunting, fishing, wildlife observation, wildlife photography, interpretation, and environmental education opportunities for a broad cross-section of the public; and provide opportunities for the public to use and enjoy the Refuge for traditional and appropriate non-wildlife dependent uses that are compatible with the purposes for which the Refuge was established and the mission of the Refuge System.

Objective 3.1: Wildlife Observation and Photography

Provide year-round opportunities to observe and photograph wildlife and habitat by improving and maintaining two existing hiking trails, a 4.5-mile auto tour route, and the existing observation deck. Develop a new hiking trail, a new canoe trail and a cross-country skiing trail system. Promote wildlife photography by working with local photographers to develop at least 1 annual workshop and assist with Upper Mississippi River NWFR photo contest.

Rationale: Wildlife observation and photography are priority public uses of the Refuge System and are to be encouraged when compatible with the purposes of the refuge. The Refuge provides outstanding wildlife observation opportunities. Improving, maintaining, and enhancing accessibility of existing facilities will increase opportunities for all people to view wildlife throughout the year. Opportunities for wildlife photography are abundant without special facilities, but working with area photographers will foster more interest and allow the staff to develop targeted programming for this user group. Finally, an entrance fee may help to provide resources for improving visitor services, but careful consideration must be given to the cost and benefits for both the Refuge and visitors.

Strategies:

1. Develop a Visitor Services Plan by 2009.
2. Provide a general brochure with maps and information for all trails.
3. Update and design new signing at trailheads and along trails.



Bird banding, Trempealeau NWR. USFWS

4. Enhance website information for compatible, wildlife-dependent recreational opportunities.
5. Maintain and enhance the 4.5-mile auto tour loop – upgrade and enhance signage; re-design booklet per Service standards.
6. Designate and enhance specific observation points along hiking trails conducive to wildlife observation and investigate installation of benches.
7. Monitor and maintain existing Woods Trail – update existing trail panels as habitat changes and new developments arise along the trail.
8. Update Prairie View Trail as a universally accessible trail according to Service standards for trail surface, signage and other required details and enhancements.
9. Upgrade and re-design current parking area at Prairie View Trail.
10. Redesign and landscape the existing native plant garden; create a living guide by adding interpretive panels and identification markers for plants.
11. Explore the potential of connecting the Prairie View trail to the Civilian Conservation Corps (CCC) historic site (off the wildlife drive), and develop an interpretive site with signs at CCC location.
12. Develop a *Birding by Ear* trail, designed for birders with visual impairments; install sound activated trail panels

13. Develop a birding by ear audio tape/CD to accompany the trail users.
 14. Establish a three-quarter-mile Marsh Discovery Trail linking with existing trails to connect three major habitats as one trail system.
 15. Establish an un-groomed Winter Wonders Cross-country Ski Trail on fire breaks and trails and develop a simple one-page trail map with guidelines.
 16. Seek funding to purchase 30 pairs of snowshoes for use by the public.
 17. Continue to prohibit all ATVs and snowmobiles from Refuge lands.
 18. Contact and establish a relationship with local photographers – seek input on needs and facilities.
 19. Offer wildlife and outdoor photography workshops at special Refuge events such as the Bird Festival in May and the Refuge Week Celebration in October.
 20. Continue to work with Upper Mississippi River NW&FR to promote a photo contest.
 21. Investigate the cost/benefit ratio of implementing an entrance fee program.
3. Improve the Great River State Trail by adding bike racks at the Marshland and main entrances, near the kiosk at the entrance to the auto tour route, and at the observation deck.
 4. Add a year-round restroom facility at either the new shop or the office location.
 5. Add a potable water source at the new shop.
 6. Develop interpretive signs specifically for bikers along the Marshland Road portion of the trail.
 7. Develop a brochure with map specific to bikers and what they may see along the trail.
 8. Investigate providing a “Blue Goose Bike Program” to encourage visitors to park autos and ride Refuge bikes.

Objective 3.3: Interpretation

At 3-year intervals, random surveys indicate at least 90 percent of visitors report they felt welcome and enjoyed their visit, that they have an understanding of the Refuge as a place where wildlife comes first and appreciate the role of the Refuge System in preserving our Nation’s wildlife heritage.

Rationale: Interpretive programming is the looking glass through which visitors experience the Refuge. It is also a priority public use of the Refuge System, to be encouraged when compatible with the purposes of the refuge. Interpreting the resources and challenges of the Refuge to the general public is important to influencing the future well-being of the Refuge and the natural world. Only through understanding and appreciation will people be moved to personal and collective action to ensure a healthy Refuge for the future. Interpretation is also key to changing attitudes and behavior which affect the Refuge through off-Refuge land use decisions and on-Refuge conduct and use. This objective reflects an improvement in the quality and availability of interpretive materials and programs, and reflects the importance of these programs in an integrated resource management alternative. It provides for the basic needs necessary to inform and educate visitors, and help them make the most of their Refuge visit while protecting sensitive resources. The facilities and programs proposed are detailed in the strategies.

Objective 3.2: Great River State Trail (Bicycling)

By 2010 improve the Great River State Trail by adding a variety of visitor services, including bike racks, potable water source, restrooms, and interpretive signs and brochures. By 2008, work with the Wisconsin DNR and partners to facilitate extension of bike trail to Winona.

Rationale: The Great River State Trail is a popular bike trail and is likely to become more popular as the public eye turns more toward health and fitness activities. Bicycling is a low impact way of experiencing nature and this objective reflects an improvement in facilities and interpretation to encourage more visitors to consider traveling by bike.

Strategies:

1. Work closely with the Wisconsin DNR and any advisory committee to facilitate extension of the bike trail to Winona, while minimizing impacts to Refuge lands.
2. Improve directional signs and install “watch for bikes” signs along the auto tour route.



Interpretation book reading at a local library. USFWS

Strategies:

1. By 2009, include interpretation in the Visitor Services Plan and develop procedures for conducting visitor surveys.
2. Design and install updated kiosks at all Refuge entry areas (main entrance, Marshland, and River Bottoms), boat landing, the observation deck, Hwy. 35 scenic overlook, and the West Prairie Road wayside park.
3. Improve agency identity by including on each kiosk, an interpretive panel on the U.S. Fish and Wildlife Service and the National Wildlife Refuge System.
4. Include Refuge regulations on all kiosks.
5. Update signs on all trails and along the wildlife drive auto tour.
6. Improve directional signs and interpretive materials for bicyclists.
7. Update and reprint to Service standards a self-guided booklet that corresponds with auto tour route stops. Explore the possibility of enhancing some stops by adding a “sound post” with digital recordings of common wildlife sounds, calls, songs, and their sources.
8. Update all brochures in accordance with Service standards. Develop a “series” of brochures for the Refuge relating to the big six priority public uses.
9. Develop and publish a list of interpretive events and environmental education opportunities annually.
10. Produce the following brochures: plant list, invasive plant management, winter wildlife, hiking guide with trail maps, biking guide.
11. Develop a traveling pop-up exhibit for use at special events to highlight the Refuge mission and key resources including Refuge history and recreational opportunities.
12. Update and maintain current events on the Refuge website quarterly. Include current events, trail information, and seasonal bird sightings.
13. Investigate an internet link to a bird cam (eagle cam).
14. Publish a seasonal interpretive schedule.
15. Continue to hold an annual birding festival each spring; participate in the Mississippi Valley Birding Festival sponsored by Audubon.
16. Develop at least three ranger-led interpretive programs for visitors – some would be year-round and others seasonal in nature. At least one cultural or historical interpretation program would be offered.
17. Hire a permanent, seasonal park ranger to develop and lead interpretive programs and assist with other aspects of the public use program.
18. Purchase 30 pairs of binoculars and field guides, and provide an annual budget for interpretive supplies.
19. Explore opportunities to develop volunteer-led interpretive programs by involving volunteers in program development and training them as docents.
20. Establish a Junior Ranger program.
21. Continue to issue news releases on special events or temporary changes to regulations.
22. Investigate developing a Master Naturalist program.
23. Participate in local area expos, sportsman shows, and other outdoor events to promote the Refuge.
24. Prepare a bi-annual column for area newspapers highlighting Refuge news, events and wildlife sightings.

25. Work closely with local community groups, like chamber of commerce, tourism board, library, Great River Road Committee, and Perrot State Park to share resources and coordinate programming.
26. Construct a dividable, multi-purpose classroom addition to the office building, (1,000 square feet), to conduct year-round interpretive programs and special events.

Objective 3.4: Environmental Education

Improve delivery of environmental education programs, and by 2010 have in place a comprehensive environmental education program that includes the following elements:

- # A grade-specific curriculum that meets local, state and national guidelines.
- # A Refuge Educator's Guide.
- # A 900-square-foot outdoor learning shelter, with restrooms.
- # Special annual programs, lending library, and educational partnerships as noted in the following strategies.

Rationale: Young people, like adults, learn best when they are actively engaged in the learning process and when they are having a good time. They are naturally curious and when invited outdoors become explorers and questioners, artists and poets. Refuge environmental education programs help people develop important skills they can use throughout their lives, such as asking meaningful questions, making careful observations, finding ways to test their ideas, and sharing their thoughts and observations with others. The goal of environmental education is to encourage curiosity and concern about the natural world and to provide experiences from which people gain an understanding of the way natural systems function. What people learn and how much they care will affect the Refuge through changes in attitudes and behaviors both on and off Refuge lands. This alternative represents a marked increase in environmental education programming and associated facility development. Since environmental education is curriculum-based and labor intensive, efforts will be focused on training teachers, volunteers and other experts to use the Refuge and its facilities.

Strategies:

1. Work with local teachers to develop grade-specific environmental education curricula that meet local, state and national education standards.
2. Construct an outdoor environmental education learning shelter (roughly 900 square feet) at a site to be determined by elevation surveys. The three-season shelter would have restrooms capable of handling small groups, electricity, and running water.
3. Continue to offer River Education Days (RED) targeting 5th grade students from surrounding Wisconsin and Minnesota schools.
4. Develop specific education programs for trappers and hunters using the Refuge.
5. Develop environmental educational opportunities for people with special needs, like birding for visually impaired people or waterfowl hunting for youth and new hunters.
6. Promote collaboration and partnerships with area teachers, schools, colleges, other wildlife agencies, and natural resource and conservation groups to increase environmental education opportunities focused on Refuge and river corridor ecosystems
7. Offer environmental education workshops for teachers.
8. Train volunteers to provide environmental education programs for school groups.
9. Contact schools annually notifying them of the Refuge's facilities, resources and educational opportunities by means of fliers or letters to principals and individual teachers.
10. Develop a lending library of videos, books, and educational trunks available for teachers to accompany their environmental education subject matter.
11. Update the Trempealeau NWR Educators Guide by 2010.
12. Encourage additional partnerships with high school science or biology classes to assist with research, wildlife surveys, or bird banding.

13. Encourage high schools and universities to utilize the Refuge facilities for curriculum based programs.

Objective 3.5: Waterfowl Hunting

By 2009, amend the Refuge Hunt Plan to include a managed waterfowl hunt west of the Canadian Pacific Railroad dike that assures high quality hunting opportunities for people with disabilities, youth, and other hunters new to the sport.

Rationale: Urbanization, changing lifestyles, and shifting cultural priorities have contributed to a steady decline in the number of people who hunt. The opportunities, skills, and traditions of the hunter are slowly being replaced by other interests, demands, and pursuits. Evidence suggests that recruitment of hunters may be a problem as there has been a decline in participation by younger age groups and declines in the number of hunter education graduates (Enck et al. 2000). The ability to recruit and retain hunters has serious implications for fish and wildlife conservation. A strong argument can be made that an expected outcome of providing and nurturing waterfowl hunting opportunities should be a waterfowl hunting community with a strong sense of stewardship for not only a sustained waterfowl harvest, but for the associated ecosystem as well (Case 2004). This objective reflects the need to recruit new hunters, promote long-term hunter participation and encourage land stewardship. In addition, the Refuge would continue to provide opportunities for hunters who would otherwise be excluded from hunting because of limited mobility.

The Refuge looked at several options for providing a sustainable, quality hunting program.

The FWS Manual (parts 600-699) defines “quality” wildlife-dependent recreation as having the following 11 characteristics:

- # Promotes safety of participants, other visitors, and facilities;
- # Promotes compliance with applicable laws and regulations and responsible behavior;
- # Minimizes or eliminates conflict with fish and wildlife population or habitat goals or objectives in an approved plan;
- # Minimizes or eliminates conflicts with other compatible wildlife-dependent recreation;
- # Minimizes conflicts with neighboring landowners;

- # Promotes accessibility and availability to a broad spectrum of the American people;
- # Promotes resource stewardship and conservation;
- # Promotes public understanding and increases public appreciation of America’s natural resources and our role in managing and protecting these resources;
- # Provides reliable and reasonable opportunities to experience wildlife;
- # Uses facilities that are accessible and blend into the natural setting; and
- # Uses visitor satisfaction to help define and evaluate programs.

The “quality” criteria are factors to consider when developing wildlife-dependent recreational use programs. They are guidelines for refuge managers to use when starting, analyzing, or evaluating a wildlife-dependent recreational use. Nothing in the policy requires that any of the wildlife-dependent recreational uses meet all of the goals listed under the “quality” definition. The term “quality” is used as a standard we strive to achieve in our wildlife-dependent recreational use programs. This objective reflects the need and opportunity to consider these guidelines to ensure that a new hunt program on the Refuge is indeed a “quality” program that develops and promotes a strong sense of stewardship within an expanding community of new hunters.

Strategies:

1. Allow ample time for public review, and comment on any changes to hunting programs.
2. With partners conduct an annual “learn to hunt” program. Participate in the state “youth” hunting program.
3. Investigate opportunities to partner with the state’s “Becoming an Outdoorswoman” program.
4. Investigate options for developing a “learning to hunt” program.
5. Expand and improve the hunt for people with disabilities by providing more hunting opportunities and accessible facilities.
6. Publish a Refuge Hunting brochure that informs the public of hunting opportunities and Refuge-specific regulations.



Waterfowl hunt for people with disabilities at Trempealeau NWR. USFWS

7. Annually review Refuge hunting regulations to ensure clarity and to address emerging issues or concerns, and to give the public an opportunity to review and comment on any changes.
8. Improve the general hunting experience by continuing to improve habitat quality and enforcement of regulations.
9. Clearly sign boundaries of areas closed to hunting.

Objective 3.6: Fishing

Continue to provide fishing opportunities on the Refuge and by 2010 enhance the existing fishing platform and boat launch facilities. By 2022, construct one new fishing platform along the Trempealeau River and work with partners to improve the county boat launch.

Rationale: Fishing is one of the priority uses of the National Wildlife Refuge System and is to be encouraged when compatible with refuge purposes. The demand for fishing at Trempealeau is small because the sport fishery is mainly comprised of bullheads and excellent fishing can be found just off the Refuge on the Mississippi River. Rough fish and management of shallow water impoundments precludes the development of a viable sport fishery in the interior units. However, the Trempealeau River offers better fishing opportunities and this objective would promote fishing by adding additional facilities along the river. Fishing in general would be promoted through interpretive materials, educational programs, as well as assisting with fishing events on the Mississippi River.

Strategies:

1. Consult with the La Crosse Fishery Resource Office to update the Fishery Management Plan by 2010.
2. By 2009, develop a Visitor Services Plan that includes fishing.
3. Improve existing boat ramp, parking and fishing platform at Kiep's Island.
4. Remove sediment and milfoil from around existing fishing platform to improve habitat for fish.
5. Coordinate with Trempealeau County to improve their boat launch on the Trempealeau River.
6. All new and existing facilities would conform to Service standards for accessibility.
7. Install a new fishing platform along the Trempealeau River, upstream from the entrance road.
8. Install new information panels on fishing at boat landing and two fishing platforms.
9. Promote fishing through interpretive posters and exhibits.
10. Include fish biology and management in environmental education events and curriculums.
11. Work with staff of Upper Mississippi NWFR to provide an annual fishing event for young people.

See Objective 2.4, Invasive Plant and Animals, for additional fishery management objectives.

Goal 4: Neighboring Landowners and Communities

We will communicate openly and work cooperatively with our neighbors and local communities to help all benefit from the aesthetic and economic values of the Refuge.

Objective 4.1: Community Outreach

Beginning in 2008, increase opportunities for positive interaction with local community groups by implementing the following strategies.

Rationale: Rebuilding society's connection with their environment is an important component of long-term resource protection and citizen support is critical to a successful resource management program. This objective reflects an emphasis on building connections between the Refuge and the

community by promoting active involvement by Refuge staff in local events and community development organizations.

Strategies:

1. Participate in two local expos, three community festivals, at least one career fair, and one sportsman show or outdoor event.
2. Join the Trempealeau County Tourism Council and Trempealeau Chamber of Commerce and attend meetings.
3. Attend meetings of the Great River Road Promotion Committee, Mississippi River Parkway Commission and Scenic Byways Commission.
4. Develop relationships with Galesville, Trempealeau, and Ettrick libraries to hold evening programs and set up seasonal exhibits.
5. Continue to issue news releases to local newspapers, radio and television stations for public events, environmental education programs, changes to Refuge regulations, management activities of interest to the public and special wildlife viewing opportunities.
6. As opportunities arise, work with Western Wisconsin Cable Television to produce programs about the Refuge and its resources for public access TV.
7. Develop an “It’s your backyard” program for local landowners and citizens, inviting them to the Refuge for a special day of programs and events tailored to their interests as Refuge “neighbors.” Ensure opportunities for communication between staff and citizens.

Objective 4.2: Friends Group

By the end of 2008 help establish a “Friends of Trempealeau Refuge” group to provide an independent citizen voice for the protection, conservation, and enhancement of Refuge resources.

Rationale: The Refuge staff is tasked with managing resources within the laws, policies, guidelines and goals set forth for the Refuge. Citizens who have concerns about issues impacting the Refuge are free to voice their opinions and are often in a better position to do so when they come together as a Friends group. Friends groups also provide support by volunteering, fund raising, and educating the public. Friends can be an effective voice for the

Refuge within the community. This objective focuses on assisting local citizens in forming an effective Friends group for the Refuge.

Strategies:

1. Invite key individuals to coordinate establishment of a Friends group by setting goals, writing bylaws and establishing 501C3 tax exempt status.
2. Assist new members with mentoring and applications for start-up grants with the National Fish and Wildlife Foundation.
3. Suggest a list of membership and team building projects that would benefit the Refuge.
4. Assist Friends with contacts and introduction to state and federal legislative staffs.
5. Assist Friends group with inventory, set up, and operation of a Refuge bookstore.

Objective 4.3: Volunteers

Continue to support an active volunteer program and increase volunteer hours and number of volunteers by an average of 5 percent per year through 2022. Recruit volunteers from a variety of backgrounds. Keep volunteers active in all Refuge programs.

Rationale: Volunteers are a valuable asset providing thousands of hours of labor completing tasks that would otherwise go undone. The Refuge has a corps of dedicated volunteers that is committed to protecting and enhancing the Refuge. Staff is unlikely to increase in the future and volunteers may be called upon to perform more of the surveys or maintenance tasks that the staff can not accomplish. This objective reflects an increase in recruiting, retaining and rewarding volunteers.

Strategies:

1. Keep volunteer contact information current. Contact each volunteer at least once annually whether they participated that year or not.
2. Have clear expectations and instructions for each volunteer and each task.
3. Train volunteers to effectively conduct educational and interpretive programs, biological surveys, and maintenance operations. Ensure that volunteers receive the same safety training as paid staff.

4. Provide an identity for volunteers with uniforms and standard nametags.
5. Recruit volunteers with a diversity of backgrounds and skills, matching them with tasks that complement their interests and abilities.
6. Keep volunteers active in all programs: administration, biology, maintenance, and public use.
7. Recognize and thank volunteers for their efforts. Ensure that they feel they are a contributing part of the staff team.
8. Hold an annual volunteer appreciation banquet.
9. Keep a current volunteer news and recognition bulletin board in the office building.

Objective 4.4: Partnerships

By 2010, hire a private lands biologist (shared with Winona District) to work on reducing erosion on private land in Buffalo and Trempealeau Counties. At least annually meet with area universities, local sportsman and conservation groups, and Perrot State Park.

Rationale: Opportunities for upper watershed improvements in northern Trempealeau and Buffalo Counties are abundant. These projects are important to reducing sediments flowing into the Trempealeau and Buffalo Rivers, and ultimately the Mississippi River. Landowners are supportive and many are on a waiting list of projects. Adding a shared position to focus on private land projects would improve the ability to complete more projects and provide assistance on other land management issues like control of invasive plants. The objective also would focus on better communication and coordination with partners that would result in sharing expertise, labor, funds, and equipment.

Strategies:

1. Share a new permanent full-time private lands biologist with Winona District. Biologist would work on Upper Mississippi River tributary headwaters in Buffalo and Trempealeau Counties to reduce sediment inputs.
2. Meet twice a year with Perrot State Park staff to coordinate land management, and public use issues.



Trempealeau NWR volunteer collecting plants for purple loosestrife beetle rearing. USFWS

3. Develop partnerships with University of Wisconsin and the University of Minnesota and other local colleges to share resources and to implement graduate level, adaptive management research.
4. Improve coordination and communication with local sportsman and conservation groups.
5. Develop a program for invasive plant control, especially purple loosestrife, on private lands.
6. Monitor three conservation easements annually for compliance and to assess habitat management needs.

Goal 5: Administration and Operations

We will seek adequate funding, staffing, and facilities; and improve public awareness and support to carry out the purposes, vision, goals, and objectives of the Refuge.

Objective 5.1: Entrance Road Flooding

By 2015 replace existing road with a bridge that can accommodate at least a 10-year flood event.

Rationale: Options for alleviating the access road flooding problems have been thoroughly investigated over past years. The decision to construct a new bridge to span the section of the road that floods was arrived at after careful consideration and input from engineers, consultants, citizens, and community leaders. Potential designs for the new bridge are under consideration and have been distributed for review by nearby landowners. This objective represents a continued pursuit of funds and support for constructing a bridge at the entrance road.

Strategies:

1. Continue with design work on a bridge that meets all state and federal regulations, and will accommodate at least a 10-year flood.
2. Contact all adjacent landowners to discuss potential impacts to their lands.
3. Seek Department of Transportation Act Road Enhancement funding
4. Keep Congressional staffers apprised of progress.
5. Communicate and coordinate with Trempealeau County.

Objective 5.2: Facilities

By 2009, replace the existing shop with a similar-sized building, and by 2015 construct a 1,500-foot office addition.

Rationale: This objective represents a balanced approach to replacing the 70-year-old shop building and expanding office facilities to accommodate new volunteers, biological technicians, and increased visitor services.

Strategies:

1. Replace existing shop with a similar sized facility that includes a tornado shelter, fully accessible rest room, lockers for staff, storage, office, workshop, and vehicle maintenance facilities.
2. Add a 1,500-foot addition to the office building to provide space for five offices for new staff, a volunteer workspace, expanded storage and utility room, and additional space for office equipment.
3. Ensure that Refuge office and maintenance needs are reflected in budget needs databases.

4. Continue to maintain Service-owned facilities using annual maintenance budget allocations.

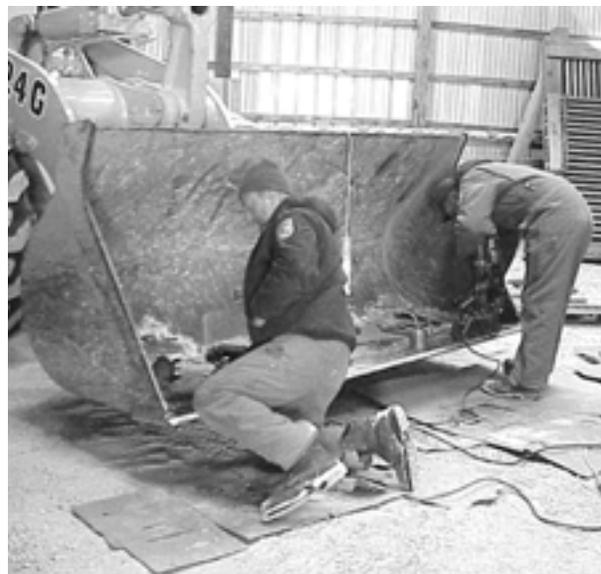
Objective 5.3: Staffing

By 2022, add three seasonal and two shared staff in a range of disciplines to benefit the wildlife and habitat management, and public use objectives in this alternative (see Appendix H, Figure 1 on page 288 for a proposed staffing chart).

Rationale: This objective reflects a balanced approach to Refuge management by providing operations and maintenance staff deemed necessary to meet the goals and objectives of this alternative. Like all land management, Refuge management is labor intensive and labor costs represent over 95 percent of the base operations funding received each year. As public demand for educational programs, biological information, and resource protection increases adequate staffing becomes more critical. These staffing needs are documented in the strategies for various objectives in this alternative.

Strategies:

1. Ensure that staffing needs are incorporated in budget needs databases.
2. Hire a permanent-seasonal park ranger, biological technician, and tractor operator.



Equipment and facilities maintenance, Trempealeau NWR. USFWS



Aquatic vegetation sampling at Trempealeau NWR. USFWS

3. Share a new permanent full-time law enforcement position and a private lands biologist position with the Winona District of the Upper Mississippi NWFR.

Objective 5.4: Operations and Maintenance Needs

Complete annual review of Refuge Operations Needs (RONS) and Service Assessment and Maintenance Management System (SAMMS) databases to ensure they reflect needs of the integrated public use and wildlife focus alternative.

Rationale: The RONS and SAMMS databases are the chief mechanisms for documenting ongoing and special needs for operating and maintaining a national wildlife refuge. These databases are part of the information used in the formulation of budgets at the Washington and Regional levels, and for the allocation of funding to the field. It is important that the databases be updated periodically to reflect the needs of the Refuge, and in particular the objectives and strategies elsewhere in this alternative.

Strategies:

1. Update databases as needed or at least once annually.

Table 4: Alternative Comparison by Issue/Objective, Trempealeau NWR

Objectives	Alternative		
	A: No Action (Current Direction)	B: Wildlife and Habitat Focus	C: Integrated Public Use and Wildlife and Habitat Focus (Preferred)
<i>1.1 Acquisition within approved boundary</i>	By 2022, acquire from willing sellers the remaining 340 acres within the approved boundary as delineated in the 1983 Master Plan. The proposed acquisition includes 340 acres within the approved boundary of the Refuge and approximately 12 acres outside of the current approved boundary. These latter acres would be added under the Regional Director's authority.	Same as Alt. A.	Same as Alt. A.
<i>1.2 Refuge Boundary</i>	Maintain the integrity of the Refuge boundary; inspect problem areas as time and staffing permits.	Maintain the integrity of the Refuge boundary by inspecting signs annually, correcting deficiencies in signage, and installing an automatic gate at the main entrance.	Maintain the integrity of the Refuge boundary by inspecting signs bi-annually, and by 2010 correct deficiencies in signage, and install an automatic gate at the main entrance.
<i>1.3 Flood Protection</i>	Manage flooding on an annual basis as needs arise. Coordinate flood protection with partners on a case-by-case basis.	By 2008, implement the following flood management policy: When the Mississippi River is in flood stage, do not allow water to enter Refuge pools through the lower diversion dike structure, the Marshland Road inlet or any other facilities.	Same as Alt. B.
<i>1.4 Natural Area and Special Designations</i>	Conduct yearly visits to Black Oak Island to document condition.	By 2010 develop a management plan, including a habitat survey for Black Oak Island. By 2022, remove all invasive plants from Black Oak Island.	By 2010 develop a management plan, including a habitat survey and archeological resource inventory and protection for Black Oak Island.
<i>1.5 Archeological Resources</i>	Inventory potential sites on a project-by-project basis as needed to facilitate management. Continue on-call law enforcement response.	Same as Alt. A.	By 2008, improve protection of cultural resources by developing an Archeological Resource Protection Plan and implementing a variety of administrative changes to protect known sites.
<i>2. 1 Forest Management</i>	By 2010 develop a Habitat Management Plan incorporating forest management. By 2022 enhance 50 acres of upland hardwood forest; and 500 acres of floodplain hardwood forest in three separate blocks.	Same as Alt. A plus remove all Scotch pine and pine plantings.	Same as Alt. A except remove all Scotch pine and selectively thin all pine plantings by 50%.

Table 4: Alternative Comparison by Issue/Objective, Trempealeau NWR (Continued)

Objectives	Alternative		
	A: No Action (Current Direction)	B: Wildlife and Habitat Focus	C: Integrated Public Use and Wildlife and Habitat Focus (Preferred)
<p><i>2.2 Wetland Management</i></p>	<p>Maintain infrastructure to allow management of 3,350 acres of wetlands as described below: Two out of every 5 years, provide an average of 275 acres of moist soil/mudflat habitat primarily for shorebirds, waterfowl, and wading birds.</p> <p>By 2020, provide an average of 1,725 acres of emergent marsh habitats on the Refuge. This habitat will be characterized by water depths ranging from 3 to 30 inches interspersed with stands of cattail, bulrush, phragmites, arrowhead, pickerelweed, water lily and American lotus. Submerged aquatic plants such as coontail and sago pondweed will usually be present. Emergent marsh habitat will be apportioned among the refuge pools as follows: Pool A – 250 acres; Pool B – 1,050 acres; Pool C1 – 125 acres; Pool E – 300 acres. Continue to provide approximately 1,350 acres of deepwater marsh habitat among Refuge pools. This habitat will generally consist of open water greater than 30 inches in depth. Submersed vegetation such as coontail, sago pondweed, and wild celery is desired. These habitats will provide open water rafting areas for diving ducks and foraging habitat for pelicans, cormorants, Bald Eagles, and other fish-eating birds. Deepwater habitat would be distributed among Refuge pools roughly as follows: Pool A – 350 acres; Pool B – 1,000 acres.</p>	<p>Working with others and through a more aggressive Refuge program, seek a continuous improvement in the quality of water flowing into and out of the Refuge in terms of long-term monitoring of dissolved oxygen, major plant nutrients, suspended material, turbidity, pH, temperature, sedimentation and contaminants. By 2022, develop and maintain infrastructure to allow management of 5,500 acres of wetlands as described below: 2 out of every 5 years, provide an average of 275 acres of moist soil/mudflat habitat primarily for shorebirds, waterfowl, and wading birds.</p> <p>By 2022, provide an average of 2,750 acres of emergent marsh habitats on the Refuge. This habitat will be characterized by water depths ranging from 3 to 30 inches interspersed with stands of cattail, bulrush, phragmites, arrowhead, pickerelweed, water lily and American lotus. Submerged aquatic plants such as coontail and sago pondweed will usually be present. Emergent marsh habitat will be apportioned among the refuge pools as follows: Pool A – 250 acres; Pool B – 1,050 acres; Pool C1 – 500 acres; Pool C2 – 150 acres; Pool D – 300 acres; Pool E – 300 acres; Pool F – 200 acres.</p> <p>Continue to provide approximately 1,550 acres of deepwater marsh habitat among Refuge pools. This habitat will generally consist of open water greater than 30 inches in depth. Submerged vegetation such as coontail, sago pondweed, and wild celery is desired. These habitats will provide open water rafting areas for diving ducks and foraging habitat for pelicans, cormorants, Bald Eagles, and other fish-eating birds. Deepwater habitat would be distributed among Refuge pools roughly as follows: Pool A – 350 acres; Pool B – 1,000 acres; Pool D – 150 acres; Pool F – 50 acres.</p>	<p>Same as Alt. B.</p>

Table 4: Alternative Comparison by Issue/Objective, Trempealeau NWR (Continued)

Objectives	Alternative		
	A: No Action (Current Direction)	B: Wildlife and Habitat Focus	C: Integrated Public Use and Wildlife and Habitat Focus (Preferred)
<i>2.3 Grassland Management</i>	Maintain existing 335 acres of prairie and oak savanna. Prairie component will have native cool and warm season grasses and wild flowers typical of undisturbed sand prairie in western Wisconsin. Oak savanna will comprise 20 to 40 percent of the prairie area with an open canopy of native, uneven aged oaks.	Same as Alt. A with addition of by 2022 restore 250 acres of prairie/oak savanna habitat.	Same as Alt. A except restore 100 acres of prairie/oak savanna to create a total of 435 acres.
<i>2.4 Invasive Plants and Animals</i>	<p>Reduce abundance of invasive and non-indigenous plants as follows:</p> <ul style="list-style-type: none"> # Reduce leafy spurge infestation in prairie and oak savanna habitats to 20% or less of prairie habitat by 2022. # Reduce black locust occurrence to 20% or less of upland forest and prevent new spread in prairie/oak savanna habitat. # Reduce occurrence of European buckthorn, Siberian Pea, and Tartarian honeysuckle to 20 percent or less of oak savanna habitat by 2022; reduce occurrence to 20% or less in upland forest by 2022; target 1 acre a year for treatment in floodplain forest. # No action on Scotch pine, red pine and white pine. # Raise 100 pots of defoliating beetles annually for release at 5 new floodplain forest and wetland sites. <p>If conditions allow, once every 5 years prior to drawdown of Pool A, remove invasive carp and other rough fish using commercial fishing.</p>	<p>Reduce abundance of invasive and non-indigenous plants as follows:</p> <ul style="list-style-type: none"> # Reduce infestation of leafy spurge to 10% or less of prairie habitats by 2022. # Convert a minimum of 5 acres of black locust to prairie habitat; in upland forest habitat, reduce occurrence to 10% or less. # Reduce occurrence of European buckthorn, Siberian pea, and tartarian honeysuckle to 10 percent or less of oak savanna habitat by 2022; in upland forest, reduce occurrence to 10% or less of understory by 2022; in floodplain forest, treat 5 acres a year. # Remove all Scotch pine from prairie and oak savanna; remove all pine plantations from upland forest habitat and restore landscape to oak savanna. # Raise 200 pots of defoliating beetles annually for release at five new floodplain forest and wetland sites. <p>If conditions allow, once every 5 years prior to drawdown of Pool A, remove invasive carp and other rough fish using commercial fishing.</p>	Same as Alt. B, with the exception that pine plantations would be selectively thinned by 50%.

Table 4: Alternative Comparison by Issue/Objective, Trempealeau NWR (Continued)

Objectives	Alternative		
	A: No Action (Current Direction)	B: Wildlife and Habitat Focus	C: Integrated Public Use and Wildlife and Habitat Focus (Preferred)
<i>2.5 Monitoring Fish, Wildlife and Plants</i>	By 2010 update the Wildlife Inventory Plan to include all federally listed species, species of regional conservation concern, furbearers, and deer. Increase partnerships with agencies and universities and encourage applied research on the Refuge.	Same as Alt. A.	Same as Alt. A.
<i>2.6 Threatened and Endangered Species</i>	Continue to monitor Bald Eagles.	Continue to monitor Bald Eagles. By 2009, evaluate all state listed species for potential occurrence on the Refuge and the need for monitoring or management action.	Same as Alt. B.
<i>2.7 Deer Management</i>	By 2010, update the Wildlife Inventory Plan and Habitat Management Plan to include management and monitoring of white-tailed deer and related browse impacts. Continue to coordinate the Refuge deer hunt with Wisconsin Department of Natural Resources.	By 2010, update the Wildlife Inventory Plan and Habitat Management Plan to include management and monitoring of white-tailed deer and related browse impacts. Base harvest levels of deer on annual population monitoring and evaluation of habitat quality.	Same as Alt. B.
<i>2.8 Furbearer Management</i>	Update the Furbearer Management Plan by 2009 and continue to manage muskrat, beaver, and raccoon populations at levels that limit damage to dikes and interference with water management and bird banding operations.	Same as Alt. A.	Same as Alt. A.
<i>3.1 Wildlife Observation and Photography</i>	Provide year-round opportunities to observe and photograph wildlife and habitat by maintaining two existing hiking trails, a 4.5-mile auto tour route, and the existing observation deck.	Provide year-round opportunities to observe and photograph wildlife and habitat by improving and maintaining two existing hiking trails, a 4.5-mile auto tour route, and the existing observation deck. Close pools to public access September 15- November 15 to limit disturbance to rest areas for migratory waterfowl.	Provide year-round opportunities to observe and photograph wildlife and habitat by improving and maintaining two existing hiking trails, a 4.5-mile auto tour route, and the existing observation deck. Develop a new hiking trail, a new canoe trail and a cross-country skiing trail system. Promote wildlife photography by working with local photographers to develop at least 1 annual workshop and assist with Upper Mississippi NWFR photo contest.

Table 4: Alternative Comparison by Issue/Objective, Trempealeau NWR (Continued)

Objectives	Alternative		
	A: No Action (Current Direction)	B: Wildlife and Habitat Focus	C: Integrated Public Use and Wildlife and Habitat Focus (Preferred)
<i>3.2 Great River State Trail (Bicycling)</i>	Maintain the existing portion of the Great River State Trail that traverses the Refuge.	Same as Alt. A	By 2010 improve the Great River State Trail by adding a variety of visitor services including, bike racks, potable water source, restrooms, and interpretive signs and brochures. By 2008, work with the WDNR and partners to facilitate extension of bike trail to Winona.
<i>3.3 Interpretation</i>	Maintain existing interpretive signs, brochures and other materials for the public. Annually, provide two events for the public. Provide minimal staff led interpretive programming on an as requested basis.	Maintain existing interpretive signs, brochures and other materials for the public. Provide minimal staff-led interpretive programming on an as-requested basis. Emphasize invasive plant and habitat management in all interpretive materials and programs.	At 3-year intervals, random surveys indicate at least 90 percent of visitors report they felt welcome and enjoyed their visit, that they have an understanding of the Refuge as a place where wildlife comes first; and appreciate the role of the Refuge System in preserving our Nation's wildlife heritage.
<i>3.4 Environmental Education</i>	Annually host one environmental education event and conduct minimal education programs as requested.	Conduct minimal environmental education programs, focusing staff and resources on wildlife and habitat management.	Improve delivery of environmental education programs, and by 2010 have in place a comprehensive environmental education program that includes the following elements: # A grade-specific curriculum that meets local, state and national guidelines. # A Refuge Educator's Guide. # A 900-square-foot outdoor learning shelter, with restrooms. # Special annual programs, lending library, and educational partnerships as noted in the strategies.
<i>3.5 Waterfowl Hunting</i>	Continue the managed hunt west of the Canadian Pacific Railroad dike for people with disabilities.	Maximize resting habitat for migratory birds by closing the Refuge to all waterfowl hunting.	By 2009, amend the Refuge Hunt Plan to include a managed waterfowl hunt west of the Canadian Pacific Railroad dike that assures high quality hunting and provides opportunities for people with disabilities, youth, and other hunters new to the sport.

Table 4: Alternative Comparison by Issue/Objective, Trempealeau NWR (Continued)

Objectives	Alternative		
	A: No Action (Current Direction)	B: Wildlife and Habitat Focus	C: Integrated Public Use and Wildlife and Habitat Focus (Preferred)
<i>3.6 Fishing</i>	Continue current low-key fishing program. Maintain existing facilities.	Same as Alt. A.	Continue to provide fishing opportunities on the Refuge and by 2010 enhance the existing fishing platform and boat launch facilities. By 2022, construct one new fishing platform along the Trempealeau River and work with partners to improve the county boat launch.
<i>4.1 Community Outreach</i>	Continue limited community outreach, informing public with news releases of changes in regulations or events. Attend career fairs and sportsman events as time and staffing permit.	Same as Alt. A.	Beginning in 2008, increase opportunities for positive interaction with local community groups by implementing the following strategies.
<i>4.2 Friends Group</i>	Continue the current relationship with the Bob Pohl Chapter of the Friends of the Upper Mississippi River Refuge.	By the end of 2008 help establish a “Friends of Trempealeau Refuge” group to provide an independent citizen voice for the protection, conservation, and enhancement of Refuge resources.	Same as Alt. B.
<i>4.3 Volunteers</i>	Continue to support an active volunteer program and increase number of volunteers and hours by an average of 5 percent per year through 2022. Recruit volunteers from a variety of backgrounds. Keep volunteers active in all Refuge programs.	Continue to support an active volunteer program and increase number of volunteers and hours by an average of 5 percent per year through 2022. Recruit volunteers from university biology and wildlife programs. Focus volunteer efforts on habitat restoration and wildlife surveys.	Same as Alt. A.
<i>4.4 Partnerships</i>	Continue to fund 2-3 projects each year to reduce sedimentation in the upper Trempealeau and Buffalo River watersheds. Meet with landowners as requested and as staff and time permits. Coordinate with Perrot State Park as issues arise.	By 2010, hire a private lands biologist (shared with Winona District) to work on reducing erosion on private land in Buffalo and Trempealeau Counties. Coordinate with universities to secure funding for at least one graduate research project every 3 years. Strengthen partnerships with local sportsman and conservation groups by contacting them or attending one meeting annually. Meet twice yearly with Perrot State Park.	By 2010, hire a private lands biologist (shared with Winona District) to work on reducing erosion on private land in Buffalo and Trempealeau Counties. At least annually meet with area universities, local sportsman and conservation groups, and Perrot State Park.

Table 4: Alternative Comparison by Issue/Objective, Trempealeau NWR (Continued)

Objectives	Alternative		
	A: No Action (Current Direction)	B: Wildlife and Habitat Focus	C: Integrated Public Use and Wildlife and Habitat Focus (Preferred)
<i>5.1 Entrance Road Flooding</i>	Maintain existing road and continue to use Marshland access when road is impassable.	Same as Alt. A.	By 2015 replace existing road with a bridge that can accommodate at least a 10-year flood event.
<i>5.2 Facilities</i>	By 2009, replace existing shop with a similar sized building.	Same as Alt. A.	Same as Alt. A as well as construct a 1,500-foot office addition by 2015.
<i>5.3 Staffing</i>	Maintain current permanent, full-time staffing of four people.	By 2022, add one seasonal and two permanent full-time positions in a range of disciplines which would benefit the wildlife and habitat management objectives in this alternative .	By 2022, add 3 seasonal and 2 shared staff in a range of disciplines to benefit the wildlife and habitat management, and public use objectives in this alternative (see Appendix H, Figure 1 on page 288 for a proposed staffing chart).
<i>5.4 Operations and Maintenance Needs</i>	Complete annual review of Refuge Operating Needs (RONS) and Service Assessment and Maintenance Management System (SAMMS) databases to ensure these reflect needs of current direction.	Complete annual review of Refuge Operating Needs (RONS) and Service Assessment and Maintenance Management System (SAMMS) databases to ensure these reflect needs of the wildlife and habitat focus alternative.	Complete annual review of Refuge Operations Needs (RONS) and Service Assessment and Maintenance Management System (SAMMS) databases to ensure they reflect needs of the integrated public use and wildlife focus alternative.

Chapter 3: Affected Environment

3.1 Ecosystem Setting

3.1.1 The Upper Mississippi River/Tallgrass Prairie Ecosystem

The U.S. Fish and Wildlife Service has adopted an approach to fish and wildlife conservation that is described as an ecosystem approach. This means that the Service is working to perpetuate dynamic, healthy ecosystems that ultimately will foster natural biological diversity. The strategy behind this effort is interdisciplinary and integrates the expertise and resources of all stakeholders.

Trempealeau National Wildlife Refuge lies within the Upper Mississippi River/Tallgrass Prairie (UMR/TGP) Ecosystem (Figure 13). This large, ecologically diverse area encompasses land in the states of Illinois, Iowa, Minnesota, Missouri, and Wisconsin. The ecosystem is bisected into an east and west portion by the Mississippi River. Major rivers in this ecosystem include the Minnesota, Chippewa, Black, Wisconsin, Iowa, Rock, Skunk, Des Moines, Illinois, and Kaskaskia. The Refuge is located within two overlapping ecotypes within the ecosystem – these include the Driftless Area and the Oak Savanna and Forestland Area. The Driftless Area covers parts of Minnesota, Iowa, Wisconsin, and Illinois. Because it was not subject to glacial drift during the latter part of the Pleistocene epoch, the Driftless Area is characterized by highly dissected uplands with deeply cut valleys. Overlaying the Driftless Area in much of southern and western Wisconsin is a fire-dependent ecotype which once covered more than 30 million acres in the Region. Today, the oak savannas of the Midwest are considered by some to be the world's most threatened communities. Conversion of oak savanna to agricultural lands, elimination of fire, invasion by exotic



*Raccoon in a tree along Refuge Road, Trempealeau NWR.
USFWS*

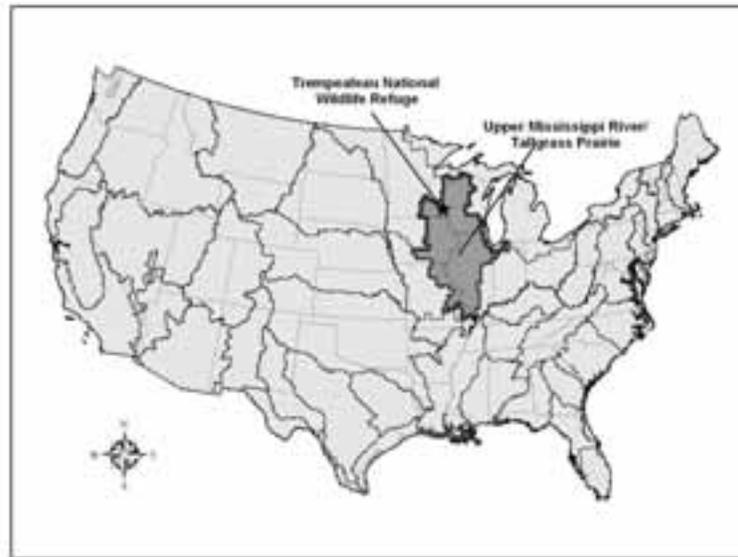
species, and human development have largely eliminated this ecotype from the UMR/TGP Ecosystem. Trempealeau NWR is blessed with remnants of prairie/oak savanna habitats with opportunities for management to extend their life into the future.

3.2 Physical Environment

3.2.1 Climate

The Upper Mississippi River Watershed, which includes the Refuge, is characterized by great temperature extremes. Lows occur in January and February with extremes of minus 30 degrees Fahrenheit or lower and highs in the 90s occurring in July and August. Extreme maximum temperatures of 108 degrees Fahrenheit have been recorded. Some moderation in temperature extremes within the Upper Mississippi River valley have been observed. This is apparent in the spring

Figure 13: Trempealeau NWR and Upper Mississippi River/Tallgrass Prairie Ecosystem



when hardwood trees begin leafing out several days earlier than those on the plateaus flanking the valley.

Average annual precipitation is about 30 inches. About 80 percent occurs as rain from April through October with the remainder falling as snow from November to March. Winter moisture accumulates and can cause excessive runoff and flooding following the spring break-up.

3.2.2 Hydrology

With the closing of the culverts and bridges in the BNSFRR dike separating the Refuge from the main channel of the Mississippi River, and construction of the barrier dikes to divert the Trempealeau River in 1911, Refuge wetlands were essentially isolated. Floodwaters entered the Delta FFF marshes during the damaging flood in 1965 when the BNSFRR dike washed out. Floodwaters entered what is now the Refuge main pool. The upper limits of high water during the spring of 1965 define what is referred to as the “100-year flood” as depicted on Figure 14.

The BNSFRR dike protects Refuge wetlands from the impacts of barge traffic, oil spills, and other pollution that is occurring in the Mississippi River. Probably most significant is the much slower rate of siltation occurring in Trempealeau NWR wetlands. An abundance of wild rice and other sensi-

tive species of aquatic plants on the Refuge that are becoming scarce in many river backwaters attests to the buffering influence of these dikes.

Construction of a series of locks and dams on the Mississippi River in the 1930s created a deeper, relatively stable water system, especially during the summer. Although flooding was not a serious problem at Trempealeau NWR because of barrier dikes, the low water cycle, so important to aquatic plants dependent on mud flats and sandbars for their reproduction, was virtually eliminated. With stable and higher water levels, wind and wave action gradually eliminated aquatic plant beds, particularly in the lower Refuge pools.

Prior to 1994 water management in the 5,500-acre Refuge pools consisted mainly of discharging flows into the adjacent Trempealeau River through a four-bay, gravity structure located in the Lower Diversion Dike near Trempealeau Mountain (Figure 15 on page 96). Water management by the U.S. Army Corps of Engineers at Lock and Dam No. 6 downstream from the Refuge can have a significant effect on the ability to manage water levels. The Trempealeau River enters Pool 6 of the Mississippi River about 1 mile downstream from the

Figure 14: Portion of Trempealeau NWR Above the 100-Year Flood Elevation (1965)

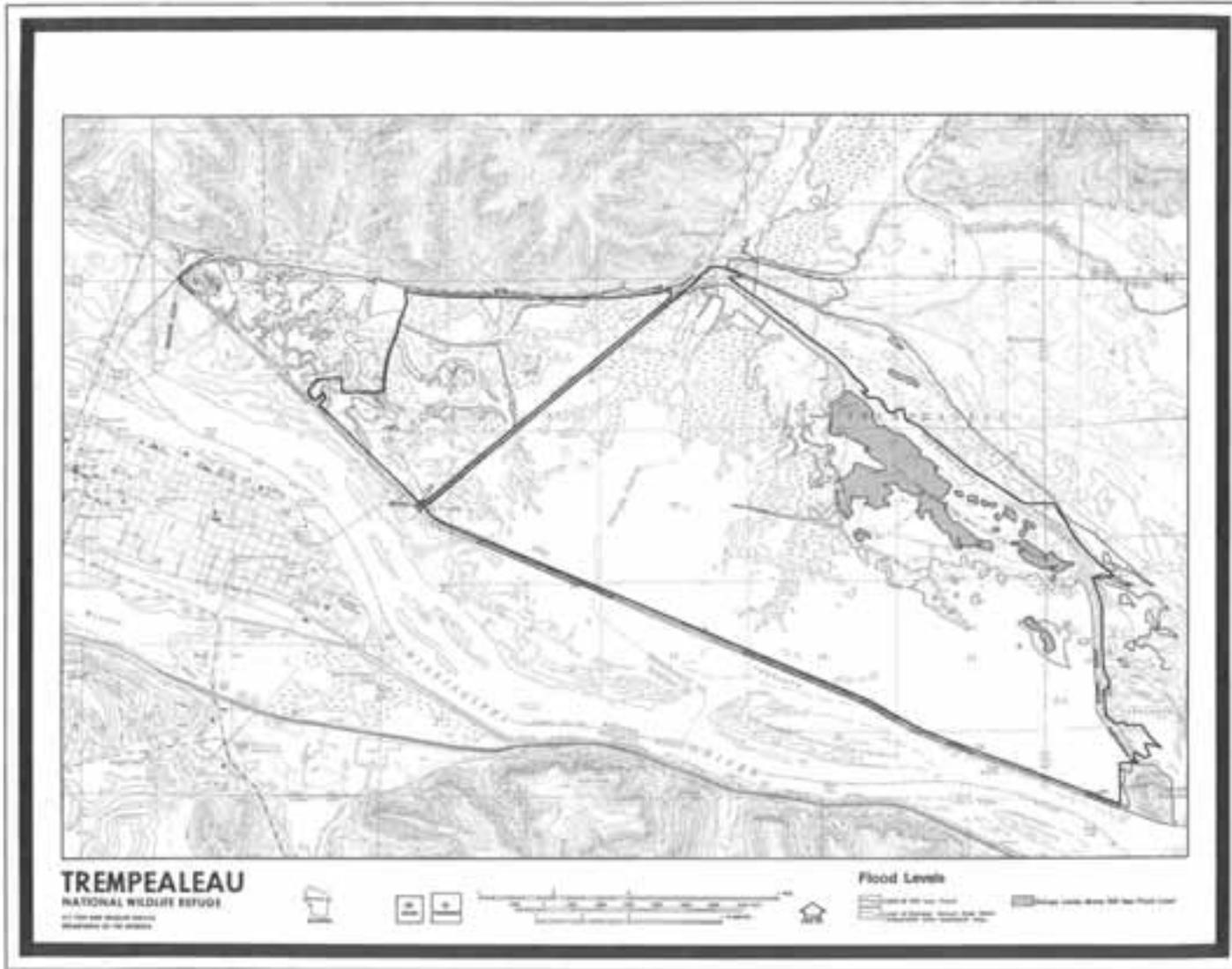
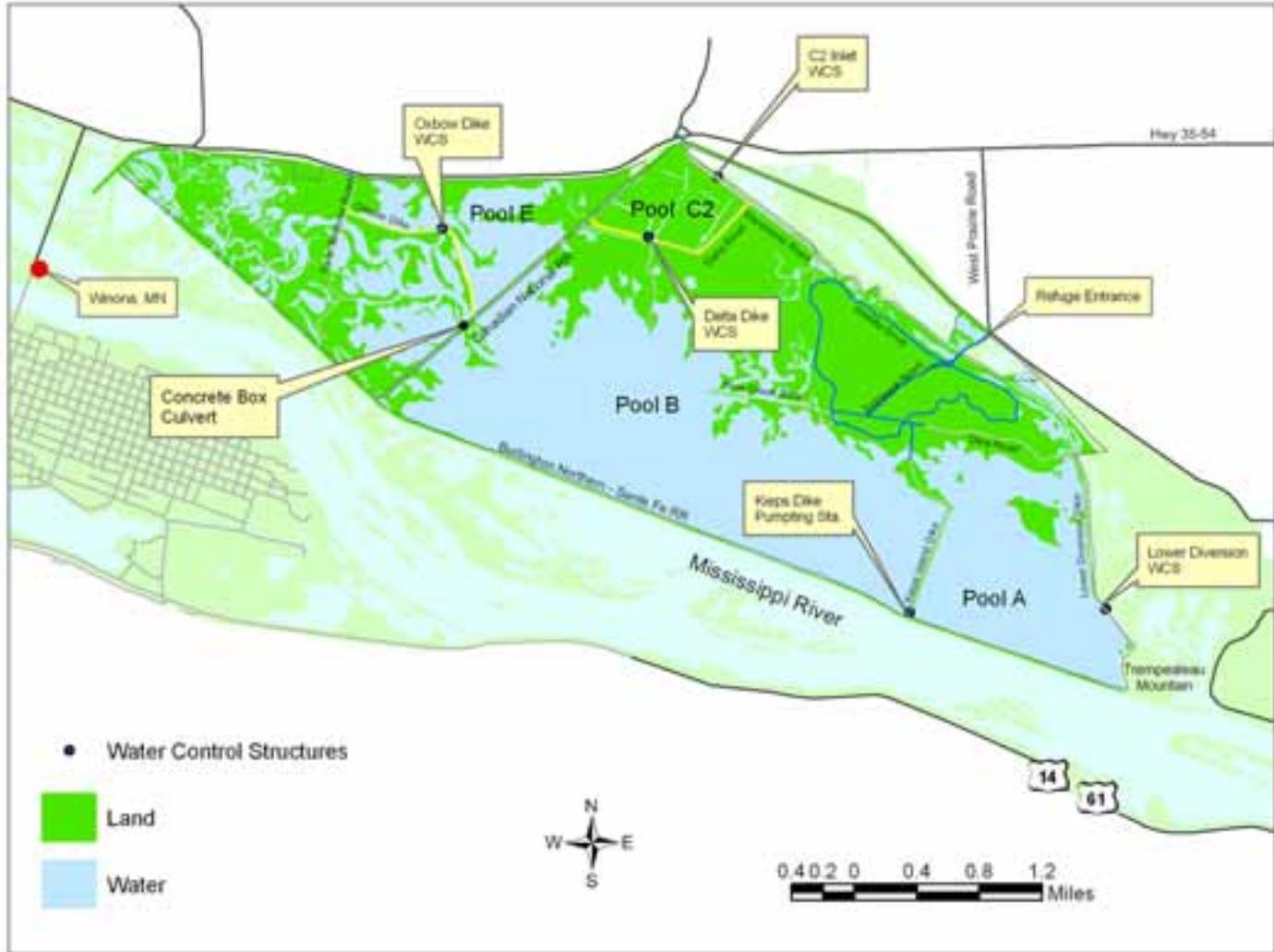


Figure 15: Existing Water Management, Trempealeau NWR





Aerial view of Pool A looking south during the summer of 2002 drawdown. USFWS

Lower Diversion Dike. How the Corps manages water levels in Pool 6 determines the level of the Trempealeau River at this location. This determines the water head at the present discharge site and sets the upper limit on Pool A outflow.

Through the Environmental Management Program a series of dikes and pump stations was completed in 1999. This system created three separate impoundments of 700, 225, and 600 acres within which water levels can be manipulated by gravity and/or pumping to enhance conditions for growth of desirable plants. However, the remaining 4,000 acres of water in Pool B are essentially unmanageable. Water levels in this pool since 2001 have been above desirable levels but pumping and discharge to improve conditions are impractical due to its large area and depth. Subdividing this pool into smaller, more manageable units has been discussed.

The new water management system received its first “test” in 2000 when water level manipulation began. In Pool A water was drawn down by pumping to the maximum (3 feet) exposing about 15 to 20 percent of the bottom. Aquatic plant response on these areas, which had not been exposed for over 60 years, was excellent. By allowing a rise in water levels in the fall, important habitat for migrating waterfowl and marsh birds was provided. Experience gained during the 2000 drawdown showed that groundwater seepage in Pool A is considerable and would probably preclude maintaining low water levels throughout the winter months. In 2004, the Pool A pump station was modified to permit removal of additional water to expose a greater area of pool bottom during a drawdown.

The ability to draw down Pool A allows the Refuge to create mudflats and vegetated shallow water

areas that attract thousands of shorebirds and hundreds of Blue-winged Teal and Northern Shovelers during late spring migration. Through the summer, Sandhill Cranes, Canada Geese, and Mallards feed on the mudflats, and White Pelicans, Great Egrets, and Great Blue Herons loaf in the shallows and feed on schools of fish. During a drawdown, the pool is held as low as possible into the winter when ice conditions prevent pumping. Waterfowl and other birds take advantage of the plentiful food source during fall migration.

Flooding Pool C2 in the late winter attracts waterfowl when the remainder of the Refuge waters are still iced over. This provides limited ability for water level control because the water is released after three weeks to prevent swamp white oak trees in the southeast corner of the impoundment from being stressed.

Pool E is lowered about 6 inches in early June to allow wild rice to grow. The rice attracts waterfowl in the fall. Typically there is an abundant rice crop every other year.

Pool B is the largest pool and includes the wetlands from Kieps Dike west to the Canadian National Railroad and the wetlands west of the railroad outside of Oxbow Pool. This makes it difficult to manage and over the years the emergent marsh habitat and floating vegetation mats have declined in quantity due to high water levels.

As mentioned earlier, the BNSFRR dike forms an integral part of the barrier dike system which impounds water within Trempealeau NWR. This dike was breached and over-topped in 1965 and was repaired by the railroad. During the near-record flood in the spring of 2001, floodwaters rose to a level even with the bottom of the rails at several points but the dike held. Again, additional rock was added at several points. Railroad personnel were concerned about the large “head” of water against their dike and requested that the Service let water into Trempealeau NWR to equalize the pressure on the dike. In response, gates on the water control structure in Lower Diversion Dike near Trempealeau Mountain were opened as well as gates on the Marshland Road inlet structure, allowing water from the Trempealeau River to enter the Refuge pools. Water elevations on the Trempealeau River were several feet lower than on the Mississippi River at points upstream where pressure on the dike was greatest. As a result, the quantity of water

which could be diverted into the Refuge pool was insufficient to offer protection for the railroad dike at the critical locations.

From the Refuge's perspective, opening the gates on the Lower Diversion and Marshland Road structures and allowing floodwaters to enter the Refuge caused serious damage to biological resources and infrastructure as follows:

1. High inflows damaged the electric weir and one lift gate on the water control structure with a repair cost of several thousand dollars.
2. Higher water levels in Refuge pools coupled with strong winds caused bank erosion on the Refuge side of the BNSFRR dike.
3. With damage to the electric weir, carp and other rough fish were allowed to enter Pool A. In the future, with big-headed and silver carp and other exotic species entering the Mississippi River, biological consequences from this action to aquatic systems in the Refuge pool could be severe.
4. Floodwaters uprooted or drowned out beds of emergent aquatic plants that had become established during the previous year's drawdown in Pool A and those beds that were well established in the upper ends of Pool B between Pine Creek Dike and the Canadian National Railroad.
5. Interior Refuge roads and dikes suffered damage from high water. Kieps Island spillway was damaged from overtopping and needed extensive repairs.



The main access road into Trempealeau NWR floods annually. USFWS

In summary, this incident clearly demonstrated that the present water management infrastructure at Trempealeau NWR affords little opportunity for management actions that can reduce Mississippi River flood impacts on the BNSFRR dike. Letting flood waters into Pool A through the lower diversion structure will damage emergent vegetation thereby countering the beneficial effects of drawdowns, and may accentuate bank erosion on the railroad and interior dikes while offering virtually no additional protection to the BNSFRR dike.

If the BNSFRR placed a large, gated culvert or series of culverts through their dike upstream of the junction with the Canadian National Railroad (CNRR) dike, it might be possible to discharge enough water into the upper portion of Trempealeau NWR to save the dike during a disastrous flood event. Such a project could jeopardize the CNRR dike that bisects the Refuge pool and would undoubtedly cause considerable damage to Refuge habitats and infrastructure.

Water inflow into Refuge pools can occur through an inlet structure between the upper end of C2 Pool and the Trempealeau River backwaters and through a drainage ditch off the Buffalo Township Park. Other inflow comes from seepage through railroad and barrier dikes and from groundwater input. This latter source is probably considerable but has not been measured. A number of artesian wells drilled by the former owners of the Delta FFF are scattered throughout Refuge wetlands. The quantity of water inflow has not been measured but is believed to be relatively insignificant.

Flooding of the 0.2-mile township road that provides the main access to the existing auto-tour route occurs for up to 6 weeks annually during spring break-up and at other times following heavy rains. During this time, the surface gravel is washed from the road into the wetland downstream. This material is slowly filling the wetland from years of flooding. As part of a feasibility study to look at alternatives for providing all-weather access to the Refuge, a hydraulic analysis of Trempealeau River flows was conducted. These data are available in Refuge files.

3.2.3 Geology and Soils

The Upper Mississippi River Valley was substantially influenced by the Pleistocene geologic age. During this period, heavy water flows caused substantial erosion and cut the present deep valley. As

flows lessened, sediments composed of sand and gravel were deposited forming the basis for present Refuge soils.

Soils within the Refuge range from alluvial types in the wetlands to finely eroded sands on the steeper uplands. Varying levels of silt overlies sand and gravel sediments in the wetland bottoms. However, isolation of Refuge marshes from adjacent river floodwaters by the barrier dikes has reduced the degree of siltation compared to adjacent Mississippi backwater areas.

The 700-acre central upland portion is an area of rolling sand dunes formed from wind-blown material deposited in the valley during a former dry period.

Soils, to a great extent, influence the growth and type of vegetation which occur on a particular area. Soil also determines the suitability of a site for a particular use. Accordingly, soil characteristics as described in soil surveys from Buffalo and Trempealeau Counties (USDA 1962, 1977) were mapped and used in conjunction with other data to determine the suitability of various locations for Refuge management and development.

3.2.4 Environmental Contaminants

In February 1991, sediment samples were collected from several locations in the main Refuge pool. These were borings taken from 0 to 19 feet for bulk chemical testing to determine suitability of sand for dike construction. Samples were analyzed for heavy metals, organochlorine pesticides and PCBs and were found to be relatively clean. Complete results of the analysis are listed in Appendix A of the January 1994 Corps of Engineers Definite Project Report for the Trempealeau NWR HREP (USACE 1994).

As mentioned earlier, Trempealeau NWR is bordered and bisected by active railroad grades. The BNSFRR in particular is a busy track with trains passing at 20 to 30 minute intervals during working hours. Railroads transport a variety of chemicals, fertilizers, and other materials, some of which would be harmful to fish and wildlife if a derailment occurred adjacent to the Refuge and contaminants entered the wetlands.

3.2.5 Water Quality

Outbreaks of blue-green algae have been noted in Refuge pools during summer months, turning the water a pea-green color. Studies during July 2002 by

USGS researchers from the Upper Mississippi Environmental Sciences Center (UMESC) in La Crosse found that nitrogen concentrations in the Refuge pool were low relative to phosphorus. Low nitrogen levels can limit phytoplankton growth. Phytoplankton such as blue-green algae that can fix atmospheric nitrogen, however, will have a competitive advantage over non-fixing species – hence the huge bloom noted.

Refuge pools are shallow and fertile and receive no inflow from adjacent rivers during the winter months. As a result, dissolved oxygen levels become quite low during most winters particularly when snowfall is above normal.

3.3 Vegetation and Habitat Resources

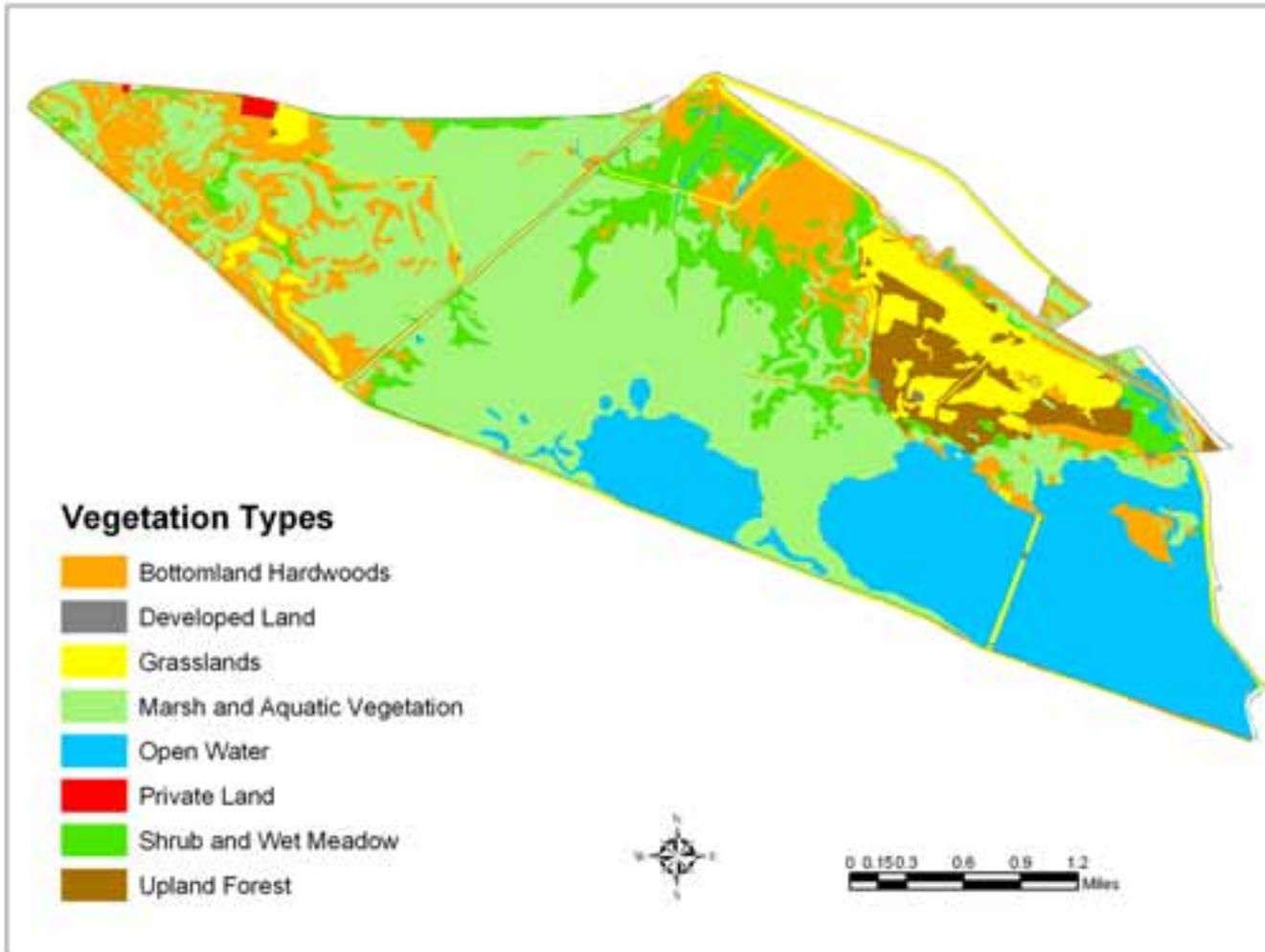
3.3.1 Habitats and Vegetation Types

Vegetative cover type, density, and height are all important factors used in planning and managing the Refuge. The 1994 GIS habitat coverage maps from USGS and ground fieldwork were used to code all the vegetative types on the Refuge. Figure 16 illustrates these vegetative types.

Using this system, the Refuge's vegetation types can be grouped into the following categories: 2,574 acres of marsh and aquatic vegetation; 1,446 acres of open water; 572 acres of wetland, shrub, and wet meadow; 227 acres of upland forest; 969 acres of bottomland forest; 408 acres of grassland; and 30 acres of developed land. The total Refuge area is 6,226 acres.

Marsh and aquatic vegetation occupies about 41 percent of the Refuge. The primary emergent species are cattail, burreed, sedges, bulrush, arrowhead, and phragmites. Wild rice, a particularly important fall food plant for migratory birds, is abundant, particularly in the western half of the Refuge. During some years this plant may occupy several hundred acres of the Refuge. Floating-leaf and submergent aquatics including American lotus, pickerelweed, water lily, pondweeds, waterweed, coontail, and water milfoil are present in varying levels of abundance. First noted in the mid-1980s, the invasive purple loosestrife has spread throughout the Refuge and now occurs in some stands that

Figure 16: Landcover/Land Use Map, 1994, Trempealeau NWR





Oak stand with a dense understory of European buckthorn and honeysuckle. USFWS



The same area after removal of invasive woody shrubs. USFWS

are several acres in size. Other invasive aquatic plants present include Eurasian milfoil and curly-leaved pondweed.

Wetland shrub and **wet meadow** types comprise about 9 percent of the Refuge. Principal species within the wetland shrub type are willow, red-osier dogwood, and buttonbush. The wet meadow type includes various sedges and the invasive reed canary grass. There are indications that willow may be spreading and occupying areas formerly occupied by emergent and wet meadow species.

Upland forest covers about 4 percent and is dominated by red and black oaks, black locust, green ash, and black cherry with a few scattered pine plantations. Nearly 190 acres of this upland forest are dominated by non-native tree species in their overstory. The red and white pine found on the Refuge are not indigenous to this particular area of Wisconsin. Scotch pine and red cedar are not native to this area. All of these species were planted decades ago in an attempt to provide additional habitat niches. However, these plantings fragment prairie habitats that are becoming extremely rare in the region due to development and agriculture.

Recently, nearly all upland forests have been invaded by European buckthorn which in many areas forms a dense, monotypic understory shading out native hardwood tree and shrub seedlings and wildflowers. An extensive effort to remove buckthorn, honeysuckle, Siberian pea and exotic elms was made in fall 2003 and winter 2003/2004 (see adjacent photographs). This was done in conjunction with an environmental education effort using over 500 students and a few staff to clear most of the understory invasives and all of the mature exotics in

the overstory within a 4.5-acre area. This level of effort likely could not be maintained at the current level of staffing.

The **bottomland hardwood forest** covers about 16 percent of the Refuge and is dominated by silver maple, river birch, swamp white oak, cottonwood, willow, and ash.

Prior to impoundment, much of the old river channels on the western portion of the Refuge were bordered with bottomland hardwoods. Some areas were cleared for farming and then later maintained by the Refuge as grasslands in order to create edge habitat. Now that the importance of bottomland hardwoods (and other habitats) in unfragmented condition is known, and the difficulty of maintaining these fields using fire is realized, the Refuge has recently begun to restore these areas to bottomland hardwoods. Some restoration has already occurred with planting of seedlings and direct seeding of various trees including swamp white oak, hackberry, and green ash. This restoration may make these areas more attractive to such species as the Red-shouldered Hawk and Cerulean Warbler.

Grassland areas make up about 7 percent of the Refuge. Past management efforts have encouraged re-establishment of native grasses such as big and little bluestem, switchgrass, Indian grass, side-oats grama, Junegrass, and green needlegrass. In the last two decades, the importance of prairie wildflowers has been recognized including species such as purple prairie clover, lupine, prairie larkspur, goatsrue, spiderwort, leadplant, and yellow puccoon. Non-native, cool season grasses such as quackgrass, smooth brome grass and bluegrass occur throughout the grasslands. Leafy spurge began invading grass-

lands on Trempealeau NWR in the mid 1980s and is now present throughout upland prairie habitats. This plant thrives from its persistent underground root system, defying mowing and burning. Releases of flea beetles that attack and feed on leafy spurge plants began in the early 1990s and show promise for future control.

Prescribed burning has been an important part of prairie management on Trempealeau NWR. About 335 acres within 17 grassland units are burned on a rotational system during the spring months under prescriptions described in a Fire Management Plan (USFWS, in preparation in 2007).

Black locust, a native of the southeastern U.S. was brought to the Refuge in the late 1930s and 1940s to control erosion and provide wildlife cover. The species did well in sandy soil areas and became very invasive due to its aggressive, spreading root system. The Refuge has been “battling” black locust using mechanical and chemical means for many years with varying levels of success. At present, black locust stands of varying age occupy about 30 percent of the upland area of the Refuge.

Developed land accounts for less than 1 percent of the Refuge area and includes the headquarters area, maintenance and storage facilities, roads, parking areas, and water control structures.



Refuge staff planting Swamp white oak trees on a former cropfield. October 2003. USFWS

3.4 Fisheries Habitats and Resources

3.4.1 General

Based on limited population sampling conducted in 1979, 1981, 1984, and 1994, the fishery resource of the Refuge can best be described as mixed, but dominated by non-game fish. Carp, buffalo, and bullheads are the most abundant species and may comprise as much as 85 percent of the standing crop by weight. These species are the most resistant to the partial and often severe winter-kills that occur regularly. Northern pike and yellow perch are the most abundant game species found in Refuge pools. Using a diversity of sampling techniques in 1994, a total of 23 species of fish were recorded (Appendix G).

3.4.2 Commercial Fishing

Commercial harvest of carp and buffalo on the Refuge has occurred sporadically over the past 25 years. During the period from 1982 to 1986, more than 700,000 pounds of fish were taken. Attempts to utilize commercial harvest to control rough fish populations to improve aquatic plant growth and survival have met with limited success. Unstable pricing and market conditions have often reduced incentives for harvest at times when rough fish populations are high and resource impacts most severe. However, with completion of the interior dikes and pump stations in 1999, commercial salvage for carp in Pool A prior to a drawdown year can significantly reduce the population. This improves conditions for growth of both emergent and submersed aquatic vegetation by reducing the amount of carp foraging in the sediment. It also allows a quicker drawdown to occur because fewer fish are present to reduce the flow of water to the pumping station by blocking the intake culvert. Pumps can then run continuously.

3.4.3 Forage Fish

Little is known about this component of the fish population in Refuge pools. However, its importance to many fish-eating birds that frequent the Refuge is substantial. White Pelicans and Double-crested Cormorants, for example, arrive in April and are present until late October in numbers often exceeding 500 birds of each species. Hundreds of Ring-billed Gulls and Bald Eagles roost and feed on the Refuge during both spring and fall migrations. Great Blue Herons and Great Egrets from a rook-

ery 1 mile west of the Refuge number more than 500 nesting pairs and use the Refuge as a major feeding area during breeding season. In short, Trempealeau NWR pools provide an enormous food source for many hundreds of fish-eating birds for 8 to 9 months of the year. This food base is comprised of young-of-the-year carp and buffalo, gizzard shad, and an undetermined number of other species.

3.4.4 Sport Fish

Trempealeau NWR supports a meager sport fishery with bullheads comprising the majority of the catch by bank fishermen. Limited numbers of northern pike are taken with a few large fish (over 10 pounds) usually reported each year. Other game fish including bass, bluegill, crappie and yellow perch are present. Their numbers tend to fluctuate depending on severity of the most recent winterkills.

3.4.5 Threatened and Endangered Fish

No federally listed species are known to occur within the Refuge. However, state listed species including the American eel (special concern) and the river and greater redhorse, both threatened, are known to occur in the Trempealeau River. There are also records of the pirate perch collected on the former Delta FFF in 1947 although the species has not been encountered recently.

3.4.6 Invasive and Exotic Fish and Molluscs

Several non-native species have been introduced into Wisconsin waters either accidentally or, in some cases, on purpose. Some have become “invasive” in that they overwhelm native species and take over a body of water. Aquatic invasive species threaten the diversity and productivity of the Mississippi River System and Trempealeau NWR.

Common carp have been present in the Refuge pool system for many years. Their numbers have somewhat stabilized and tend to fluctuate depending on the severity of winterkills. Two other species of carp are cause for serious concern, however. Big-head carp and silver carp were first brought to the U.S. in the 1970s by Arkansas fish farmers to consume algae in fish production ponds. They escaped and began to appear in the southern Mississippi River in the 1980s and now occur in large numbers below Lock and Dam 19 in Iowa. A bighead was caught in Pool 4 (Lake Pepin) about 25 miles upstream from Trempealeau NWR in the fall of



Red fox. USFWS

2003. Both species are large-bodied filter feeders that compete directly with native mussels and other fish for food. There is great concern about their potential effect on fish communities if they become established in Wisconsin waters. Both bighead and silver carp are known to jump out of the water in response to boat motors. Continued maintenance and operation of the electric barrier in the Lower Diversion Dike water control structure is essential to ensure that exotic fishes like the silver and big-head carp do not enter Trempealeau NWR from the Trempealeau River when the gates are open and water is being discharged.

Zebra mussels, native to Eastern Europe and Western Asia, are now found in the entire Wisconsin portion of the Mississippi River. These hardy and prolific mollusks, which can clog water-intakes and decimate native mussel populations, as yet have not been found in Trempealeau NWR pools.

3.5 Wildlife

Trempealeau NWR habitats provide potential resting and feeding areas for migratory and resident wildlife. Wooded river bluffs are used by songbirds while many species of raptors take advantage of updrafts created by the valley slopes for their migrations. The diverse mix of wetland, forest, and prairie habitats within and adjacent to Trempealeau NWR support a great variety of birds, mammals, reptiles, and amphibians as described in the following sections.

Refuge wildlife monitoring is an important priority with results used to support adaptive management techniques that can be used to benefit a

variety of wildlife species. Various techniques are used as specified in the stations current Wildlife Inventory Plan (USFWS 1987).

3.5.1 Waterfowl

Waterfowl usually begin arriving in mid-March as ice break-up occurs in Refuge pools. Migrants, which include Goldeneyes and Common and Hooded Mergansers, show up earlier on adjacent Mississippi River backwaters where river currents and water level fluctuations cause ice-out to occur before Trempealeau NWR. Essentially all diving and dabbling ducks common to the Mississippi Flyway can be seen at Trempealeau NWR during the spring migration. Canada Geese are a common spring migrant – Snow Geese are rarely seen. Tundra Swans move through by the thousands in mid to late March on their way to sub-arctic nesting grounds. Flocks numbering into the hundreds can be seen on the Refuge for brief periods in the spring. Blue-winged Teal are usually the last waterfowl species to arrive.

Canada Geese, Mallards, Blue-winged Teal, and Wood Ducks are the principal nesting waterfowl. All four are listed as Resource Conservation Priority (RCP) species based on their recreational and economic value (Appendix G). Families of Canada Geese are conspicuous during summer months when flightless molting adults and their young congregate in Refuge marshes. An annual roundup in July coordinated by Wisconsin DNR usually results in over 100 goslings and flightless adults being banded on the Refuge. Wood Ducks are the most abundant nesting duck on Trempealeau NWR and adjacent Mississippi River backwaters using cavities in bottomland hardwood forest stands for nesting.



Refuge and Wisconsin DNR staff and volunteers round up flightless geese for banding on the Refuge. July 2002. USFWS

Fall migration begins in late August coinciding with the ripening of wild rice in stands on the upper pools. During bumper years, this plant may occupy hundreds of acres in the western half of Trempealeau NWR providing a tremendous food source utilized by Wood Ducks, Mallards, Sora and Virginia Rails, Coots, and thousands of Black Birds. Flocks of Blue-winged Teal are apparent at this time preparing for their early fall departure.

Trempealeau NWR is important as a fall waterfowl feeding and resting area for the complex of wetlands occurring in the general area. Neither adjacent Pool 6 within the Upper Mississippi River NW&FR nor state-managed wetlands in Trempealeau Bay include any areas closed to waterfowl hunting. By maintaining only limited waterfowl hunting for disabled persons and restricting human entry and modes of access during fall migration, adequate sanctuary has been provided on Trempealeau NWR to protect and hold large numbers of waterfowl. This has improved waterfowl hunting and wildlife viewing opportunities on surrounding areas over the years.

Diving ducks including Ring-necked Ducks and Canvasback ducks are attracted to Trempealeau NWR pools during the fall migration. More than two-thirds of the mid-continent population of Canvasbacks are believed to pass through the “Upper Miss” and Trempealeau NWR during fall migration.

In recent years it has been estimated that more than 30,000 Tundra Swans move through the Upper Mississippi River Valley during fall migration, staging on closed areas within the Upper Mississippi River NW&FR and on Trempealeau NWR. These birds begin to arrive in late October and may stay for a month or more. Peak numbers in excess of 1,000 on the Refuge have been recorded. Thousands of visitors enjoy watching these spectacular birds as they brighten our lives for a few brief weeks in the fall (and spring).

Canada Geese and Mallards are usually the last waterfowl to depart. During years when snow comes late and birds can feed in harvested crop fields nearby, hundreds of geese and thousands of Mallards can be seen roosting on pool ice well into December.

3.5.2 Waterbirds

3.5.2.1. Pelicans and Cormorants

White Pelicans began appearing on Trempealeau NWR and vicinity in the mid-1980s. Since then num-



American White Pelicans. Sandra Lines

bers have increased with peaks of up to 1,000 birds recorded. Flocks are assumed to consist of non-breeding adults and sub-adults since nesting occurred for the first time in 2007 on the Mississippi River navigation Pool 9. These birds find ample forage fish for their diet as flocks of pelicans can usually be seen on the Refuge from ice-out to freeze-up.

Formerly listed as endangered in Wisconsin, Double-crested Cormorant numbers have rebounded dramatically in the Upper Midwest. Until 1985, a small nesting population was maintained on man-made structures located west of Delta Point. This effort was discontinued as Cormorant numbers increased and it became obvious that major recruitment was occurring elsewhere. The large flocks that now stage on the Refuge and adjacent Mississippi River backwaters in late summer and fall are causing consternation among anglers regarding their potential impacts on gamefish numbers. As with pelicans, main food sources within Trempealeau NWR are likely young carp, buffalo, and gizzard shad.

3.5.2.2. Herons, Bitterns and Egrets

Serious declines in numbers of nesting Great Blue Herons and Great Egrets have occurred on the adjacent Upper Mississippi River in recent years. For example, of four known rookeries active in 1987 on Pools 4, 5, and 6 of the Winona District, only the Mertes Slough rookery in Pool 6 remains viable. This colony located only 1 mile upstream of Trempealeau NWR contained an estimated 600 Great Blue Heron and 100 Great Egret nests in the year 2000. Vegetation losses and general decline in foraging habitat are believed to be at least partly responsible for the demise of these rookeries.

Studies demonstrate that many nesting Great Blue Herons and Great Egrets that were followed by aircraft traveled from the Mertes Slough rook-

ery to Trempealeau NWR for feeding (Custer, 1999). It is likely that Trempealeau NWR marshes play a critical role in the survival of this rookery. Other heron species found on the Refuge include the Green Heron, Black-crowned Night Heron, and Least Bittern. Sightings/records of the American Bittern on or near the Refuge are extremely rare.

3.5.2.3. Cranes and Rails

Sandhill Crane numbers have increased in recent years with six to 10 nesting pairs on the Refuge. Flocks of up to 30 birds on and near the Refuge are common.

Sora and Virginia Rails become apparent when wild rice begins to mature. Many birds can be heard calling from stands of wild rice and other emergent vegetation in the western two-thirds of the Refuge from late August into early October. Both species nest on Trempealeau NWR.

3.5.2.4. Gulls and Terns

Flocks of Ring-billed Gulls winging their way up through the Mississippi River Valley are a sure sign that spring and flocks of waterfowl are not far behind. These birds move through by the thousands, but do not nest.

Trempealeau NWR provides one of the largest nesting populations of Black Terns on the Upper Mississippi River. These birds build their nests on floating vegetation. Nesting pairs peaked in the mid- to late-90s between 60 and 100 pairs. The population bottomed out at 15 pairs during the high water year of 2001. Since then numbers recovered and stabilized at about 30 nesting pairs. Clearly, more stable water levels within Trempealeau NWR provide more secure nesting conditions for Black Terns than adjacent Mississippi River backwaters where water level fluctuations are more severe. Black Terns are a Regional Resource Conservation Priority Species and are listed as a species of Special Concern in Wisconsin. (Appendix G).

3.5.3 Shorebirds

Shorebird habitat is generally scarce on Trempealeau NWR except during years when drawdowns are conducted on Pool A, exposing mudflats for shorebird foraging. Shorebirds took advantage of the Pool A drawdown in 2000 which coincided with their northward migration in the spring. Twenty-three species of shorebirds used the Refuge during this time. Greater and Lesser Yellowlegs were the first to arrive in mid to late April. Dunlins came in

the hundreds from early to late May peaking at about a thousand. Unusual species included a Red Knot, Hudsonian and Marbled Godwits, American Avocets, and Ruddy Turnstones. Though the fall migration was less spectacular, a few hundred shorebirds made use of low water levels in the pool.

The American Woodcock is a common migrant and a nesting species on Trempealeau NWR.

3.5.4 Raptors

Bald Eagle (see Section 3.5.11 on page 108) and Osprey, which is listed as threatened in Wisconsin, nest on the Refuge. A pair of Ospreys have nested most years on a platform on top of a transmission line support structure along the Canadian National Railroad dike. This nest was first discovered in 1975 and at that time was the only known nest in the area. Since then at least three other nests have appeared within 5 miles west of the Refuge. A pole and nesting platform placed near Kiep's Island has received limited use by Ospreys. Nesting occurred in 1998, 1999, 2000, 2001 and 2007 but only two young were fledged in 2000 and 2007.

There are previous nesting records for the Red-shouldered Hawk on Trempealeau NWR but sightings of this species have been few in recent years. Red-shouldered Hawks seem to prefer large tracts of mature bottomland forest within the Mississippi River floodplain for nesting. This kind of habitat is present but limited on Trempealeau NWR.

The Peregrine Falcon, a state-listed endangered species in Wisconsin, has nested on bluff outcrops within 2 miles of the Refuge and on man-made structures in towns and cities nearby. The species is observed occasionally at Trempealeau NWR and has been seen taking waterfowl.

3.5.5 Upland Game Birds

Wild Turkeys were reintroduced into southwestern Wisconsin in the mid-1980s. Since then Wild Turkey sightings have become more frequent and at present a population of 20-25 birds on the Refuge is estimated. Although few in number, the birds are often conspicuous providing visitors with many wildlife observation opportunities. Spring and fall turkey hunting seasons are offered in Wisconsin but the Refuge is closed to Wild Turkey hunting.

Ruffed Grouse are an uncommon resident of forest edges and shrub habitats on Trempealeau NWR.

3.5.6 Passerines (Songbirds)

The most recent bird list for Trempealeau NWR includes 266 recorded species of which 143 are passerines. This great diversity of species is a response to the variety of habitats on and near the Refuge. Riverine wetlands with a mix of emergent marshes, shrub swamps and bottomland forest combined with upland forest and "goat prairies" on the valley slopes attract many species during spring and fall migrations. The period from late April to mid-May in particular is a high point for visitors who come to Trempealeau NWR to watch the spring warbler migration. During the summer few warblers nest here, but many other passerines do. The woodlands support a number of woodpecker species, Vireos, Black-capped Chickadees, White-breasted Nuthatches, House Wrens and other songbirds nesting there. The prairie is home to Eastern Meadowlarks, Grasshopper Sparrows, Dickcissels, Field Sparrows, and Orchard Orioles. In the wetlands there are Sedge Wrens, Red-winged Blackbirds, and Yellow-headed Blackbirds. Yellow-headed Blackbirds were observed frequently prior to the 1990s before the cattail beds were destroyed in Pool B. Very few were found on the Refuge until spring 2003 when they began nesting in cattails that became established after the Pool A drawdown in 2000.

A series of point count surveys were made on Trempealeau NWR from spring to fall in various habitats. A total of 76 species were recorded, of which 60 were passerines (Appendix G).

3.5.7 Mammals

A resident white-tail deer herd estimated at between 50 and 75 animals occurs on the Refuge and provides both wildlife viewing and hunting opportunity for the public. Since the early 1980s managed hunts including some "antlerless only" seasons have reduced the herd to a level which is currently at or below carrying capacity of Refuge habitats. Many people would like to see more deer on the Refuge, but higher deer numbers could cause negative impacts on hardwood forest reproduction through over-browsing.

Beaver and muskrats are the most conspicuous of the furbearers. Beaver lodges with food piles and cuttings, and the presence of the animals themselves, provide enjoyment for many visitors. When colonies are situated near roads, culverts, and dikes, however, they can cause serious problems. Selected



Leopard frog. Copyright Sandra Lines

harvest of problem beaver by permittee trapping has been conducted in the past and is recommended where necessary. Harvest of muskrats through permittee trapping is allowed with an annual harvest of 1,000 to 1,500 animals. Trapping of muskrats reduces the number of these animals, which burrow into dikes and cause structural damage. Beaver and muskrat trapping units are awarded through an auction held each year prior to the opening of the season.

The Refuge and surrounding area seems to support high numbers of raccoons, based on observations of tracks and other sign and numbers of roadkills. During Wood Duck trapping and banding operations in late summer, placement of corn for bait at trap sites immediately attracts raccoons, which must be live-trapped and relocated or excluded from banding sites with electric fencing. The impacts of this high raccoon population on nesting waterfowl and other ground-nesting birds on the Refuge is unknown but may be significant. Trappers remove a small number (7-10) of raccoons during the fall season.

Coyote numbers have also increased throughout southwest Wisconsin. Sightings on Trempealeau NWR are now becoming more frequent. Other mammals known to occur include minks, otters, striped skunks, weasels, red and gray foxes, cottontail rabbits, gray and fox squirrels, and a variety of small mammals including ground squirrels, moles, pocket gophers, voles, mice, and shrews.

3.5.8 Reptiles and Amphibians

According to the Wisconsin Herpetological Society, 59 species of reptiles and amphibians are known to be indigenous to Wisconsin. Forty-nine of these species may occur on Trempealeau NWR – 15 have been recorded to date (Appendix G). Three species are of special significance and are listed in Wisconsin. The wood turtle and Blanding's turtle are both classified as threatened while the eastern Massasauga rattlesnake is listed as endangered by the State. The Blanding's turtle is frequently observed during the egg-laying season.

Frog and toad call surveys have been conducted on the Refuge since 1981 by staff and volunteers. Species recorded include the American toad, green frog, wood frog, leopard frog, chorus frog, spring peeper, Eastern gray treefrog and Cope's gray treefrog. A reptile and amphibian list covering the Upper Mississippi River NW&FR includes 35 recorded species with 10 additional recorded from adjacent counties. Since the Upper Mississippi River NW&FR stretches north and south 261 miles downstream into northwest Illinois, the list includes a few species that would not be expected to occur at Trempealeau. The bullfrog, for example, has not been found north of LaCrosse, Wisconsin.

3.5.9 Invertebrates

A lack of benthic invertebrates in bottom sediments has been noted in Trempealeau NWR pools. Studies were conducted by USGS to determine if toxic sediment ammonia or fish predation was responsible for the scarcity of aquatic invertebrates (Richardson, pers. comm). Using comparisons within and outside of fish exclosures, it was concluded that fish predation probably limits invertebrate populations. This is not surprising in view of the large standing crop of black and brown bullheads in Refuge pools.

3.5.10 Invasive and Exotic Wildlife Species

European Starlings are uncommon on the Refuge during most seasons of the year. There is potential for their early nesting behavior to compete with Bluebirds, Tree Swallows, Wood Ducks, Kestrels, and probably many other species for nest cavities. Mute Swans are occasionally seen on the Refuge and vicinity. A native invasive species is the Brown-headed Cowbird, which is common and parasitizes nest of other songbirds.

3.5.11 Federally Endangered and Threatened Wildlife Species

The Bald Eagle was recently removed from the federal threatened and endangered species list. The eastern Massasauga rattlesnake is currently a candidate species being considered for federal listing. Formerly, this species was found at numerous sites in bottomland forests and emergent marsh habitats on the Upper Mississippi River NW&FR. It is now known to occur only on state and Refuge lands along the lower Chippewa River near Nelson, Wisconsin and at a site in the Van Loon Bottoms in Pool 7. There are no recent records of the eastern Massasauga rattlesnake on Trempealeau NWR, however, former owners of the Delta FFF reported having killed several Massasaugas prior to 1975 while cutting hay on fields adjacent to what is now Delta Road. Karner Blue butterflies have not been seen on the Refuge but suitable habitat may exist.

Three Bald Eagle nesting territories were active in the spring of 2006 on Trempealeau NWR. Bald Eagles pass through during migration often in large numbers particularly during ice break-up in the spring. Peak numbers of more than 100 birds are common during the month of March when ice-out exposes an abundance of carcasses from the most recent winter fish kill.

3.5.12 State Listed Species

Table 5 lists vertebrate species receiving special designation as Endangered, Threatened, or Special Concern Species pursuant to the Wisconsin Endangered Species Act.

3.6 Special Uses

3.6.1 Scientific Research

A number of research projects have been conducted on the Refuge since 1995. Most of these are studies designed to better understand ecological processes occurring on the Refuge and to assist in developing effective management strategies. A few have been carried out by local universities to address research interests not directly related to Refuge management questions.

Research has included Black Tern nesting, frog deformities, White Pelicans, Cormorants, Tundra Swans, and aquatic ecology in Refuge pools.

Table 5: Species With Special State Designation, Trempealeau NWR

Species	Status
Plants	
Brittle Prickly Pear Cactus	State Threatened
Butterflies	
Karner Blue Butterfly	Endangered
Fritillary Butterfly	Endangered
Birds	
American Bittern	Special Concern
Least Bittern*	Special Concern
Trumpeter Swan	State Endangered
American Black Duck	Special Concern
Peregrine Falcon	State Endangered
Red-shouldered Hawk*	State Threatened
Osprey*	State Threatened
Northern Harrier	Special Concern
Great Egret	State Threatened
Great Blue Heron	Special Concern
Black-crowned Night Heron	Special Concern
American White Pelican	Special Concern
Caspian Tern	State Endangered
Forster's Tern	State Endangered
Black Tern*	Special Concern
Red-headed Woodpecker*	Special Concern
Prothonotary Warbler*	Special Concern
Grasshopper Sparrow*	Special Concern
Lark Sparrow*	Special Concern
Dicksissel*	Special Concern
Orchard Oriole*	Special Concern
Reptiles	
Blanding's Turtle	State Threatened
Wood Turtle	State Threatened
*Breeding on Trempealeau NWR	

3.6.2 Utilities

Several electric transmission lines border and cross the Refuge. These structures and the wires stretching between them cause an undetermined number of bird strikes and they impact aesthetics by disrupting views of the natural landscape. On the other hand, of four known Osprey nests in the area, all were built on powerline structures. Eagles and other raptors are often observed using these structures for perches. Utility companies have easements from the Refuge for right-of-way maintenance and structure repair; however, all entry and work is done via Special Use Permit with Special Conditions regarding mode of access, herbicide use, etc.

3.7 Public Access, Education and Recreational Opportunities

This section describes existing public access, educational and recreational opportunities on Trempealeau NWR. Recreational features and access points on the Refuge are shown in Figure 17.

3.7.1 Public Access

Trempealeau NWR is open to the public during daylight hours throughout the year. The main Refuge entrance, which also serves as part of the Great River State Trail, is a low-lying gravel road in the backwaters of the Trempealeau River. Approximately 1,800 feet of this road is subject to frequent flooding and lies below the elevation of the entrance road bridge that was replaced in 1994. The entrance road and parts of the auto tour route are closed for about 4 or 5 weeks each year due to high water. Typically this occurs in the spring and summer months when visitation is greatest due to opportunities to observe migrating birds in the spring and warmer temperatures in the summer.

The existing entrance road north of the Trempealeau River bridge is owned by the Township of Trempealeau but maintained by the Refuge under a Cooperative Agreement. There are no entrance fees charged at Trempealeau NWR at this time.

Alternate access to the Refuge during flooding is available via the Marshland entrance; however, Wisconsin Department of Transportation has requested that this alternate entrance not be promoted due to its location on a curve of State Highway 35 and close proximity to a signed railroad crossing (Figure 17).



River Education Days at Trempealeau NWR. USFWS

A third Refuge access point is from Highway 35 via a parking area at the north end of River Bottoms Road (Figure 17). From this parking area visitors can hike or bike to areas of the Refuge west of the Canadian National Railroad dike.

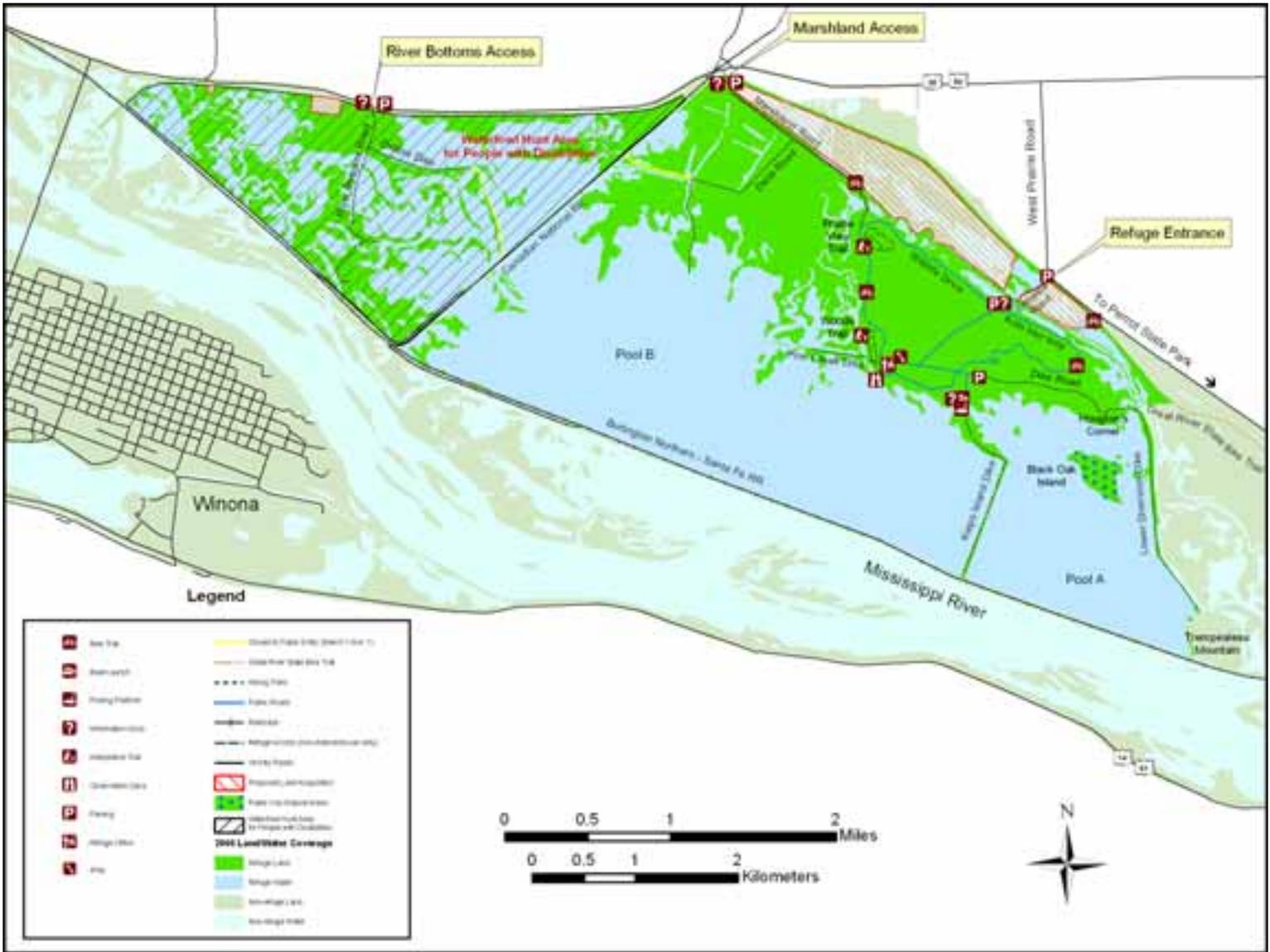
The old railroad right-of-way on the north side of the Refuge is bordered by private property on the north and south sides. These properties are currently owned by the same owner. The Refuge constructed two crossings to allow the private landowner to move cattle and farm machinery back and forth. This special use permit will continue to be renewed as long as there are no violations of the permit conditions.

3.7.2 Recreation

3.7.2.1. Wildlife Dependent Recreation

Between 60,000 and 70,000 people visit Trempealeau NWR annually to participate in the variety of wildlife-dependent recreational and educational opportunities offered. These include wildlife observation and photography, interpretation, environmental education, fishing, and hunting. These activities are supported by a number of facilities including a 5-mile, self-guided auto tour route which

Figure 17: Current Public Use, Trempealeau NWR



is also open to bicycles, a visitor contact area in the Refuge office, a boat access for hand-powered and electric-motor equipped boats, a bank fishing structure, an observation platform for wildlife viewing, two interpretive trails, and several miles of dikes and roads closed to motor vehicles but open to hiking and biking.

Wildlife Observation and Photography. Wildlife viewing at Trempealeau NWR is best in spring and fall as migrating birds pass through. The observation platform near Refuge headquarters provides an expansive view of the main pool area where Bald Eagles, Tundra Swans, geese, and ducks can be seen from mid-March well into April. A walk on one of many miles of trails, roads, and dikes open to hiking in late April or early May can be rewarding for visitors wanting to view migrating warblers, vireos, and other songbirds that may only be seen at Trempealeau NWR for a few weeks each year. Driving the 5-mile auto tour route or biking that portion of the Great River State Trail passing through the Refuge affords visitors an opportunity to see Wild Turkeys, deer, and an abundance of wild flowers blooming on sand prairies.

During years when Pool A is drawn down, an abundance of exposed mudflats attract a variety of shorebirds not normally seen. Excellent viewing opportunities of this pool are available to visitors that hike on the Kieps Island or Lower Diversion dikes (Figure 6 on page 34).

Beginning in late summer (August), a ripening crop of wild rice on the western portion of Trempealeau NWR offers visitors some unique wildlife observation opportunities. The wild rice crop attracts large numbers of Mallards, Wood Ducks and teal and other birds, especially Soras and Virginia Rails. Opportunities for photography from either River Bottoms Road or Oxbow dike are usually very good. Both these areas are accessible via a short hike from River Bottoms Road parking area just off Highway 35 (Figure 6).

For visitors who want a closer view of birds on the marsh, a boat landing at Kieps Island provides visitor access via canoes, kayaks or boats with electric motors.

Two interpretive trails are available on the Refuge. The 1-mile Woods Trail winds through upland forest beginning at an observation deck parking lot across from Refuge Headquarters. The Prairie View Trail is one-half mile in length, surfaced with screened gravel and is accessible to persons with

disabilities. This looped trail begins at a parking area just off the wildlife drive (Figure 6 on page 34) and affords excellent views of rolling sand prairie habitat and close-ups of native grasses and wild flowers in season.

Interpretation. Refuge Headquarters constructed in 1998 includes a small visitor contact area with public restrooms. A 4-by-8-foot table top topographic model of the Refuge is popular with visitors providing both orientation as well as demonstrating how Trempealeau NWR fits into the surrounding landscape. The office is staffed from 7:30 a.m. through 4:00 p.m. weekdays and some Saturdays. Refuge brochures, maps, bird lists, etc., are available to visitors.

About 25 qualified Refuge volunteers assist visitors on the observation platform on weekends from May to October. They help answer questions and assist with wildlife identification. In recent years more than 1,400 visitors were contacted annually.

A 5-mile self-guided wildlife drive winds through the upland portion of Trempealeau NWR. A leaflet provides explanation for visitors regarding management programs and habitats and wildlife featured at several numbered stops along the drive. Prairie management, prescribed fire, invasive species, and unique wildlife species are high-lighted. The wildlife drive is also included as a portion of the Great River State Trail, which is open to bicycles through the Refuge. Approximately 18,000 bikers have used this trail annually since it was opened in 1990. The Woods Trail and Prairie View Trails have interpretive signs along the route.

Refuge staff conduct several interpretive programs annually both on and off Refuge. Opportuni-



Songbird banding for a Girl Scout program at Trempealeau NWR. USFWS

ties for these activities are currently somewhat limited by staff and group facility availability.

Fishing. Because rough fish (carp and buffalo) and bullheads dominate the fish population in Refuge pools, the demand for angling on Trempealeau NWR is relatively low. Most anglers fish for bullheads from shore. Bullheads are quite plentiful and easy to catch but not large in size. Refuge pools are open to boat fishing (electric motors only) via the ramp at Kieps Island boat landing. A bank fishing structure on Kieps Island dike is used regularly by anglers. A limited number of canoeists and kayakers use the Refuge, mostly on weekends.

Hunting. Trempealeau NWR is not open to public hunting for waterfowl. However, for the past 14 years a special hunt for sportspersons with disabilities has been held on a portion of Refuge lands west of the Canadian National Railroad (CNR) dike. From 1988 to 2001 the hunt was conducted on one weekend only in an area between the CNRR and River Bottoms Road. The waterfowl hunt was expanded to include new acquisition of 500 acres west of River Bottoms Road (Figure 6 on page 34). After 2001, hunting was permitted from two blinds for two additional weekends. In 2003, 20 hunters with disabilities participated in the hunt along with 25 volunteer helpers. The hunting program is coordinated, managed, and financed by volunteers, particularly members of Wisconsin Waterfowl Association and Wisconsin DNR, with Refuge staff providing equipment and administrative and logistical support. During the two-day weekend hunt in October 2003, a total of six geese and 103 ducks were harvested.

The Refuge is open to the public by special use permit for firearms (rifles prohibited) deer hunting during the regular nine-day Wisconsin season which begins the Saturday before Thanksgiving. In recent years, 35 to 60 individuals were selected by random drawing for the either-sex hunt. Archery deer hunting is permitted in the Refuge during the late archery season. An unlimited number of permits is issued to archery hunters. All hunting permits cost \$10.00.

The number of deer harvested from the Refuge from all hunts in recent years has averaged about 20.

3.7.2.2. Non-Wildlife Dependent Recreation

People look for (hunt) and pick morel mushrooms in late April and early to mid-May. Morel crops are sporadic depending on spring rainfall and soil tem-



Bicycling on the Great River State Trail generates more than one-fourth of all public visits to the Refuge. USFWS

perature. Red and black raspberries, locally called “black caps” are sought by wildlife and a small number of visitors. Mushroom and berry picking for personal use is allowed without a permit.

Bicyclists riding that portion of the Great River State Trail passing through Trempealeau NWR probably consist of two kinds of users: those who come because of the opportunity to see wildlife; and those who are riding strictly for the exercise or for general enjoyment of the outdoors. At present the Great River State Trail ends at Trempealeau NWR, so the Refuge is, to a degree, an end point or destination. Therefore, at present the assumption is that bicyclists come to the Refuge to see wildlife and they are counted as wildlife observation the same as people driving the 5-mile auto tour route in their motor vehicle. In the future, however, the proposed bike trail extension from Marshland, Wisconsin, into Winona, Minnesota, could result in the Refuge becoming more of a rest stop or wayside for bicyclists passing through. This could change the way this activity is viewed in terms of wildlife-dependent versus non-wildlife-dependent recreation. For the present, we recognize that some level of non-wildlife-dependent bicycling occurs on Trempealeau NWR.

3.7.3 Environmental Education

Programs for school groups, scouts and other organized groups are conducted by Refuge staff both on and off Trempealeau NWR. In recent years between 800 and 1,200 students/scouts have participated in Refuge-led environmental education programs. Regularly scheduled events include a spring birding festival and a Refuge Week activity in the

fall. There appears to be plenty of demand for further use of Trempealeau NWR as an outdoor classroom.

3.7.4 Resource Protection

During certain times of the year, some areas are closed to limit disturbance to wildlife. Access beyond the water control structures at Oxbow and Delta Dikes is prohibited March through mid-November to prevent disturbance to all wildlife in those areas. Access around eagle nests is posted as closed to prevent disturbance to eagles during the breeding season.

Those persons participating in hunting or fishing are expected to comply with Refuge and state regulations. Several general regulations are in place to reduce disturbance to wildlife while visitors participate in public use programs. These include:

- # All pets must be confined by a leash 6 feet or shorter.
- # The Refuge is closed during night time hours (dusk to dawn) to reduce disturbance to wildlife.
- # Bicycles are restricted to service roads to prevent habitat damage including erosion caused by off trail riding.

3.8 Cultural Resources and Historic Preservation

Cultural resources are important parts of the Nation's heritage. The Service is committed to protecting valuable evidence of human interactions with each other and the landscape. Protection is accomplished in conjunction with the Service's mandate to protect fish, wildlife, and plant resources. Cultural resources management in the Service is the responsibility of the Regional Director and is not delegated for the Section 106 process when historic properties could be affected by undertakings, for issuing archeological permits, and for Indian tribal involvement. The Regional Historic Preservation Officer advises the Regional Director about procedures, compliance, and implementation of the several cultural resources laws. The Refuge Manager protects archeological sites and historic properties on Service managed and administered lands, by monitoring archeological investigations by contractors and permittees, and by reporting violations.

The following information was taken from a report by Michael M. Gregory et al. entitled "A Cultural History Summary and Cultural Resources Management Planning Resource for the Upper Mississippi River National Wildlife and Fish Refuge and the Trempealeau National Wildlife Refuge." (Great Lakes Archaeological Research Ctr. 2003)

3.8.1 Native American Cultural History and Landscape

3.8.1.1. Prehistoric

The combined cultural history sequence for the Upper Mississippi River NW&FR and Trempealeau NWR reflects a continuous human occupation that began 12,000 or more years ago. The earliest evidence of human use of the area surrounding Trempealeau NWR dates to the **Paleoindian** period from 12000 Before Present (B.P) to 7500 B.P. Paleoindians are characterized as nomadic hunters and gatherers whose substructure base depended heavily upon the exploitation of Pleistocene mammals, for example, mammoth, mastodon, bison, and caribou. Much of what is known about this period is derived especially from kill sites excavated in other parts of the region. Site 47-TR-85 on the Refuge contains a Paleoindian component as do three sites in the vicinity of the Refuge. Undisturbed sites from this culture are very rare and thus very important to archaeologists.

The **Archaic** period followed the Paleoindian from about 9000 B.P to 3000 B.P and is marked by a subsistence strategy that incorporated smaller game and a broader range of plant species. This subsistence base was linked to climatic conditions, which became more moderate as the glaciers retreated. Two sites on the Refuge have components from late in the Archaic period, although none with human remains.

Adaptations that characterized Archaic traditions carried into **Woodland** traditions (3000 to 700 B.P). Well defined traits marking the tradition are the presence of ceramics, the construction of earthen mounds for burials, and the cultivation of plants. However, hunting and gathering continued to dominate the subsistence strategy. Ten sites on the Refuge are from the Woodland culture. The Refuge may contain a mound group near the Trempealeau River. Human remains have been excavated from non-mound sites.

Middle Mississippian (1000 to 500 B.P) cultures occupied the fertile alluvial land of the Mississippi River and its tributaries. Together, the arrival of corn and interaction with Middle Mississippian cultures eventually led to the disappearance of the Woodland peoples and gave rise to a group known as the Oneota. Oneota sites of the Upper Mississippi traditions are distributed throughout the Upper Midwest and were occupied by farmers pursuing a subsistence economy based on cultivating corn, supplemented by fishing and hunting. The present day Winnebago, including the HoChunk, are believed to be descendants of the Oneota. Two sites on the Refuge contain evidence from the late prehistoric Oneota culture.

3.8.1.2. Historic Native American Groups

The Upper Mississippi River Valley Region associated with the “UMRNWFR” and Trempealeau NWR has been utilized or inhabited primarily by twelve historical Native American groups. They are the Ioway, Winnebago, Ottawa, Huron, Miami, Eastern Dakota, Menominee, Mascouten, Kickapoo, Sauk, Meshwaki, and Potowatomi. Several of these groups trace their origin to the region, while others immigrated into it as a result of political and economic events linked to interactions with French, British, and American interests. Constant warring and displacement of groups continued into the mid-nineteenth century. Indian tribes listed in Chapter 6 have a potential concern for traditional cultural resources, sacred sites and cultural hunting and gathering areas in the counties in which the Refuge is located. The tribal concern was identified by federal government recognition, self identification, or presumption from the historical record.

3.8.2 Archaeological Resources

A number of recorded archaeological sites are located on Trempealeau NWR. More sites probably exist. During an archaeological survey in September 1990, Robert Boszhardt from Mississippi Valley Archaeology Center (MVAC) collected a number of diagnostic ceramic sherds from the Early, Middle, and late Woodland traditions that span a time range of circa 250 B.C. - A.D. 1200. During this survey, he noted that severe bank erosion was threatening cultural resources. Since then, extensive bank stabilization work with rock has been conducted to protect cultural resources at those sites.

Illegal collecting of artifacts along eroded shorelines has occurred in the past and law enforcement patrolling emphasis has been increased in response

to the problem. In January 1984, an anonymous “collector” reported a human skull protruding from an exposed bank. A team of archaeologists from MVAC excavated the remains which proved to be an adult male Native American about 30 years of age at death. The remains were estimated to be between 50 and 1,000 years old.

An upland location includes a grave marker or headstone dated 1895. The marker has the inscription “Jim Yellowbank” with the accompanying date. A core sample did not reveal evidence of a human burial associated with this marker. However, further excavation is needed to determine if indeed a burial is associated with the site.

Since the Refuge was established, 18 cultural resources studies, reports, or collections have surveyed 82 acres of the Refuge, identified 48 sites, and produced 6,906 artifacts. Most of these artifacts are stored and curated at the Mississippi Valley Archaeology Center under terms of a cooperative agreement. The Federal Government owns the artifacts, and the Regional Historic Preservation Officer may recall them for exhibits or other Refuge purposes. The prehistoric artifacts are currently not associated with any modern tribe. The artifacts include human remains but no funerary objects, sacred objects or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act. The U.S. Army Corps of Engineers, Saint Paul District, is thought to have the 724 artifacts from the 1991 O’Mack collection. Private collectors have additional artifacts from the Refuge. The Refuge manages museum property under terms of the Region-wide scope of collections statement dated October 31, 1994. The Refuge has no on-site museum property such as archeological collections, artwork, historical documents, or natural history collections.

3.8.3 Euro-American Cultural History

The Fur Trade. The French first established the fur trade in the Upper Mississippi River Valley and maintained it from about 1610 through the early 1760s, when control passed to the British, who dominated it until the War of 1812, after which Americans controlled the regional trade until it collapsed in the late 1840s and early 1850s. The Trempealeau area developed into a strategic fur trading location. However, the exact location of forts, posts, homes, and settlements is not well known as little archaeological research has been directed there.

Transportation and Settlement. Between 1830 and 1890 the adjacent Mississippi River served as a transportation route for moving huge rafts of logs from the pineries of northern Wisconsin and Minnesota to St. Louis for distribution. Steamboats were the chief means of transporting goods up and down river until the advent of the railroads during the late 19th century. The grade that is now the Burlington Northern Santa Fe Railroad was constructed in 1895 and formed the beginnings of isolation of wetlands within what would become the Delta FFF and later Trempealeau NWR.

The upland portion of Trempealeau NWR was settled sometime after the General Land Office surveys were completed in the late 1840s. An 1896 Plat Book for Trempealeau County shows that S.A. Hamilton owned much of the bottomland portion of what is now Refuge. By 1910, H.E. Clark, a surveyor for one of the railroads purchased most of the land from Hamilton and established the Trempealeau Drainage District.

On April 11, 1911, rerouting of the Trempealeau River began. Both the Trempealeau River and Pine Creek were rerouted near Marshland and channeled to flow along the east boundary of present Refuge lands. A huge levee was constructed to retain the waters of the rerouted Trempealeau River. The rerouting, culverts, ditches, and additional dikes were built by the newly formed LaCrosse Dredging Company.

In 1915, two large pumps were installed at the lower end of the levee, just north of Trempealeau Mountain, to pump during periods of high water and dike seepage. This attempt to convert the bottomlands into farmland failed and the area later became the Delta Fish and Fur Farm. Michael Lipinski and later his son Richard managed the Delta FFF from the 1930s until the property was sold to Dairyland Power Cooperative in 1975. A number of dwellings and farm buildings remained on the property when the Service acquired the Delta FFF in 1979. These buildings were sold, materials salvaged and the remainder buried on-site. Prior to Refuge establishment, 707 acres of land were purchased from H.E. Clark by the U.S. Biological Survey with the intention of acquiring the surrounding wetlands of the Delta FFF. Administrative buildings consisting of a residence, pump house, service building/office and a small barn were constructed. A large lodge/laboratory was constructed on the site of the H.E. Clark home, which formerly stood near the existing observation platform. Policy changes caused this building

to be unused and it was later used by the Girl Scouts as a campsite and meeting place. Both the lodge and former residence were demolished in the early 1980s.

In 1935 a Civilian Conservation Corps (CCC) Camp was maintained on the Refuge for several months. Remnants from structures associated with the camp still remain. The CCC aided in construction of roads, trails, bridges, and fences and planted trees, shrubs, and food plots. During the late 1930s, Works Progress Administration (WPA) workers did further improvements including construction of several miles of split-rail fence using salvaged timber.

As of December 2006, the National Register of Historic Places does not include any properties in the immediate vicinity of the Refuge. On the Refuge, the National Park Service has determined that site 47-TR-86 is eligible for the National Register. The State Historic Preservation Officer (SHPO) considers all the sites on Kieps Island as eligible. For the rest of the Refuge, the SHPO has determined 4 sites are eligible and 9 are not eligible. The SHPO considers any remaining sites as eligible until determined otherwise.

3.9 Existing Facilities and Infrastructure

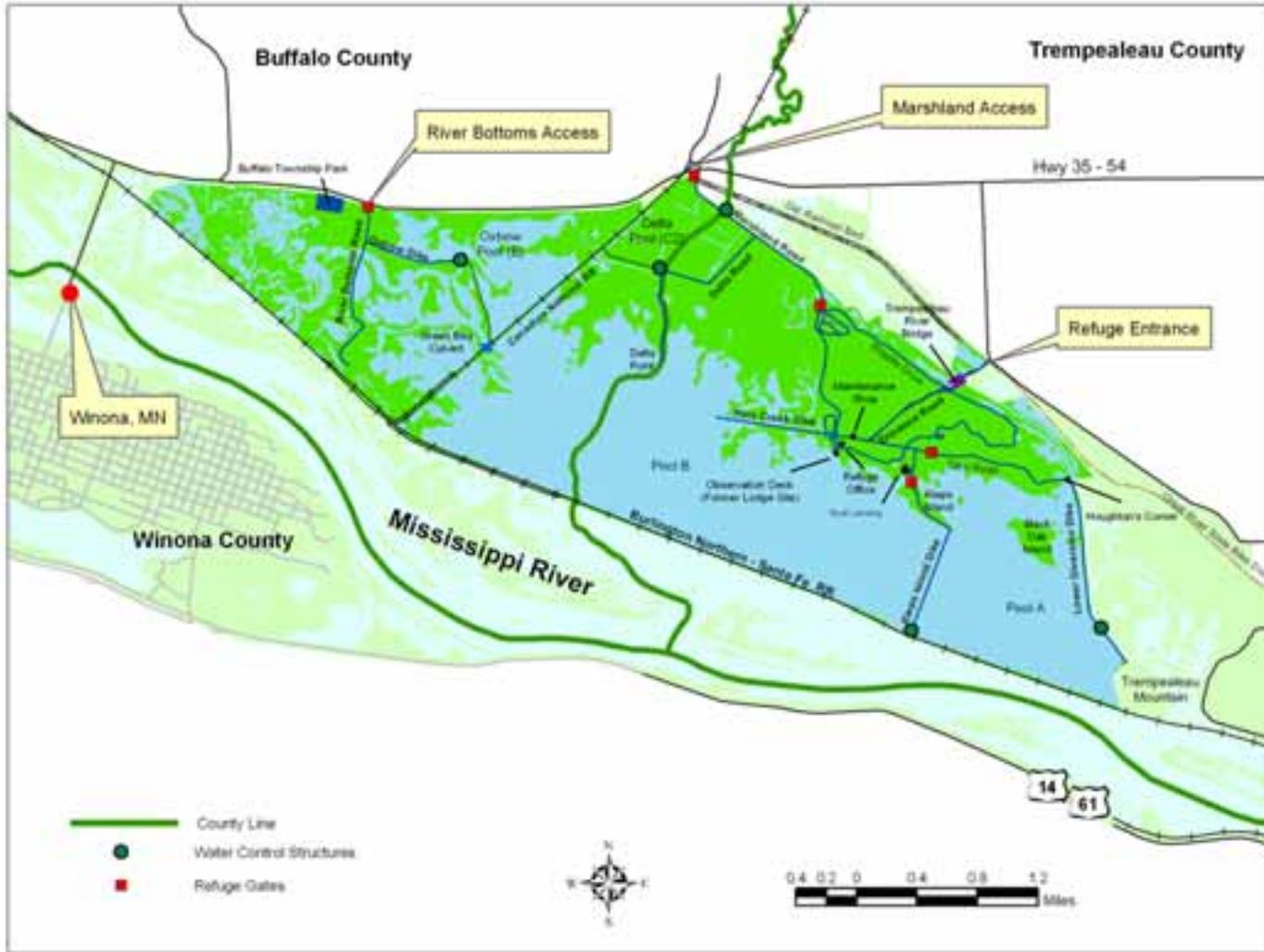
Major facilities on the Refuge are shown in Figure 18 and described below.

Buildings. The existing Refuge office building was constructed in 1998 on a site above the 100-year flood elevation. It includes a visitor contact and display area, offices for five Refuge staff, a conference room and restrooms. The former headquarters building is now used as a shop and office for maintenance staff. A 60-foot by 100-foot pole building and three-stall garage on the site are used for vehicle and equipment storage.

Bridges. A concrete bridge spanning the Trempealeau River on the entrance road was constructed in 1994, replacing an iron structure that had a restricted load capacity. (Figure 18).

Dikes. About 2.5 miles of barrier dikes separate Refuge pools from the man-made channel of the Trempealeau River. Lower Diversion Dike is about 1.5 miles long and ties into Trempealeau Mountain on its lower end (Figure 18). Marshland Dike spans about 1 mile from the wildlife drive to the Marshland access. Both dikes were originally constructed

Figure 18: Facilities and Structures, Trempealeau NWR





*Bush chipping and clearing dikes at Trempealeau NWR.
USFWS*

in 1911. They have been repaired and added to over the years but received major reconstruction in 1995 when they were raised and widened considerably. Interior dikes include the Kieps Island dike (0.75 mile), Oxbow dike (1 mile), and the C2 dike (1.25 miles). About 7 miles of the BNSFRR dike borders Trempealeau NWR on the south and separates Refuge pools from the Mississippi River. The 2.5-mile long CNRR dike crosses the Refuge. A large box culvert under this dike allows water levels to equalize on the upstream and downstream sides (Figure 15 on page 96).

Water Control Structures (WCSs). There are five water control structures on the Refuge. These include the lower diversion structure, Pool A pump station, C2 pool WCS and portable pump station, C2 pool inlet structure, and the E Pool WCS and portable pump station (Figure 15 on page 96).

The lower diversion structure is a four-bay structure with steel lift gates. Constructed in 1984, this structure has no pumping capability and is used primarily to discharge water from Pool A by gravity flows when Trempealeau River levels permit. The structure is equipped with an electric weir to prevent entry of rough fish from the Trempealeau River when the gates are open.

The Pool A pump station is located in the south end of Kieps Island dike. It is equipped with two permanent pumps with a combined capacity of 22,000 gallons per minute. An outlet pipe under the BNSFRR dike allows discharge of water by pumping into the Mississippi River. The pump station has the capability of removing water from Pool A or Pool B. There is also an attached water control structure that allows gravity flow of water between Pools A and B when the pumps are not being used (Figure 15 on page 96).

Both the C2 and E WCSs may be used to manage water by gravity flow or portable electric pumps with a combined pumping capacity of 9,000 gallons per minute. Pumps are stored at the Refuge shop and installed in the structures only when needed.

The C2 inlet structure is located in the Marshland Dike and is used in the early spring to divert water from the Trempealeau River and Pine Creek into C2 pool.

Roads. There are nearly 14 miles of roads on Trempealeau NWR. Of these, only the 1-mile entrance road is black-topped. All other roads are surfaced with gravel. Of the 14 miles of roads, about 7 miles are open to private vehicles. This includes the entrance road and the 4.5-mile wildlife drive. All surfaced roads are open to the public for hiking and bicycling. The 0.25-mile gravel access road between West Prairie Road and the concrete bridge over the Trempealeau River is owned by the Township of Trempealeau but maintained by the Refuge under a Cooperative Agreement.

3.10 Socioeconomics

This section provides an overview of the local demographic, land use and economic setting in the vicinity of Trempealeau NWR and its watershed, with emphasis on issues specific to the CCP. It is estimated that the majority of annual recreational visitors (approximately 85 percent) to the Refuge reside within a 30-mile radius. Thus, the “local area” described here includes the lower Trempealeau River watershed and an area bounded on the north by Arcadia and Alma, Wisconsin; on the west by Winona, Minnesota; and on the south by La Crosse, Wisconsin. (Figure 1 on page 2). Socioeconomic data for both Trempealeau and Buffalo Counties are included in this section.

3.10.1 Socioeconomic Setting

Trempealeau NWR is located in southwest Wisconsin with about one-third of the Refuge (2,100 acres) in Buffalo County and two-thirds (4,100 acres) in Trempealeau County. The largest population center nearby with more than one million people is the Minneapolis-St. Paul metropolitan area located a distance of about 125 miles to the northwest. Smaller cities within the local area include La Crosse, Wisconsin and Winona, Minnesota, with populations of 51,800 and 27,100 respectively.

Light industry and government provide the greatest share of employment in the vicinity of the

Refuge. Major private sector employers include Fastenal Corporation and Peerless Chain in Winona; Ashley Furniture in Arcadia with 2,800 employees; and Trane Company, City Brewing, and St. Francis and Gundersen-Lutheran Medical Centers in La Crosse. Collectively, government offices including federal, state, County, and City jurisdictions within the Refuge's local area employ a significant number of people.

Four universities are located within the local area of the Refuge. These include Winona State and St. Mary's University in Winona and Viterbo University and the University of Wisconsin-La Crosse in La Crosse. The influx of several thousand university students for 9 months each year has a significant positive impact on local economies.

3.10.1.1. Population and Demographics

From 1980 to 2001 the human population in the State of Wisconsin went from 4.7 to 5.4 million, an increase of almost 15 percent (Henderson, 2004). During this period, Trempealeau County showed a 3.3 percent increase and Buffalo County a 3.7 percent decrease (Henderson, 2004). However, major population growth is occurring nearby, notably in areas between the Refuge and La Crosse. Large tracts of land are being developed for residential subdivisions in formerly rural townships in northwestern La Crosse County.

3.10.1.1.1 Trempealeau County

Trempealeau County is about 734 square miles in size with the community of Whitehall as county seat. County population trends have changed during the past 20 years. From 1980 to 1990 the population went from 26,214 to 25,317, a decrease of 3.5 percent (Henderson, 2004). From 1990 to 2000, however, a 6.9 percent increase from 25,317 to 27,010 occurred (Appendix F-1). This trend was more apparent for the Township of Trempealeau which includes all of the Refuge lands in the southern portion of Trempealeau County. From 1990 to 2000 the population of Trempealeau Township increased by 20.6 percent from 1,341 to 1,618 (Town of Trempealeau, 2002). Projections for the year 2010 are for the township population to increase by an additional 13 percent. The job center of the La Crosse area has shifted and expanded northward towards Trempealeau County. U.S. Highway 53 was recently reconstructed to a four lane, 65 mph highway which leads directly from the expanding job center of La Crosse and Onalaska to the Town of Trempealeau via State Highway 35 (Town of Trempealeau, 2002).

In 2000, county population was 98.8 percent Caucasian compared to 88.9 percent for the state as a whole and 75.1 percent for the U.S.A. Persons of Hispanic or Latino origin constitute the largest non-white population group at 0.9 percent (Appendix F-5).

3.10.1.1.2 Buffalo County

Buffalo County is about 685 square miles in size with the county seat located at Alma, Wisconsin. Population trends have shown a similar pattern to Trempealeau County with a 5.7 percent decrease from 14,337 to 13,558 from 1980 to 1990, and a 1.9 percent increase from 13,558 to 13,819 from 1990 to 2000 (Appendix F-2). Again, recent growth in Buffalo County is well below the state and national levels.

All Refuge lands within Buffalo County are included within Buffalo Township which is located at the southern tip of Buffalo County. Since 1980 the township population has declined steadily from 821 to 667 people, a decrease of 18.8 percent (Buffalo County Outdoor Recreation Plan, 2002). Projections through 2010 show a continued decline in population.



Wild bergamot. USFWS

3.10.1.2. Employment and Income

3.10.1.2.1 Trempealeau County

Appendix F shows the full- and part-time employment by major business sector in Trempealeau County in 1980, 1990, and 2001. In 1980, over four-fifths of employment was concentrated in five sectors: farming (22 percent), retail trade (16 percent), services (16 percent), manufacturing (15 percent), and government (14 percent). In 2001, employment in manufacturing increased to 32 percent, while services (20 percent) and government (13 percent) remained strong. However, farming experienced a noticeable decline, where employment represented only 13 percent of total employment in Trempealeau County. Between 1980 and 2001, dramatic employment decreases were exhibited in farming, retail trade, and finance, insurance, and real estate.

Employment in Trempealeau County between 1980 and 2001 increased by 22 percent, which is comparable to the employment growth in Wisconsin (29 percent). While the Trempealeau County population has grown only by 3.2 percent over the last 20 years (Appendix F), the rise in employment has outpaced population growth.

Total employment earnings from the major business sectors in Trempealeau County increased about 30 percent from \$292 million in 1980 to \$417 million in 2001 (Henderson, 2004). During that 21-year period, per capita income increased from \$18,085 to \$24,010, an increase of 24.7 percent based on 2003 dollars. This is close to the 25.2 percent increase in per capita income for the State of Wisconsin as a whole.

3.10.1.2.2 Buffalo County

Buffalo County's employment growth between 1980 and 2001 has far outpaced its population growth. As shown in Appendix F, employment remained relatively constant between 1980 and 1990, and then increased over the following 10 years.

In 1980, nearly one-third of employment was represented by the farming sector. Other predominant employment sectors included services (14.2 percent), government (14.1 percent), and retail trade (13.5 percent). Between 1980 and 2001, the composition of employment has moved away from the farming sector (28.2 percent decrease) and retail trade sector (20.1 percent decrease). While the farming sector still comprised 16.6 percent of employment in 2001, the services sector accounted for 24.3 percent.

Buffalo County earnings from the major business sector increased 32.1 percent from \$160 million in 1980 to \$233 million in 2001. During this same period, per capita personal income (adjusted for 2003 dollars) went from \$19,452 to \$27,385, an increase of 29 percent. This was slightly more than the 25.2 percent increase for Wisconsin as a whole during this period (Henderson, 2004).

3.10.1.3. Transportation Patterns

The Refuge Office is 2 miles from State Highway 35-54. This two-lane highway provides the main route of travel in Wisconsin between Winona and La Crosse. It is 10 miles from the City of Winona to the office via Highway 35-54 and the Minnesota-Wisconsin bridge. La Crosse is about 25 miles away. A new, expanded section of Highway 53 now provides a double-lane connection between Highway 35 near Holmen, Wisconsin and Interstate 90 at La Crosse.

State Highway 35-54 borders the north boundary of Trempealeau NWR in Buffalo County between Marshland and the turn-off to the interstate bridge at Winona. Traffic on this road can be heavy with an average daily traffic of 3,000 vehicles per day at Marshland, Wisconsin (Buffalo County Outdoor Recreation Plan, 2002). This highway provides many thousands of travelers and commuters an opportunity to enjoy scenic views of the Trempealeau NWR.

3.10.2 Land Use

This section presents an overview of land uses within the local area of Trempealeau NWR. Because the Refuge covers portions of both Trempealeau and Buffalo Counties, the land use practices and regulations of both are included. This section also emphasizes the lands comprising the Black Oak Island Public Use Natural Area and portions of the Great River State Trail.

3.10.2.1. General Land Use and Management

Historically, the area surrounding Trempealeau NWR supported a variety of land uses (see Section 3.7.1 on page 109 and Section 3.7.3 on page 112). These included subsistence hunting and gathering, fur trapping, logging, commercial fishing and clamming and agriculture. Today, low-density residential and agriculture constitute the principal land uses within the local area of the Refuge. Within the Trempealeau NWR, visitors can enjoy open space while viewing wildlife and habitats that are becoming rare elsewhere in the vicinity.

A number of observed changes in the land use patterns have occurred in the local area since the Refuge Master Plan was completed in 1983 (USFWS 1983). Some may indirectly affect Refuge habitats and/or programs while others may potentially affect wildlife habitat, water quality or views-capes in the local area.

Bluffland development. New homes are continually being built on the wooded valley bluffs. Views-capes in some areas are changing from a more pristine natural landscape to a more structured, suburban look.

Increased land prices. Land prices are being driven higher by an increased demand for rural housing and hunting land. Leasing of farms or woodlots for hunting and higher timber prices have resulted in woodland and property values exceeding that of cropland in many areas. Landowners often split off and sell the woodland portion of their farm for hunting land while continuing to farm the remaining cropland.

Increase in non-resident land ownership. Non-local and non-residents are purchasing land in Buffalo and Trempealeau Counties for hunting land and cabin sites.

Decline in dairy operations. The number of farms milking cows in Buffalo and Trempealeau Counties has declined significantly in recent years. From 1987 to 1997, the number of dairy herds in Trempealeau County decreased by 40.8 percent (Town of Trempealeau, 2002).

Conservation Reserve Program (CRP). Retiring cropland and planting of permanent grass/forb cover or trees has created blocks of valuable wildlife habitat on private lands in the Refuge vicinity.

3.10.2.1.1 Trempealeau County

Trempealeau County is primarily a rural county with about 25 percent of the land in forests and scattered woodlots. The remainder of the landscape is farmland with scattered towns and a few housing developments. In December 2000, the Town of Trempealeau adopted a revised Trempealeau County Zoning Ordinance. This document implemented the Town of Trempealeau Land Use Plan (Trempealeau County 2002). The objectives of the land use plan were to develop zoning and land use categories, including a land use map, determine a minimum lot size for the township, preserve farmland, and develop policies to guide future develop-

ment. Land use and agricultural preservation policies developed for the township included the following:

1. Promote forest management through the County Forester's office.
2. Create and maintain tourism opportunities.
3. Do not offer incentives for development.
4. Develop criteria that the Town of Trempealeau and the County Zoning Committee can utilize when analyzing a property owner's land use change request (Town of Trempealeau, 2002).

3.10.2.1.2 Buffalo County

Buffalo County is located on the western border of Wisconsin and is characterized by a topography consisting of broad rolling uplands and deep valleys. About 43 percent of the County is covered by forest land with 37 percent devoted to harvestable agricultural crops and 14 percent in pasture or idle cropland. The remaining 6 percent is in rural home sites, roads, farm sites, towns, and cities. Although Buffalo County is a typical Wisconsin dairy county, the number of milking herds is declining. Still farming continues to employ the largest number of people, with nearly 20 percent of the work force engaged directly in farming. It is not surprising that in a county with 43 percent of the area forested, timber harvest and lumber processing are important activities on the land (Mississippi River Regional Planning Commission, 2002).

3.10.2.2. Special Status Lands

The Service manages one Public Use Natural Area and a portion of a State Recreation Trail on the Refuge. These areas are shown on Figure 17 on page 110 and are described below.

3.10.2.2.1 Black Oak Island Natural Area

This 46-acre island complex is located in Pool A within the Trempealeau NWR (Figure 18 on page 116). The unit was designated a Public Use Natural Area in October, 1986 based on its unique and relatively undisturbed character. The complex includes one large and three small islands covered with mature stands of red and black oaks. Many of the trees are quite large, exceeding 24 inches in diameter breast height (d.b.h.). The islands are accessible only by canoe or kayak and receive very little use by visitors. The unit is open to the public for staff-guided wildlife observation, hiking, and photography.

3.10.2.2 Great River State Trail

See Section 3.7.2.2 on page 112 for a description of the Great River State Trail.

3.10.3 Refuge Management Economics

The existing Refuge staff consists of four permanent employees who account for an annual payroll (including salaries and benefits) of approximately \$203,608. Trained volunteers are part of the Refuge's volunteer program. In 2003, volunteers on Trempealeau NWR contributed about 1,676 hours assisting with visitor services, invasive species control, facility and grounds maintenance and administration of the Refuge.

In addition to providing salaries and benefits, the Refuge purchased goods and services totaling approximately \$107,008 in 2003. Some of these expenditures (e.g. for flood damage restoration and maintenance management system projects) were one-time costs and are not expected to be repeated.

Trempealeau NWR contributes funds to local units of government (townships) in Wisconsin for revenue sharing payments. The federal government makes payments in lieu of taxes of up to 0.075 percent of the appraised value of Refuge lands out of the Refuge Revenue Sharing Fund. In 2003, \$7,520 were paid to Trempealeau Township and \$4,868 to Buffalo Township.

3.10.4 Area Recreation Sector

The natural beauty and abundant wildlife of the Upper Mississippi River (UMR) attracts millions of boaters, anglers, hunters, and other individuals seeking recreation. Recreational resources along the UMR within the local area of Trempealeau NWR include the Upper Mississippi River NW&FR, Great River State Trail, Perrot State Park, and the Trempealeau Lakes area (Figure 19).

Portions of the Upper Mississippi River National Wildlife and Fish Refuge lie adjacent to Trempealeau NWR and include most backwater and main channel habitat on Navigation Pool 6. In addition to being an important fish and wildlife refuge, the "Upper Miss" also supports both wildlife dependent recreation including fishing, hunting, wildlife observation and interpretation. Open water and main channel areas adjacent to sand beaches are also popular for non-wildlife dependent uses such as power boating, water skiing, swimming, and camping. Annual visits on the 50-mile stretch of Missis-



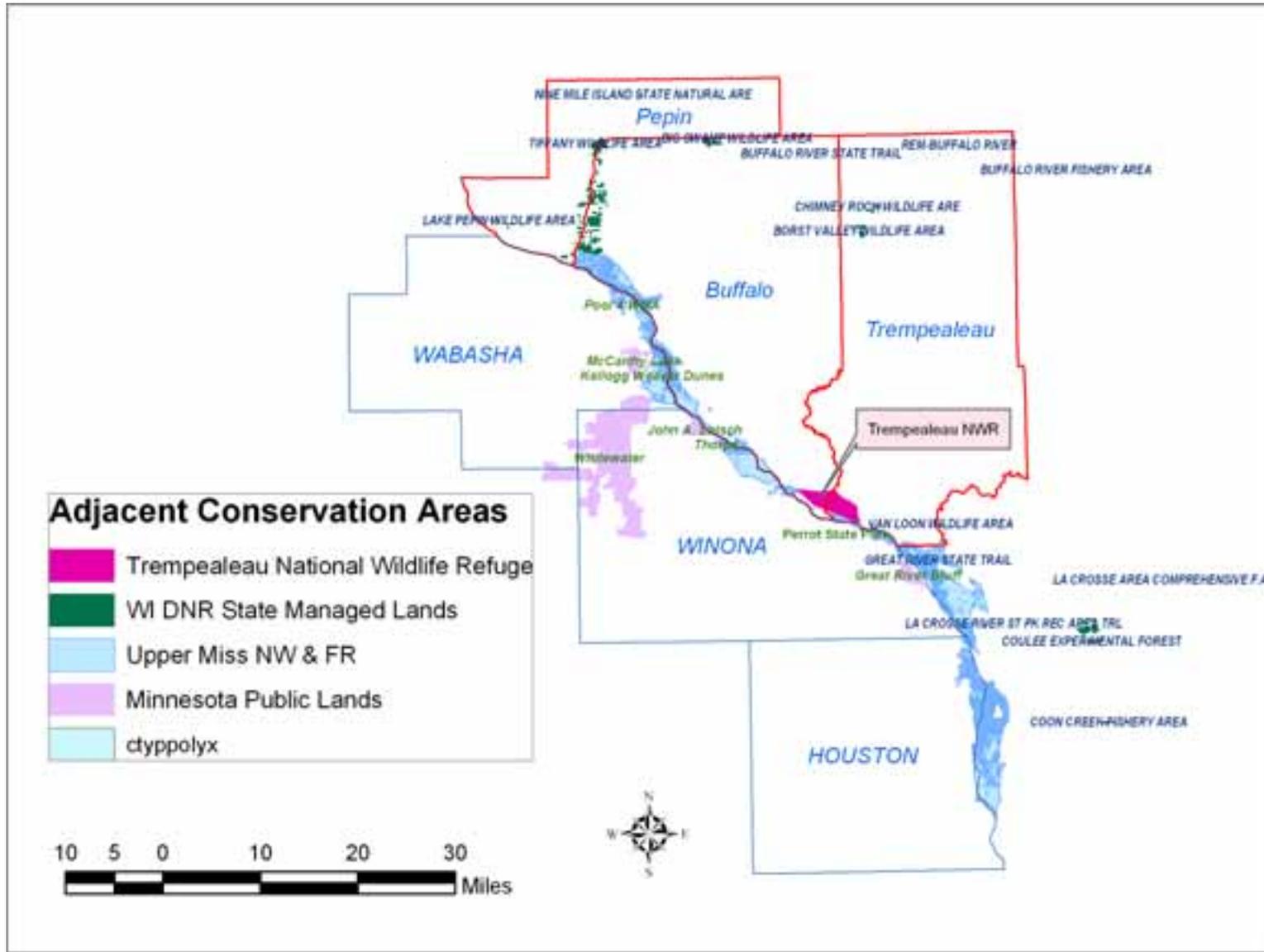
Trempealeau NWR volunteers planting swamp white oak. USFWS

issippi River from Lock and Dam 6 at Trempealeau upstream to the mouth of the Chippewa River may exceed 750,000.

The Great River State Trail connects with the La Crosse River State Trail near Onalaska, Wisconsin and continues 24 miles north and west on an abandoned railroad grade to Marshland, Wisconsin. The Trail crosses 18 bridges and is surfaced with compacted gravel screenings for most of its length. It enters Trempealeau NWR where bikers can follow the 4.5-mile wildlife drive and exit the Refuge at the Marshland gate or return to the main trail at the Refuge entrance. It is estimated that 18,000 to 20,000 bikers use the Refuge portion of the Great River State Trail annually.

Perrot State Park lands border the Refuge on the east (Figure 19). This 1,400-acre property administered by Wisconsin DNR has several miles of hiking and cross-country ski trails that wind through mature upland forest and native grasslands called "goat prairies." Spectacular views of the Mississippi River and Trempealeau NWR are available from places like Trempealeau Mountain, Brady's Bluff and Perrot Ridge. The Park also features a 98-unit campground, nature center and boat launch ramp which provides access to the Mississippi and Trempealeau Rivers. Unique cultural and historic

Figure 19: Adjacent Conservation Areas, Trempealeau NWR



resources are also found in the Park including Native American burial mounds and stone buildings and structures built by the Civilian Conservation Corps in the 1930s. Perrot Park staff also manage state lands within the Three Lakes Recreation Area located east of the village of Trempealeau, Wisconsin. This property includes shoreline on First, Second, and Third Lakes which are popular fishing areas.

3.10.4.1. Trempealeau County

The southern portion of Trempealeau County offers many outdoor recreation opportunities due to the scenic qualities of lands bordering the Mississippi River and an abundance of public lands. Portions of two national wildlife refuges, a recreational trail, a state park, and a recreational fishing area occur within the county. Many miles of rural roads within Trempealeau County provide opportunities for sight-seeing and biking. The Trempealeau Township Land Use Plan reflected the importance given to protecting and maintaining the rural and scenic character of the landscape, both for local residents and as a basis for tourism. (Town of Trempealeau, 2002).

3.10.4.2. Buffalo County

The **Great River Road** passes through Buffalo County between the Pepin and Trempealeau County lines adjacent to the Mississippi River. This road, also designated State Highway 35, was recently named a **National Scenic Byway** allowing the County and individual communities to compete for funds to enhance the cultural, scenic, natural and recreational features related to the natural beauty and features of the road.

The 2002-2005 Wisconsin State Comprehensive Outdoor Recreation Plan recognized **pleasure driving** as the second most popular form of outdoor recreation, engaged in by 69 percent of respondents to a statewide survey. Buffalo County also recognized the importance of resource protection to support this activity when they wrote:

“Because this activity is almost entirely related to the scenic, historic, or natural resource attractions available, it is necessary to maintain the integrity of the attractions to serve the anticipated demand. This will necessitate the protection of these attractions from changes in land use and from incompatible uses. The

county’s various land use and zoning ordinances that together make up the county’s environmental protection tools are among the best friends outdoor recreationalists have as they work towards protecting the outdoors.”*Buffalo County Outdoor Recreation Plan, 2002-2005*

3.10.5 Agricultural Sector

3.10.5.1. Trempealeau County

Principal cash crops in the county are corn and soybeans with acreage on the increase. Soybean acreage increased by 48 percent from 1987 to 1997. Hay and alfalfa acreage declined by 29 percent during the same period (Town of Trempealeau, 2002). Harvested cornfields in the local area of the Refuge are used by field feeding waterfowl, principally Mallards and Canada Geese, particularly late in the hunting season. This trend provides some unique waterfowl hunting opportunities on private lands in the area.

3.10.5.2. Buffalo County

About 37 percent of the land area of Buffalo County is devoted to harvestable crops, principally corn and soybeans. Another 14 percent is in pasture, cover crop or set-aside/CRP (Buffalo County Outdoor Recreation Plan, 2002). The mix of forest, hay, and cropland in the county provides excellent habitat which supports good populations of Wild Turkeys, Ruffed Grouse, gray and fox squirrels, and white-tailed deer.

Chapter 4: Environmental Consequences

4.1 Introduction

This chapter evaluates the three alternatives on the basis of environmental consequences (effects or impacts) to the environment described in Chapter 3. This evaluation is conducted in three parts. First, there is a discussion of the effects common to all alternatives. Second, the effects of each alternative are analyzed for each of more than 39 physical, biological, and socioeconomic parameters or concerns. A table at the end of the chapter (Table 10 on page 151) helps compare and contrast these effects. Lastly, the cumulative impacts of the alternatives are discussed.

As described in Chapter 2, three alternatives are being considered. Alternative A, No Action, would maintain the current level of effort on fish and wildlife and habitat management. Public use programs and regulations would remain virtually unchanged. Alternative B, Wildlife and Habitat Focus, would increase the level of effort on fish, wildlife, and habitat management. Some public use opportunities would remain the same and others reduced in favor of wildlife and habitat protection. Alternative C, Integrated Public Use, Wildlife and Habitat Focus, would increase the level of effort on fish, wildlife, and habitat management. It would take a more proactive approach to public use management to ensure a diversity of opportunities for a broad spectrum of users, both for wildlife-dependent uses and traditional and appropriate non-wildlife uses. Alternative C is the preferred alternative.



Wood Duck. USFWS

4.2 Effects Common to All Alternatives

4.2.1 Climate Change Impacts

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

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

secure storage of carbon that would otherwise be emitted to or remain in the atmosphere.”

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

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

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

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

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

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

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

4.2.1.1. Observed Climate Trends

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

4.2.1.2. Scenarios of Future Climate

During the 21st century, models project that temperatures will increase throughout the Midwest, and at a greater rate than has been observed in the 20th century. Even over the northern portion of the region, where warming has been the largest, an accelerated warming trend is projected for the 21st century, with temperatures increasing by 5 to 10 degrees Fahrenheit (3 to 6 degrees Celsius). The average minimum temperature is likely to increase as much as 1 to 2 degrees Fahrenheit (0.5 to 1 degree Celsius) more than the maximum temperature. Precipitation is likely to continue its upward trend, at a slightly accelerated rate; 10 to 30 percent increases are projected across much of the region. Despite the increases in precipitation, increases in temperature and other meteorological factors are



Bird's foot trefoil. USFWS

likely to lead to a substantial increase in evaporation, causing a soil moisture deficit, reduction in lake and river levels, and more drought-like conditions in much of the region. In addition, increases in the proportion of precipitation coming from heavy and extreme precipitation are very likely.

4.2.1.3. Key Issues in the Midwest

4.2.1.3.1 Reduction in Lake and River Levels

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

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

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

4.2.1.3.2 Agricultural Shifts

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

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

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

4.2.1.3.3 Changes in Semi-natural and Natural Ecosystems

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

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

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

4.2.2 Air Quality

Prescribed burning has short-term localized negative impacts to air quality that would be similar for all alternatives as similar numbers of acres are burned annually. The impacts are mitigated by small burn unit size (150 acres is the largest unit) and distance from population centers. No smoke management issues exist at present as long as smoke management parameters outlined in the Fire Management Plan (USFWS in preparation in 2007) are met.

4.2.3 Emergency Response to Contaminant Spills

Under all alternatives the capabilities of the staff to effectively respond to contaminant spills or other emergencies that may jeopardize Refuge resources would be improved. Habitats would be better protected because staff would have the training and ability to respond more quickly and with the best available equipment and expertise. With specific training, the amount of habitat impacted and the severity of the impact could be reduced by quick and effective response.

4.2.4 Management of Wildlife Diseases

Options for mitigating the deleterious effects of wildlife disease outbreaks to either people or animals are often limited. However, under all alternatives the ability of the Refuge staff to respond would be improved. Locations and types of expertise and equipment would be identified and staff would be familiar with proper safety, sampling and containment procedures. Communication channels between responding agencies would be in place and avenues for keeping the public informed would be improved.

4.2.5 Threatened and Endangered Species

All alternatives considered in the EIS/CCP have objectives to improve habitat conditions for native fish and wildlife including species listed as threatened or endangered under the Endangered Species Act. The required Endangered Species Act consultation has been completed for nearly all habitat activities proposed on the Refuge during the next 15 years. Other projects or activities in the alternatives of the Final EIS/CCP during the next 15 years (new boat ramps, parking facilities, buildings or other structures), are not likely to adversely affect listed species. This opinion is based on construction of similar projects in the past; to date, none of these activities have adversely affected federally listed species.

One candidate species recently occurred on or in the vicinity of the Refuge. The eastern Massasauga rattlesnake (*Sistrurus catenatus catenatus*) occurred recently (1970s) within the Refuge, and potential habitat still exists. Alternatives B and C include objectives with both targeted and non-targeted benefits for eastern Massasauga. First, the objectives include restoring sedge meadow, bottomland forest, and reducing the pervasiveness of exotic species throughout the Refuge. All of these actions could have long-term benefits for eastern Massasauga by providing or enhancing potential habitat. Second, the Refuge would investigate developing a plan to reintroduce eastern Massasauga. Although the plan is in the conceptual phase, the commitment would be to:

- # implement Massasauga-compatible management,
- # restore or enhance habitat to support a viable population, and
- # provide long-term protection for such habitat.

Although Massasauga-compatible management would be conducted, unavoidable impacts may occur. These impacts should be rare and minimal in extent, however, as the Refuge is committed to using the best management practices developed specifically for eastern Massasauga.

For these reasons and given that the goals and objectives in applicable portions of the EIS/CCP directly and indirectly benefit the continued survival of eastern Massasauga, the implementation of the CCP which emerges is not likely to appreciably reduce the survival and recovery of these species.

On the contrary, the expectation is for implementation of a Final CCP to perpetuate viability of these species within the Refuge.

Section 4.4.1 on page 133 contains additional information, by alternative, on the potential impacts to the recently delisted Bald Eagle.

4.2.6 Furbearer Trapping

Under all alternatives, the currently approved furbearer trapping program would continue unchanged until a new furbearer trapping plan is completed by October 2009. A description of the current program can be found in Chapter 3, Section 3.5.7 on page 106. Impacts from the current trapping program are summarized in the current compatibility determination available on the Refuge's planning website or at the Refuge office. Until the new furbearer trapping plan is completed, future biological and economic impacts are unknown. A separate environmental assessment will be done in conjunction with preparation of the new plan and all impacts explored. Public involvement will be part of new plan preparation.

4.2.7 Adjacent Landowners

Landowners adjacent to the Refuge may benefit economically from owning property next to the Refuge. A recent report (Boyle et al. 2002) shows that land and property values are typically higher for properties next to a national wildlife refuge, when holding other factors constant. For example, a four-bedroom, two bath house on a quarter-acre lot increases in value as the distance from the refuge decreases. For the four refuges included in the report, property values increased from \$351 to \$7,469 per mile as the distance of each property to the refuge decreased. The report states on page 19:

"The significant premium people pay to purchase properties near refuges clearly indicates that [refuges] provide desirable environmental amenities and permanent open space to local residents."

As property value increases, taxes would also be expected to increase. While this may result in increased revenue for the county, it also increases the tax burden for adjacent landowners. However, based on several townships included in the report, the annual tax increase of properties adjacent to refuges is fairly small, with annual tax increases averaging between \$88 and \$112 per home.



Mourning Dove. USFWS

Since the alternatives would not radically change current land and water management direction or preclude any existing public use, it is anticipated that none of the alternatives would have a significant effect on property values in general or on the desirability of owning or buying property adjacent to the Refuge.

4.2.8 Land Use

No significant changes to land use and management would be expected to occur under any of the alternatives. The remaining 340 acres within the existing approved acquisition boundary for the Refuge would be purchased as funds and willing sellers became available. Of the 340 acres, about 20 are presently cropland that would be taken out of production. The rest of the proposed acquisition land is primarily wetland or bottomland forest and would remain so. Stream bank and wetland restorations on private lands would increase under Alternatives B and C, but no land would be taken out of production.

4.2.9 Management of Easements and Right-of-Ways

Under all alternatives impacts to Refuge habitats from management activities in easements and right-of-ways would be reduced. Better communication and coordination would help all parties complete needed work with less disturbance to habitats and wildlife.

4.2.10 Revenue Sharing

These payments are made annually in Wisconsin to compensate local townships and municipalities for loss of tax revenue on federal refuge lands within their jurisdiction. The amount paid for revenue sharing is derived from a formula based on three-quarters of 1 percent of the assessed value of the land or 25 percent of the sale of refuge products, whichever is greater. This formula determines the authorized payment amounts. However, in recent years, Congress has appropriated funds representing varying amounts less than 100 percent.

With eventual acquisition of the remaining 340 acres within the approved Refuge boundary, revenue sharing payments to Trempealeau Township would increase by a modest amount. Assuming all 340 acres were acquired next year and their average assessed value was \$1,500 per acre, the maximum additional revenue sharing payment would be \$3,825 ($340 \times \$1500 \times .0075$).

4.2.11 Environmental Justice

Executive order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” was signed by President Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income community’s access to public information and participation in matters relating to human health or the environment.

Overall, none of the alternatives are expected to disproportionately place an adverse environmental economic, social, or health effect on minority or low-income persons.

4.2.12 Cultural and Historical Preservation

Activities outlined in each alternative have the potential to impact cultural resources, either by direct disturbance during construction of habitat projects and facilities related to public use or administration and operations, or indirectly by exposing artifacts during management actions such as water drawdown or prescribed burning. Although the presence of cultural resources including historic properties cannot stop a federal undertaking, the undertakings are subject to Section 106 of the National Historic Preservation Act, and at times, other laws.

Thus, the Refuge will, during early planning of actions, provide the Regional Historic Preservation Officer a description and location of all projects, activities, routine maintenance and operations that affect ground and structures, details on requests for allowable uses, and the range of alternatives being considered. The regional officer will analyze these undertakings for their potential to affect historic properties and enter into consultation with the State Historic Preservation Officer and other parties as appropriate. The Refuge will notify the public and local government officials to identify concerns about impacts by the undertakings. This notification will be at least equal to, but preferably with, the public notification accomplished for NEPA compliance and compatibility determinations.

4.3 Effects of Alternatives on Physical Parameters/Concerns

4.3.1 Ecosystem

4.3.1.1. Alternative A – No Action

Under this alternative there would be no overall change in the quality or functioning of ecological processes within the ecosystem.

4.3.1.2. Alternative B – Wildlife and Habitat Focus

The addition of a private lands biologist would allow more restoration projects within the headwater tributaries of the Mississippi River. Sediments and nutrients entering the River system would be reduced by a small amount. Overall, the ecosystem would benefit a small amount by reduced sediment loads in a few small tributaries of the Mississippi River.

4.3.1.3. Alternative C – Integrated Wildlife, Habitat, and Public Use Focus

The addition of a private lands biologist would allow more restoration projects within the headwater tributaries of the Mississippi River. Sediments and nutrients entering the River system would be reduced by a small amount. Public use staff would provide more opportunities for the public to learn about the functions of ecosystems and the importance of ecosystem management. Overall, more restoration projects and more public awareness of ecosystem issues would begin to improve the overall system.

4.3.2 Water Quality

4.3.2.1. Alternative A – No Action

Sediments and agricultural contaminants would continue to flow into the Refuge from the Trempealeau River and its tributaries. Rough fish would be abundant, creating turbid water and limiting the growth of aquatic plants. The large, open pools would continue to be impacted by wind and waves that suspend bottom sediments. Little water quality monitoring would occur, leading to a lack of information on which to base management decisions. Overall, Refuge waters would continue to be turbid with poor clarity and little light penetration, especially in the large pools.

4.3.2.2. Alternative B – Wildlife and Habitat Focus

More work restoring upstream tributaries on private lands would reduce sediments in the Trempealeau River and improve water quality on the Refuge. Routine drawdowns and commercial fishing would reduce rough fish populations and improve water clarity. The pools would be broken into smaller units by dikes and islands, alleviating some of the impacts of wind and waves. Proposed wetland management actions would improve growth of aquatic plants, helping to stabilize bottom sediments and filtering suspended solids and some contaminants. More water quality monitoring would be conducted and data could be used to improve management decisions. Overall, Refuge waters would have less suspended solids, better clarity and improved water quality.

4.3.2.3. Alternative C – Integrated Wildlife, Habitat, and Public Use Focus

Same as Alternative B, but public use staff would include programs on water quality issues in interpretive and educational materials. A better under-

standing by individuals of how their activities may impact water quality would lay the ground work for long-term improvements to water systems.

4.3.3 Sedimentation

4.3.3.1. Alternative A – No Action

Erosion of lands in northern Trempealeau and Buffalo Counties would continue to contribute sediment to the tributaries that feed into the Trempealeau and eventually the Mississippi River. A few projects each year through Partners for Wildlife would restore short stretches of degraded streams, but the overall reduction in sediment flow would be minor.

4.3.3.2. Alternative B – Wildlife and Habitat Focus

The Partners for Wildlife Program would be more fully utilized to complete stream restoration projects that would reduce sediments eroding from upstream agricultural lands. This alternative would have the greatest impact at reducing sediments flowing into the Trempealeau River and eventually the Refuge.



Trempealeau NWR. USFWS

4.3.3.3. Alternative C – Integrated Wildlife, Habitat, and Public Use Focus

Same as Alternative B except more opportunities for the public to learn about erosion and sedimentation would help citizens understand their role in reducing downstream impacts to water quality.

4.3.4 Geomorphology

4.3.4.1. Alternative A – No Action

Overall geomorphology would continue to be driven by flood events, off-Refuge land use practices, and Refuge water management operations. Overall there would be little change to geomorphology from this alternative.

4.3.4.2. Alternative B – Wildlife and Habitat Focus

Under this alternative there would be moderate, local changes in floodplain geomorphology as projects involving island and dike construction and water management facilities are completed.

4.3.4.3. Alternative C – Integrated Wildlife, Habitat, and Public Use Focus

Same as Alternative B.

4.3.5 Hydrology

4.3.5.1. Alternative A – No Action

Under this alternative the hydrology of the river systems and the Refuge would continue to function as they currently do. Management practices would remain unchanged and overall there would be no impact to hydrologic processes.

4.3.5.2. Alternative B – Wildlife and Habitat Focus

The additional staffing and funding for watershed-scale technical assistance on private lands in this alternative could lead to a gradual moderation in peak tributary flows during spring runoff and storm events. Improved infrastructure would allow better water management in wetland units, and reductions in sediment loads in the Trempealeau River may change its flooding patterns.

4.3.5.3. Alternative C – Integrated Wildlife, Habitat, and Public Use Focus

Same as Alternative B except that more opportunities would be available for the public to learn about and understand the importance of floodplains to large river systems.

4.3.6 Use of Prescribed Fire

4.3.6.1. Alternative A - No Action

As noted in Chapter 2, a draft comprehensive Fire Management Plan for the Refuge was awaiting approval in 2007 and provides detailed guidance for the suppression or use of fire. The plan outlines wildfire response and prescribed fire objectives, strategies, responsibilities, equipment and staffing, burn units, implementation, monitoring, and evaluation. The complete Fire Management Plan and Burn Unit Maps (USFWS, 2001) are available at the Refuge Office, or on-line at:

www.fws.gov/midwest/planning/Trempealeau.

Physical Fire Effects: Due to the relatively small size of the burn units on the Refuge and anticipated intensity and frequency of the prescribed fires, the effects on soil would be beneficial by hastening the recycling of nutrients and increasing soil fertility. There would also be no impacts to water quality due to location and slope of the burn units. Air quality would only be affected negatively in the immediate vicinity of the prescribed burn, and only for a limited time during the burn. This temporary impact to air quality would be mitigated by small burn unit size, direction of winds, and distance of units from population centers. All burns would be well within air quality parameters. In the event of special air quality alerts by state or local agencies during a planned burn, burning will be deferred until conditions improve. There is potential for archaeological artifacts to be present, but these are generally below the surface and would not be impacted since fire would move relatively quickly through the area



Prescribed burn at Trempealeau NWR. USFWS

and not generate high soil temperatures. Some artifacts could be exposed temporarily by the removal of vegetation, and detection and removal by the public could increase. However, laws and regulations that should minimize such disturbance protect all artifacts on the Refuge. The maintenance of firebreaks around certain burn units will create visual impacts for an indefinite period of time, and a local reduction of optimum habitat. However, the firebreaks are minor in terms of area compared to habitat in the burn unit, and a necessary trade-off to provide overall habitat and wildlife benefits and to minimize fire escape.

Biological Fire Effects: None of the federally listed threatened or endangered species found on the Refuge are known to inhabit or frequent the burn units that would be treated with fire, so there would be no effect. Burn units are also not in the vicinity of active Bald Eagle nests, so prescribed burns would pose no disturbance. Burning removes plant cover for 1-2 weeks and this would decrease the amount of habitat available for food and cover for a variety of grassland wildlife species. However, seasonal and long-term plant vigor and health would be enhanced by prescribed burns, which in turn would make the areas more productive for wildlife. In addition, since many of the burn units contain native tallgrass prairie, a fire-dependent plant community, it is expected that periodic burning will help ensure the continued existence of this rare ecosystem.

Socioeconomic Fire Effects: The use of fire often evokes an emotional response in local residents who have different experiences, fears, and values concerning wildland burning. This social impact can be mitigated to some degree by proactive information, education, and advance notification of a planned burn through media contacts and one-on-one visits with burn unit neighbors. Smoke from prescribed fires is also a concern since it can create a visibility hazard on nearby roads. In addition, smoke can enter private dwellings and businesses depending on wind direction. The fire management plan outlines precautions and specific actions to take to avoid and reduce any impacts from smoke, and contingency plans to be implemented should wind conditions change during a burn. Prescribed burning can have a benefit to the public by creating enhanced wildlife observation, photography, and hunting opportunities through the resulting increase in wildlife populations. Firebreaks put in place for prescribed burning can also help stop an unplanned wildfire and thus provide a measure of

protection to any adjacent private habitat or dwellings. In the event that a prescribed fire does jump a firebreak and burn into unplanned areas, there is a high probability of rapid control by staff on-the-ground and thus minimal adverse impact. In addition, prescribed burn units on the Refuge average less than 115 acres, have light fuel loads (.025 to 3 tons per acre), and would be burned under low fuel moisture conditions and specific wind and weather conditions. These factors would help avoid and minimize fire escape.

4.3.6.2. Alternative B – Wildlife and Habitat Focus

Same as Alternative A except removal of pine plantings and invasive shrubs would consolidate burn units making them easier to burn. Removal of black locust and downed timber would also improve burning capabilities.

4.3.6.3. Alternative C – Integrated Wildlife, Habitat, and Public Use Focus

Same as Alternative A but removal of invasive shrubs, black locust, and downed timber would improve burning capabilities.

4.3.7 Flood Protection

4.3.7.1. Alternative A – No Action

The biological resources and infrastructure of the Refuge would be in jeopardy without a predetermined policy on how to deal with extreme flood levels in the Mississippi River. Alternative A would continue to rely on case-by-case negotiations at the time of the event to determine how to manage damage to dikes and other structures. Refuge habitats could be damaged if necessity or political pressures determined how to manage floodwaters. Also, the lessons learned in the 2001 flood could be lost as staff and other partners change. Flood waters could once again be turned into the Refuge, destroying valuable habitats, but providing little protection to railroad dikes. This alternative would not provide safeguards needed to protect the Refuge from large flood events.

4.3.7.2. Alternative B – Wildlife and Habitat Focus

To the extent possible, habitats and infrastructure would be protected from loss due to flood events on the Mississippi River. Policies would be negotiated and known by partners in advance of flooding. Other alternatives would be explored without considering turning water into the Refuge pools. Over the long-term, emergent vegetation would remain in place around dikes, islands, utility poles

and sensitive shorelines providing more consistent protection from wave and ice damage.

4.3.7.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B, but there would be more public understanding of the role of floodplains in large river systems and the need to preserve them to buffer flood damage.

4.4 Effects of Alternatives on Biological Parameters/Concerns

4.4.1 Threatened and Endangered Species

The Bald Eagle was removed from federal listing in 2007. However, eagles will still be monitored and taken into consideration when planning management actions.

4.4.1.1. Alternative A – No Action

Impacts to Bald Eagles from management actions would not change under this alternative. Forests would continue to be impacted by invasive shrubs that often prevent regeneration of native trees preferred by eagles for nesting. Mature nesting trees would be limiting for Bald Eagles. Food resources would remain adequate, especially with the abundance of carp in the pools. Disturbance to nests from public use would continue to be evaluated on an as need basis, depending on where nests were located and whether they were active. Overall impacts to Bald Eagle from alternative A would not change.

4.4.1.2. Alternative B – Wildlife and Habitat Focus

Bald Eagles would benefit from removal of invasive understory shrubs and regeneration of large native trees. Restoration of bottomland forests would provide additional nesting and roosting habitat as trees matured. Periodic removal of rough fish may have short-term impacts, but in general fish are abundant in other Refuge pools and on the adjacent Mississippi River. Eagle nests would be better protected from disturbance by a mandatory 100-foot closure around any active nests. Most nests are in remote, hard to reach places and disturbance is gen-

erally not an issue. Overall this alternative would provide long-term habitat improvements for nesting and roosting Bald Eagles.

4.4.1.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B.

4.4.2 Waterfowl

4.4.2.1. Alternative A – No Action

Habitat conditions would continue to slowly improve for waterfowl, especially if drawdowns are completed as scheduled. Aquatic plants and invertebrates would be abundant in some pools and lacking in others. Nesting habitat would also be adequate for over-water nesting species unless vegetation were destroyed by a major flood on the Mississippi River. Nesting cavities for species like Wood Ducks would continue to decline as forests mature with little recruitment of new trees. Fall migrants would experience some disturbance from recreational boating. Canoeing, kayaking or boats with electric motors would be allowed in all pools during daylight hours. Generally boating use is light, with one or two boaters per week on the main pools. Overall impacts from recreational boating would continue to be minor.

4.4.2.2. Alternative B – Wildlife and Habitat Focus

Aquatic insects and plant resources would be enhanced with improved water management capabilities afforded by smaller pools and additional water control structures. Aquatic habitats would be further improved with reductions in invasive plants and animals, and improved water quality. Waterfowl, especially dabbling ducks and Canada Geese, would benefit from additional foraging habitat. The pools would be closed to recreational boating in the fall so disturbance from boating would be eliminated during migration. However, since only one or two boats per week currently enter the Refuge pools, the benefits of reduced disturbance would be minor. Nest sites for cavity nesting ducks would become more abundant with better forest management practices. Grassland nesting species would find larger blocks of dense grass cover and would be less prone to depredation. Overall, production, foraging, and resting habitat would improve and waterfowl use would increase.

4.4.2.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B except that pools would remain open to non-motorized, or electric motor recreational boating in the fall. Waterfowl migrating in the fall would experience some disturbance. Overall, boating use would be light and displacement of birds would be minor.

4.4.3 Waterbirds

4.4.3.1. Alternative A – No Action

In general habitat conditions for most waterbirds would be similar to what currently exists. Drawdowns in pools A and E would enhance foraging and nesting habitats for bitterns, rails, and Black Terns. Other pools would continue to have few aquatic plants or invertebrates and would provide poor foraging or nesting habitats for most waterbirds. Foraging habitats for fish-eating birds like pelicans, cormorants, herons and egrets would be sufficient because of high carp populations. Overall, habitat conditions for most waterbirds would remain unchanged under this alternative.

4.4.3.2. Alternative B – Wildlife and Habitat Focus

Better wetland management in all units, especially drawdowns, would increase abundance and diversity of aquatic and emergent plants and invertebrates. Nesting for over-water nesting terns, grebes, and bitterns and rails would be significantly enhanced. Foraging and hiding cover would be abundant for these secretive marsh species. Nesting success would also be better safeguarded because water levels could be maintained so that nests would not flood. Herons, egrets, pelicans, and other fish-eating birds would see initial decreases in large fish numbers. Eventually, as overall vigor of the wetlands increased, smaller, native fish would become more abundant and the food base for fish-eating birds would improve. Overall, nesting, foraging, and hiding habitat for waterbirds would improve significantly with this alternative.

4.4.3.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B.

4.4.4 Shorebirds

4.4.4.1. Alternative A – No Action

Under this alternative, shorebirds would find few shallow water or mudflat habitats during migration.



Indigo Bunting. USFWS

In general shorebird use would remain low due to poor foraging and lack of resting or staging habitats.

4.4.4.2. Alternative B – Wildlife and Habitat Focus

Smaller pools and more water control structures would allow more flexibility in timing and frequency of pool drawdowns. Shallow water and mudflat could be created early in the spring or fall to better accommodate migrating shorebirds. Aquatic invertebrates, a major food resource for shorebirds would become more abundant as wetland habitats become more productive.

4.4.4.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B.

4.4.5 Raptors/Owls

4.4.5.1. Alternative A – No Action

Under this alternative, raptors or owls would not be impacted by any changes to management actions.

4.4.5.2. Alternative B – Wildlife and Habitat Focus

In general, improved forest and grassland management would provide more food and nesting resources for raptors and owls. Control of invasive shrubs would especially benefit species that capture prey from the forest floor. Cavity nesters would benefit from long-term management of uneven-aged stands. Removal of pine plantations would reduce

roosting and wintering cover, especially for owls, but appropriate habitat is available in other forest types on the Refuge. Overall this alternative would benefit production and survival of raptors and owls.

4.4.5.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B, although some roosting habitat would remain in pine plantations that would be thinned versus entirely removed.

4.4.6 Upland Game Birds

4.4.6.1. Alternative A – No Action

Under this alternative, turkeys, grouse and pheasants would persist at current low levels. Management actions would not impact upland game birds.

4.4.6.2. Alternative B - Wildlife and Habitat Focus

Restoration of oak savanna and upland forest would increase foraging and nesting habitats for turkeys, grouse, and pheasants. Larger, less fragmented blocks of grassland cover would improve nesting success of grassland nesting species. Increased abundance and survival of mast producing trees would provide a better food base, especially during the winter months. Removal of invasive shrubs and pine plantings may change habitat conditions for some species that roost or find thermal shelter in dense understory vegetation. Eventually native understory species would return and provide similar conditions. In general, this alternative would have positive impacts on reproduction and survival of upland game species.

4.4.6.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B.

4.4.7 Songbirds

4.4.7.1. Alternative A – No Action

In general, songbirds find rich and abundant resources on the Refuge for foraging, breeding, and migrating. Habitat conditions under this alternative would not change and there would be little overall impact to songbirds.

4.4.7.2. Alternative B – Wildlife and Habitat Focus

Changes to habitats proposed in this alternative would have mixed impacts to songbirds depending on the types of habitat each species uses. Many

songbirds utilize the thick understory of invasive shrubs to find food, shelter, and nesting habitat. Removal of the shrub understory would have negative impacts for these species until native plants returned. In some areas species assemblages might change to more forest interior or forest floor foraging species. An overall decrease in fragmentation of habitats, especially oak savanna and prairie, would improve nesting success for grassland species. Forest interior species would likely experience less “edge-effect” depredation and parasitism as pine planting and invasive black locust stands were removed. The diversity of habitats on the Refuge would continue to provide excellent habitat for a diverse assemblage of songbirds. Overall, this alternative would benefit native songbirds.

4.4.7.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B, although grassland habitats would remain fragmented into smaller blocks and forest edge habitat would not be reduced. Grassland and forest interior nesting species would continue to experience high depredation or parasitism rates associated with edge habitats.

4.4.8 Fish

4.4.8.1. Alternative A – No Action

Refuge involvement in fishery management would remain limited under this alternative since there would be little fishery planning, no clear Refuge-specific fishery objectives, and no increase in monitoring. Opportunities for integrating fishery management with Refuge management would remain limited and opportunities would be lost for improving fish habitat. Without more private land and watershed work in the tributaries, silt, nitrates and other contaminants would continue to enter the river system at current rates and impact fish. Future increases in exotic fish and plants may prove detrimental to some native fish. Overall, this alternative would not improve conditions for fish on the Refuge.

4.4.8.2. Alternative B – Wildlife and Habitat Focus

Refuge involvement in fishery management would increase under this alternative. A Fishery Management Plan, Refuge-specific fishery objectives, and an increase in monitoring, opportunities for integrating fishery and wildlife management with Refuge administration and operations would help increase fish populations. Coordination and

sharing of expertise with the Service’s fisheries resource office would increase to the benefit of fish initiatives and management. Private lands work in the tributaries would help reduce silt, nitrates, and other contaminants improving fish health and productivity. In general, implementation of habitat projects would improve water quality and habitat for most fish. Increased attention to invasive aquatic plants and animals could lead to improved fish carrying capacity on the Refuge. Removal of rough fish would enhance habitats for native fish. Overall, this alternative would have a positive influence on fish populations on the Refuge

4.4.8.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B.

4.4.9 Freshwater Mussels

4.4.9.1. Alternative A – No Action

Under this alternative there would be no overall change in habitat conditions for freshwater mussels. Freshwater mussels would continue to be limited to soft substrate adapted species such as floaters, papershells and heelsplitters. Poor water quality and sedimentation would limit reproduction and growth rate of mussels. Under Alternative A freshwater mussels would occur in limited abundance and species diversity.

4.4.9.2. Alternative B – Wildlife and Habitat Focus

Improved water quality and reduced sedimentation would improve conditions for filter feeding mussels. However, species diversity would be limited to soft substrate adapted species because the impounded pools generally do not support enough flow or have sand-gravel substrates. Better monitoring may provide further insight into the needs of mussels on the Refuge. Overall, improved water quality would increase productivity of freshwater mussels, but in general species diversity would remain limited.

4.4.9.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B.

4.4.10 Reptiles and Amphibians

4.4.10.1. Alternative A – No Action

High nutrient loads and siltation would continue to stress aquatic reptiles and amphibians. A lack of

knowledge about the distribution and life history of turtles, frogs, and snakes on the Refuge would continue to hamper sound decisions regarding impacts of human activities. Limited drawdowns may improve emergent and submerged habitats important for amphibians and turtles. However, improvements would likely be short-lived without increased attention to invasive aquatic plants which can choke important foraging and travel areas for turtles and frogs. Under this alternative there would be no overall change in habitat conditions for reptiles or amphibians.

4.4.10.2. Alternative B – Wildlife and Habitat Focus

Water quality would improve as more work is done with private landowners along the tributaries to curb contaminants, nutrients, and sediment entering the river. Increased use of drawdowns would improve the health and vigor of emergent and submerged habitats to the benefit of loafing and foraging turtles and frogs. Invasive plants would be monitored and controlled, improving both aquatic and terrestrial habitats that reptiles and amphibians use for foraging and reproducing. Forest resources would be monitored and actively managed to the benefit of frogs, toads and turtles. Forest practices could include efforts to improve sedge meadow openings for Massasauga rattlesnake habitat. Improved monitoring and research would facilitate more informed decisions regarding land use and impacts to turtles and frogs. Public education programs would be limited and support for conservation of more obscure species like frogs and turtles may suffer. Overall, reptile and amphibian populations and productivity would likely increase under this alternative.

4.4.10.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B, except that a focus on public education would increase awareness of the conservation needs of reptiles and amphibians.

4.4.11 Control of Invasive Species

4.4.11.1. Alternative A – No Action

Invasive plants and animals would continue to spread on the Refuge and have negative effects. The current modest level of removal would not outpace the spread of invasives into new areas. Aquatic habitats would be severely degraded without rough fish control. Monitoring of new species and outbreaks would not be sufficient to detect new invasions.

4.4.11.2. Alternative B – Wildlife and Habitat Focus

Aggressive removal and control of new outbreaks would slow the spread of invasive plants. Some habitats would begin to see a return of native species. Close monitoring and mapping would detect the abundance and distribution of existing invasives and detect new outbreaks. Quick removal of new outbreaks would decrease costs associated with control of large, ubiquitous stands of invasives. Better management of rough fish would improve wetland habitats. Programs on private lands would begin to help area landowners stop the spread of invasive plant on their properties.

4.4.11.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B, except public awareness of the impacts of invasive species and the public's role in their spread may reduce new invasions and promote support and funding for control efforts.

4.4.12 Invertebrates

4.4.12.1. Alternative A – No Action

Water quality and plant abundance and diversity are critical habitat components for most insects. Aquatic invertebrate populations would remain unchanged or slightly decline as wetland habitats remain turbid with limited aquatic plant diversity and abundance. Upland insects would continue to thrive in the grasslands where diverse prairie grasses and forbs occur. Periodic prescribed fire would continue to benefit terrestrial invertebrates in grasslands. Overall, this alternative would not change invertebrate populations significantly.

4.4.12.2. Alternative B – Wildlife and Habitat Focus

Improvements in water quality and wetland management, especially drawdowns, would improve conditions for reproduction of aquatic insects. As the



Trempealeau NWR point. USFWS

abundance and diversity of aquatic plants improved, so would feeding and breeding habitats for insects. Crayfish, a keystone species that provides resources for many other species, would benefit from improved management of bottomland forests. Terrestrial insects would benefit from active grassland management, reduction of invasive plants and regular prescribed burns. Overall this alternative would improve the diversity and abundance of invertebrates using Refuge habitats.

4.4.12.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B.

4.4.13 Mammals

4.4.13.1. Alternative A – No Action

This alternative would have little effect on current management of mammals. Trapping to protect dikes and structures would continue as in the past. Deer harvest would also continue as in the past, as a tool for controlling over-browsing of vegetation. No changes in impacts to mammals would occur from this alternative.

4.4.13.2. Alternative B – Wildlife and Habitat Focus

Harvest management of mammals would be more fine tuned based on population monitoring and harvest returns. Populations of harvested mammals would be maintained at more stable, healthy levels that limit damage to habitats and structures. In general improved habitats would benefit all life stages for mammals using the Refuge.

4.4.13.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B.

4.4.14 Wetlands

4.4.14.1. Alternative A – No Action

Aquatic plants and wetland habitats would improve slightly under current management scenarios in some pools. Other pools would continue to be too turbid for the germination of aquatic plants because of foraging rough fish, and disturbance of bottom sediments by wind and waves. Aquatic plants, dikes and other infrastructure would be in jeopardy during major flood events if water was turned into the Refuge from the Mississippi River. Few private lands projects would not appreciably alter the amount of sediment entering downstream

river systems. Overall, this alternative would have slightly positive benefits for those pools with current water management capabilities. Other pools would continue to decline in productivity.

4.4.14.2. Alternative B – Wildlife and Habitat Focus

Wetland plants and wildlife would benefit from improved infrastructure and better water management capabilities. A broader range of wetland habitat types would be provided at appropriate times to benefit the lifecycles of migrating and breeding birds. Water quality would improve and aquatic plants would flourish with removal of rough fish, reduced upstream sediment loads and less wind and wave action. More emphasis would be placed on restoring tributaries upstream of the Refuge, further reducing sediment loads. A Habitat Management Plan and better monitoring would improve the manager's abilities to make timely and more informed management decisions. Flood protection policies would better protect wetlands from catastrophic loss during major flood events. This alternative would improve water quality, plant and animal diversity and abundance, and overall productivity and vigor of wetland systems.

4.4.14.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B except that the public would appreciate and understand water quality and wetland habitats through enhanced opportunities for interpretation and education.

4.4.15 Forests

4.4.15.1. Alternative A – No Action

Black Locust, silver maple, and ash will continue to dominate the bottomland forests because of poor regeneration of mast producing trees, and the shading of pioneer species like cottonwood and willow. Any opening in the forest canopy would likely result in the invasion of reed canary grass. Forest habitats would improve slightly under this alternative with purchase of an additional 340 acres, the modest removal of invasive shrubs and restoration of bottomland forest at River Bottoms Road. In general, however, forest coverage, density, diversity, and structure would continue to gradually decline under this alternative.

4.4.15.2. Alternative B – Wildlife and Habitat Focus

Forest resources would be actively managed with the goal of maintaining a healthy forest that contains sufficient diversity of tree species, sizes, and



White-tailed deer. USFWS

ages to provide a wide array of habitat structure and food (mast) resources. Nonnative pine plantings would be removed and restored to native prairie or oak savanna, creating larger, less fragmented habitats for an array of prairie species. Invasive understory shrubs would be aggressively controlled, improving recruitment of native hardwoods. Overall, this alternative would result in an increase of native forest habitats with more diverse assemblages of native understory plants.

4.4.15.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B except that prairies and oak savanna habitats would continue to be fragmented by nonnative pine plantings. Overall, grassland wildlife would benefit less from the fragmented habitat, but pine forest species would persist.

4.4.16 Grasslands

4.4.16.1. Alternative A – No Action

Management of 335 acres of prairie and oak savanna habitats would not change. Prairie units would be burned on a 3-year rotation to limited encroachment of woody plants and encourage warm season grasses. A continuous, focused effort would be required to prevent black locust from encroaching on the prairies. Funding and staff to control black locust would be limited and some areas may have to be abandoned. Overall this alternative would result in a gradual decrease in the acres of prairie as the spread of black locust out-paced the ability of the staff to control it.

4.4.16.2. Alternative B – Wildlife and Habitat Focus

Under this alternative 60 percent (250 more acres than Alternative A) more prairie/oak savanna habitat would be created by removing pine plantings, non-native trees and invasive shrubs. Additional staff and funds would be directed towards black locust removal and biological control of leafy spurge. Larger, more contiguous prairie units would improve burning capabilities. Edge habitat that favors nest predators and parasites, would be reduced, improving nesting success of both forest and grassland birds. Better monitoring of both plants and wildlife would improve decision making and habitat management. Overall, this alternative would restore and maintain the most acres of grasslands and have the greatest benefit for birds and other wildlife using grasslands.

4.4.16.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

About 30 percent more prairie/oak savanna would be restored, 100 acres more than would be restored under Alternative A. Some grassland units would remain small and fragmented because pine plantings would be thinned rather than removed. Species favoring the pine plantings such as owls would continue to inhabit them. Edge habitat and associated problems with depredation and parasitism of nesting birds would continue unchanged. Better monitoring of both plants and wildlife would improve decision making and habitat management. Overall, this alternative would restore and maintain a medium amount of grasslands and have benefits for birds and other wildlife using grasslands, while preserving habitat for pine forest species.

4.5 Effects of Alternatives on Socioeconomic Parameters/Concerns

For the complete economic data that is the source for this section, refer to Erin Henderson's 2004 report entitled "The Economic Impacts of the Alternatives for the Trempealeau NWR CCP/EIS." The report is available at the Refuge office in Trempealeau or is on-line at <http://midwest.fws.gov/planning/tremp/index.html>.

Table 6: Comparison of Annual Economic Effects of Alternatives on Hunting, Trempealeau NWR

Category	Alternative A	Change from Alternative A	
		Alt. B	Alt. C (Preferred Alt.)
Activity Days	542	-160	235
Net Economic Value	\$24,759	-\$7,309	\$10,735
Total Expenditures	\$6,163	-\$3,023	\$4,291
Economic Output	\$7,787	-\$4,021	\$5,719
Employment	0.1	-0.1	0.1
Labor Income	\$2,159	-\$1,075	\$1,529
Tax Impact	\$928	-\$462	\$657

4.5.1 Hunting

4.5.1.1. Alternative A – No Action

This alternative would have little effect on waterfowl hunting opportunities on the Refuge. A minimum of 500 acres of land and water would remain available to hunters with disabilities for a limited hunt of approximately 8 days. Restoration of bottomland forests in the hunt area would benefit Wood Ducks and may provide improved hunting opportunities. Since this alternative involves no change in regulations or hunting methods or practices, hunters should find little disruption to their normal expectations and routines. For some waterfowl hunters, however, this alternative will not alleviate their concerns such as the feeling of exclusion in managed hunts and intense competition with waterfowl hunters in other areas.

In Alternative A the managed hunt for whitetail deer would likewise remain unchanged. Hunters would have an equal opportunity to apply for a limited number of permits based on the need to maintain deer numbers at a level that sustains vegetation vigor and contributes to state management objectives for adjacent lands. Chronic wasting disease, which is present in eastern Wisconsin, would be monitored closely and deer hunting objectives could change if the disease was found near the Refuge or if the State requested special harvest guidelines.

This alternative would continue to have a positive economic impact to local economies as reflected in Table 6. Overall, this alternative would not change the current quality or opportunity for hunting on the Refuge.

4.5.1.2. Alternative B – Wildlife and Habitat Focus

Hunting opportunities would be reduced because waterfowl hunting would be eliminated from the Refuge in favor of providing undisturbed resting habitat for Pool 6 of the Mississippi River. Hunters with disabilities would be disproportionately affected because few nearby areas are accessible to them. Other hunters may perceive the closure as an attempt to limit their use and enjoyment of public lands. Conversely, non-hunting visitors would have improved wildlife viewing opportunities.

The managed hunt for whitetail deer would remain unchanged, although better vegetation and deer population monitoring would enable managers to fine tune harvest levels based on age and sex ratios. Hunters would have an equal opportunity to apply for a limited number of permits based on the need to maintain deer numbers at a level that sustains vegetation vigor and contributes to state management objectives for adjacent lands. Chronic wasting disease, which is present in eastern Wisconsin, would be monitored closely and deer hunting objectives could change if the disease was found near the Refuge or if the State requested special harvest guidelines.

Alternative B would have a less positive economic impact to local economies as reflected in Table 6. Overall, this alternative would reduce hunting opportunities on the Refuge but would enhance wildlife viewing opportunities and improve resting habitat for migrating waterfowl.

Table 7: Comparison of Annual Economic Effects of Alternatives on Fishing, Trempealeau NWR

Category	Alternative A	Change from Alternative A	
		Alt. B	Alt. C (Preferred Alt.)
Activity Days	336	-10	100
Net Economic Value	\$5,785	-\$172	\$1,722
Total Expenditures	\$2,364	--	\$703
Economic Output	\$3,066	--	\$937
Employment	0.0	--	0.0
Labor Income	\$845	--	\$250
Tax Impact	\$364	--	\$108

4.5.1.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Under this alternative, waterfowl hunting opportunities would be expanded for hunters with disabilities, youth, women and other first-time hunters. About 500 acres would be used to accommodate a special series of managed hunts that would be geared towards recruiting new hunters and providing them with a high quality hunting experience. The sport of waterfowl hunting and the revenues it provides toward preserving and protecting waterfowl habitats would benefit, as new people were encouraged to participate. In general, the hunting regulations on national wildlife refuges hold participants to a high standard of ethics and behavior. The special managed hunts proposed in this alternative would strive to instill sportsmanship and provide a high quality and rewarding hunt for new hunters. Additionally, small, managed hunts would help to limit hunting pressure to a level that maintained bird use of the area and thus quality hunting opportunities.

The managed hunt for whitetail deer would remain unchanged, although better vegetation and deer population monitoring would enable managers to fine tune harvest levels based on age and sex ratios. Hunters would have an equal opportunity to apply for a limited number of permits based on the need to maintain deer numbers at a level that sustains vegetation vigor and contributes to state management objectives for adjacent lands. Chronic wasting disease, which is present in eastern Wisconsin, would be monitored closely and deer hunting

objectives could change if the disease was found near the Refuge or if the State requested special harvest guidelines.

Alternative C would have the most positive economic impact to local economies as reflected in Table 6. Overall this alternative would provide more hunting opportunities and have long-term benefits to the sport and associated conservation initiatives.

4.5.2 Fishing

4.5.2.1. Alternative A – No Action

This alternative would have little effect on current fishing opportunities on the Refuge. Fishing contributes only slightly to the area economy as reflected in Table 7.

4.5.2.2. Alternative B – Wildlife and Habitat Focus

Fishing opportunities would decrease in the fall when pools would be closed to minimize disturbance to migrating waterfowl. Some wetland management techniques may decrease the prevalence of rough fish and improve habitats for sport fish, thereby improving fishing success. The economic output from fishing under this alternative would be similar to Alternative A.

4.5.2.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Fishing opportunities would be improved and enhanced with upgrading of existing facilities and the installation of new fishing platforms. Some wetland management techniques may decrease the prevalence of rough fish and improve habitats for sport fish, thereby improving fishing success. The



River Education Days at Trempealeau NWR. USFWS

economic output from fishing under this alternative would be slightly more positive than Alternative A as reflected in Table 7. Overall this alternative would provide additional fishing opportunities on the Refuge.

4.5.3 Interpretation

4.5.3.1. Alternative A – No Action

Interpretive and staff led programming would be continued at the current level. Existing signs and brochures would be used with few changes or additions. The trend toward increased visitation would continue as tourism in the area is promoted. However, opportunities for the public to enjoy and understand the Refuge would be limited to existing facilities. Overall, the visitor experience would be low quality and the perception of the Refuge as a well kept, professional and valuable institution would be diminished.

4.5.3.2. Alternative B – Wildlife and Habitat Focus

The impacts discussed in Alternative A would also apply to this alternative, but with the additional impacts of fewer staff led programming as staff were directed to wildlife and habitat projects.

4.5.3.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Interpretive facilities and materials would be updated and improved. Additional signs, trails and staff led programming would be developed. The staff would be better equipped to accommodate increased visitation and the visitor would leave with a better understanding of Refuge resources and an

appreciation for the professionalism and value of the Refuge System. Overall this alternative would provide interpretation in line with demand and current visitor service standards.

4.5.4 Environmental Education

4.5.4.1. Alternative A – No Action

Under this alternative, the current trend of increased requests for environmental education programs would continue. However, limited staff, facilities, and funding resources would continue to limit the number of students and teachers that the Refuge could accept. This alternative would not meet the demand for environmental education as gauged by past use and inquiries. Overall environmental education programs would continue to be offered at the current level of accommodation.

4.5.4.2. Alternative B – Wildlife and Habitat Focus

Under this alternative, there would be a marked decline in environmental education opportunities, as the emphasis of staff and funding would be shifted to more wildlife-based work. Facilities to accommodate groups would not be constructed and existing facilities would not accommodate traditional teaching methods. The gap between public demand and Refuge capability would continue to widen and students and teachers would be turned away. This alternative could have long-term consequences in terms of public and political support that could negatively impact projects and funding for improving the quality of fish and wildlife habitat. Overall minimal environmental education programs would be conducted as staff and resources would be focused on habitat management.

4.5.4.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Staff and facilities would be increased to provide more environmental education programs. Specific curriculum based programming would allow staff to train teachers to deliver programs independently. Facilities would accommodate groups and allow staff to use new technologies to better deliver their message. Volunteers would be trained as docents and additional teacher training programs would further expand educational capabilities. The gap between demand for programming and Refuge capabilities would be decreased, with fewer students turned away. Increased facilities and visitation could cause some displacement or disturbance to habitats, but avoiding sensitive or high use areas would minimize

Table 8: Comparison of Annual Economic Effects of Alternatives on Wildlife Observation, Trempealeau NWR

Category	Alternative A	Change from Alternative A	
		Alt. B	Alt. C (Preferred Alt.)
Activity Days	64,857	-1,500	4,520
Net Economic Value	\$589,064	-\$13,624	\$41,053
Total Expenditures	\$179,743	-\$5,336	\$15,955
Economic Output	\$239,702	-\$7,124	\$21,275
Employment	3.7	-0.1	0.3
Labor Income	\$64,070	-\$1,904	\$5,687
Tax Impact	\$27,539	-\$818	\$2,444

this. This alternative could have long-term consequences in terms of public and political support that could positively impact projects and funding for improving the quality of fish and wildlife habitat. Overall, this alternative would significantly improve the Refuges ability to provide environmental education.

4.5.5 Wildlife Observation and Photography

4.5.5.1. Alternative A – No Action

Opportunities to view and photograph wildlife would continue unchanged. New facilities would not be added, but general improvements in habitat could encourage more wildlife use and improve viewing opportunities. This alternative would generally not meet the demands for facilities related to observation and photography (trails, tour routes, blinds, overlooks) as gauged by inquiries, past visitation trends, and growing tourism interests. This alternative would continue to have positive economic impacts as shown in Table 8. Overall wildlife observation and photography opportunities would remain the same.

4.5.5.2. Alternative B – Wildlife and Habitat Focus

Under this alternative, opportunities to view and photograph wildlife would be reduced as areas were closed to limit disturbance to migrating waterfowl. New facilities would not be added, but general improvements in habitat would encourage more wildlife use and improve viewing opportunities. This alternative would generally not meet the demands

for facilities related to observation and photography (trails, tour routes, blinds, overlooks) as gauged by inquiries, past visitation trends, and growing tourism interests. Existing facilities would degrade more quickly as staff were directed to higher priority fish and wildlife related projects. This alternative would continue to have positive economic impacts as shown in Table 8. Overall opportunities to view and photograph wildlife would decline.

4.5.5.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Opportunities to view and photograph wildlife would increase under this alternative due to habitat improvements and an increase in related facilities. Additional staff would be focused on public use programs and facilities that could enhance the quality and quantity of observation and photography visits. Increased facilities and visitation would cause some displacement of habitat and increase disturbance to wildlife, although avoiding important habitats and wildlife use areas would minimize this. This alternative could have long-term positive consequences in terms of public and political support that could positively impact projects or funding for improving quality of fish and wildlife habitat. This alternative is predicted to have a corresponding increase in positive economic impact as reflected in Table 8. Overall, opportunities to view and photograph wildlife would increase.

4.5.6 Other Uses

4.5.6.1. Alternative A – No Action

Most other uses such as berry and mushroom picking, biking, cross-country skiing, and hiking would continue unchanged.

4.5.6.2. Alternative B – Wildlife and Habitat Focus

Fewer and poorer quality biking opportunities would occur because certain dikes would be closed seasonally to reduce disturbance to wildlife. The bike trail would remain as is with no improvements or extensions. Hiking and skiing trails would not be improved or extended and other access restrictions may reduce opportunities for mushroom and berry picking. Overall, most other uses would continue, but the ease of access and the quality of the experience would be reduced as staff and resources became more focused on biological monitoring and habitat improvements.

4.5.6.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Opportunities and quality of biking and other activities would improve with additional facilities and extension of the bike, skiing, and hiking trails. Opportunities for berry and mushroom picking would remain unchanged. Overall, visitors would have more and better opportunities to enjoy the Refuge in ways that are compatible with the needs of wildlife.

4.5.7 Protection of Archeological Resources

4.5.7.1. Alternative A – No Action

Artifacts would continue to be compromised by soil disturbance, wave action, and illegal collection. The location, extent and identity of artifacts would remain unknown. Law enforcement coverage would remain inadequate to protect resources. Public closures to protect certain sites would continue indefinitely. Overall archeological resources would continue to be lost, and restrictions to public access and habitat management activities would impede attainment of other Refuge goals.

4.5.7.2. Alternative B – Wildlife and Habitat Focus

Same as Alternative A.

4.5.7.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

An Archeological Resource Protection Plan would guide management actions and define needed physical or administrative protection to known resources. Goals for future survey work would be identified and funding could be sought to investigate priority sites. Protection techniques would be defined for individual sites that would have the least impact on habitats, visitor services, or management actions. Law enforcement coverage would be increased and the problems of illegal collection would be addressed. Public use staff would be available to design and implement programs to help the public become more aware of the historical significance and value of the archeological resources on the Refuge. Overall, archeological resources would be better identified, protected and valued.

4.5.8 Refuge Access

4.5.8.1. Alternative A – No Action

Public access to the Refuge would continue to be limited during spring due to flooding of the main access road. Visitors would be prevented from witnessing much of the spring songbird migration, one of the most opportune wildlife viewing events on the Refuge. Certain sites with archeological significance would remain closed to protect them from vandal-



Canada Geese on frozen Refuge pools at Trempealeau NWR. USFWS

ism. Overall, Refuge access would be limited during the times of the year when some of the best wildlife viewing occurs.

4.5.8.2. Alternative B – Wildlife and Habitat Focus

Same as Alternative A, with the additional restrictions of limited public access on dikes and pools during the fall migration. Fall migrants would be better protected from disturbance, but the public would have a more difficult time enjoying viewing opportunities. Public access would be the most restricted by this alternative.

4.5.8.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Access to the Refuge would be dramatically improved with the construction of a bridge to replace the section of entrance road that floods each spring. Visitors would have year-round access to most portions of the Refuge. Specific closures to protect archeological sites would be minimized with the development of an Archeological Resource Protection Plan. Overall, public access would be significantly improved.

4.5.9 Community Outreach

4.5.9.1. Alternative A – No Action

Community awareness, participation, and support for Refuge events and issues would continue to be minimal as staff make limited effort to reach out to citizen groups or community leaders.

4.5.9.2. Alternative B – Wildlife and Habitat Focus

Same as Alternative A, with staff focused on wildlife monitoring and habitat management rather than community outreach.

4.5.9.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Additional public use staff would become involved in community organizations and events to showcase the Refuge and the Refuge System. The Refuge would have an identity, and become known and appreciated as an asset to the local area. Citizens would value the Refuge and realize the benefits of their natural resources.

4.5.10 Partnerships

4.5.10.1. Alternative A – No Action

Work on private lands through the Partners for Wildlife program would continue at the current

level, with a few small projects accomplished each year. Some improvements to tributaries in the watershed above the Refuge would be realized, but the rate of degradation would far out pace the rate of improvements. Partnerships with other agencies, universities, communities, and private organizations would continue at the current low level on an as-needed basis. The Refuge would not fully realize the benefits of shared expertise, labor, equipment or finances.

4.5.10.2. Alternative B – Wildlife and Habitat Focus

The addition of a staff position dedicated to restoration work on private land would significantly increase partnership building capabilities and facilitate work to reduce erosion in the upper watershed of the Mississippi River. More work would be accomplished to reduce invasive plants on private land by expanding the Refuge's biological control program. Additional staff would facilitate better communication and coordination with universities, state and local agencies, and other non-profit groups. More partnership building would improve public recognition and support for the Refuge System, and for habitat and wildlife management programs.

4.5.10.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B.

4.5.11 Friends/Volunteers

4.5.11.1. Alternative A – No Action

No changes would be made to the current way the Friends and Volunteer groups are managed. The Refuge would continue to have a consistent and dedicated group of volunteers accomplishing a variety of biological, maintenance and public use tasks. The Friends of Upper Mississippi River Refuge would continue to represent Trempealeau NWR, as well as their own interests.

4.5.11.2. Alternative B – Wildlife and Habitat Focus

The volunteer program would be improved and more attention would be paid to encouraging and recognizing the significant contributions of the volunteers to the Refuge. The volunteer program would flourish with volunteers sufficiently trained and supported with the tools they need to effectively accomplish their jobs with a sense of ownership and identity. Under Alternative B the volunteer program would emphasize tasks oriented to biological monitoring and habitat.

The Refuge would establish its own “Friends of Trempealeau Refuge” that would build support for issues specific to Trempealeau NWR. The Refuge’s relationship with the community would be strengthened.

4.5.11.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative B except the volunteers program would emphasize public use, maintenance, administrative, and biological programs.

4.5.12 Regional Economics

For the complete economic data, the basis for this section, refer to Erin Henderson’s 2004 report entitled “The Economic Impacts of the Alternatives for the Trempealeau NWR CCP/EIS.” The report is available at the Refuge office in Trempealeau or is on-line at:

www.fws.gov/midwest/planning/Trempealeua.html.

4.5.12.1. Alternative A – No Action

Most Refuge funding comes from the federal government and other sources external to the local economy. The Refuge’s payroll and other expenditures comprise net revenue for the local economy and have a direct effect on the regional economy. Every federally supported job at the Refuge results in local expenditures and indirectly supports additional employment in the region. Under the No Action Alternative, the Refuge’s annual base budget and staffing are expected to remain comparable to recent funding and staffing levels. In 2006, the Refuge base budget supported four full-time employees. Assuming little change in base budget, the Refuge would indirectly support at least 11.6 regional jobs and therefore continue to have positive effects on the regional economy (Appendix F).

4.5.12.2. Alternative B – Wildlife and Habitat Focus

Same as Alternative A except that staffing would increase to 7.5 full-time employees, indirectly supporting 13.2 jobs in the area. The Refuge base budget would increase over 100 percent to \$685,000.00 to support the new positions. The positive effect on the regional economy would be significant, especially in the sectors of environmental management

4.5.12.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Same as Alternative A except that the staff would increase to 6.5 full-time employees and indirectly



Trempealeau NWR volunteer assisting with education program. USFWS

support 12.8 regional jobs. The positive effect on the regional economy would be significant, especially in the sectors of environmental management, education, and tourism.

4.5.13 Refuge Administration and Operations

4.5.13.1. Alternative A – No Action

Under this alternative, the overall Refuge budget is expected to increase in accordance with inflation adjustments, but Refuge staffing levels would remain the same as current, or four full-time employees. With levels of public use and interest continuing to rise, meeting the information needs of the public will likely fall short of public expectation in terms of personal contact, programs, leaflets, and other media work. Coordination with various agencies and partners will continue at current levels, resulting in gaps in Refuge presence on community and resource issues.

The Refuge office and visitor facility would remain the same, but the 70-year-old shop facility would be replaced to address safety issues. Visitor facilities would remain inadequate to meet increasing demands of environmental education, especially for group programming.

Annual salary and operations expenditures would continue to have a positive economic impact, with current economic output estimated at \$310,000.00 (Henderson, 2004).

4.5.13.2. Alternative B – Wildlife and Habitat Focus

Under this alternative, the overall annual Refuge budget would increase substantially, mainly due to increases in staffing to an eventual 7.5 full-time equivalents. This increase in staffing would dramatically increase biological monitoring, soundness of decisions, and direct habitat work. Personal service to the public and coordination with other agencies and partners would increase, especially in terms of habitat and biological programs that would be the priority under this alternative.

The Refuge office and visitor facility would remain the same, but the 70-year-old shop facility would be replaced to address safety issues. Visitor facilities would remain inadequate to meet increasing demands of environmental education, especially for group programming.

Annual salary and operations expenditures would result in a positive economic impact commensurate with increases. Staff salary expenditures alone could increase by 90 percent by the end of the planning period in 2022, resulting in a similar economic increase.

4.5.13.3. Alternative C – Integrated Wildlife, Habitat and Public Use Focus

Under this alternative, the overall annual Refuge budget would increase substantially, mainly due to increases in staffing to an eventual 6.5 full-time equivalents. This increase in staffing would dramatically increase biological monitoring, soundness of decisions, and direct habitat work. Personal service to the public and coordination with other agencies and partners would increase, especially in terms of habitat and biological programs and public use and education that would be a priority under this alternative.

The Refuge office would be enlarged to accommodate new staff and the 70-year-old shop facility would be replaced to address safety issues. Visitor facilities would be improved to meet increasing demands of environmental education, especially for group programming. Construction of new facilities would increase public accessibility, information, and programs, and improve employee productivity and recruitment.

Annual salary and operations expenditures would result in a positive economic impact commensurate with increases. Staff salary expenditures alone

could increase by 90 percent by the end of the planning period in 2022, resulting in a similar economic increase.

4.6 Cumulative Impacts

4.6.1 Cumulative Impacts – Physical Environment

Alternatives B and C, and to a lesser extent Alternative A, call for increased attention to habitat restoration and/or enhancement projects, floodplain and adjacent land acquisition, and improvement in water quality in terms of both chemistry and reduced sediment. Collectively and over time, these actions will improve the ability of the wetland system to process nutrients and store carbon and along with other basin-wide regulations and initiatives, contribute to improvements in hypoxia in the Gulf of Mexico and overall climate change. Physical changes through projects will restore tributaries and improve water management capabilities in Refuge pools, resulting in a more diverse and dynamic system.

Although the rates and amounts of sediment entering the Refuge and eventually the Mississippi River may be reduced over time, none of the alternatives will adequately address the movement of sediments to the mouth of the Mississippi River. Thus, the actions in the alternatives will not cumulatively improve the continued deficit of sediment on the Mississippi River delta.

To slightly varying degrees, all alternatives emphasize maintaining the integrity of the Refuge boundary and conserving the scenic beauty. Actions taken to ensure long-term forest health, acquire bottomland forest, and preserve and enhance rare prairies will serve as a model for land use planning and zoning adjacent to the Refuge. In addition, when actions on the Refuge are combined with the actions of the State, non-profit organizations, and private landowners, there can be measurable progress in stemming the rate or type of developments which detract from the scenic beauty of the Upper Mississippi River Valley.

4.6.2 Cumulative Impacts – Biological Impacts

Although the degree of habitat quantity and quality is different under the alternatives, all should con-

tinue to improve fish and wildlife habitat, and thus populations. For migratory birds, the Refuge will likely grow in importance as other habitats become scarcer. Reduced habitat for migrating waterfowl in the Midwest, for example, has made the Upper Mississippi River an important stopover for large portions of the continent, Canvasback and Tundra Swans. In this regard Alternative B provides the largest area of undisturbed habitat and may best meet the needs of large numbers of migrating birds thereby having the most positive cumulative impact on continental populations.

Habitat improvements under the alternatives should also benefit rare and declining species and species listed as threatened or endangered. Along with conservation actions for these species on other public and private lands, the Refuge actions across all alternatives, but especially Alternatives B and C, will have a positive cumulative impact. For some species, the Refuge may provide a source for populations expanding onto adjacent lands or, conversely, may provide habitat for expanding populations searching for new habitats to exploit. An example would be the endangered Whooping Crane. Although population restoration efforts were started elsewhere, some birds are now using nearby areas and may in the future breed on the Refuge, thus adding to wild populations and eventual recovery.

The area surrounding the Refuge is principally agricultural lands. Before European settlement (pre-1850s), these lands were prairie and oak savanna habitat. Now they are gradually being developed into residential areas. Within 50 years, it is likely that aside from existing goat prairies and a few private lands, the Refuge will have the only remaining expanse of prairie in the area. Efforts to restore prairie and oak savanna habitat on the Refuge will help to secure this habitat type in the local area. Alternative B would make the greatest strides in this effort by restoring 150 acres in 15 years, and Alternative A would have the least impact by restoring about 15 acres. In the preferred Alternative C, 100 acres would be restored with the intent of restoring the remaining 90 acres of non-native forest within the following 30 years.

In all alternatives, 55 acres of bottomland hardwood forest would be restored. These habitats are in decline in the Mississippi River backwaters, and this restoration would recover a small amount of that lost habitat.

Although Alternatives B and C provide an increase in the monitoring and control of invasive plants and animals, infestations are expected to continue to increase and expand to new areas.

Alternatives B and C also have a strong biological monitoring component, with increases in species and habitats surveyed, and research and coordination with others. This increased information would not only aid decision making that benefits fish and wildlife on the Refuge, but add to the body of knowledge collected by other agencies which can affect resource decision-making over a broader landscape.

4.6.3 Cumulative Impacts – Socioeconomic Environment

A variety of objectives in Alternatives B and C will have varying degrees of impact on recreational use of the Refuge. Earlier sections detailed specific impacts on individual uses such as hunting, fishing, wildlife observation, and photography. Cumulatively, each alternative has a different economic impact since it affects the level of public use. Table 9 summarizes this cumulative impact by alternative.

Each alternative takes a different approach to managing the variety of recreational uses that occur on the Refuge, ranging from status quo (Alternative A) to an integrated approach (Alternatives C) that seeks to conserve wildlife and habitat while providing a diversity of recreational opportunities for visitors. These varying alternatives will have cumulative impacts given that demand for nearly all recreation is expected to grow while the amount of Refuge space and natural resources is relatively finite.

In Alternative A, current uses would continue without much change. Alternative B might be perceived as too restrictive in terms of recreation and too liberal in emphasizing wildlife monitoring and habitat improvement. Alternative C attempts to strike a reasonable balance to ensure that the Refuge remains a destination of choice for both wildlife and people. If successful, this integrated approach may prove more sustainable and have positive, long-term natural resource, social, and economic impacts both on the Refuge and beyond.

Alternatives B and C also involve an approximate 250 percent increase in the Refuge's base operations and maintenance budget over the next 15 years, plus additional maintenance and construction funding for new facilities. Although budgets are impossi-

Table 9: Comparison of Annual Economic Effects of Alternatives on Public Use, Trempealeau NWR

Category	Alternative A	Change from Alternative A	
		Alt. B	Alt. C (Preferred Alt.)
Activity Days	65,735	-1,670	+4,855
Net Economic Value	\$619,607	-\$21,105	+\$53,509
Total Expenditures	\$188,269	-\$8,429	+20,949
Economic Output	\$250,555	\$-11,243	+\$27,931
Employment	3.8	-0.2	+0.4
Labor Income	\$67,074	-\$3,005	+\$7,466
Tax Impact	\$28,831	-\$1,291	+\$3,209

ble to predict, this increase could impact operations funding at other refuges and wetland management districts in the Region if it came from existing allocations. This would result in delaying or forgoing habitat and facility improvements and other work at these stations, although the change would be small at any particular station.

Working relationships with the State of Wisconsin, area colleges and universities, private landowners and others should improve in terms of responsiveness to inquiries and speed of joint projects under Alternatives B and C. This improvement would be mainly the result of increased staffing in key areas such as biology, public use, and law enforcement.

Overall coordination and communication with the general public should improve under Alternative C due to new staff positions dealing with public use and public information. Since some may oppose changes in one or more of the alternatives, or likewise support them, the cumulative impact on public perception of the Refuge and the Fish and Wildlife Service could be negative or positive. More emphasis on public education and information in Alternative C should foster more understanding and appreciation of resource issues and needs, and could lead to increased political support and funding which could positively affect fish and wildlife resources on the Refuge and the Mississippi River as a whole. Increased outreach of these alternatives could also positively impact land use decisions outside of the Refuge by local governments and private landowners, and thus lead to increased fish and wildlife populations over a broader area.

4.7 Short-term Uses and Long-term Productivity

Habitat protection and restoration actions across all alternatives often entail short-term negative impacts to ensure long-term productivity of the Refuge. Construction of islands and dikes entail intense disturbance to fish, wildlife, and plants, and increased water turbidity and disruption of public uses. However, these impacts are site-specific and relatively short duration, more than offset by increasing the long-term productivity of the sites and surrounding plant and animal communities. Given the altered nature of the floodplain within the Refuge due to locks and dams and other development, it is unlikely that the long-term productivity of the Refuge can be sustained in many areas without such short-term uses and impacts.

Many of the cyclic management actions in the alternatives, namely pool drawdowns, prescribed burning, invasive plant and animal control, and forest management, can have dramatic short-term impacts. These impacts include the direct mortality of some plants and animals, displacement of species, and cessation of certain types of public use. However, these short-term impacts are generally offset by near-term and long-term benefits of these practices, practices that often mimic the natural and thus sustainable processes necessary for long-term habitat health. Many of these long-term benefits were described in more detail earlier in this chapter under the applicable parameters or concerns.

As discussed in Section 4.6.3 (cumulative impacts), the short-term disruption in current



Brown bat. USFWS

means, locations, and timing of public uses inherent in Alternatives B and C, should, in the long-term, help sustain the greatest diversity of opportunity for the greatest number of people. Also, diversity of opportunity for public use should provide the best long-term positive economic impact to local communities. This mirrors the widely accepted premise that maintaining diversity in natural systems helps ensure the long-term resiliency of these systems.

4.8 Unavoidable Adverse Effects

As noted previously, many of the habitat and facility construction projects in the alternatives have a certain level of unavoidable adverse effects, especially during the actual construction. These effects are mitigated to some degree by the use of practices and precautions that safeguard water quality, avoid sensitive or irreplaceable habitats, or time actions or include features to avoid or minimize impacts to fish and wildlife. Adverse effects are generally short-term and more than offset by the long-term gains in habitat quality and resulting fish, wildlife, and plant productivity. Some projects may have an adverse impact on cultural resources. The

process for dealing with these impacts on a case-by-case basis is discussed in Section 4.2.12 (cultural and historical preservation).

Some existing habitat types on the Refuge will be adversely affected. For example, there will be a loss of open water habitat on portions of the pools within the Refuge as new islands are constructed. Also, drawdowns will increase emergent aquatic vegetation such as bulrush and cattail, converting many areas to marsh habitat versus open water. Forest habitat is also likely to undergo change in species composition and structure as invasive understory plants are. Some forested areas may be converted to grassland, while some grassland areas may be converted to forest depending on the outcome of more site-specific planning. All of these unavoidable adverse effects will be relatively local in nature and more than offset by the long-term diversity and ecological health of the broader landscape.

Land acquisition entails an unavoidable impact to local units of government due to the loss of tax revenue as lands transition from private to public ownership. This unavoidable effect, along with mitigation measures, is discussed more fully in Section 4.2.10 (revenue sharing).

All alternatives, to varying degree, will have adverse impacts to a certain segment of the public that does not desire change to current public use programs and regulations, or that may have differing views on the course of action to be taken. Some visitors will see a loss of opportunity in terms of time and space restraints for certain uses such as boating, fishing, and hunting, or means of use restraints by limiting types of watercraft in certain areas. These impacts to individuals or groups are unavoidable given the diversity and number of publics, inherent conflicts between and within user groups, continued increase in use numbers, and relatively finite nature of land and waters available on the Refuge for public recreation. Alternative C, the preferred alternative, represents the most balanced alternative in terms of minimizing and mitigating these adverse impacts to citizens and reflects public involvement and input of the planning process.

Table 10: Summary of Environmental Consequences, Trempealeau NWR

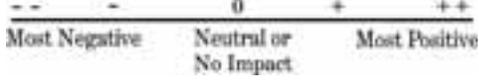
Parameter	Alt. A No Action (Current Management)	Alt. B Wildlife and Habitat Focus	Alt. C Integrated Wildlife and Public Use (Preferred Alternative)
			
Physical			
<i>Ecosystem</i>	0 No change	+ Sediment and contaminant inputs reduced in headwaters of Trempealeau and Buffalo Rivers.	++ Sediment and contaminant inputs reduced in headwaters of Trempealeau and Buffalo Rivers. More opportunities provided for public education on ecosystem issues
<i>Climate Change</i>	+ Increases in protection and restoration of bottomland forests, grasslands and emergent marsh would increase carbon sequestration.	+ Same as A	+ Same as A
<i>Water Quality</i>	- Sediments and contaminants continue to flow into Refuge from headwaters of Trempealeau River; rough fish, wind and waves continue to impact clarity and suspension of solids; little monitoring;	+ Sediments and contaminants reduced in watershed; rough fish control and construction of dikes and islands improves clarity and suspension of solids; monitoring improved.	++ Sediments and contaminants reduced in watershed; rough fish control and construction of dikes and islands improves clarity and suspension of solids; monitoring improved; more opportunities provided for public education on water quality issues
<i>Air Quality</i>	0 No change	0 No change	0 No change
<i>Sedimentation</i>	- Sediments flow would increase from unabated erosion in headwaters of Trempealeau and Buffalo Rivers	+ Private lands projects would reduce sediment loads in watershed	++ Private lands projects would reduce sediment loads in watershed; more opportunities provided for public education on sediment issues

Table 10: Summary of Environmental Consequences, Trempealeau NWR (Continued)

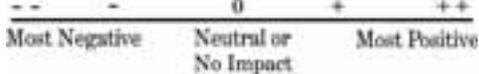
Parameter	Alt. A No Action (Current Management)	Alt. B Wildlife and Habitat Focus	Alt. C Integrated Wildlife and Public Use (Preferred Alternative)
<p style="text-align: center;">  </p>			
<i>Geomorphology</i>	0 Overall geomorphology would continue to be driven by flood events and off-Refuge land use practices	+ Moderate, local changes in floodplain geomorphology with construction of dikes and islands; watershed restoration could reduce peak river flows and sediment deposition.	+ Same as B
<i>Hydrology</i>	0 No change	+ Watershed restoration could reduce peak river flows; improved infrastructure would allow better water management in wetland units; reductions in sediment loads in Tremp. River may change flooding patterns on adjacent lands.	++ Watershed restoration could reduce peak river flows; improved infrastructure would allow better water management in wetland units; reductions in sediment loads in Tremp. River may change flooding patterns on adjacent lands; opportunities to inform public about floodplain issues would be improved.
<i>Use of Prescribed Fire</i>	0 No change	++ Removal of pine plantations and invasive shrubs would reduce fragmentation of burn units; removal of black locust and downed timber would improve burn capabilities	+ Removal of invasive shrubs from understory and removal of downed timber would improve burn capabilities.
<i>Flood Protection</i>	- Flood events would have the potential to severely damage habitat and infrastructure	+ To the extent possible, habitats and infrastructure would be protected from loss due to flood events; policies would be clear and known by partners in advance of flooding.	++ To the extent possible, habitats and infrastructure would be protected from loss due to flood events; policies would be clear and known by partners in advance of flooding; opportunities to educate the public about the importance and functions of floodplains would be improved.

Table 10: Summary of Environmental Consequences, Trempealeau NWR (Continued)

Parameter	Alt. A No Action (Current Management)	Alt. B Wildlife and Habitat Focus	Alt. C Integrated Wildlife and Public Use (Preferred Alternative)
<i>Emergency Response to Contaminant Spills</i>	+ Spill response training and capabilities would be improved.	+ Same as A	+ Same as A
Biological			
<i>Threatened and Endangered Species</i>	0 No change	+ Bottomland forest would be improved for Bald Eagle nesting; nests protected from human disturbance; management and monitoring plans would consider state listed species; reintroduction of Massassagua would be considered	+ Same as B
<i>Waterfowl</i>	+ Periodic drawdowns would improve forage base and nesting habitat for waterfowl.	++ Periodic drawdowns would improve forage base and nesting habitat for waterfowl; wetland management would increase amount and quality of habitat; public access restrictions would reduce disturbance.	+ Same as B
<i>Waterbirds</i>	0 No change	+ Waterbirds would benefit from improved wetland health, increased food base, and more secure nesting habitats; water management would help reduce flooding of nest sites.	+ Same as B
<i>Shorebirds</i>	0 No change	+ Periodic drawdowns would provide additional foraging habitats for migrating shorebirds; improved wetland health would increase food base.	+ Same as B

Table 10: Summary of Environmental Consequences, Trempealeau NWR (Continued)

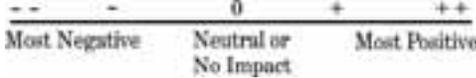
Parameter	Alt. A No Action (Current Management)	Alt. B Wildlife and Habitat Focus	Alt. C Integrated Wildlife and Public Use (Preferred Alternative)
			
<i>Raptors/Owls</i>	0 No change	+ In general improved forest and grassland habitats would provide more food and nesting resources for raptors and owls. Removal of pine planting would decrease roosting habitat for owls.	+ Same as B
<i>Upland Game Birds</i>	0 No change	+ Restoration of oak savanna and upland forests would improve food base and nesting opportunities for these species.	+ Same as B
<i>Songbirds</i>	0 No change	++ Removal of invasive shrub understory, restoration of bottomland forest, removal of pine plantings, and an overall decrease in fragmentation and edge habitats would improve habitats for songbirds	+ Forest habitats would be improved for songbirds by reducing invasive shrubs, restoring prairies and bottomland forests. Prairie units would be more fragmented and smaller than in alternative B and grassland songbird and edge species would be impacted.
<i>Fish</i>	0 No change	+ Removal of rough fish, improved water quality, and wetland health would improve habitats for fish.	+ Same as B
<i>Freshwater Mussels</i>	0 No change	+ Improved water quality and rough fish management would improve mussel habitats.	+ Same a B

Table 10: Summary of Environmental Consequences, Trempealeau NWR (Continued)

Parameter	Alt. A No Action (Current Management)	Alt. B Wildlife and Habitat Focus	Alt. C Integrated Wildlife and Public Use (Preferred Alternative)
<p style="text-align: center;"> </p>			
<i>Reptiles and Amphibians</i>	0 No change	+ Reducing water levels periodically would improve wetland habitats for reptiles and amphibians; Restoration of bottomland forests would provide better habitats.	+ Same as B
<i>Control of Invasive Species</i>	- Modest level of removal would not outpace spread into new areas; aquatic habitats would be severely degraded without rough fish control; monitoring of new species and outbreaks would not be sufficient to prevent invasion.	+ More aggressive removal and control would outpace new invasions and begin to restore some habitats; better management of rough fish would improve wetland habitat quality; programs on private lands would raise awareness and slow spread of invasives; better monitoring would slow spread of new species and new infestations.	++ Same as B with improved public understanding of the vectors that promote invasion and the public's role in preventing the spread of invasives.
<i>Invertebrates</i>	0 No change	+ Wetland management, especially drawdowns would improve conditions for reproduction of aquatic insects. Upland insects would benefit from restored prairies with a more abundant forb component.	+ Same as B

Table 10: Summary of Environmental Consequences, Trempealeau NWR (Continued)

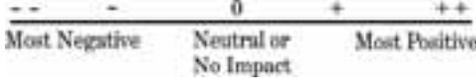
Parameter	Alt. A No Action (Current Management)	Alt. B Wildlife and Habitat Focus	Alt. C Integrated Wildlife and Public Use (Preferred Alternative)
			
<i>Mammals</i>	0 No change	+ Better management of harvest would help maintain healthy, stable populations at levels that would limit damage to habitats. In general improved habitats would benefit all life stages for mammals.	+ Same as B
<i>Wetlands</i>	+ Aquatic plants and wetland habitats would improve slightly under current drawdowns and other management actions; wetland habitats would not be protected from severe flood events; invasive plants would continue to impact wetlands.	++ Improved infrastructure, drawdowns, and better monitoring and aggressive control of invasive plants would improve wetland habitats. Water quality would improve with removal of rough fish, reduced sediment loads, less wind and wave action and more consistent monitoring.	++ Same as B and, the public would appreciate and understand water quality and wetland habitats through better interpretation and education.
<i>Forests</i>	+ Forest habitats would improve slightly with modest removal of invasive shrubs and restoration of bottomland forests	++ Aggressive removal of invasive shrubs would restore the most acres of forests; bottomland restoration would continue, but with more emphasis on uneven age trees and a mix of native species; all pine plantings would be returned to prairie or oak savanna	++ Same as B although pine plantings would continue to fragment prairie units.
<i>Grasslands</i>	- Prairie lost to encroaching black locust as staff and funding are insufficient to treat existing acres.	++ Maximum acres of oak savanna and prairie would be restored; grassland units would be larger and less fragmented with removal of pines.	+ Fewer acres restored and grassland units would be smaller and more fragmented by pine plantings than in alternative B; public would be more aware of the uniqueness and benefits of prairie habitats.

Table 10: Summary of Environmental Consequences, Trempealeau NWR (Continued)

Parameter	Alt. A No Action (Current Management)	Alt. B Wildlife and Habitat Focus	Alt. C Integrated Wildlife and Public Use (Preferred Alternative)
<i>Management of Wildlife Diseases</i>	+ Staff ability to respond to outbreaks in an efficient and safe way would be improved; coordination with the public and other partners would be improved	+ Same as A	+ Same as A
Socio-economic			
<i>Hunting</i>	0 No change	- Fewer waterfowl hunting opportunities; no change in deer hunting.	+ Increased opportunities for waterfowl hunting; no change in deer hunting.
<i>Fishing</i>	0 No change	- Fishing opportunities would decline in the fall because of pool closures to protect migrating waterfowl	+ Improve existing and provide new facilities; increase interpretive and educational programs on fishing.
<i>Furbearer Trapping</i>	0 No change	0 No change	0 No change
<i>Interpretation</i>	0 No change	- Fewer staff led programs; existing facilities maintained, but no new ones added	+ More opportunities for the public to enjoy and understand wildlife and habitats through increased staff and interpretive facilities and materials.
<i>Environmental Education</i>	0 No change	- Minimal environmental education programs would be conducted; staff and resources would be focused on habitat management	+ More educational opportunities would be provided through and expanded EE program; an outdoor learning shelter would be constructed and teacher and volunteer led curriculums developed;

Table 10: Summary of Environmental Consequences, Trempealeau NWR (Continued)

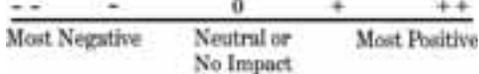
Parameter	Alt. A No Action (Current Management)	Alt. B Wildlife and Habitat Focus	Alt. C Integrated Wildlife and Public Use (Preferred Alternative)
			
<i>Wildlife Observation and Photography</i>	0 No change	- Access would be limited on dikes and pools during peak migration resulting in fewer opportunities to view or photograph wildlife.	+ New hiking trail, cross-country ski trails, and other new facilities would provide additional and improved viewing and photography programs
<i>Other Uses</i>	0 No change	- Fewer and poorer quality biking opportunities; trail and facilities not improved or extended; access restrictions during migration may reduce opportunities for berry and mushroom harvest.	+ Opportunities and quality of biking experience would be improved with additional facilities and extension of the bike trail; opportunities for harvest of berries and mushrooms would not change.
<i>Protection of Archeological Resources</i>	- Artifacts would continue to be compromised by soil disturbance, wave action and illegal collection	- Same as A	+ A protection plan would guide management actions, define needed physical protection, and address illegal collecting; the public would be more aware of the historical significance and value of archeological resources
<i>Refuge Access</i>	- Public access would continue to be limited by flooding of the entrance road;	-- Public access would continue to be limited by flooding of the entrance road and restrictions to dikes and pools during migration.	+ Public would have year-round access with the construction of a new entrance road bridge.
<i>Land Use</i>	0 No change	0 No change	0 No change

Table 10: Summary of Environmental Consequences, Trempealeau NWR (Continued)

Parameter	Alt. A No Action (Current Management)	Alt. B Wildlife and Habitat Focus	Alt. C Integrated Wildlife and Public Use (Preferred Alternative)
<p style="text-align: center;"> </p>			
<i>Adjacent Landowners</i>	+ Staff would improve communication and problem solving with neighboring land owners	+ Same as A	++ Staff would improve communication and problem solving with neighboring land owners; landowners would be invited to at least one annual event on the Refuge geared towards their interests.
<i>Community Outreach</i>	0 No change	0 No change	+ Staff would become more involved in community organizations and events, showcasing the Refuge and the Refuge System and helping citizens realize the benefits of preserving natural resources
<i>Partnerships</i>	0 No change	+ Additional staff would work on developing partnerships with private land owners; better communication and coordination with universities, State and local agencies, and other special interest groups would improve public support and opportunities for habitat management	+ Same as B
<i>Friends/Volunteers</i>	0 No change	+ Volunteer program would be improved; new friends group would focus on supporting Trempealeau NWR needs.	+ Same as B

Table 10: Summary of Environmental Consequences, Trempealeau NWR (Continued)

Parameter	Alt. A No Action (Current Management)	Alt. B Wildlife and Habitat Focus	Alt. C Integrated Wildlife and Public Use (Preferred Alternative)
<p style="text-align: center;"> </p>			
<i>Management of Easements/Right of Ways</i>	+ Better communication and coordination would help all parties complete needed work with less habitat impacts.	+ Same as A	+ Same as A
<i>Regional Economics</i>	0 No change	+ More staff and habitat management projects would contribute to economic growth of the area; eco-tourism would increase contributing to local and regional economies.	++ Increased staff, construction and habitat management projects would improve regional economics; large increases in public use and eco-tourism would boost local and regional economies.
<i>Revenue Sharing</i>	+ Small increase if additional properties are added to Refuge	+ Small increase if additional properties are added to Refuge	+ Small increase if additional properties are added to Refuge
<i>Refuge Administration and Operations</i>	0 No change	+ Refuge budget would increase due to increased staffing; existing facilities would remain inadequate in terms of staff productivity and public use.	++ Refuge budget would increase due to increased staffing; improved facilities would increase staff productivity and accommodate needs of visiting public
<i>Environmental Justice</i>	0 No change	0 No change	0 No change
<i>Cumulative Impacts</i>	+ Habitat quality would continue to slowly improve; public use would continue without much change	++ Habitat quantity and quality would improve over time and fish and wildlife populations would benefit; public use would continue, but some restrictions would change the timing and amount of visitation.	++ Habitat quantity and quality would improve over time and fish and wildlife populations would benefit; compatible public use would increase and the quality of the experience would improve.

Chapter 5: List of Preparers

5.1 List of Preparers

Table 11: List of Preparers

Name	Title/Contribution	Degrees/Other Related Experience	Years with FWS
Refuge Staff, Region 3			
Donald Hultman	Complex Manager; Review Draft, Direct Planning Effort, Public Meetings	M.A., Univ. of Minnesota, Mpls./ St. Paul, Env. Educ.; B.S., Univ. of Minnesota, Comm/Wildlife. Other: Wyoming Game and Fish Dept., 1 yr.	27
Vickie Hirschboeck	Refuge Manager, Direct Planning Effort, Writer	M.S., Univ. of Montana, Missoula, Wildlife Biology; B.S., Biology and B.F.A., Univ. of Michigan, Ann Arbor	18
Robert Drieslein (retired)	Refuge Manager; Writer; Direct Planning Effort	M.S., South Dakota State Univ., Brookings, Wildlife Mgmt., B.S. Univ. of IL, Ag. Science.	35
Eric Nelson	UMRNWFR Refuge Planner, Public Meetings, Document Review	M.S. and B.S., Univ. of Wisconsin, Stevens Point, Natural Resources, Wildlife. Other: Bureau of Land Management, 2 yrs.	27
Lisa Reid	Refuge Biologist, Writer	B.S. Univ. Northern IL, Biology	23
Jennifer Lilla	Park Ranger, GIS Cartographer	B.S., Purdue University, W.Lafayette, IN., Nat. Resources & Environmental Science. Other: National Park Service, 18 years	6
Ann Prochowicz	Administrative Technician, Document Formatting, Typing	Silver Lake College, Univ. of Wisconsin, La Crosse, Music History. Other: U.S. Army Corps of Engineers, 2 yrs	21
Brian Stemper	Biological Technician. GIS Cartographer	B.S., South Dakota State Univ., Wildlife & Fisheries Mgmt. Other: Corps of Engineers, 2 yrs.	8

Table 11: List of Preparers

Name	Title/Contribution	Degrees/Other Related Experience	Years with FWS
Branch of Conservation and Planning, Region 3			
Thomas Larson	Chief of Conservation Planning, CCP Review	M.S., University of Wisconsin, Madison Wildlife Ecology. Other: National Park Service, Peace Corps	30
John Schomaker	Refuge Planner, EIS and CCP coordination, review and editing.	Ph.D., Colorado State Univ., Fort Collins. Other: USDA Forest Service, 8 yrs.	20
Jane Hodgins	Technical Writer/Editor. Newsletter, EIS	B.A., College of St. Thomas, St. Paul, Journalism. Other: Senior Editor, Editor and Reporter, 14 yrs.	8
Gabriel DeAlessio	GIS Specialist/Biologist. Cartography	B.S., Univ. of Connecticut, Storrs, Natural Resource Engineering & Mgmt., Other: Contractor, DoD, 2.5 yrs.	8
Ecological Services, Region 3			
Jeffrey Gosse	Regional Environmental Coordinator. NEPA Review	Ph.D. and M.S., Utah State Univ., Logan; B.S., Univ. of Wisconsin, Madison. Other: Texas Parks and Wildlife, 8 mo., Private Consulting, 6 yrs.	20
Visitor Services and Communication, Region 3			
H. John Dobrovoly	Regional Historic Preservation Officer. Historian	B.A., Sacramento State College, History, Sacramento. Other: National Park Service, 14 yrs.	27
Division of Economics, Arlington, VA			
Erin Henderson	Economist, Economic Assessments	M.S., Oregon State Univ., Agriculture & Resource Economics, B.A., Occidental College, Los Angeles, CA, Economics	5
Consultants			
Kathy Holzer	Conservation Breeding Specialist Group, Program Officer. Public Meetings–Scoping Workshops, Designer/Facilitator	Ph.D., Univ. of Minnesota, St. Paul, Conservation Biology. M.S., North Dakota State Univ., Fargo, N.D., Animal Behavior. B.S. College of William & Mary, Williamsburg, VA, Biology & Psychology. Associated with IUCN Conservation Breeding Specialist Group, 12 yrs., Minnesota Zoo, Apple Valley, MN, Conservation Research and Education, 18 yrs.	0
Ted Sickley	Research Program Manager, Univ. of Wisconsin, Dept. of Forest Ecology and Mgmt., Provided pre-settlement land cover information and maps.	M.S., University of New Hampshire, 17 years as GIS Specialist, 10 were at Univ. of Wis. Contributed data and maps related to pre Euro-American settlement (1840's), and current land cover (1990's).	0

Table 11: List of Preparers

Name	Title/Contribution	Degrees/Other Related Experience	Years with FWS
Rob Nurre	Land Records Manager, State of Wisconsin, Board of Commissioners of Public Lands. Pre-settlement land survey notes and plat map contribution.	B.S., Univ. of Wisconsin, Stevens Point, Natural History Interpretation. Landscape Historian, 15 years. Contributed data regarding land use history from original land surveyors notes.	0

Chapter 6: Compliance, Consultation, and Coordination with Others

6.1 Compliance

In undertaking the Proposed Action, the Service must comply with a number of federal laws, Executive Orders, regulations, or other guidance pertinent to a federal action. These are listed and summarized in Appendix D.

6.2 Consultation and Coordination with Others

This section describes consultation and coordination efforts with the public, interested groups and other agencies.

6.2.1 Public Outreach

The following summarizes public outreach, including public meetings/open houses, workshops, Congressional briefings, Planning Update mailings and Federal Register notices.

6.2.1.1. Public Meetings/Open Houses

Date and Location: September 26, 2002, Scoping Meeting, Centerville, Wisconsin

Purpose: To develop a list of planning issues based on public input and to inform the public on CCP planning process

Number of Non-Service Participants: 22

Audience: Public

Topics Discussed:

- # description of planning process, laws, regulations and policies governing NWRS.



Muskrats. USFWS

- # Refuge history, existing management, problems (exotic plants), etc.

- # issues to be considered in planning process

Date and Location: June 28, 2007, Public Comment Meeting on Draft EIS/CCP, Trempealeau Wisconsin.

Purpose: To allow citizens and interested parties to comment on draft EIS/CCP.

Number of Non-Service Participants: 26

Audience: Public

Topics Discussed:

- # History of Trempealeau NWR management and current land conditions
- # Mission of Refuge System and purpose of Trempealeau NWR

- # Planning process and development of alternatives
- # Objectives and strategies of the preferred Alternative C

Public comment period followed formal presentation. See Chapter 7 on page 166 for details of comments received.

6.2.1.2. Workshops

Date and Location: March 15, 2003, Manager for a Day Workshop, Trempealeau Middle School, Trempealeau, Wisconsin.

Purpose: To discuss issues developed partly at September 2002 scoping meeting and develop solutions/strategies for implementation.

Number of Non-Service Participants: 26

Audience: Public, representatives of local groups

Topics Discussed: Workshop attendees participated in small, working groups and selected four or five issues to discuss from the following list: (1) Prairie and oak savanna restoration; (2) invasive species; (3) water level management; (4) managing the Refuge deer population; (5) minimizing human impact; (6) off-Refuge impacts of Trempealeau NWR; (7) waterfowl hunting; (8) Refuge access; (9) bike trail; (10) trapping; (11) horseback riding; (12) community involvement; and (13) environmental education.

Date and Location: July 10, 2007; Trempealeau, Wisconsin.

Purpose: To discuss Objective 3.5 Waterfowl Hunting

Number of Non-Service Participants: 2

Audience: Public

Topics Discussed:

- # Continued support for waterfowl hunt for people with disabilities.
- # Options for youth hunting and the need to gain interest and assist of single parents with teaching their children.
- # Options for accommodating aging population and access needs.
- # Learn to hunt and mentoring new hunter programs.
- # Advisory committee for revision to hunt plan.



River Education Days at Trempealeau NWR. USFWS

6.2.1.3. Congressional Outreach

Date and Location: Congressional briefing, LaCrosse District Conference Room, Onalaska, Wisconsin

Purpose: To brief Congressional Offices from Minnesota and Wisconsin on CCP planning process for CCP, Refuge background, major issues, and planning timetable.

Attendees: Karrie Jackelen, Aide for Wisconsin Congressman Ron Kind; Robert Kierlin, State Senator from Winona, Minnesota; Richard Larson, Aide for Congressman Gil Gutknecht, Minnesota.

Topics Discussed: Described CCP planning process, Refuge history and background, major issues, controversy expected and planning timetable.

6.2.1.4. Planning Update Mailings

As of May 28, 2004, the Service published three Comprehensive Conservation Plan Updates for the Upper Mississippi River National Wildlife Refuge Complex, which included Trempealeau NWR. Updates were mailed to more than 2,600 addresses in August 2002, December 2002 and July 2003.

- # The August 2002 issue included a brief description of Trempealeau NWR and the

CCP process and announced Open House/Scoping meetings.

- # The December 2002 issue summarized issues raised by the public at the Scoping meeting and announced dates and times for “Manager for a Day” Workshops.
- # The last issues in July 2003 described results from the series of “Manager for a Day” Workshops.
- # An update summarizing the Draft EIS/CCP was sent to approximately 250 addresses in June 2007. This update was in addition to the distribution of the Draft EIS/CCP in printed and electronic format.

6.2.1.5. Federal Register Notices

A formal “Notice of Intent to Prepare a Comprehensive Conservation Plan and Associated Environmental Impact Statement for the Upper Mississippi River National Wildlife and Fish Refuge Complex” was published in the Federal Register on May 30, 2002. This Notice covered the Upper Mississippi River NW&FR, Trempealeau NWR and Driftless Area NWR.

A Notice of Availability of the draft comprehensive conservation plan and environmental impact statement was published in the Federal Register on June 12, 2007. This notice included a request for comments.

6.2.2 Interest Groups and Other Agency Consultation/Coordination

Refuge headquarters and Winona District staff gave several CCP updates at Board meetings of the Friends of the Upper Mississippi River Refuges (FUMRR) and at local Bob Pohl Chapter meetings. Refuge Manager Don Hultman gave an update on the CCPs from both Upper Mississippi River NW&FR and Trempealeau NWR at the Mississippi River Commission’s “State of the River” meeting in Winona, Minnesota on March 23, 2004. He also gave a similar presentation at the Upper Mississippi River Conservation Committee’s Annual Meeting in LaCrosse, Wisconsin in March 2004.

Refuge Manager Robert Drieslein (retired) made two presentations to other agency personnel summarizing and updating the CCP process for Trempealeau NWR and soliciting comments and input. The first meeting was in Dubuque, Iowa, on January 21, 2004 and included staff from the Army Corps of Engineers and the four states of Minnesota, Wis-

consin, Iowa and Illinois. The second meeting was at Trempealeau NWR on February 6, 2004 and included several local Wisconsin DNR employees (conservation officers, wildlife and fish managers, and State Park managers).

6.3 Contacts

Elected Officials

- # U.S. Senator Russ Feingold
- # U.S. Senator Herb Kohl
- # U.S. Representative Ron Kind

Elected State Officials

- # State Senator Ron Brown
- # State Senator Barbara Gronemus

Federal Agencies

- # Advisory Council on Historic Preservation
- # U.S. Army Corps of Engineers
- # U.S. Department of Agriculture, Natural Resource Conservation Service
- # U.S. Department of Interior, Bureau of Indian Affairs
- # U.S. Department of Interior, Fish and Wildlife Service
- # U.S. Department of Interior, Geological Survey
- # U.S. Environmental Protection Agency
- # U.S. Department of Transportation

Native American Tribes

- # Flandreau Santee Sioux Tribe of South Dakota
- # Ho-Chunk Nation of Wisconsin
- # Iowa Tribe of Kansas and Nebraska
- # Iowa Tribe of Oklahoma
- # Lower Sioux Indian Community in the State of Minnesota
- # Mille Lacs Band of Ojibwe
- # Oneida Tribe of Indians of Wisconsin
- # Prairie Island Indian Community in the State of Minnesota
- # Sac & Fox Nation Oklahoma
- # Sac & Fox Tribe of Mississippi in Iowa
- # Saint Croix Band of Ojibwe
- # Santee Sioux Nation, Nebraska

- # Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota
- # Spirit Lake Nation Fish and Wildlife
- # Upper Sioux Community, Minnesota
- # Winnebago Tribe of Nebraska

State Agencies

- # Wisconsin Department of Natural Resources
- # Wisconsin Department of Transportation
- # Wisconsin Division of Tourism
- # Wisconsin Department of Agriculture
- # Wisconsin State Historic Preservation Officer
- # Office of the State Archaeologist, Wisconsin

Cities

- # Trempealeau, Wisconsin
- # Fountain City, Wisconsin
- # Galesville, Wisconsin
- # Winona, Minnesota

Organizations

- # National Audubon Society
- # Boy Scouts of America
- # Girl Scouts of America
- # The Nature Conservancy
- # Friends of the Upper Mississippi River Refuges
- # Wisconsin Waterfowl Association
- # Associated Sportsmens Clubs of Trempealeau County
- # Hiawatha Valley Bird Club
- # Ducks Unlimited
- # Buffalo County Historical Society
- # Mississippi River Parkway Commission
- # Mississippi Valley Archaeology Center
- # National Trust for Historic Preservation
- # Trempealeau County Historical Society

Businesses

- # Riverland Energy
- # Xcel Energy
- # Dairyland Power Cooperative
- # Burlington Northern Sante Fe Railroad
- # Canadian National Railroad

Schools/Universities

- # Winona State University
- # St. Marys University
- # Gale-Ettrick-Trempealeau School District
- # Cochrane-Fountain City School District
- # Winona School District

Media

- # Winona Daily News
- # Winona Post
- # Cochrane-Fountain City Recorder
- # Galesville Republican
- # Arcadia News Leader
- # La Crosse Tribune
- # Trempealeau County Cable Television
- # WKBT Television
- # WLAX Television
- # WXOW Television
- # WHLA Television
- # LaCrosse Radio Group
- # WIZM Radio
- # WLSU Radio
- # KHME Radio
- # Winona Radio
- # KQAL Radio
- # Minnesota Public Radio
- # Wisconsin Public Radio

Citizens

- # 123 individuals

Chapter 7: Public Comment on Draft EIS and Response

The following is a summary of the comments received on the Draft EIS/CCP and how the issues are addressed in the final document. Written comments were received from 18 individuals, two special interest groups and two governmental agencies. These comments contained 48 issues, concerns, or questions that the U.S. Fish and Wildlife Service responds to in this chapter.

Comments received on the Draft EIS/CCP are presented at the end of this chapter, beginning on page 175.

7.1 Comments on the Planning Process

- 1) ***The U.S. Environmental Protection Agency indicated that they had a lack of objection to the plan and did not identify the need for additional information or consideration of environmental issues.***

Response: Comments acknowledged. The Service appreciates this endorsement of its plan. No changes were made to the plan in response to this comment.

- 2) ***Three people expressed general support for the plan and the Refuge.***

Response: Comments acknowledged. The Service appreciates this endorsement of its plan. No changes were made to the plan in response to this comment.

- 3) ***One person commented on the failure to advertise nationally or contact animal protection groups.***

Response: Chapter 6 on page 164 summarizes the outreach and consultation that occurred during the preparation of the plan. More than 200 groups and individuals were contacted directly; many more attended public meetings and workshops. More than 2,600 people were mailed updates and all proceedings and copies of drafts were available on the Service's planning web site. Notices of availability were published nationally in the federal register and notices for public meetings were published in local print, radio, news and electronic media. The Service made every effort to contact a wide range of interested parties.

- 4) ***The U.S. Environmental Protection Agency requested that additional National Environmental Policy Act (NEPA) analysis and documentation be completed when implementing specific projects.***

Response: As required, any projects likely to have a significant impact on the environment will comply with NEPA and have the appropriate documentation. Appendix H on page 275 lists the step-down plans that will be completed to identify details specific to each action. These step-down plans will include NEPA evaluation and public involvement as appropriate.

7.2 Comments on Goal 1: Landscape

- 5) *The Nature Conservancy commented that they would like to see more protection and restoration of blufflands adjacent to the Refuge.*

Response: Authority for land acquisition, either in fee or easement, stems from the Record of Decision signed by the Regional Director for the 1983 Refuge Master Plan. That plan did not identify bluffland areas for addition to Trempealeau NWR. The CCP does not alter the approved Refuge boundary established by that earlier authority. Many agencies need legislative authority for acquisition, but in the Service, that authority still rests with the agency, although major expansion now require Director's approval and new NEPA compliance documentation.

- 6) *The U.S. Environmental Protection Agency requested additional information on how the Refuge would integrate with the Navigation Ecosystem Sustainability Program (NESP).*

Response: NESP was recently authorized by Congress, but appropriations for implementation of projects have yet to be authorized and are uncertain. The Refuge will consider how it might integrate NESP with the goals and objective of the CCP depending on how funding and projects are authorized and administered.

7.3 Comments on Goal 2: Wildlife and Habitat

- 7) *Three people commented that they would like to see increased efforts to manage for shorebirds, including appropriately timed pool drawdowns.*

Response: Wetland management, including drawdowns will consider the needs of shorebirds (see Objective 2.2 on page 69). Timing of drawdowns is important for these migrants, however, high spring flows often preclude lowering pool levels during the appropriate time. Mudflats will be available in the fall during years when the pools are lowered. This

will not occur every year, because other issues such as invasive plant and fish management, and costs of pumping must be considered.

- 8) *Eleven people expressed support for the variety and quality of habitats, restoration of prairies, and control of invasive and exotic plants.*

Response: Comments acknowledged. The Service appreciates this endorsement of its plan. No changes were made to the plan in response to this comment.

- 9) *One person opposed prescribed burning due to impacts on frogs and release of mercury into the air.*

Response: Impacts to wildlife from prescribed burning are short-term and not expected to significantly effect populations. Burn units are situated on upland grassland areas and adequate escape cover is adjacent to all units. A smoke management plan is prepared before any burn and strict guidelines are followed to ensure that smoke does not cause a human health hazard.

Mercury emissions from prescribed fire of natural vegetation are expected to be minor and present no added environmental threat. No changes were made to the plan in response to this comment.

- 10) *One person commented that the over population of cormorants is depleting game fish, especially walleyes.*

Response: Trempealeau NWR does not have a breeding population of Double-crested Cormorants nor does it support a viable walleye population. This comment would be more applicable to adjacent Mississippi River waters. The plan does not have any objectives that call for increased populations of cormorants. No changes were made to the plan in response to this comment.

- 11) *One person requested more management emphasis be placed on management of Osprey.*

Response: The Refuge currently maintains four nesting platforms for Osprey. Osprey require large breeding ranges and rarely are all four platforms used in the same year. In 2007, three platforms had successful nests.

Forage fish are plentiful in Refuge pools. It would seem that abundant habitat is available for these birds. Other factors beyond the control of the Refuge staff, like competition from increasing Bald Eagle populations may be contributing to low Osprey numbers. No changes were made to the plan in response to this comment.

12) Three people commented that the plan needed more focus on grassland birds and neotropical migrants.

Response: Objectives 2.1, 2.3, and 2.4 all call for habitat improvements to grasslands and forests. In addition, the plan calls for the writing of a Habitat Management Plan (HMP) by 2010. The HMP will describe in detail the specific methods, timing, and location of management actions and how those actions are expected to benefit various types of songbirds. The Service recognizes the importance of the Refuge to songbirds and Objective 2.5 outlines plans for monitoring both birds and habitats. No changes were made to the plan in response to this comment.

13) The Nature Conservancy supported increased emphasis on improvements to tributary streams.

Response: Comments acknowledged. Objective 4.4 on page 83 calls for increased staffing and effort to restore tributaries in the upper watersheds of the Trempealeau and Buffalo Rivers.

14) The Nature Conservancy supported the protection of threatened and endangered species and the reintroduction of extirpated species.

Response: Comments acknowledged. Objective 2.6 on page 74 outlines the strategies for protection of threatened and endangered species.

15) One person opposed the release of insects for biological control of invasive plants.

Response: All insects released as part of biological control programs on the Refuge undergo rigorous testing for many years before the U.S. Department of Agriculture approves them for release. These insects are specific to the host plant and do not impact other plants. Biological control is strongly

preferred as an alternative to chemical control that can have secondary impacts to fish, wildlife, and other plants. No changes were made to the plan in response to this comment.

16) One person opposed logging pine plantations.

Response: The goal of habitat restoration on the Refuge is to more closely emulate the historic, pre-settlement conditions of the area. Prairie/oak savanna is a rare habitat throughout its former range due to conversion to agriculture, residential developments, invasive plants, and the need for periodic fire or grazing to maintain it. The roughly 800 acres of prairie/oak savanna on the Refuge is virtually all that remains of the historic “Trempealeau Prairie” that once covered thousands of acres across the lower half of the county. The objective is to restore the maximum amount of prairie/oak savanna. Non-native, pine plantations fragment the prairie units and provide few wildlife benefits. These pine plantations will be thinned or removed to provide larger, more contiguous areas of prairie. Specific details of the timing and location of pine removal will be detailed in a step-down habitat management plan as per Objective 2.1 on page 68. No changes were made to the plan in response to this comment.

7.4 Comments on Goal 3: Public Use

17) Ten people commented that they would like to see more emphasis on birding and other non-consumptive uses.

Response: Birding is generally included as a part of wildlife observation and is identified as a need in Section 1.4.8.3.1 on page 22 of the plan. Both wildlife observation and interpretation as well as photography are identified as priority uses of the Refuge System and are encouraged when compatible with the purpose of the Refuge. Objectives 3.1 and 3.3 on page 76 and page 77 respectively call for improvements to facilities and programming that will benefit birding and other non-consumptive uses. Additionally, waterfowl hunting (Objective 3.5 on page 80) will be restricted to less than one-third of the Refuge area and will be permitted to special groups

of new hunters or hunters with disabilities. Hunting pressure will be minimized by limiting the number and timing of hunts. The gun deer hunt lasts only 9 days. During most of the year the entire Refuge is open solely for use by non-consumptive users. We believe the plan calls for a fair distribution of consumptive and non-consumptive uses. No changes were made to the plan in response to this comment.

18) *Two people commented on the need to increase public awareness of the needs of songbirds.*

Response: We agree. Objectives 3.3 and 3.4 both address increased public awareness of the needs of wildlife on the Refuge.

19) *One person was opposed to any hunting or trapping on the Refuge.*

Response: We understand some citizens' concern with hunting on national wildlife refuges. However, hunting on refuges remains an important form of outdoor recreation for millions of citizens and a use that we are to facilitate when compatible with the purpose of the refuge and the mission of the Refuge System per the National Wildlife Refuge System Administrative Act (Refuge Administration Act). We have taken care to ensure the right balance between the needs of wildlife and people on the Refuge in keeping with the Refuge Administration Act and Service policy and regulation. We have also determined in a compatibility determination that hunting, with stipulations such as controlling the number of hunters, access, and timing of hunting, is a compatible use on the Refuge. We made no change to the rule as a result of this comment.

20) *One person commented that birth control, rather than hunting, should be used to reduce deer populations.*

Response: Birth control has been used experimentally to control some wildlife populations. In the case of white-tailed deer, the logistics, cost, and effectiveness of using birth control methods on a wide ranging population is impractical and of doubtful success. No changes were made to the plan in response to this comment.

21) *One person wanted more open water around the observation deck to improve waterfowl viewing opportunities.*

Response: The wetlands around the observation deck contain a diverse mixture of emergent plants that have increased over the years. The wetland emulates a 50:50 ratio of water to emergent cover that is ideal for waterfowl. It does however obstruct viewing as birds move in and out of the plants. The above water portions of the plants are present from about April to September, but die back during the fall when large numbers of waterfowl are present for viewing in the fall. Other species such as terns, herons, egrets and songbirds use the emergent vegetation in the spring and summer. All of the area around the deck is healthy and supports abundant wildlife throughout the year. The plan does not call for altering the habitat to improve viewing at the deck. No changes were made to the plan in response to this comment.

22) *Five people commented that any recreational use should always be secondary to wildlife conservation.*

Response: We agree. In fact the National Wildlife Refuge System Improvement Act (see Section 1.4.4 on page 6) directs that each refuge shall be managed to fulfill the mission and purposes for which it was established, and that no uses may be permitted unless they are determined to be compatible with the fulfillment of mission or purposes. Compatibility determinations for all permitted uses are included in Appendix I of the plan. No changes were made to the plan in response to this comment.

23) *One commenter asked that the Service not open or expand hunting opportunities on the Refuge citing concerns over compliance with the National Wildlife Refuge System Improvement Act, the National Environmental Policy Act (NEPA), and the Endangered Species Act, Section 7; and concerns that non-consumptive uses are not given enough emphasis.*

Response: This comment makes reference to a legal complaint filed in Federal Court, The Fund et al. v. Williams et al., Civ.No. 03-677. The complaint is under evaluation by the

court as of this writing and does not specifically discuss the hunting program on Trempealeau NWR. No changes were made to the plan in response to this comment.

24) *Three people expressed interest in opportunities to view and experience native wildlife and plants in a quiet, scenic, natural and intimate way.*

Response: The vision for the Refuge (Section 1.4.7 on page 15) embraces the notion of the Refuge as a “scenic, beautiful place where a diversity of native plants and animals thrive...” The vision provides a simple statement of the desired, overall future condition of the Refuge and forms the basis of the goals and objectives. Implementation of the plan will provide ample opportunities for quiet, contemplative interaction with Refuge resources. No changes were made to the plan in response to this comment.

25) *One person expressed support for continuing the hunting program for people with disabilities.*

Response: Comments acknowledged. The Service appreciates this endorsement of its plan. No changes were made to the plan in response to this comment.

26) *One person expressed support for canoeing and kayaking on the Refuge.*

Response: Comments acknowledged. The Service appreciates this endorsement of its plan. No changes were made to the plan in response to this comment.

27) *Two people suggested that access be improved for elderly people.*

Response: All new facilities or improvements to existing facilities will be accessible to people of all abilities as required by the Americans with Disabilities Act of 1992.

28) *Two people commented that they liked the trail system, but one person opposed additional trails or signage.*

Response: The dike roads on the Refuge as well as the designated trails are open for hiking and other activities. At a minimum, people using the trails and dikes need interpretive information about regulations and safety. Additional interpretive signs are used to

enhance the visitor’s experience and to instill a better understanding of Refuge resources. Signs are carefully designed to be unobtrusive and to fit in with the environment. In addition, some facilities such as benches or observation decks are in place to ensure that people of all physical abilities may use them. No changes were made to the plan in response to this comment.

29) *Three people expressed support for improvement to the bike trail; one person opposed improvements for biking.*

Response: The bike trail is managed jointly with the Wisconsin DNR and is used by thousands of bicyclists each year. The trail is an important asset to the Refuge and is an appropriate activity for enjoying the scenic beauty of the area in a non-consumptive way. No changes were made to the plan in response to this comment.

30) *One person supported the construction of facilities for environmental education.*

Response: Comments acknowledged. The Service appreciates this endorsement of its plan. No changes were made to the plan in response to this comment.

7.5 Comments on Goal 4: Neighboring Landowners and Communities

31) *One person expressed support for the use of volunteers and in general for the volunteer program.*

Response: Comments acknowledged. The Service appreciates this endorsement of its plan. No changes were made to the plan in response to this comment.

7.6 Comments on Goal 5: Administration and Operations

- 32) *One person acknowledged the problem with the entrance road flooding, but would rather have funds spent on wildlife conservation than building a new bridge.*

Response: Staff and visitors need safe and reliable access to the facilities on the Refuge. Alternatives for providing year-round access to the Refuge for staff and the public have been evaluated numerous times over the years. The secondary entrance road at Marshland is actually a dike constructed in the early 1900s to divert the Trempealeau River. The dike was not designed as a major roadway and would need to be raised and widened, entailing significant wetland filling. In addition, the current access point to Highway 35/54 is on a corner, near a railroad intersection. The Wisconsin Department of Transportation has requested that the Refuge not encourage the use of this entrance by the public because of safety concerns at the highway/train intersection. The most prudent alternative is to replace the entrance road with a bridge that will provide access throughout the year. No changes were made to the plan in response to this comment.

7.7 Responses to comments by the State of Wisconsin Department of Natural Resources

- 33) *“We strongly support the primary land and water management goals in the Integrated Alternative such as: invasives survey and control; reduction of sedimentation; use of prescribed fire....; expansion of rare habitats such as sand prairie and oak barrens; and protected habitat for migratory birds.”*

Response: Comments acknowledged. The Service appreciates this endorsement of its plan. No changes were made to the plan in response to this comment.

- 34) *“We support increased resource inventory if data is collected by consistent and statistically valid means, and volunteers are given the same rigorous training and have the same ability as resource professionals to collect quality data”*

Response: We concur. Objective 4.3 on page 82 specifies that volunteers will be trained to effectively conduct biological surveys. No changes were made to the plan in response to this comment.

- 35) *“We support the expanded waterfowl hunting program geared to beginning and disabled hunters.”*

Response: Comments acknowledged. The Service appreciates this endorsement of its plan. No changes were made to the plan in response to this comment.

- 36) *“Due to the State’s interest in chronic wasting disease, we strongly support the continuation of deer hunting.”*

Response: Comments acknowledged. The Service appreciates this endorsement of its plan. No changes were made to the plan in response to this comment.

- 37) *“We are pleased that you plan to continue with the present trapping program as a sound resource management measure.”*

Response: Comments acknowledged. The Service appreciates this endorsement of its plan. No changes were made to the plan in response to this comment.

- 38) *The plan should include all “species of greatest conservation need” as identified in the State Comprehensive Wildlife Conservation Plan.*

Response: We concur. Objective 2.5 on page 73 has been amended to include “species of greatest conservation need” as identified in the State Comprehensive Conservation Plan.

- 39) *The Bald Eagle has now been officially de-listed as federally Threatened.*

Response: Changes were made to the document to update the current de-listed status of the Bald Eagle.

40) The assessment for potential reintroduction of the Massasauga rattlesnake should include the entire Refuge rather than specifying any given location.

Response: Concur: Objective 2.6 on page 74 was changed to assess the potential for reintroduction of Massassagua rattlesnakes to the Refuge.

41) The potential for reintroduction of Karner blue butterflies should be assessed.

Response: Concur. An additional strategy has been added to Objective 2.6 on page 74.

42) A herptile management plan should be incorporated into future management. Turtles in particular many need special consideration.

Response: We concur. An additional strategy has been added to Objective 2.5 on page 73 to include development of a Herptile Management Plan.

43) Two State species of merit deserve special consideration in the plan: the State Endangered regal fritillary butterfly (*Speyeria idalia*) and the State Threatened brittle prickly pear cactus (*Opuntia fragilis*).

Response: We concur. These species have been added to Table 5: Species with Special State Designation, on page 108. In addition, Objectives 2.5 on page 73 and 2.6 on page 74, define monitoring and consideration of species with special designations.

44) Include reed canary grass and phragmites as key species needing control.

Response: Concur. An additional strategy has been added to Objective 2.4 on page 71.

45) Use mowing and herbicides as well as bio-controls on leafy spurge.

Response: Leafy spurge is abundant on prairie areas in the Refuge, but rarely forms monocultures to the exclusion of native plants. The use of mowing and herbicides would impact all plants on the site including the desirable prairie species. At this time it is preferable to continue the biological control program that seems to be keeping leafy spurge somewhat in control at least to the

point that it is not excluding native prairie plants. No changes were made to the plan in response to this comment.

46) Limit clearing of downed timber via fire-wood cutting to allow habitat for snakes, turtles and lizards.

Response: Downed timber will be removed from areas that are within already established prairie burn units to facilitate efficient and safe burning operations. Low lying areas of forest used by most reptiles are generally not within the burn units. Adequate cover will be available for reptiles in areas adjacent to units where downed timber will be removed. No changes were made to the plan in response to this comment.

47) We support the removal of pine plantations.

Response: Concur. No changes made to the plan in response to this comment.

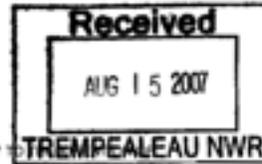
48) Bell's Vireo habitat needs to be maintained and expanded.

Response: The Refuge does support nesting pairs of Bell's Vireos. Understory restoration and removal of invasive shrubs will be phased so that habitat remains available to these birds until native plants reestablish. Specifics of grassland and forest restoration, and its relationship to Bell's Vireo and other species, will be described in the step-down plans listed in Appendix H, and will be available for comment before approval. No changes were made to the plan based on this comment.

U.S. Environmental Protection Agency Comment, Page 1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590



AUG 01 2007

B-19J

Ms. Victoria Hirschboeck
Refuge Manager
United States Department of the Interior
Fish and Wildlife Service
Trempealeau National Wildlife and Fish Refuge
W28488 Refuge Road
Trempealeau, Wisconsin 54661

RE: Comments for Draft Environmental Impact Statement for Trempealeau Wildlife & Fish Refuge EIS NO. 20070248

Dear Ms. Hirschboeck:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the U. S. Environmental Protection Agency (U.S. EPA), Region 5 has reviewed the Draft Environmental Impact Statement (EIS) and Comprehensive Conservation Plan (CCP) for the Trempealeau National Wildlife and Fish Refuge (Refuge). The Refuge was established by Executive Order 1936 to provide a refuge and breeding ground for migratory birds and other wildlife. The Refuge encompasses 6,226 acres of Mississippi River floodplain in western Wisconsin along the Mississippi River. The CCP will help ensure that this Refuge will contribute to fulfilling the overall mission of the Refuge system. The Draft EIS is to identify the new preferred alternative. Your agency has selected alternative C as the preferred alternative which calls for integrated public use, habitat, and wildlife focus.

Based on our review, we have rated the draft EIS as "LO". The "LO" indicates that we have a lack of objection and did not identify the need for additional information or environmental issues to be considered. However, we do offer the following comments for your consideration. These comments are on NEPA compliance and the relationship between the CCP and the Navigation Ecosystem Sustainability Program (NESP) which is led by the United States Army Corps of Engineers. We agree with the approach taken for this programmatic EIS to determine which broad thematic approach would be appropriate for the Refuge. Since the focus of a programmatic EIS is holistic, we can not agree that this document alone is suitable to provide specific project analysis to support future decisions under NEPA.

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U.S. Environmental Protection Agency Comment, Page 2

Programmatic EISs are by nature not specific, therefore we believe that additional NEPA analysis and documentation that tiers from the Programmatic EIS is appropriate when implementing a specific project. We also recommend that the Final EIS provide narrative that explains how your agency will integrate the CCP for this Refuge with the NESP.

Thank you for the opportunity to review and comment on the draft EIS and Comprehensive Conservation Plan for the Trempealeau National Wildlife and Fish Refuge. If you have any questions or comments, please contact Al Fenedick of my staff. Al can be reached at 312 886-6872 or by E-mail at Fenedick.al@epa.gov.

Sincerely,



for Kenneth A. Westlake, Supervisor
NEPA Implementation
Office of Enforcement and Compliance Assurance

Wisconsin DNR Comment, Page 1



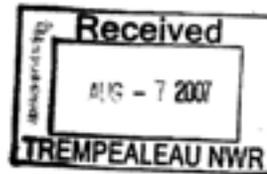
State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary
Scott Humrickhouse, Regional Director

La Crosse Service Center
State Office Building
3550 Mormon Coulee Road
La Crosse, Wisconsin 54601
Telephone 608-785-9000
FAX 608-785-9990

August 1, 2007

Ms. Victoria Hirschboeck
Refuge Manager
USFWS - Trempealeau National Wildlife Refuge
W28488 Refuge Road
Trempealeau, WI 54661



RE: Draft Environmental Impact Statement and Comprehensive Conservation Plan - Trempealeau National Wildlife Refuge

Dear Ms. *Hirschboeck*:

The following comments represent the Wisconsin DNR comments on the Draft Environmental Impact Statement and Comprehensive Conservation Plan, Trempealeau National Wildlife Refuge. Our comments are organized in categories of General, Endangered Resources, and Invasive Species.

The Trempealeau National Wildlife Refuge is a large federal property located within the western border of Wisconsin. It provides tremendous opportunities for citizens to enjoy trapping, hiking, biking, and bird watching. It also provides unique opportunities for handicapped waterfowl hunting and special deer hunting seasons. From a natural resource perspective, the Trempealeau National Wildlife Refuge is one of the few and is the largest site on the Wisconsin side of the Mississippi River that features extensive uplands (mostly sand prairie, oak barrens, oak forest) in direct contact with the river corridor.

With this in mind we believe the overall plan represents a positive step forward for the future of the 6,226 acres over the next 15 years. We strongly support the primary land and water management goals in the "Integrated Alternative" such as: invasives survey and control; reduction of sedimentation; use of prescribed fire as a primary tool on appropriate upland habitat (prairie, barrens/savanna/ oak forest); expansion of rare habitats such as sand prairie and oak barrens; providing ample protected habitat for migratory birds. We support any opportunities to manage cooperatively with the Wisconsin Department of Natural Resources and other conservation land groups to help maintain the integrity of the area and in keeping with the NWR mission.

We support increased resource inventory, as the plan states, especially if data is collected by consistent and statistically valid means. The report also indicates that volunteers will be needed to complete these inventories. We assume a rigorous training program will be part of this program to help volunteers have the same ability as resource professionals to collect quality data.

Three recommendations of the plan are especially important to the Department in this Comprehensive Conservation Plan. First, we support the expanded waterfowl hunting program geared to beginning, youth and disabled hunters. Second, due to the state's interest in Chronic Wasting Disease we strongly support the continuation of deer hunting as an important measure to combat overpopulation and the spread of the disease. Finally, we are pleased that you plan to continue with the present trapping program as a sound resource management measure.

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Wisconsin DNR Comment, Page 2

Endangered Species

The plan states that it will include occasions to work "with partners on endangered, threatened, special concern species". This should also include "species of greatest conservation need" as identified in our USF&WS funded and approved Wildlife Action Plan and also known as the Comprehensive Wildlife Conservation Plan.

The Bald Eagle has now been officially de-listed as a federally Threatened species. The document should reflect that changed status.

We support assessing the potential for massasauga reintroduction into the refuge with Wisconsin DNR. As a first step we suggest the location for this should state "into the refuge" rather than specifying any given location. The proposed River Bottom Rd area for reintroduction is likely not as viable for the snakes as the Wildlife Drive area due to its smaller size and lack of connectedness to the Trempealeau river. It will become more important to protect the Refuge from Mississippi river floods if this species is to be successfully reintroduced.

Similarly we would support the potential of reintroducing the Karner blue butterflies if sufficient lupine habitat is present. We can help provide a source of these insects when the habitat requirements are adequate in the Refuge.

A herptile management plan should be incorporated into future management. Turtles, in particular, may need special consideration when planning and implementing flowage management. Several turtles of high conservation concern occur on the Refuge (e.g., Blanding's and Wood turtles). We would extend the expertise of our Endangered Resources program to assist on such a plan and to work with you on the Wildlife Inventory Plan.

Two important state species merit consideration in this plan. The state endangered regal fritillary butterfly (*Speyeria idalia*) was documented on the Refuge in 1997 by Karl Leglar, Joan Berkopec and Ron Eichorn in S1/2 NW1/4 sec 12. Less than 10 populations of this species are known to still exist in WI with the TNWR population being one of them. Surveys should be conducted to verify that the population still exists. The larval host for this species is primarily Bird's foot and Prairie violets. Fire in burn units containing violets can reduce and potentially extirpate this species if consideration is not taken. The state threatened brittle prickly pear cactus (*Opuntia fragilis*) (may be referred to as *Opuntia humifera* in the back of the document) was documented in 1991. On a visit to the refuge on July 5, 2007 it was documented again. Both of these species deserve special consideration in the next 15 years and beyond.

Invasive Species

It would make sense to focus control efforts on those invasives that are most likely to spread into, increase in abundance, and seriously degrade key habitats (e.g., black locust and leafy spurge in prairie and barrens/habitats); reed canary grass in disturbed floodplain forest. A second focus might be to target those species that appear to be getting a foothold on the Refuge now, and which could be controlled relatively easily such as Phragmites.

Leafy spurge control should not rely on biocontrols alone, as control using this method has proved negligible at nearby Brady's Bluff at Perrot State Park. Instead, we recommend an integrated approach combining herbicide use, biocontrols, and carefully timed mowing. These methods have proved to be the most effective at Fort McCoy Military base.

Wisconsin DNR Comment, Page 3

We don't support increasing deer numbers (browsing pressure) as a means of controlling invasive shrubs (pg 22). Increased deer numbers are likely to reduce native plant species diversity, reducing the resilience of the system to thwart non-native species invasion.

Clearing downed timber via firewood cutting (pg 68) should be limited to allow some of this material to remain for thermo regulating opportunities and cover from predators for snakes, turtles, and lizards.

We support the removal of the pine plantations that fragment the open landscape context of the refuge prairies. The removal will benefit many rare and declining open landscape species such as grasshopper, lark, and vesper sparrows.

The Bell's Vireo, shrub habitat needs to be maintained and potentially expanded as well as situated so that potential conflicts with prairie restoration or invasive shrub control are minimized or eliminated. That said we continue to support black locust removal and control.

Thank you for the opportunity to comment on the Trempealeau National Wildlife Refuge – Draft Environmental Impact Statement and Comprehensive Conservation Plan. We look forward to working with you on this important refuge along the Mississippi River.

Sincerely,


Gretchen L. Benjamin
Mississippi River Team Leader

CC: Scott Loomans, WDNR, Madison, WI
Scott Humrickhouse, WDNR, Eau Claire, WI
Perrot State Park, Trempealeau, WI
John Colison, Galesville, WI
Alma DNR office, Alma, WI

The Nature Conservancy Comment, Page 1



The Nature Conservancy in Wisconsin
633 West Main Street
Madison, Wisconsin 53708

tel 608/251-8140
fax 608/251-8585
nature.org/wisconsin

August 10, 2007

Vickie Hirschboeck, Refuge Manager
U.S. Fish and Wildlife Service
Trempealeau National Wildlife Refuge
W28488 Refuge Road
Trempealeau, WI 54661

Subject: Comments on Draft Environmental Impact Statement and Comprehensive Conservation Plan for the Trempealeau National Wildlife Refuge

Dear Ms. Hirschboeck:

The Nature Conservancy (Conservancy) has reviewed the Draft Environmental Impact Statement and Comprehensive Conservation Plan (CCP) for the Trempealeau National Wildlife Refuge (Refuge). The Conservancy supports the preferred alternative, Alternative C, identified in the CCP. Implementation of this alternative would improve the protection and management of the important biodiversity found in this refuge.

1. Conservancy's interest in the Refuge: The Conservancy is a global conservation organization with about 1 million members worldwide. We work closely with communities, businesses, governments, and other organizations to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. The Conservancy has identified the Upper Mississippi River as an important freshwater ecosystem and is focusing on restoring and conserving the ecological function, and dynamics of this floodplain-river ecosystem. The Conservancy is encouraged that we are not alone in seeking this goal as many other groups also have similar interests. We hope to accomplish our goals by working in partnership with others, including the U.S. Fish and Wildlife Service (Service). We view Trempealeau National Wildlife Refuge, with its matrix of floodplain forests, wetlands, and prairies, as an important element to the Upper Mississippi River system.

2. Refuge vision and goals: Overall, the vision statement and goals identified for the Refuge in the CCP are reasonable and appropriate.

3. Priority actions needed to restore ecosystem health: The Conservancy has identified the following goals as critical for achieving a healthy ecosystem for the Upper Mississippi River:

- a) Restore bluff-floodplain mosaic (i.e., the ecosystems extending from the main river channel through the floodplain and up to the bluffs), including functional interaction with the rivers that run through them by
 - restoring ecological function to the floodplain,

The Nature Conservancy Comment, Page 2

- restoring more natural flows to the river and floodplain, and
 - addressing the threat of invasive and nuisance species.
- b) Restore the stability and integrity of tributary streams to naturalize flows and reduce sediment, nutrient and chemical loads ultimately being delivered to the Upper Mississippi River.
- c) Protect and restore bluffland and terrace habitats adjacent to the Upper Mississippi River.

Alternative C addresses all of these goals, directly or indirectly. As the Service moves forward with finalizing and implementing the CCP, we encourage you to emphasize actions that contribute to accomplishing these goals. This is important not only for the health of the Refuge but also for the health of the Upper Mississippi River.

Actions identified in the CCP that we feel are particularly important include:

- a) Increased water level management in summer to mimics natural conditions to the extent possible
- b) Undertake aggressive actions to reduce the introduction and spread of invasive plants.
- c) Improved protection of endangered and rare species and implementing reintroductions.

The Conservancy understands that the Service has limited resources to expend on management of Refuge, but we encourage you to set priorities as you implement the CCP that target protecting and managing biodiversity to ensure their viability into the future.

We hope these comments help you as you finalize the CCP. Thank you for considering them. We look forward to working with you in the future to restore and protect the health of the Refuge. Please call me at (608) 251-8140 if you have any questions or want to discuss these issues further.

Sincerely,



Mary Jean Huston
State Director
The Nature Conservancy in Wisconsin

The Humane Society of the United States Comment, Page 1



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August 10, 2007

VIA FAX 608-539-2703

Trempealeau National Wildlife Refuge
Attention: CCP Comment
W28488 Refuge Road
Trempealeau, WI 54661-8272

RE: Comments on Draft CCP for Trempealeau National Wildlife Refuge

Dear Refuge Manager:

On behalf of the nearly 10 million members and supporters of the Humane Society of the United States and The Fund for Animals (hereinafter collectively "HSUS"), over 200,000 of whom reside in Wisconsin, The HSUS submits the following comments to be considered on the Draft Comprehensive Conservation Plan (CCP) for Trempealeau National Wildlife Refuge (Refuge).

Legal Precedence

The HSUS is opposed to the draft plan and believes that the action proposed represents a continuing violation of federal law, namely the National Environmental Policy Act (NEPA), given the U.S. Fish and Wildlife Service's (FWS) ongoing failure to prepare an Environmental Impact Statement (EIS) on its national wildlife refuge sport-hunting program or, more broadly, its overall refuge recreation program.

While the FWS apparently believes the National Wildlife Refuge System Improvement Act (NWRISA) provides it carte blanche approval to allow sport hunting on Refuges, the Act retains and reemphasizes the compatibility requirements and imposes other standards that require more, not less, biological and ecological evidence to support decisions to open refuges to sport hunting activities. See 16 U.S.C. § 668dd(a)(2); see also Complaint filed in *The Fund et al. v. Williams et al.*, Civ. No. 03-677. Nor does the NWRISA relieve the FWS of its obligations to consider the environmental impacts of, and alternatives to, the agency's decisions with regard to hunting in the Refuge system when preparing CCPs.

Promoting the protection of all animals

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The Humane Society of the United States Comment, Page 2

The HSUS does not believe that sport hunting is compatible with the purposes for which many Refuges were created. See 16 U.S.C. § 460k. Moreover, there is no indication that the FWS ensured the availability of sufficient funds before it approved sport hunting initially at the Refuge and must, therefore, do so now if the FWS intends to continue to authorize and/or expand hunting under the CCP. *Id.* § 460k(b).

The proposed CCP must take into account not only the effects of hunting on other wildlife species in the Refuge, but also the cumulative impacts of hunting on wildlife, migratory birds, and non-hunting visitors to Refuges throughout the Refuge System before permitting hunting to continue via CCP. The FWS has effectively admitted that its NEPA compliance on Refuge hunting and, indeed, all Refuge recreational and use activities, is lacking given its failure to ever complete its Refuges 2003 Plan and EIS (herein incorporated by reference). That Draft EIS, which was published on January 15, 1993, conceded that the National Wildlife Refuge System was experiencing a crisis in terms of increased use, increased damage to biotic and abiotic resources, increased user conflicts and, specifically, identified a number of potential adverse impacts associated with refuge hunting programs (i.e., disturbance to feeding or resting waterfowl; trampling of low ground vegetation; soil compaction and/or erosion; abandonment of nest sites and reduced productivity and survival; increased visitation resulting in a negative effect on refuge biodiversity; adverse impacts on the distribution, relative abundance, and sex and age composition of wildlife; changes in wildlife behavior due to increased disturbance by hunters).

To date, no final EIS has been published nor has the FWS explained the status of Refuges 2003 or why it has apparently elected to halt the process midstream. The FWS cannot, on the one hand, initiate an EIS process conceding that the environmental impacts of hunting and other Refuge uses have not been adequately evaluated only to, on the other hand, halt the process and then continue to open Refuge after Refuge to hunting with no substantive analysis of the Refuge-specific or program-wide impact of the activity on wildlife or the refuge system itself.

Considering the various reports published over the past several decades emphasizing the adverse impacts of Refuge uses, including hunting activities, and the abject failure of the compatibility determination process in preventing incompatible uses (see, e.g., Leopold Committee report, the FWS report entitled *Field Station Threats and Conflicts*, the FWS report entitled *Fish and Wildlife Service Resource Problems*, and the 1989 GAO National Wildlife Refuges: Continuing Problems With Incompatible Uses Call for Bold Action), the need for an EIS cannot be disputed. The biological, ecological, social, economic, aesthetic, and other impacts inherent to the FWS's decision necessitate the preparation of an EIS to properly, objectively, and comprehensively evaluate the full range of environmental impacts associated with this action. Until and unless an EIS is prepared, the FWS cannot finalize the proposed CCP.

In addition, in preparing the CCP and NEPA document, the FWS must analyze a full range of alternatives to the proposed action, including the hunting component of the Plan. This includes considering alternatives to sport hunting for achieving the FWS's management objectives for the Refuge and the wildlife that use the Refuge. NEPA requires federal agencies

The Humane Society of the United States Comment, Page 3

to "study, develop, and describe appropriate alternatives to recommended courses of action" 42 U.S.C. § 4332(E); 40 C.F.R. § 1508.9(b) (requiring analysis of alternatives in EAs). NEPA's alternatives analysis is "designed to insure that an agency's single-minded approach to a proposed action is tempered by the consideration of other feasible options that may have different (and fewer) environmental effects." *Sierra Club v. Watkins*, 808 F.Supp. 852, 875 (D.D.C. 1991).

Finally, Section 7 of the ESA requires that each federal agency shall "insure that any action authorized, funded or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species . . ." 16 U.S.C. § 1536(a)(2). To comply with this mandate, before taking an action which may affect listed species, the FWS must first engage in formal consultation with any agency taking such action and produce a Biological Opinion which details the steps necessary to avoid jeopardy. *Id.* § 1536(b). In this process, the FWS reviews "the best scientific and commercial data available or which can be obtained," evaluates the status of impacted species, determines the cumulative effects of the action, and formulates its Biological Opinion as to "whether the action, taken together with cumulative effects, is likely to jeopardize the continued existence of listed species . . ." *Id.* § 402.14. If so, the FWS identifies alternatives which, if implemented, will avoid jeopardy. *Id.* If the action will result in a "take" of listed species, the Service must provide a take statement identifying what level, if any, of take will be permitted. *Id.* In addition, the Service identifies discretionary recommendations which will further reduce the impacts of the project on listed species. *Id.*

Prior to engaging in the consultation which results in such a Biological Opinion, an agency must prepare a Biological Assessment which contains the information that is provided to the Fish and Wildlife Service at the inception of formal consultation. The BA must present an analysis of the effects of the action on species, "including consideration of cumulative effects," and consideration of "alternate actions considered by the Federal agency for the proposed action." *Id.* § 402.12(f). Only if the BA concludes that a project will not adversely affect any listed species, and the Fish and Wildlife Service concurs in writing, may the agency avoid formal consultation. 50 C.F.R. § 402.13. The ESA prohibits an agency from proceeding with a project which may impact listed species before the analysis required by Section 7 is complete. 16 U.S.C. § 1536(c)(1) (BA must be completed before project begins); *id.* § 1536(d) (agency may not make irreversible commitment of resources while consultation is underway). Indeed, all federal agencies have an on-going obligation to ensure that ESA listed species are not jeopardized by their actions.

The FWS has engaged in a pattern of compromising the biological and ecological integrity of our National Wildlife Refuges by providing hunters the opportunity to kill for fun and sport the variety of wildlife species that inhabit these Refuges. The fact that the public overwhelmingly rejects hunting of wildlife on National Wildlife Refuges – lands that most believe should be sanctuaries for wildlife – is evidently immaterial to the FWS.

The Humane Society of the United States Comment, Page 4

The Role of Non-Consumptive Wildlife Recreation

The impact of hunters and hunting on non-consumptive Refuge users has also not been of significant concern to the FWS despite a fundamental purpose of the Refuge system to provide recreational opportunities (including non-consumptive opportunities). Considering that far more people use the Refuge to observe, enjoy, and photograph wildlife compared to the number of people who use this Refuge for hunting, the impacts of expanded hunting on the experience and potential socioeconomic contribution of these non-consumptive users must be taken into account.

The number of hunters has steadily declined over the last few decades. This trend is so startling, that the *Wildlife Society Bulletin* produced an issue dedicated to the topic of the changing trends in attitudes towards and participation in the "consumptive" use of wildlife. Data from the U.S. Department of Fish and Wildlife reveals that the number of hunters declined 18% from 1975 until 2000 with a 7% decline occurring between 1991 and 2001.¹⁴⁴

A study in Alabama found that the precipitous decline in hunting license sales in that state could be attributed to a lack of time and interest on the part of former hunters. The study also revealed that 2/3 of all non-hunters did not want to see animals killed for recreation.¹⁴⁵

Surveys and studies reveal that social, economic, and cultural changes over the last 30 years have resulted not only in a drop in the number of hunters but also a shift in the focus of wildlife manager education from consumption to conservation.¹⁴⁶ In fact, one study indicated that those who had been in the wildlife profession for less than 5 years as of 1998 were much less likely to support the consumptive use of wildlife than those who had been in the profession for over 20 years.¹⁴⁷

A study that examined participation in wildlife-related activities in Canada revealed a similar trend. That analysis showed that the probability of participating in waterfowl hunting decreases with birth year and age. Not only is the number of young hunters decreasing every year, but the overall number of hunters is also decreasing. Additionally, the study revealed that the probability of participation in wildlife viewing has greatly increased over the last three generations.¹⁴⁸

From an economic standpoint, non-consumptive wildlife uses continue to increase revenue for local governments while the money spent on hunting has not kept pace with inflation. In 1991, non-consumptive wildlife enthusiasts spent \$18.1 billion on all aspects of their hobbies while hunters spent \$12.3 billion.¹⁴⁹ In 1996, non-consumptive expenditures were up to \$29.2 billion while hunters spent \$20.6 billion.¹⁵⁰ In 2001, the most recent date for which data is available, non-consumptive expenditures had increased to \$38.3 billion while hunting expenditures remained the same at \$20.6 billion, despite inflation.¹⁵¹ Even in this small subset for which data is readily available, it is clear that hunting expenditures and participation are down while non-consumptive wildlife activities are on the rise.

Such a small segment of the population currently participates in hunting and this number is dwindling with each passing year. The minority status of hunters also extends to patrons of

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National Wildlife Refuges. The 2004 economic benefit analysis of National Wildlife Refuge Visitation clearly states that 68% of the revenue from National Wildlife Refuges is from non-consumptive users, 27% from fishing activities and only 5% from hunting.⁸ This report also states that "[s]urveys show refuge visitors would have been willing to pay more for their visit than it actually cost them." This is known as a consumer surplus. This same survey revealed that 63% of the potential consumer surplus is derived solely from non - consumptive visitors.

FWS must begin to realize the revenue potential of non-consumptive wildlife patrons and begin to reform their revenue base around this rapidly increasing segment of the population. The Refuge should conduct a survey of consumptive versus non-consumptive visitors to the Refuge in order to assess the economic input of each group. These data may be used to assess whether hunting is an economically viable option for the refuge or if it is simply retained as a means to appease a vocal minority.

The FWS has ignored these data and failed to capitalize on the potential economic gain that would come from these non-consumptive users. This seems especially foolhardy in light of the fact that budget and cost woes are often highlighted in the *Refuge Update* newsletter.⁹ Additionally, the wildlife experience of non-consumptive patrons can only be enhanced by the elimination of hunting in these refuges. The current system of setting aside small parcels of land for non-consumptive visitors while opening up large portions of the refuge to hunters is nonsensical and only serves to marginalize a lucrative majority for the sake of a dwindling minority. Removing the dangers and disturbances inherent in hunting areas and allowing for a more complete exploration of these areas for non-hunters can only lead to increased visitation and a subsequent increase in revenue from this segment of the wildlife recreation community.

Conclusion

For all these reasons, we respectfully request that the FWS not open/expand hunting on this Refuge. Thank you in advance for considering these comments.

Sincerely,



Andrew Page
Campaign Manager, Hunting

Endnotes

⁸ U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau. 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. 161pp.

⁹ Eack, J.W. et al. 2000. Status of hunter recruitment and retention in the United States. *Wildlife Society Bulletin* 28(4): 817 - 824.

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- ²⁸ Mehmood, S. et al. 2003. Factors associated with declining hunting license sales in Alabama. *Human Dimension of Wildlife* 8(4): 243 – 262.
- ²⁹ Organ, J.F. and E.K. Fritzell. 2000. Trends in consumptive recreation and the wildlife profession. *Wildlife Society Bulletin*, 28(4): 780 – 787.
- ³⁰ Riley, S.J. et al. 2003. Deer populations up, hunter populations down: Implications of interdependence of deer hunter population dynamic on management. *Ecoscience* 10(4): 455 – 461.
- ³¹ Spence, M. 2002. The effect of age on the probability of participation in wildlife – related activities: a birth year cohort study. *American Journal of Agricultural Economics* 84(5): 1384 – 1389.
- ³² 1991 National Survey of Fishing, Hunting and Wildlife – Associated Recreation. Online at: <http://www.census.gov/prod/1/gen/interior/index.html>.
- ³³ 1996 National Survey of Fishing, Hunting and Wildlife – Associated Recreation. Online at: <http://www.census.gov/prod/3/97pubs/fhw96nat.pdf>.
- ³⁴ 2001 National Survey of Fishing, Hunting and Wildlife – Associated Recreation. Online at: <http://www.census.gov/prod/2003pubs/fhw01-us.pdf>.
- ³⁵ Caudill, J. and E. Henderson. 2005. Banking on Nature 2004: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation. Division of Economics, U.S. Fish and Wildlife Service, Washington DC. 442 pp. Available online: http://www.fws.gov/refuges/policyMakers/pdfs/BankingOnNature_2004_finalt.pdf.
- ³⁶ Archives can be viewed online: <http://www.fws.gov/refuges/refugeUpdate/index.html> (Accessed March 2007).

dels ccp comments

xviii - invasive plants - what efforts has management made to get local nursery profiteers to stop selling exotic invasive plants to avoid national taxpayers having to shell out millions to get rid of the exotic invasives. has any collaborative effort been made to help national taxpayers here?

deer mgt is not "mgt" at all - it is simply capitulation by mwr to perverted gun wackos who need to kill to be happy - as outrageous an act as anything can be. to encourage gun wackos is insane. wildlife watchers outspend these killers and shuld be encouraged. they are peaceful and dont hurt things.

xix - hunting/killing is insane promotion of gun violence. grown men pretending its still 1860 America and they fail to recognize its 2007 now. many think these gun wackos ought to grow up, get real and help wildlife and birds instead of being murderers of wildlife.

xxii - ban all hunting and trapping. the deer murdering by gun wackos should cease.

pg 3 - a refuge shuld be a place of peace for peaceful people and wildlife not a site for people with murder and killing and violence in their hearts. what a travesty this place is.

the 1936 act of providing a place of peace has been violated by gun wacko murderers with their perverted need to kill wildlife.

pg 4 - hunting should be banned. hunting is 60th on the list of activities that americans engage in. why are you catering to this murderous tiny group of perverts when there are 59 other activities americans do as activities?

pg 6 - if your goal is to maintain habitat for wildlife, you are deluding yourself. actually your main goal seems to be to provide opportunities for gun wackos to kill wildlife. that is what is factually happening so you have lost sight or relevance to your goal.

7 hunting is not "compatible" at all with other activities. absolutely not.

pg 17 - what has management done to get local nursery profiteer businesses to stop selling exotic invasive plants - have they done anything at all?

pg 18 - no additional lands should be opened. migrating birds need protection from perverted gun wacko hunters who aer well known to shoot anything that moves.

pg 20 - the word "killing" could be substituted for "management" in almost every instance in this plan when wildlife or birds are mentioned. there is no other plan like birth control or moving animals or anything - the one method of population control is to kill the animal. what a horror that this agency isnt aware this is 2007 and birth control is available for many species. women have been using it for the last 70 years. the plan likes to deceive the public so it uses deceptive words continually. the "mgt" evidently doesnt want the public to become aware of the awful carnage that takes place at this alleged "refuge". "refuge" is misnaming this site when it operates as a killing field.

prescribed burning means when you burn mercury is released into the air. mercury is a killer. fine particulate matter is also released which can travel on air currents for thousands of miles. such fine particulate matter cannot be seen. it is microscopic. it causes lung cancer, heart attacks, strokes, allergies, asthma, and pneumonia and is a killer of people. such air pollution cannot be tolerated any more.

pg 23 - bikes are ok. letting in atvs and snowmobiles is quite another story. they are noisy. they pollute air. they scare animals and birds. this idea is horrible.

pg 42 - one has to wonder why disabled people who expect compassion from others because of their

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Appendix A: Glossary

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Alluvial

Sand, silt and mud left by flowing water; a river delta

Alternative

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

Big 6 Priority Public Uses

The National Wildlife Refuge System Improvement Act of 1997 defines and establishes that wildlife dependent recreational uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation) are the priority public uses of the System and, if found compatible, will receive enhanced and priority consideration in refuge planning and management over other general public uses.

Biocontrol

The use of naturally occurring agents such as insects, fungus, or bacteria to eradicate or suppress invasive plants or animals.

Biological Diversity

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

Biological Integrity

The composition, structure, and functioning of living organisms processes and systems consistent with natural conditions.

Bottomland Hardwood Forest

See *Floodplain Forest* in this appendix.

Carrying Capacity

The maximum population of a species able to be supported by a habitat or area.

Closed Area

Areas on the refuge closed to waterfowl hunting.

Compatible Use

A wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Director, will not materially interfere with or detract from the fulfillment of the Mission of the System or the purposes of the refuge (Draft Service Manual 603 FW 3.6). A compatibility determination supports the selection of compatible uses and identifies stipulations or limits necessary to ensure compatibility.

Comprehensive Conservation Plan (CCP)

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

Conservation Easement

Establishes certain preservation restrictions on a property while maintaining private possession and use of the property.

Cool Season Grasses

Grasses that complete their maximum growth and set seed early in the growing season and are dormant by late summer. Examples include June grass and green needle grass.

Cultural Resources

“those parts of the physical environment – natural and built – that have cultural value to some kind of sociocultural group ... [and] those non-material human social institutions...” (King 1998). Cultural resources include historic sites, archeological sites and associated artifacts, sacred sites, traditional cultural properties, cultural items (human remains, funerary objects, sacred objects, and objects of cultural patrimony), and buildings and structures. (McManamon, Francis P. DCA-NPS; letter 12-23-97 to Walla Walla District, COE.)

Deciduous Forest

Forest dominated by trees and shrub that lose their leaves for part of the year.

Deepwater Marsh

Areas with water depths over 30 inches and dominated by aquatic submergent or floating leaved plants.

Drawdown

To reduce the water depth in a pool or impoundment for a specific amount of time during the growing season to promote plant growth.

Ecosystem

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

Ecosystem Management

Management of a broad area that includes all ecological, social, and economic components that make up the whole system.

Emergent

Plant species able to withstand flooding of their root systems during the growing season. Cattails, bulrush and arrowleaf are examples of emergent vegetation.

Endangered Species

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

Environmental Health

The physical and chemical factors that function independently of living organism and effect the functioning of natural environments.

Environmental Quality Incentive Program

Reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill) to provide a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals.

Environmental Impact Statement

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

Exotic Species

With respect to a particular ecosystem, any species that is not native to that system.

Extirpation

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

Federal Trust Species

Trust species include endangered and threatened species, migratory birds, inter-jurisdictional species of fish, marine mammals, and other species listed in individual refuge establishing legislation or Executive Orders.

Flea Beetle

Foliage and root boring beetles of genus *Aphthona* used to suppress and eradicate leafy spurge.

Floodplain Forest

Low lying forest with tree species defined mostly by their ability to survive various levels of flooding. Species include willow, cottonwood, silver maple and green ash in low wet areas, and oaks and hickories in higher sites.

Forb

A broad-leaved, herbaceous plant.

Goals

Descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define measurable units.

Goat Prairie

Remnant native prairies on the steep sides of bluffs along the Upper Mississippi River.

Grassland

A region of vegetation consisting mainly of grass and grass-like plants.

Hardwood Species

Tree species characterized by broad, flat leaves, as distinguished from coniferous or needle-leaved trees. Oak, cherry, maple, and hickory are examples.

Impoundment

Areas of water enclosed by man-made dikes and usually containing some type of water control structure.

Indigenous

Growing or living naturally in a specific region.

Interjurisdictional Fish

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

Invasive Species

An alien species whose introduction does or is likely to cause economic or environmental harm, or harm to human health.

Issue

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

Land And Water Conservation Funds

Created by Congress in 1964 to provide money to federal, state and local governments to purchase land, water, and wetlands for the benefit of all Americans.

Landbird

A category of bird that obtains at least part of their food from the land and nests in mainland areas. Landbirds include raptors and songbirds among others.

Moist Soil Habitat

Wet areas usually created by periodically removing water to allow plants to germinate; provides excellent food resources for birds.

Mudflat

Areas of wet soil exposed when water levels in a given area decline.

National Scenic Byway

Recognition given by the U.S. Secretary of Transportation for roads with archeological, cultural, historic, natural, recreational, or scenic qualities.

National Wildlife Refuge System

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

Native Species

A species that has not been introduced to an area and historically occurred in that ecosystem.

Native Prairie

Areas dominated by non-introduced, historically occurring grasses and forbs.

Natural Cavities

Holes in standing trees or downed logs resulting from ageing, disease, trauma, or animal activity.

Neotropical Migrant

Birds that breed in North America, but migrate to the tropical regions of Mexico, Central America, South America, and the Caribbean in the winter.

Non-Indigenous

Species that did not historically or naturally occur in an area.

Oak Savanna

See *Savannah* in this appendix.

Oak Wilt

Oak wilt is a fungal infection affecting oak trees. All species of oak are susceptible with red oaks being particularly vulnerable. In red oaks, oak wilt is almost always lethal and death can occur in as little as one month. There is currently no known cure.

Objectives

Actions to be accomplished to achieve a desired outcome.

Passerine

Perching birds that are mostly small and living near the ground, with feet having 4 toes arranged to allow for gripping a perch.

PCB

Poly-chlorinated biphenyl, a family of chemicals used to produce plastics and fire retardants.

Pleistocene Epoch

The 6th epoch of the Cenozoic era, beginning 1.8 million years ago and ending 11,000 years ago.

Pine Plantation

A grouping of coniferous pine trees, usually planted in rows to accommodate harvest machinery.

Pool

An area of the Mississippi between 2 lock and dams; or an area impounded by man-made dikes.

Pre-European Settlement Habitats

Areas containing plant and animal species and processes that occurred before European settlers arrived.

Preferred Alternative

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

Prescribed Fire

Controlled fires set intentionally to achieve specific habitat management objectives.

Regional Resource Conservation Priority Species²⁴³

A species in Region 3 of the USFWS considered to be in the greatest need of attention under the USFWS's full span of authorities.

Riverine Wetlands

Land adjacent to or effected by river hydrology, that are dominated by water loving plants and have soils that are inundated for part of the growing season.

Rough Fish

Species not monitored or stocked by the state for sport; any of a number of unwanted fish caught by anglers; usually referring to carp species.

Sand Prairie Habitat

Wide-open grasslands with dry, sandy soil and few trees or shrubs; dominated by dry land grasses like big and little bluestem.

Savannah

A rolling grassland scattered with shrubs and isolated oak trees.

Scoping

A process for determining the scope of issues to be addresses by a comprehensive conservation plan and for identifying the significant issues.

Federal, state and local agencies, and private organizations and individuals are involved in the scoping process.

Seabird

A group of birds that obtain at least some of their food from the ocean by traveling some distance over its surface. They typically breed on islands and along coastal areas. Seabirds include gulls, alcids, pelicans, albatrosses, storm-petrels, and cormorants among others.

Shorebird

Any of numerous wading birds that frequent the wet edges of water bodies, foraging for insects and crustaceans in the wet mud.

Shrub-Scrub

Habitats dominated by low growing woody brush.

Species

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

Strategies

A general approach or specific actions to achieve objectives.

Submergent

Aquatic plants that are adapted to live completely or partially under water during the entire growing season.

Threatened Species

Those plant or animal species likely to become endangered species throughout all of or a significant portion of their range within the foreseeable future. A plant or animal identified and defined in accordance with the 1973 Endangered Species Act and published in the Federal Register.

Trust Species

See *Federal Trust Species* in this appendix.

Undertaking

“a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those

requiring a Federal permit, license or approval...," i.e., all Federal actions. (36 CFR 800.16(y); 12-12-2000)

Upland

Dry land dominated by grasses, shrubs, forbs, and trees that do not tolerate wet conditions.

USGS Quick Response Research Program

A funding program established to match U.S. Geological Survey expertise with USFWS research needs.

Vegetation

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

Vegetation Type

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

Wading Bird

Any of many long-legged birds that wade in water in search of food.

Warm Season Grasses

Grasses that reach their maximum growth and produce seed in late summer. Species include big and little bluestem and switch grass.

Water-Level Management

The practice of lowering water depth in an impoundment or pool to promote the growth of aquatic and emergent plants.

Watershed

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

Wet Meadow

Grassland with waterlogged soil near the surface but without standing water for most of the year.

Wetland

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

Wildlife Diversity

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

Wildlife-dependent Recreational Use

See *Big 6 Priority Uses* in this appendix.

Appendix B: Acronyms and Abbreviations

Appendix B: Acronyms and Abbreviations

ARPA	Archaeological Resources Protection Act	MVAC	Mississippi Valley Archaeology Center
BCP	Bird Conservation Plan	NEPA	National Environmental Policy Act
BNSFRR	Burlington Northern Santa Fe Railroad	NHPA	National Historical Preservation Act
CCC	Civilian Conservation Corps	NGO	Non-governmental organization
CCP	Comprehensive Conservation Plan	NOI	Notice of Intent
CFR	Code of Federal Regulations	NRCS	Natural Resources Conservation Service
CNRR	Canadian National Railroad	NWFR	National Wildlife and Fish Refuge
CORPS	U.S. Army Corps of Engineers	NWR	National Wildlife Refuge
Delta FFF	Delta Fish and Fur Farm	NWRS	National Wildlife Refuge System
DNR	Department of Natural Resources	PCB	Polychlorinated biphenyl
EIS	Environmental Impact Statement	PIF	Partners in Flight
EMP	Environmental Management Program	RCP	Resource Conservation Priorities
EPP	Environmental Pool Plan	RONs	Refuge Operating Needs System
EQIP	Environmental Quality Incentives Program	ROW	Right of Way
ESA	Endangered Species Act	ROS	Refuge Operations Specialist
FMP	Fire Management Plan	RM	Refuge Manual
FSA	Farm Services Agency	UMESC	Upper Mississippi Environmental Sciences Center
FONSI	Finding Of No Significant Impact	UMR	Upper Mississippi River (mainstem river from the confluence with Ohio River at Cairo, IL, to St. Paul, MN)
FTE	Full-time Equivalent	UMR/TGP	Upper Mississippi River/Tallgrass Prairie
FW	Fish and Wildlife Service Manual	UMRNWFR	Upper Mississippi National Wildlife and Fish Refuge
GIS	Geographic Information System	UMRS	Upper Mississippi River System (UMR and navigable tributaries, including the Illinois River, but excluding the Missouri River)
GRST	Great River State Trail	UMVGL	Upper Mississippi Valley/Great Lakes
HREP	Habitat Rehabilitation and Enhancement Project	USACE	U.S. Army Corps of Engineers
LE	Law Enforcement	USDA	United States Department of Agriculture
LTRMP	Long Term Resource Monitoring Program	USFWS	United States Fish and Wildlife Service
MMS	Maintenance Management System		

USGS	United States Geological Survey
WCS	Water control structure
WDNR	Wisconsin Department of Natural Resources
WPA	Waterfowl Production Area

Appendix C: Distribution List

Appendix C. Distribution List

The CCP mailing list contains 161 addresses of individuals, media, business and government contacts. For a complete list of agency contacts, see Chapter 6.

Appendix D: Applicable Laws and Executive Orders

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

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

Antiquities Act (1906)

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

Migratory Bird Treaty Act (1918)

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

Migratory Bird Conservation Act (1929)

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

Fish and Wildlife Coordination Act (1934), as amended (1958)

Requires that the Fish and Wildlife Service and state fish and wildlife agencies be consulted whenever water is to be impounded, diverted or modified under a federal permit or license. The Service and state agency recommend measures to prevent the loss of biological resources, or to mitigate or compensate for the damage. The project proponent must take biological resource values into account and adopt justifiable protection measures to obtain maximum overall project benefits. A 1958 amendment added provisions to recognize the vital contribution of wildlife resources to the Nation and to require equal consideration and coordination of wildlife conservation with other water resources development programs. It also authorized the Secretary of Interior to provide public fishing areas and accept donations of lands and funds.

Migratory Bird Hunting and Conservation Stamp Act (1934)

Requires every waterfowl hunter 16 years of age or older to carry a stamp and earmarks proceeds of the Duck Stamps to buy or lease waterfowl habitat. A 1958 amendment authorizes the acquisition of small wetland and pothole areas to be designated as

‘Waterfowl Production Areas,’ which may be acquired without the limitations and requirements of the Migratory Bird Conservation Act.

Historic Sites, Buildings and Antiquities Act (1935) as amended

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

Refuge Revenue Sharing Act (1935) as amended

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

Executive Order No. 7437 (1936)

Establishing Trempealeau Migratory Waterfowl Refuge.

The Bald and Golden Eagle Protection Act of 1940 (16USC 668 et seq.)

Provides protection for Bald and Golden Eagles.

Transfer of Certain Real Property for Wildlife Conservation Purposes Act (1948)

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

Federal Records Act (1950)

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

Fish and Wildlife Act (1956)

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

Fish and Wildlife Coordination Act of 1958

Requires equal consideration and coordination of wildlife conservation with other water resource development programs.

Refuge Recreation Act (1962)

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

Wilderness Act (1964) as amended

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

Land and Water Conservation Fund Act (1965)

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

National Wildlife Refuge System Administration Act (1966) 16 USC 668dd-668ee

Provides for administration, management, and planning for National Wildlife Refuges.

National Historic Preservation Act (1966) as amended

Establishes as policy that the federal Government is to provide leadership in the preservation of the nation's prehistoric and historic resources.

Architectural Barriers Act (1968)

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

National Environmental Policy Act (1969)

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

Uniform Relocation and Assistance and Real Property Acquisition Policies Act (1970) as amended

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

The Clean Water Act of 1972, Section 404 (33 USC1344 et seq.), as amended

Provides for protection of water quality.

Ports and Waterways Safety Act of 1972 (33 USC 1221 et seq.), as amended

Promotes pollution controls for ships.

Endangered Species Act (1973)

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

Rehabilitation Act (1973)

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

Archaeological and Historic Preservation Act (1974)

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

Clean Water Act (1977)

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

Surface Mining Control and Reclamation Act (1977) as amended (Public Law 95- 87) (SMCRA)

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

Executive Order No. 11593, Protection and Enhancement of the Cultural Environment

States that if the Service proposes any development activities that may affect archaeological or historical sites, the Service will consult with federal and State Historic Preservation Officers to comply with Section 106 of the National Historic Preservation Act of 1966, as amended.

Executive Order 11988, Floodplain Management (1977)

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

Executive Order 11990, Protection of Wetlands (1977)

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

Executive Order 12372 (Intergovernmental Review of Federal Programs)

Directs the Service to send copies of the Environmental Assessment to State Planning Agencies for review.

American Indian Religious Freedom Act (1978)

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

Fish and Wildlife Improvement Act (1978)

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

Archaeological Resources Protection Act (1979) as amended

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

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (PL 96-510; 42 USC 9601, et aeq.) (CERCLA)

Provides mechanism for hazardous waste clean up.

Fish and Wildlife Conservation Act of 1980 (16 USC 661-667e) as amended

Requires the Fish and Wildlife Service to monitor non-game bird species, identify species of management concern, and implement conservation measures to preclude the need for listing under the Endangered Species Act.

Federal Farmland Protection Policy Act (1981) as amended

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

U.S. Fish and Wildlife Service Region 3, Regional Director Bulletin (1983)

Changes spelling from wild life to “wildlife” in Refuge name.

Emergency Wetlands Resources Act (1986)

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

Oil Pollution Act of 1990 (PL 101-380; 33 USC 2701, et seq.)

Provides oil pollution policies and protections.

Federal Noxious Weed Act (1990)

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

Native American Graves Protection and Repatriation Act (1990)

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

Director’s Order Number 132 (January 18, 2001)

National Wildlife Refuge System Mission, Goals and Purposes. This reiterates the mission of the Refuge System and how it relates to the mission of the Fish and Wildlife Service. Order also provides guidance on the use of goals and purposes in the administration and management of the system.

Americans With Disabilities Act (1992)

Prohibits discrimination in public accommodations and services.

Executive Order 12898, Environmental Justice for Minority Populations (1994)

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

Executive Order 12962, Recreational Fisheries (1995)

Federal agencies shall, to the extent permitted by law and where practicable, and in cooperation with states and Tribes, improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities.

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

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

Executive Order 13006, Locating Federal Facilities On Historic Properties In Our Nation's Central Cities (1996)

Strengthen our Nation's cities by encouraging the location of federal facilities in our central cities.

Executive Order 13007 Indian Sacred Sites (1996)

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

National Wildlife Refuge System Improvement Act (1997) PL 105-57

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

Migratory Bird Treaty Reform Act (1998)

Public law 105-312 amends the first section and section 2 of the Upper Mississippi River Wild Life and Fish Refuge Act (16 U.S.C. 721,722) by striking “Upper Mississippi River Wild Life and Fish Ref-

uge” each place it appears and inserting “Upper Mississippi River National Wildlife and Fish Refuge.”

National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act (1998)

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

Executive Order 13112 Invasive Species (1999)

Directs federal agencies to prevent the introduction of invasive species, control populations of such species, monitor invasive species populations, provide for restoration of native species and habitat conditions in ecosystems that have been invaded, conduct research, promote public education on invasive species and the means to address them, and consult with the Invasive Species Council.

Water Resources Development Act (1999)

Provides for the conservation and development of waterfowl and related resources, to authorize the Secretary of the Army to construct various projects for improvements to rivers and harbors of the United States.

Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, 6 November 2000

Provides a mechanism for establishing regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications.

Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, 2001

Instructs Federal agencies to conserve migratory birds by several means, including the incorporation of strategies and recommendation found in Partners in Flight Bird Conservation Plans, the North American Waterfowl Plan, the North American Waterbird Plan, and the United States Shorebird Conservation Plan, into agency management plan and guidance documents.

Appendix E: Executive Order Establishing Trempealeau Migratory Waterfowl Refuge Wisconsin

Appendix E: Executive Order Establishing Trempealeau Migratory Waterfowl Refuge Wisconsin

Establishing Trempealeau Migratory Waterfowl Refuge Wisconsin

By virtue of and pursuant to the authority vested in me as President of the United States, and in order to effectuate further the purposes of the migratory Bird Conservation Act (45 Stat. 1222), it is ordered that the following-described lands in Trempealeau County, Wisconsin consisting of 706.94 acres, more or less, be, and they are herby, reserved and set apart for the use of the Department of Agriculture, subject to valid existing rights, as a rfuqe and breeding ground for migratory birds and other wildlife;

Fourth Principal Meridian

T. 18 N, R. 9 W, sec. 7:

that part of the SW1/4 lying west of the Chicago & Northwestern Railroad right of way.

T. 18 N., R. 10 W, sec. 1:

that part of the SW1/4SW1/4 described as follows: Beginning at the southwest corner of section 1; thence N. 0°53' W., on line between sections 1 and 2, 9.65 chains; thence through section 1, S. 48°14' E, 8.73 chains; thence S. 60°58' E., 7.13 chains to a poin on line between sections 1 and 12; thence with section line S. 88°33' W, 12. 53 chains to point of beginning;

sec. 2:

that part of the S1/2SE1/4 described as follows: Beginning at the southeast corner of section 2; thence S. 88°24' W. on line between sections 2 and 11, 33.05 chains; thence through section 2, N. 12°15' E, 18.00 chains; thence N. 32°52' E., 3.25 chains; thence N. 89°06' E., 8.85 chains; thence S. 37°54' E., 5.33 chains; thence N. 84°35' E., 4.20 chains; thence S. 57°33' E., 3.50 chains; thence S. 29°43' E., 5.33 chains thence S. 57°41' E., 3.25 chains; thence N. 51°41' E., 3.33 chains

to a point on line between sections 1 and 2; thence with section line S. 0°53' E., 9.65 chains to point of beginning;

sec. 11:

that part of the E1/2 described as follows: Beginning at the northeast corner of section 11; thence on line between sections 11 and 12, 1°22' E., 40.04 chains; thence S. 1°15' E., 29.59 chains; thence through section 11, N. 63°26' W., 19.87 chains; thence S. 57°24' W., 4.14 chains; thence N. 61°21' W., 2.42 chains; thence N. 28°47' W., 11.69 chains; thence N. 11°17'W., 17.88 chains; thence N. 9°22' E, 28.04 chains; thence N. 52°08' W, 8.95 chains to a point on line between sections 2 and 11; thence with section line N. 88°24' E., 33.05 chains to point of beginning;

sec. 12:

that part described as follows: Beginning at the northwest corner of section 12, thence N. 88°32' E., on line between sections 1 and 12, 12.53 chains; thence through seccion 12, S. 52°06' E., 35.53 chains; thence S. 58°58' E., 14.47 chains; thence S. 56°47' E., 6.38 chains; thence S. 62°00' E., 3.41 chains; thence S. 61°38' E., 9.76 chains to a point on theeast and west center line of said section; thence N. 89°02' E, on center line 10.95 chains to the 1/4 corner on east boundary of section 12; thence S. 1°54' E. on boundary line 39.88 chains to the southeast corner of said section; thence through the section N. 77°58' W., 16.91 chains, thence N. 70°27' W, 16.66 chains; thence N. 42°38' W., 7.56 chains; thence N. 80°22' W, 24.16 chains; thence N. 79°56' W, 11.01 chains, thence S. 6°49' W, 9.26 chains; thence S. 9°48' W., 5.53 chains; thence N. 64°30' W, 6.63 chains to a point on line between sections 11 and 12; thence with section line N. 1°15' W, 29.59 chains; thence N. 1°22' W, 40.04 chains to a point of beginning.

This refuge shall be known as the Trempealeau Migratory Waterfowl Refuge.

s/Franklin D. Roosevelt

August 21, 1936

Appendix F: Economic Analysis of Refuge Alternatives and Demographics

Appendix F. Economic Analysis of Refuge Alternatives and Demographics

Section 1: Trempealeau County Population and Percentage Change

Trempealeau County Population and Percentage Change: 1980, 1990, & 2001¹

Area	1980	1990	2001	Percent Change		
				1980 to 1990	1990 to 2001	1980 to 2001
Trempealeau County	26,214	25,317	27,068	-3.5 percent	6.5 percent	3.2 percent
Wisconsin	4,712,045	4,904,562	5,405,947	3.9 percent	9.3 percent	12.8 percent
United States	227,224,719	249,622,814	285,317,559	9.0 percent	12.5 percent	20.4 percent

1. Source: Bureau of Economic Analysis

Section 2: Buffalo County Population and Percentage Change

Buffalo County Population and Percentage Change: 1980, 1990, & 2001¹

Area	1980	1990	2001	Percent Changes		
				1980 to 1990	1990 to 2001	1980 to 2001
Buffalo County	14,337	13,558	13,819	-5.7 percent	1.9 percent	-3.7 percent
Wisconsin	4,712,045	4,904,562	5,405,947	3.9 percent	9.3 percent	12.8 percent
United States	227,224,719	249,622,814	285,317,559	9.0 percent	12.5 percent	20.4 percent

1. Source: Bureau of Economic Analysis

Section 3: Trempealeau County Employment

Trempealeau Employment by Major Business Sector: 1980, 1990, & 2001¹

Sector	1980	1990	2001	Percent of Total Employment, 2001	Percent Change in Employment, 1980-2001
Farming	2,796	2,346	2,045	12.5%	-36.7%
Ag. Services, Forestry, & Fishing	98	(D) ²	(D)	(D)	(D)
Mining	23	(D)	(D)	(D)	(D)
Construction	462	448	512	3.1%	9.8%
Manufacturing	1,943	3,970	5,218	32.0%	62.8%
Transportation & Public Utilities	459	456	547	3.4%	16.1%
Wholesale Trade	443	509	(D)	(D)	(D)
Retail Trade	1,991	1,879	1,193	7.3%	-66.9%
Finance, Insurance, & Real Estate	734	457	455	2.8%	-61.3%
Services	1,962	2,264	3,228	19.8%	39.2%
Government	1,759	1,841	2,179	13.4%	19.3%
Trempealeau County Total Employment	12,670	14,337	16,311	100.0%	22.3%
Wisconsin Total Employment	2,449,057	2,835,395	3,429,667	100.0%	28.6%

1. Source: Bureau of Economic Analysis

2. Small population sizes are denoted by "D" and are not shown to avoid disclosure of confidential information, however the estimates for this item are included in the totals.

Section 4: Buffalo County Employment

Buffalo Employment by Major Business Sector: 1980, 1990, & 2001¹

Sector	1980	1990	2001	Percent of Total Employment, 2001	Percent Change in Employment, 1980-2001
Farming	2,081	1,623	1,623	16.6%	-28.2%
Ag. Services, Forestry, & Fishing	78	84	201	2.1%	(D) ²
Mining	(D)	0	(D)	(D)	(D)
Construction	245	233	577	5.9%	57.5%
Manufacturing	313	452	408	4.2%	23.3%
Transportation & Public Utilities	433	976	(D)	(D)	(D)
Wholesale Trade	303	251	315	3.2%	3.8%
Retail Trade	871	743	725	7.4%	-20.1%
Finance, Insurance, & Real Estate	284	227	528	5.4%	46.2%
Services	912	1,084	2370	24.3%	61.5
Government	905	902	1,000	10.3%	9.5%
Buffalo County Total Employment	6,432	6,575	9,753	100.0%	34.1%
Wisconsin Total Employment	2,449,057	2,835,395	3,429,667	100.0%	28.6%

1. Source: Bureau of Economic Analysis

2. Small population sizes are denoted by "(D)" and are not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.

Section 5: Trempealeau & LaCrosse Demographics

Trempealeau & La Crosse Demographic Characteristics, 2000 Census

Category	Trempealeau	La Crosse	Wisconsin	USA
Population, 2000	27,010	107,120	5,363,675	281,421,906
Population, percent change, 1990 to 2000	6.9%	9.4%	9.6%	13.1%
White persons (percent)	98.8%	94.2%	88.9%	75.1%
Black or African American persons, percent	0.1%	0.9%	5.7%	12.3%
American Indian and Alaska Native persons, percent	0.2%	0.4%	0.9%	0.9%
Asian persons, percent	0.1%	3.2%	1.7%	3.6%
Persons of Hispanic or Latino origin, percent	0.9%	0.9%	3.6%	12.5%
High School graduates, percent of persons 25+	80.9%	89.7%	85.1%	80.4%
Homeownership rate	74.1%	65.1%	68.4%	66.2%
Persons below poverty, percent	8.3%	10.7%	8.7%	12.4%

Section 6: Comparison of Annual Budget

Comparison of Annual Budget Expenditures for Three Alternatives

	Alternative A	Alternative B	Alternative C
Salaries and Fringe Benefits	\$203,600	\$449,200	\$511,100
Non-Salary Expenditures	\$107,000	\$236,100	\$268,600
Total Annual Budget	\$310,600	\$685,300	\$779,700
FTE's	4.0	8.0	9.0

Section 7: Comparison of Annual Economic Effects – Hunting

Comparison of Annual Economic Effects of Alternatives on Hunting

Category	Alternative A	Change from Alternative A	
		Alternative B	Alternative C
Activity Days	542	-160	235
Net Economic Value	\$24,759	-\$7,309	\$10,735
Total Expenditures	\$6,163	-\$3,023	\$4,291
Economic Output	\$7,787	-\$4,021	\$5,719
Employment	0.1	-0.1	0.1
Labor Income	\$2,159	-\$1,075	\$1,529
Tax Impact	\$928	\$-462	\$657

Section 8: Comparison of Annual Economic Effects – Fishing

Comparison of Annual Economic Effects of Alternatives on Fishing

Category	Alternative A	Change from Alternative A	
		Alternative B	Alternative C
Activity Days	336	-10	100
Net Economic Value	\$5,785	-\$172	\$1,722
Total Expenditures	\$2,364	--	\$703
Economic Output	\$3,066	--	\$937
Employment	0.0	--	0.0
Labor Income	\$845	--	\$250
Tax Impact	\$364	--	\$108

Section 9: Comparison of Annual Economic Effects – Wildlife Observation

Comparison of Annual Economic Effects of Alternatives on Wildlife Observation

Category	Alternative A	Change from Alternative A	
		Alternative B	Alternative C
Active Days	64,857	-1,500	4,520
Net Economic Value	\$589,064	-\$13,624	\$41,053
Total Expenditures	\$179,743	-\$5,336	\$15,955
Economic Output	\$239,702	-\$7,124	\$21,275
Employment	3.7	-0.1	0.3
Labor Income	\$64,070	-\$1,904	\$5,687
Tax Impact	\$27,539	\$-818	\$2,444

Section 10: Comparison of Annual Economic Effects – Public Use

Summary of Annual Economic Effects of Alternatives on Public Use

Category	Alternative A	Change from Alternative A	
		Alternative B	Alternative C
Activity Days	65,735	-1,670	4,855
Net Economic Value	\$619,607	-\$21,105	\$53,509
Total Expenditures	\$188,269	-\$8,429	\$20,949
Economic Output	\$250,555	-\$11,243	\$27,931
Employment	3.8	-0.2	0.4
Labor Income	\$67,074	-\$3,005	\$7,466
Tax Impact	\$28,831	\$-1,291	\$3,209

Appendix G: Species Lists

Appendix G. Species Lists

The attached lists are not complete, since no scientific surveys have been conducted. To the best of our knowledge, species on these lists have been sighted at Trempealeau NWR.

1. Bird Species

Bird Species Found on Trempealeau NWR

Common Name	Scientific Name	Special Status					Seasonal Abundance: a= abundant (seasonally numerous) c= common (almost certain to be seen) u= uncommon (present but seen only occasionally) r= rare (seen at intervals of 2-5 years)				
		Federal Status	State Status	FWS Region 3 Regional Conservation Priority	BCP Physiographic Area ¹	American Bird Conservancy Green List ²	Spring	Summer	Fall	Winter	Migrant ³
Avocets and Stilts											
Avocet, American	<i>Recurvirostra americana</i>					2	r	r	r		m
Stilt, Black-necked	<i>Himantopus mexicanus</i>										a
Blackbirds and Allies											
Blackbird, Brewer's	<i>Euphagus cyanocephalus</i>						u	u	u	r	b
Blackbird, Red-winged	<i>Agelaius phoeniceus</i>						a	a	a	u	b
Blackbird, Rusty	<i>Euphagus carolinus</i>					2	c		c	u	m
Blackbird, Yellow-headed	<i>Xanthocephalus xanthocephalus</i>						u	u	u		b
Bobolink	<i>Dolichonyx oryzivorus</i>						u	u	u		b
Cowbird, Brown-headed	<i>Molothrus ater</i>						a	a	u	r	b
Grackle, Common	<i>Quiscalus quiscula</i>						a	a	a	u	b
Meadowlark, Eastern	<i>Sturnella magna</i>						c	c	c	u	b
Meadowlark, Western	<i>Strunella neglecta</i>						r	r	r		b
Oriole, Baltimore	<i>Icterus galbula</i>						c	a			b
Oriole, Orchard	<i>Icterus spurius</i>						u	u			b
Cardinals and Allies											
Bunting, Indigo	<i>Passerina cyanea</i>						c	c	c		b
Bunting, Snow	<i>Plectrophenax nivalis</i>								r	u	m
Cardinal, Northern	<i>Cardinalis cardinalis</i>						a	a	c	c	b
Dickcissel	<i>Spiza americana</i>					2	c	c			b
Grosbeak, Rose-breasted	<i>Phœucticus ludovicianus</i>						c	c	c		b

Bird Species Found on Trempealeau NWR (Continued)

		Special Status					Seasonal Abundance: a= abundant (seasonally numerous) c= common (almost certain to be seen) u= uncommon (present but seen only occasionally) r= rare (seen at intervals of 2-5 years)				
Common Name	Scientific Name	Federal Status	State Status	FWS Region 3 Regional Conservation Priority	BCP Physiographic Area ¹	American Bird Conservancy Green List ²	Spring	Summer	Fall	Winter	Migrant ³
Chickadees and Titmice											
Chickadee, Black-capped	Poecile atricapillus						c	c	c	c	b
Titmouse, Tufted	Baeolophus bicolor						u	u	u	u	b
Cormorants											
Cormorant, Double-crested	Phalacrocorax auritus			X			c	c	c		b
Cranes											
Crane, Sandhill	Grus canadensis						u	u	u		b
Creepers											
Creeper, Brown	Certhia americana						c	u	u	u	b
Crows and Jays											
Crow, American	Corvus brachyrhynchos						a	a	a	c	b
Jay, Blue	Cyanocitta cristata						a	a	a	c	b
Raven, Common	Corvus corax										a
Cuckoos											
Cuckoo, Black-billed	Coccyzus erythrophthalmus			X	16		u	c	c		b
Cuckoo, Yellow-billed	Coccyzus americanus						c	c	u		b
Doves											
Dove, Mourning	Zenaida macroura						c	c	c	a	b
Dove, Rock	Columba livia						c	c	c	c	b
Ducks, Geese and Swans											
Bufflehead	Bucephala albeola				16		c		a	r	m
Canvasback	Aythya valisineria			X	16		a	r	a	u	m
Duck, American Black	Anas rubripes			X	16	2	a	r	a		m
Merganser, Red-breasted	Mergus serrator						c		u	u	m

Bird Species Found on Trempealeau NWR (Continued)

		Special Status					Seasonal Abundance: a= abundant (seasonally numerous) c= common (almost certain to be seen) u= uncommon (present but seen only occasionally) r= rare (seen at intervals of 2-5 years)				
Common Name	Scientific Name	Federal Status	State Status	FWS Region 3 Regional Conservation Priority	BCP Physiographic Area ¹	American Bird Conservancy Green List ²	Spring	Summer	Fall	Winter	Migrant ³
Duck, Ring-necked	<i>Aythya collaris</i>						a	r	a		m
Duck, Ruddy	<i>Oxyura jamaicensis</i>						c	r	c	r	m
Duck, Wood	<i>Aix sponsa</i>			X			a	c	a	r	b
Gadwall	<i>Anas strepera</i>						c	u	a		m
Goldeneye, Common	<i>Bucephala clangula</i>						a		a	c	m
Goose, Canada	<i>Branta canadensis</i>			X			a	c	a	c	b
Goose, Snow	<i>Chen caerulescens</i>			X			u		u		m
Mallard	<i>Anas platyrhynchos</i>			X			a	c	a	c	b
Merganser, Common	<i>Mergus merganser</i>						r		r	c	m
Merganser, Hooded	<i>Lophodytes cucullatus</i>				16		c	c	c	r	b
Pintail, Northern	<i>Anas acuta</i>			X			c	r	c	r	m
Redhead	<i>Aythya americana</i>				16		c	r	c	u	m
Scaup, Greater	<i>Aythya marila</i>				16		u		u		m
Scoter, Surf	<i>Melanitta perspicillata</i>										a
Scoter, White-winged	<i>Melanitta fusca</i>						r		u	r	m
Shoveler, Northern	<i>Anas clypeata</i>						c	u	c		m
Swan, Mute	<i>Cygnus olor</i>						r	r	r	r	b
Swan, Trumpeter	<i>Cygnus buccinator</i>		E				r	r	u	r	b
Swan, Tundra	<i>Cygnus columbianus</i>						a		a	u	m
Teal, Blue-winged	<i>Anas discors</i>			X			a	c	a		b
Teal, Cinnamon	<i>Anas cyanoptera</i>										a
Teal, Green-winged	<i>Anas crecca</i>			X			c	r	c	r	m
Wigeon, American	<i>Anas americana</i>						a	u	a		m
Wigeon, Eurasian	<i>Anas penelope</i>										a
Emberizid Finches, Sparrows and Allies											
Junco, Dark-eyed	<i>Junco hyemalis</i>						a		a	a	m

Bird Species Found on Trempealeau NWR (Continued)

		Special Status					Seasonal Abundance: a= abundant (seasonally numerous) c= common (almost certain to be seen) u= uncommon (present but seen only occasionally) r= rare (seen at intervals of 2-5 years)				
Common Name	Scientific Name	Federal Status	State Status	FWS Region 3 Regional Conservation Priority	BCP Physiographic Area ¹	American Bird Conservancy Green List ²	Spring	Summer	Fall	Winter	Migrant ³
Longspur, Lapland	<i>Calcarius lapponicus</i>						r		r	r	m
Sparrow, American Tree	<i>Spizella arborea</i>						c		a	a	m
Sparrow, Chipping	<i>Spizella passerina</i>						a	c	a		b
Sparrow, Clay-colored	<i>Spizella pallida</i>						u		u		m
Sparrow, Field	<i>Spizella pusilla</i>						a	c	c	r	b
Sparrow, Fox	<i>Passerella iliaca</i>						c		c		m
Sparrow, Grasshopper	<i>Ammodramus savannarum</i>						c	c	u		b
Sparrow, Harris'	<i>Zonotrichia querula</i>					2	u		u		m
Sparrow, Henslow's	<i>Ammodramus henslowii</i>		T			1	r		r		m
Sparrow, Lark	<i>Chondestes grammacus</i>						u	u			b
Sparrow, Le Conte's	<i>Ammodramus leconteii</i>						r	r	r		m
Sparrow, Lincoln's	<i>Melospiza lincolnii</i>						u		u		m
Sparrow, Savannah	<i>Passerculus sandwichensis</i>						u	u	u		b
Sparrow, Song	<i>Melospiza melodia</i>						a	a		u	b
Sparrow, Swamp	<i>Melospiza georgiana</i>						c	c	r		b
Sparrow, Vesper	<i>Pooecetes gramineus</i>						u	u	u		b
Sparrow, White-crowned	<i>Zonotrichia leucophrys</i>						u		u	r	m
Sparrow, White-throated	<i>Zonotrichia albicollis</i>						c		c	r	m
Towhee, Eastern	<i>Pipilo erythrophthalmus</i>						u	u	u	r	b
Falcons											
Falcon, Peregrine	<i>Falco peregrinus</i>		E	X	16		u	u	u		b
Kestrel, American	<i>Falco sparverius</i>						c	c	c	u	b
Merlin	<i>Falco columbarius</i>						u		u		m

Bird Species Found on Trempealeau NWR (Continued)

		Special Status					Seasonal Abundance: a= abundant (seasonally numerous) c= common (almost certain to be seen) u= uncommon (present but seen only occasionally) r= rare (seen at intervals of 2-5 years)				
Common Name	Scientific Name	Federal Status	State Status	FWS Region 3 Regional Conservation Priority	BCP Physiographic Area ¹	American Bird Conservancy Green List ²	Spring	Summer	Fall	Winter	Migrant ³
Tern, Black	<i>Chlidonias niger</i>			X	16		c	c	u		b
Tern, Caspian	<i>Sterna caspia</i>		E				u	u	u		m
Tern, Common	<i>Sterna hirundo</i>		E	X			u	u	u		m
Tern, Forster's	<i>Sterna forsteri</i>		E	X			c	u	u		b
Tern, Least	<i>Sterna antillarum</i>			X		2					a
Hawks, Kites and Eagles											
Eagle, Bald	<i>Haliaeetus leucocephalus</i>	T		X	16		c	c	a	c	b
Eagle, Golden	<i>Aquila chrysaetos</i>						r		u	r	m
Goshawk, Northern	<i>Accipiter gentilis</i>			X	16				r	u	m
Harrier, Northern	<i>Circus cyaneus</i>						u	u	u	u	b
Hawk, Broad-winged	<i>Buteo platypterus</i>						c	u	a		b
Hawk, Cooper's	<i>Accipiter cooperii</i>						u	u	c	u	b
Hawk, Red-shouldered	<i>Buteo lineatus</i>		T	X			u	u	u	r	b
Hawk, Red-tailed	<i>Buteo Jamaicensis</i>						c	c	a	c	b
Hawk, Rough-legged	<i>Buteo lagopus</i>						u		u	u	m
Hawk, Sharp-shinned	<i>Accipiter striatus</i>						c	u	a	u	m
Hawk, Swainson's	<i>Buteo swainsoni</i>			X		2			r		m
Osprey	<i>Pandion haliaetus</i>		T				u	u	c		b
Herons, Egrets, and Bitterns											
Bittern, American	<i>Botaurus lentiginosus</i>			X			u	u	u		b
Bittern, Least	<i>Ixobrychus exilis</i>						u	u	u		b
Egret, Cattle	<i>Bubulcus ibis</i>						u	r	u		m
Egret, Great	<i>Ardea alba</i>		T				a	c	a		b
Egret, Snowy	<i>Egretta thula</i>		E				r	r			m
Heron, Black-crowned Night-heron	<i>Nycticorax nycticorax</i>			X			u	u	r		b

Bird Species Found on Trempealeau NWR (Continued)

		Special Status					Seasonal Abundance: a= abundant (seasonally numerous) c= common (almost certain to be seen) u= uncommon (present but seen only occasionally) r= rare (seen at intervals of 2-5 years)				
Common Name	Scientific Name	Federal Status	State Status	FWS Region 3 Regional Conservation Priority	BCP Physiographic Area ¹	American Bird Conservancy Green List ²	Spring	Summer	Fall	Winter	Migrant ³
Heron, Great Blue	<i>Ardea herodias</i>						a	a	a	r	b
Heron, Green	<i>Butorides virescens</i>						c	c	c		b
Heron, Little Blue	<i>Egretta caerulea</i>					2		u			m
Heron, Yellow-crowned Night-heron	<i>Nyctanassa violacea</i>		T				u	r	u		b
Hummingbirds											
Hummingbird, Ruby-throated	<i>Archilochus colubris</i>						u	c	u		b
Ibises											
Ibis, Glossy	<i>Plegadis falcinellus</i>										a
Ibis, White	<i>Eudocimus albus</i>										a
Ibis, White-faced	<i>Plegadis chihi</i>										a
Kingfishers											
Kingfisher, Belted	<i>Ceryle alcyon</i>						c	c	u	u	b
Kinglets											
Kinglet, Golden-crowned	<i>Regulus satrapa</i>						u		u	r	m
Kinglet, Ruby-crowned	<i>Regulus calendula</i>						c		c		m
Larks											
Lark, Horned	<i>Eremophila alpestris</i>						r	r	r	u	b
Loons											
Loon, Common	<i>Gavia immer</i>						u		u		m
Loon, Red-throated	<i>Gavia stellata</i>										a
Mockingbirds and Thrashers											
Catbird, Gray	<i>Dumetella carolinensis</i>						c	c	c		b
Mockingbird, Northern	<i>Mimus polyglottos</i>						r	u	r		m
Thrasher, Brown	<i>Toxostoma rufum</i>						c	c	c		b

Bird Species Found on Trempealeau NWR (Continued)

		Special Status					Seasonal Abundance: a= abundant (seasonally numerous) c= common (almost certain to be seen) u= uncommon (present but seen only occasionally) r= rare (seen at intervals of 2-5 years)				
Common Name	Scientific Name	Federal Status	State Status	FWS Region 3 Regional Conservation Priority	BCP Physiographic Area ¹	American Bird Conservancy Green List ²	Spring	Summer	Fall	Winter	Migrant ³
Nightjars											
Nighthawk, Common	Chordeiles minor						c	c	u		b
Whip-poor-will	Caprimulgus vociferus			X	16		u	u	u		b
Nuthatches											
Nuthatch, Red-breasted	Sitta canadensis						u		u	u	m
Nuthatch, White-breasted	Sitta carolinensis						c	c	c	c	b
Owls											
Owl, Barred	Strix varia						c	c	c	c	b
Owl, Eastern Screech-owl	Otus asio				16		u	u	u	u	b
Owl, Great Horned	Bubo virginianus						c	c	c	c	b
Owl, Long-eared	Asio otus			X	16		u	r	u	u	b
Owl, Northern Saw-whet	Aegolius acadicus										a
Owl, Short-eared	Asio flammeus			X	16	2	u		u	u	m
Owl, Snowy	Nyctea scandiaca						r			r	m
Old World Sparrows											
Sparrow, House	Passer domesticus						a	a	a	a	b
Pelicans											
Pelican, American White	Pelecanus erythrorhynchos						c	u	c		m
Pheasants, Grouse, and Quail											
Bobwhite, Northern	Colinus virginianus				16		u	u	u	u	b
Grouse, Ruffed	Bonasa umbellus						c	c	c	c	b
Pheasant, Ring-necked	Phasianus colchicus						u	u	u	u	b
Turkey, Wild	Meleagris gallopavo						u	u	u	u	b
Pipits											
Pipit, American	Anthus rubescens						r		r		m

Bird Species Found on Trempealeau NWR (Continued)

		Special Status					Seasonal Abundance: a= abundant (seasonally numerous) c= common (almost certain to be seen) u= uncommon (present but seen only occasionally) r= rare (seen at intervals of 2-5 years)				
Common Name	Scientific Name	Federal Status	State Status	FWS Region 3 Regional Conservation Priority	BCP Physiographic Area ¹	American Bird Conservancy Green List ²	Spring	Summer	Fall	Winter	Migrant ³
Plovers											
Killdeer	Charadrius vociferus						c	c	c	r	b
Plover, American Golden-	Pluvialis dominica					2	u		u		m
Plover, Black-bellied	Pluvialis squatarola						u		u		m
Plover, Semipalmated	Charadrius semipalmatus						u	u	u	u	m
Rails and Coots											
Coot, American	Fulica americana						a	r	a	u	b
Moorhen, Common	Gallinula chloropus			X			u	u	u		b
Rail, King	Rallus elegans			X		1	r	r			b
Rail, Virginia	Rallus limicola						c	c	c		b
Sora	Porzana carolina						c	c	u		b
Sandpipers and Allies											
Dowitcher, Long-billed	Limnodromus scolopaceus						u			r	m
Dowitcher, Short-billed	Limnodromus griseus			X		2	u	u	u		m
Dunlin	Calidris alpina					2	u	u	u		m
Godwit, Hudsonian	Limosa haemastica			X		2	r				m
Godwit, Marbled	Limosa fedoa			X		2	r				m
Knot, Red	Calidris canutus					3					a
Phalarope, Wilson's	Phalaropus tricolor			X	16	2	u	u	r		m
Sanderling	Calidris alba					2	u	u	u		m
Sandpiper, Baird's	Calidris bairdii						u	u	u		m
Sandpiper, Least	Calidris minutilla						c	c	c		m
Sandpiper, Pectoral	Calidris melanotos						c	c	c		m
Sandpiper, Semipalmated	Calidris pusilla					2	c	c	c		m
Sandpiper, Solitary	Tringa solitaria					2	u	u	u		m

Bird Species Found on Trempealeau NWR (Continued)

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Common Name	Scientific Name	Federal Status	State Status	FWS Region 3 Regional Conservation Priority	BCP Physiographic Area ¹	American Bird Conservancy Green List ²	Spring	Summer	Fall	Winter	Migrant ³
Sandpiper, Spotted	<i>Actitis macularia</i>						c	c	c		b
Sandpiper, Stilt	<i>Calidris himantopus</i>			X		2	u	u	u		m
Sandpiper, Upland	<i>Bartramia longicauda</i>			X	16	2	r	r			b
Sandpiper, Western	<i>Calidris mauri</i>					2	r				m
Sandpiper, White-rumped	<i>Calidris fuscicollis</i>						u	u	u		m
Snipe, Common	<i>Gallinago gallinago</i>						c	u	c	u	m
Turnstone, Ruddy	<i>Arenaria interpres</i>						u	r	u		m
Willet	<i>Catoptrophorus semipalmatus</i>						r	r	r		m
Woodcock, American	<i>Scolopax minor</i>			X	16	2	u	u	u		b
Yellowlegs, Greater	<i>Tringa melanoleuca</i>			X			u	u	u		m
Yellowlegs, Lesser	<i>Tringa flavipes</i>					2	c	c	c		m
Shrikes											
Shrike, Loggerhead	<i>Lanius ludovicianus</i>		E	X	32,16		r	r	r		b
Shrike, Northern	<i>Lanius excubitor</i>						u		u	u	m
Starlings											
Starling, European	<i>Strunus vulgaris</i>						a	a	a	c	b
Swallows											
Martin, Purple	<i>Progne subis</i>						u	u	u		b
Swallow, Bank	<i>Riparia riparia</i>						c	u	u		b
Swallow, Barn	<i>Hirundo rustica</i>						c	c	c		b
Swallow, Cliff	<i>Petrochelidon pyrrhonota</i>						u	r	u		b
Swallow, Northern Rough-winged	<i>Stelgidopteryx serripennis</i>						c	c	u		b
Swallow, Tree	<i>Tachycineta bicolor</i>						a	a	c		b

Bird Species Found on Trempealeau NWR (Continued)

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Common Name	Scientific Name	Federal Status	State Status	FWS Region 3 Regional Conservation Priority	BCP Physiographic Area ¹	American Bird Conservancy Green List ²	Spring	Summer	Fall	Winter	Migrant ³
Swifts											
Swift, Chimney	Chaetura vauxi						c	c	u		b
Tanagers											
Tanager, Scarlet	Piranga olivacea						c	u	u		b
Thrushes and Allies											
Bluebird, Eastern	Sialia sialis						c	c	c	r	b
Robin, American	Turdus migratorius						a	a	a	u	b
Thrush, Gray-cheeked	Catharus minimus						c		u		m
Thrush, Hermit	Catharus guttatus						u		u		m
Thrush, Swainson's	Catharus ustulatus						u		u		m
Thrush, Wood	Hylocichla mustelina			X	16	2	c	u	u		b
Veery	Catharus fuscescens						u	r	u		b
Tyrant Flycatchers											
Flycatcher, Alder	Empidonax alnorum						r				m
Flycatcher, Great Crested	Myiarchus crinitus						c	a	u		b
Flycatcher, Least	Empidonax minimus						c	c	c		b
Flycatcher, Olive-sided	Contopus cooperi			X		2	r	u	u		m
Flycatcher, Willow	Empidonax traillii					2	u	u	u		b
Flycatcher, Yellow-bellied	Empidonax flaviventris						r	r	r		m
Kingbird, Eastern	Tyrannus tyrannus						c	c	u		b
Kingbird, Western	Tyrannus verticalis										a
Pewee, Eastern Wood-	Contopus virens						c	c	c		b
Phoebe, Eastern	Sayornis phoebe						c	u	c		b
Vireos											
Vireo, Bell's	Vireo bellii		T	X	16	2	r	r			b
Vireo, Blue-headed	Vireo solitarius						u	u	u		m

Bird Species Found on Trempealeau NWR (Continued)

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Vireo, Philadelphia	<i>Vireo philadelphicus</i>						u		u		m
Vireo, Red-eyed	<i>Vireo olivaceus</i>						a	a	a		b
Vireo, Warbling	<i>Vireo gilvus</i>						a	a	a		b
Vireo, Yellow-throated	<i>Vireo flavifrons</i>						u	u			b
Vultures											
Vulture, Turkey	<i>Cathartes aura</i>						e	e	e	r	m
Waxwings											
Waxwing, Bohemian	<i>Bombycilla garrulus</i>									r	m
Waxwing, Cedar	<i>Bombycilla cedrorum</i>						c	c	c	u	b
Wood Warblers											
Chat, Yellow-breasted	<i>Icteria virens</i>						r	r			b
Ovenbird	<i>Seiurus aurocapillus</i>						c	u	u		b
Parula, Northern	<i>Parula americana</i>						r		u		m
Redstart, American	<i>Setophaga ruticilla</i>						a	a	c		b
Warbler, Bay-breasted	<i>Dendroica castanea</i>					2	r				m
Warbler, Black-and-white	<i>Mniotilta varia</i>						e		e		m
Warbler, Blackburnian	<i>Dendroica fusca</i>						c		c		m
Warbler, Blackpoll	<i>Dendroica striata</i>						c		c		m
Warbler, Black-throated Blue	<i>Dendroica caerulescens</i>						r		r		m
Warbler, Black-throated Green	<i>Dendroica virens</i>						u		u		m
Warbler, Blue-winged	<i>Vermivora pinus</i>			x	16	3	u	u			b
Warbler, Canada	<i>Wilsonia canadensis</i>					2	r		u		m
Warbler, Cape May	<i>Dendroica tigrina</i>						u		u		m
Warbler, Cerulean	<i>Dendroica cerulea</i>		T			2	u	u			b

Bird Species Found on Trempealeau NWR (Continued)

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Warbler, Chestnut-sided	<i>Dendroica pensylvanica</i>						c		u		m
Warbler, Golden-winged	<i>Vermivora chrysoptera</i>					1	u	u	u		m
Warbler, Magnolia	<i>Dendroica magnolia</i>						u		u		m
Warbler, Mourning	<i>Oporornis philadelphia</i>						r	r	u		m
Warbler, Nashville	<i>Vermivora ruficapilla</i>						c		c		m
Warbler, Orange-crowned	<i>Vermivora celata</i>						r		u		m
Warbler, Palm	<i>Dendroica palmarum</i>						c		c		m
Warbler, Prothonotary	<i>Protonotaria citrea</i>					2	c	c			b
Warbler, Tennessee	<i>Vermivora peregrina</i>						c		c		m
Warbler, Wilson's	<i>Wilsonia pusilla</i>						u		u		m
Warbler, Yellow	<i>Dendroica petechia</i>						a	a	u		b
Warbler, Yellow-rumped	<i>Dendroica coronata</i>						a		a		m
Warbler, Yellow-throated	<i>Dendroica dominica</i>						r	r			b
Waterthrush, Louisiana	<i>Seiurus motacilla</i>						u	u	u		m
Waterthrush, Northern	<i>Seiurus noveboracensis</i>						c		u		m
Yellowthroat, Common	<i>Geothlypis trichas</i>						a	a	c		b
Woodpeckers											
Flicker, Northern	<i>Colaptes auratus</i>						c	c	c	u	b
Sapsucker, Yellow-bellied	<i>Sphyrapicus varius</i>						c	c	c	r	b
Woodpecker, Downy	<i>Picoides pubescens</i>						c	c	c	c	b
Woodpecker, Hairy	<i>Picoides villosus</i>						c	c	c	c	b
Woodpecker, Pileated	<i>Dryocopus pileatus</i>						u	u	u	u	b
Woodpecker, Red-bellied	<i>Melanerpes carolinus</i>						c	c	c	c	b
Woodpecker, Red-headed	<i>Melanerpes erythrocephalus</i>			X	16	2	u	u	u	r	b

Bird Species Found on Trempealeau NWR (Continued)

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Wrens											
Wren, House	Troglodytes aedon						a	a	c		b
Wren, Marsh	Cistothorus palustris						c	c	c		b
Wren, Sedge	Cistothorus platensis			X	16		u	u	u		b
Wren, Winter	Troglodytes troglodytes						u	u	u	r	b

1. *Partners in Flight Bird Conservation Plan Area 32 = Dissected Till Plains, Area 16 = Upper Great Lakes Plains*
2. *American Bird Conservancy Green List: 1= highest continental concern; 2=moderately abundant species with declines or high threats; 3=species with restricted distributions and low population size.*
3. *(m) Breeding (b) Accidental (a)*

2. Mammal List

Mammals List, Trempealeau NWR

		Federally (T or E)	Wisconsin (T or E)	RCP
Common Name	Species (Scientific Name)			
Bats				
Bat, Big Brown	<i>Eptescius fuscus</i>			
Bat, Hoary	<i>Lasiurus cinereus</i>			
Bat, Northern Long-eared Myotis	<i>Myotis septentrionalis</i>			
Bat, Little Brown	<i>Myotis lucifugus</i>			
Bat, Red	<i>Lasiurus borealis</i>			
Bat, Silver-haired	<i>Lasionycteris noctivagans</i>			
Pipistrel, Eastern	<i>Pipistrellus subflavus</i>			
Carnivores				
Badger	<i>Taxida taxus</i>			
Bear, Black	<i>Ursus americanus</i>			
Bobcat	<i>Lynx rufus</i>			
Coyote	<i>Canis latrans</i>			
Fox, Gray	<i>Urocyon cinereoargenteus</i>			
Fox, Red	<i>Vulpes fulva</i>			
Mink	<i>Mustela vison</i>			
Otter, River	<i>Lutra canadensis</i>			
Raccoon	<i>Procyon lotor</i>			
Skunk, Spotted	<i>Spilogale putorius</i>			
Skunk, Striped	<i>Mephitis mephitis</i>			
Weasel, Least	<i>Mustela nivalis</i>			
Weasel, Long-tailed	<i>Mustela frenata</i>			
Weasel, Short-tailed	<i>Mustela erminea</i>			
Hooved Animals				
Deer, White-tailed	<i>Odocoileus virginianus</i>			
Insectivores				
Shrew, Least	<i>Cryptotis parva</i>			
Shrew, Masked	<i>Sorex cinereus</i>			

Mammals List, Trempealeau NWR (Continued)

		Federally (T or E)	Wisconsin (T or E)	RCP
Common Name	Species (Scientific Name)			
Shrew, Short-tailed	<i>Blarina brevicauda</i>			
Marsupials				
Opossum, Virginia	<i>Didelphis virginiana</i>			
Rabbits				
Rabbit, Eastern Cottontail	<i>Sylvilagus floridanus</i>			
Rodents				
Beaver	<i>Castor canadensis</i>			
Chipmunk, Eastern	<i>Tamias striatus</i>			
Gopher, Plains Pocket	<i>Geomys bursarius</i>			
Lemming, Southern Bog	<i>Symptomys cooperi</i>			
Mouse, Deer	<i>Peromyscus maniculatus</i>			
Mouse, House	<i>Mus musculus</i>			
Mouse, Meadow Jumping	<i>Zapus hudsonius</i>			
Mouse, Western Harvest	<i>Reithrodontomy megalotis</i>			
Mouse, White-footed	<i>Peromyscus leucopus</i>			
Muskrat	<i>Ondatra zibethicus</i>			
Rat, Norway	<i>Rattus norvegicus</i>			
Squirrel, Eastern Fox	<i>Sciurus niger</i>			
Squirrel, Eastern Gray	<i>Sciurus carolinensis</i>			
Squirrel, Franklin's Ground	<i>Spermophilis franklinii</i>			
Squirrel, Red	<i>Tamiasciurus hudsonicus</i>			
Squirrel, Southern Flying	<i>Glaucomys volans</i>			
Squirrel, Thirteen-lined Ground	<i>Spermophilus tridecemlineatus</i>			
Vole, Meadow	<i>Microtus pennsylvanicus</i>			
Vole, Woodland	<i>Microtus pinetorum</i>			
Vole, Prairie	<i>Microtus ochrogastor</i>			
Woodchuck	<i>Marmota monax</i>			
¹ E (Endangered); T (Threatened)				
² RCP (Regional Conservation Priority; FWS, Region 3)				

3. Reptiles List

List of Reptiles Found on Trempealeau NWR

		Federally (T or E) ¹	Wisconsin (T or E) ¹	RCP ²
Common Name	Species (Scientific Name)			
Lizards				
Racerunner, Prairie ¹	<i>Cnemidophorus sexlineatus viridis</i>			
Snakes				
Bullsnake	<i>Pituophis melanoleucus</i>			
Snake, Massasauga	<i>Sistrurus catenatus</i>	C	E	X
Rattlesnake, Timber	<i>Crotalus horridus</i>			X
Snake, Brown	<i>Storeria dekayi</i>			
Snake, Eastern Garter	<i>Thamnophis sirtalis</i>			
Snake, Eastern Hognose	<i>Heterodon platirhinos</i>			
Snake, Milk	<i>Lampropeltis triangulum</i>			
Snake, Northern Red-bellied	<i>Storeria occipitomaculata</i>			
Snake, Northern Water	<i>Nerodia sipedon</i>			
Snake, Prairie Ringneck	<i>Diadophis punctatus arnyi</i>			
Turtles				
Turtle, Blanding's	<i>Emydoidea blandingii</i>		T	
Turtle, False Map	<i>Graptemys pseudogeographica</i>			
Turtle, Map	<i>Graptemys geographica</i>			
Turtle, Painted	<i>Chysemys picta</i>			
Turtle, Smooth Softshell	<i>Apalone mutica</i>			
Turtle, Snapping	<i>Chelydra serpentina</i>			
Turtle, Spiny Softshell	<i>Apalone spinifera</i>			
Turtle, Ouachita Map	<i>Graptemys ouachitensis</i>			
Turtle, Wood	<i>Clemmys insculpta</i>		T	
Turtle, Common Musk	<i>Sternothernus odoratus</i>			
¹ E (Endangered); T (Threatened) ² RCP (Regional Conservation Priority; FWS, Region 3) X = Extirpated C = Common				

1. Note that this species' name has been reclassified from six-lined to prairie.

4. Amphibians List

List of Amphibians Found on Trempealeau NWR

		Federally (T or E) ¹	Wisconsin (T or E) ¹	RCP ²
Common Name	Species (Scientific Name)			
Frogs and Toads				
Bullfrog	<i>Rana catesbeiana</i>			
Frog, Green	<i>Rana clamitans</i>			
Frog, Blanchard's Cricket	<i>Acris crepitans blanchardi</i>		E	
Frog, Northern Leopard	<i>Rana pipiens</i>			
Frog, Pickerel	<i>Rana palustris</i>			
Frog, Western Chorus	<i>Pseudacris triseriata</i>			
Frog, Wood	<i>Rana sylvatica</i>			
Peeper, Spring	<i>Pseudacris crucifer</i>			
Toad, American	<i>Bufo americanus</i>			
Treefrog, Gray	<i>Hyla versicolor</i>			
Treefrog, Cope's Gray	<i>Hyla chrysoscelis</i>			
Salamanders				
Mudpuppy	<i>Necturus maculosus</i>			
Salamander, Blue-spotted	<i>Ambystoma laterale</i>			
Salamander, Eastern Tiger	<i>Ambystoma tigrinum</i>			
Newt, Central	<i>Notophthalmus viridescens louisianensis</i>			
¹ E (Endangered); T (Threatened)				
² RCP (Regional Conservation Priority; FWS, Region 3)				

5. Fish List

List of Fish Species Found on Trempealeau NWR

Fish*		Federally (T or E) ¹	Wisconsin (T or E)	RCP ²	Pool 6 ³
Common Name	Species (Scientific Name)				
Bass Family	Percichthyidae				
Bass, White	<i>Morone chrysops</i>				C
Bowfin Family	Amiidae				
Bowfin	<i>Amia calva</i>				C
Catfish Family	Ictaluridae				
Bullhead, Black	<i>Ameiurus melas</i>				O
Bullhead, Brown	<i>Ameiurus nebulosus</i>				O
Bullhead, Yellow	<i>Ameiurus natalis</i>				O
Catfish, Channel	<i>Ictalurus punctatus</i>				C
Madtom, Tadpole	<i>Noturus gyrinus</i>				O
Drums	Sciaenidae				
Drum, Freshwater	<i>Aplodinotus grunniens</i>				C
Gar	Lepisosteidae				
Gar, Longnose	<i>Lepisosteus osseus</i>				C
Gar, Shortnose	<i>Lepisosteus platostomus</i>				C
Herring Family	Clupeidae				
Shad, Gizzard	<i>Dorosoma cepedianum</i>				A
Minnows	Cyprinidae				
Carp, Common	<i>Cyprinus carpio</i>				A
Minnow, Bluntnose	<i>Pimephales notatus</i>				O
Minnow, Bullhead	<i>Pimephales vigilax</i>				A
Minnow, Fathead	<i>Pimephales promelas</i>				U
Shiner, Emerald	<i>Notropis atherinoides</i>				A
Shiner, Golden	<i>Notemigonus crysoleucas</i>				O
Shiner, River	<i>Notropis blenniuis</i>				A
Shiner, Spotfin	<i>Cyprinella spiloptera</i>				C
Shiner, Spottail	<i>Notropis hudsonius</i>				C
Mooneye Family	Hiodontidae				
Mooneye	<i>Hiodon tergisus</i>				C
Mudminnows	Umbridae				
Mudminnow, Central	<i>Umbrina limi</i>				

List of Fish Species Found on Trempealeau NWR

Fish*		Federally (T or E) ¹	Wisconsin (T or E)	RCP ²	Pool 6 ³
Common Name	Species (Scientific Name)				
Darter, Johnny	<i>Etheostoma nigrum</i>				U
Perch, Yellow	<i>Perca flavescens</i>				C
Walleye	<i>Stizostedion vitreum</i>			X	C
Pike Family	Esocidae				
Pike, Northern	<i>Esox lucius</i>				C
Silversides	Atherinidae				
Silverside, Brook	<i>Labidesthes sicculus</i>				C
Suckers	Catostomidae				
Buffalo, Bigmouth	<i>Ictiobus cyprinellus</i>				C
Buffalo, Smallmouth	<i>Ictiobus bubalus</i>				O
Quillback	<i>Carpionodes cyprinus</i>				C
Redhorse, Golden	<i>Moxostoma erythrurum</i>				U
Redhorse, Shorthead	<i>Moxostoma macrolepidotum</i>				C
Sucker, White	<i>Catostomus commersoni</i>				C
Sunfish Family	Centrarchidae				
Bass, Largemouth	<i>Micropterus salmoides</i>				C
Bass, Smallmouth	<i>Micropterus dolomieu</i>				O
Bluegill	<i>Lepomis macrochirus</i>				A
Crappie, Black	<i>Pomoxis nigromaculatus</i>				C
Crappie, White	<i>Pomoxis annularis</i>				C
Pumpkinseed	<i>Lepomis gibbosus</i>				C
Sunfish, Green	<i>Lepomis cyanellus</i>				O
Sunfish, Orange-spotted	<i>Lepomis humilis</i>				O
* Fish species data supplied by La Crosse Wisconsin Fishery Resource Office of the U.S. Fish & Wildlife Service.					
¹ E (Endangered); T (Threatened)					
² RCP (Regional Conservation Priority; FWS, Region 3)					
³ X = Probably occurs only as a stray from a tributary or inland stocking.					
H = Records of occurrence are available, but no collections have been documented in the last 10 yrs.					
R = Considered to be rare. Some species in this category may be on the verge of extirpation.					
U = Uncommon. Does not usually appear in sample collections; populations are small, but the species					
O = Occasionally collected. Not generally distributed, but local concentrations may occur.					
C = Commonly taken in most sample collections. Can make up a large portion of some samples.					
A = Abundantly taken in all river surveys.					

6. Plant List

From: Galatowitsch, S.M.; McAdams, T.V.; July, 1994; *Distribution and Requirements of Plants on the Upper Mississippi River: Literature Review*. Iowa Cooperative Fish and Wildlife Research Unit, Ames, Iowa.

The floristic list was compiled from published records for the Upper Mississippi River; e.g., Mohlenbrock (1983), Peck and Smart (1986), Swanson and Sohmer (1978). Nomenclature follows Gleason and Cronquist (1991). General geographic distribution was obtained from Gleason and Cronquist (1991).

*Denotes species not indigenous to North America

**Denotes species added to the list in 2004 by the Upper Mississippi NWFR

***Denotes plant species added to this list that have not been verified through observation, or in various surveys conducted at Trempealeau [i.e., species listed but not denoted with *** may also be present, but have not been formally verified at Trempealeau].

List of Plants Found on Trempealeau NWR

Scientific Name	Family	Common Name
<i>Abutilon theophrasti</i> Medikus*	Malvaceae	Velvetleaf
<i>Acalypha rhomboidea</i> Raf.	Euphorbiaceae	Three-seeded mercury
<i>Acer negundo</i> L.	Aceraceae	Box elder
<i>Acer rubrum</i> L.	Aceraceae	Red maple
<i>Acer saccharinum</i> L.	Aceraceae	Silver maple
<i>Acer saccharum</i> Marsh.	Aceraceae	Sugar maple
<i>Achillea millefolium</i> ***	Asteraceae	Common yarrow
<i>Acorus calamus</i> L.	Araceae	Sweet flag
<i>Actaea alba</i> (L.) Miller	Ranunculaceae	White baneberry
<i>Actaea rubra</i> (Aiton) Willd.	Ranunculaceae	Red baneberry
<i>Agalinis purpurea</i> (L.) Penn.	Scrophulariaceae	Large purple agalinis
<i>Agastache scrophulariaefolia</i> (Willd.) Kuntze	Lamiaceae	Purple giant hyssop
<i>Agrimonia parviflora</i> Ait.	Rosaceae	Southern agrimony
<i>Agropyron repens</i> ***	Gramineae	Quack grass
<i>Agrostis gigantea</i> Roth.	Poaceae	Red top
<i>Alisma gramineum</i> Lej.	Alismataceae	Grass-leaved water plantain
<i>Alisma subcordatum</i> Raf.	Alismataceae	Southern water plantain
<i>Alisma triviale</i> Pursh	Alismataceae	Northern water plantain
<i>Alliaria petiolata</i> *,**	Brassicaceae	Garlic mustard
<i>Allium canadense</i> L.	Liliaceae	Wild garlic
<i>Allium cernuum</i> ***	Liliaceae	Nodding wild onion
<i>Allium stellatum</i> ***	Liliaceae	Wild Onion
<i>Allium tricoccum</i> Ait.	Liliaceae	Wild leek
<i>Alnus serrulata</i> (Ait.) Willd.	Betulaceae	Alder
<i>Alopecurus geniculatus</i> L.	Poaceae	Marsh foxtail
<i>Amaranthus hybridus</i> L.	Amaranthaceae	Green amaranth
<i>Amaranthus rudis</i> Sauer	Amaranthaceae	Water hemp (Tall amaranth)

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Amaranthus spinosus</i> L.	Amaranthaceae	Spiny pigweed
<i>Amaranthus tuberculatus</i> (Nutt.) Moq.	Amaranthaceae	Water hemp
<i>Ambrosia artemisiifolia</i> L.	Asteraceae	Common ragweed
<i>Ambrosia trifida</i> L.***	Asteraceae	Giant ragweed
<i>Amelanchier canadensis</i> (L.) Medikus	Rosaceae	Eastern serviceberry
<i>Ammania coccinea</i> Rottb.	Lythraceae	Toothcup
<i>Amorpha canescens</i> ***	Fabaceae	Lead plant
<i>Amorpha fruticosa</i> L.	Fabaceae	False indigo
<i>Ampelamus albidus</i> (Nutt.) Britton	Asclepiadaceae	Climbing milkweed
<i>Ampelopsis cordata</i> Michx.	Asclepiadaceae	Sandvine
<i>Amphicarpa bracteata</i> (L.) Fern.	Fabaceae	Hog peanut
<i>Andropogon gerardii</i> Vitman	Poaceae	Big bluestem
<i>Anemone canadensis</i> L.	Ranunculaceae	Canada anemone
<i>Anemone cylindrica</i> ***	Ranunculaceae	Long-headed thimbleweed
<i>Anemone quinquefolia</i> L.	Ranunculaceae	Wood anemone
<i>Anemone virginiana</i> ***	Ranunculaceae	Thimbleweed or Tall Anemone
<i>Antennaria neglecta</i> ***	Asteraceae	Field cat's foot
<i>Apios americana</i> Medic.	Fabaceae	Ground nut
<i>Apocynum cannabinum</i> L.	Araliaceae	Indian hemp
<i>Apocynum sibiricum</i> Jacq.	Araliaceae	Clasping dogbane
<i>Arabis lyrata</i> ***	Cruciferae	Lyre-leaved rock cress
<i>Aralia nudicaulis</i> L.	Araliaceae	Wild sasparilla
<i>Aralia racemosa</i> L.	Araliaceae	Spikenard
<i>Arisaema dracontium</i> (L.) Schott.	Araceae	Green dragon
<i>Aristida oligantha</i> Michx.	Poaceae	Prairie three-awn
<i>Asarum canadense</i> L.	Aristolochiaceae	Wild ginger
<i>Asclepias hirtella</i> (Pennell) Woodson	Asclepiadaceae	Prairie milkweed
<i>Asclepias incarnata</i> L.***	Asclepiadaceae	Swamp milkweed
<i>Asclepias purpurascens</i> L.	Asclepiadaceae	Purple milkweed
<i>Asclepias speciosa</i> Torr.	Asclepiadaceae	Showy milkweed
<i>Asclepias syriaca</i> ***	Asclepiadaceae	Common milkweed
<i>Asclepias tuberosa</i> ***	Asclepiadaceae	Butterfly Milkweed
<i>Asparagus officinalis</i> L.*	Liliaceae	Garden asparagus
<i>Aster drummondii</i> Lindl.	Asteraceae	Drummond's aster
<i>Aster ericoides</i> ***	Asteraceae	Heather aster
<i>Aster laevis</i> ***	Asteraceae	Smooth Aster
<i>Aster lanceolatus</i> ***	Compositae	Eastern-lined Aster
<i>Aster lanceolatus</i> Willd.***	Asteraceae	Eastern-lined aster
<i>Aster novae-anglei</i> ***	Asteraceae	New-England aster
<i>Aster oblongifolium</i> ***	Compositae	Aromatic aster

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Aster ontarionis</i> Wieg.	Asteraceae	Bottomland aster
<i>Aster oolentangiensis</i> ***	Asteraceae	Sky Blue Aster
<i>Aster racemosus</i> Elliott.	Asteraceae	Small-headed aster
<i>Aster turbinellus</i> ***	Asteraceae	Prairie aster
<i>Astragalus crassicaarpus</i> ***	Fabaceae	Ground Plum
<i>Avena sativa</i> ***	Gramineae	Oats
<i>Azolla mexicana</i> Presl	Salviniaceae	Mosquito fern
<i>Baptisia alba</i> ***	Fabaceae	White Wild Indigo
<i>Baptisia lactea</i> (Raf.) Thieret	Fabaceae	White wild indigo
<i>Baptisia tinctoria</i> ***	Leguminosae	Wild Indigo
<i>Belamcanda chinensis</i> (L.) DC.*	Iridaceae	Blackberry lily
<i>Berberis thunbergii</i> ***	Berberidaceae	Japanese barberry
<i>Berteroa incana</i> (L.) DC***	Cruciferae	Hoary alyssum
<i>Betula nigra</i> L.	Betulaceae	River birch
<i>Bidens bipinnata</i> L.	Asteraceae	Spanish needles
<i>Bidens cernua</i> L.	Asteraceae	Stick-tight
<i>Bidens comosa</i> (Gray) Wiegand.	Asteraceae	Straw-stem beggarstick
<i>Bidens connata</i> Muhl. Willd.	Asteraceae	Purple-stem beggarticks
<i>Bidens frondosa</i> L.	Asteraceae	Devil's beggarticks
<i>Bidens laevis</i> (L.) BSP.	Asteraceae	Bur marigold
<i>Bidens polylepis</i> S.F. Blake	Asteraceae	Long-bracted tickseed
<i>Bidens vulgata</i> Greene.	Asteraceae	Tall beggars tick
<i>Boehmeria cylindrica</i> (L.) Sw.	Urticaceae	Bog-hemp
<i>Boltonia asteroides</i> (L.) L. Her.	Asteraceae	False starwort
<i>Botrychium dissectum</i> Sprengel var. <i>obliquum</i> Clute	Ophioglossaceae	Grape fern
<i>Botrychium virginianum</i> (L.) Sw.	Ophioglossaceae	Rattlesnake fern
<i>Brassica nigra</i> L.	Brassicaceae	Black mustard
<i>Cacalia suaveolens</i> L.	Asteraceae	Indian plantain
<i>Calamagrostis canadensis</i> (Michx.) Nutt.	Poaceae	Blue-joint
<i>Callitriche heterophylla</i> Pursh.	Callitrichaceae	Water starwort
<i>Callitriche verna</i> L.	Callitrichaceae	Vernal water starwort
<i>Caltha palustris</i> L.	Ranunculaceae	Marsh marigold
<i>Calylophus serrulatus</i> (Nutt.) Raven	Onagraceae	Plains yellow primrose
<i>Campanula americana</i> L.	Campanulaceae	Tall bellflower
<i>Campanula rapunculoides</i> ***	Campanuloideae	Creeping bellflower
<i>Campanula rotundifolia</i> ***	Campanulaceae	Harebell
<i>Campsis radicans</i> (L.) Seem.*	Bignoniaceae	Trumpet flower
<i>Cannabis sativa</i> L.	Cannabaceae	Cannabis
<i>Capsella bursa-pastoris</i> (L.) Medic.	Brassicaceae	Shepherd's purse

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Cardamine hirsuta</i> L.	Brassicaceae	Bitter Cress (Hairy bitter cress)
<i>Cardamine pennsylvanica</i> Muhl.	Brassicaceae	Bitter cress
<i>Carduus nutans</i> ***	Compositae	Musk Thistle
<i>Carduus nutans</i> ***	Compositae	Musk thistle
<i>Carex alopecoidea</i> Tuckerm.	Cyperaceae	Foxtail sedge
<i>Carex amphibola</i> Steud. var: <i>turgida</i> Fern.	Cyperaceae	Gray sedge
<i>Carex bebbii</i> Olney	Cyperaceae	Bebb's sedge
<i>Carex bicknellii</i> Britt.	Cyperaceae	Bicknell's sedge
<i>Carex brevior</i> (Dew.) Mackenz.	Cyperaceae	Brevior's sedge
<i>Carex brunnescens</i> (Pers.) Poir.	Cyperaceae	Sedge (Brownish Sedge)
<i>Carex comosa</i> f. <i>boott</i> .	Cyperaceae	Sedge (Bristly Sedge)
<i>Carex conjuncta</i> E. Boott.	Cyperaceae	Soft fox sedge
<i>Carex cristatella</i> Britt.	Cyperaceae	Crested sedge
<i>Carex crus-corvi</i> Shuttlew Kunze.	Cyperaceae	Raven's foot sedge
<i>Carex echinata</i> Murray	Cyperaceae	Sedge (Prickly Sedge)
<i>Carex emoryi</i> Dew.	Cyperaceae	Emory's sedge
<i>Carex frankii</i> Kunth	Cyperaceae	Frank's sedge
<i>Carex granularis</i> Muhl. ex Willd.	Cyperaceae	Meadow sedge
<i>Carex grayi</i> Carey.	Cyperaceae	Gray's sedge
<i>Carex haydenii</i> Dew.	Cyperaceae	Hayden's sedge
<i>Carex hyalinolepis</i> Steud.	Cyperaceae	Hart Wright's sedge
<i>Carex hystericina</i> Muhl.	Cyperaceae	Bottlebrush sedge
<i>Carex lacustris</i> Willd.	Cyperaceae	Lake sedge
<i>Carex laeviconica</i> Dewey.	Cyperaceae	Sedge (Long-toothed Lake Sedge)
<i>Carex lanuginosa</i> Michx.	Cyperaceae	Woolly sedge
<i>Carex lasiocarpa</i> Ehrh.	Cyperaceae	Wire sedge
<i>Carex lupulina</i> Willd.	Cyperaceae	Hop sedge
<i>Carex lurida</i> Wahl.	Cyperaceae	Sallow sedge
<i>Carex muskingumensis</i> Schwein.	Cyperaceae	Muskingum sedge
<i>Carex normalis</i> Mackenz.	Cyperaceae	Sedge (Greater Straw Sedge)
<i>Carex projecta</i> Mack.	Cyperaceae	Necklace sedge
<i>Carex retrorsa</i> Schwein.	Cyperaceae	Retrorse sedge
<i>Carex rosea</i> Schk.	Cyperaceae	Sedge (Rosy Sedge)
<i>Carex rostrata</i> Stokes.	Cyperaceae	Beaked sedge
<i>Carex scoparia</i> Schkuhr ex Willd.	Cyperaceae	Pointed broom sedge
<i>Carex shortinana</i> Dew.	Cyperaceae	Short's sedge
<i>Carex squarrosa</i> L.	Cyperaceae	Squarrose sedge
<i>Carex stipata</i> Muhl.	Cyperaceae	Sedge (Common Fox Sedge)
<i>Carex stricta</i> Lam.	Cyperaceae	Tussock sedge
<i>Carex tenera</i> Dewey	Cyperaceae	Slender sedge

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Carex tribuloides</i> Wahl.	Cyperaceae	Blunt broom sedge
<i>Carex trichocarpa</i> Muhl.	Cyperaceae	Sedge (Hairy Fruit Sedge)
<i>Carex tuckermanii</i> F. Boott.	Cyperaceae	Tuckerman's sedge
<i>Carex typhina</i> Michx.	Cyperaceae	Cattail sedge
<i>Carex vulpinoidea</i> Michx.	Cyperaceae	Fox sedge
<i>Cariganum aborescens</i> ***	Ulmaceae	Siberian Elm
<i>Carya cordiformis</i> (Wang.) K. Koch	Juglandaceae	Bitternut hickory
<i>Carya illinoensis</i> (Wang.) K. Koch	Juglandaceae	Pecan
<i>Carya laciniosa</i> (Michx.) Loud.	Juglandaceae	Shellbark hickory
<i>Carya ovata</i> (Mill.) K. Koch.	Juglandaceae	Shagbark hickory
<i>Carya tomentosa</i> Nutt.	Juglandaceae	Mockernut hickory
<i>Catalpa speciosa</i> Warder*	Bignoniaceae	Northern catalpa
<i>Celtis laevigata</i> Willd.	Ulmaceae	Sugarberry
<i>Celtis occidentalis</i> L.	Ulmaceae	Hackberry
<i>Celtis tenuifolia</i> Nutt.	Ulmaceae	Dwarfhackberry
<i>Cenchrus longispinus</i> (Hack.) Fern.	Poaceae	Sand bur
<i>Centaurea maculosa</i> *,**	Asteraceae	Spotted knapweed
<i>Cephalanthus occidentalis</i> L.	Rubiaceae	Buttonbush
<i>Cerastium vulgatum</i> L.	Caryophyllaceae	Chickweed
<i>Ceratophyllum demersum</i> L.	Ceratophyllaceae	Coontail
<i>Ceratophyllum echinatum</i> Gray	Ceratophyllaceae	Coontail (Prickly Hornwort)
<i>Cercis canadensis</i> L.	Fabaceae	Redbud
<i>Chaerophyllum procumbens</i> (L.) Crantz	Apiaceae	Spreading chervil
<i>Chamaecrista fasciculata</i> Michx.	Fabaceae	Partridge pea
<i>Chasmanthium latifolium</i> (Michx.) Yates.	Poaceae	Wild oats
<i>Chelone glabra</i> L.***	Scrophulariaceae	Turtlehead
<i>Chelone obliqua</i> L.	Scrophulariaceae	Rose turtlehead
<i>Chenopodium album</i> L.*	Chenopodiaceae	Pigweed, Lamb's-quarters
<i>Chrysanthemum leucanthemum</i> ***	Compositae	Ox-eye daisy
<i>Chrysopsis graminifolia</i> (Michx.) Elliot var. <i>latifolia</i> Fern.	Asteraceae	Grass-leaved golden aster
<i>Cichorium intybus</i> ***	Compositae	Chicory
<i>Cicuta bulbifera</i> L.	Apiaceae	Water hemlock
<i>Cicuta maculata</i> L.	Apiaceae	Spotted cowbane
<i>Cinna arundinacea</i> L.	Poaceae	Wood reed grass
<i>Circaea lutetiana</i> L.	Onagraceae	Enchanter's nightshade
<i>Cirsium arvense</i> (L.) Scop.*	Asteraceae	Canada thistle
<i>Cirsium discolor</i> (Muhl.) Spreng.***	Asteraceae	Field thistle
<i>Cirsium vulgare</i> (Savi) Tenore.*	Asteraceae	Bull thistle
<i>Claytonia virginica</i> ***	Portulacaceae	Spring Beauty

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Commelina communis</i> L.	Commelinaceae	Asiatic dayflower
<i>Commelina diffusa</i> Burman	Commelinaceae	Creeping dayflower
<i>Convolvulus arvensis</i> L.*	Convolvulaceae	American bindweed
<i>Conyza canadensis</i> (L.) Cronq.	Asteraceae	Horseweed
<i>Coreopsis palmate</i> ***	Compositae	Stiff Coreopsis
<i>Coreopsis tinctoria</i> Nutt.	Asteraceae	Golden coreopsis
<i>Cornus amomum</i> Mill.	Cornaceae	Pale dogwood
<i>Cornus drummondii</i> Meyer	Cornaceae	Rough-leaved dogwood
<i>Cornus florida</i> L.	Cornaceae	Flowering dogwood
<i>Cornus racemosa</i> Lam.	Cornaceae	Northern swamp dogwood
<i>Cornus rugosa</i> Lam.	Cornaceae	Round-leaved dogwood
<i>Cornus stolonifera</i> Michx.	Cornaceae	Red-osier dogwood
<i>Coronilla varia</i> L. *, **	Fabaceae	Crown Vetch
<i>Corylus americana</i> Walter	Betulaceae	Hazelnut
<i>Crataegus</i> (L.)***	Rosaceae	Hawthorn
<i>Crataegus punctata</i> Jacq.	Rosaceae	Dotted hawthorne
<i>Cryptotaenia canadensis</i> (L.) DC.	Apiaceae	Honewort
<i>Cucurbita foetidissima</i> HBK	Cucurbitaceae	Wild pumpkin
<i>Cuscuta cephalanthi</i> Engelm.	Cuscutaceae	Buttonbush dodder
<i>Cuscuta compacta</i> A.L. Juss.	Cuscutaceae	Dodder (Compact Dodder)
<i>Cuscuta cuspidata</i> Engelm.	Cuscutaceae	Dodder (Cusp Dodder)
<i>Cuscuta glomerata</i> Choisy.	Cuscutaceae	Rope dodder
<i>Cuscuta gronovii</i> Willd.	Cuscutaceae	Common dodder
<i>Cuscuta polygonorum</i> Engelm.	Cuscutaceae	Smartweed-dodder
<i>Cyperus acuminatus</i> Torr. & Hook	Cyperaceae	Taper-leaf sedge
<i>Cyperus bipartitus</i> Torr.	Cyperaceae	Brook sedge
<i>Cyperus diandrus</i> Torr.	Cyperaceae	Low cyperus
<i>Cyperus erythrorhizos</i> Muhl.	Cyperaceae	Red-rooted sedge
<i>Cyperus esculentus</i> L.*	Cyperaceae	Nutsedge
<i>Cyperus odoratus</i> L.	Cyperaceae	Coarse cyperus
<i>Cyperus squarrosus</i> L.	Cyperaceae	Awned cyperus
<i>Cyperus strigosus</i> L.	Cyperaceae	Straw-colored cyperus
<i>Cypripedium reginae</i> Walter	Orchidaceae	Showy lady's slipper
<i>Cystopteris bulbifera</i> (L.) Bernh.	Polypodiaceae	Bulbet-bladder fern
<i>Dalea candida</i> ***	Fabaceae	White Prairie Clover
<i>Dalea purpurea</i> ***	Fabaceae	Purple prairie clover
<i>Daucus carota</i> ***	Umbelliferae	Wild Carrot
<i>Datura stramonium</i> ***	Solanaceae	Jimsonweed
<i>Delphinium carolinianum</i> ***	Ranunculaceae	Prairie larkspur
<i>Delphinium tricorne</i> ***	Ranunculaceae	Dwarf larkspur

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Desmanthus illinoensis</i> (Michx.) MacM.	Mimosaceae	Prairietick-trefoil
<i>Desmodium canadense</i> (L.) DC.	Fabaceae	Showy Tick Trefoil
<i>Desmodium glutinosum</i> (Muhl.) Wood.	Fabaceae	Cluster-leaftick trefoil
<i>Dicentra cucullaria</i> ***	Papveraceae	Dutchman's breeches
<i>Digitaria sanguinalis</i> (L.) Scop.*	Poaceae	Crab grass
<i>Dioscorea villosa</i> L.	Dioscoreaceae	Yam
<i>Diospyros virginiana</i> L.	Ebenaceae	Persimmon
<i>Dodecatheon meadia</i> L.	Primulaceae	Shooting star
<i>Dryopteris cristata</i> (L.) Gray	Polypodiaceae	Crested wood fern
<i>Dryopteris intermedia</i> (Muhl.) A. Gray	Polypodiaceae	Fancy wood fern
<i>Dulichium arundinaceum</i> (L.) Britt.	Cyperaceae	Three-way sedge
<i>Echinochloa crusgalli</i> (L.) Beauv.	Poaceae	Barnyard grass
<i>Echinochloa muricata</i> (Beauv.) Fern.	Poaceae	Barnyard grass
<i>Echinochloa walteri</i> (Pursh) Heller	Poaceae	Swamp barnyard grass
<i>Echinocystis lobata</i> (Michx.) T. & G.	Curcubitaceae	Prickly cucumber
<i>Echinodorus berteroi</i> (Sprengel) Fassett	Alismataceae	Creeping burhead
<i>Echinodorus Corddifolius</i> (L.) Griseb.	Alismataceae	Burhead
<i>Eclipta prostrata</i> L.	Asteraceae	Yerba de tajo
<i>Eleocharis acicularis</i> (L.) Roem. & Schultes	Cyperaceae	Needle spikerush
<i>Eleocharis compressa</i> Sullivant	Cyperaceae	Flatstem spikerush
<i>Eleocharis erythropoda</i> Steud.	Cyperaceae	Bald spikerush
<i>Eleocharis ovata</i> (Roth) R. & S.	Cyperaceae	Oval Spikerush
<i>Eleocharis palustris</i> (L.) Roem. & Schultes	Cyperaceae	Marsh spikerush
<i>Eleocharis quadrangulata</i> (Michx.) Roem. & Schultes	Cyperaceae	Square-stemmed spikerush
<i>Elodea canadensis</i> Michx	Hydrophyllaceae	Common water weed
<i>Elodea nuttallii</i> (Planch.) St. John	Hydrophyllaceae	Water weed
<i>Elymus canadensis</i> L.	Poaceae	Canada wild rye
<i>Elymus virginicus</i> L.	Poaceae	Virginiana wild rye
<i>Epilobium coloratum</i> Biehler:	Onagraceae	Cinnamon willow-herb
<i>Equisetum arvense</i> L.	Equisataceae	Common horsetail
<i>Equisetum fluviatile</i> L.	Equisataceae	Water horsetail
<i>Equisetum hyemale</i> L. var. <i>affine</i> (Engelm.)	Equisataceae	Scouring rush
<i>Equisetum laevigatum</i> A.Br.	Equisataceae	Smooth scouring rush
<i>Eragrostis frankii</i> C.A. Mey	Poaceae	Sandbar lovegrass
<i>Eragrostis hypnoides</i> (Lam.) BSP.	Poaceae	Creeping lovegrass
<i>Eragrostis pectinacea</i> (Michx.) Ness.	Poaceae	Small lovegrass
<i>Eragrostis spectabilis</i> (Pursh) Seud.	Poaceae	Purple lovegrass
<i>Erechtites hieracifolia</i> (L.) Raf.	Asteraceae	Fireweed
<i>Erigeron annuus</i> (L.) Pers.	Asteraceae	Daisy fleabane

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Erigeron philadelphicus</i> L.	Asteraceae	Fleabane
<i>Erigeron pulchellus</i> Michx.	Asteraceae	Robin's plantain
<i>Erigeron strigosus</i> Muhl.	Asteraceae	Rough fleabane
<i>Erythronium albidum</i> Nutt.	Liliaceae	White dog-tooth violet
<i>Euonymus atropurpureus</i> Jacq.	Celastraceae	Wahoo
<i>Eupatorium coelestinum</i> L.	Asteraceae	Mist flower
<i>Eupatorium maculatum</i> L.	Asteraceae	Joe-pye-weed
<i>Eupatorium perfoliatum</i> L.	Asteraceae	Boneset
<i>Eupatorium purpureum</i> L.	Asteraceae	Purple joe-pye-weed
<i>Eupatorium rugosum</i> Houttuyn.	Asteraceae	White snake root
<i>Eupatorium serotinum</i> Michx.	Asteraceae	Late boneset
<i>Euphorbia corollata</i> ***	Euphorbiaceae	Flowering spurge
<i>Euphorbia cyparissias</i> ***	Euphorbiaceae	Cypress spurge
<i>Euphorbia dentata</i> Michx.	Euphorbiaceae	Toothed spurge
<i>Euphorbia esula</i> *, **	Euphorbiaceae	Leafy spurge
<i>Euphorbia humistrata</i> (Engelm.)	Euphorbiaceae	Spurge (Sandmat Spurge)
<i>Euphorbia maculata</i> L.	Euphorbiaceae	Spotted spurge
<i>Euphorbia serpens</i> HBK.	Euphorbiaceae	Round-leaved spurge
<i>Euphorbia vermiculata</i> Raf.	Euphorbiaceae	Hairy spurge
<i>Festuca elatior</i> ***	Gramineae	Meadow fescue
<i>Forestiera acuminata</i> (Michx.) Poiret.	Oleaceae	Swamp privet
<i>Fragaria virginiana</i> Duchn.	Rosaceae	Wild strawberry
<i>Fraxinus americana</i> ***	Oleaceae	White Ash
<i>Fraxinus nigra</i> Marsh.	Oleaceae	Black Ash
<i>Fraxinus pennsylvanica</i> Marsh.	Oleaceae	Green ash
<i>Galinsoga quadriradiata</i> Ruiz & Pavon	Asteraceae	Fringed quickweed
<i>Galium aparine</i> L.	Rubiaceae	Spring-cleavers
<i>Galium boreale</i> ***	Rubiaceae	Northern Bedstraw
<i>Galium concinnum</i> T. & G.	Rubiaceae	Elegant bedstraw
<i>Galium obtusum</i> bigel.	Rubiaceae	Bluntleaf bedstraw
<i>Galium tinctorium</i> L.***	Rubiaceae	Stiff bedstraw
<i>Galium trifidum</i> L.	Rubiaceae	Northern three-lobed bedstraw
<i>Gaura biennis</i> D.	Onagraceae	Biennial gaura
<i>Geranium maculatum</i> L.	Geraniaceae	Wild geranium
<i>Geum canadense</i> Jacq.	Rosaceae	White avens
<i>Geum laciniatum</i> Murr.	Rosaceae	Rough avens
<i>Geum triflorum</i> ***	Rosaceae	Prairie smoke
<i>Glechoma hederacea</i> L.	Lamiaceae	Ground ivy
<i>Gleditsia triacanthos</i> L.	Fabaceae	Honey locust
<i>Glyceria borealis</i> Nash.	Poaceae	Northern manna grass

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Glyceria grandis</i> S. Wats.	Poaceae	Reed meadow grass
<i>Glyceria striata</i> (Lam.) A. Hitchc.	Poaceae	Fowl meadow grass
<i>Gnaphalium uliginosum</i> L.	Asteraceae	Low cudweed
<i>Gnaphalium obtusifolium</i> ***	Compositae	Sweet Everlasting
<i>Gratiola neglecta</i> Torr.	Scrophulariaceae	Hedge hyssop
<i>Gymnocladus dioica</i> (L.) K. Koch	Fabaceae	Kentucky coffee tree
<i>Habenaria leucophaea</i> mutt.) A. Gray	Orchidaceae	Prairie fringed orchid
<i>Habenaria psycodes</i> (L.) Sprengel.	Orchidaceae	Purple fringed orchid
<i>Habenaria viridis</i> (L.) Br. var. <i>bracteata</i> (Muhl.) A. Gray	Orchidaceae	Frog orchid
<i>Hackelia virginiana</i> (L.) Johnston.	Boraginaceae	Stickseed
<i>Helenium autumnale</i> L.	Asteraceae	Sneezeweed
<i>Helianthus grosseserratus</i> Martens	Asteraceae	Sawtooth sunflower
<i>Helianthus pauciflorus</i> ***	Compositae	Stiff Sunflower
<i>Heliopsis helianthoides</i> (L.) Sweet.	Asteraceae	Sweet ox-eye
<i>Heliotropium indicum</i> L.*	Boraginaceae	Turnsole
<i>Hemerocallis fulva</i> ***	Liliaceae	Day Lilly
<i>Hemicarpha micrantha</i> (Vahl) Pax	Cyperaceae	Dwarf bulrush
<i>Hepatica acutiloba</i> DC.	Ranunculaceae	Sharp-lobed lobelia
<i>Heracleum lanatum</i> Michx.	Apiaceae	Cow parsnip
<i>Heterantheria limosa</i> (Sw.) Willd.	Pontederiaceae	Mud plantain
<i>Hibiscus laevis</i> All.	Malvaceae	Smooth rosemallow
<i>Hibiscus muscheutos</i> L.	Malvaceae	Swamp rosemallow
<i>Hieracium aurantiacum</i> ***	Compositae	Orange hawkweed
<i>Hieracium caespitosum</i> ***	Compositae	Yellw Hawkweed
<i>Houstonia caerulea</i> ***	Rubiaceae	Bluets
<i>Houstonia longifolia</i> ***	Rubiaceae	Long-leaved bluets
<i>Humulus lupulus</i> L.	Cannabaceae	Hops
<i>Hydrophyllum virginianum</i> L.	Hydrophyllaceae	Virginia water leaf
<i>Hypericum boreale</i> (Britt.) Bick.	Clusiaceae	Northern St. John's-wort
<i>Hypericum mutilum</i> L.	Clusiaceae	Dwarf St. John's-wort
<i>Hypericum prolificum</i> L.	Clusiaceae	Shrubby St. John's-wort
<i>Hypericum punctatum</i> L.	Clusiaceae	Spotted St. John's-wort
<i>Hypericum pyramidatum</i> Ait.	Clusiaceae	Great St. John's-wort
<i>Hypericum sphaerocarpum</i> Michx.	Clusiaceae	Roundfruit St. John's wort
<i>Hypoxis hirsuta</i> (L.) Cov.	Liliaceae	Yellow star grass
<i>Ilex decidua</i> Walt.	Aquifoliaceae	Possum haw
<i>Impatiens capensis</i> Meerb.***	Balsaminaceae	Orange jewelweed
<i>Impatiens pallida</i> Nutt.	Balsaminaceae	Pale touch-me-not
<i>Ipomoea lacunosa</i> L.	Convolvulaceae	White morning glory

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Iris versicolor</i> ***	Iridaceae	Large blueflag
<i>Iris virginica</i> L. var. <i>shrevei</i> (Small) E. Anders.	Iridaceae	Blue flag
<i>Isoetes melanopoda</i> Gay and Dur.	Isoetaceae	Quillwort
<i>Iva annua</i> L.	Asteraceae	Marsh elder
<i>Juglans cinerea</i> L.	Juglandaceae	Butternut
<i>Juglans nigra</i> L.	Juglandaceae	Black walnut
<i>Juncus acuminatus</i> Michx.	Juncaceae	Knotty-leaved rush
<i>Juncus effusus</i> L.	Juncaceae	Soft rush
<i>Juncus nodosus</i> L.	Juncaceae	Joint rush
<i>Juncus tenuis</i> Willd. var. <i>dudleyi</i> (Wieg.)	Juncaceae	Path rush
<i>Juncus torreyi</i> Cov.	Juncaceae	Torrey's rush
<i>Juniperus communis</i> L.	Cupressaceae	Common juniper
<i>Juniperus virginiana</i> L.	Cupressaceae	Red cedar
<i>Koeleria cristata</i> ***	Poaceae	Junegrass
<i>Lactuca floridana</i> (L.) Gaertner	Asteraceae	Woodland lettuce
<i>Lactuca saligna</i> L.	Asteraceae	Willowleaf lettuce
<i>Laportea canadensis</i> (L.) Wedd.	Urticaceae	Wood nettle
<i>Lathyrus palustris</i> L.	Fabaceae	Marsh pea
<i>Lathyrus venosus</i> Muhl. var. <i>intonsus</i> Butters and St. John	Fabaceae	Forest pea
<i>Leersia lenticularis</i> Michx.	Poaceae	Catchfly grass
<i>Leersia oryzoides</i> (L.) Sw.	Poaceae	Rice cutgrass
<i>Leersia virginica</i> Willd.	Poaceae	White grass
<i>Lemna minor</i> L.	Lemnaceae	Lesser duckweed
<i>Lemna obscura</i> (Austin) Daubs	Lemnaceae	Duckweed (Little Duckweed)
<i>Lemna perpusilla</i> Torr.	Lemnaceae	Duckweed (Least Duckweed)
<i>Lemna trinervis</i> (Austin) Small	Lemnaceae	Duckweed
<i>Lemna trisulca</i> L.	Lemnaceae	Star duckweed
<i>Lemna valdiviana</i> Phil.	Lemnaceae	Duckweed
<i>Leonurus cardiaca</i> L.*	Lamiaceae	Motherwort
<i>Leonurus marrubiastrum</i> L.*	Lamiaceae	Motherwort
<i>Leptochloa filiformis</i> P. (Lam.) Beauv.	Poaceae	Red sprangletop
<i>Lespedeza capitata</i> ***	Leguminosae	Bush Clover
<i>Liatris aspera</i> ***	Compositae	Rough Blazing Star
<i>Liatris cylindracea</i> ***	Asteraceae	Cylindric blazing star
<i>Liatris ligulistlis</i> ***	Asteraceae	North plains blazing star
<i>Liatris pycnostachya</i> ***	Asteraceae	Prairie blazing star
<i>Lilium canadense</i> L.	Liliaceae	Wild yellow lily
<i>Lilium michiganense</i> Farw.	Liliaceae	Michigan lily
<i>Lindaria vulgaris</i> ***	Scrophulariaceae	Butter and Eggs

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Lindernia dubia</i> (L.) Pennell.	Scrophulariaceae	False pimpernel
<i>Liquidambar styraciflua</i> L.	Hamamelidaceae	Sweet gum
<i>Lithospermum canescens</i> ***	Boraginaceae	Hoary Puccoon
<i>Lithospermum croceum</i> ***	Boraginaceae	Hairy puccoon
<i>Lobelia cardinalis</i> L.	Campanulaceae	Cardinal flower
<i>Lobelia siphilitica</i> L.	Campanulaceae	Great lobelia
<i>Lobelia spicata</i> Lam.	Campanulaceae	Pale-spike lobelia
<i>Lonicera dioica</i> L.	Caprifoliaceae	Wild honeysuckle
<i>Lonicera tartarica</i> . and others*	Caprifoliaceae	Bush honeysuckles (Tartarian Honeysuckle)
<i>Lonicera x bella</i> Zabel.*	Caprifoliaceae	Honeysuckle (White-bell Honeysuckle)
<i>Lotus corniculatus</i> ***	Leguminosae	Bird's foot trefoil
<i>Ludwigia alternifolia</i> L.	Onagraceae	Seedbox
<i>Ludwigia peploides</i> (HBK) Raven	Onagraceae	Floating primrose willow
<i>Ludwigia polycarpa</i> Short & Peter	Onagraceae	Water primrose
<i>Lupinus perennis</i> ***	Leguminosae	Wild Lupine
<i>Lychnis alba</i> ***	Caryophyllaceae	Evening lychnis
<i>Lycopersicon esculentum</i> Miller	Solanaceae	Tomato
<i>Lycopus americanus</i> Muhl.	Lamiaceae	American bugleweed
<i>Lycopus rubellus</i> Moench	Lamiaceae	Stalked water horehound
<i>Lycopus uniflorus</i> Michx.	Lamiaceae	Northern bugleweed
<i>Lycopus virginicus</i> L.	Lamiaceae	Water horehound
<i>Lysimachia ciliata</i> L.	Primulaceae	Fringed loosestrife
<i>Lysimachia hybrida</i> Michx.	Primulaceae	Mississippi Valley loosestrife
<i>Lysimachia lanceolata</i> Walt.	Primulaceae	Lance-leaved loosestrife
<i>Lysimachia nummularia</i> L.*	Primulaceae	Moneywort
<i>Lysimachia terrestris</i> (L.) BSP.	Primulaceae	Swamp candles
<i>Lysimachia thyrsiflora</i> L.	Primulaceae	Swamp loosestrife
<i>Lythrum alatum</i> Pursh.	Lythraceae	Winged loosestrife
<i>Lythrum salicaria</i> L.*	Lythraceae	Purple loosestrife
<i>Maianthemum canadense</i> Desf	Liliaceae	Wild lily of the valley
<i>Matteuccia struthiopteris</i> (L.) Todaro	Polypodiaceae	Ostrich fern
<i>Medicago lupulina</i> ***	Leguminosae	Black medick
<i>Medicago sativa</i> ***	Leguminosae	Alfalfa
<i>Melilotus alba</i> ***	Leguminosae	White Sweet Clover
<i>Melilotus officinalis</i> ***	Leguminosae	Yellow Sweet Clover
<i>Menispermum canadense</i> L.	Menispermaceae	Moonseed
<i>Mentha arvensis</i> L.	Lamiaceae F	Field mint
<i>Mimulus alatus</i> Ait.	Scrophulariaceae	Sharp-winged monkey flower
<i>Mimulus ringens</i> L.	Scrophulariaceae	Square-stemmed monkey flower

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Mitella diphylla</i> L.	Saxifragaceae	Two-leaved miterwort
<i>Mollugo verticillata</i> L.	Molluginaceae	Carpetweed
<i>Monarda fistulosa</i> ***	Lamiaceae	Wild Bergamot
<i>Monarda punctata</i> ***	Labiatae	Horse-mint
<i>Monotropa uniflora</i> ***	Labiatae	Indian Pipe
<i>Morus alba</i> L.*	Moraceae	White mulberry
<i>Morus rubra</i> L.	Moraceae	Red mulberry
<i>Muhlenbergia frondosa</i> (Poir.) Fernald	Poaceae	Satin grass
<i>Muhlenbergia racemosa</i> (Michx.) BSP	Poaceae	Green muhly
<i>Muhlenbergia schreberi</i> J.F. Gemelin	Poaceae	Nimbleweed
<i>Myriophyllum heterophyllum</i> Michx.	Haloragaceae	Milfoil (Two-leaf Milfoil)
<i>Myriophyllum pinnatum</i> (Walt.) BSP.	Haloragaceae	Milfoil (Water Milfoil)
<i>Myriophyllum spicatum</i> L. var. <i>exalbescens</i> (Fern.) Jepson*	Haloragaceae	Eurasian milfoil
<i>Myriophyllum verticillatum</i> L.	Haloragaceae	Whorled milfoil
<i>Najas flexilis</i> (Willd.) Rostk. & Schmidt	Najadaceae	Northern water nymph
<i>Najas guadalupensis</i> (Spreng.) Morong	Najadaceae	Southern water nymph
<i>Najas minor</i> All.*	Najadaceae	Eutrophic water nymph
<i>Nelumbo lutea</i> (Willd.) Pers.	Nelumbonaceae	Water lotus
<i>Nuphar advena</i> Aiton	Nymphaeaceae	Spatter dock
<i>Nymphaea odorata</i> Aiton***	Nymphaeaceae	Fragrant water lily
<i>Nyssa aquatica</i> (L.)	Cornaceae	Water tupelo
<i>Oenothera biennis</i> L.***	Onagraceae	Evening primrose
<i>Oenothera rhombipetala</i> ***	Onagraceae	Longspike evening primrose
<i>Onoclea sensibilis</i> L.	Polypodiaceae	Sensitive fern
<i>Opuntia humifusa</i> ***	Cactaceae	Prickly pear cactus
<i>Osmorhiza claytonii</i> (Michx.)	Apiaceae	Bland sweet cicely
<i>Osmunda cinnamomea</i> L.	Osmundaceae	Cinnamon fern
<i>Osmunda claytoniana</i> L.	Osmundaceae	Interrupted fern
<i>Osmunda regalis</i> L.	Osmundaceae	Royal fern
<i>Oxalis stricta</i> L.	Oxalaceae	Wood-sorrel
<i>Panicum capillare</i> L.	Poaceae	Old witch grass
<i>Panicum clandestinum</i> L.	Poaceae	Deer-tongue grass
<i>Panicum dichotomiflorum</i> Michx.	Poaceae	Fall panic grass
<i>Panicum laniginosum</i> Ell.	Poaceae	Wooly panicum
<i>Panicum rigidulum</i> Bosc.	Poaceae	Red-top panicum
<i>Panicum virgatum</i> L.	Poaceae	Switchgrass
<i>Parnassia glauca</i> Raf.	Saxifragaceae	Grass of parnassus
<i>Parthenium integrifolium</i> L.	Asteraceae	American fever-few
<i>Parthenocissus quinquefolia</i> (L.) Planch	Vitaceae	Virginia creeper

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Parthenocissus vitacea</i> (Knerr.) A. Hitchc.	Vitaceae	Grape woodvine
<i>Paspalum fluitans</i> (Elliott) Kunth.	Poaceae	Bead grass
<i>Pastinaca sativa</i> ***	Apiaceae	Wild Parsnip
<i>Pedicularis canadensis</i> L.	Scrophulariaceae	Wood betony
<i>Peltandra virginica</i> (L.) schott & Endl.	Araceae	Arrow arum
<i>Penstemon digitalis</i> ***	Scrophulariaceae	Smooth Beardtongue or Foxglove
<i>Penstemon grandiflorus</i> ***	Scrophulariaceae	Large-flowered beardstongue
<i>Penstemon hirsutus</i> ***	Scrophulariaceae	Hairy beardstongue
<i>Penthorum sedoides</i> L.	Saxifragaceae	Ditch-stonecrop
<i>Phalaris arundinacea</i> L.*	Poaceae	Reed canary grass
<i>Phleum pratense</i> ***	Gramineae	Timothy
<i>Phlox divaricata</i> L.	Polemoniaceae	Forest phlox
<i>Phlox pilosa</i> L.	Polemoniaceae	Downy phlox
<i>Phragmites australis</i> (Cav.) Trin.	Poaceae	Common reed
<i>Phyla lanceolata</i> Michx. (Green)	Verbenaceae	Fog fruit
<i>Physalis heterophylla</i> Nees***.	Solanaceae	Clammy ground cherry
<i>Physalis longifolia</i> Nutt.	Solanaceae	Long-leaved ground cherry
<i>Physalis virginiana</i> ***	Solanaceae	Swamp Milkweed
<i>Physostegia virginiana</i> (L.) Benth. *	Lamiaceae	False dragonhead
<i>Phytolacca americana</i> L.	Phtolaccaceae	Pokeweed
<i>Picea abies</i> ***	Pinaceae	Norway spruce
<i>Pilea pumila</i> L. Gray.	Urticaceae	Clearweed
<i>Pinus banksiana</i> ***	Pinaceae	Jack pine
<i>Pinus resinosa</i> ***	Pinaceae	Norway pine (ed pine)
<i>Pinus strobus</i> L. ***	Pinaceae	White Pine
<i>Pinus sylvestris</i> L.	Pinaceae	Scotch pine
<i>Plantago major</i> L.*	Plantaginaceae	Common plantain
<i>Plantago rugelii</i> Dene.	Plantaginaceae	Red-stemmed plantain
<i>Platanus occidentalis</i> L.	Plantanaceae	Sycamore
<i>Poa pratensis</i> L.	Poaceae	Kentucky bluegrass
<i>Podophyllum peltatum</i> L.	Berberidaceae	May apple
<i>Polanisia dodecandra</i> ***	Capparaceae	Clammy-weed
<i>Polygala sanguinea</i> L.	Polygonaceae	Blood polygala
<i>Polygonum amphibium</i> L.	Polygonaceae	Water smartweed
<i>Polygonum aviculare</i> L.	Polygonaceae	Water smartweed (Prostrate Knotweed)
<i>Polygonum hydropiper</i> L. ***	Polygonaceae	Common smartweed
<i>Polygonum hydropiperoides</i> Michx.	Polygonaceae	Wild water pepper
<i>Polygonum lapathifolium</i> L.	Polygonaceae	Nodding smartweed
<i>Polygonum pensylvanicum</i> L.	Polygonaceae	Pinkweed

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Polygonum persicaria</i> L.	Polygonaceae	Lady's thumb
<i>Polygonum punctatum</i> Ell.	Polygonaceae	Water smartweed
<i>Polygonum ramosissimum</i> Michx.	Polygonaceae	Bushy knotweed
<i>Polygonum scandens</i> L.	Polygonaceae	False buckwheat
<i>Polygonum virginianum</i> L.	Polygonaceae	Jumpseed
<i>Pontederia cordata</i> L.	Pontederiaceae	Pickernelweed
<i>Populus deltoides</i> Marsh.	Salicaceae	Cottonwood
<i>Populus grandidentata</i> ***	Salicaceae	Big-toothed Aspen
<i>Populus tremuloides</i> ***	Salicaceae	Quaking Aspen
<i>Portulaca oleracea</i> L.	Portulacaceae	Common purslane
<i>Potamogeton amplifolius</i> Tuckerm.	Potamogetonaceae	Bigleaf pondweed
<i>Potamogeton crispus</i> L.*	Potamogetonaceae	Curly-leaved pondweed
<i>Potamogeton diversifolius</i> L.	Potamogetonaceae	Snailseed pondweed
<i>Potamogeton epihydrus</i> Raf.	Potamogetonaceae	Ribbon-flowered pondweed
<i>Potamogeton foliosus</i> Raf.	Potamogetonaceae	Leafy pondweed
<i>Potamogeton illinoensis</i> Morong	Potamogetonaceae	Illinois pondweed
<i>Potamogeton natans</i> L.	Potamogetonaceae	Floating pondweed
<i>Potamogeton nodosus</i> Poir.	Potamogetonaceae	Long-leaved pondweed
<i>Potamogeton pectinatus</i> L.	Potamogetonaceae	Sago pondweed
<i>Potamogeton pulcher</i> Tuckerm.	Potamogetonaceae	Spotted pondweed
<i>Potamogeton pusillus</i> L.	Potamogetonaceae	Slender pondweed
<i>Potamogeton richardsonii</i> (Benn.) Rydb.	Potamogetonaceae	Red-head pondweed
<i>Potamogeton strictifolius</i> Benn.	Potamogetonaceae	Straight-leaved pondweed
<i>Potamogeton zosteriformis</i> Fern.	Potamogetonaceae	Flat-stem pondweed
<i>Potentilla norvegica</i> L.	Rosaceae	Strawberry weed
<i>Potentilla recta</i> L.*	Rosaceae	Rough-fruited cinquefoil
<i>Potentilla rivalis</i> Nutt.	Rosaceae	Brook cinquefoil
<i>Proserpinaca palustris</i> L.	Halagaraceae	Mermaid-weed
<i>Prunella vulgaris</i> L.	Lamiaceae	Self heal
<i>Prunus americana</i> Marsh.	Rosaceae	Wild Plum
<i>Prunus serotina</i> Ehrh.	Rosaceae	Black cherry
<i>Prunus virginiana</i> L.	Rosaceae	Choke-cherry
<i>Quercus alba</i> ***	Fagaceae	White Oak
<i>Quercus bicolor</i> Willd.	Fagaceae	Swamp white oak
<i>Quercus imbricaria</i> Michx.	Fagaceae	Shingle oak
<i>Quercus marilandica</i> Muench.	Fagaceae	Blackjack oak
<i>Quercus palustris</i> Muench.	Fagaceae	Pin oak
<i>Quercus prinoides</i> Willd.	Fagaceae	Chinquapin oak
<i>Quercus rubra</i> L.	Fagaceae	Red oak
<i>Quercus shumardii</i> Buckl.	Fagaceae	Shumard oak

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Quercus stellata</i> Wang.	Fagaceae	Sand post oak
<i>Quercus velutina</i> Lam.	Fagaceae	Black oak
<i>Ranunculus fascicularis</i> ***	Ranunculaceae	Early buttercup
<i>Ranunculus flabellaris</i> Raf.	Ranunculaceae	Yellow water crowfoot
<i>Ranunculus hispidus</i> Michx.	Ranunculaceae	Swamp buttercup
<i>Ranunculus longirostris</i> Godr.	Ranunculaceae	White water crowfoot
<i>Ranunculus pensylvanicus</i> L.	Ranunculaceae	Bristly crowfoot
<i>Ranunculus rhomboideus</i> ***	Ranunculaceae	Prairie buttercup
<i>Ranunculus scleratus</i> L.	Ranunculaceae	Cursed crowfoot
<i>Ranunculus septentrionalis</i> ***	Ranunculaceae	Swamp Buttercup
<i>Ranunculus subrigidus</i> W. Drew	Ranunculaceae	White water crowfoot
<i>Ratibida pinnata</i> (Vent.) Barnh.	Asteraceae	Gray-headed coneflower
<i>Rhamnus cathartica</i> L. *,***	Rhamnaceae	Common buckthorn
<i>Rhamnus frangula</i> L. *,***	Rhamnaceae	Glossy buckthorn
<i>Rhus radicans</i> ***	Anacardiaceae	Poison Ivy
<i>Rhus typhina</i> L. ***	Anacardiaceae	Staghorn Sumac
<i>Ribes americanum</i> Mill.	Saxifragaceae	Wild black currant
<i>Ribes hirtellum</i> Michx.	Saxifragaceae	Gooseberry (Smooth Gooseberry)
<i>Ribes missouriense</i> Nutt.	Saxifragaceae	Missouri gooseberry
<i>Riccia fluitans</i>	Ricciaceae	Aquatic liverwort
<i>Ricciocarpus natans</i>	Ricciaceae	Common ricciocarpus
<i>Robinia pseudo-acacia</i> L. *	Fabaceae	Black locust
<i>Rorripa nasturtium-aquaticum</i> (L.) Hayek*	Brassicaceae	Water cress
<i>Rorripa palustris</i> (L.) Bess.	Brassicaceae	Marsh cress
<i>Rorripa sessiliflora</i> (Nutt.) Hitchc.	Brassicaceae	Sessile-flowered cress
<i>Rosa blanda</i> Ait.	Rosaceae	Early wild rose
<i>Rosa Carolina</i> ***	Rosaceae	Pasture Rose
<i>Rosa setigera</i> Michx.	Rosaceae	Prairie rose
<i>Rosa suffata</i>	Rosaceae	Dwarf prairie rose
<i>Rubus allegheniensis</i> Porter.	Rosaceae	Common blackberry
<i>Rubus flagellaris</i> L.	Rosaceae	Northern dewberry
<i>Rubus occidentalis</i> L.	Rosaceae	Black raspberry
<i>Rubus strigosus</i> Michx.	Rosaceae	Red raspberry
<i>Rudbeckia hirta</i> L.	Asteraceae	Black-eyed susan
<i>Rudbeckia laciniata</i> L.	Asteraceae	Cutleaf coneflower
<i>Rudbeckia triloba</i> L.	Asteraceae	Three-lobed coneflower
<i>Ruellia humilis</i> Nutt.	Acanthaceae	Fringeleaf ruellia
<i>Ruellia strepens</i> L.	Acanthaceae	False petunia
<i>Rumex acetosella</i> L. *	Polygonaceae	Sheep sorrel
<i>Rumex altissimus</i> Wood.	Polygonaceae	Pale dock

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Rumex crispus</i> L. *	Polygonaceae	Curly dock
<i>Rumex maritimus</i> L.	Polygonaceae	Golden dock
<i>Rumex orbiculatus</i> Gray	Polygonaceae	Water dock
<i>Rumex salicifolius</i> J.A. Weinm.	Polygonaceae	Dock (Willow Dock)
<i>Rumex verticillatus</i> L.	Polygonaceae	Swamp dock
<i>Sagittaria brevirostra</i> Mack. & Bush	Alismataceae	Short-beaked arrowhead
<i>Sagittaria calycina</i> Engelm.	Alismataceae	Mississippi arrowhead
<i>Sagittaria cuneata</i> Sheldon	Alismataceae	Northern arrowhead
<i>Sagittaria graminea</i> Michx.	Alismataceae	Grass-leaved arrowhead
<i>Sagittaria latifolia</i> Willd.	Alismataceae	Broad-leaved arrowhead
<i>Sagittaria rigida</i> Pursh	Alismataceae	Sessile-fruited arrowhead
<i>Salix amygdaloides</i> Anderss.	Salicaceae	Peach-leaved willow
<i>Salix eriocephala</i> Michx.	Salicaceae	Diamond willow
<i>Salix interior</i> Rowlee	Salicaceae	Sandbar willow
<i>Salix nigra</i> Marsh.	Salicaceae	Black willow
<i>Sambucus canadensis</i> L.	Caprifoliaceae	Elderberry
<i>Sambucus pubens</i> ***	Caprifoliaceae	Red Elderberry
<i>Sanguinaria canadensis</i> L.	Papaveraceae	Bloodroot
<i>Saponaria officinalis</i> ***	Caryophyllaceae	Bouncing Bet
<i>Sassafras albidum</i> (Nutt.) Nees.	Lauraceae	Sassafras
<i>Saururus cernuus</i> L.	Saururaceae	Lizard's tail
<i>Saxifraga pensylvanica</i> L.	Saxifragaceae	Swamp saxifrage
<i>Schizachyrium scoparium</i> ***	Gramineae	Little bluestem
<i>Scirpus acutus</i> Muhl.	Cyperaceae	Hardstem bulrush
<i>Scirpus americanus</i> Pers.	Cyperaceae	Olney-three square
<i>Scirpus atrovirens</i> Willd.	Cyperaceae	Black bulrush
<i>Scirpus cyperinus</i> (L.) Kunth	Cyperaceae	Woolly bulrush
<i>Scirpus fluviatilis</i> Torr. & Gray	Cyperaceae	River bulrush
<i>Scirpus heterochaetus</i> Chase	Cyperaceae	Slender bulrush
<i>Scirpus pendulus</i> Muhl.	Cyperaceae	Nodding bulrush
<i>Scirpus validus</i> Vahl.	Cyperaceae	Softstem bulrush
<i>Scrophularia marilandica</i> L.	Scrophulariaceae	Figwort
<i>Scutellaria galericulata</i> L.	Lamiaceae	Common skullcap
<i>Scutellaria lateriflora</i> L.	Lamiaceae	Mad-dog skullcap
<i>Senecio aureus</i> ***	Compositae	Golden ragwort
<i>Senecio glabellus</i> Poir.	Asteraceae	Yellowtop
<i>Senecio plattensis</i> ***	Compositae	Prairie ragwort
<i>Setaria faberi</i> Herrm.	Poaceae	Giant foxtail
<i>Setaria glauca</i> (L.) P. Beauv.	Poaceae	Yellow foxtail
<i>Setaria viridis</i> (L.) Beauv.	Poaceae	Green foxtail

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Sicyos angulatus</i> L.	Curcubitaceae	Bur cucumber
<i>Sida spinosa</i> L.	Malvaceae	Prickly sida
<i>Silene stellata</i> ***	Caryophyllaceae	Starry Campion
<i>Silene vulgaris</i> ***	Caryophyllaceae	Bladder campion
<i>Silphium integrifolium</i>	Compositae	Prairie rosinweed
<i>Silphium laciniatum</i> ***	Asteraceae	Compass plant
<i>Silphium perfoliatum</i> ***	Compositae	Cup Plant
<i>Sisyrinchium campestre</i> E. Bickn.	Iridaceae	Prairie blue-eyed grass
<i>Sium suave</i> Walt.	Apiaceae	Water parsnip
<i>Smilax ecirrhata</i> (Engelm.) S. Wats.	Smilacaceae	Upright carrion flower
<i>Smilax herbacea</i> L.	Smilacaceae	Carrion flower
<i>Smilax hispida</i> Muhl.	Smilacaceae	Bristly greenbrier
<i>Solanum carolinense</i> L.	Solanaceae	Horsenettle
<i>Solanum dulcamara</i> L.	Solanaceae	Bittersweet
<i>Solanum nigrum</i> L.	Solanaceae	Black nightshade
<i>Solidago canadensis</i> L.	Asteraceae	Canada goldenrod
<i>Solidago gigantea</i> ***	Compositae	Smooth Goldenrod
<i>Solidago hispida</i> ***	Asteraceae	Hairy goldenrod
<i>Solidago juncea</i> ***	Asteraceae	Early Goldenrod
<i>Solidago nemoralis</i> ***	Compositae	Grey Goldenrod
<i>Solidago ohioensis</i> ***	Asteraceae	Ohio Goldenrod
<i>Solidago speciosa</i> ***	Asteraceae	Showy Goldenrod
<i>Sonchus asper</i> ***	Compositae	Spiny-leaved Sow Thistle
<i>Sorghastrum nutans</i> ***	Poaceae	Indian Grass
<i>Specularia perfoliata</i> ***	Campanulaceae	Venus' Looking-glass
<i>Spirea alba</i> ***	Rosaceae	Meadowsweet
<i>Staphylea trifolia</i> L.	Staphyleaceae	Bladdernut
<i>Stellaria aquatica</i> (L.) Scop.	Caryophyllaceae	Giant chickweed
<i>Stellaria media</i> (L.) Cyrillo	Caryophyllaceae	Common chickweed
<i>Stipa spartea</i> ***	Gramineae	Needle Grass
<i>Symplocarpus foetidus</i> (L.) Nutt.	Araceae	Skunk cabbage
<i>Tanacetum vulgare</i> L.*	Asteraceae	Common tansy
<i>Taraxacum officinale</i> Weber:	Asteraceae	Dandelion
<i>Taxodium distichum</i> (L.) Rich.	Taxodiaceae	Bald cypress
<i>Tephrosia virginiana</i> ***	Leguminosae	Goat's rue
<i>Teucrium canadense</i> L.***	Lamiaceae	American germander
<i>Thalictrum dasycarpum</i> Fisch. and Lall.	Ranunculaceae	Tall meadow rue
<i>Thalictrum dioicum</i> L.	Ranunculaceae	Early meadow rue
<i>Thalictrum revolutum</i> DC.	Ranunculaceae	Waxy meadow rue
<i>Thelypteris palustris</i> Schott.	Polypodiaceae	Marsh fern

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Thuja occidentalis</i> ***	Cupressaceae	White Cedar
<i>Tilia americana</i> L.	Tiliaceae	Basswood
<i>Toxicodendron radicans</i> ssp. <i>negundo</i> (Greene) Gillis	Anacardiaceae	Common poison ivy
<i>Toxicodendron rydbergii</i> (Small ex Rydb.) Greene	Anacardiaceae	Western poison ivy
<i>Tradescantia ohimensis</i> ***	Commelinaceae	Smooth-stemmed or Common Spiderwort
<i>Tradescantia virginiana</i> L.	Commelinaceae	Spiderwort
<i>Tragopogon pratensis</i> ***	Asteraceae	Yellow Goat's Beard
<i>Trifolium pratense</i> ***	Leguminosae	Red Clover
<i>Trifolium repens</i> ***	Leguminosae	White Clover
<i>Trillium cernuum</i> L.	Liliaceae	Nodding trillium
<i>Triodanis perfoliata</i> (L.) Nieuwl.	Campanulaceae	Spectacle-weed
<i>Triosteum perfoliatum</i> L.	Caprifoliaceae	Horse-gentian
<i>Typha angustifolia</i> L.	Typhaceae	Narrow-leaved cattail
<i>Typha latifolia</i> L.	Typhaceae	Common cattail
<i>Ulmus americana</i> L.	Ulmaceae	American elm
<i>Ulmus parvifolia</i> ***	Ulmaceae	Chinese Elm
<i>Ulmus parvifolia</i> ***	Ulmaceae	Chinese Elm
<i>Ulmus pumila</i> L.*	Ulmaceae	Siberian elm
<i>Ulmus rubra</i> Muhl.	Ulmaceae	Red elm
<i>Urtica dioica</i> L.*	Urticaceae	Stinging nettle
<i>Utricularia vulgaris</i> L.	Lentibulariaceae	Common bladderwort
<i>Uvularia grandiflora</i> J.E. Smith	Liliaceae	Bellwort
<i>Vallisneria americana</i> Michx.	Hydrophyllaceae	Water celery (Wild celery)
<i>Verbascum thapsus</i> ***	Scrophulariaceae	Common mullein
<i>Verbena hastata</i> L.***	Verbenaceae	Blue vervain
<i>Verbena stricta</i> ***	Verbenaceae	Hoary vervain
<i>Verbena urticifolia</i> L.	Verbenaceae	White vervain
<i>Verbesina alternifolia</i> (L.) Britt.	Asteraceae	Winged-stem
<i>Vernonia baldwini</i> Torr.	Asteraceae	Western ironweed
<i>Vernonia gigantea</i> (Walter) Trel.	Asteraceae	Tall ironweed
<i>Vernonia missurica</i> Rat.	Asteraceae	Missouri ironweed
<i>Veronia fasciculata</i> ***	Compositae	Smooth Ironweed
<i>Veronia fasciculata</i> ***	Compositae	Smooth Ironweed
<i>Veronica anagallis-aquatics</i> L.	Asteraceae	Water speedwell
<i>Veronica peregrina</i> L.	Scrophulariaceae	Purslane-speedwell
<i>Veronica scutellata</i> L.	Asteraceae	Marsh speedwell
<i>Veronicastrum virginicum</i> (L.) Farw.	Scrophulariaceae	Culver's root
<i>Viburnum dentatum</i> ***	Caprifoliaceae	Arrowwood
<i>Viburnum lentago</i> L.	Caprifoliaceae	Nannyberry

List of Plants Found on Trempealeau NWR (Continued)

Scientific Name	Family	Common Name
<i>Vicia cracca</i> ***	Leguminosae	Cow vetch
<i>Vicia villosa</i> ***	Leguminosae	Hairy vetch
<i>Viola pedata</i> ***	Violaceae	Bird's foot violet
<i>Viola pedatifida</i> ***	Violaceae	Prairie Violet
<i>Viola sagittata</i> Ait.	Violaceae	Arrow-leaved violet
<i>Viola sororia</i> Willd.	Violaceae	Missouri violet
<i>Vitis aestivalis</i> var. <i>argentina</i> folia	Vitaceae	Summer grape
<i>Vitis cinerea</i> Engelm.	Vitaceae	Graybark grape
<i>Vitis palmata</i> Vahl.	Vitaceae	Red grape
<i>Vitis riparia</i> Michx.	Vitaceae	Riverbank grape
<i>Vitis vulpina</i> L.	Vitaceae	Frost grape
<i>Wolffia columbiana</i> Karst.	Lemnaceae	Water meal
<i>Wolffia papulifera</i> Thompson	Lemnaceae	Water meal
<i>Wolffia punctata</i> Griseb.	Lemnaceae	Dotted water meal
<i>Wolffiella floridana</i> (J.D. Smith) Thompson	Lemnaceae	Water meal
<i>Woodsia obtusa</i> (Spreng.) Torr.	Polypodiaceae	Blunt-lobed woodsia
<i>Xanthium strumarium</i> L.*	Asteraceae	Common cocklebur
<i>Xanthoxylum americanum</i> Mill.	Rutaceae	Prickly ash
<i>Zannichellia palustris</i> L.	Zannichelliaceae	Horned pondweed
<i>Zizania palustris</i> L. var. <i>interior</i> Fassett	Poaceae	Wild rice
<i>Zizia aurea</i> (L.) W. Do J. Koch.	Apiaceae	Golden alexander
<i>Zosterella dubia</i> (Jacq.) Small	Pontederiaceae	Water stargrass

Appendix H: Plan Implementation

Appendix H: Plan Implementation

1. Introduction

This appendix summarizes the actions, funding, coordination, and monitoring required to implement Alternative C, the preferred alternative, as presented in the EIS/CCP. This appendix will be incorporated as a separate chapter in the Final CCP that emerges from the EIS. As noted in the inside cover, these plans do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition. These decisions are at the discretion of Congress in overall appropriations, and in budget allocation decisions made at the Washington and Regional levels of the Service.

2. A Word about Priorities

In the Refuge Improvement Act of 1997, Congress established a three-tiered hierarchy, or three priorities, for refuge management. As a first priority, every refuge is to be managed to fulfill its purposes and the Refuge System mission, namely conservation of fish, wildlife, and plants. Secondly, refuges are to facilitate wildlife-dependent or “Big 6” public uses, namely hunting, fishing, wildlife observation and photography, and interpretation and environmental education. Of lowest priority is managing other uses and activities such as general recreation.

However, setting priorities in a linear or in-order fashion (e.g. implementing from top to bottom on a list of prioritized actions) is generally not realistic when dealing with the complexities and multi-program nature of managing a national wildlife refuge. In practice, a linear approach is not always workable. Below are a few of the reasons why some actions identified in this Implementation Plan must be done simultaneously, or why some general recreation actions are done before other resource-related actions.

Funding streams from Congress may not follow an established hierarchy. For example, there may be no appropriations for land acquisition or habitat restoration in a given year, but



Trempealeau Mountain. © Sandra Lines

Congress may choose to fund visitor services enhancement packages.

- # A high priority such as habitat restoration is costly on a major river and dependent on funding from other sources, such as the Environmental Management Program administered by the Corps of Engineers. Thus, habitat restoration may be the highest priority for the Refuge, but if the funding is lacking, it cannot be accomplished.
- # The states or Corps of Engineers may have year-to-year priorities that benefit visitors to the Refuge and meet a Refuge objective. An example would be state funding for recreation enhancement such as extension of the state bike trail that must be spent in a given year or lost. In this case it is an urgent need in a fiscal sense, although a lower priority resource-wise.
- # The public or other units of government may strongly urge actions that may not be high resource priorities, or staff may be confronted with health, safety, or societal needs that must be addressed. Examples include a right-of-way



Prairie habitat, Trempealeau NWR. USFWS

expansion for a utility or highway project, protection of archeological resources, or entrance road flooding.

- # Many actions are integrated with other actions. For example, during migration, waterfowl stage in large flocks, resting and feeding in preparation of energy demanding flight. Disturbance from public uses can severely impact the birds' ability to put on enough reserve energy (body fat) to successfully migrate. It is important to limit disturbance to migrating waterfowl, which leads to guidelines or regulations for public use during critical times. Thus, many actions must be enacted simultaneously to achieve objectives.
- # Some actions must be sequenced. For example, Objective 2.2 calls for using commercial fishing to reduce rough fish abundance. Rough fish control is most effective in coordination with a pool drawdown the following spring. Drawdowns are scheduled at 5-year intervals, so commercial fishing would likely also occur at a 5-year interval.

Given the above, the actions listed below are in two categories: those that can be completed with existing funding and staffing, and those that will take additional resources. Target dates for completion give an indication of the priority and are useful for planning workloads in any given year. Many actions are ongoing as noted, and some of these may also be included in a step-down plan (see list, Section 6). If an action has the date of 2022, this means the action will be done no later than 2022, the 15-year planning horizon for the CCP. It is hoped that many of these actions will be completed well ahead of that date. This list is not all inclusive and details in specific objectives, along with all the strategies, will be used as applicable in implementing the CCP.

3. Actions – Existing Funding and Staffing

The following actions are derived from objectives and strategies in the CCP and represent those actions that can be accomplished with existing resources. Some of these actions reflect current, ongoing efforts, but most require a new initiative and/or redirection of existing Refuge funding and staff effort. This list will help focus annual work planning and performance plan preparation during the 15-year life of the plan. Details of these actions are found in Chapter 2 of the EIS/CCP.

Goal 1: Landscape

1. Maintain contact with landowners within the approved acquisition boundary.
2. Keep Regional Realty Specialists informed of any changes to property status.
3. Seek Land and Water Conservation Fund appropriations for land acquisition
4. Travel the boundary every other year to inspect signs and correct deficiencies.
5. Request a survey of the north boundary along Highway 35 between Marshland and River Bottoms Road. Correctly post.
6. Correctly post west boundary of River Bottoms property, surveying if necessary
7. Implement the following flood management policy: “When the Mississippi River is in flood stage, do not allow water to enter Refuge pools through the lower diversion dike structure, the Marshland Road inlet or any other facilities.”
8. Meet with BNSFRR officials to explain the policy and explore other alternatives to protect their dike.
9. Develop a Management Plan for Black Oak Island.
10. Determine if further shoreline protection is needed to prevent erosion of artifacts from Black Oak Island.
11. Protect archeological resources on Black Oak Island by increasing law enforcement surveillance and closing the island to unsupervised public access.
12. Improve relationship and coordination with the Mississippi Valley Archeology Center.

13. Restrict public access to the top of the road on Kiep's Island.
14. Work with Wisconsin DNR and Perrot State Park to protect cultural resources on Trempealeau Mountain.

Goal 2: Wildlife and Habitat

1. Develop a Habitat Management Plan.
2. Annually treat 5 acres each of upland and floodplain forest to remove black locust and European buckthorn.
3. Work with Army Corps of Engineers foresters to identify stands and prescriptions for timber sales. Permit commercial harvest of black locust and pine.
4. By 2008, clear down timber from burn units by permitting firewood cutting.
5. Protect swamp white oak in Pool C2 by lowering the water level during the growing season to avoid prolonged flooding.
6. With others, seek research on floodplain forest regeneration and restoration of forest habitats to benefit cavity-dependent species.
7. Once every 5 years reduce water levels in pool A by pumping to expose 50 percent (350 acres) of the bottom.
8. Once every 5 years (alternating with Pool A), reduce water elevations in Pool E. Avoid prolonged flooding of swamp white oaks in Unit C2 by lowering water level below the root mass of these trees during the growing season.
9. Maintain stable or declining water levels in Pools B and E, June through August



Bald Eagle. USFWS

10. Use commercial fishing and winter drawdowns to reduce populations of rough fish in Pools A and B.
11. Work with USGS and the National Weather Service to re-establish a permanent weather station.
12. Continue to stress the importance of water quality in public information and interpretation, and environmental education programs.
13. Maintain existing 335 acres of prairie.
14. Use prescribed fire as described in the approved Fire Management Plan (USFWS 2001)
15. Expand the flea beetle release program to reduce leafy spurge in all prairie/oak savanna habitats.
16. Removing all pine plantings from within prairie units.
17. Use volunteers and school groups to collect and redistribute native grass and wildflower seed.
18. Develop interpretive and education programs on prairies and invasive plants.
19. Write an Integrated Pest Management Plan.
20. Seek seasonal staff and funding to accelerate current control of invasives.
21. Continue to work with the Department of Agriculture, other agencies, the state, and other refuges in securing insects for release on the Refuge and on private lands within the Trempealeau and Buffalo River Watersheds.
22. Seek grants, cost-sharing, or special funding opportunities for invasive plant removal.
23. Conduct public information efforts including media, brochures, signs, and programs to increase awareness of the threats posed by invasive plants and what citizens can do to minimize the introduction or spread of invasive species.
24. Monitor all pools for invasive fish, aquatic plants and mollusks.
25. Investigate feasibility of implementing an exchange program for gardeners with loosestrife planted in ornamental gardens.
26. Continue to serve as a source of flea beetles for other agencies and landowners who have infestations of leafy spurge.

27. Update the Wildlife Inventory Plan to include all federal and state listed species, species of regional conservation concern, furbearers, and deer.
28. Participate in formal coordination meetings with USGS to share biological data, monitoring and monitoring expertise.
29. Work with the Upper Mississippi NW&FR GIS biologist and the Winona District biologist to coordinate equipment, staff, survey schedules, and data analysis.
30. Foster partnerships with colleges and universities to encourage graduate research projects.
31. Continue to use volunteers to complete wildlife surveys.
32. Evaluate all state listed species for potential occurrence on the Refuge and the need for monitoring or management action.
33. Continue to monitor Bald Eagle nesting and success.
34. Close a 100-meter radius around active Bald Eagle nests to public entry February 1 to July 1.
35. Where feasible, protect large nest trees from prolonged flooding and erosion.
36. Work with Wisconsin DNR to assess the potential for reintroduction of Massassagua rattlesnakes in the River Bottoms Road area.
37. Increase education and outreach on threatened and endangered species and their needs.
38. Encourage research by universities and partner agencies on deer-habitat interactions including implications to invasive plant abundance.
39. Work closely with Wisconsin DNR to coordinate information exchange, planning, and management of chronic wasting disease (CWD) on nearby lands.
40. Continue to use a managed public hunt of white-tailed deer to maintain acceptable levels of browse.
41. Update the Hunt Plan to include white-tailed deer hunting.
42. Update the Visitor Service Plan to improve safety and require all pedestrians to wear blaze orange during the gun hunt.
43. Investigate options for closing the Refuge to non-hunting visitors during key hunting times.
44. Continue issuing over-the-counter permits for late season archery.
45. Continue to operate a check station on opening weekend.
46. Require mandatory reporting of hunter success or loss of 1-year hunting privileges.
47. Continue to follow Wisconsin guidelines for season dates and times.
48. Update the Furbearer Management Plan.
49. Continue to manage muskrat, beaver, and raccoon populations at levels where damage to dikes and interference with water management and bird banding operations is limited.
50. Use furbearer harvest data to determine appropriate levels to minimize damage to dikes and structures.

Goal 3: Public Use

1. Improve and maintain two existing hiking trails, a 4.5-mile auto tour route, and the existing observation deck.
2. Promote wildlife photography by working with local photographers to develop at least one annual workshop and assist with Upper Mississippi NW&FR photo contest.
3. Develop a Visitor Services Plan.
4. Investigate the cost/benefit ratio of implementing an entrance fee program.
5. Work closely with the Wisconsin DNR and advisory committee to facilitate extension of the bike trail to Winona, while minimizing impacts to Refuge lands.
6. Improve directional signs and install “watch for bikes” signs along auto tour route.
7. Add bike racks at the Marshland and main entrances, near the kiosk at the entrance to the auto tour route, and at the observation deck.
8. Improve directional signs and interpretive materials for bicyclists.
9. Develop and publish a list of interpretive events and environmental education opportunities.
10. Update and maintain current events on the Refuge website quarterly. Include current events, trail information, and seasonal bird sightings
11. Continue to hold an annual birding festival each spring; participate in the Mississippi Valley Birding Festival sponsored by Audubon.

12. Explore opportunities to develop volunteer-led interpretive programs by involving volunteers in program development and training them as docents.
13. Establish a Junior Ranger program.
14. Continue to issue news releases on special events or temporary changes to regulations.
15. Investigate developing a Master Naturalist program.
16. As practical, participate in local area expos, sportsman shows, and other outdoor events to promote the Refuge.
17. Prepare a bi-annual column for area newspapers highlighting Refuge news, events and wildlife sightings.
18. Work closely with local community groups, like the Chamber of Commerce, tourism board, library, Great River Road Committee, and Perrot State Park to share resources and coordinate programming.
19. Work with local teachers to develop grade-specific environmental education curricula that meet local, state and national education standards.
20. Continue to offer River Education Days (RED) targeting 5th grade students from surrounding Wisconsin and Minnesota schools.
21. Promote collaboration and partnerships with area teachers, schools, colleges, other wildlife agencies, and natural resource and conservation groups to increase environmental education opportunities focused on Refuge and river corridor ecosystems.
22. Offer environmental education and other related topic workshops for teachers.
23. Contact schools annually, notifying them of the Refuge's facilities, resources and educational opportunities by means of fliers or letters to principals and individual teachers.
24. Update the Trempealeau NWR Educators' Guide by 2010.
25. Encourage additional partnerships with high school science or biology classes to assist with research, wildlife surveys, or bird banding.
26. Encourage high schools and universities to utilize the Refuge facilities for curriculum based programs.
27. Develop a hunting program that provides opportunities for people with disabilities, youth,



Hunt Program for person with disabilities, Trempealeau NWR. USFWS

- and other first time hunters, and allow ample time for public review and comment.
28. Investigate opportunities to partner with the state's "Becoming an Outdoorswoman" program.
29. Investigate options for developing a "learning to hunt" program.
30. Annually review Refuge hunting regulations to ensure clarity and to address emerging issues or concerns, and to give the public an opportunity to review and comment on any changes.
31. Improve the general hunting experience by continuing to improve habitat quality and enforcement of regulations.
32. Clearly sign boundaries of areas closed to hunting.
33. Consult with the La Crosse Fishery Resource Office to update the Fishery Management Plan by 2009.
34. Remove sediment and milfoil from around the existing fishing platform to improve habitat for fish.

35. Coordinate with Trempealeau County to improve their boat launch on the Trempealeau River.
36. Promote fishing through interpretive posters and exhibits.
37. Include fish biology and management in environmental education events and curriculums.
38. Work with staff of Upper Mississippi NW&FR to provide an annual fishing event for young people.

Goal 4: Neighboring Landowners and Communities

Existing Funding and Staffing

1. Join the Trempealeau County Tourism Council and Trempealeau Chamber of Commerce and attend meetings.
2. Attend meetings of the Great River Road Promotion Committee, Mississippi River Parkway Commission and Scenic Byways Commission.
3. Develop relationships with Galesville, Trempealeau, and Ettrick libraries to hold evening programs and set up seasonal exhibits.
4. Continue to issue news releases to local newspapers, radio and television stations for public events, environmental education programs, changes to Refuge regulations, management activities of interest to the public and special wildlife viewing opportunities.



Refuge Week school group visit, Trempealeau NWR. USFWS

5. Work with Western Wisconsin Cable Television to produce programs for public access TV.
6. Invite key individuals to coordinate establishment of a Friends group.
7. Assist new Friends members with mentoring and applications for start-up grants
8. Suggest a list of Friend's team building projects that would benefit the Refuge.
9. Assist Friends with contacts and an introduction to state and federal legislative staffs.
10. Assist Friends with inventory, set up, and operation of a Refuge bookstore.
11. Increase volunteer hours and number of volunteers by an average of 5 percent per year.
12. Keep volunteer contact information current. Contact each volunteer at least once annually whether they participated that year or not.
13. Have clear expectations and instructions for each volunteer and each task.
14. Train volunteers to effectively conduct educational and interpretive programs, biological surveys, and maintenance operations.
15. Ensure that volunteers receive the same safety training as all staff.
16. Provide an identity for volunteers with uniforms and standard nametags.
17. Recruit volunteers with a diversity of backgrounds and skills, matching them with tasks that complement their interests and abilities.
18. Keep volunteers active in all programs: administration, biology, maintenance, and public use.
19. Recognize and thank volunteers for their efforts. Ensure that they feel they are a contributing part of the staff team.
20. Hold an annual volunteer appreciation banquet.
21. Keep a current volunteer news and recognition bulletin board in the office building.
22. Meet twice a year with Perrot State Park staff to coordinate land management, and public use issues.
23. Develop partnerships with Universities of Wisconsin and Minnesota, and other local colleges to share resources and to implement graduate level, adaptive management research.



Observation deck, Trempealeau NWR. USFWS

24. Improve coordination and communication with local sportsman and conservation groups.
25. Monitor three conservation easements annually for compliance and to assess habitat management need.
26. Ensure opportunities for communication between staff and area citizens.

Goal 5: Administration and Operations

1. Ensure that Refuge office and maintenance needs are reflected in budget needs databases.
2. Continue to maintain Service-owned facilities using annual maintenance budget allocations.
3. Ensure that staffing needs are incorporated in budget needs databases.
4. Update databases as needed or at least once annually.

Goal 1: Landscape

Action	Short-term or project-specific costs (thousands)	Recurring cost per year (thousands)
1. Acquire from willing sellers 340 acres within approved boundary	\$510	
2. Install automatic gate a entrance	\$30	\$1
3. Develop interpretive program on importance of flood plains	\$5	
4. Map vegetation on Black Oak Island	\$5	
5. Remove invasive plants from Black Oak Island	\$15	\$5
6. Inventory archeological resources on Black Oak Island	\$25	
7. Develop a Cultural Resources Management Plan	\$15	
8. Develop interpretive program on ancient people of refuge	\$12	
9. Hire PFT law enforcement officer , shared ½ time w/Winona District	\$70	\$30
10. Provide archeological resource protection training for all staff	\$6	
11. Inventory archeological resources on sensitive sites	\$15	\$5

4. Actions – New Funding and Staff

The following actions are derived from objectives and strategies in the CCP and represent those actions that can be accomplished if new funding and/or staffing is allocated to the Refuge. The completion target for these actions is generally 2022 given the unknown nature of funding. Details of these actions are identified in Chapter 2 of the EIS/CCP.

Costs are estimates and will likely be higher or lower based on detailed project planning and timing of implementation. Staff costs reflect 2006 salary and benefit rates at grades normal for the positions described. These needs will be reflected in key Refuge System databases such as the Refuge Operating Needs System, Maintenance Management System, and Service Assessment and Maintenance Management System which provide information used in budget formulation and allocation. The Refuge will also seek other project funding such as cost share agreements with partners, agency grant programs, grants from non-profit groups, and cost-saving or reprogramming measures within existing budget allocations.

Total funding needs for the 15-year life of the CCP equals the one-time or project-specific costs plus the recurring costs per year times 15 years (\$4.5 million), or a total of \$16.2 million. Of this total, \$10 million, or 62 percent, is directly related to habitat improvements and land acquisition.

Goal 2: Wildlife and Habitat

Action	Short-term or project-specific costs (thousands)	Recurring cost per year (thousands)
1. Enhance 500 acres of floodplain forest	\$250	
2. Remove all Scotch pine and thin pine plantations by 50%	\$100	
3. Continue restoration of swamp white oaks at river bottoms site		\$10
4. Once every 7 years pump pool B		\$5
5. Develop infrastructure to manage 5,500 acres of wetlands	\$6,000	\$50
6. Hire seasonal tractor operator to maintain pumps dikes, structures		\$40
7. Continuously monitor water quality at 6 locations	\$20	\$2
8. Restore 100 acres prairie/oak savanna		\$20
9. Annually convert 5 acres black locust to prairie		\$10
10. Annually plant 2 acres of oaks and hardwoods		\$10
11. Hire seasonal biological technician to oversee prairie/oak savanna restoration and invasive plant removal		\$40
12. Build and maintain GIS database on invasive plants	\$10	\$2
13. Explore installation of fish barriers at all structures	\$50	
14. Summarize and analyze survey data	\$50	
15. Every 5 years count deer/model browse impacts		\$20
16. Improve signs and develop hunting safety brochure	\$10	
17. Provide Refuge-specific training for trappers		\$3

Goal 3: Public Use

Action	Short-term or project-specific costs (thousands)	Recurring cost per year (thousands)
1. Develop a canoe trail	\$10	\$2
2. Develop trail guide and maps	\$5	
3. Update and add new trail signs	\$10	\$2
4. Maintain and enhance auto-tour loop	\$20	\$2
5. Develop observation points along hiking trails; install benches	\$80	\$2
6. Update signs on Woods Trail	\$15	
7. Improve and upgrade accessibility at Prairie View Trail	\$100	\$5
8. Update and enhance the native plant interpretive garden	\$15	\$1
9. Interpret the historic CCC camp site	\$75	\$1
10. Develop an accessible trail and interpretive program for people with vision impairments	\$150	\$2
11. Develop a Marsh Discovery Trail and connect 3 existing trails	\$250	\$5
12. Establish a system of cross-country ski trails and trail maps	\$10	\$2
13. Purchase 30 pairs of snowshoes	\$10	

Goal 3: Public Use (Continued)

14. Replace existing observation deck	\$125	\$1
15. Install bird cam w/internet link	\$10	\$1
16. Construct an outdoor, fully accessible restroom to accommodate groups	\$80	\$5
17. Add an outside drinking fountain/water source to shop	\$25	
18. Develop interpretive signs for Marshland portion of bike trail	\$5	
19. Develop interpretive materials for bicyclists	\$5	
20. Develop a Blue Goose Bike program, to encourage park and bike on Refuge	\$25	\$5
21. Update 3 and add 6 new kiosks with interpretive panels	\$180	\$2
22. Update and reprint self-guided tour route brochure; enhance stops with sound posts	\$30	
23. Develop brochures on Big 6 public uses, plant list, invasives, winter wildlife and others	\$30	
24. Develop a traveling, pop-up display about Refuge	\$10	
25. Develop 3 ranger-led interpretive programs	\$10	
26. Hire seasonal park ranger to lead programs	\$40	
27. Purchase 30 binoculars, field guides and misc. interpretive supplies	\$10	\$3
28. Add a multi-purpose classroom addition (1,000ft ²) to office	\$300	\$5
29. Construct a 3 season outdoor learning shelter (900 ft ²)	\$400	\$5
30. Develop a lending library of books, videos, trunks	\$10	\$2
31. Conduct annual "learn to hunt" program		\$5
32. Expand hunt for people with disabilities	\$150	\$2
33. Improve boat ramp, parking, and existing fishing platform	\$200	
34. Install a new fishing platform on the Tremp. River	\$75	

Goal 4: Neighboring Landowners and Communities

Action	Short-term or project-specific costs (thousands)	Recurring cost per year (thousands)
1. Participate in 2 local expos, 3 festivals, 1 sportsmen show and 1 career fair annually		\$6
2. Develop an "It's your backyard" program for local landowners and citizens		\$3
3. Hire a private lands biologist (shared ½ time w/ Winona District)	\$30	\$70
4. Develop an invasive plant control program for private landowners	\$10	\$2

Goal 5: Administration and Operations

Action	Short-term or project-specific costs (thousands)	Recurring cost per year (thousands)
1. Continue design work on bridge for entrance road	\$150	
2. Replace existing shop	\$1,200	\$2
3. Add a 1500 ft ² office addition for new staff, volunteers, and storage	\$500	

5.New Funding Summary

New Funding Summary by Major Category to Fully Implement the CCP	Short-term or project-specific costs	Recurring cost per year
Land Acquisition within approved boundary	\$0.5 million	0
Habitat Improvement	\$6.5 million	\$0.2 million
Improved and expanded public use programs	\$2.4 million	\$0.1 million
General operations and maintenance	\$2.3 million	\$0.1 million
TOTAL	\$11.7 million	\$0.3 million

5. Summary of Step-Down Plans Needed

Below is a list of step-down plans called for in the EIS/CCP or required by Service policy. The planned completion date is in parenthesis, as well as a notation as to whether the step-down plan is new or is a revision of an existing plan. These Refuge-specific plans provide the details of implementing the respective program or initiative described in broad terms in the objectives and strategies, and in sections 3 and 4 above. These plans will be developed in consultation with other agencies, states, and partners. The public will be given ample opportunity for plan review and comment. Environmental assessments or other documentation may also be needed to comply with National Environmental Policy Act or other requirements.

- # Fire Management Plan (current, 2001)
- # Public Use Natural Area Management Plan (new, 2010)

- # Wildlife Inventory and Monitoring Plan (revise, 2008)
- # Habitat Management Plan (new, 2010)
- # Cultural Resources Management Plan (new, 2008)
- # Threatened, Endangered and Candidate Species (new, 2009)
- # Fishery Management Plan (revise, 2009)
- # Hunting Plan (revise, 2009)
- # Visitor Services Plan (revise, 2009)
- # Trapping Plan (revise, 2009)
- # Spill Response Plan (revise, 2009)
- # Educator’ Guide (new, 2010)
- # Easement/ROW Management Plan (new, 2010)
- # Disease Contingency Plan (new, 2010)
- # Herptile Management Plan (new, 2010)

6. Monitoring and Evaluation

Objectives and strategies implemented will be continually monitored and evaluated during the 15-year life of the plan. The wildlife inventory and monitoring plan update will be critical since fish and wildlife are important barometers of habitat condition and health. Many of the objectives in the plan deal directly with better monitoring and evaluation, and in this regard, adequate staffing and continued partnerships with the Corps of Engineers, states, U.S. Geological Survey, and others will be important. Many actions inherent in the plan are new directions, and monitoring will help understand the effects of the actions on habitat, fish and wildlife populations, and public use patterns and levels. In addition, the Mississippi River and its watershed will certainly change, and likely in ways unforeseen. Land use changes, invasive species, floods, disease outbreaks, and climate may alter expected outcomes, and monitoring will be critical to detecting and reacting to such change.

7. Plan Review and Revision

As noted previously, environmental change and unforeseen effects may call for changes in the plan. The Refuge will practice adaptive management, using monitoring, evaluation, and experimentation to learn and change aspects of the plan as needed.

Since the CCP will be a constant reference and guide for Refuge staff, internal review will be continuous. In addition, it is expected that the public and partners will offer continuous feedback. At least every 3 years, representatives of the Corps of Engineers, the state, other agencies, and non-profit and citizen groups will be invited to meet and provide more formal input into what is working, what is not, and possible changes the Refuge should consider. Revisions will be undertaken as needed by amendments to the CCP. There will be an opportunity for public review and comment prior to making any substantive changes. A major plan review and rewrite will occur after 15 years.

8. Partnerships

Refuge staff works with the Wisconsin Department of Natural Resources in designing and carrying out projects and programs. The Corps of Engineers is often a partner due to its dominant role in navigation, water level management, for-



River Education Days, Trempealeau NWR. USFWS

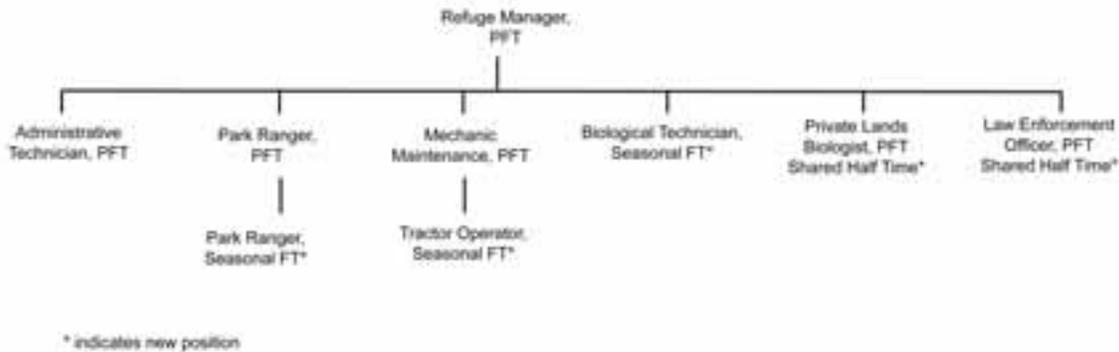
estry, and the planning and construction of environmental restoration projects. Much of the large scale habitat restoration and enhancement work is done through the Environmental Management Program administered by the Corps, and this work could accelerate should Congress approve and fund the Navigation and Environmental Sustainability Program (NESP).

The U. S. Geological Survey, Environmental Protection Agency, Department of Agriculture, and state-level counterpart agencies all play a role in biological monitoring, research, environmental regulation, and policy making on the river, and thus the Refuge. Other U.S. Fish and Wildlife Service programs such as fisheries and ecological services also play a key role, both as leaders for certain projects and programs, and in support. The Service's Partners for Fish and Wildlife Program will continue to play a critical role in working with private landowners to improve the watersheds of the Refuge.

Conservation organizations are active in policy issues and/or land acquisition affecting the Refuge and include Audubon, The Nature Conservancy, Ducks Unlimited, Trout Unlimited, Boys and Girls Scouts, and American Rivers. A host of local conservation and sporting organizations like the Wisconsin Waterfowl Association and the Associated Sportsman's Clubs of Trempealeau County are active. Lastly, many citizen conservationists help the Refuge as volunteers and as members of the Friends of the Upper Mississippi River Refuges, a citizen support group.

The forum for bringing together such a diversity of partners, who often have different missions and

Figure 1: Staff Chart, Trempealeau NWR



agendas, is both formal and informal. Established associations, commissions, committees, and working groups bring people together; plans, planning, and public meetings allow input from everyone. Specific projects and events let citizens lend a helping hand. These partnerships will remain an important part of plan implementation, both in gaining and maintaining public and partner understanding and support, and through the joint funding of specific actions.

9. Proposed Staff Chart

Please see Figure 1.

Appendix I: Compatibility Determinations

Appendix I: Compatibility Determinations

In accordance with the Refuge Improvement Act of 1997, no uses for which the Service has authority to regulate may be allowed on a unit of Refuge System unless it is determined to be compatible. A compatible use is a use that, in the sound professional judgment of the refuge manager, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the national wildlife refuge. Managers must complete a written compatibility determination for each use, or collection of like-uses, that is signed by the manager and the Regional Chief of Refuges in the respective Service region.

Draft compatibility determinations were included in the Draft EIS/CCP to allow public review and comment. Compatibility determinations based on Alternative C, the preferred alternative in the Final EIS/CCP, are available on the planning website at:

<http://www.fws.gov/midwest/planning/trempealeau>

Final compatibility determinations will be signed following release of the Record of Decision and will be available for viewing at the Refuge office. A list of compatibility determinations, a list of future uses that will require a case-by-case compatibility determination, and a list of uses that are generally prohibited and therefore not subject to compatibility follows:

- # Archeological investigations and surveys
- # Canoeing and kayaking
- # Commercial fishing
- # Deer Hunting
- # Environmental education
- # Fruits of the soil harvest
- # Interpretation, wildlife observation, and photography
- # Migratory Bird Hunting
- # Recreational Fishing
- # Research by Third parties
- # Temporary work outside of existing rights-of-way
- # Trapping of furbearers
- # Tree harvest

Case-by-case compatibility determinations (not included in CCP and EIS)

- # Special events, non-Refuge sponsored
- # Commercial filming
- # Military exercises
- # New or expanded rights-of-way
- # Mosquito and other pest control (e.g. gypsy moth)
- # Predator control by others
- # Research by third parties, not related to refuge management information needs

Generally prohibited uses – no compatibility determination required

- # Business, commercial or industrial
- # Civilian aircraft landing
- # Tally ho fox hunting
- # Sand and gravel extraction
- # Off road vehicle use (including ATVs, golf carts, airboats)
- # Snowmobiling
- # Horseback riding
- # Field trials
- # Beekeeping
- # Wild rice harvest
- # Rock hounding
- # Geo-caching
- # Paintball games
- # Antler collecting
- # Harvest of plants or plant parts (other than raspberries, blackberries, or mushrooms)
- # Kite flying
- # Turtle Harvest
- # Night-lighting fish or wildlife

